

THE HERBERT M. SINGER
ANNUAL REPORT SERIES



STATE OF THE NATION REPORT

SOCIETY, ECONOMY AND POLICY IN ISRAEL

2020



The Herbert M. Singer Annual Report Series

State of the Nation Report

Society, Economy and Policy in Israel 2020

Avi Weiss, Editor



Taub Center for Social Policy Studies in Israel

Jerusalem, December 2020

Taub Center for Social Policy Studies in Israel

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DEDICATION TO PROF. YAAKOV KOP Z\"L

In the name of the staff of the Taub Center, past and present, I am honored to dedicate the *State of the Nation Report 2020* to the memory of Prof. Yaakov Kop z\"l.

In 1982, Prof. Kop along with Prof. Israel Katz founded The Center for Social Policy Studies in Israel, today's Taub Center. For a decade, he served as its head of research, and in 1992, became its director — a position that he held until his retirement in 2008.

Prof. Kop, who was an economist and demographer by training, had a wide depth of knowledge in the social sciences and was able to provide the Center with a perspective that combined many disciplines in social policy: education, welfare, health, and economics. This knowledge and perspective helped him establish an external advisory board that included academic experts in Israel alongside professionals working in the field. At that time, the Center was the only research institute in Israel that both analyzed data and formulated policy recommendations in the social policy realm. The Center's activities during this period were based on a small staff and on a wide net of researchers in different fields — economics, sociology, social work, and demography — who wrote studies, surveys, and books on a variety of subjects. The work was published by the Center and soon became essential tools for many policy makers. Prof. Kop maintained a close relationship with the JDC, which was a founder of the Center, and established working relationships with important research centers around the world including the Brookings Institute, with collaborative work and conferences on subjects like social policy and macroeconomics.

Prof. Kop also accompanied the Center on its move from two small flats in the Rasco neighborhood of Jerusalem to its current home.

Above and beyond his abilities as a researcher and director, he will be remembered as someone with a pleasant personality who was able to form and lead a team of workers and researchers with different views and approaches with few tensions. Out of a deep commitment to the welfare of Israel's citizens, he succeeded in connecting the academic research world with the political world in a way that allowed the Center to conduct a social policy dialogue that rested on deep empirical analyses. In his quiet and laid-back way, he knew how to overcome many obstacles, and turned the Taub Center into a well-respected and influential institute.

May his memory be blessed.

The Editor

A Message from the Chair of the Board of Directors



It gives me great satisfaction to present the 2020 edition of the Taub Center's Singer Series *State of the Nation Report*. This has been an incredibly difficult year for everyone, with the coronavirus pandemic reshaping our lives. As Chair of the Taub Center for Social Policy Studies in Israel, I was particularly proud of the studies that the researchers released in the *Viral Economics* series, analyzing the pandemic and its effects on all aspects of Israeli life and society. This, in addition to the usual continuing research efforts and publication of studies throughout the year

unrelated in whole or part to the pandemic, as witnessed in this book. As always, the Taub Center staff continues to create important and relevant research and brings it to the attention of the audiences that need to see it.

As a result of the pandemic, the book this year is somewhat different from those in other years. Macroeconomics, labor markets, welfare, and education, focus on the coronavirus: how the crisis was handled, what should have been done, what needs to be done, the effects of the coronavirus has had on Israel to this point, the effects that are expected going forward, and so much more. The hope is that this difficult period will terminate reasonably quickly, and that next year's book will be able to bring back the more standard fare, analyzing long term trends rather than concentrating on the present, showing where we stand among the developed nations of the world rather than focusing mostly inwards.

Good health to us all!

Helen Abeles

Chair, Taub Center Board of Directors

A Message from the Director General



Fulfilling the Taub Center's mission of conducting high-quality social policy research and sharing this research with all those who can use it to positively impact Israeli society means that we are always working to bring to light Israel's most pressing policy issues, those that have real implications for people's day-to-day lives. This year, perhaps more than ever, the urgency of our mission has come into focus, giving us the chance not only to analyze the current situation and provide insight to policy makers and the public in real time, but also to identify challenges magnified by the coronavirus

pandemic and to consider opportunities for long-term policy changes that will enable us to ultimately build a stronger, more sustainable Israeli society. This year's Herbert M. Singer Series *State of the Nation Report* will serve as a critical resource for all those who seek to better understand the implications of the coronavirus for Israel's society and economy, and we are grateful to the Herbert and Nell Singer Foundation for making it possible. We are also incredibly grateful to our Board of Directors, General Assembly, and all of our supporters, whose steadfast commitment has enabled us to continue doing what we do best in spite of the unprecedented challenges we have all faced.

During this year, the phenomenal staff at the Taub Center have worked tirelessly to ensure that we not only carry out the highest quality research possible, but also that we ensure the efficacy and relevance of our research by sharing our expertise widely in a variety of forums, from publicly available lectures to meetings with MKs and senior-level government ministry staff. One particularly meaningful aspect of our work that was further strengthened this year through the proliferation of online meeting platforms was the opportunity to convene experts from a variety of different fields and disciplines to facilitate joint learning and the development of public policy that is grounded in evidence-based research. The coronavirus has kept us as busy as ever, and we are proud that in carrying out our 38-year-old mission, we have been able to bring our resources to bear for the benefit of all those who live in Israel.

Suzie Patt Benvenisti

Director General, Taub Center

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Editor's Introduction



I am honored once again to present this year's Taub Center for Social Policy Studies in Israel's *State of the Nation Report*, the latest in the Herbert M. Singer Annual Report Series. This year's book is dedicated to the memory of Prof. Yaakov Kop, z"l, who was instrumental in the Center since its inception in 1982 and was the director from 1992 until his retirement in 2008.

The year 2020 has been an unusual one by all standards, with the coronavirus pandemic heavily influencing almost all aspects of our lives and of the economies in Israel and worldwide.

As in the last few years, this year's book contains five overview chapters in health, macroeconomics, labor markets, education, and welfare, all of which concentrate on the effects of the pandemic to date and implications for the future. In addition, the book contains eight complete research papers, some new and some released earlier this year, and three executive summaries of papers from earlier in the year. Two of these are part of a new Taub Center research paper series on early childhood, authored by members of the Taub Center Initiative on Early Childhood Development and Inequality. In addition to these studies, the Center also issued numerous studies during the year that were focused more narrowly on the epidemic. These are all available on our website and will not be replicated here.

The natural place to start given the new reality is with the health system, which bore and continues to bear a substantial share of the burden from the pandemic. The overview chapter, authored by *Prof. Dov Chernichovsky, Prof. Benjamin Bental, Rachel Arazi, and Elon Seela*, is divided into two main sections. In the first, the authors start with an international comparison showing that Israel's situation is "relatively" good, and then breaks this down by population groups, considering both the health and the economic effects of the pandemic and its handling. In particular, there is a fascinating discussion of potential intergenerational conflicts that may emerge out of the heavy burden placed on working-age individuals through the shutdowns, for the benefit of

the health of those most susceptible to die from the disease — the elderly. The second half of the paper delves deeply into the administrative handling of the crisis, guiding the reader through the myriad of agencies involved and the tasks carried out by each along the way. One of the main takeaways from this discussion is that the health funds, the Kupot Holim, were best placed to be able to handle the crisis within the neighborhoods but were not brought into the fray until late in the process.

The health section continues with a new paper that presents a survey of the supply of physicians in Israel, past and future. In this chapter, *Prof. Aviad Tur-Sinai*, *Noam Zontag*, *Prof. Orna Blondheim*, *Prof. Alex Weinreb*, and *Prof. Dov Chernichovsky* carefully follow the developments in this market, which they show to be in a far superior state than expected just a decade ago. The increased supply has come from growth in the number of Israeli physicians, including a fast-growing number of Arab Israeli doctors who mostly study overseas, replacing the large supply of physicians that arrived in Israel from the former Soviet Union in the nineties and have retired or are near retirement. Differentiating between physicians and specialists, the paper shows that while both have been increasing steadily since the turn of the century, the relative increase in specialists has been more substantial, signifying an increase in the quality of medical care (at least from the perspective of physicians) in the country. However, the ever-growing population in Israel (1.9 percent per year) means that the supply of physicians must increase just to keep pace. While the number of specialists per capita has increased, this is not the case for the number of physicians per capita, which has fallen by about 9 percent since 2000, though this falling trend has been reversed in the last few years. The paper also looks carefully at the countries in which medical degrees are earned and demonstrates the relatively greater success of those who studied in Israel.

The book turns next to the other obvious casualty of the pandemic — the economy. The macroeconomic overview chapter, authored by *Prof. Benjamin Bental* and *Dr. Labib Shami* considers what has happened to the Israeli economy in 2020, what is expected going forward, and how this compares to what occurred in other countries. Israel's economy was hard hit, though not harder than in many other OECD countries, but when taking into account Israel's population growth, the situation is more dire. While Israel has done much to assist workers put on leave, its assistance to the business sector has lagged behind that in most other developed countries. This could place a heavy burden on many businesses, particularly on the smaller ones.

This is followed by demographic projections for Israel until 2040 by *Prof. Alex Weinreb*. This paper shows how population size and structure will change over the next twenty years. It pays particularly close attention to the precise age distribution and fertility patterns in the country. Israel's population has a classic though now unusual pyramid shape, with population size decreasing with age. This means that although life expectancy is higher than in most developed countries, the portion of the population that is elderly is significantly smaller. This percentage, however, will increase rapidly over the next 20 years, especially in the Arab Israeli population, posing many challenges that it would behoove the country to start addressing now. All told, Israel's population is projected to increase from about 9 million in mid-2019 to 12.8 million in 2040. Interestingly, the annual growth rate is projected to fall from 1.9 percent per year to about 1.5 percent, with this reduction being driven disproportionately by reductions in fertility in the Arab Israeli sector. The projections in this paper could be used to inform policies regarding the education system, health needs, employment expansion, and many other social aspects of Israeli society.

The final paper in this section is a study of the non-observed economy, more commonly known as the "black economy," in Israel by *Dr. Labib Shami*. In this paper, Dr. Shami estimates the size of the non-observed economy in Israel using a "currency demand" method. Based on this model, Israel's non-observed economy has fallen steadily since 2007, and in 2018 accounted for about 10 percent of GDP. Only a tenth of that is the result of tax evasion, with criminal activities making up almost all of the remaining 9 percent of GDP. Referring to the current situation, it seems that some of the conditions for receiving government assistance due to the pandemic (such as having lost at least 25 percent of the company's turnover) could encourage businesses to conceal income, thus increasing the size of this "underground" economy.

The labor market section begins with an overview by *Noam Zontag*, *Prof. Gil S. Epstein*, and me, once again concentrating on the effects of coronavirus. The paper begins by clarifying the different measures of unemployment that have popped up since the pandemic started, and shows how these have changed over time, both overall and in different population groups and economic branches. The chapter also contains an interesting spotlight that explains the recent decision by the Ministry of Finance to freeze the updates that are meant to result from publication of the average wage, e.g., an adjustment in some wages in Israel, including the minimum wage. During the shutdowns, the workers who were temporarily absent from their place of work or were

let go tended to be lower salaried workers, with average salaries about 60 percent of the average in the labor market. By removing these people from the workforce, the average wage artificially increased significantly. The Ministry's decision is meant to avoid an unjustified linking of salaries to this temporarily high index.

Following the overview, the issue of the ability to work from home that has become so focal during this crisis is investigated by *Shavit Madhala* and *Prof. Benjamin Bental*. The paper concentrates on the characteristics of workers that enable them to work from home. The findings indicate that workers in more prestigious occupations have a greater ability to work from home. Conversely, workers under the age of 25, those without an academic education, and Arab Israelis have a lower probability of being able to work from home. The authors stress the importance of improving technology-based skill levels among these weaker groups in order to improve their integration into the labor market.

The last chapter in the labor market section, by *Haim Bleikh*, addresses the issue of overeducation in Israel. An overeducated worker is one who attained an academic degree but works in a job in which that degree is not required. Aside from such a worker earning less than he could potentially, an overeducated worker tends to also have relatively low job satisfaction and motivation. The analysis shows that there tends to be high level of overeducated among those without good proficiency in Hebrew (mostly immigrants who studied abroad but also many Arab Israelis), those who change jobs at an advanced labor-market age, and those who are less mobile (e.g., those who travel by bus). All told, about one out of every six workers in Israel is overeducated or "underemployed."

The welfare overview by *Prof. John Gal* and *Shavit Madhala* comes next. The authors analyze the welfare state's response to the pandemic, uncovering those areas in which the response has been substantial and sufficient and those in which it has not. It is clear that poverty and inequality will increase as a result of the pandemic, and unemployment of the weaker strata of the population will remain high for an extended period. As in other countries, most of the expenditure is on social protection (e.g., unemployment benefits) with far less spent on social investment (e.g., vocational training programs). All told Israel's expenditure on social security and social welfare grew by about NIS 183 billion in 2020, 47 percent more than in 2019. The paper breaks down the different support spheres and allocations made by the government and shows which were implemented on a significant scale and which were not.

This issue of social investment versus social protection is analyzed deeply in the next chapter, by *Prof. John Gal, Shavit Madhala, and Guy Yanay*. There are two schools of thought of how to best utilize resources allocated for welfare purposes. The traditional view is that the welfare state should concentrate on helping the weakest populations — those with insufficient income and resources to meet their needs. A different approach is to use these resources to enhance human capital through early childhood education and training programs for adults that will help people to improve their skills enabling them to find better employment. This paper shows the extent to which the social investment approach has been expanded relatively and discusses the potential of such an approach as well as its limitations. The reader should note that, as shown in the previous chapter, 2020 has brought with it a massive increase in social protection with relatively little increase in social investment.

The final section of the book deals with education and begins with an overview by *Nachum Blass* who discusses opportunities and risks presented to the education system by the new reality. The paper considers how the system functioned during the lockdown, but it is also concerned with the long-term effects on the education system. To this end, the book considers four different groups — students, teachers, the Ministry of Education, and parents — from multiple crucial angles. To help address the future implications the author utilizes an initial analysis of responses by some 6,000 teachers to a survey conducted by the Taub Center together with the Israel Teachers Union regarding their experiences during the lockdown. Along the way the chapter also addresses the issue of strengthening measures to reduce educational gaps by changing the bagrut exams and creating a national education council.

The next chapter, also by *Nachum Blass*, is a new study presents three alternative frameworks for adapting the education system during this pandemic due to the requirement to decrease class sizes. The first is the one adopted by the Ministry of Education in which different grades return to school for varying numbers of days and hours and learn in groups with no more than 20 students. The second has students learning the entire week, but in shifts. This alternative requires a sharp increase in the number of teachers, which requires both finding enough qualified teachers and increasing budgets substantially. The third has students learning the entire week in smaller groups, but for fewer hours than before the pandemic. This requires finding enough classrooms to house an increased number of classes, and the author offers some potential solutions to this problem. While the first two alternatives are

provisional and temporary measures, the third has the potential of becoming a highly significant permanent change.

The final full chapter presented in the book is a study of expenditure per class and per student in primary schools in Israel by *Nachum Blass* and *Haim Bleikh*. It considers the issue of differential budgeting between the different systems and between schools with students from different socioeconomic strata. The analysis shows that less preference is currently given to the official public education system than in the past, but that within each part of the system the level of affirmative action — that is, augmented support for schools serving poorer populations — has increased.

The book concludes with executive summaries of three additional studies carried out this year. The first is on achievement gaps by sector and socioeconomic background in the Israeli education system by *Nachum Blass*. Findings indicate a continuous but slowing improvement in student achievement in both the Hebrew and Arab education systems, and a narrowing of the gaps between those with similar socioeconomic standings. The gaps between strong and weak students, however, remain great.

The other two executive summaries are on papers written as part of the Taub Center Initiative on Early Childhood Development and Inequality. These papers are being published separately in a Taub Center research paper series on early childhood.

The first of these, by *Dana Vaknin*, compares the characteristics of early childhood education in Israel to that in other OECD countries and considers their influence on later achievements. While the percentage of children in preschool is double the OECD average, only one-quarter of them are in government supervised settings and the quality of preschool education needs much improvement; the child-staff ratio is very high and the level of formal education of the staff (primarily assistants) is quite low.

The final executive summary is on a paper by *Noam Zontag*, *Dr. Yael Navon*, *Dana Vaknin*, *Liora Bowers*, *Dr. Carmel Blank*, and *Prof. Yossi Shavit* that considers how participation in educational frameworks in early childhood affect achievements in national (Meitzav) and international (PIRLS and PISA) exams years later. The results differ across different population segments, but overall, it is clear that such participation is highly beneficial later on in life, especially for children raised by less educated mothers.

I would like to take this opportunity to thank a number of people who have been incredibly instrumental in publishing this book. First and foremost, Ayelet Kamay and Laura Schreiber who worked day and night on editing, graphics, layout, and so much more. Their level of professionalism is evident on every page of this publication. Second, Prof. Alex Weinreb and Prof. Gil Epstein for their assistance in reviewing the studies for content. Third, Anat Sela-Koren and her staff who make sure that our findings reach the people who need to see them, first and foremost decision makers. Fourth, I would like to thank the authors who were always respondent to my comments and suggestions and are those who deserve the credit for the high-quality research presented in this book. Fifth, Director General Suzie Patt Benvenisti who stands by my side throughout the year and takes upon herself extra responsibilities in the final quarter of the year in order to allow me to dedicate myself to this publication. Sixth, the Taub Center board members who support us and our efforts throughout the year, and especially our chair, Helen Abeles. Finally, I would like to thank all the Taub Center workers for their efforts throughout the year — you make the Center what it is.

Once again it has been a privilege bringing these studies to you, and, as in the past, I wish you pleasant reading and hope that you will learn from these studies as much as I did. We trust that the research carried out at the Center will continue to inform policy makers in Israel and will contribute to improving the well-being of all Israelis.

Prof. Avi Weiss

*President, Taub Center for Social Policy Studies in Israel
Department of Economics, Bar-Ilan University*

A few days after the completion of this report, Prof. Dov Chernichovsky, Chair of the Taub Center Health Policy program, passed away. Dov was a pillar of the Center, a renowned researcher and a unique individual. He will be greatly missed. May his memory be blessed.

Abbreviations

ALMP	Active labor market policies
CBS	Central Bureau of Statistics
CDC	US Centers for Disease Control and Prevention
EAG	<i>Education at a Glance</i> , annual publication of the OECD
ECEC	Early Childhood Education and Care
EU	European Union; 28 member states
GDP	Gross domestic product
GNI*	Modified gross national income
ILO	International Labor Organizations
IMF	International Monetary Fund
Meitzav	Hebrew acronym for School Growth and Efficiency Measures; exams administered in the 5 th and 8 th grades
NII	Israel's National Insurance Institute
NIS	New Israeli shekel, ₪
OECD	Organisation for Economic Co-operation and Development
PIAAC	Programme for the International Assessment of Adult Competencies; Survey of Adult Skills
PIRLS	Progress in International Reading Literacy Study; exams administered by the International Association for the Evaluation of Educational Achievement
PISA	Programme for International Student Assessment; OECD administered exams
RAMA	National Authority for Measurement and Evaluation in Education
TIMSS	Trends in International Mathematics and Science Study; exams administered by the International Association for the Evaluation of Educational Achievement

HEALTH

1

The Battle Against the Coronavirus From the Perspective of the Healthcare System: An Overview

Dov Chernichovsky, Benjamin Bental, Rachel Arazi, and Elon Seela

Introduction

The prevention and treatment of the coronavirus pandemic will be costly worldwide. Although a vaccine has been developed, and, hopefully, the future will hold cures as with other similar diseases, vaccines and treatments are not free. Up until now, the battle against the virus is unique in several respects. First, absent a medical solution — no matter how expensive — the prevention of infection and its consequences means a disruption of economic and social activity on a scale that has not been seen since the Spanish flu at the beginning of the previous century. Second, once infection occurs, there are additional costs to the medical treatment, namely the forfeited consumption out of a dwindling GDP. The day-to-day efforts to prevent the spread of infection by imposing economic and social restrictions and the additional budgets allocated to medical care require, therefore, a challenging balancing act between the prevention of infection and mortality on the one hand and the economic effect on GDP and consumption on the other.

The challenge is to save life at as low a price as possible in terms of lost GDP, while preventing social harm on an unprecedented scale. The coronavirus crisis is first and foremost a health crisis and that the focus on protecting the healthcare services should be at the core of the fight in order to prevent a situation in which hospitals are unable to admit patients, as occurred in Italy and Spain early on in the pandemic in February and March 2020.

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Like a chess game, the fight against the virus, in Israel and elsewhere, is a battle where the means for the opponent's defeat are known but simply not available. In contrast, it is known that, at least until that means is found, the king — namely, the healthcare system — must be defended, using a hard-to-predict “give and take” and perhaps even at any price. The analogy of a chess game is guiding the discussion of protecting a weakened healthcare system, which is facing a threat that was, at least at first, unfamiliar. The fight against the virus is exposing and amplifying the strengths and weaknesses of Israeli society and of the Israeli healthcare system, which need to be taken into account in solving the current crisis and certainly in crises to come. Moreover, the crisis can constitute an opportunity to make long overdue improvements in the healthcare system.

This survey has four main parts. The first part discusses the prevention of the spread of infection and morbidity, which constitutes a kind of protective wall around the healthcare system's ability to treat infected patients. After presenting Israel's achievements in terms of mortality rates, the second section looks at the healthcare system itself and the other players involved in the response to the pandemic. In this context, the main question that arises is whether Israel could have dealt better with the virus. As part of the discussion of prevention, we present the advantages Israel enjoys alongside the economic challenges it faces in confronting the pandemic. Furthermore, we devote particular attention to the “price of life” in Israeli society in the context of the coronavirus crisis.

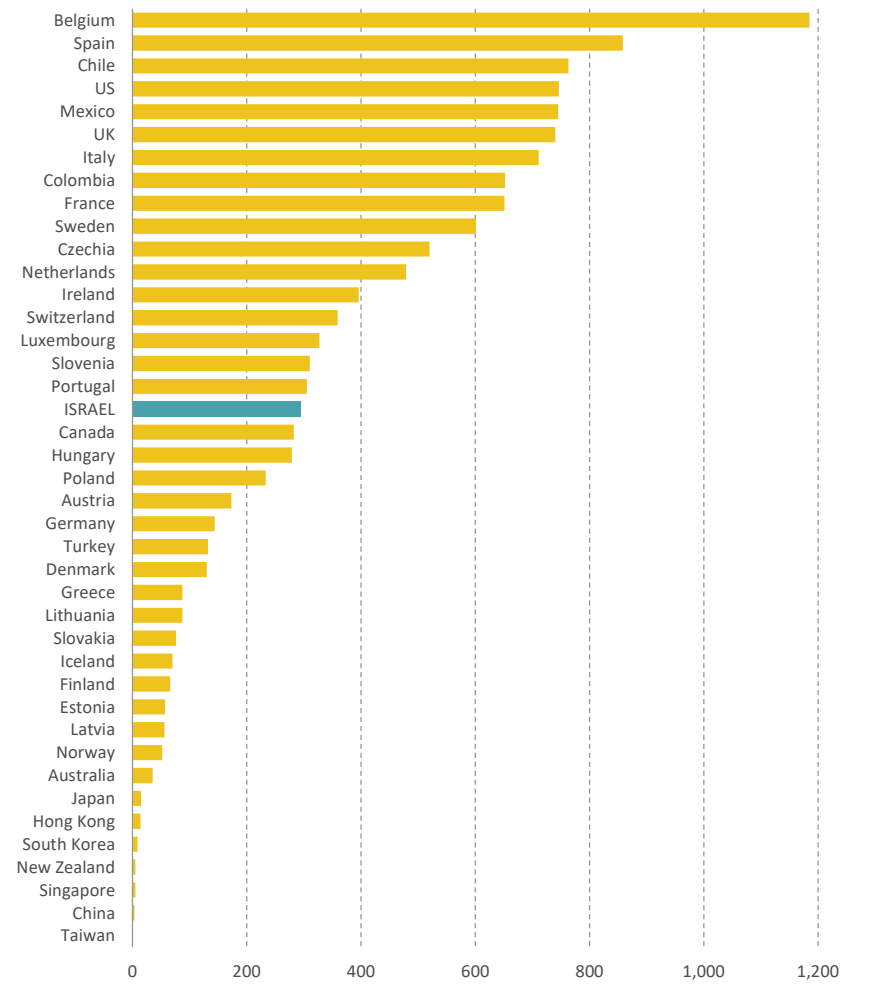
In the third part of the discussion, we examine the crisis management and the actions of the various agencies involved in fighting the pandemic, including the Ministry of Health and the Ministry of Defense as well as the authority they are granted (or not granted) by laws and regulations. Finally, in the fourth part, we discuss the healthcare system — its level of preparedness and the extent to which the budget assistance that it received can facilitate the long-term solutions it needs.

Israel's performance in the fight against the coronavirus

In terms of mortality per million inhabitants due to the virus, Israel is somewhere in the middle among the developed countries. In mid-November, the number of deaths per million inhabitants in Israel stood at about 290, which is higher than countries in the Far East — whose performance was a model for the fight

against the pandemic (only 9 deaths per million in South Korea, for example) — and some countries in Europe, and lower than in other Western countries whose performance was abysmal, including Belgium, Spain, the UK, and Italy, whose situations were dire early on in the process (Figure 1).

Figure 1. Mortality per million population, November 2020
OECD and selected countries



Source: Chernichovsky et al., Taub Center | Data: [Worldometers.info](https://www.worldometers.info)

This is little comfort. The questions to be answered are the following: Could Israel have done better? What worked in Israel's favor in the fight against the virus and what didn't? The answers to these questions can lead to improvements in the response to future crises.

A favorable starting position

Israel began the fight against the virus under relatively favorable conditions, particularly with respect to the demographic-health profile of morbidity and mortality caused by the coronavirus and with respect to lockdown capabilities.

Demography and the economy

Israel's population in 2019 was 9.136 million, which is distributed within a relatively small area of 22,145 sq. km, thus giving it a population density of 413 per sq. km, an area that is relatively easy to manage. The population is young: the 65+ age group accounts for only about 10 percent of the population, which is about half the rate in most of the developed countries. The population's health is relatively good, which is due not only to its young age profile but also to Israel's high levels of income and education. In view of the characteristics of the highest risk group in terms of the relative number of deaths from the virus, i.e., those of advanced age, in frail health, and of low socioeconomic status, with low access to medical services — it is to be expected that the mortality rate in Israel will be low relative to other developed countries.¹

Accessibility to healthcare services

Moreover, Israel's inhabitants — unlike those of the US as a prime example — enjoy universal healthcare, which guarantees them access to modern healthcare services. In other words, there is no situation in Israel in which a patient will be denied medical care, even when it is not emergency treatment.

The geopolitical situation

For political and security reasons, Israel is a geopolitical island with relatively hard borders, even considering the borders to the Palestinian territories. The main entrance that needs to be effectively closed is Ben Gurion airport.

1 It should be noted that Israel's high ranking in Figure 1 is, in part, due to the fact that there is no adjustment for the population age structure in the data.

Preparedness for a (short) crisis

As a result of its continual readiness for war, Israel can mobilize its resources, including advanced technological capabilities, for a short-term confrontation (in the form of an “operation”) more quickly and more efficiently than most other countries, which were also unprepared for this type of crisis. In the first lockdown, which was accompanied by high levels of uncertainty due to a general lack of understanding of the virus and its behavior, this preparedness spurred the population to comply with the social distancing directives and strengthened Israel’s ability to deal with the challenge relatively quickly.

Social solidarity

Despite the tribalism of Israeli society, its level of solidarity is relatively high. This was critical in the process to mobilize society and to minimize the potential intergenerational tension that prevailed at the beginning of the crisis between the young, who are “contributing” to the fight, and the elderly, who benefit most from medical treatment and whose lives are saved. This will be further discussed below.

Socioeconomic challenges

At least at first glance, it appears that the response of the public to the first lockdown, which was accompanied by high levels of uncertainty regarding the virus, differed from the behavior of significant parts of the population after the lifting of the lockdown, which was characterized by non-compliance with the directives as the character of the pandemic became clearer. It is possible that underlying this behavioral change was a growing understanding of the pandemic’s costs and benefits over time, which put long-term solidarity into question. From a socioeconomic perspective, this involves the risk from the pandemic faced by each population group and the price of prevention of infection and medical care.

Tribalism: morbidity, hospitalization and mortality in the various sectors

The differences between the various “tribes” in Israel — Haredim (ultra-Orthodox Jews), non-Haredim, and Arab Israelis, none of which are a monolithic group — are numerous, diverse and deep-seated, but are not the subject of this survey. These differences likely contributed to the different behavior patterns in

relation to the lockdowns and in the level of compliance with the government's directives to prevent the spread of the virus. From a socio-behavioral perspective, there is a question as to the extent to which a pattern of behavior is rational from the standpoint of the risk to the group that adopts it and the tribal psychology that is liable to accompany this risk, even unintentionally.

The morbidity and mortality caused by the virus are clearly age-dependent. The age distribution of the various population groups is one of the most evident differences between them, and therefore their patterns of morbidity and mortality differ. The Haredi population in Israel is particularly young, as is the Arab Israeli population. Thus, for example, individuals over 80 constitute about 4 percent of the non-Haredi Jewish population in Israel, in contrast to about 1 percent of the Arab Israeli population and about 0.5 percent of the Haredi population. Similarly, about 30 percent of non-Haredi Jews are over the age of 50 while in the Arab Israeli and Haredi populations this group constitutes 16 percent and 10 percent respectively (Table 1).

Table 1. The age distribution in Israel by population group, 2018

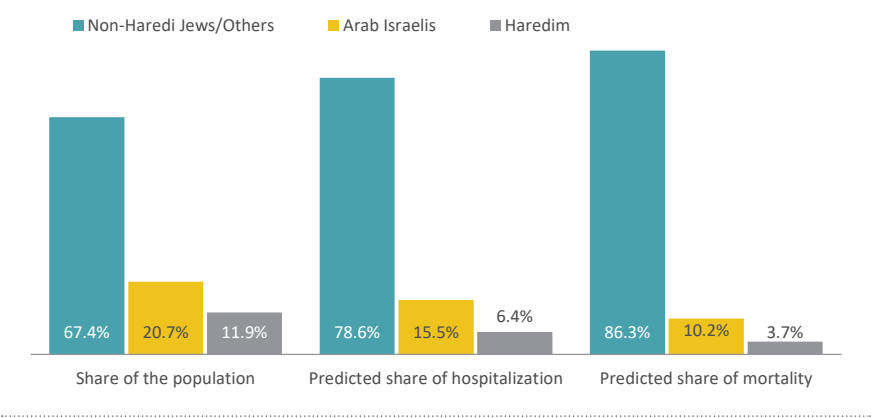
Age group	Non-Haredi Jews/Others	Arab Israelis	Haredim
0–9	16.4%	21.9%	34.1%
10–19	15.0%	21.3%	23.8%
20–29	12.5%	16.9%	14.9%
30–39	13.1%	13.3%	10.6%
40–49	12.2%	10.8%	6.8%
50–59	10.6%	7.9%	4.7%
60–69	9.5%	4.6%	3.1%
70–79	6.6%	2.2%	1.4%
80+	4.1%	1.0%	0.6%

Source: Chernichovsky et al., Taub Center | Data: CBS

Due to a lack of satisfactory data for the Israeli population, we used data from the Centers for Disease Control and Prevention (CDC) in the US to obtain age-adjusted probabilities for hospitalization and death from the virus and applied these probabilities to the relevant populations in Israel (Figure 2). Although the non-Haredi Jews constitute about 67 percent of the population in Israel, due to their age distribution their expected share of all hospitalizations is about 79 percent and of all deaths is about 86 percent. On the other hand, the share of the Haredim in the population is about 12 percent while their

expected share of hospitalizations is about 6.4 percent and of deaths is about 3.7 percent. The share of Arab Israelis in the population is about 21 percent and their expected share of hospitalizations is about 15.5 percent and of deaths is about 10.2 percent.²

Figure 2. The expected share of hospitalization and mortality for various population groups



Source: Chernichovsky et al., Taub Center | Data: CDC

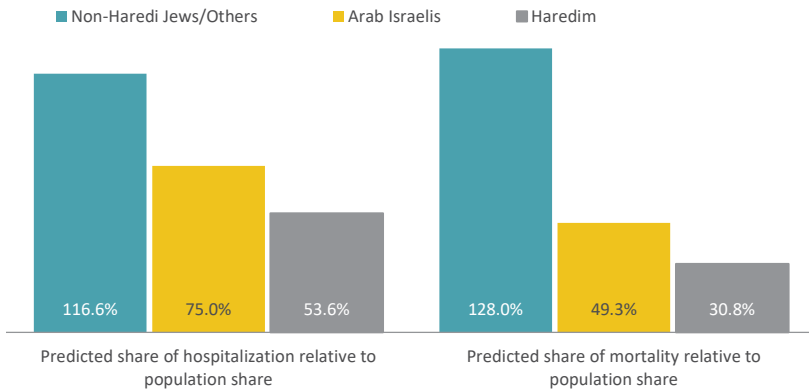
According to this data, it is possible to calculate for the average individual in each group the relative probability of hospitalization and death due to the coronavirus (Figure 3). Based on this calculation, the average likelihood of a Haredi individual being hospitalized is about 46 percent of that for a non-Haredi Jew while the figure for an Arab Israeli is about 64 percent. With respect to mortality, the chance of a Haredi individual dying from the virus is about 24 percent of that for a non-Haredi Jew and the figure for an Arab Israeli is about 38 percent.

Thus, within the limited boundaries of this discussion and ignoring many other factors, the tribal behavior of compliance or non-compliance with the rules of the lockdown makes some sense since it reflects the relative risk that each population group perceives and takes on. It became clear that this

2 The actual morbidity, hospitalization, and mortality rates among the Arab Israeli population, and even more so among the Haredi population, far exceed those expected based only on these populations' age structure.

reality creates a major challenge in the fight against the pandemic, namely the internalization of the cost to society in general, particularly to the majority who are not Arab Israelis or Haredim who take the toll for the behavior of some group or another. This discussion is not intended to propose solutions but rather to provide, to the extent possible, a quantitative presentation of the challenge, which is substantial from a numerical-probability perspective.

Figure 3. The expected share of hospitalization and mortality relative to the population group's share in the total population



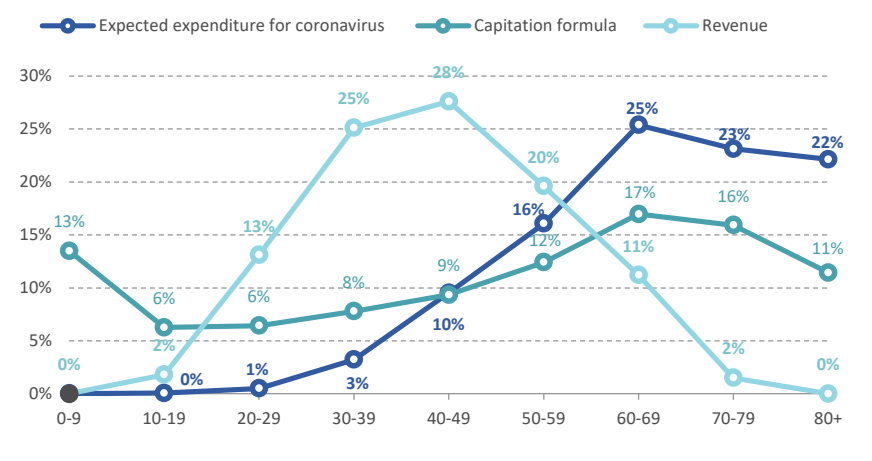
Source: Chernichovsky et al., Taub Center | Data: CDC

Intergenerational tension over time

In a national health insurance system such as Israel's, there is always an intergenerational transfer of resources from the young and relatively healthy to the old and relatively less healthy. This involves an arrangement for financing the current budget in which the insurance premiums and the health benefits they provide do not accumulate in favor of a particular insured individual. Rather, the payment is according to ability-to-pay, and eligibility is according to need, without any relationship between the payer and the beneficiary. Therefore, taxes and health insurance premiums are collected by the State and the National Insurance Institute (NII) and are then pooled by the latter and distributed to the health funds according to the number of their members and their profile by age and gender, with an adjustment for those living in the periphery (the "capitation formula").

Figure 4 (Chernichovsky & Bental, 2020) shows the share of the various age groups in the income distribution that is the basis for the public healthcare tax that helps finance the system, and the expected expenditure on each group according to the capitation formula. We assume that the two distributions represent the priorities of Israeli society and its willingness to subsidize treatment and save lives through medical care or to transfer income between age groups for this purpose, under the terms of the National Health Insurance Law. Under this assumption, the reality dictated by the National Health Insurance Law represents the social contract with respect to healthcare and life-saving in Israel.

Figure 4. The share of each age group in income, in healthcare expenditure according to the capitation formula, and in expected healthcare expenditure due to the coronavirus



Source: Chernichovsky et al., Taub Center, based on Chernichovsky and Bental, 2020

Accordingly, the young (up to the age of 19) are net beneficiaries. This is in fact an underestimation since a significant share of 18 to 21-year-olds serve in the army, which provides them with healthcare at the public's expense. The older age group of 57–58+ are also net beneficiaries. It is worth mentioning that this positive subsidy starts to decline at the late 60s. In general, the main working-age population, ages 21 to 57, subsidizes children on the one hand and parents on the other while also paying insurance for their own medical care.

One can frame the transfer from workers to retirees also in terms of insurance. The workers view the retirees at the present as themselves in the future, expecting that society will take care of their needs in the future just as they are taking care of the older generation at the present. The transfer to the young is considered to be an investment in future workers.

From the viewpoint of expenditure on the fight against the coronavirus, a different picture emerges. In order to construct the distribution of this expenditure across the various age groups, we made the following assumptions: a) in the absence of data unique to Israel, the probability of hospitalization and mortality for each age group is based on the CDC data presented above; b) the costs of treatment are divided between expected cost of hospitalization and of mortality based on the assumption that the cost of treating a patient who was hospitalized and recovered constitutes 92 percent of the cost of treating a patient who was hospitalized and dies.³ Based on these assumptions, we projected the expected cost related to the response to the coronavirus onto the various age groups. In contrast to the expected and generally accepted costs according to the capitation formula, the costs of the response to the coronavirus tend to benefit the 60+ group to a relatively large extent. In contrast to the under-21 age group, which hardly accounts for any of the costs and therefore is not subsidized, the elderly account for about 85 percent of the total cost of the coronavirus care, as opposed to about 40 percent of the daily cost in normal times. In other words, with regard to the response to the coronavirus, the elderly age group receives the share of the very young within healthcare costs — amounting to about 20 percent — and another 10 percent from the premiums paid for by the working-age population.

This reflects the reality of financing the general healthcare system in Israel from an age perspective, but is also applicable in a more general context. The economic costs of the lockdown are clearly related to the income age distribution, while the benefits are related to the relevant shares of the expected benefits of the prevention of hospitalization and death. In other words, those who bear the economic burden of the lockdown — from the perspective of age alone — constitute the population that produces about half of total income; however, they and their children gain almost no benefit from

3 The discussion is based on French et al. (2017). It should be mentioned that the previous estimates of the cost of death — the last year of life — were on the magnitude of about 60 percent of the total medical costs over the life cycle (Scitovsky, 1984). According to this figure, the curve would be even more biased toward the older age groups.

the prevention of infection. From the point of view of human capital, the fact that the young do not benefit creates an additional problem.

The solidarity implicit in the law is based on the social contract according to which when the young reach old age they will be treated like the elderly are treated today.⁴ This contract is not necessarily applicable in the case of the response to the coronavirus, which is perceived as a unique, temporary, and costly event. Since the income of the employed and the self-employed constitutes about 50 percent of GDP, and since the additional direct investment in the healthcare system up to now as a result of the response to the coronavirus (about NIS 17 billion) constitutes about 1.2 percent of GDP in 2019, the financing of only this additional cost is equivalent to about a 2 percent tax on the income of the employed and the self-employed. This implies an excess burden that is imposed on the working population in order to finance the direct response to the coronavirus pandemic.⁵

To conclude this section, the deviation of the distribution of the coronavirus subsidy from the normal subsidy distribution in Israel is liable over time to generate social tension and may put intergenerational social solidarity to the test. The burden of the response to the coronavirus, which benefits the elderly almost exclusively according to what we know at this time, is borne by the young who, together with their children, gain far less benefit. This situation represents a deviation from the normal age-based cost-benefit configuration determined by the National Health Insurance Law, which represents the social contract accepted in Israel with respect to the saving of life by means of healthcare. Despite the moral and ethical issues involved and given the existing resources — and in particular at a time when they are dwindling — a society tends to invest in the young rather than in supporting the old.

The “price of a life”

The first lockdown imposed in Israel lasted about a month and ended on April 19th, 2020. The lockdown, which was successful from the viewpoint of preventing mortality, of course had an economic cost. Even though “life does not have a price,” the question nonetheless arises of whether, in retrospect, the price that was paid is indeed acceptable to the Israeli society, within the given context.

4 The term “solidarity” is limited in this discussion only to intergenerational transfer and ignores transfers between other groups in society.

5 Based on data obtained from the Ministry of Health.

In practice, this question is answered when determining the budget for public healthcare services, within the framework of the National Health Insurance Law, and particularly in decisions regarding the adoption of new technologies and in the discussions of the Healthcare Services Basket Committee (also known as “the Basket Committee” or the “Healthcare Basket Committee”). In the first stage, the state decides on the public budget for the healthcare system. Within this process there is already a kind of determination of priorities regarding the saving of life, which is sometimes simply the means available to the doctor at the patient’s bedside. Furthermore, a designated share of the total public healthcare budget is allocated to the funding of new technologies (primarily pharmaceuticals) that will be included in the healthcare basket. In parallel to the budget decision, the Healthcare Basket Committee, which is an ad hoc public committee, prioritizes the technologies that will be adopted as part of the budget. In 2019, this budget totaled half a billion shekels (about \$143 million).

The committee, whose members include healthcare professionals, economists, religious leaders, and representatives of the public, prioritizes the technologies that are candidates to be included in the healthcare basket according to complicated medical, economic, ethical, and social criteria, including the cost-benefit ratio of the technology and, no less importantly, according to the number of patients that will benefit from it. The technologies that are finally included in the healthcare basket are those at the top of the list of priorities, up until the full utilization of the allocated budget.

The budget designated for new technologies and the committee’s decisions reflect the general norms established by the law and its interpretation and reflect social priorities (at the margins) with respect to the use of curative and life-saving technologies. Based on the Healthcare Basket Committee’s decisions in 2006 to 2007, Shmueli and Nissan-Engelchin inferred a value of NIS 200,000 (in 2006 prices) for a statistical life year (not adjusted for quality of life) and a value of NIS 250,000 for the price that society is willing to pay for a life year (adjusted for quality of life) (Shmueli & Nissan-Engelchin 2008; Shmueli, 2009). Using the lower figure, we increased it by 60 percent, according to the change in GDP in current prices between 2006 and 2019. We assume, therefore, that Israeli society’s willingness to pay for a life year, as reflected in the Healthcare Basket Committee’s decisions, increases by the rate of growth in GDP or income. This appears to be a good approximation in view of the relatively fixed share of healthcare expenditure out of GDP (about 7 percent).

Furthermore, we correct for the increase in medical costs beyond the growth in GDP at a rate of about 6 percent during this period. This correction assumes that the allocation to the healthcare basket at the margins remains stable in real terms and that it compensates for the change in healthcare costs relative to GDP, even if the committee’s budget is not explicitly adjusted in this manner.

According to these two adjustments to the original estimate, the value of a life year in Israel in 2019 was approximately NIS 340,000. This amount is more than double GDP per capita in 2019 (approximately NIS 150,000). Since we are not taking into account the cost of improving quality of life, we use this value in order to evaluate the investment, on the margin, in saving a life in the response to the coronavirus pandemic.

Our estimates for number of life years that can be saved in Israel by preventing mortality, according to age group, are based on the exact life expectancy of each age group in the country, as presented in Table 2 (Chernichovsky & Bental, 2020). We discount potential future life years by a rate of 3 percent (the accepted rate in the calculations carried out by the NII).

Table 2. Life expectancy and discounted life expectancy in Israel

Age group	Life expectancy	Discounted life expectancy
0–9	77.7	30.9
10–19	67.7	29.7
20–29	57.9	28.1
30–39	48.2	26.1
40–49	38.4	23.3
50–59	29.2	19.8
60–69	20.4	15.5
70–79	12.2	10.4
80+	7.3	6.7

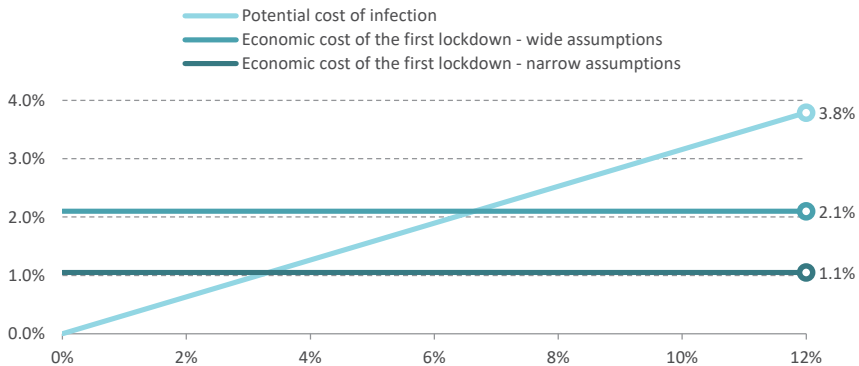
Source: Chernichovsky et al., Taub Center, based on Chernichovsky and Bental, 2020

We then apply the estimated value of a life year (i.e., NIS 340,000) to these data. Thus, for example, according to the third column in the table, Israeli society should be willing to invest up to NIS 10.5 million to save the life of a 5-year-old child but only up to NIS 2.3 million in order to save that of an individual age 80 or older. Although such a calculation leads to a thorny ethical dilemma, it is unavoidable since it represents the basic fact that the life expectancy of the

elderly is less than that of the young. Nonetheless, it is important to emphasize that underlying the approach used here is the assumption that a life year is the same no matter whose life it is or what its quality is.

Eckstein, Bental, and Sumkin (2020) report Israel's situation in the context of morbidity and mortality rates by age groups as of May 31st, 2020. On the basis of their data and the data in the life expectancy table, we can calculate (using an extrapolation that assumes a linear relationship between rates of infection and rates of mortality) the value of life years in terms of GDP that would be lost at various rates of infection, based on an estimated value of NIS 340,000 for each life year. Figure 5 charts the relationship between the rate of infection and the loss in the value of life years as a percentage of GDP, up to a maximum infection rate of 12 percent, which represents a situation of "sit and do nothing."⁶ According to the morbidity and mortality data as of the end of May, this rate of infection would have led to the deaths of about 17,000 individuals in Israel.⁷

Figure 5. The potential value of discounted life years that can be saved as a percentage of GDP by infection rate



Source: Chernichovsky et al., Taub Center | Data: Ministry of Health data for May 31st, 2020

- 6 According to the data of the government of Italy, during the month of March the rate of infection in Bergamo was 6–12 percent. The actual rate of infection was probably double that. See Buonanno, Galletta and Pucca (2020).
- 7 As of the end of May, the rate of infection in Israel was 0.215 percent and caused the deaths of 303 individuals. The result is obtained on the assumption that the ratio between the rate of infection and the number of deaths remains fixed.

The data in the figure can be interpreted as representative of the maximum amount, expressed as a percentage of GDP that would be worth sacrificing in order to “buy” life years at each rate of infection, up to the maximum number of deaths according to the experience in Bergamo, Italy. In other words, a 12 percent rate of infection would mean the loss of 17,258 lives, which translates into 156,107 life years. The lost value of life years is approximately equal to 3.79 percent of GDP in 2019. In economic terms, it would have been worthwhile for Israel to invest about 3.79 percent of its GDP in order to prevent morbidity. In actuality, there were 320 deaths up until the end of the second quarter, which represented a loss of 2,892 life years, whose value is 0.07 percent of GDP in 2019. If the difference is attributed to the lockdown, then it saved life years valued at 3.72 percent of GDP.

Although the first lockdown began in mid-March 2020, most of it fell in the second quarter. In real terms, GDP in the second quarter was lower by 8.2 percent than in the same quarter in 2019, while according to the rate of growth for 2020 that was indicated prior to the pandemic, it would have been higher by 3.5 percent relative to GDP in the second quarter of 2019. Using the financial values for 2019, this implies an amount of about NIS 30 billion or about 2.1 percent of GDP for 2019. According to this calculation, even if we attribute all of the loss to the lockdown, then at an infection rate of 6.5 percent the economic damage is equivalent to the value of life years that were saved as a result of the lockdown. If only one-half of the economic damage is attributed to the lockdown (on the assumption that the pandemic itself reduced economic activity), then the rate of potential infection of 3.25 percent equalizes the saving in life years to the economic damage. Of course, to the same extent, lower rates of potential infection result in the lockdown policy being less worthwhile as a “remedy,” from the perspective of the Healthcare Services Basket.

Analogously to the calculation of the value of life years saved up to May 31st, 2020, the period that includes the first lockdown, we now calculate the value of the life years that were lost between the lockdowns by not continuing the lockdown. In order to compare to GDP data, we relate to the third quarter (July 1st to September 30th, 2020). During this period, the number of deaths rose from 320 to 1,552, i.e., an additional 1,232 deaths, which according to the age distribution of mortality from the virus results in a loss of 12,162 life years. On the assumption that the continuation of the lockdown would have increased the number of deaths by 320, a loss of 9,270 life years can be attributed to the

lifting of the lockdown, with a value of about NIS 3.1 billion according to NIS 340,000 per life year. This amount constitutes 0.24 percent of GDP for 2019. Since GDP in the third quarter of 2020 grew by 8.6 percent relative to GDP in the second quarter, GDP grew during this period by about NIS 26.8 billion (in 2019 prices), which is about 1.9 percent of GDP in 2019.⁸ In other words, the increase in GDP is much larger than the value of the life years lost as a result of the opening of the economy during that period. In financial terms, for every life year lost the economy “gained” NIS 2.9 million, which is more than 8-fold the value of a life year, i.e., NIS 340,000, according to the healthcare basket calculations. On the basis of this purely objective calculation, the growth in GDP as a result of the lifting of the lockdown more than compensated the Israeli economy for the loss caused by the rise in mortality.

It is important to clarify the difference between the two outcomes, namely the one related to the beginning of the first lockdown and the other related to the ending of the lockdown. According to the latter, imposing the lockdown was worthwhile. The former calculation is based on the apocalyptic forecast according to which Israel would have suffered 17,000 deaths without a lockdown. This is an even lower number than that considered by decision makers at the time.⁹ It is clear that the larger the expected number of deaths, the more worthwhile is the investment in the lockdown, for any value of life. In contrast, the second calculation is based on realized data on GDP and mortality. In other words, given the data at that time, one cannot conclude from the discussion that as foreseen then, the first lockdown was not worthwhile. Moreover, it cannot be concluded from the data that a lockdown is necessarily not worthwhile in the long run. In Sweden, where there has been no formal lockdown, the rates of mortality rose and there was an economic loss. Thus, in contrast to Israel, Sweden paid twice — in terms of a high mortality rate as well as in the loss of GDP.¹⁰ It should also be noted that part of the price of the fight against the coronavirus pandemic is likely to be resulting illness and death caused by lack of routine treatment that would have been provided in normal times (Weinreb, 2021).

8 See Table F1 in the Monthly Bulletin of Statistics for Israel. The data are seasonally adjusted.

9 At that time, the National Security Council expected about 30,000 deaths in their “optimistic” forecast. See the [Report of the Advisory Group to the National Security Council on Responding to the Corona Pandemic](#), May 10th, 2020 (in Hebrew).

10 For a comparison between Denmark, where a lockdown was imposed, and Sweden, see Andersen, et al., 2020.

Crisis management: From over-concentration of authority to overlapping responsibilities, a lack of orchestration, and confusion

Much has been said about the management of the coronavirus crisis in Israel. Underlying this criticism is the original sin of the system, namely the actions of the Ministry of Health, both as an agent and as a policy maker and regulator (see, for example, Chernichovsky & Kfir, 2019a; 2019b). The Ministry has refrained from giving up any of its executive powers. This is reflected in the marginalization of the health funds and community medicine — the cornerstone of medical care in Israel — at least early on in the crisis. The combination of concentration of authority in the Ministry and legislative constraints has led to non-compliance with rules and regulations by individuals and the state itself, and, in turn, to the institutional disorder that has accompanied the crisis management until now.

This section examines the content of the legislation and the regulations and their quality, as well as the gap between them, on the one hand, and the reality on the ground, on the other. In other words, we will be examining the model used by the healthcare system in preparation for national health emergencies and its implementation in practice during the first few months of the coronavirus pandemic.

Routine and crisis: Authority and responsibility

The management of the Israeli healthcare system rests on two legal principles: the National Health Insurance Law, 5754-1994 (herein: the Law) and the Mandatory 1940 Health of the People Ordinance (herein: the Ordinance). The Law determines the day-to-day activity of the system in normal times. The underlying principle is of managed competition, based on the idea that the system is too complicated to be run in a centralized manner. Therefore, the state guarantees that the system will have sufficient public funding, it determines policy and eligibility and it regulates the activity of diffuse competing agents on the ground, through the health funds, which operate to the benefit of the insured public. The health funds are committed to a national deployment of services, including primary care, secondary care, diagnostic centers, and laboratories. In addition, they also operate call centers for various remote services, which constitute an important layer in their day-to-day activity.

The Ordinance, which was passed in 1940 and amended periodically, regulates the activity of the healthcare system also in matters related to public health and disease prevention, which naturally also require non-medical ancillary activities, such as supervision of sanitary conditions or activities on the population level, such as the issuing of directives and their enforcement in the case of an infectious disease outbreak.

Among other things, the Ordinance states that the control of disease and of infectious diseases in particular will be under the responsibility of the Ministry of Health, and it provides instructions for how to respond to such an outbreak. The Ordinance and the regulations that follow it define a series of preventive measures that the Ministry is to carry out, whether on its own or in concert with other ministries, such as the Ministry of Agriculture or the Ministry of Environmental Protection, and with the local authorities. In addition, the Ordinance states that, in cases of widespread disease, responsibility for the event management will be transferred to the Ministry of Defense.

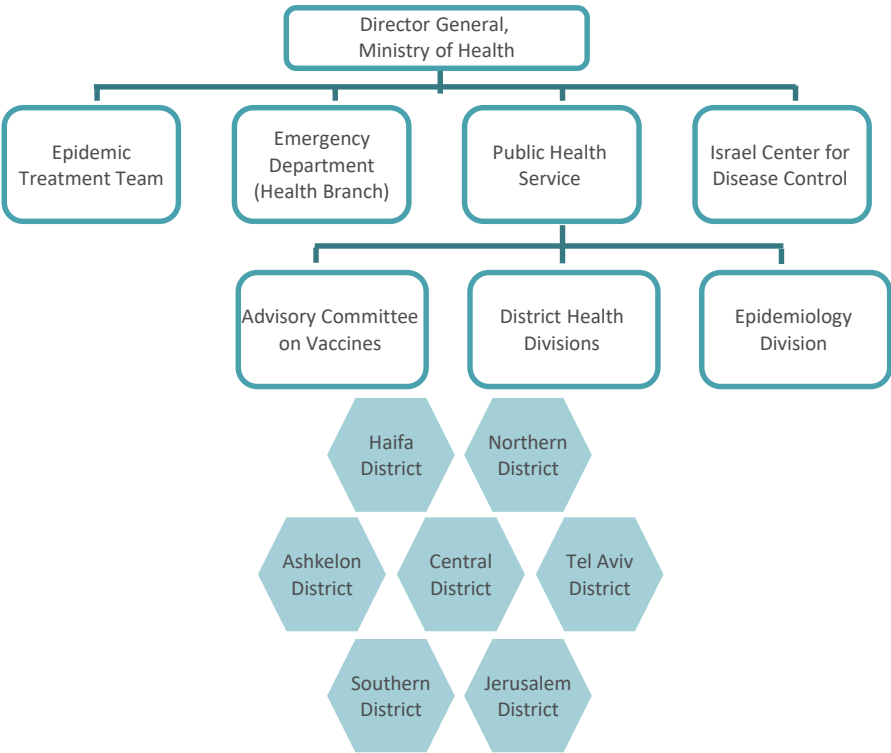
As can be seen in Figure 6, the Ministry of Health, in its function as regulator, includes various units that deal with tracking and monitoring during an epidemic or a crisis, and primary among them is the Public Health Service, which operates through the district health offices. In addition, there is an Emergency Division, which is meant to implement the Ministry's policy. Reporting to it is the Epidemic Treatment Team, which advises the Director General of the Ministry in all aspects of epidemics and their control, including the formulation of strategy and operational guidelines. The Team monitors outbreaks of disease and estimates the risk of them spreading to Israel, and determines the need to prepare and to take preventive measures. In the event of an outbreak of an epidemic, the Epidemic Treatment Team is meant to assist in the event management. Another body within the Ministry of Health, which reports to the Branch for Evaluating Medical Technologies, Information and Research is the Israel Center for Disease Control whose role is to monitor the spread of disease.

During an emergency, the healthcare system in Israel is operated by the Authority for Hospitalization and Healthcare During Emergencies (Procedure 1.003),¹¹ which is a designated authority of the Economic Emergency Committee (the body that manages the economy during an emergency on behalf of the Ministry of Defense). The Authority is meant to plan, organize,

11 See [Health System Preparedness for Hospitalization and Healthcare in an Emergency](#) (in Hebrew).

and operate the hospitals and the healthcare system in an emergency, to serve all victims and maintain the hospitalization services for those in need, as well as the healthcare services in the community and preventive healthcare for the population as a whole. The headquarters of the Authority is located within the Emergency Department of the Ministry of Health. Its managerial staff includes the Director General of the Ministry of Health and the Chief Medical Officer, as well as the directors of the health funds. Its core staff includes the Director General of the Ministry of Health, the Chief Medical Officer, and the Director General of the Clalit Health Fund.

Figure 6. The main agencies within the Ministry of Health responsible for dealing with an outbreak of disease and the prevention of epidemics



Source: State Comptroller, 2020, p. 524

According to the directives of the Ministry of Health, in a crisis (a war, a biological disaster, an earthquake, etc.) the health funds are to be prepared for all emergency scenarios and to be able to function as community treatment centers and to offer initial assistance to victims. According to the existing procedures, in an emergency, the health funds are expected to operate in full cooperation with the municipalities, various organizations, nearby hospitals, and the district health offices.

The procedures are defined according to the plans drawn up by the Ministry of Health: a 2005 preparedness plan for a pandemic, a 2007 plan called “Preparedness of the Healthcare System for a Flu Pandemic,” and a 2008 generic operational plan that formalizes the handling of a biological disaster.¹² The assumption in these documents is that the risk in such an event is the large-scale spread of disease that poses a public health risk and creates a burden on the hospital system preventing its optimal operation.

The division of authority described here, which is based on the aforementioned government decisions, establish that the Ministry of Health is responsible for managing the professional aspects of responding to a pandemic, including the operation of hospitals, clinics, and health offices; clinical and laboratory monitoring; preparing reference scenarios for an event; procurement and allocation of drugs and vaccines; and, finally, informing the public. In contrast, the defense sector, as explained above, is responsible for managing the other aspects of the response, by means of the Home Front Command and the Economic Emergency Committee, which in 2009 became the National Emergency Management Authority (NEMA). These aspects include the actions to be taken in an emergency, including the opening and closing of schools, maintaining public order, imposing of lockdowns and if needed, the operation of the economy. The procedures, which are in line with accepted practice worldwide, define the stages of a pandemic and the activity of the healthcare system according to those stages. In the preparatory stage (Stage IV), before the appearance of the disease in Israel, the Ministry of Health is to inform the health funds and the relevant government ministries of the approaching pandemic and instruct them to make the necessary preparations.

12 See [The Medical Response Plan for an Unusual Biological Event — the First Few Hours](#) (in Hebrew).

At Stage V, where transmission is clear and the danger of a pandemic is more imminent although without morbidity in Israel, the Ministry of Health is to update the government, the Ministry of Defense, the Economic Emergency Committee, the directors of essential agencies, and the local authorities that Stage V has been reached and its implications. The Ministry of Health is also to transfer responsibility for managing the crisis to a Crisis Management Group in the Ministry of Defense and also to operate the headquarters of the Hospitalization Authority, to fully deploy all the components of the healthcare system and to update all of the healthcare frameworks of the event. In Stage Vb, immediately upon detection of patients in Israel, the healthcare system is expected to activate the Hospitalization Authority (Procedure 1.003).¹³

Stages of preparedness for a pandemic as the basis for the division of authority

The World Health Organization (2005) defined six stages in preparing for a flu pandemic:

- Stage I** A new virus in animals. A low risk for appearance in humans.
- Stage II** A new virus in animals. A high risk for appearance in humans.
- Stage III** Instances of morbidity in humans (random and rare transmission among humans).
- Stage IV** Limited infection from person to person and localized morbidity.
 - IVa** Small clusters of morbidity abroad.
 - IVb** Small clusters of morbidity in Israel also.
- Stage V** Significant transmission from person to person with localized disease.
 - Va** Significant clusters of morbidity abroad.
 - Vb** Significant clusters of morbidity in Israel also.
- Stage VI** A flu pandemic — widespread transmission throughout the world.
 - VIa** Disease has not yet spread to Israel.
 - VIb** Spread of the disease in Israel also.

13 See [Procedures for an Emergency — Hospitalization, Part 1 — Organization and Operation](#) (in Hebrew).

The relevant stage is determined by the World Health Organization at any given time while the sub-stage in Israel is determined by the Ministry of Health. From Stage V onward, the national responsibility for managing the crisis is that of the Crisis Management Group in the Ministry of Defense, by means of the Economic Emergency national headquarters and the Home Front Command (Ministry of Health, 2007).

The Ministry of Defense. According to law, it is the Ministry of Defense that is responsible for national emergencies in Israel. According to the State Comptroller Report published in March of this year, when there are a large number of victims and the functioning of the economy is impeded, the overall responsibility for the functioning of the various sectors in the economy is that of the Ministry of Defense by means of The National Emergency Management Authority (NEMA) and the Home Front Command (State Comptroller, 2020). Support for this can be found in Government Decision 4356¹⁴ from 2005, which states that when the WHO declares a pandemic, “it is the responsibility of the Ministry of Defense to provide solutions on the national level in essential areas of the economy by means of the Crisis Management Group through the Economic Emergency national headquarters (which in 2009 became the National Emergency Management Authority) and the Home Front Command.” In this situation, the assistant to the Minister of Defense is to coordinate “the work of the Crisis Management Group on behalf of the Minister of Defense by means of the Economic Emergency Committee” while the Ministry of Health has the overall responsibility for managing the professional and medical aspects of the crisis.

The National Emergency Management Authority (NEMA) was established by Government Decision 43/b on December 23rd, 2007.¹⁵ It serves as the coordinating agency for all organizations dealing with the home front during an emergency, in a wide variety of scenarios, including a pandemic. As a civilian body, NEMA assists the Minister of Defense in crisis situations and orchestrates the functional continuity of the economy and of government ministries.

When NEMA was created, its officials were scattered among various districts and it was managed by senior professionals with military and other logistic experience. Over the years, the status of NEMA has declined.

14 See Government Decision No. 4356, [Preparedness for a Flu Pandemic Outbreak](#), November 6, 2005 (in Hebrew).

15 See the [Ministry of Defense website](#).

In May 2018, it was placed under the Home Front Command, the number of its positions was reduced significantly (currently it is operated by only a few junior-ranked individuals), and its function of liaison with the local authorities was canceled. Since December 2019, NEMA has had no director and only recently, at the beginning of July 2020, was a tender publicized to hire one.

According to changes in 2018, NEMA is to focus on planning and coordination, while execution and responsibility for the economy in a crisis, for the operations rooms, and for the local authorities has been transferred to the Home Front Command. These recommendations were not approved by the government, but were nonetheless implemented in practice.

The Home Front Command, which can be characterized as a military logistic body, operates as part of the army (Israel Defense Forces, IDF) under the responsibility of the Ministry of Defense. The Home Front Command was created with the goal of operating on the civilian front, both in normal times and in an emergency, in order to prepare the population for an emergency. The Home Front Command works in cooperation with the various emergency organizations: the police, the Firefighters and Rescue Authority, Magen David Adom (Israel's Red Cross) and others. The Home Front Command districts are responsible for maintaining continuous contact with the local authorities, with emergency organizations, and with the government ministries. Oddly enough, it is not to cooperate, officially, with the health funds.

The Home Front Command is responsible for early warning, reinforcement of buildings and bomb shelters, the location of rocket landings, search and rescue, disseminating information and instructions among the population prior to an emergency situation, and operation of the command and control systems that are designated for the home front. Over the years, the Home Front Command has undergone various transformations. Currently, it is the body that organizes emergency activity. The Home Front Command has primarily prepared for various security scenarios and for earthquakes and has been less focused on pandemics.

The National Security Council (NSC) was created in March 1999 and in 2008 it was established by law as the national security body that advises the Prime Minister and the government in the areas of foreign affairs and security. The role of the NSC according to law is to coordinate the activity of the government, the Ministerial Committee for National Security, and any other ministerial committee to do with foreign affairs and security, to

prepare materials for the discussions of the government and its committees, to monitor the implementation of decisions and to recommend the invitation of guest participants to sessions of the various committees, to be responsible on behalf of the Prime Minister for inter-organizational and inter-ministerial activity related to foreign affairs and defense, and even “to operate the Center for the Management of National Crises within the Prime Minister’s Office,” a body that to the best of our knowledge does not yet exist. The NSC is an advisory body and usually does not act as an executive body.

It should be mentioned that in many countries, the handling of crisis situations has been assigned to a separate government ministry, such as, the Department of Homeland Security in the US or the Interior Ministry in Germany and the United Kingdom.

Crisis management in practice

In a comparison of system guidelines for procedures on the ground, there appear to be gaps on various levels. However, it should be emphasized that in the legislation and the regulations there are a multiplicity of agencies and there is no clear definition of the division of authority between them. These agencies, and first and foremost, NEMA, which are meant to coordinate the response to crises, have essentially been neutralized. The health funds, which form the backbone of healthcare services in Israel, are not part of the Home Front Command’s infrastructure. The municipalities, in contrast, have a defined role, although it is unclear what means are available to them in order to fulfill it.

From a survey of the Ministry of Health guidelines relative to the processes that actually took place, various gaps emerge. Some of them are gaps in authority and responsibility. Others are the result of difficulty in defining the operational units and the interfaces between the various agencies or the long period of time that has elapsed since the guidelines were put in place. Still others are simply the result of implementation not according to the guidelines, nor according to the approved operational plans, and without any mobilization of the relevant agencies within the Ministry of Health and outside of it.

Gaps in legislation, authority, and responsibility

The National Health Insurance Law does not relate explicitly to the provision of medical services in the community in an emergency. Given that, it is difficult to determine who is responsible for providing medical services in an emergency and on what scale. With respect to overall legislation and procedures and the role of the healthcare system in times of emergency, it appears that the interfaces and realms of responsibility are not defined either. A simulation exercise in December 2018 to test the ministerial and inter-ministerial preparedness in a scenario of a flu pandemic (*Nachshol Bari*, literally, a “healthy wave”), which was carried out jointly by the staff of the Assistant to the Minister of Defense, NEMA, and the Ministry of Health, showed that clarification of authority and responsibility in the response to an outbreak is needed, as well as with respect to the procurement and distribution of medicines and vaccines. It also demonstrated the existence of “legal-ethical challenges,” a shortage in manpower, and more. The gaps in authority and responsibility in a health emergency could be seen on several levels:

Between government ministries. First, the roles and areas of responsibility for each of the agencies were not defined, nor were the interfaces between the Ministry of Health and other frameworks in the areas of information sharing, computer systems, a situation room, etc., whether those agencies were parallel to it (such as the Ministry of Welfare) or under its supervision (such as the health funds). Nor were there any simulations of an emergency.

The most extreme example can perhaps be found in the guidelines of the Ministry of Defense, which is meant to coordinate the event. They make almost no mention of the health funds, their laboratories, or the nationwide services they offer. They even explicitly mention that “if it is decided to open centers for the distribution of medicine, the local authorities will assist the IDF in opening those centers.” In other words, to the extent that there was any mention of the health funds, the Ministry of Defense did not identify their potential with respect to the diffusion of their services nor their knowledge and infrastructures.

The Hospitalization Authority. The activity of the Hospitalization Authority is specified in the Ministry of Health guidelines; however, its authority to issue directives to the healthcare institutions is not set by law. Beginning in 1995, proposed legislation dealing with this issue was tabled and the State Comptroller’s reports for 2007 and 2014 relate to the situation. However, to the best of our knowledge, the Authority’s activity has not yet been legislated.

The healthcare system. According to information published on the website of the Ministry of Health, in an emergency, the health funds will constitute a community center for the provision of primary medical care. According to these guidelines, the health funds need to prepare for such an emergency situation with respect to accessibility, allocation of manpower, infrastructure, and handling of special populations. The website presents guidelines and information on the principles governing the health funds' activity during an emergency, including guidelines for requests for care, the operation of "unified clinics," the organization and deployment of local clinics, and other useful information on the preparedness for such a scenario. There is no mention of a defined budget source to finance this readiness and there is ample evidence of that the health funds expect to receive designated funding for preparedness, while the Ministry of Health expected them to provide these solutions from their own funding sources.

Preparation of infrastructures for implementation

The gaps between the guidelines and reality sometimes emerge in seemingly esoteric matters, which in the moment of truth nonetheless have a significant impact. An example is the fact that the level of implementation which the various guidelines relate to is the "district." It should be mentioned that the Ministry of Health districts are not defined the same as the health fund districts (and there is no consistency among the health funds either) and they also differ from the districts of the Ministry of Defense, the Ministry of Labor, Social Affairs and Social Services and the Ministry of Education, a situation that impedes event management.

As preparation for the outbreak of a pandemic, a reference scenario for such an outbreak in Israel was drawn up. The goal of the scenario was to define the threat (number of patients, level of infection, etc.) to decision makers, in order to assist them in determining the necessary steps to be taken. At the beginning of 2019, the Ministry of Health sent an updated scenario to the Minister of Defense; however, as of November 2019, the Ministry of Defense had not reviewed it, a fact that compromised the ability of the economy to ready itself. The initial scenarios drawn up used Italy and Spain as references and quickly became irrelevant, particularly since 96 percent of individuals tested in Israel were dealt with in the community rather than in the hospital system.

It is also worthwhile noting that only about a month elapsed between the declaration of a new global pandemic and its arrival in Israel. Nonetheless, according to the Knesset Coronavirus Committee, “Even in this given situation [of uncertainty regarding the disease and its impact], it is the committee’s impression that the month-long warning period was not used to formulate policy, to accumulate physical means of protection, and to establish operating frameworks to deal with the pandemic” (Knesset, 2020, 11). As part of the preparations for the pandemic, and in an effort to optimize the preparations based on the little information available on the coronavirus, the Ministry of Health, in collaboration with the Gertner Institute, prepared an initial reference scenario in late February and early March that constituted the initial basis for discussion and decision making. Despite the State Comptroller Report (2020), which concluded that the inventory of medicines and equipment in the emergency storerooms had expired and was unusable, there does not appear to have been any movement to begin procurement. During the period of preparations, and in view of the information published in various places, it appears that the Sarel company, which is responsible for the Ministry of Health’s procurement, did not provide any meaningful assistance in the procurement process, whether because it was unable to do so or because it was not asked to. Only on March 13th was a directive issued to the Government Procurement Administration to become involved in the procurement of equipment needed to deal with the pandemic. Other procurement efforts by various agencies, such as the General Security Services, were not always based on professional knowledge, and, as a result, the products did not meet technical requirements and were unusable. It appears that a gap existed between the guidelines and the reference scenarios for the preparation of the healthcare system, on the one hand, and the assessment of the defense sector that the main burden would be on the hospitals and the mass diagnostic centers, on the other hand. Thus, in the initial stage, most of the resources were invested in the hospitals and mass diagnostic centers, while the health funds were directed to make only limited preparations for the arrival of patients in the clinics. It appears that the defense sector’s reference scenario was not updated even as the situation became clearer, and major resources were not shifted to community healthcare even when it was understood that more patients than expected were being treated in the community.

Over the years, the Ministry of Health has on a number of occasions recommended that in a crisis the service provided to patients at home by the health fund physicians in secondary medicine should be expanded, that the authority of nurses should be expanded, or that the health funds should be reinforced with volunteers. However, no regulatory infrastructure was prepared, there was no training of manpower and again there was no earmarked budget source.

Management

Based on considerations that are not clear to the authors, most of the existing guidelines were not followed and authority was not granted to them. A national emergency was not declared, a step that would have mobilized systems and budgets accordingly. In the stage of preparation for the coronavirus crisis, the Prime Minister decided during the second half of February that the NSC would manage the crisis. To the best of our knowledge, there was no prior legal discussion of the NSC's authority to coordinate and lead efforts in a crisis of this sort. The Home Front Command was also only partially mobilized. Since a national emergency was not declared, neither NEMA nor the assistant to the Minister of Defense were mobilized, which according to the guidelines were meant to coordinate the event. Instead, and a number of months after the onset of the pandemic, a project manager was appointed on behalf of the government. His authority is not defined and, therefore, he, too, has become just an advisor.

During the first wave, a variety of bodies were assigned to implementation, such as the Ministry of Health, the Home Front Command, Magen David Adom, a number of designated laboratories, and the hospitals. In normal times, these entities are not connected to one another and they share no infrastructure for communication between them or guidelines for working together, neither with respect to testing, nor with respect to patients. Even if each of them is efficient on its own, the interfaces between them are limited and their ability to track a blood sample until a result is delivered to the patient is highly limited. To the best of our knowledge, and despite the need for managing the process and its monitoring, no single entity has been defined to coordinate patient care from the moment they make contact with the healthcare system until they recover.

According to the existing guidelines, the health funds, apart from the Clalit Health Fund, are not part of the core group that directs the Hospitalization Authority in an emergency nor do they have any role in the management of the event, but rather are only involved in implementation. Nonetheless, it is not clear why most of the health funds were not invited to the discussion of preparations for the pandemic held in the Ministry of Health, not even as it became clear that the pandemic was approaching Israel. On the other hand, there is a question as to why the health funds did not prepare for the approaching crisis on their own initiative. Even if they had done more, it appears that the health funds were paralyzed, waiting in expectation of directives from the Ministry of Health, and they only took the initiative several weeks after the onset of the pandemic. There are those in the healthcare system who ask why the health funds were not involved in the thinking and planning processes. They emphasize the health funds' needs for a full picture and their involvement in decision making, even if only to provide them with the opportunity to present their relative advantages in responding to the pandemic. Nor was the relative advantage of the Ministry of Health as a regulator, including its ability to gather the best minds and to mobilize the best infrastructures, to learn from other countries and to generate local knowledge, to define standards and guidelines and to coordinate with other government ministries, used to the fullest extent possible due to the overconcentration of authority within the ministry itself.

One of the main guiding principles during a crisis is the broad allocation of authority to implementation agents on the ground, exploiting their strengths, including their familiarity with the territory and their ability to quickly make decisions based on the data. During the initial stage of the pandemic, and according to a variety of sources, the Ministry of Health operated in a highly concentrated manner. This did not allow others to participate in decision making, to take a leading role in processes, or to share data. This led to decisions that were not in line with the reality in the field. During the crisis, a number of municipalities lost patience and instead of waiting for directives, they took a number of local initiatives, such as the distribution of food, visits to individuals living alone, and the organization of educational and recreational activities. This process also created collaborations with the healthcare system and of course primarily with community medicine in the provision of assistance, in the supply of medicines, in mobilizing volunteers, etc. The sharing of medical and other information with the municipalities is complicated by the Protection of Privacy Law. Only at the beginning of April was a bulletin published by

the Ministry of Health which provided guidelines for the transfer of medical information to the local authorities and made it possible to coordinate activity related to patients in quarantine or who are liable to be at risk. The Home Front Command, which was responsible for maintaining contact with the quarantined, was not always able to create such a relationship of trust.

Implementation

Many years have passed since the guidelines of the Ministry of Health (the Emergency Branch's last position paper was in 2013; plans for a flu epidemic from 2007; guidelines for dealing with a biological disaster from 2008; etc.) and numerous gaps have appeared between them and the world of modern technology. As a result, and despite the well-known areas of responsibility, there has not been any development of guidelines for the transfer of information nor a communication infrastructure that connects between the source of the initial diagnosis and the agencies responsible for treatment (in the hospitals, in the designated quarantine hotels, or in the community), which would facilitate the transfer of information and the continuity of treatment.

During the first wave of the coronavirus pandemic in Israel, the various systems were operated directly by the Ministry of Health and the other ministries, and, as a result, the existing model of provision of services, which had been in place for decades, was eroded and the health funds were marginalized. Thus, it was, in fact, the providers of services whose role in normal times is the provision of a variety of healthcare services to diverse populations and which by their very nature have a national distribution and are able to move samples and staff around also in normal times, who were excluded from the efforts to mitigate the first wave of the pandemic.

The question of who has a relative advantage and the required experience in carrying out certain tasks on a national level or in the procurement of healthcare items was not given any consideration and thus, in spite of their massive presence in the community and a national deployment, as well as their experience in taking samples, transporting them, and testing them in a laboratory, the health funds were not instructed at the beginning of the pandemic to prepare for providing specialized treatment in the community. Moreover, on March 18th, the Ministry of Health sent a document to the health funds in which it was made clear that they are to continue to operate as normal with no instructions to prepare their laboratories for coronavirus testing. Instead, the task was given to Magen David Adom, which has abundant

experience in providing service in an emergency but lacks the experience and equipment to collect and transport samples, as well as the technical infrastructure and computer systems for the identification and tracking of samples. This occurred in spite of the fact that both the plan drawn up by the Ministry of Health to prepare the healthcare system for the outbreak of a flu pandemic and the 2007 document on preparing the healthcare system included guidelines for preparations to be made in the community for the treatment of patients by the health funds and the principles for implementing that treatment.

The knowledge for diagnosing a new disease and treating its victims was accumulated in the course of the first wave. Around the time of the onset of the pandemic in Israel, the Ministry of Health uploaded a designated website in order to keep healthcare workers informed. The site had abundant content and thousands of pages were added to it within a short period of time, thus providing evidence of the lack of information (which was understandable, given the circumstances), the regulatory load and the confusion that prevailed in the system during the first wave. The subject of laboratory testing is an example of this lack of knowledge (which is understandable given the complexity of dealing with a new disease). Combined with other constraints, such as the concentration of authority and the lack of trust between the various agents, this led to a situation in which there was no issuing of regulations, there were no consistent directives, and there was no process of certification for laboratories. At the beginning of the process, only one laboratory in Israel was prepared for carrying out coronavirus testing. This was due to objective reasons, namely a shortage of equipment and knowledge, and various subjective reasons, including that additional laboratories were not prepared in a timely manner. Only on June 22nd, 2020 — more than four months after the onset of the pandemic — was a one-day open seminar held on testing.

The challenges of providing the manpower needed for treatment and implementation were also foreseen. The existing guidelines and reference scenarios described in the documents forecast a shortage of between 25 percent (according to the defense sector documents) and 35 percent (according to the healthcare system documents) in healthcare workers in an emergency and they suggested that the gap be filled by volunteers and soldiers. It does not state who will be responsible for training and managing these support personnel and no budgets were allocated for this purpose. Indeed, there was no training, nor was there any mapping of manpower that could be trained.

The challenges in operating the laboratories and their effect on the number of tests carried out have already been mentioned; nonetheless, they are also related to another component of the response to the pandemic, namely contact tracing, which is a critical tool in managing a pandemic and rapidly truncating the chain of infection by quarantining potential carriers. In order to accomplish this, it is necessary to diagnose infected individuals by means of laboratory testing and contact tracing, continuous interviewing and technological means that map the individual's whereabouts and encounters with others. In normal times, this responsibility belongs to the district health offices, which each have about 10 assigned workers. Due to a persistent shortage of manpower in the health offices, no manpower was trained for emergencies and no relevant technological systems were put in place.

The transfer of patients from the hospitals to the community and the continuity of care are clearly defined in the guidelines, including the involvement of the district health office and the operation of a desk by each of the health funds and the health offices in the hospitals, with the goal of tracing and managing these transfers. The hospitals are meant to appoint a nurse to coordinate the transfers. In practice, information was not conveyed to the health funds, due to the infrastructure limitations among other reasons, and often treatment continuity was not maintained.

Communicating with the public. According to the guidelines, an authorized medical professional in the Ministry of Health is to be responsible for providing information to the public. In practice, most of the information was provided to the public in two main ways at the beginning of the crisis: messages to the public that were conveyed almost every evening by the Prime Minister and information posted on the website of the Ministry of Health. Another source was, of course, the various news channels whose information was not always authorized. Activities that are closely connected to the management of the crisis, such as, public relations, were not carried out by professionals and existing frameworks, such as the IDF Spokesman or the public relations professionals at the Home Front Command.

The dissemination of information in a culturally-sensitive way or in languages other than Hebrew was insufficient, whether because of language and medium constraints (the messages were conveyed in Hebrew and relatively quickly and on channels that not everyone watches) or because of the low level of technological ability among some of the public. It is, in fact, the more vulnerable populations (the Haredi community, the elderly, and some

Arabic speakers) that were not exposed to relevant messages. The National Emergency Portal that was operated by the Home Front Command, in Hebrew and Arabic only, also included information in sign language and directives for autism caregivers, as well as directives for the religious sector. However, cultural mediators who assist the health funds were not utilized, not with respect to high-risk populations nor with respect to any other populations. The health funds, which are involved in marketing and the dissemination of information to a variety of target audiences, quickly identified this shortcoming and by early April began disseminating messages to various populations in a culturally-sensitive manner.

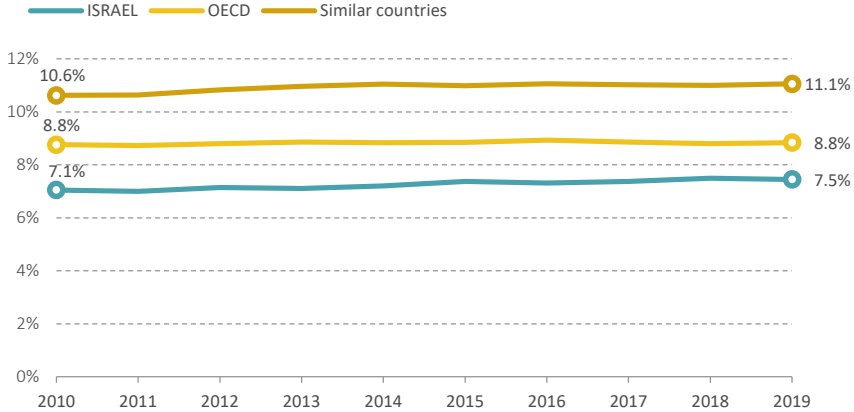
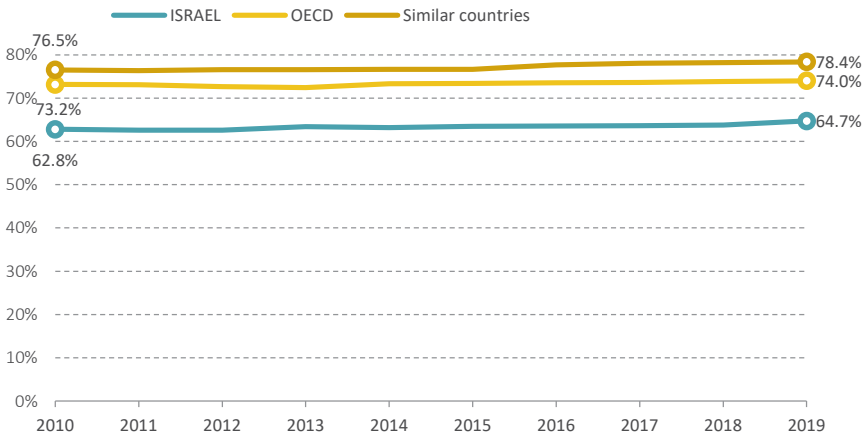
The healthcare system and the addition of resources to deal with the coronavirus

Limited sources of funding: National and public expenditure

As in previous years, national expenditure on healthcare was low prior to the crisis relative to other developed countries and stood at about 7.5 percent of GDP in 2019 (Figure 7). Despite the slight increase from 7.1 percent to 7.5 percent during the past decade, Israel's situation lagged far behind those of the OECD countries, in which healthcare accounts for 8.8 percent of GDP on average. The gap is even larger and expanding relative to the situation of countries similar to Israel with respect to the structure of their healthcare systems (herein, the similar countries),¹⁶ in which the national expenditure on healthcare in 2019 was about 11 percent, following an increase of about 0.5 percentage points during the past decade. Although the gap shrinks when Israel's younger age profile is taken into account, it is still considerable.

The share of public expenditure on healthcare in Israel also continues to be relatively low (Figure 8), despite a rise of about 2 percentage points during the past decade. Only about 64.7 percent of healthcare expenditure in Israel is publicly financed, as compared to about 74 percent in the OECD countries and about 78.4 percent in the similar countries (in 2019). Relative to the similar countries, Israel's situation remains unchanged since they experienced a similar increase.

16 Countries that have a model of managed competition between health funds and similar bodies (Belgium, Germany, France, the Netherlands, and Switzerland).

Figure 7. Expenditure on healthcare as a percent of GDP**Figure 8. The share of public expenditure within total healthcare expenditure**

Source for Figure 7 and 8: Chernichovsky et al., Taub Center | Data for Figure 7 and 8: OECD.Stat

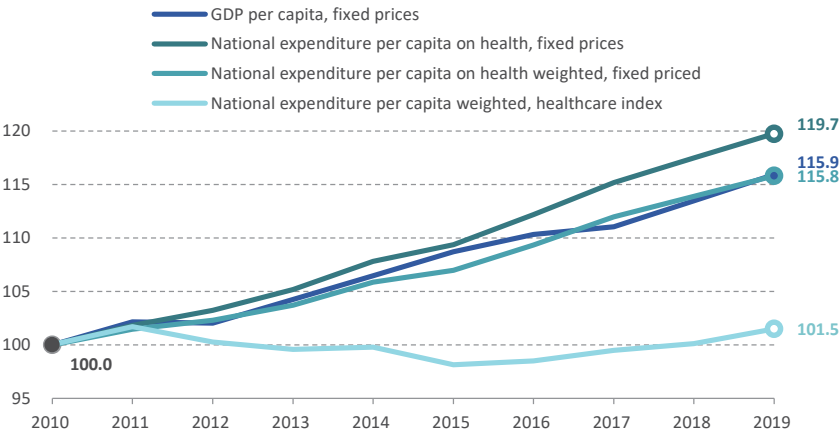
It is worth noting that private expenditure on healthcare in Israel is composed of, among other things, supplementary insurance offered by the health funds and private health insurance, where the share of the latter within total private expenditure has been consistently rising over time and is generating

a distorted system of incentives from the viewpoint of equity and efficiency (Chernichovsky, 2020). It appears that if the private healthcare system made any contribution to the war on the virus, it was only a minimal one.

The share of national expenditure on healthcare within GDP has been on an upward trend in recent years. This implies that the rate of increase in expenditure on healthcare services in Israel is somewhat higher than the rate of growth in GDP. Nonetheless, “real” output generated by that expenditure is not necessarily rising at the same rate (Figure 9). After adjusting for demographic changes, namely the aging of the population, the national expenditure per standard person has, since 2010, risen at a similar rate to that of GDP per capita. If changes in the price of healthcare services in those years (as represented by the index of healthcare prices) is also taken into account, it appears that the rate of increase in the national expenditure on healthcare has been significantly less than the rate of growth in GDP per capita. In other words, when demographic changes and the price of healthcare are considered, expenditure on healthcare in real terms has risen by just about 1.5 percent since 2010.

Figure 9. The index of healthcare expenditure per capita in Israel, adjusted for demographic changes and the increase in healthcare prices

Index year: 2010 = 100



Source: Chernichovsky et al., Taub Center | Data: CBS; Ministry of Health

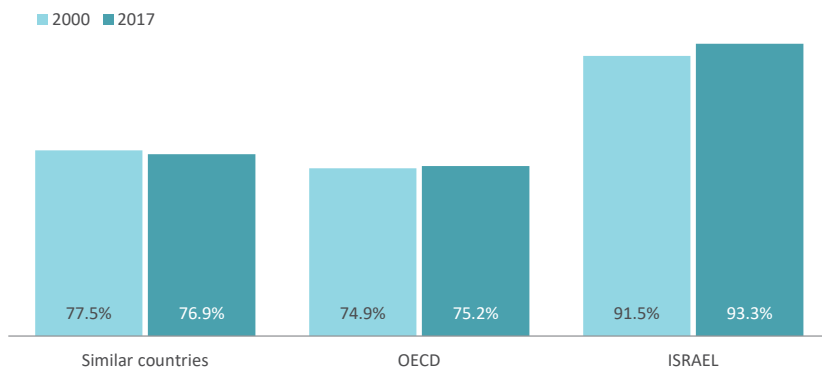
Indeed, the situation is reflected in significant shortfalls in the system's sources of funding and these can be seen in the fragile state of healthcare services, both in the hospitals and in the community.

The general hospital care system in Israel

The general hospital care system is still characterized by a low number of beds per capita and a relatively short duration of hospitalization. This was also the situation prior to the crisis and it contributed a great deal to the atmosphere of hysteria, at least during the first lockdown. The number of beds in the general hospitals in Israel stands at 2.2 per 1,000 population, as compared to an average of 3.6 in the OECD countries and 4.1 in the similar countries (in 2018).¹⁷ After adjusting for the younger age profile in Israel, the number of beds per 1,000 population rises to 2.5, which is somewhat higher but still lags behind the rest of the developed world to a significant degree.

The low number of beds per 1,000 population leads to a high occupancy rate of hospital beds: in 2017, Israel had an average occupancy rate of 93 percent, in contrast to 75 percent in the OECD and 77 percent in the similar countries (Figure 10). As a result, it also has a high patient turnover rate for each bed. Thus, the duration of hospitalization is short in Israel relative to the developed countries: an average of about 5 days as compared to about 6.5 in the OECD and 6.3 in the similar countries (data for 2017 to 2018).

Figure 10. Occupancy rate of general hospital beds



Source: Chernichovsky et al., Taub Center | Data: OECD.Stat

¹⁷ The OECD average relates to its members for which there are data. The figures for Germany and the US are for 2017.

This indicates that the general hospital care system in Israel is continuously overloaded, which has a cost in terms of the level of health among Israel's population. This overload may lead to health risks, such as infection, a drop in the quality of care since patients have to be discharged as quickly as possible in order to free up beds, and a lack of preparedness for security or medical emergencies, since the hospitals do not have a margin of safety that allows them to intake additional patients beyond the needs of routine hospitalization.

Healthcare in the community

The overloading of the hospital system relative to the sources of funding represents to a large degree the situation of healthcare in the community in the zero-sum game between the two systems. Chernichovsky and Kfir (2019a; 2019b) discuss this issue in detail. Apart from the overall shortage in funding, the system of payment for hospitalization (the CAP mechanism) encourages the preference of hospitalization over care in the community.

It is possible that the weakness of healthcare in the community is reflected in the fact that it was ignored, at least at the beginning of the crisis, which was apparently the result of an overemphasis on the hospital system, the concentration of authority in the Ministry of Health, and the inadequacy of legislation, as described previously.

Additional resources provided to the system as a result of the coronavirus crisis

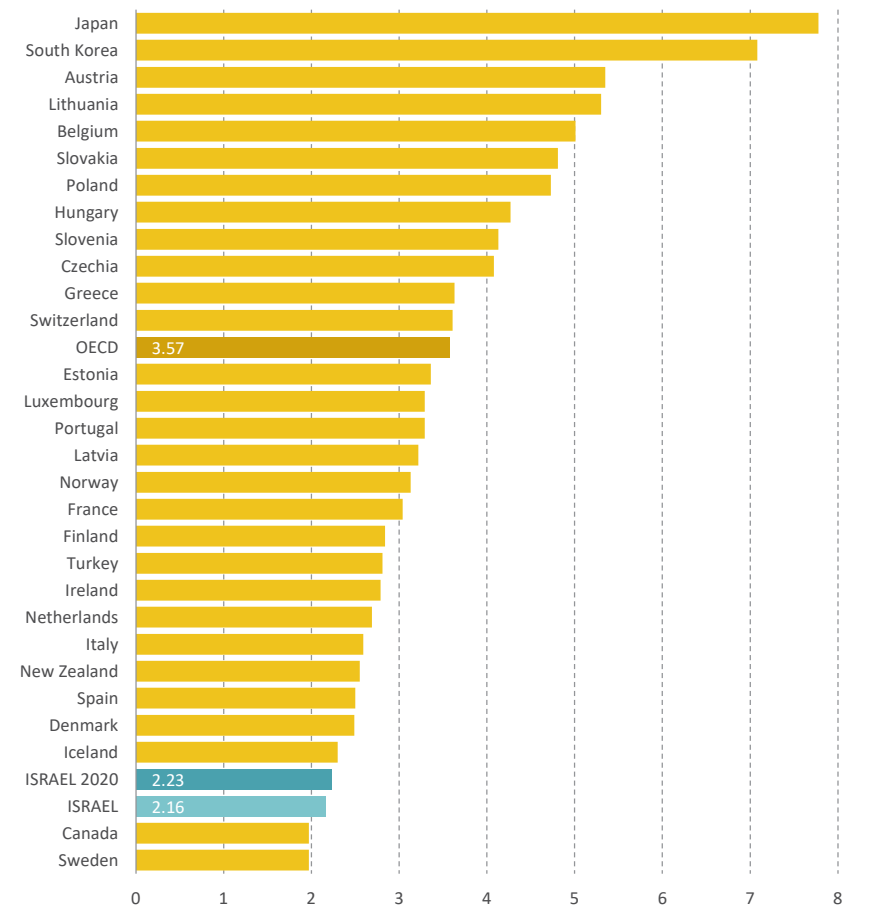
With the onset of the coronavirus, the government and the healthcare system had to invest additional resources in order to protect the functioning of the system and to improve it. An amount of NIS 17 billion was allocated to this task. If the investment in respirators, protective gear, and special medicines is ignored, then only about NIS 4 billion was allocated directly to the healthcare system. About one-third of this amount is designated for intervention in the community, including the procurement of flu vaccines. Of the budget addition earmarked for dealing with the virus, it is estimated that about NIS 2.7 billion was invested in manpower, infrastructure, and technology that can be utilized in normal times, if the government chooses to leave the budget in the system.

Thus, for example, in order to deal with the expected morbidity from the virus and prepare for a level of morbidity much greater than previously experienced, about 3,200 beds were added in the hospital system, which represents an addition of about 16 percent to the existing number of beds in the general hospitals. Of the additional beds, about 1,000 are standard beds and about 2,200 are temporary beds, which have been placed in parking lots and protected spaces, areas that are not normally used for that purpose. On the assumption that the state decides to leave the standard beds in the hospitals after a vaccine for the virus is found, they will constitute a welcome improvement in the hospital system, which as already mentioned is characterized by a severe shortage of beds. Nonetheless, this will be the only addition of hospital beds in 2020, and on the assumption that the population in Israel grows by a rate of 1.9 percent, the number of beds per 1,000 population will be about 2.23 in 2020, as compared to 2.16 in 2019 (Figure 11). Although this will increase the number of beds per 1,000 population by 0.07, the number of beds in general hospitals in Israel will remain low relative to other countries.

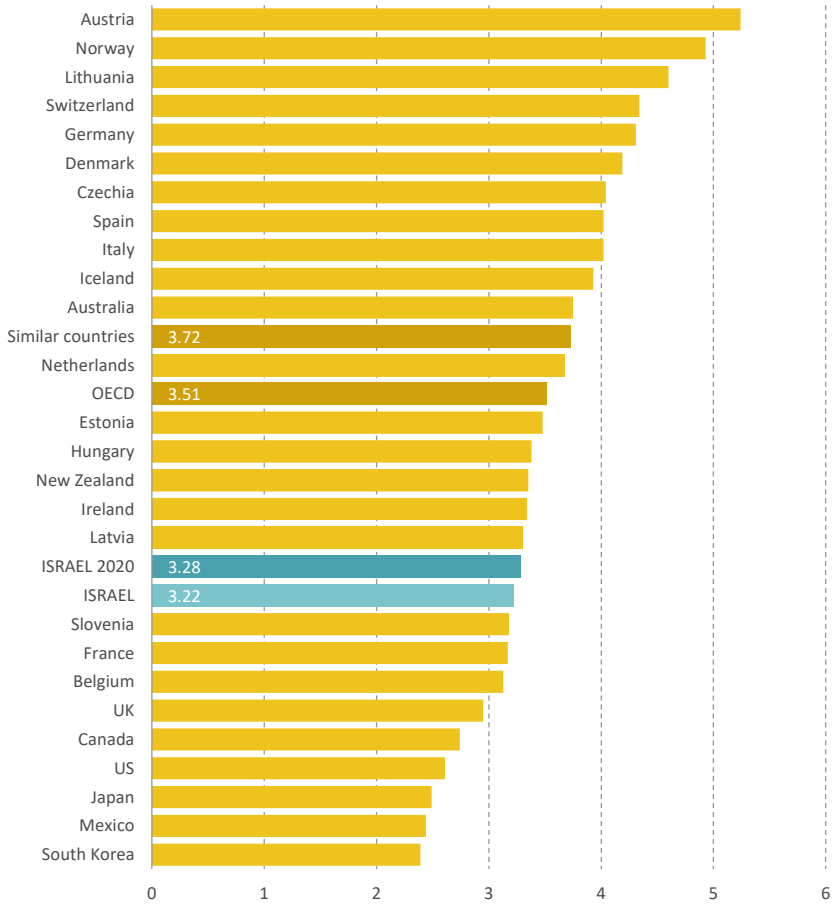
Similarly, the healthcare system received about 500 new positions for physicians in response to the coronavirus crisis. If these positions are defined as permanent, they will help solve the ongoing shortage of physicians in Israel. Between 2014 and 2018, the average number of physicians rose by about 980 per year. On the assumption that the number of physicians will grow by a similar number in 2020, an addition of 500 positions beyond the regular increase, if successfully filled, will bring the number of physicians in Israel to 30,575 as of the end of 2020 and the number of practicing physicians per 1,000 population to 3.28, as compared to 3.22 in 2018 (Figure 12). Despite the slight upward trend, the number of physicians is still significantly lower than the OECD average of 3.51 and the average of 3.72 in the similar countries.

In other words, even on the assumption that the additional positions are not cancelled, the potential effect of the coronavirus crisis on the number of physicians and the number of beds will not be sufficient, at least in comparison to the situation in other countries.

Figure 11. Hospital beds per 1,000 population, OECD, 2018



Note: For Belgium, Canada, Denmark, Iceland, Israel, Luxembourg, and New Zealand, data are for 2019.
 Source: Chernichovsky et al., Taub Center | Data: OECD; CBS; the World Bank

Figure 12. Physicians per 1,000 population, OECD, 2018

Note: For Canada, Iceland, Ireland, Italy, Norway, and the UK, data are for 2019.

Source: Chernichovsky et al., Taub Center | Data: OECD; CBS; the World Bank

Conclusion

At least until now, the Israeli health system has successfully dealt with the coronavirus relative to other OECD countries. However, in view of Israel's small population and its younger age profile, its overall level of solidarity, its relatively high standard of living, and its isolation from surrounding countries, a better outcome could perhaps have been expected.

In retrospect, the first lockdown was a success from the perspective of mortality and the economic investment in preventing what was then viewed as an apocalyptic vision of mortality, similar to that in Italy at the beginning of 2020. The economic loss from the lockdown — of about 2.1 percent of GDP, on the assumption that the lockdown is responsible for the full decline in GDP — was far smaller than the economic value of the potential loss of life years according to the estimated mortality at the time and according to the estimated value of a life year (calculated from the decisions of the Healthcare Basket Committee as NIS 340,000).

It appears that the deterioration in the management of the crisis began with the population's learning curve in understanding the character of the crisis, at least in comparison to the original forecast, while at the same time the state did not learn to manage the crisis. The population began to internalize a message that the crisis is less serious in terms of mortality and more serious in socioeconomic terms. Tensions emerged that can be characterized economically, although this is a narrow characterization that ignores other tensions. From the perspective of non-compliance with the directives, a share of the Haredi and Arab Israeli population behaved according to their own perceived low risk of hospitalization and death from the coronavirus, relative to the non-Haredi population. Moreover, as the crisis progressed, the public realized that in contrast to normal times, during which there is an accepted cross-subsidization between the age groups, as embodied in the National Health Insurance Law, the subsidization during the coronavirus crisis imposes a particularly heavy burden on the working-age population and even on future generations in order to finance the treatment of coronavirus patients who are primarily the elderly. Nor did society understand that the imposition of a lockdown imposes a relatively high price in terms of "paying for human life," which is at least 6-fold greater than what is accepted according to the standard of the National Health Insurance Law.

It also appears that the government has not internalized the method of crisis management in its policy. Underlying this issue is outdated legislation that has not been adequately amended over the years. There is tension between the National Health Insurance Law and the Health of the People Ordinance and its various amendments. The Law for example views the health funds as the system's main operational component while the Ordinance assigns this role to the local authorities, which have no medical infrastructure. The transfer of responsibility for managing the crisis from the Ministry of Health to the Ministry of Defense is hindering the ability to carry out policy in a well-orchestrated way.

One way or another, the Ministry of Health — due to its tendency toward centralization of authority and the mixing of regulation and implementation — at first ignored the community care system, and focused on preventing the collapse of the hospital system, which even in normal times it over-manages. If at first there was perhaps justification for this approach, in view of the apocalyptic vision and the almost 100 percent occupancy of the hospital system prior to the crisis, there was no such justification later on. Essentially, the Ministry of Health held onto its apocalyptic vision even though, according to the heads of the health funds, who at the beginning of the crisis were excluded from the treatment efforts, 96 percent of coronavirus patients are currently treated in the community and relatively few are hospitalized.

It is possible that the resulting reality was an overreaction due both to inadequate legislation and the complex concentration of authority in the Ministry of Health (at least with regard to laboratories). A reality emerged that is not set in comprehensive and fully-formed legislation. There was no declaration of an "Economic Emergency," which would have facilitated a more structured national effort. NEMA, which by law was meant to manage the crisis as part of the Home Front Command, was almost not utilized. In contrast, the management of the crisis was assigned to the NSC, which has no legal standing in the management of such a crisis. The project manager appointed by the government has no such standing either.

At the moment, there is no great hope that the crisis will be used as an opportunity to amend existing legislation and to add sources of long-term funding for the healthcare system. After the addition of hospital beds, if they are made permanent, the number of beds per 1,000 population in 2020 will be about 2.23, as compared to about 2.16 in 2019. Although this represents an increase of 0.07 beds per 1,000 population, Israel still lags behind other

countries. With respect to manpower, the addition and filling of 500 physician positions beyond the normal annual increase will bring the number of physicians in Israel to about 30,575 at the end of 2020 and the number of practicing physicians per 1,000 population to 3.28, as compared to 3.22 in 2018. This increase reinforces the positive trend that began in 2017, which is described in Tur-Sinai et al. (2020), but this level is still low relative to the OECD average of 3.51.

The handling of the coronavirus crisis thus far, which we have tried to describe comprehensively in this survey, calls for an in-depth process to learn its lessons, if only to prepare the healthcare system for the next crisis, to prevent panic of the system's collapse, and to advance legislation and regulation for crisis management.

References

English

- Buonanno, P., Galletta, S., & Puca, M. (2020). Estimating the severity of COVID-19: Evidence from the Italian epicenter. *PLoS ONE*, 15(10): e0239569.
- Centers for Disease and Prevention (2020). [Coronavirus Disease 2019](#); Cases, Data and Surveillance; Covid-19 hospitalization and death by age.
- Chernichovsky, D., & Bental, B. (2020). [The war on coronavirus and its financing by the Israeli National Health Insurance](#). Viral Economics Series. Jerusalem: Taub Center for Social Policy Studies in Israel.
- Chernichovsky, D., & Kfir, R. (2019a). [The acute care hospitalization system in Israel: The current situation](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2019* (pp. 387–430). Jerusalem: Taub Center for Social Policy Studies in Israel.
- Chernichovsky, D., & Kfir, R. (2019b). [The acute care hospitalization system in Israel: From a vision of decentralization to a centralized and out of control reality](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2019* (pp. 431–463). Jerusalem: Taub Center for Social Policy Studies in Israel.
- French, E. B., McCauley, J., Aragon, M., Bakx, P., Chalkley, M., Chen, S. H., ... Kelly, E. (2017). [End-of-life medical spending in last twelve months of life is lower than previously reported](#). *Health Affairs*, 36(7), 1211–1217.
- Scitovsky, A. A. (1984). “The high cost of dying”: What do the data show? *The Milbank Memorial Fund Quarterly/Health and Society*, 62(4), 591–608.
- Shmueli, A. (2009). [Economic evaluation of the decisions of the Israeli public committee for updating the national list of health services in 2006/2007](#). *Value in Health*, 12(2), 202–206.
- Tur-Sinai, A., Zontag, N., Blondheim, O., Weinreb, A., & Chernichovsky, D. (2020). Physicians in Israel: Trends in Characteristics and Training. In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2020*. Jerusalem: Taub Center for Social Policy Studies in Israel.
- Weinreb, A. (forthcoming). *Excess mortality in Israel, 2020*. Jerusalem: Taub Center for Social Policy Studies in Israel.
- WHO (2005). [WHO checklist for influenza pandemic preparedness planning](#). Geneva: World Health Organization.

Hebrew

- Eckstein, Z., Bental, B., & Sumkin, S. (2020). [*Morbidity, GDP, and employment in the second quarter in Israel and internationally*](#). Petah Tikvah and Jerusalem: The Aaron Institute for Economic Policy and the Taub Center for Social Policy Studies in Israel.
- Knesset (2020). [*The Special Committee on Dealing with the Coronavirus: Interim conclusions*](#). Jerusalem: Knesset.
- Ministry of Health (2007). [*A readiness program for the healthcare system for a flu pandemic*](#). Jerusalem: Ministry of Health.
- Shmueli, A., & Nissan-Engelchin, E. (2008). A preliminary estimate of the value of statistical life in Israel and its implication to the technological update of the National Health Insurance package of benefits. *The Economic Quarterly*, 55(4), 467–487.
- State Comptroller and Ombudsman of Israel (2020). [*The health system's response to the renewed outbreak of diseases*](#). In *The 70A Annual Audit Report* (pp. 515–592). Jerusalem: State Comptroller and Ombudsman of Israel.

Physicians in Israel: Trends in Characteristics and Training

**Aviad Tur-Sinai, Noam Zontag, Orna Blondheim, Alex Weinreb,
and Dov Chernichovsky**

Introduction

In a report on preparedness for contending with the coronavirus, the OECD made mention of Israel's relatively good situation with regards to the supply of the healthcare workforce (OECD, 2020). In this sense, Israel is in a privileged position among countries, alongside Norway, Switzerland, Germany, Austria, Sweden, and Denmark. Naturally, the OECD views the healthcare workforce as a central factor in the struggle against the virus which has been testing health systems everywhere. According to the OECD data, in 2017, Israel had 3.3 physicians per 1,000 people. This statistic exceeds the pessimistic forecast of the State Comptroller (2009), who, a decade ago, predicted that the number would drop to 2.8 — in other words, below the “red line” of 2.9 physicians per 1,000 residents that the Horev Commission determined in 2010.

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However, these numbers, which consider all those licensed to practice medicine, do not present a complete picture.¹ They do not address the number of physicians in the various branches of medicine — such as internal medicine, emergency medicine, intensive care, infectious diseases, family medicine, and geriatrics — which is important particularly in view of the shortage of specialists and the restricted number of positions in the public health system. Indeed, the Israeli medical system, particularly the public health system, has, over the past two decades, been operating under continuing limitations due to shortages in budgets, infrastructures, and government funded positions (Chernichovsky, 2019).

Nevertheless, in general, the Israeli health system still enjoys, at least potentially, a relatively healthy supply of physicians. This stems from periods during which the health system thrived, including the massive, one-time immigration from the former Soviet Union when the supply of medical personnel that arrived was proportionately larger than the increase in population.

The supply of the healthcare workforce has been discussed in several research studies over the years. Shemesh et al. (2012) presented the supply of physicians and their main employment characteristics in 2008. The Israel Medical Association (IMA) indicated the notable shortage of physicians in specific medical fields (IMA, 2016). Chernichovsky and Regev (2014) highlighted the reduction in the supply of physicians with the aging and subsequent retirement of the physician population, together with the increasing integration of women in the profession, who, on average, work fewer hours than their male counterparts. Nirel, Shirom, and Ismail (2003) focused on medical specialists. They found that the majority of specialists worked in more than one setting, and a large share of them reported that they were considerably overworked — with long work hours, a large patient load, and difficulties in allocating their time. Van Dyck et al. (2011) found that there is a growing trend of physicians leaving the profession. They claim that physicians' satisfaction with their work conditions and wages is significantly lower for those remaining in the medical profession than for those who have left the medical profession for other jobs. Belinsky, Ben Naim, and Hecht find that 29 percent of the average salary of physicians with at least ten years'

1 It should be noted that not all licensed persons provide medical services in practice — some of them are not in Israel and some do not practice their profession — although, of course, this is the case in all countries.

experience who are employed in government hospitals comes from private medicine. However, it was found that between 2007 and 2017, the salaries of physicians with at least ten years' experience in government hospitals increased by 90 percent, an increase ten times greater than the increase in the average wages of salaried employees in the country during the same period (Belinsky, Ben Naim & Hecht, 2018; Ben Naim & Belinsky, 2019).

The current paper, the first in a series now underway, is based on a unique database that covers the past 20 years (see Appendix). It can be read in conjunction with and as an update to previous studies, with a focus on analyzing long-term trends in the basic variables affecting the supply of physicians and specialists in Israel over the past two decades. These variables are the licenses to practice medicine and specialist licenses — by physician's country of origin and location of medical school — and the demographic characteristics of physicians. The aim is to assist in shaping policy that preserves Israel's relatively good standing with regard to the supply of physicians and to improve upon it.

Framework for discussion

The total labor supply of physicians in all specialties at any given time is determined by two variables: a) the number licensed to practice medicine, and b) their participation in the labor force in the defined period. Participation can vary between zero hours during the defined period (a week, for example), implying non-participation, and a number of hours that might even exceed what is accepted as a full-time position. The annual labor supply is calculated by multiplying the number of those licensed to practice medicine or a medical specialization in a given year by the average number of work hours in that year. Alternatively, the supply may be calculated by multiplying the average number of practicing physicians per year by the average number of work hours of a physician who works more than zero hours per year.

In general, the labor force inventory in professions such as medicine is a long-term variable. Since the training of a medical specialist is likely to last some 15 years or more, the number of physicians is subject to relatively slow change. In addition to the long-term processes, factors that are likely to change the supply of physicians include migration and changes in licensing and employment terms (mainly with regard to retirement age and continued post-retirement work).

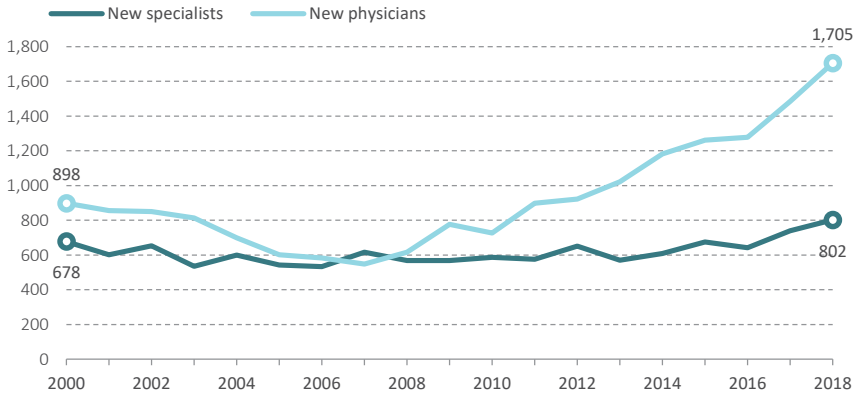
In contrast, participation in the labor force is a short-term variable. The decision whether to participate in the labor force may change rapidly and even suddenly in accordance with institutional and personal circumstances. This paper focuses on long-term variables, including migration and retirement age, which require long-term policies.

The number of general practitioners and specialists in the labor force

Entry of general practitioners and specialists

Between 2000 and 2007, the number of new physicians in Israel followed a downward trend (Figure 1). In 2007, which was the lowest point, only 548 new physicians were licensed. From that year, the trend reversed, and the number of licenses increased steadily. In 2018, 1,705 new physicians were licensed — 3.1 times the number licensed in 2007.

In contrast, the number of new medical specialists was relatively stable during most of the period, varying, between 2000 and 2016, between 500 and 700 new specialists per year. In recent years, there has been a notable trend of growth in the number of new specialists, which stood at 802 in 2018. Two factors support the continuing growth in the number of specialists in the next few years. The first is the increase in the number of new licenses conferred in recent years, which contributes to an increase in the potential for training new specialists in the coming years. The other factor is the increase that has occurred in the number of medical residents, as indicated by Ministry of Health data. Given the time that elapses between receipt of a physician's license and receipt of a specialist's license, based on the growth in the number of licenses, it can be expected that there will be an increase in the number of specialists in the future — provided that there are funded positions for specialization.

Figure 1. New physicians and specialists in Israel

Source: Tur-Sinai et al., Taub Center | Data: CBS; Ministry of Health

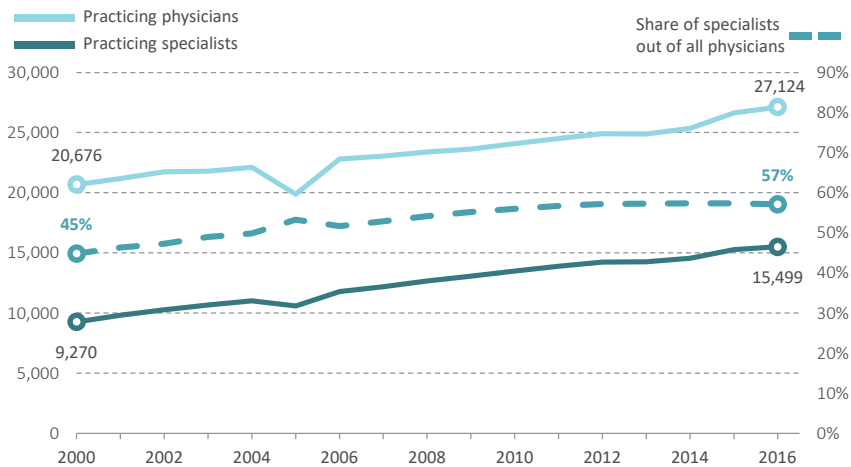
The overall number of practicing physicians and specialists

In order to calculate the number of practicing physicians in Israel at a particular time, the data from the Ministry of Health, containing all those licensed to practice medicine in Israel, were merged with data from the tax authority containing information on the income of physicians (without identifying the individual physicians). Merging the files made it possible to identify the group of those licensed to practice medicine who had income in Israel between 2000 and 2016. It is important to note that, owing to the lack of data about the field of activity of those physicians, the group of practicing physicians includes all those holding licenses who had any income in a particular year, even if they did not treat patients. In other words, the data includes not only physicians who treat patients, but also those whose main activity is research, university lecturing, the bio-technological industry, or managerial positions, and even those who do not practice medicine at all.

Figure 2 shows that, in the past two decades, there has been a considerable increase in the share of specialists among the active physicians. From 2000 to 2016, the overall number of practicing physicians grew from 20,676 to 27,124 (an increase of 31 percent). In contrast, the number of practicing specialists in Israel increased from 9,270 to 15,499 (an increase of 67 percent). This is an

average annual increase of 381 physicians and of 389 specialists. Since 2004, more than half of the practicing physicians in Israel are specialists, and, in recent years, the share of specialists has been some 57 percent of all physicians. Non-specialist physicians include general practitioners (those with licenses who have not completed their specialization, and many of whom are employed as physicians in positions that do not require a specific specialization) and medical residents who are still in the process of specialization.²

Figure 2. Practicing physicians and specialists in Israel



Note: The CBS data for 2005 that are the basis for this figure are incomplete, and so the data for that year are outliers relative to other years.

Source: Tur-Sinai et al., Taub Center | Data: CBS; Ministry of Health

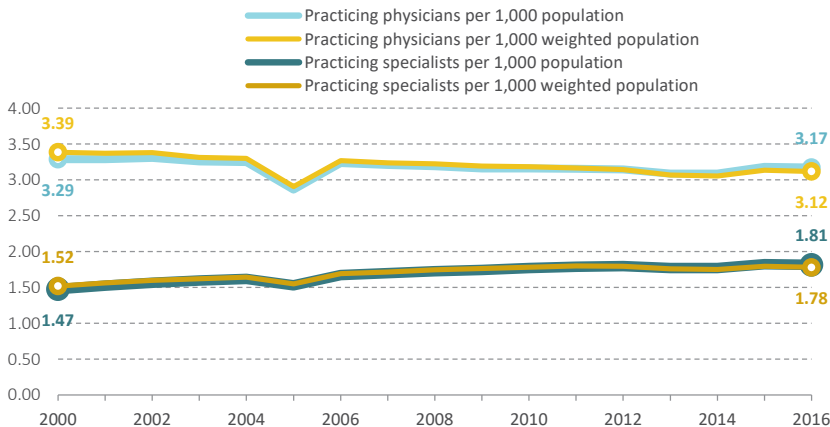
- 2 There is no correlation between the entry of new physicians and specialists into the system and the number of all those practicing the profession. This is almost certainly due to the various databases from which each item of information is drawn and from the scarcity of accurate information about patterns of retirement. Hence, it is preferable to focus on trends that are reflected in the data.

Physicians and specialists in the population

Physicians per 1,000 population

The growth and aging of the population in Israel contribute to the increase in medical needs and the need for medical services. These changes are estimated using the capitation formula which also serves in the division of the health basket budget that is divided among the health funds according to the number of their insured members and their age (and gender) distribution. Figure 3, in addition to the ratio of physicians to the population, shows the ratio between the number of physicians and the size of the population weighted according to the capitation formula. Between 2000 and 2016, there was a decrease of 8 percent in the number of practicing physicians per 1,000 weighted population. In contrast, during the same period, there was an increase of some 15 percent in the number of practicing specialists per 1,000 weighted population. In other words, the quantitative decrease in the number of physicians per person by an estimate of needs was accompanied by a qualitative increase as demonstrated by the rise in the number of specialists relative to the weighted population size as per the capitation formula.

Figure 3. Practicing physicians and specialists per 1,000 population and per 1,000 weighted population in Israel



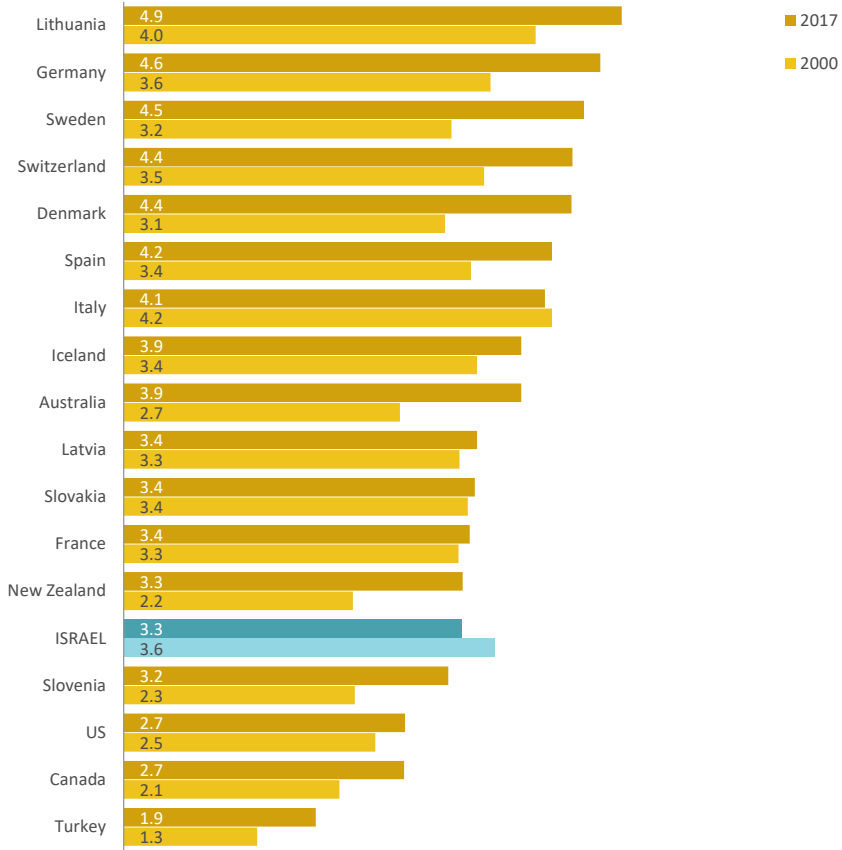
Note: The CBS data for 2005 that are the basis for this figure are incomplete, and so the data for that year are outliers relative to other years. The calculation for weighted population according to the capitation formula is based on data from the Financial & Strategic Planning Administration, Ministry of Health, "National Health Insurance Law — Dataset 2019."

Source: Tur-Sinai et al., Taub Center | Data: CBS; Ministry of Health

Physicians per 1,000 population: An international comparison³

In the wake of the rapid growth of the population in Israel between 2000 and 2017, there was a decrease in the number of physicians per capita (Figure 4). This decrease took place despite the increase of 26 percent in the number of physicians in those years (Figure 5). This was an outlier relative to other OECD countries, in which, except for Italy, there was a notable increase in the number of physicians per capita — largely because of the changes in population size which decreased in most of the countries. It is important to emphasize that this does not reflect on the level of current physician supply ratio, but rather on the downward trend that took place in those years whose serious nature is exacerbated by the aging of the Israeli population. The number of physicians per capita in Israel in 2000 was one of the highest in the Western world. Despite the downward trend, even at the end of this period, the number of physicians per capita is not considered low relative to other developed countries, as mentioned at the beginning of this paper. Moreover, the data do not reflect a reversal in the trend of recent years, as mentioned above.

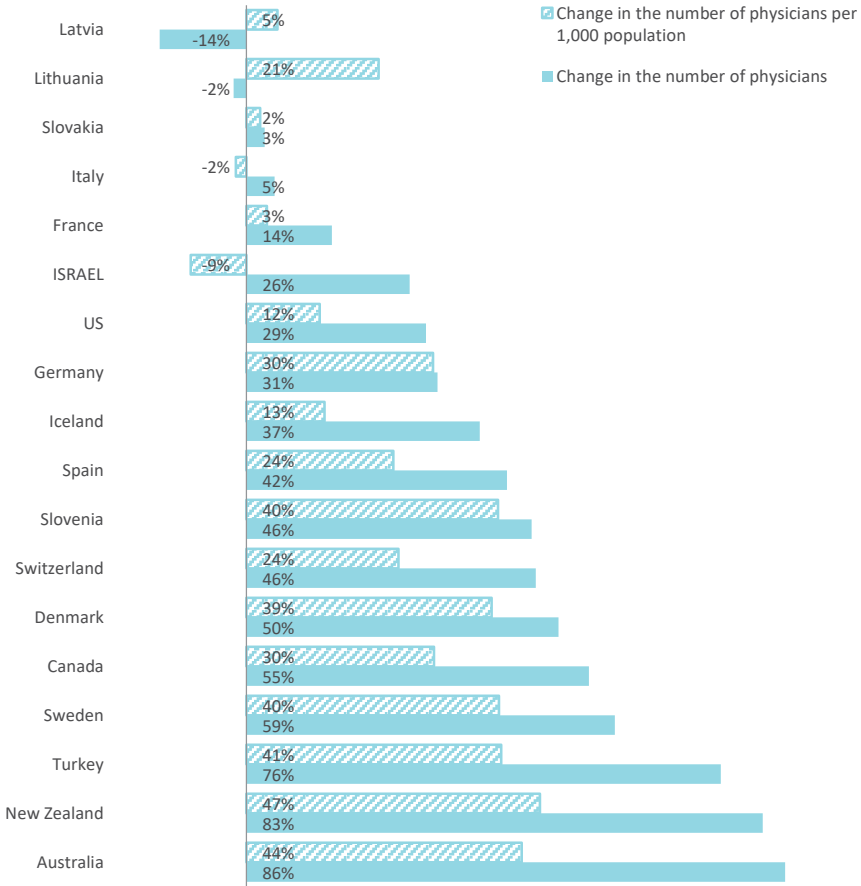
3 The discussion is based on comparative data from the OECD on the number of physicians (license holders in the countries for which comparative data were available) up to age 67 per 1,000 population, and includes those physicians living outside of Israel. The data include physicians who are not actively practicing medicine. Conversely, the data do not include active physicians who chose to continue working after age 67. The discussion does not take into account data about the aging of the population.

Figure 4. Number of physicians per 1,000 population in OECD countries

Note: OECD countries with available data.

Source: Tur-Sinai et al., Taub Center | Data: OECD

Figure 5. Percentage change in the number of physicians and physicians per 1,000 population in OECD countries, 2000–2017



Source: Tur-Sinai et al., Taub Center | Data: OECD

Practicing physicians in Israel: Demographic characteristics

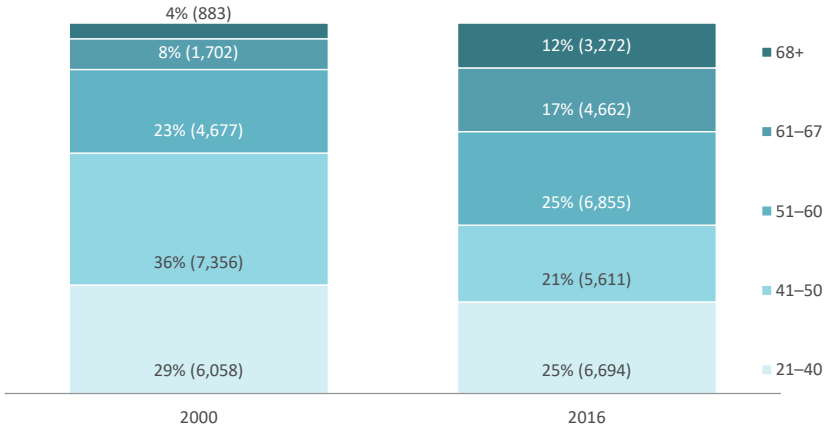
Age

The average age of practicing physicians in Israel has risen significantly since 2000. The number of physicians in the two older age groups (61–67 and 68+) grew between 2000 and 2016 (Figure 6). The number of physicians in the 61–67 age group increased from 1,702 to 4,662 (an increase of 174 percent) and the number of physicians who continue to practice after official male retirement age (67) grew even more significantly, from 883 to 3,272 (an increase of 271 percent). Over the same period, the share of active physicians over retirement age out of the total active physicians in Israel grew from 4 percent to 12 percent. With the increase in the number of physicians in the older age groups, there was a decrease in the number of practicing physicians ages 41–50. It is possible that this situation is linked to the age distribution of those physicians who came from the former Soviet Union. At the same time, in recent years, there has been an increase in the number of young physicians (up to age 40) after many years of decline which reached a low-point in 2009. The increase in the number of young physicians apparently stems from the trend in the growth of license holders in the last decade. Despite the increase in the number of young physicians in recent years, their share dropped from 29 percent to 25 percent of all active physicians.

The trend in the rise in actual retirement age of physicians is in keeping with studies that examined employment characteristics of the working-age population in Israel. These studies identify a trend of a rising share of older adults remaining in the labor force after the official retirement age, particularly among those with higher education (Kimhi & Shraberman, 2013; Weinreb, 2020). In practice, this is not a case of “binary retirement,” that is to say, retirement of a physician at a specific point in time, but rather a gradual process of reducing the number of work hours until full retirement.

Figure 6. Practicing physicians in Israel

By age group



Note: In parentheses, the number of practicing physicians out of the age group.

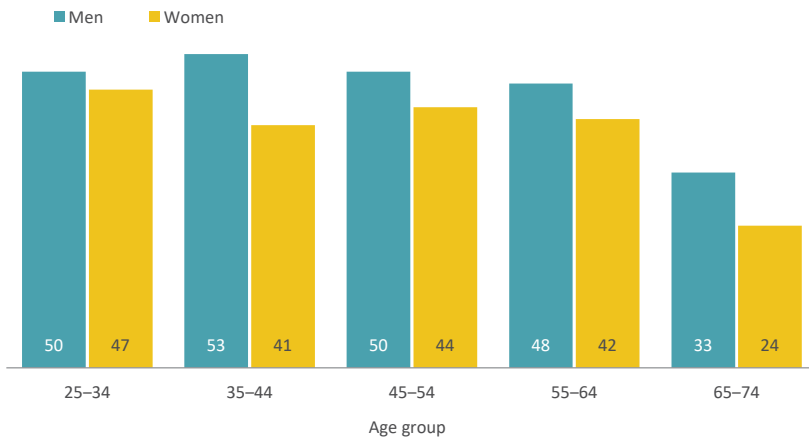
Source: Tur-Sinai et al., Taub Center | Data: CBS

The change in the distribution of physician ages affects the average number of hours worked, which change continually over the work life (Figure 7). Between ages 25 and 64 the number of weekly work hours of male physicians ranges from 48 to 53, and of female physicians, from 41 to 47. Older female and male physicians constitute a considerable share of the inventory of physicians in Israel, but their number of work hours is relatively low: male physicians ages 65 to 74 work an average of 33 weekly hours, and female physicians of the same age work an average of 24 weekly hours. In comparison to the 55 to 64 age group, this is 31 percent and 43 percent less, respectively.

Since older physicians tend to work fewer hours on average than young physicians, a growth in the number of older physicians out of all the active physicians is liable to cause an increase in the average number of hours of work of medical residents. Since many young physicians are still at the stage of specialization, they are obliged to work long, and strenuous hours in hospital wards. Residents are thus an important tier in the array of medical service provision to the public, and they provide a considerable share of services, especially to populations who are not able to make use of private medicine.

In contrast, in recent years, the trend of growth in the number of licensed physicians each year and the number of young physicians has become apparent. This growth is likely to contribute to a rise in the average number of work hours of physicians. One way or another, current trends point to a potential decrease in the effective labor supply of specialists, at least in the public system.

Figure 7. Average number of weekly work hours per physician, 2014–2017

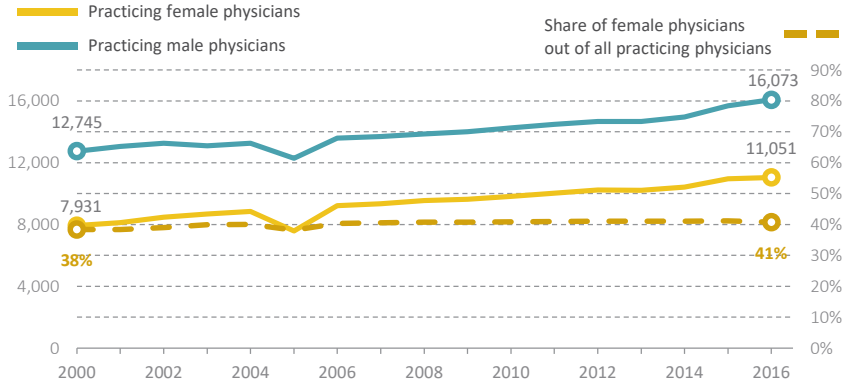


Source: Tur-Sinai et al., Taub Center | Data: CBS, Labor Force Survey 2014–2017

Gender

In recent decades, there have been no significant changes in the gender distribution of physicians in Israel. The share of women among active physicians stood at 38 percent in 2000, increased to 41 percent in 2007, and since then has not changed significantly (Figure 8). This is not much different than the share of women among all new medical license holders which has ranged, in the past decade, between 42 percent and 45 percent.

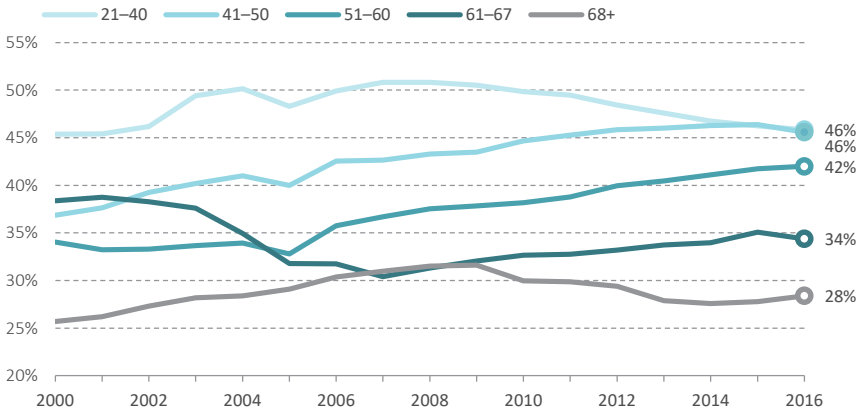
However, with regard to the physicians who are expected to retire in the coming years — those ages 60 and over — the share of women is relatively low. As a result, it is possible that there will be a certain increase in the share of women among all active physicians (Figure 9). This expected increase is likely to reduce, to a certain extent, the average number of work hours per physician, due to the disparity between the average work hours of male and female physicians (Figure 7).

Figure 8. Gender distribution of practicing physicians in Israel

Note: A practicing physician holds a medical license and has had income in Israel in the given year (either employed or self-employed). The CBS data for 2005 that are the basis for this figure are incomplete, and so the data for that year are outliers relative to other years.

Figure 9. Share of female physicians out of all practicing physicians

By age group

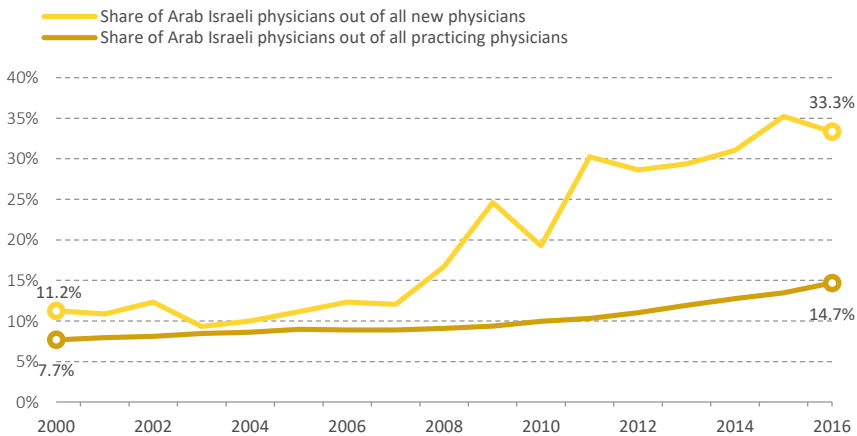


Source for Figure 8 and 9: Tur-Sinai et al., Taub Center | Data for Figure 8 and 9: CBS; Ministry of Health

Arab Israeli sector

Between 2000 and 2006, the share of new physicians from the Arab Israeli sector out of all new physicians grew, and, in recent years, their share reached over 30 percent, as opposed to 11 percent in 2000 (Figure 10). In parallel, the share of Arab Israeli physicians among active physicians has increased and, in 2016, reached some 15 percent, in contrast to 8 percent at the beginning of the period. The implications are that the share of active Arab Israeli physicians out of the total number of physicians is nearing the share of Arab Israelis in the population — some 21 percent.

Figure 10. Share of new physicians and practicing physicians in the Arab Israeli sector



Source: Tur-Sinai et al., Taub Center | Data: CBS; Ministry of Health

Country of origin and location of medical school

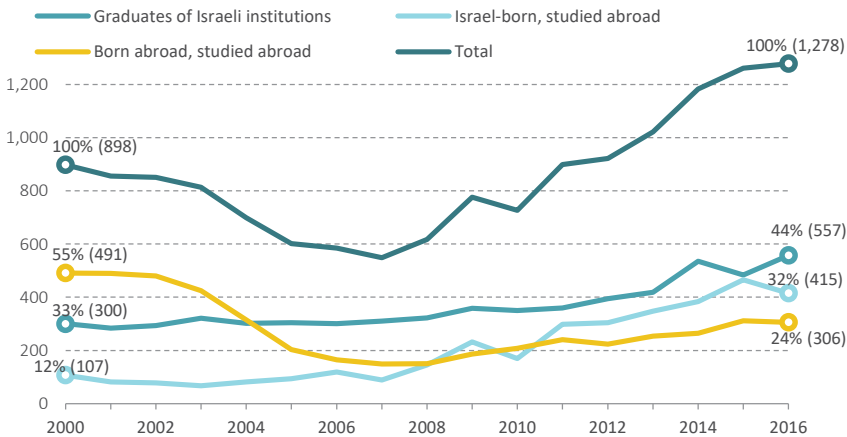
Country of origin

New physicians in Israel can be divided into three groups. Physicians who studied in Israel (independent of their country of origin), physicians who were born in Israel and studied abroad, and new immigrant physicians who were both born and studied abroad. Between 2000 and 2006, the number of new licenses conferred dropped from 898 to 548, a decrease of 39 percent (Figure 11). Immigrant physicians prompted this decrease. In 2007, the trend

reversed, and since then and up to the end of the period studied, there has been an increase of 133 percent in the number of licenses conferred. This increase was driven by physicians who studied abroad (given the growth in their numbers in those years), and particularly the increase in the number of native-born Israelis who studied abroad, including a growing number of Arab Israeli physicians. The number of native-born Israelis who completed their medical studies abroad grew from 89 in 2007 to 415 in 2016 (an increase of 366 percent). The number of graduates of medical schools in Israel also grew, but at a more moderate rate, from 310 to 557 (an increase of 80 percent).

The mix of newly licensed physicians has changed dramatically during the period surveyed. The share of new immigrants who studied abroad dropped significantly from 55 percent to 24 percent, and the share of Israeli graduates increased significantly from 33 percent to 44 percent. Most notably, the share of native-born Israelis who studied abroad increased from 12 percent to 32 percent. These data are in keeping with the growth in the number of physicians from the Arab Israeli sector, which represents a considerable share of those studying abroad.

Figure 11. The number of newly licensed physicians by country of birth and location of medical school



Source: Tur-Sinai et al., Taub Center | Data: CBS

Medical studies in Israel

The number of students studying medicine in Israel has been on an upward trend. In 1990, the number of medical students was 1,098, of whom 483 were women (44.0 percent). Three decades later, the overall number of medical students was 2,016 (an increase of 83.6 percent), of whom 1,185 were women (58.8 percent).

The number of Arab Israeli students studying medicine in Israel and their share among all medical students has also been growing over the years. In 1990, the number of Arab Israeli medical students was 60 (5.5 percent of all medical students in Israel), and three decades later their number was 300 (14.9 percent) — an increase of 400 percent.

Medical studies abroad

The share of medical graduates from Israeli universities has dropped steadily since 2000: from 74 percent at the beginning of the period to 51 percent at its end (Figure 12). The share of graduates from Hungarian and Russian universities is also on a downward trend, in contrast to an increase in the share of graduates from universities in Romania, Italy, and, especially, Jordan. In general, the country with the second-largest number of Israeli medical school graduates is Hungary, where a tenth of all Israeli licensed physicians were trained in the period studied. It is also interesting to note the significant growth in the number of medical students in Jordan, which reached 7 percent of all new physicians in recent years, an increase that parallels the growth in the number of new physicians from the Arab Israeli sector.

The share of male physicians who studied abroad is higher than the share of female physicians (Figure 13). In other words, we are witnessing a change in the mix with more women graduates of Israeli universities and male graduates from universities abroad. This is significant in terms of the gender mix of specialists, as will be discussed.

Figure 12. Distribution of new physicians by country of medical school, Israel-born only

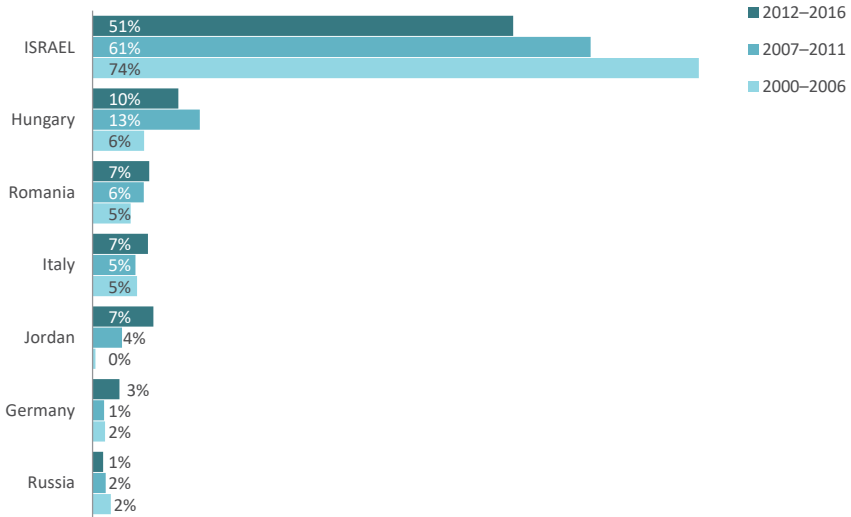
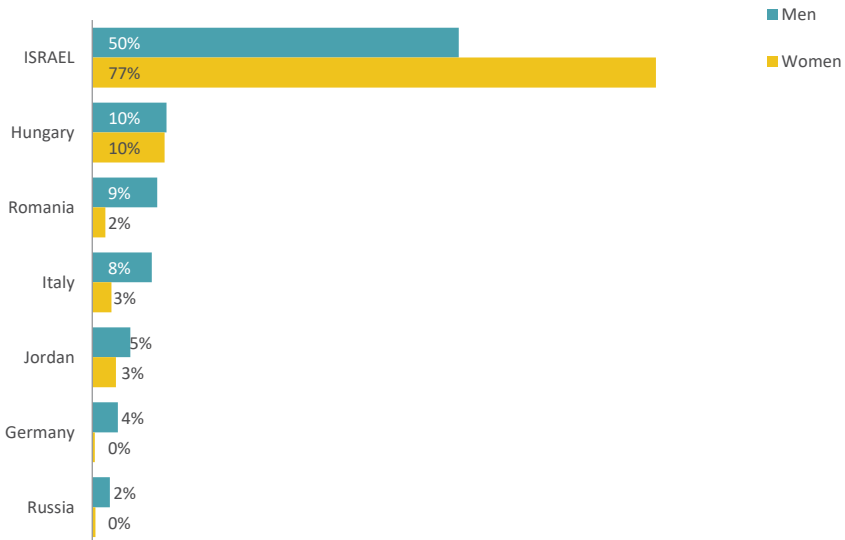


Figure 13. Distribution of new physicians by country of medical school and gender, Israel-born only



Source for Figure 12 and 13: Tur-Sinai et al., Taub Center | Data for Figure 12 and 13: CBS

Medical residencies

In recent years there has been a debate about the shortage of medical residents in certain essential fields. A decisive factor for acceptance to residency in a specific field is based on the basic level of knowledge that interns demonstrate during their internship. This knowledge is based on the quality of their medical studies, and, therefore, the share of physicians completing their residencies can be viewed as an indicator of the quality of medical studies and their level of professional knowledge. In order to estimate the share of residencies among physicians, the share of specialists out of all physicians was examined a decade after the completion of medical studies. This extended period of time was intended to suffice for most medical residents to have completed the process of specialization, even if, for any reason, there were delays (for example, maternity leave, particularly long residencies, and so on).⁴

As shown in Figure 14, there is a general increase in the share of new specialists entering the system; there is no significant difference between men and women among the new specialists, but there is a difference of 9 percentage points in favor of Jewish specialists relative to Arab Israeli specialists.

The data in Figure 15 show that the share of those who completed residencies and graduated from Israeli medical schools was large relative to those who graduated from overseas universities. Among physicians who graduated from Israeli universities and received their license between 1996 and 2007, the share of those who completed residencies was 79 percent, whereas, among the graduates of overseas faculties of medicine, the share was much lower, at just 43 percent. Among the graduates of overseas faculties, there is a gap between the percentage of Jews who completed residencies — 77 percent — and their percentage among students — 43 percent.

4 Two comments should be made concerning the data on which the following figures are based. First, the data do not identify physicians who studied medicine in the academic program of the Israel Defense Forces who, upon completion of their studies, were obligated to complete their regular army service and reserve service lasting several years before they could begin their residencies. For this group of eighty individuals per year, their residency is likely to have been delayed beyond the 10 years after the receipt of their license. Second, the data include licensed physicians who completed their residency in Israel only, and do not include information about physicians who received an Israeli license, did their residency overseas and remained there to work.

Hence, among the Jewish Israeli students who studied abroad, the share of specialists is similar to the share of specialists among Israeli students who studied in Israel.

Figure 14. Share of physicians completing residency within 10 years of receipt of their license

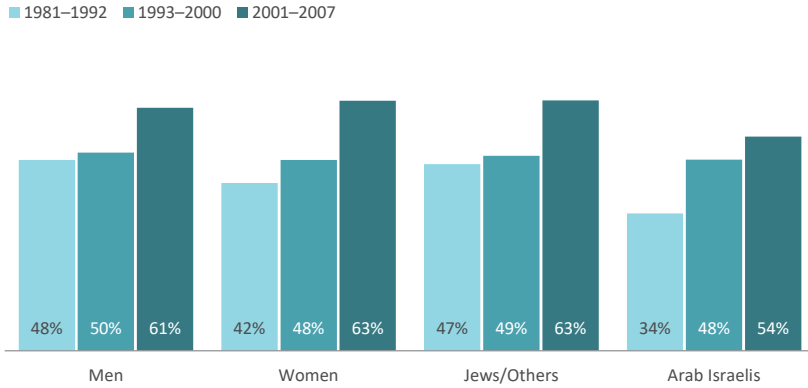
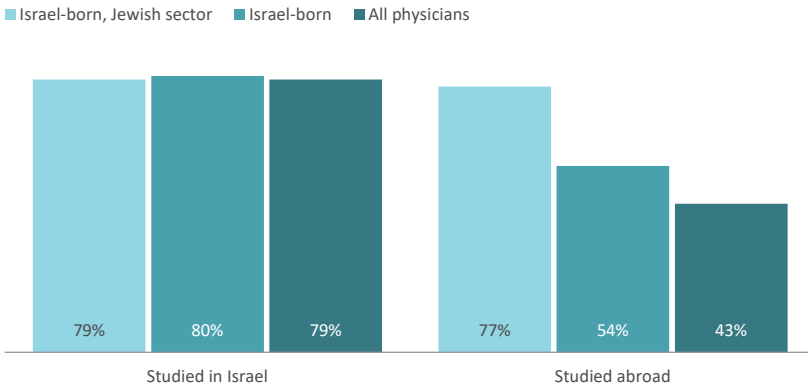


Figure 15. Share of physicians completing residency within 10 years of receipt of their license, 1996–2007



Source for Figure 14 and 15: Tur-Sinai et al., Taub Center | Data for Figure 14 and 15: CBS

Table 1 presents the number of new specialists in Israel by field of specialization in three groupings of five years: 2003–2007, 2008–2012, and 2013–2017. Likewise, the table presents the rate of change between the first grouping (2003–2007) and the third (2013–2017), with the goal of identifying the processes of change by specialization.⁵ It should be noted that the table does not reflect the percentage change in the number of specialists or specialists per population. To show this one would also have to consider the number already practicing in the healthcare system and the number that retired in the same time period.

The largest increase took place among those completing specialization in the field of child and adolescent psychiatry — an increase of 96 percent. It should be noted that the number of those completing any psychiatry residency dropped by 18 percent in the same period, indicating that there was a drop in the number of those completing other sub-specialties in the field. Other fields that showed a relatively large increase were occupational medicine (44 percent), plastic surgery (40 percent), and ophthalmology (37 percent).

The fields in which there was a very significant reduction in the number of new residents in this period were public health — a decline of 31 percent — and geriatrics — a drop of 29 percent. There was also a decrease in the number of new specialists in physical medicine and rehabilitation (-4 percent), urological surgery (-7 percent), and, as noted, general psychiatry (-18 percent). Hence, there has been a drop in the rate of growth in residencies for which there is a great need, especially public health and geriatrics.

5 The data in the first line of the table is the total number of new specialists during the entire period. This number differs slightly from the data in Figure 1, which includes small fields of specialization that are not featured in Table 1.

Table 1. Physicians completing residencies and rates of change between 2003–2007 and 2013–2017

	Period 1 2003–2007	Period 2 2008–2012	Period 3 2013–2017	Rate of change: Period 1 to 3
Total	2,827	2,951	3,239	1.15
Psychiatry, child/adolescent	25	20	49	1.96
Occupational medicine	18	14	26	1.44
Plastic surgery	30	33	42	1.40
Ophthalmology	102	103	140	1.37
Diagnostic radiology	100	115	123	1.23
Obstetrics/gynecology	200	196	244	1.22
Pediatrics	393	422	478	1.22
Ear, nose, and throat	53	54	64	1.21
Family medicine	327	402	382	1.17
Neurology	60	62	68	1.13
Internal medicine	623	589	704	1.13
Pathological anatomy	25	27	28	1.12
Skin/sexual diseases	49	46	54	1.10
Orthopedic surgery	149	151	161	1.08
Anaesthesiology	132	139	139	1.05
General surgery	106	134	110	1.04
Physical medicine/rehabilitation	23	24	22	0.96
Urological surgery	43	44	40	0.93
Psychiatry	172	168	141	0.82
Geriatrics	51	52	36	0.71
Public health	26	12	18	0.69

Source: Tur-Sinai et al., Taub Center | Data: CBS

Conclusions

Between 2000 and 2007, the number of new physicians receiving a license in Israel followed a downward trend. In 2007, this trend was reversed, and since then the number of new physicians in Israel has increased steadily. The number of new specialists was stable in the years 2000 to 2017, and then also began to rise. In addition, the share of female physicians out of all physicians remained fairly stable during this period, and, since 2007, it has remained steady at 41 percent.

There has been a slight drop in the number of physicians per 1,000 population due to the continued growth in Israel's population, and particularly when we taking into account the aging of the population (weighted using the capitation formula). Nonetheless, this decrease is smaller than the pessimistic forecasts of just a decade ago. Israel is still in a respectable place in the world in terms of the potential supply of physicians — 3.2 physicians per 1,000 population, some 10 percent above the “red line” determined by the Horev Committee (2010). The public health system can exploit this supply by allocating suitable positions, particularly in view of the aging of the physician population in Israel and an increase in the number of physicians who work part-time, especially those nearing retirement age and thereafter.

The growth in the number of new physicians arises mainly from those who received their licenses after studying abroad. There is also an increase in the number of those who received their licenses after studying medicine in Israel, but these are not the main engine for growth, despite the recommendations of various committees formed to study this matter (Pazi Committee 2002, Bennun Committee 2007, Halevi Committee 2007).

The growth in the number of new physicians compensates for the decrease in the number of new immigrant physicians (who were born and studied abroad) and for the retirement of active physicians. Another source for the increase in the number of practicing physicians is the continued work of physicians past retirement age. Since they work fewer hours than they did before retiring, it is possible that the overall labor supply of physicians will be reduced. The net impact on the supply (work hours) of specialists needs further study.

The change in the composition of those receiving licenses, including practicing physicians, naturally raises questions about the quality of treatment. We are witnessing an increase in the number of specialists in the past few years. On the other hand, there is a “loss of specialization” due to the retirement of specialists at a time when young physicians entering the profession are not yet

qualified as specialists. Within ten years after the end of their studies, some 80 percent of the physicians who studied in Israel, completed their residency, no matter their country of origin or sector. In contrast, among physicians who studied abroad, only 43 percent had completed their residency in this time period. Of those 43 percent, the highest share was among native-born Israelis who studied abroad; even higher than this was the share of native-born Israelis in the Jewish sector, whose share of residency graduates was similar to the share of residency graduates of Israeli medical schools.

Child and adolescent psychiatry is the field that accounts for the greatest increase in the number of those completing their residency between 2003 and 2017. Additional fields that enjoyed a relatively significant increase are occupational medicine (44 percent), plastic surgery (40 percent), and ophthalmology (37 percent). The fields that had a very significant reduction in the number of physicians completing their residency in those years included public health and geriatrics — areas in which the need for specialists is growing.

In 2018, the State Comptroller noted discrepancies in the level of training and the expertise of physicians who studied abroad and those who studied in Israel. In his report he stated that he had found fundamental disparities in the percentages of success in the licensing examinations for physicians who had studied abroad and those who had studied in Israel: 97 percent of the students who had studied medicine in Israel passed the licensing examinations for physicians between 2014 and 2017, in contrast to only 50 percent of those who had studied abroad (State Comptroller, 2018). This great difference seems to indicate significant gaps in knowledge between the two groups. It is important to qualify this conclusion with regard to licensing examinations, though. These examinations test the level of knowledge of students on the Israeli curriculum, with all its special emphases, and it is very possible this gives Israeli medical students an advantage over students who studied different curricula abroad. It is also important to note that one of the main reasons that Israeli students decide to study abroad is that they were not able to meet the conditions for acceptance to faculties of medicine in Israel. Therefore, it is reasonable to assume that there was a gap in the academic achievements of the two groups before they began their medical studies, at least as reflected in their matriculation results and psychometric examinations.

In 2019, the Ministry of Health tightened medical licensing criteria and reduced the list of medical faculties overseas with recognized study programs whose graduates are entitled to take the Israeli licensing examination.

Nevertheless, even if we assume that the gaps in the share of residencies between graduates of medical schools abroad and in Israel are linked at least in some measure to the country in which they studied, it cannot be assumed that there are professional gaps that cannot be bridged with the appropriate investment as was previously proven with new immigrant physicians from the former Soviet Union. It is possible that differences in the command of the Hebrew language, that is common to those born abroad and the Arab Israeli sector, make it more difficult for them to complete their residency, which includes multiple-choice questions, where language disparities become a factor. It is possible, too, that there are gaps in Israel between the various sectors in terms of the importance attributed to physician specialization. Likewise, it is possible that there are gaps between groups in the resources available that affect an individual's ability to complete a long and demanding residency successfully (such as economic support in the challenging periods of the residency, assistance with child care, and more). It is also possible that gaps in the share of residencies sometimes stems from a certain discrimination against physicians who studied abroad, with preference given to physicians who studied in Israel. This preference may stem from various factors. The first is that it is possible that, due to the perception that physicians who studied abroad are not as good as their colleagues who studied in Israel, hospitals prefer to accept those who studied in Israel, particularly when it comes to desirable residencies and the most in-demand hospitals. This perception, whether correct or not, is likely to bring about a reduction in the range of possibilities open to physicians who studied abroad. The second is that hospitals have agreements with faculties of medicine in Israel, and it is possible that these agreements, either directly or indirectly, influence the preference for physicians who studied in those faculties over those who studied abroad. The third reason may be that contacts and personal acquaintance between the department directors in the Israeli health system help physicians who studied in Israel to be accepted more easily for a residency.

One way or another, it is important for the State of Israel to realize the potential of the physicians it has by expanding available positions for physicians and medical residents, so as to improve the quantity and quality of the labor supply being offered to the system.

References

English

- CBS (various years). *Labor Force Survey*. Jerusalem: Central Bureau of Statistics.
- Chernichovsky, D. (2019). [The healthcare system: An overview](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2019* (pp. 363–386). Jerusalem: Taub Center for Social Policy Studies in Israel.
- Chernichovsky, D., & Regev, E. (2014). [Financing and work force issues in Israel's healthcare system](#). Policy Paper No. 2014.17. Jerusalem: Taub Center for Social Policy Studies in Israel.
- Kimhi, A., & Shraberman, K. (2013). [Employment and income trends among older Israelis](#). Policy Paper No. 2013.07. Jerusalem: Taub Center for Social Policy Studies in Israel.
- OECD (2020). [Beyond Containment: Health systems responses to COVID-19 in the OECD](#). Paris: OECD Publications.
- Weinreb, A. (2020). [Population projections for Israel, 2017–2040](#). Policy Paper No. 02.2020. Jerusalem: Taub Center for Social Policy Studies in Israel.

Hebrew

- Belinsky, A., Ben Naim, G., & Hecht, Y. (2018). *Salaries of doctors in government hospitals, from private to public medicine — findings and trends*. Discussion paper set. Jerusalem: Ministry of Finance.
- Ben Naim, G., & Belinsky, A. (2019). *An analysis of physician's salaries in government hospitals and public and private clinics — in light of the reforms*. Jerusalem: Ministry of Finance.
- Bennun Committee (2007). *Report of the Committee to Examine Estimates of Future Labor Force Needs in the Health System: Doctors and Nurses*. Jerusalem: Ministry of Health.
- Horev Committee (2010). *Report of the Committee to Plan Manpower for Doctors and Nurses in Israel*. Jerusalem: Ministry of Health.
- IMA (2016). *The shortage of physicians in Israel, Status report*. Ramat Gan: Israel Medical Association.
- Nirel, N., Shirom, A., & Ismail, S. (2003). [Physician consultants in Israel: Characteristics of their employment and its implications for their work life](#). Research paper. Jerusalem: Myers-JDC-Brookdale.
- Pazi Committee (2002). *Report of the Committee to Examine the Future Need for Physicians*. Jerusalem: The Higher Education Authority.

- Shemesh, A., Rotem, N., Haklai, Z., Gorgi, M., & Horev, T. (2012). [*Employment characteristics of physicians in Israel*](#). Jerusalem: Ministry of Health and the Central Bureau of Statistics.
- State Comptroller and Ombudsman (2009). Ministry of Health: Medical and Nursing Manpower — Status report. In *The Ombudsman Annual Report 59b* (pp. 353–397). Jerusalem: Office of the State Comptroller and Ombudsman.
- State Comptroller and Ombudsman (2018). Ministry of Health: Clinical training of doctors and the arrangement between the healthcare system and academia. In *The Ombudsman Annual Report 63c* (pp. 500–509). Jerusalem: Office of the State Comptroller and Ombudsman.
- Van Dyke, D., Holtman-Schweid, K., Bin-Nun, G., & Kushnir, T. (2011). Work satisfaction, turnover intentions and leaving the medical profession among physicians in Israel: Survey of licensees in 2000, 2002, 2004, and 2006. *Harefua* 150(4), 310–313.

Appendix

The research data are based on a combination of a number of administrative information sources, as follows:

1. **Registry of Physicians in the State of Israel.** The source for this registry is data from the Ministry of Health, which contains information about every person licensed to practice medicine in Israel in the years 2000–2018 — year of receipt of license, country of completion of medical school, medical residencies, and year residency began. This was the basis for the creation of the research database, for it makes it possible to identify those with a license to practice medicine in Israel, to characterize them, and to examine their patterns of behavior in the labor force over the years.
2. **File on individual income.** This file was obtained from the Tax Authority. The file gives detailed information about income from salaried work and independent work, the number of jobs per year and details about months of employment in which an individual worked or did not work in each job each year. This file contains relevant information on each licensed medical professional and his/her spouse, starting with the date on which the license to practice medicine was received up to 2018.
3. **Population Registry.** This file was obtained from the Population and Immigration Authority. The file contains demographic information about each person licensed to practice medicine and his/her spouse up to 2018. Details include year of birth, gender, country of birth, date of immigration, religion, population group, personal status, and year of death (in order to identify deceased during the course of the study).
4. **Emigrants.** This file was obtained from the Population and Immigration Authority in order to locate emigrants from Israel during the course of the research. The file contains information on each holder of a medical license and his/her spouse since the receipt of the license to practice medicine up to 2018, whether they left or returned to Israel, and in what year.
5. **Conferring of degrees.** In order to establish the highest level of education of each person licensed to practice medicine and his/her spouse, this information was obtained from the Central Bureau of Statistics with regard to academic studies over the years and entitlement to a degree. This information was required as some of the graduates continue to study after completion of medical school, and it is important to assess the contribution of additional education on employment patterns in the medical field.

The information derived from these five sources about those licensed to practice medicine who received a license between 2000 and 2018, was merged into a long-term follow-up file that facilitates tracking integration into the labor force in general and into the healthcare labor force in particular from the date of completion of studies and the receipt of the license from 2000 to the end of 2018. As outlined above, the advantages of this database, which was built in conjunction with the Central Bureau of Statistics specifically for this research study, are two-fold. The first is that because it contains management data (not sampling data based on surveys), it contains information about all physicians who received a license to practice medicine in Israel. The second is that the merging of the two main data files — the file on those holding licenses and the file from the Tax Authority — makes it possible to locate the active physicians in each year, defined in the present document as physicians licensed to practice medicine in Israel who had income in Israel in that year. This group does not include physicians who retired, lived abroad, or, for other reasons, did not have income in Israel in that year.

MACROECONOMIC TRENDS

2

The Impact of the Coronavirus on the Economy of Israel: An Overview

Benjamin Bental and Labib Shami

When the coronavirus pandemic began, Israel's economy was healthy and, in some respects, was even flourishing. In a presentation by Prof. Amir Yaron, the Governor of the Bank of Israel, on January 20th, 2020, to the Knesset Finance Committee, the growth rate of GDP was forecasted to be 2.9 percent in 2020 and 3.2 percent in 2021 (Yaron, 2020). The labor market was in excellent shape. According to the presentation, the labor force participation rate in October 2019 was 80.9 percent, the employment rate was 78.3 percent and the unemployment rate was 3.2 percent. On the fiscal side, the Governor reported a stabilization of the national debt-to-GDP ratio at 60 percent.¹ Nonetheless, according to the presentation, the government's budget deficit had reached 3.7 percent of GDP, which is significantly higher than the 2019 target of 2.9 percent.

In that same presentation, the Governor discussed processes in the economy that are sources of concern. The drop in the debt-to-GDP ratio was in part due to "technical" and transitory factors and as a result the trend could change. In particular, the index of output prices was rising faster than the CPI and accordingly, in current prices, GDP was rising at a faster rate than the debt (see also Bental & Brand, 2019). Another effect that was reducing the debt was the appreciation of the shekel, which reduces the value of shekel-denominated external debt. The government's expenditure programs at that time and the addition to the defense budget that was being discussed were expected to increase the deficit during the subsequent five years to a level of 5.2 percent of GDP and the national debt ratio to 75.5 percent. Meeting the target for total

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1 The debt-to-GDP ratio at that level is considered not to present a problem for debt servicing. See below for further details.

expenditure and the deficit target as specified by law would have lowered the deficit gradually to 1.5 percent of GDP in 2025, alongside a slight drop in the debt (relative to the existing situation) to 59.6 percent of GDP.

From a structural perspective, the Governor presented several fundamental problems we have also discussed in the *State of the Nation Report 2019* (Bental & Brand, 2019). The first is the low level of labor productivity in Israel and the widening gaps over time relative to other developed countries. The second is the lack of change in the low labor force participation rate among Haredi (ultra-Orthodox Jewish) men and the continuing low rate among Arab Israeli women, despite the notable upward trend in that group. The low level of productivity is attributed to the low level of human capital, as reflected in the PIAAC surveys and the PISA tests, and to a low level of physical capital and transportation infrastructure, as well as burdensome regulations that hinder business sector activity in Israel. The low participation rates of the two population groups mentioned is well known and has been discussed in, for example, Fuchs and Epstein (2019). Needless to say, the coronavirus crisis has not solved any of these problems and seems to have only exacerbated them. Finally, the Governor mentioned the challenges facing the Bank of Israel and central banks in general, including, among others, the “emergence of new risks.” He, of course, could not have imagined that the challenge would arrive with such short notice.

At the beginning of 2020, the trends of the previous year continued — until the arrival of the coronavirus crisis which changed the situation dramatically. Accordingly, the macroeconomic survey this year will focus on the immediate impact of the coronavirus crisis on economic activity in Israel and will relate to the indications for coming years.

A brief timeline of events

The healthcare system began preparing for the coronavirus pandemic at the end of January 2020. On January 30th, flights from China were stopped and other countries were added during February. On March 12th, the education system in Israel was closed down and on the 19th a lockdown was imposed that prohibited people from leaving their homes except when necessary. On April 12th, the mandatory wearing of face masks was introduced. Some loosening of restrictions were introduced on the 19th, which included the reopening of businesses in selected sectors. Additional exemptions were introduced

on April 26th. The education system reopened at the beginning of May but under limitations on activity, and on the 14th it began operating without any restrictions. At the same time, economic activity was allowed to return to a nearly normal level, including traffic through Ben Gurion Airport (except for incoming tourism which was still prohibited). Towards the end of June, as the rates of infection began to rise, restrictions were again imposed on gatherings of various sizes and on a variety of activities. The failure of these measures led to a second lockdown, which began on September 18th and was further tightened on the 25th. In particular, it was decided to close workplaces and the airport and to severely limit mobility. During the first half of October, the process of ending the lockdown gradually began, with the lifting of restrictions on mobility, the reopening of the airport, preschools, and schools.

Main macroeconomic variables

The coronavirus crisis drastically changed the trends of the previous years. The following graphs focus on the data for growth, unemployment, the deficit, and the public debt over the past decade. In all of the graphs, the effect of the coronavirus pandemic is presented by the Bank of Israel forecasts (made at the end of October) for 2020 and 2021.²

GDP

Figure 1 describes the path of growth in GDP per capita and the Bank of Israel forecast.³ The Bank of Israel believes that if the pandemic is brought under control (the optimistic scenario), the decline in GDP for 2020 will be 5 percent.⁴ Taking into consideration the rate of increase in the population, which is 1.9 percent per year, this is a major drop in standard of living, as reflected in the decline of 6.9 percent in GDP per capita. This decline returns the level of GDP per capita to where it was in 2014 (about NIS 139,000).

2 See [Research Department Staff Forecast, October 2020](#), Bank of Israel.

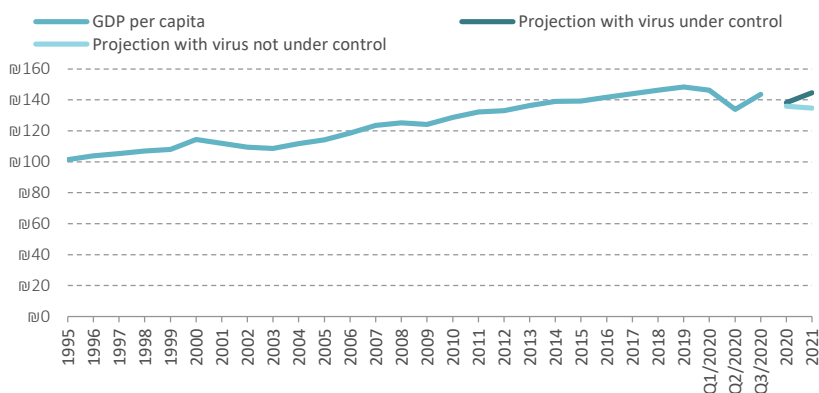
3 The calculations for the first three quarters of 2020 are based on the change in GDP per capita compared to each of the same quarters in 2019. At this time, the drop in GDP is about 3 percent relative to the same three quarters in 2019.

4 In its latest update, the Bank of Israel estimated that the GDP would drop from 4.5 percent to 5 percent. See the [presentation by the Governor of the Bank of Israel](#), December 2020 (in Hebrew).

According to the optimistic scenario, GDP will grow in 2021 by 6.5 percent, which puts GDP at the end of next year at a level that is 5 percent less than what was expected without the coronavirus pandemic. The level of GDP per capita will be similar to what it was in 2017 (about NIS 144,000). This scenario is similar to that reflected in the IMF forecasts made in October 2020 for other developed countries.⁵ The IMF expects that in 2020, GDP per capita will drop by 6.2 percent in this group and will rise by 3.6 percent in 2021. This forecast puts the 2020 level of GDP per capita in the group of developed countries at the level it was at in 2015 and in 2021 back to its level in 2017.⁶

Figure 1. GDP per capita in Israel

In 2015 prices, NIS thousands



Note: Annual GDP per capita for each quarter are based on the quarterly per-capita growth rate relative to the previous quarter.

Source: Benjamin Bental and Labib Shami, Taub Center | Data: Bank of Israel; CBS

In contrast, if control over the pandemic is not achieved and additional lockdowns are imposed toward the end of 2020 (the pessimistic scenario), the Bank of Israel predicts negative growth of 6.5 percent in 2020. According to that scenario, the level of GDP per capita in Israel will return to its level in 2013 (about NIS 136,000). Moreover, in this scenario GDP is expected to grow

5 The IMF includes 36 countries in this group, 34 of which are members of the OECD (all of the countries in the organization except for Chile, Colombia, and Turkey), and also Hong Kong and Singapore.

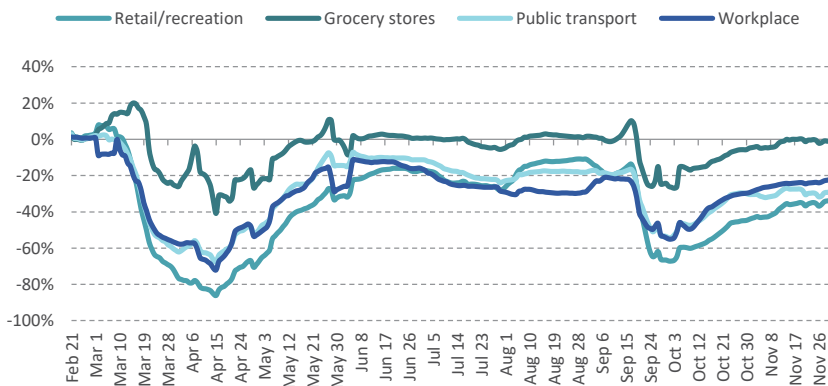
6 See the [IMF](#) site.

in 2021 by only 1 percent, i.e., a negative growth rate of 0.9 percent in per capita terms. As a result, GDP per capita will return to almost what it was in 2012 (about NIS 133,000).

Consumer activity during the coronavirus crisis

The fear of infection during a pandemic has a moderating effect on economic activity. For example, research recently carried out in Scandinavia showed that the decline in consumer activity in Sweden, where restrictions were only voluntary, was only somewhat less than in Denmark, which imposed a formal lockdown on its citizens (Andersen, Hansen, Johannesen & Sheridan, 2020). Nonetheless, a formal lockdown has a greater effect on economic activity, as reflected in Google's mobility reports (Figure 2).⁷ The graph provides information on the change in the mobility of Israel's residents relative to the situation prior to the coronavirus crisis for the purpose of retail purchases and recreation and grocery shopping, and movements in public transportation centers and workplaces. All of the curves point to a strong decline in activity during the first and second lockdowns and a lower level than prior to the crisis also during the period between the lockdowns. Activity for the purpose of grocery shopping declined the least and even returned to its original level when the first lockdown was lifted.⁸

Figure 2. Mobility of Israeli residents between February and November, 2020
Seven-day moving average, percent change from baseline



Source: Benjamin Bental and Labib Shami, Taub Center | Data: [Google community mobility report](#)

7 See the timeline of the imposition of lockdowns below.

8 For a discussion of the connection between the severity of the restrictions on the one hand and mobility and economic activity on the other, see also IMF, 2020.

The restrictions on mobility also had an effect on purchasing habits among Israeli consumers, who shifted a significant portion of their activity to online purchasing, which can be carried out only with a credit card. As a result, the Bank of Israel began to report the daily levels of credit card purchases, which essentially made it possible to track consumer responses to the development of the crisis. Moreover, the Bank of Israel breaks down the data by industry, so it is possible not only to track total consumer activity but also to identify the effect of the crisis on specific components of the consumption basket. Figures 4–6 describe the daily average credit card purchases in sectors whose activity was particularly affected (hotels, recreation, and restaurants), average purchases at grocery store chains which were unaffected, and activity at gas stations, which represent the degree of mobility in the economy.⁹

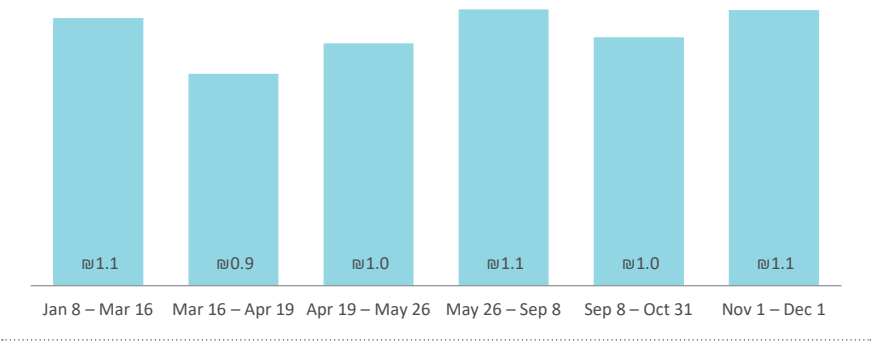
In order to facilitate the discussion, we divided the time axis into six periods that represent the development of the crisis in Israel:

1. The original situation of the economy: from the beginning of 2020 until the first lockdown of the economy — January 8th, 2020, until March 16th, 2020.
2. The first lockdown period: March 16th, 2020, until April 19th, 2020 (after Passover), which is reflected in the sharp drop in activity in Figure 2.
3. The end of the first lockdown until the opening of restaurants, swimming pools, and tourism: April 19th, 2020, until May 26th, 2020, represented by the upward trend in Figure 2.
4. A return to restricted activity: May 26th, 2020, until September 8th, 2020, represented by the stabilization of activity in Figure 2.
5. Declaration of restricted zones (including a second lockdown) until a gradual return to routine with restrictions: September 8th, 2020, until November 1st, 2020, represented by the sharp drop and then a recovery during the second wave in Figure 2.
6. The end of the second lockdown period and a staged return to normal from November 1st, 2020 to December 1st, 2020.

⁹ In the graphs, sectors are grouped according to their scope of activity for ease of comparison.

Figure 3 presents average total daily credit card purchases in each of the periods. The graph shows a sharp drop in economic activity, as reflected in the 21 percent drop in credit card purchases following the government declaration of economic restrictions on March 16th. Simultaneous with the removal of restrictions, there was a recovery in economic activity, as reflected in the rise in credit card purchases, back to pre-crisis levels and slightly higher. The second lockdown, which began on September 8th, again led to a drop in the level of activity, but this time it was much more moderate (about 10 percent). It can be assumed that the difference in the reactions to the two lockdowns is an indication of the lower severity of the second lockdown relative to the first, as well as the public’s changing consumption habits. Along with the ending of the lockdown came a return to economic activity at the level prior to the beginning of the second lockdown.

Figure 3. Average daily credit card purchases
NIS billions



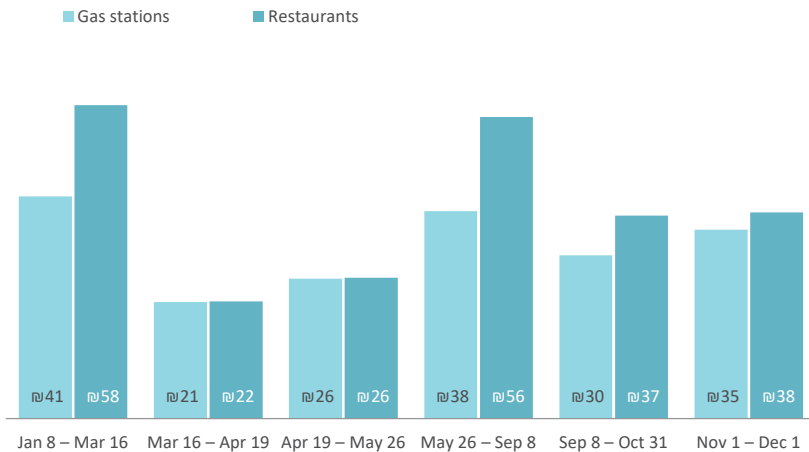
Source: Benjamin Bental and Labib Shami, Taub Center | Data: Bank of Israel

A similar pattern characterizes the average credit card purchases broken down by sector, though to a different extent. Figures 4 and 5 focus on four sectors whose level of activity was particularly sensitive to the restrictions on mobility (gas stations) and the restrictions on gatherings (restaurants, recreation, and hotels). The restrictions on mobility in the first wave reduced activity in the gas stations by 49 percent, but once the restrictions were lifted, gas stations returned to nearly the pre-crisis level (Figure 4). Here again, the effect of the second lockdown was much more moderate than the first and the activity

of the gas stations fell by only 21 percent. In the restaurant industry, the reaction was more pronounced. The first lockdown reduced activity in this industry to about one-third of its normal level while the second lockdown led to a reduction of only 34 percent. As of the beginning of December, and considering the continued restrictions on the restaurant industry, economic activity has not returned to pre-second lockdown levels.

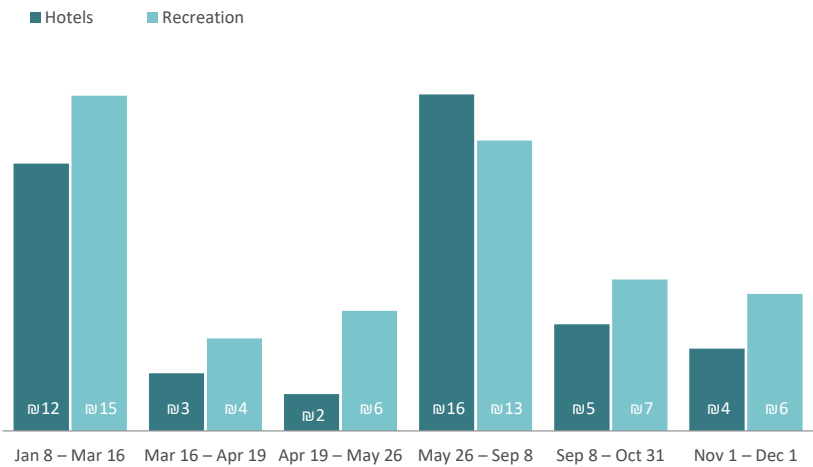
Figure 5 focuses on the hotel and recreation sectors. In both of these sectors, the first lockdown reduced the level of activity to one-quarter of its normal level. However, with the lifting of the first lockdown, there was a dramatic recovery in these sectors and activity in the hotel industry even exceeded the pre-crisis level (apparently as a substitute for traveling abroad during the summer). The second lockdown, in which the hotels were again closed, led to a drastic reduction in activity. Activity in the recreation industry was cut in half.

Figure 4. Average daily credit card purchases on gasoline and in restaurants
NIS millions



Source: Benjamin Bental and Labib Shami, Taub Center | Data: Bank of Israel

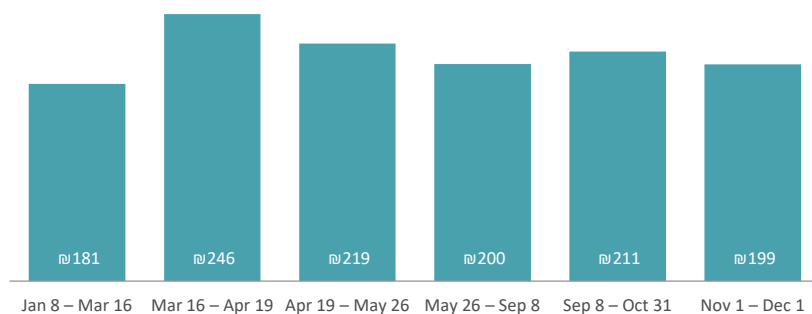
Figure 5. Average daily credit card purchases on hotels and recreation
NIS millions



Source: Benjamin Bental and Labib Shami, Taub Center | Data: Bank of Israel

In comparison to the aforementioned industries, the trends in the various grocery store chains were dramatically different. Figure 6 shows that during the period of the first lockdown credit card purchases rose by more than one-third. This is apparently consistent with the drop in mobility which led to a shift from in-store shopping, where cash purchases are possible, to online shopping where only credit cards can be used. It appears that these purchase habits also had a lasting effect, since total credit card purchases in the summer months remained higher by about 10 percent than their pre-crisis level. The second lockdown led to an increase in credit card purchases by another 6 percent, but left them at a level that was about 14 percent lower than the peak during the first lockdown. These data, together with the gas station data, tend to confirm the hypothesis that the second lockdown was much less stringent than the first.

Figure 6. Average daily credit card expenditure in the grocery store chains
NIS millions



Source: Benjamin Bental and Labib Shami, Taub Center | Data: Bank of Israel

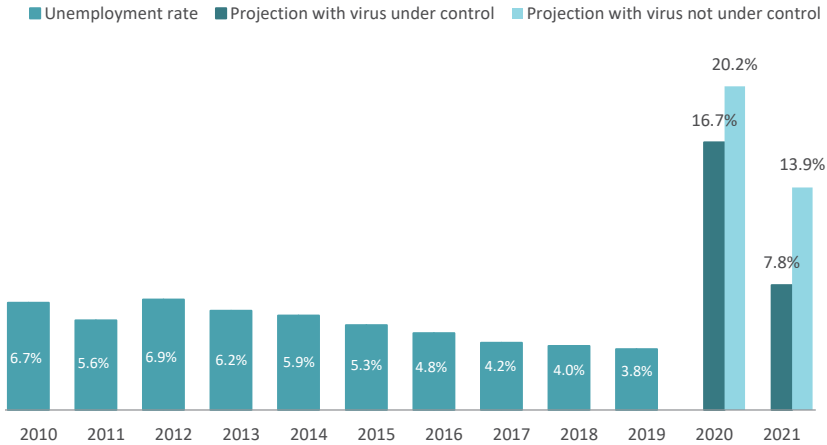
Unemployment and unpaid leave¹⁰

Under normal circumstances, unemployment is measured as the share of individuals of working age who are not working but are engaged in active job seeking. As can be seen in Figure 7, that rate declined consistently during the past decade and, during the first quarter of 2020, it was also at a low level.

As a result of the coronavirus crisis, the concept of unemployment was modified to fit the new circumstances. In mid-March, with the imposition of the first lockdown, about a million Israelis were sent on unpaid leave. As a result, it was decided to expand the definition of “unemployed” to include those who were absent from their place of work for at least a week because of the coronavirus crisis. The expanded definition also includes individuals who were working before the crisis, were laid off and are no longer seeking employment (under normal circumstances they would be classified as “not participating in the labor force”). The Bank of Israel believes that in a scenario where the virus is brought under control, the rate of unemployment according to the expanded definition will be 16.7 percent at the end of 2020 and 7.8 percent at the end of 2021. If the virus is not brought under control, the rates will be 20.2 percent and 13.9 percent, respectively. The last time that unemployment exceeded 10 percent was during the second *intifada*. It appears therefore that in this context, too, the coronavirus crisis has set us back many years.

¹⁰ Zontag, Epstein, and Weiss (2020) discuss this issue in more detail.

Figure 7. The rate of unemployment in Israel between 2010 and 2019 and the forecast for 2020 and 2021



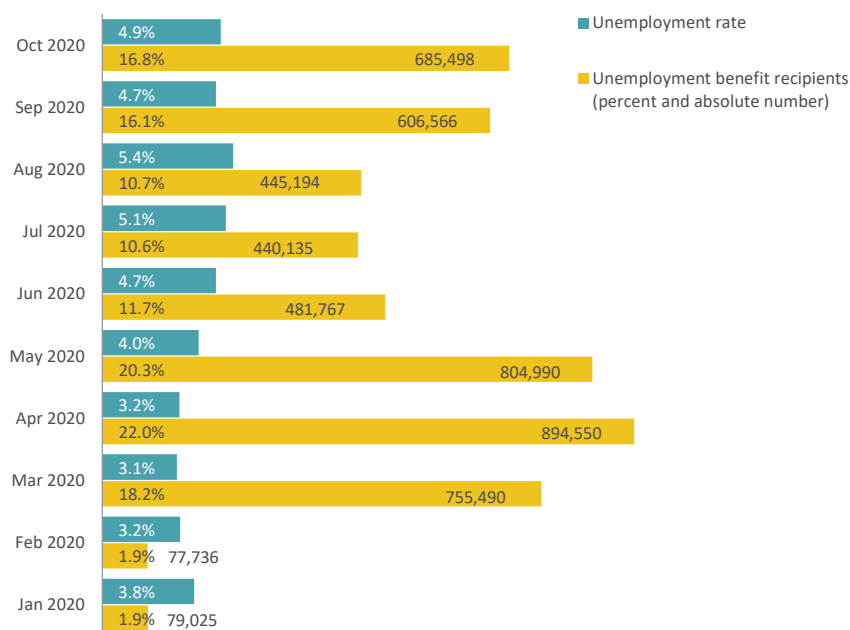
Source: Benjamin Bental and Labib Shami, Taub Center | Data: Bank of Israel

As mentioned, with the imposition of the first lockdown, it was announced that workers on unpaid leave are eligible for unemployment benefits from their first day without a job.¹¹ Figure 8 presents the rates of unemployment benefit recipients during the first nine months of the year. As can be seen, the rate jumped 10-fold in March 2020 relative to February and continued to climb to a peak of 22 percent of the labor force (almost 900,000 workers) in April 2020. The exit from the lockdown during June, July, and August lowered the number of workers on unpaid leave by 50 percent, but the second lockdown in September–October again led to a significant increase and returned about 240,000 workers to this category.¹² The graph also depicts a picture of the gap between the two characteristics of the non-employed: the “classic” unemployed and the workers on unpaid leave. While at the start of the year the unemployment rate was higher than the rate of unemployment benefit

- 11 Under normal circumstances, unemployment benefits are paid to workers who have been on unpaid leave after 30 days. There are those, who do not meet the criteria to receive unemployment benefits. There are also unemployment benefit recipients who continue to work (in particular, self-employed individuals).
- 12 For further discussion of the safety net put in place by the National Insurance Institute for workers on unpaid leave, see Gal and Madhala, 2020.

recipients (due to duration restrictions on eligibility for unemployment benefits in normal times), since the onset of the crisis, there has been a separation of the two definitions. In April, this separation reached its peak when the unemployment rate was only 3.2 percent of the labor force. The drop in the rate of unemployment benefit recipients during the summer was in fact accompanied by an increase in the unemployment rate, such that the second lockdown in September and October was characterized by a small drop in the unemployment rate. It appears that this decline primarily reflects the exit from the labor force of those who have stopped seeking employment, which is also reflected in the slight drop in the size of the labor force in September.¹³

Figure 8. Rate of unemployment benefit recipients relative to labor force and the unemployment rate, January to October 2020



Source: Benjamin Bental and Labib Shami, Taub Center | Data: Bank of Israel; CBS

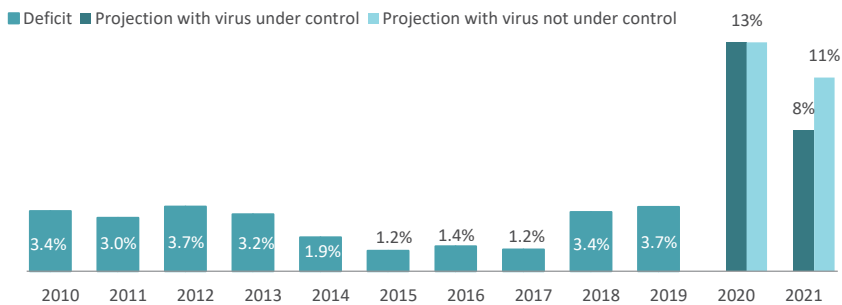
¹³ The change was from 4,126,300 workers in August to 4,069,400 in October. CBS, *Monthly Statistical Abstract for Israel*, November 2020.

The government budget

Support for workers on unpaid leave and the massive healthcare needs as a result of the coronavirus crisis are forcing many governments, including Israel's, to dramatically increase their expenditure. At the same time, the crisis has led to a significant decline in tax revenues, which has further increased the deficit. Figure 9 shows the forecasted deficit for this year and next year relative to that of recent years. The graph depicts the actual budget deficit in each year relative to GDP in current prices.¹⁴ The increase in the deficit to 3.7 percent, which was, as mentioned, also reported by the Governor of the Bank of Israel in 2019, exceeded the target that had been set (at 2.9 percent) and turned out to be an impediment in view of the developments during the first half of 2020 and those that are expected in the course of this year and in years to come. The deficit forecasted by the Bank of Israel for 2020 in the scenario where the virus is brought under control is 13 percent with a drop to 8 percent in 2021. If the virus is not under control, the deficit for 2020 is expected to be 13 percent, but in 2021 it is expected to drop to only 11 percent. This trajectory for the deficit is quite similar to that expected by the IMF for the developed countries, where the deficit for 2019 was 3.6 percent of GDP on average. In the current year, the deficit in these countries is expected to be 11 percent, but the drop next year is expected to be larger — down to 5.6 percent.

The shortage in resources will have to be found by the government at the capital markets, i.e., increasing the national debt and shifting the burden of repayment into the future (see below).

Figure 9. The deficit in the government budget relative to GDP

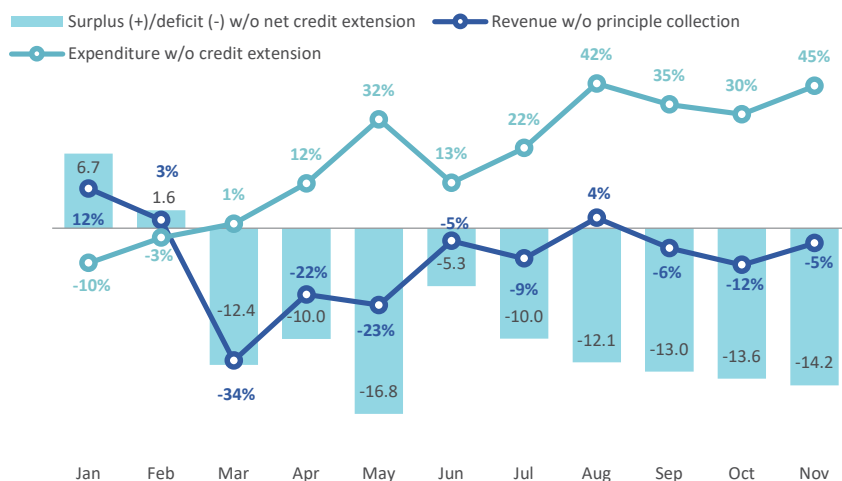


Source: Benjamin Bental and Labib Shami, Taub Center | Data: Bank of Israel

14 The data for the deficit can be found at [The Accountant General Department, Ministry of Finance](#).

Figure 10 presents the source of the increased deficit. The graph presents the gap between government revenues, government expenditure, and the deficit for each of the months in 2020 and the same months in 2019, in millions of shekels. It can be seen that, in the first quarter of 2020, the trajectory of the government's expenditure was similar to that in the same month in 2019, which reflects the continuation of the 2019 budget in the absence of a new budget for 2020 (according to the rule that allows monthly expenditure of 1/12 of the total budget each month). Moreover, In January and February 2020, the deficit was lower than in the same months in 2019. This trend was reversed with the full onset of the crisis in March. Expenditure had still not adjusted to the new situation but government revenues plummeted as a result of the lockdown imposed on the economy and the deferral of payment of various taxes. As a result, the monthly deficit in March was NIS 12 billion higher than in March 2019. In April, a sharp increase was recorded in expenditure and in May the addition to the monthly budget reached approximately NIS 17 billion. It is worth mentioning that with the exit from the first lockdown the gap between government revenues in 2020 and 2019 narrowed but the gap in expenditure continued to grow as did monthly deficits relative to 2019. At this stage, the accumulated deficit during the first three quarters of 2020 stands at 12 percent of the accumulated GDP.

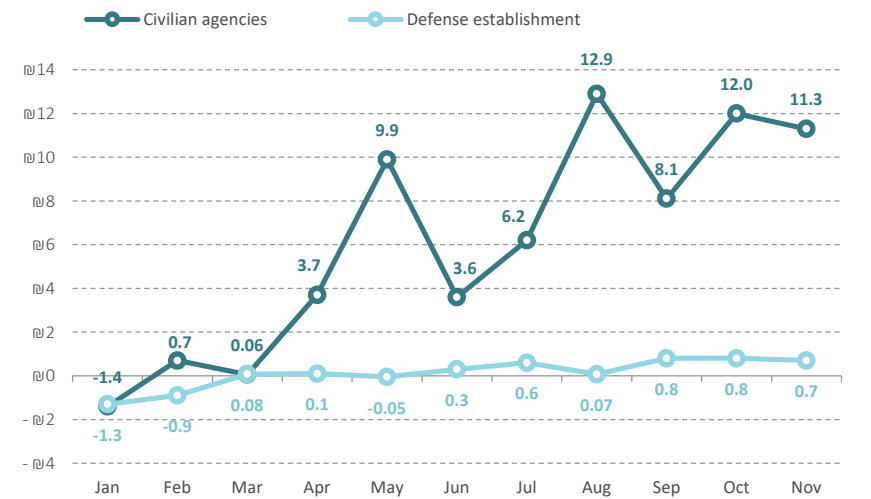
Figure 10. Revenue, expenditure, and the deficit in 2020 relative to 2019



Source: Benjamin Bental and Labib Shami, Taub Center | Data: The Accountant General Department, Ministry of Finance

Finally, Figure 11 shows the dramatic impact of the coronavirus crisis on the structure of public expenditure in Israel. It can be seen that relative to the same months in 2019, defense expenditure at the beginning of the year fell somewhat and later in the year rose somewhat.¹⁵ In contrast, starting in April, civilian expenditure was much higher than in the previous year, with the gap widening over time. Accordingly, civilian expenditure is almost entirely responsible for the rise in the deficit, as can be seen in the figure.¹⁶

Figure 11. Civilian and defense expenditure in 2020 relative to 2019
NIS billions



Source: Benjamin Bental and Labib Shami, Taub Center | Data: The Accountant General Department, Ministry of Finance

The national debt

In contrast to the exceptionally large deficit relative to other developed countries, Israel’s national debt is at a low level. Figure 12 shows the continuous decline in the debt-to-GDP ratio over the years. The downward trend that characterized the Israeli economy since the 1990s put Israel in a very favorable

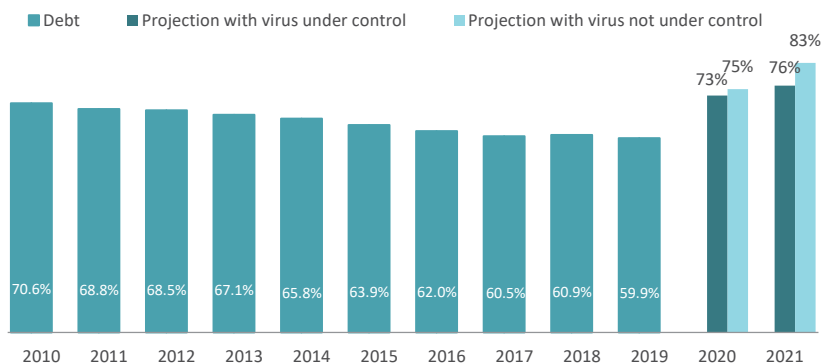
15 The majority of the rise is due to defense establishment activities related to the coronavirus epidemic.

16 Expenditure on social welfare is discussed in detail in Gal and Madhala, 2020.

position in the international capital markets (see below). The debt-to-GDP ratio of about 60 percent, which Israel reached prior to the coronavirus crisis, was set thirty years ago in the Maastricht Treaty as a criterion for joining the euro bloc (which was violated by most of the bloc's member countries as a result of the Great Recession of 2008). This ratio was determined at the time under the notion that the economic growth rates and the interest rate environment of about 3 percent, which prevailed at the time the euro bloc was created, made it possible to service the debt over time without exceeding a deficit of 3 percent, which was also set as a target.

However, it is clear that the increase in the deficit seen in Figure 9 and the drop in GDP depicted in Figure 1 will necessarily lead to an increase in the debt-to-GDP ratio to levels beyond 70 percent. According to the estimates of the Bank of Israel, in the optimistic scenario the debt-to-GDP ratio in 2020 will be 73 percent and in 2021 will reach 76 percent. In the scenario where the virus is not under control, the ratio will reach 75 percent and 83 percent, respectively. In order to put these forecasts into perspective, it is worth mentioning that the last time that the debt-to-GDP ratio exceeded 70 percent was at the end of the 2000s, and it had exceeded 80 percent in the mid-2000s. Therefore, once the pandemic has passed, the government will need to rapidly reduce its deficit and encourage growth in order to return the debt-to-GDP ratio to its pre-crisis level within a span of about 10 years. Nonetheless, the situation of Israel's national debt is much better than that of the other developed countries. According to IMF figures, the national debt of those countries in 2019 was 104 percent of GDP and in 2020 and 2021 it is expected to rise to 124 percent.

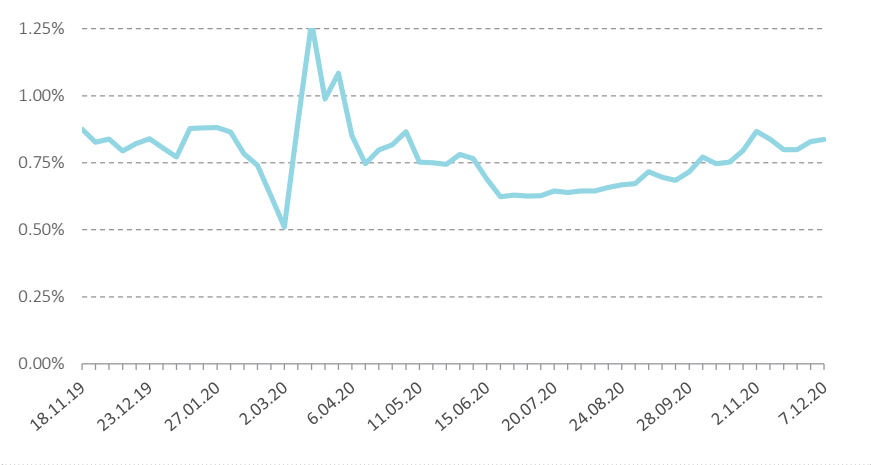
Figure 12. Debt-to-GDP ratio



Source: Benjamin Bental and Labib Shami, Taub Center | Data: Bank of Israel

In order to correctly assess the increase in debt in Israel and in other countries, account should be taken of the dramatic change in the economic environment since the signing of the Maastricht Treaty and particularly following the Great Recession in 2008. The significant monetary expansion that has characterized the central banks since then has reduced short-term nominal interest rates to their lower boundary, namely zero, without any significant rise in the rate of inflation. This interest rate environment has also influenced long-term interest rates. This phenomenon can also be seen with respect to Israel's national debt. Figure 13 shows the trend in the yields on Israeli government bonds with 10-year maturity for the past year. As can be seen, following a sharp rise in mid-March (as a result of the total lockdown), the nominal annual yields on these bonds fell to about 0.6 percent by the end of the first lockdown. However, notice that there has been a continuous increase of about 25 basis points during the summer months, and in particular prior to the imposition of the second lockdown, with some moderation towards the end of November. This interest rate environment relieves the pressure created by debt servicing on the state budget. In particular, if the economy returns to the growth rate characteristic of the years prior to the coronavirus crisis in the foreseeable future, i.e., about 3.5 percent, then the rate at which the debt-to-GDP ratio declines will be accelerated.

Figure 13. Yields on 10-year government bonds



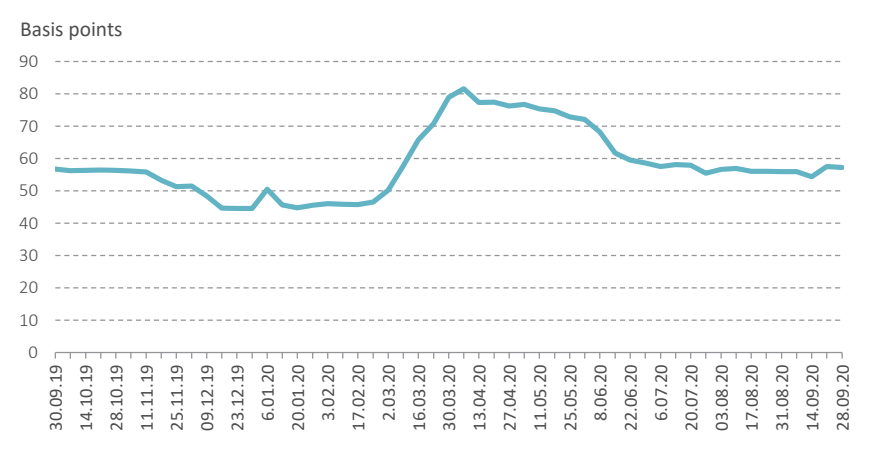
Source: Benjamin Bental and Labib Shami, Taub Center | Data: [World Government Bond](#)

Another measure of the global capital market's confidence in the Israeli economy is the premium paid on credit default swaps (CDS). In using these swaps, a lender to a company or a country is buying a kind of insurance, in which the insurer will return the amount of the loan (or part of it) to the lender if the borrower defaults. Figure 14 shows that the CDS premium on five-year bonds issued by the State of Israel is about 57 basis points, a drop from about 81 basis points at the beginning of April.¹⁷ These premiums can be "translated" into a probability that the capital market attributes to an event with which the borrower (in this case, the government of Israel) cannot meet its obligations under various assumed levels of the insured debt. For example, if the insurer promises to return 40 percent of the debt in the case of a breach of contract, according to the market there is a probability of 0.95 percent that Israel will not repay its debt in another five years, as compared to 1.35 percent at the beginning of April.¹⁸ At the same time, the credit rating companies of Fitch, Moody's, and S&P left Israel's credit rating at relatively high levels (A+, A1, and AA-, respectively) despite the sharp rise in the deficit and the debt-to-GDP ratio. These levels are evidence of the confidence of the companies in Israel, which provides Israel with fairly wide margins within which to increase its debt. Nonetheless, this confidence is dependent on the belief in Israel's ability to service its debt, which in turn depends on the investment of resources in growth-oriented programs that will justify this confidence.

17 In this context, Israel is similar to Portugal, Poland and Spain. For the sake of comparison, the CDS on Germany's five-year bonds was about 11 basis points at the end of October and on American bonds it was 16 basis points.

18 The probability of a violation of a commitment is obtained, to a first-order approximation, through dividing the market premium by the proportion of the loan that will not be returned by the insurer in the event of a breach in contract.

Figure 14. Credit default swaps transactions in five-year bonds



Source: Benjamin Bental and Labib Shami, Taub Center | Data: [World Government Bond](#)

Monetary policy

In response to the indications of stress that appeared in the financial markets in Israel in mid-March, the Bank of Israel announced a series of steps to calm the market. It allocated an amount of \$15 billion for swap transactions with the banks, which allows the banks to deposit shekel loans with the Bank of Israel and to borrow dollars against them. This measure reduced the liquidity pressure on the banks in foreign currency. In addition, the Bank of Israel increased the level of repo transactions, which allow the banks to obtain liquidity against collateral composed of government bonds, and, later on, it allowed the banks to use high-rated corporate bonds (AA and above) as collateral. Towards the end of March, the Bank of Israel announced its willingness to purchase government bonds in the secondary market in the amount of up to NIS 50 billion. This measure is meant to stabilize the government bond market and lower the long-term interest rate. At the beginning of April, it lowered the monetary rate of interest by 15 basis points to a level of 0.1 percent. At that same interest rate, it introduced a program of loans to the commercial banks for a period of three years in the amount of NIS 5 billion, which is intended to provide loans to micro businesses. At the beginning of July, the Bank expanded its intervention in the capital market by announcing its intention to purchase corporate bonds in the secondary market within a wide range of ratings (from AA and upward). At the same time, it was active on the regulatory level in order

to lessen the capital requirements of the banks. These measures were meant to “strengthen the transmission from monetary policy to the credit market, by reducing the interest at which companies obtain credit in the capital market and free up additional sources of credit in all of the economy’s sectors.”¹⁹ As part of this trend, the Bank of Israel left the interest rate at 0.1 percent at the end of November and also decided to expand the purchase of government bonds in the secondary market by another NIS 35 billion. In addition, and in order to reduce the interest rate for small and micro businesses, it declared the establishment of a NIS 10 billion shekel program in which the commercial banks can obtain loans for four years at a negative interest rate of 0.1 percent against loans they provide to small and micro businesses at an interest rate of not more than prime plus 1.3 percent.

The government program in response to the coronavirus crisis

In response to the health and economic crisis as a result of the spread of the coronavirus in Israel and worldwide, the government of Israel began to formulate an economic program to mitigate its effects. On April 7th, an amendment to the Basic Law: The National Economy was passed, according to which the government can increase its expenditure to beyond the limit of the continuation budget in order to finance excess expenditure needed to deal with the crisis. Since the approval of the first amendment to the law, another five have been approved, the last of which was on September 30th. Figure 15 presents the cumulative allocation at the beginning of each month (in dark blue) and the addition to it as specified in the amendment to the Basic Law: The National Economy during the period prior to it (in light blue), according to the report on budget execution in each of the months issued by the Accountant General Department in the Ministry of Finance.²⁰ Accordingly, the total amount of the economic program for coping with the coronavirus crisis stood at NIS 139 billion at the end of November.²¹

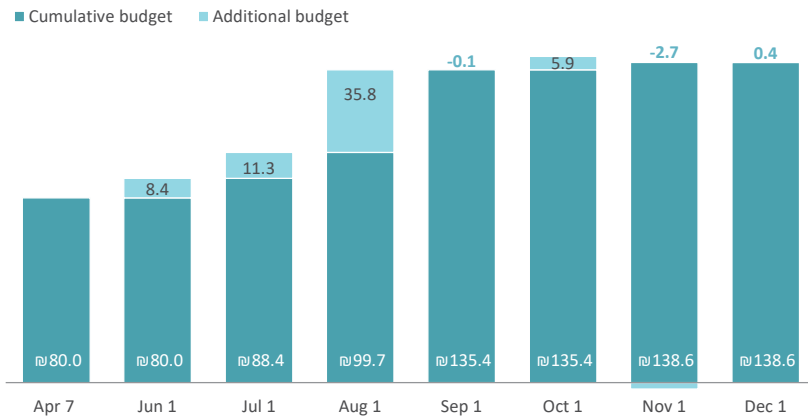
19 See [The Bank of Israel announces an additional set of steps to expand the monetary response to the coronavirus crisis](#), Bank of Israel.

20 The negative addition in September is the result of the cancellation of a program intended to encourage continued employment.

21 It is important to mention that the last amendment to the Basic Law: The National Economy includes additional budgets that are intended for use in 2021 (such as the extension of eligibility for unemployment benefits and the assistance grant paid every two months to the self-employed and business owners up to the end of June 2021). These budget allocations do not appear in the economic program for coping with the coronavirus crisis for 2020.

Figure 15. The development of the economic program for 2020

NIS billions



Source: Benjamin Bental and Labib Shami, Taub Center | Data: The Accountant General Department, Ministry of Finance, Budget Execution for March to December

The economic program for coping with the coronavirus crisis in 2020 has four components:²²

1. Healthcare and civilian response in the amount of NIS 16 billion

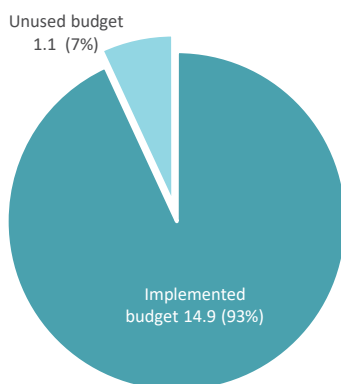
This component includes Ministry of Health expenditures related to the coronavirus crisis (acquisition of respirators and protective equipment, testing, etc.), expenditure related to government ministry measures taken to minimize exposure to the virus and solutions for populations at risk, such as the elderly.

Figure 16 presents the total budget implementation in cash and commitments within the total budget designated to this component. The graphs shows that, as of the end of November, the implementation rate in cash and commitment within the total budget designated to this component is 93 percent and is in line with the time elapsed since the establishment of the program.

22 For further discussion, see [Ministry of Finance — Economic plan for coping with the coronavirus crisis](#).

Figure 16. Civilian and healthcare response, implemented and unused budget as of November, 2020

NIS billions



Source: Benjamin Bental and Labib Shami, Taub Center | Data: The Accountant General Department, Ministry of Finance

2. Expansion of the social security net: Budget cost of NIS 52.1 billion (of which NIS 12.5 billion is from the budget of the NII and is designated for workers on unpaid leave)

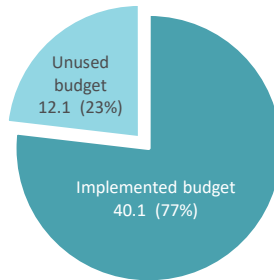
This component includes the grant to the self-employed that was paid in several rounds, a one-time assistance grant (Passover grant), an extension of eligibility for unemployment benefits, a special grant for those aged 67+ who were sent on unpaid leave or fired, wage subsidies for workers on unpaid leave (up to 80 percent of their last salary), a universal grant, and the distribution of food coupons to disadvantaged populations (in the process of implementation at the time of writing). The rest of the budget is to finance the early withdrawal of grants to discharged soldiers, budget assistance to non-profit organizations that are supported by the government, and the program of vocational training for the unemployed (in the process of implementation as of the end of November).

Figure 17 presents the total execution in cash and commitments within the total budget for this component. The graph shows that as of the end of November, the rate of execution in cash and commitments within the

budget designated for this component stood at 77 percent. The reasons for the relatively low rate of implementation are, among others, the low utilization of the budget designated for vocational training programs and for the early withdrawal of discharged soldier grants, and the non-utilization of budgets for food stamps for weaker populations and other grants for soldiers.

Figure 17. Social security, implemented and unused budget as of the end of November, 2020

NIS billions



Source: Benjamin Bental and Labib Shami, Taub Center | Data: The Accountant General Department, Ministry of Finance

3. Business continuity: Budget in the amount of about NIS 25 billion and credit in the amount of about NIS 41.2 billion (total of about NIS 66.2 billion)

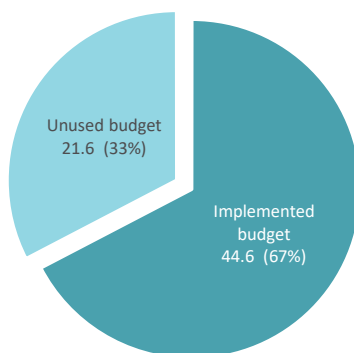
This component includes a participation grant in the financing of fixed costs for small businesses whose economic activity has been adversely affected by the coronavirus crisis, an employment support grant for businesses, a grant to maintain employees as a result of the lockdown during the High Holidays, assistance to industries in distress (such as hotels), deferral of VAT payments, national insurance, electricity and water for small and mid-size businesses, reimbursement of tax advances to the Tax Authority, reduction in municipal taxes for business owners who were not permitted to open, a loan fund under state guarantee for small and mid-size businesses, a loan fund under state guarantee for large businesses and businesses at risk, the creation of a joint investment fund between the government and

institutional investors for assistance to Israeli companies in raising capital to fund their activities (in the process of implementation at the time of writing), business compliance with the directives of the Ministry of Health, financing solutions for large employers, and regulatory exemptions for the renewal of licenses and permits.

Figure 18 presents the total implementation in cash and commitments out of the total budget designated for this component. The figure shows that as of the end of November, the implementation rate in cash and commitments out of the total budget designated for this component stood at only 67 percent. Particularly noticeable is the under-utilization of the business assistance lines, such as assistance for industry branches during the crisis (51 percent utilization) and the employment encouragement grant (56 percent utilization), in addition to the low utilization rates for the program to provide loans under state guarantee to large businesses and businesses at risk. Furthermore, the budget for the preservation of workers as a result of the High Holidays lockdown in the amount of NIS 600 million was not utilized at all.

Figure 18. Business continuity, implementation and unused budget as of the end of November, 2020

NIS billions



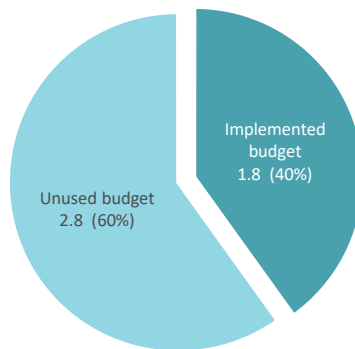
Source: Benjamin Bental and Labib Shami, Taub Center | Data: The Accountant General Department, Ministry of Finance

4. **Program for acceleration and development of the economy: Budget cost of NIS 3.1 billion and credit totalling NIS 1.5 billion (for a total of NIS 4.6 billion)**

This component includes the acceleration of infrastructure projects, acceleration of high tech infrastructure projects (under the responsibility of the Innovation Authority and the Ministry of the Economy), encouraging investment in high tech institutional investors, and the improvement of service to the customer by means of digitization, including remote learning. Figure 19 presents the utilization in cash and commitments within the total budget designated for this component. The figure shows that as of the end of November, the implementation rate of cash and commitments within the total budget designated for this component stood at 40 percent. Apart from the budget lines for the acceleration of infrastructure projects led by the Ministry of Transportation, whose rate of utilization stood at 100 percent, and the increase in high tech programs, with an uptake of 86 percent, the rate of utilization for the other budget lines of this component was less than 25 percent. In contrast to previous components, this component is meant to achieve long-term goals with the hope that over time projects will be identified that can be funded by this allocation.

Figure 19. Acceleration and development of the economy, implemented and unused budget as of the end of November, 2020

NIS billions



Source: Benjamin Bental and Labib Shami, Taub Center | Data: The Accountant General Department, Ministry of Finance

In conclusion, and in view of the fact that at the time of writing there is one month remaining in the year, the budget implementation rate for the economic program for 2020 for the months March to November (73 percent) is not on schedule. An in-depth examination of the four components of the economic program paints a complex picture. On the one hand, under-utilization of the acceleration and development of the economy program (40 percent) and the business continuity program (67 percent) is liable to hinder the economy's ability to recover and limit the future engines of growth. On the other hand, and despite the utilization according to schedule in the healthcare and civilian component, there is excess utilization in the sub-component of Ministry of Health measures (109 percent), primarily as a result of the expenditures that focused on the additional needs of the healthcare system during the first half of the year. These additions, which may turn out to be inefficient or non-optimal (for example, an expenditure on items that have passed their date of expiry), may lead to a budget deficit and an inability to meet future commitments.

Size of Israel's assistance budget relative to other countries

Bruegel, the European think tank specializing in the economy based in Belgium, built a database of assistance programs in a number of European countries and the US.²³ The information only includes data on programs that are actually being implemented and compares the assistance programs of various countries according to a classification into three assistance channels. The first is the immediate fiscal impulse, which includes direct support to households, grants to businesses, tax reductions, investment in the healthcare system, etc. The expenditure in this channel is "genuine" and directly raises the government's budget deficit. The second is the deferral of tax payments, such as municipal taxes, VAT and the like, which is meant to ease the cash flow problem. The expenditure in this channel raises the deficit in the immediate term but not over time. The third is the provision of state guarantees to private borrowers. These guarantees solve the market failure problem associated with aggregate risk, in which case the state should provide insurance to lenders against a general failure among borrowers resulting from the crisis, in contrast to failures arising

23 See [Bruegel](#).

from individual business conduct. This channel has no immediate effect on the deficit but may have an effect later on if borrowers are unable to redeem their loans and the state is forced to realize the guarantee.²⁴

Figure 20 presents the structure of the support programs included in Bruegel's comparison, with the addition of Israel and a number of countries with a similar population.²⁵ The data are updated for the months of June and July and are calculated relative to GDP for 2019.²⁶ The graph is organized according to the size of the fiscal incentive, and it can be seen that Israel is in the group of countries with a relatively large incentive.²⁷ In contrast, in terms of total scope of the program, Israel is in the group of countries with a low level of intervention. This fact is primarily the result of the limited scope of state guarantees provided to borrowers in the private market. In this context, Italy is an outlier whose policy constitutes a sort of mirror image to Israel's: a high level of guarantees and tax deferrals and a low level of fiscal incentives. In Israel, the government leaves the management of risk in the hands of the banks to a large extent. In view of the character of the risk, it appears that it is worth considering the expansion of the use of guarantees in order to provide the business sector with certainty and the ability to weather the crisis.²⁸

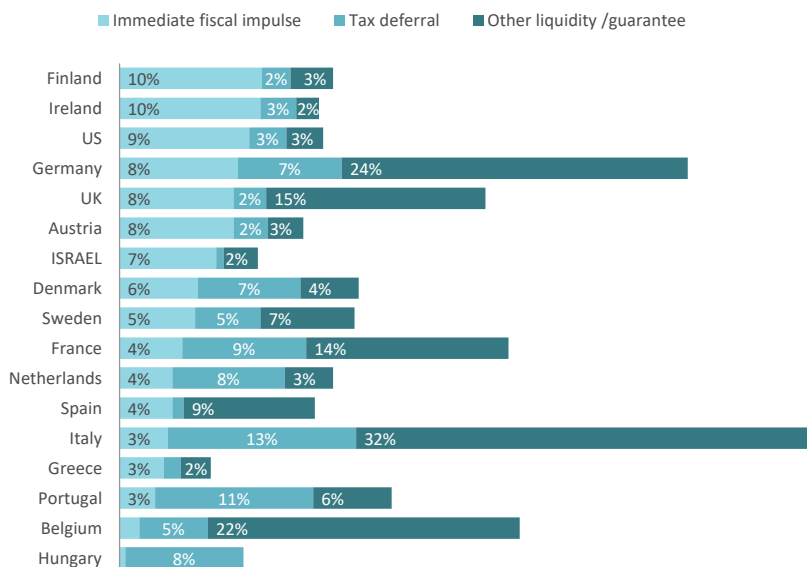
24 For another international comparison, see Benmelech and Tzur-Ilan, 2020. They divide the assistance programs according to fiscal expenditure, healthcare expenditure, support of households, support of small and mid-size businesses, support of large businesses, expenditure on hotel infrastructure, restaurants and tourism, local government and guarantees. Their data include 85 countries but there are significant data gaps.

25 Austria, Belgium, Denmark, Finland, Ireland, Netherlands, and Sweden, which are similar to Israel in population but are wealthier, and Hungary, Greece, and Portugal which are similar to Israel in population but are less wealthy. Italy, Spain, and France are larger countries that were adversely affected during the first wave of the pandemic.

26 For Ireland, the data is for GNI* (modified gross national income), which is unique to it and includes, in contrast to GDP, also income from abroad. This definition of national income takes into account the presence of numerous multinational companies in Ireland, which makes it difficult to measure GDP in the conventional manner.

27 These data do not include the addition of NIS 50 billion (4.2 percent of 2019 GDP) that the government of Israel approved at the end of July for the year 2021.

28 For further discussion of the success of the US assistance program to small businesses (which relied on forgivable loans), see Hubbard and Strain, 2020.

Figure 20. Structure of the support program in various countries

Note: The data are updated to November 2020. It should be mentioned that assistance programs were finalized as early as autumn 2020.

Source: Benjamin Bental and Labib Shami, Taub Center | Data: The Accountant General Department, Ministry of Finance; [Bruegel](#); [IMF](#)

Conclusion

The coronavirus crisis is having a far-reaching effect on the economy of Israel, as well as those of most other countries. As shown in international studies, the fear of infection is enough to reduce economic activity to a considerable extent. Restrictions on mobility and the lockdowns imposed by many countries in order to reduce contact have led to additional declines in economic activity. According to the IMF, the global economy is expected to shrink by 4.4 percent this year as a result of the crisis.

Israel's economy has been seriously affected, even if other OECD countries have been affected to a greater extent. It should be remembered that the rate of growth of Israel's population of 1.9 percent annually is three or more times higher than the OECD average, which is only 0.6 percent and therefore, in terms of GDP per capita, the effect on Israel's economy is much more significant.

The crisis has led to unprecedented levels of unemployment in Israel, which has forced the government to put a social security net in place for hundreds of thousands of workers who have lost their livelihood. At the same time, the government and the Bank of Israel have initiated assistance programs for the business sector. A comparison to other countries shows that the size of the fiscal assistance program (which has a direct effect on the state budget, on the deficit, and on the national debt) in Israel is similar to those of other OECD countries, and is in some cases larger. However, the assistance program to the business sector, and in particular the provision of guarantees, is of a smaller scope than in other countries. This situation weakens the ability of businesses to survive, especially small businesses, and is liable to hinder the recovery from the crisis following the implementation of a large-scale vaccination effort.

The recovery process is also dependent on active support for getting workers back into the labor market. This assistance must include vocational training programs and an upgrade of information systems in order to shorten the process of search, placement, and acclimation of workers in a new job. The improvement of information systems is only one part of an overall information reform that the government needs to implement in order to improve the communication between citizens and the government, the ability to work from home, and the ability to learn remotely. The coronavirus has led to an unprecedented crisis in Israel's stormy history. Nevertheless, despite the difficulty, the Israeli government and society must find the strength to fix flaws and to revitalize the economy in order to facilitate a return to full employment and a path of growth.

References

English

- Andersen, A. L., Hansen, E. T., Johannesen, N., & Sheridan, A. (2020). [*Pandemic, shutdown and consumer spending: Lessons from Scandinavian policy responses to COVID-19.*](#)
- Benmelech, E., & Tzur-Ilan, N. (2020). [*The determinants of fiscal and monetary policies during the COVID-19 crisis.*](#) NBER Working Paper No. 27461.
- Bental, B., & Brand, G. (2019). [*The Israeli economy: An overview.*](#) In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2019* (pp. 11–39). Jerusalem: Taub Center for Social Policy Studies in Israel.
- Gal, J., & Madhala, S. (2020). The social welfare system and the coronavirus crisis: An overview. Jerusalem: Taub Center for Social Policy Studies in Israel. In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2020*. Jerusalem: Taub Center for Social Policy Studies in Israel.
- Hubbard, R. G., & Strain, M. R. (2020). [*Has the paycheck protection program succeeded?*](#) NBER Working Paper No. 28032.
- IMF (2020). [*The great lockdown: Dissecting the economic effects.*](#) Chapter 2. In *World economic outlook: A long and difficult ascent*. Washington DC: International Monetary Fund.
- Zontag, N., Epstein, G., & Weiss, A. (2020). The Israeli labor market under coronavirus: An overview. In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2020*. Jerusalem: Taub Center for Social Policy Studies in Israel.

Hebrew

- Yaron, A. (2020). *Survey of the state of the economy*. Jerusalem: Bank of Israel.

Population Projections for Israel 2017–2040

Alex Weinreb

Introduction

In 2012, researchers at the Israeli Central Bureau of Statistics (CBS) published long-term population projections for five-year intervals to 2059 (Paltiel, Sepulchre, Kornilenko & Maldonado, 2012). Updated projections are also published annually in the CBS *Statistical Abstract of Israel* (see Table 2.10, various years), and by other branches of government (Shvadron & Avramson, 2017).

Why, then, is the Taub Center producing its own projections? There are two main reasons. The first is instrumental. Both Paltiel and colleagues, the CBS in general, and Shvadron and Avramson publish projections in 5-year intervals covering 5-year age groups. For various public policy questions under investigation at the Taub Center, these two types of aggregations are not specific enough. For example, in forthcoming Taub research on the education system (Weinreb, Shavit & Blass, 2021), it is important for us to know how many children will be entering 1st grade over the next decade — including children not yet born — or reaching university age. Likewise, in forthcoming Taub research on elderly health and welfare, it is important to know how many adults are likely to reach the age of retirement over the next couple of decades. In both of these cases, we could generate single-year estimates from the published CBS projections by interpolating both 5-year values and 5-year age groups (into single years and single ages). However, that interpolation would result in a loss of information by, for example, smoothing over year-on-year fluctuations in birth cohort size.

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The second reason for producing our own projections is more substantive. We do not agree with some of the assumptions that Paltiel et al. (2012) used to shape the inputs in its own projections. And the fact that more recent annual report projections differ so dramatically from the Paltiel et al. estimates suggests that the CBS has markedly changed those assumptions.

For example, the projected population in 2040 according to the medium variant is 11.95 million people in Paltiel et al. (interpolated from the pace of change between the 2039 and 2044 projections) and 13.22 million in the most recent *Statistical Abstract of Israel* (CBS, 2019a).

In prior work (Weinreb & Blass, 2018), we described the ways in which Paltiel et al. follow standard — and recommended — demographic procedures. Examples include the use of improved Lee-Carter methods to project mortality, and expert opinion regarding the range of future fertility rates. However, we also pointed to two problems with Paltiel et al.'s approach.

The problem stems from the decision to estimate a discrete series of projections for Haredim (ultra-Orthodox Jews) and “Jewish/Other” while assuming zero net movement between these streams of Judaism. In the same research, we argued that there is 10–20 percent net loss to Haredim, which suggests that Paltiel et al. overestimate the percentage of the population that will be Haredi, and, therefore, overestimate the growth rate of the population as a whole.¹ The second problem is existing projections' approach to migration and fertility. We will discuss these in more detail below, but for now, suffice to say that in the last 15 years, there has been a significant increase in net in-migration to Israel. At the same time, fertility has also increased somewhat in the non-Haredi Jewish sector, fallen moderately among Haredim and fallen quite sharply in the Arab Israeli sector. There is, therefore, a need to update the migration and fertility assumptions underlying the population projections.

These considerations give rise to the central goal of this paper: to project the number of people in Israel by single age for each year up to 2040. Our projections, using a standard “cohort component” model, are based on anticipated trends in fertility, mortality and migration. In all cases, the estimates are disaggregated by sex and ethnicity: Jewish, including “other,” and Arab Israeli.

1 Since fertility is much higher in the Haredi sector, and is the main factor underlying population growth in Israel as a whole, assuming a higher percentage of Haredim in 2030 raises the mean fertility of the whole population.

We have chosen to limit the projections to 2040 for a few reasons. First, although the arithmetics of extending them is not complicated, we feel that with every additional year, our loss of confidence in the accuracy of those projections outweighs the potential benefits of a longer time horizon.² Additionally, limiting ourselves to 2040 years also simplifies projection methods, especially, as discussed below, for mortality. Finally, the longer-term timeline is less relevant for Taub research, making it less important for us to push the projection beyond 20 years.

A final difference between these projections and those of the CBS is that we do not estimate discrete demographic trajectories for the Haredi and non-Haredi Jewish populations. As implied thus far, we think there is too much movement across levels of religiosity — and too many shared demographic attributes — to justify this separation. We think it best to make this first run of projections disaggregating only by Jewish/Other and Arab Israelis — there is very little movement between these two groups, and group-specific measures of fertility and mortality are easily available for both — and only then divide the Jewish/Other category by levels of religiosity. We will leave the latter for a later elaboration.³

In terms of total population in Israel, the central finding of our projections is that they fall on the high side relative to Paltiel's estimates — somewhere between their median and high scenarios, though closer to the latter. However, they fall on the low side relative to the most recent projections in the *Statistical Abstract of Israel* (CBS, 2019a), somewhere between the low and median scenarios.

The main body of this paper is divided into two sections. In the first, we describe the underlying assumptions regarding the three parameters that affect the projected population: future age-specific mortality, fertility, and

2 Barring unforeseen crises (medical, military, environmental) that would suddenly increase mortality or stimulate significant in- or out-migration, the main problem confronting demographic projections in the longer-term is what to assume about future fertility. The fertility patterns of Jewish Israelis, in particular, are quite unusual — and therefore puzzling — in demography (see Weinreb, Chernichovsky & Brill, 2018), making it more difficult to forecast with any real confidence. We return to this below.

3 A first version of this will appear in a forthcoming Taub publication projecting the number of Israelis entering higher education between now and 2040 (Weinreb et al., 2021).

migration rates. We end this section by outlining six projection scenarios, based on variability in those parameters. In the second section, we discuss the projections themselves, presenting basic results for all six scenarios and detailed results — focusing on specific age groups — based on what, in our view, is the most likely scenario.

1. Assumptions

Mortality

Age-specific mortality rates (ASMRs) are one of the core components of demographic projections. These tell us the proportion of people that die at any given age, which is almost always the principal way in which people leave a population (the other is migration).

Since ASMRs differ across major population groups, and by sex, it is standard practice in demography to identify discrete ASMRs by subpopulation and sex, then project those ASMRs into the future. For example, to identify the percentage of Jewish 30-year-old men that will survive to age 38, we subject them to the ASMR for Jewish men aged 30, 31, 32, etc, up to mortality at age 37. Yet, this also demands that we forecast what the ASMR of 31-year-olds will be in a year, ASMR of 32-year-olds in two years, and 37 year olds in seven years. The longer the time horizon of the projection, the further into the future we have to project changes in ASMRs, and the greater the likely error term in our projection.

The standard method of forecasting future mortality is to use the Lee-Carter model. Very simply, this model identifies a vector that captures up to 90 percent of a mortality trend over a long historical time series. It then projects that vector forward as a “random walk” with trend, assuming constant long-term mortality reduction.

In these projections, given that our projections are limited to little more than 20 years and, more importantly, that gains to life expectancy in most developed countries over the last few decades — including Israel — have

been fairly constant year after year, we do not use the Lee-Carter model.⁴ Instead, we employ a simpler method. Disaggregating the population into four subpopulations — by gender and into Jewish/Other and Arab Israeli sectors — we estimate the annualized change in age-specific mortality rates (ASMR) between 2007 and 2015 for every age group up to 89. For ages 90 to 94 and 95+, ASMRs were not available before 2012, so we estimated the annualized rate of change for the 2012 to 2015 period.

These annualized rates of change for five-year age groups are presented in Table 1.⁵ They show continued reductions in ASMRs across all four subpopulations and almost all ages, pointing to ongoing gains in population health. Yet there is also some variability across the four subpopulations. Among Jews, men's ASMR fell more sharply than women's at all ages below 55 (the exception is ages 1–14) and less sharply at all ages 55 or over. Among Arab Israelis, men's ASMR fell more sharply in only seven age groups, with no distinct age pattern in this difference. Likewise, among both males and females, there were faster reductions among Jews than Arab Israelis in 13 of these 21 age-groups, and slower in seven age-groups.

4 The Lee-Carter method was designed for long-term forecasting, extrapolating future trends from a long historical series. In their comparison of the original Lee-Carter method and a few later variants, Booth et al. (2006) point to problems with random walk models (p. 305) based on long-time horizons, arguing that where “a longer fitting period is not advantageous, the heavy data demands of the Lee-Carter method can be somewhat relaxed” (p.290).

5 To clarify, we use single-year estimates for this projection input. However, our estimates of change in age-specific mortality rates use five-year age groups. This is the only way to avoid fluctuations in estimated rates of change that arise from the fact that Israel has both a small population and very low mortality, especially at young ages. Small temporary spikes in mortality can therefore significantly influence the annual mortality estimate and, therefore, estimates of change in mortality across time.

Table 1. Annualized change in age-specific mortality rates, 2007–2015

Age	Jews/Others		Arab Israelis	
	Men	Women	Men	Women
0	-0.034	-0.030	-0.024	-0.016
1–4	-0.025	-0.044	-0.039	-0.022
5–9	-0.044	-0.064	-0.017	0.019
10–14	-0.037	-0.048	0.007	-0.023
15–19	-0.042	-0.037	-0.004	0.007
20–24	-0.045	-0.031	-0.048	-0.063
25–29	-0.024	-0.022	-0.034	0.014
30–34	-0.027	-0.012	-0.009	-0.013
35–39	-0.044	-0.026	-0.002	0.005
40–44	-0.043	-0.033	-0.011	-0.015
45–49	-0.042	-0.036	-0.027	-0.020
50–54	-0.021	-0.013	-0.026	-0.036
55–59	-0.016	-0.023	-0.009	-0.033
60–64	-0.012	-0.018	-0.023	-0.035
65–69	-0.024	-0.025	-0.024	-0.029
70–74	-0.027	-0.033	-0.025	-0.022
75–79	-0.027	-0.031	-0.022	-0.031
80–84	-0.016	-0.021	-0.015	-0.025
85–89	-0.037	-0.054	-0.029	-0.047
90–94*	0.014	0.001	0.021	0.007
95+*	0.009	-0.002	-0.022	0.034

Note: Annualized change 2012–2015.

Source: Alex Weinreb, Taub Center | Data: CBS, 2019a

These reductions are consistent with those of other low-mortality/high life expectancy countries, especially in the Mediterranean region. They are also consistent with the most recent projections from the Global Burden of Disease project (Foreman et al., 2018), which also expects Israel's age-specific mortality to continue to fall over the next 20 years.⁶ That said, these reductions provide a more mixed picture about convergence between women and men, and between Jews and Arab Israelis. In most ages, reductions in mortality will be greater among women than men, and among Jews than Arab Israelis.

⁶ Note that not all OECD countries are expected to be on this trajectory. The US is the most notable exception — life expectancy was 78.9 in 2013 and 78.8 in 2018 (Woolf & Schoemaker, 2019). There are also worrying signs in the UK, which has experienced virtually no gains in life expectancy since 2011 (Raleigh, 2019).

We apply these rates of change in ASMRs up to 2040 to each of these four subpopulations in two ways, allowing us to tap into a longstanding debate within demography about how long mortality rates can continue to fall, and how quickly. Thus far, skeptics have been repeatedly proven wrong. In the highest life expectancy countries — a “maximum life expectancy” club that includes Israel — life expectancy has continued to increase at a fairly consistent rate. The first scenario assumes that this trend will continue in Israel for the next two decades, in other words, that the ASMR will continue to change at the same pace as in the 2007 to 2015 period.

The second scenario taps into concerns that rising Israeli morbidity in younger ages — due especially to the rapid rise in obesity and diabetes — will slow the pace of mortality reduction. This scenario assumes that the ASMR will change at only half the pace of the 2007 to 2015 period.

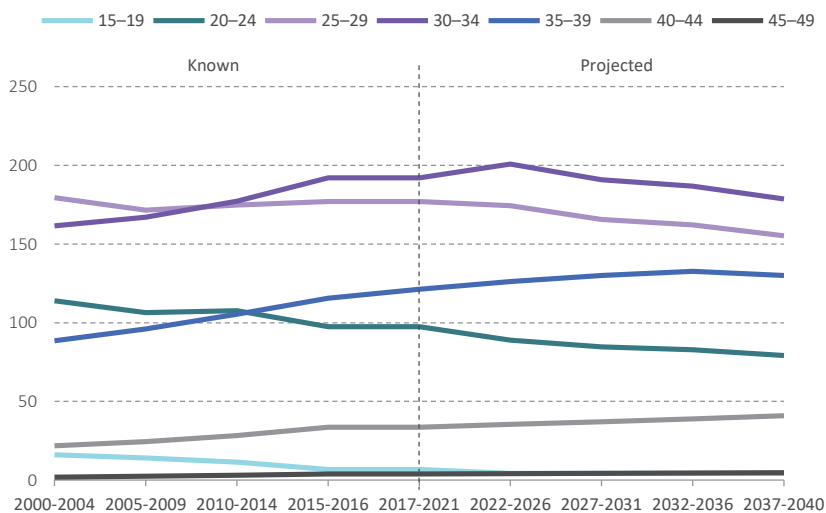
Fertility

Age-specific fertility rates (ASFRs) are a second core component of demographic projections. Multiplied by the number of women in each age group, they tell us the number of births in any given year. Births are almost always the principal way in which populations grow (the other is migration). In Israel, unlike in most developed countries, there is a substantial excess of births over deaths that accounts for about 80 percent of annual population growth.

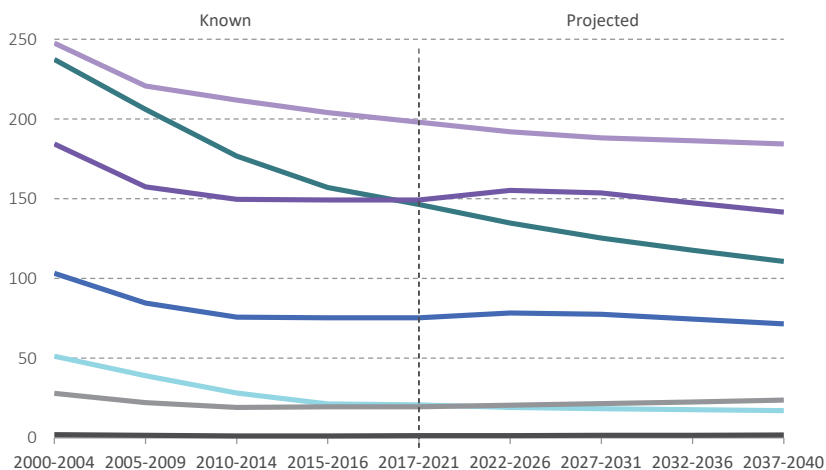
Figure 1 presents the ASFR for the Jewish/Other women (Figure 1a) and Arab Israeli women (Figure 1b). In each panel, the lines on the left side of the vertical line are the known ASFRs for each population from 2000 to 2016, aggregated into the 5-year rates with the exception of 2015 to 2016. Lines on the right side of the vertical line are the ASFRs used in our main projection (Scenario 1).

Figure 1. Age specific fertility rates, births per 1,000 women

a. Jews/Others



b. Arab Israelis



Source: Alex Weinreb, Taub Center | Data: CBS, *Statistical Abstract of Israel 2017*, Table 3.13

Among Jewish women since 2000, there have been significant reductions in ASFR in the under-25 age range, stability in the 25–29 age range, and substantial increases in ASFR in the 30–44 age range. The main projection (Scenario 1, described below) assumes that these trends will continue — albeit with a reduction in the rate of increase — for the next 10 years or so, and then start to fall (25–34), or stabilize (40–44). The only exception to this is the 35–39 age group, where we expect continued slow increase, reflecting increasing delays in childbearing and single parenthood. These trends are documented and discussed in prior Taub research (Weinreb, Chernichovsky & Brill, 2018).⁷

Among Arab Israeli women, the reductions in ASFR since 2000 have extended across all age groups, though they have been particularly sharp among women under age 30. Given the ongoing increases in Arab Israeli women’s education and employment, we expect these trends to continue, though at a slower pace. We also expect to see increases in delayed childbearing — hence the projected stability, and even moderate increase, in fertility rates in the age 30–44 age groups.

To generate lower and upper bounds for fertility, projections were replicated with two additional scenarios (in addition to the one just discussed). One assumes a sharper reduction in ASFRs in women’s 20s, and the second completely stable ASFRs.⁸ The ASFRs of these three scenarios are used to generate the Total Fertility Rates presented in Table 2. In the main Scenario 1, there is relative stability in TFR in the Jewish population for the next decade, then a slight reduction, falling below 3.0 by the late 2030s. In the Israeli Arab population, in the meantime, there is a deceleration in the pace of fertility decline, though continued reductions, with TFR falling to 3.0 in the next decade, and to 2.75 by the late 2030s. These declines are in line with those in neighboring Arab states.

-
- 7 Note that these projected reductions in fertility take into account the increasing percentage of women in the Israeli population that are Haredi or very religious. In other work, we have shown that Haredi women’s fertility has fallen somewhat over the last 10 years. Given ongoing increases in Haredi women’s education and employment, limitations on their husband’s employment, in addition to changes in consumption patterns and cost of living, we expect a continued downward trend in Haredi TFR.
- 8 The assumption of stable age-specific fertility rates is not a reasonable one. We use it to highlight how fluctuations in the number of women of reproductive age can influence the number of births.

Table 2. Actual and projected total fertility rates, by year, sector, and scenario

Given the assumed trends in age-specific fertility rates

Scenario		2010– 2014	2015– 2016	2017– 2021	2022– 2026	2027– 2031	2032– 2036	2037– 2040
1 Slow fertility reduction	Jews/Others	3.04	3.13	3.16	3.17	3.08	3.06	2.96
	Arab Israelis	3.31	3.14	3.05	3.01	2.93	2.84	2.75
2 Fast fertility reduction	Jews/Others	3.04	3.13	3.13	3.14	2.95	2.83	2.74
	Arab Israelis	3.31	3.14	3.05	2.97	2.85	2.73	2.63
3 Stable fertility	Jews/Others	3.04	3.13	3.13	3.13	3.13	3.13	3.13
	Arab Israelis	3.31	3.14	3.14	3.14	3.14	3.14	3.14

Source: Alex Weinreb, Taub Center | Data: Calculated from specific population tables

As noted above, the number of actual births is the sum of age-specific fertility rates multiplied by the number of women in the associated age group. This means that even if the ASFR were to remain constant over the next 20 years (Scenario 3, Table 2), differences in age-structure of women’s Jewish and Arab Israeli populations up to age 50 — mainly reflecting prior fertility in these populations — would themselves lead to fluctuations in the number of births. Evidence of these fluctuations in age structure can be seen in Figures 2a and 2b, which graph, respectively, the number of Jewish and Arab Israeli women by single years of age in 2017, from age 0 to 50. By comparing the relative size of cohorts we see that in 2037 there will be roughly the same number of women aged 20 in the Arab Israeli sector as there were in 2017 — when the latter were aged 0. In the Jewish sector, in contrast, there will be far more women aged 20 in 2037 than there were in 2017. Differences in the number of births will follow from this difference in cohort size. We describe these age structure effects in greater detail below.

Figure 2. Age structure, females, ages 0–50, 2017

a. Jews/Others

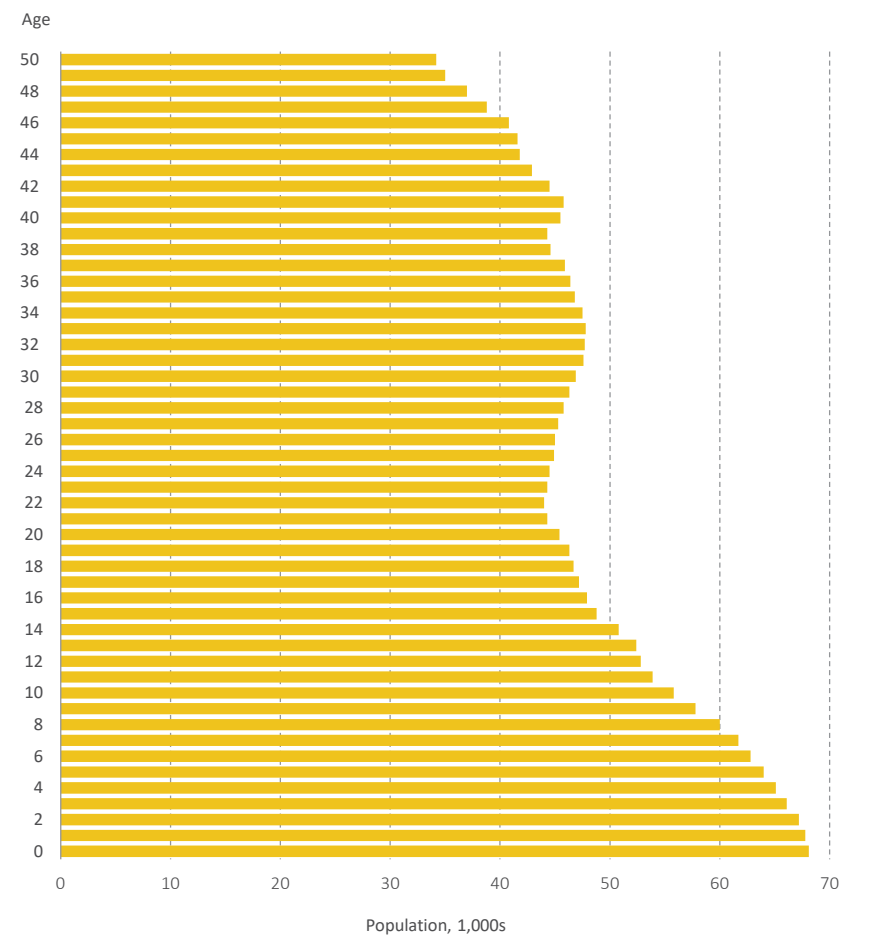
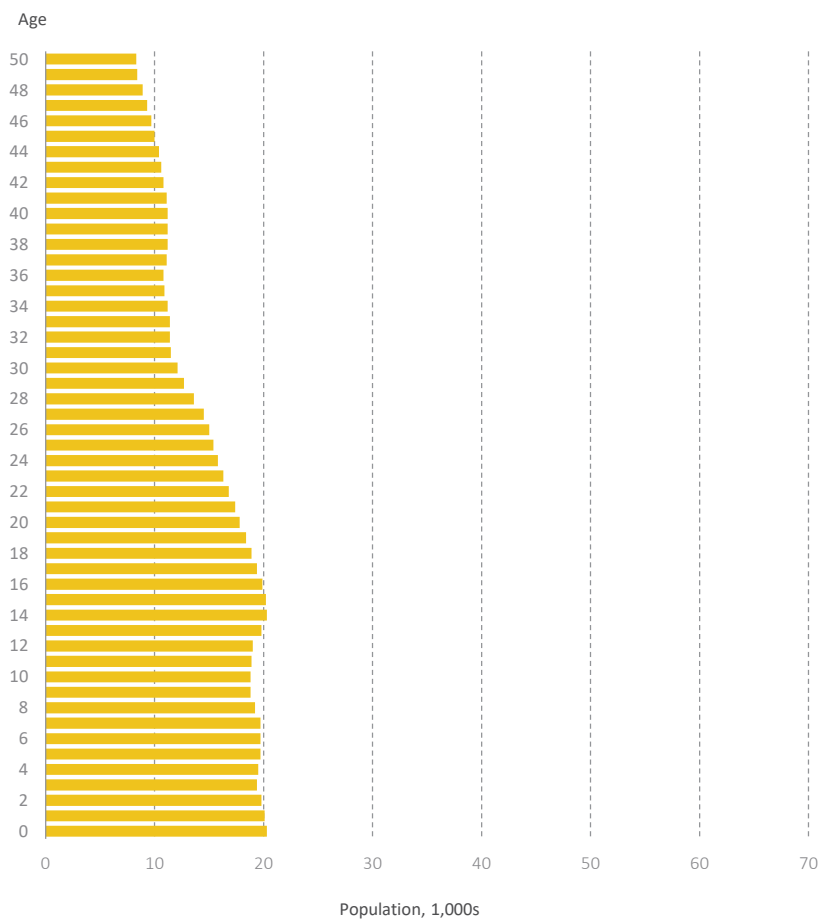


Figure 2 (continued). Age structure, females, ages 0–50, 2017**b. Arab Israelis**

Source: Alex Weinreb, Taub Center | Data: CBS, *Statistical Abstract of Israel 2018*

Migration

Migration is typically the worst measured component of demographic change (Preston, Heuveline & Guillot, 2000, p. 133). Whereas births and deaths are singular events that can occur only once to each person, and are, in most cases, easily recorded in modern states' vital registration systems, migration can occur once or multiple times, at any (or many) points in a life-course, can be in a single direction to a single country or to multiple countries, and it can also involve "circular migration" with returns to one's country of origin. Variation in legal and administrative definitions of different types of movement further complicate measurement. For example, migration can be legal or "undocumented," or involve changes in status associated with transitions between labor migration, marriage migration, tourism, or refugee movements. Likewise, at the population level, migration is difficult to forecast because it is so easily affected by historical events that are largely unforeseen and unforeseeable. For example, no demographic projection in the 1980s or 2000s included, respectively, the large-scale movements of Russian Jews into Israel in the early 1990s, or Middle Eastern refugees into Europe in the 2014 to 2016 period.

Paltiel et al.'s (2012) projections assume a "closed population." This means that they ignore migration, preferring "a clean estimate of the influence of natural growth (births minus deaths)" (p.8). This means that they implicitly assume net zero migration, with the same number of people leaving Israel as moving to it. Our projections take a different approach, closer to that of Shvadron and Avramson (2017), for two reasons.

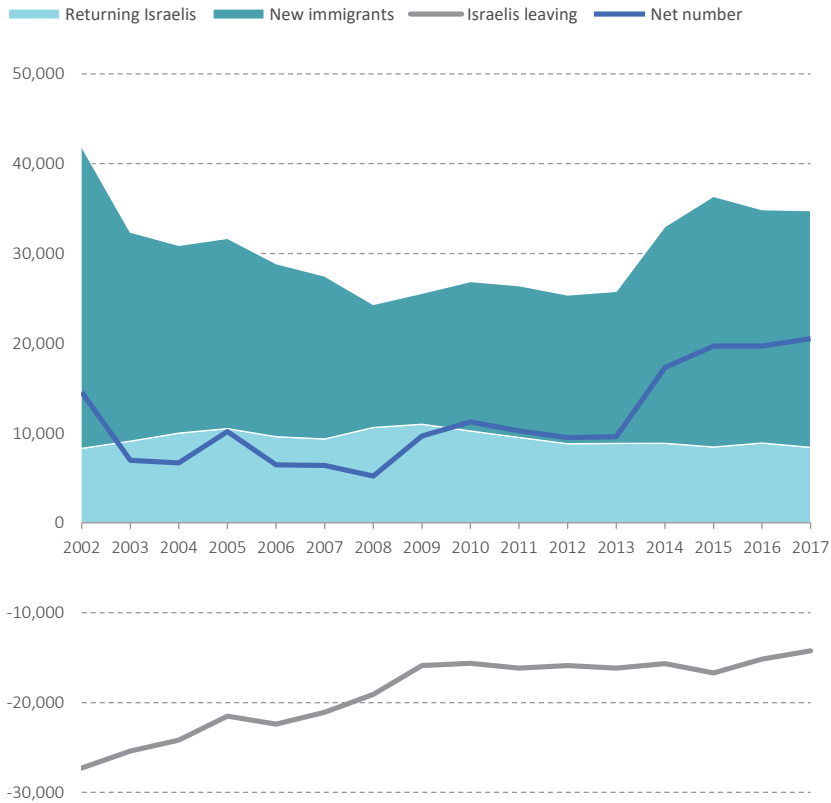
First, as shown in Figure 3, which graphs the number of new immigrants coming into Israel, in addition to returning Israelis and Israelis leaving Israel (defined as being outside Israel for at least one year), the net number of in-migrants to Israel is positive and increasing. In the first decade of this century, that net number hovered around 6,000–7,000 in most years, dropping to 5,225 in 2008. In most of those years, more than 20,000 Israelis left the country every year, even if a substantial portion of these were former immigrants — five times more likely to leave than veteran Israelis in the early 2000s (Hason, 2006), and accounting for 55 percent of all leavers 2017 (CBS, 2019b). By the 2010 to 2013 period, however, the net number of in-migrants had increased to the 9,000–11,000 range, and since 2015 it has exceeded 19,000 per year. Across the total 2002 to 2017 period, that is a net gain of 184,000 people. Yet that number in itself understates the full demographic impact of this in-migration,

since migrants are disproportionately young or prime-age adults, meaning that a substantial number of these 184,000 migrants will give/have given birth to children in Israel. Nor is it likely that this net number will change dramatically in the near future: a combination of economic stagnation, political instability, or antisemitism in many other countries with significant Jewish populations — Argentina, Ukraine, France, the UK — will drive continued migration to Israel, especially as Israel's economic growth continues to outpace the OECD average. Indeed, over the first 10 months of 2019, there was a 20 percent increase in immigration rates over the same period in 2018, pointing to an ongoing increase in this trend (CBS, 2019c).

This last point touches on the second reason for incorporating migration into the current projections. Israel has become increasingly appealing to other groups of migrants. As of 2017, there were around 67,000 workers in Israel who had entered the country as tourists, around 99,000 labor migrants with temporary residential status in Israel, and around 37,000 people who claimed asylum (CBS, 2018). Even if only a small portion of these 200,000 people stay in Israel — a tiny percentage of asylum seekers given official authorization, a larger number of the tourists and workers marrying Israelis — that would also act as a net contributor to Israeli population growth. Moreover, the increasing use of bilateral labor migration agreements for care of the elderly, construction and agricultural sectors, in addition to more recent calls to allow for skilled migrants in high tech fields, alongside ongoing increases in tourism — including Israelis traveling to other countries — will inevitably lead to more interpersonal connections that, in turn, lead to romantic relationships and marriage.⁹ Given Israel's economic status relative to most of these migrants' countries of origin, that will result in at least some permanent movement into Israel as opposed to out of Israel.

9 Between 2014 and 2018, the number of international visitors to Israel increased from 3.251 to 4.389 million (CBS, 2019d).

Figure 3. Number of new immigrants, returning Israelis, and Israelis leaving Israel, by year



Source: Alex Weinreb, Taub Center | Data: (top) CBS, Publication 242/2019, Tables 1 and 4; (bottom) CBS, *Statistical Abstract of Israel 2018*, Table 206

Our projections use two migration scenarios. The main projection (Scenario 1) assumes the following:

1. A net gain of 20,000 migrants and returning Israelis each year, divided equally by sex, with 19,000 assigned to the Jewish population, and 1,000 to the Arab Israeli population, in each case distributed proportionately across the 0–90 age group. This number approximates the minimum net number

of migrants entering Israel since 2015, alongside the assumption that the increasing geographic mobility of young Arab Israelis — there have been a sharp rise in the number of Arab Israelis studying outside Israel (Waked, 2018) — will generate some in-migration of spouses.

2. A gain of 1,400 others each year. These include labor migrants, tourists, and asylum seekers, divided 60:40 women:men, 90 percent assigned to the Jewish/Other population, and distributed proportionately across the population aged 20–44.¹⁰

In terms of overall impact on the projections, the first of these items is clearly the most important, having both direct and indirect (through fertility) effects on the future population. But at least conceptually it is important to try to capture some of the other lesser movements into Israel, too.

A second projection model was run without any migration. Comparing this model to others allows us to evaluate how much migration contributes over time to the Israeli population, including through indirect effects of migrants' fertility.

10 The contribution of these 1400 individuals to the overall projection is so small that whether they are assigned in a 50:50 female:male ratio or a 60:40 ratio, makes absolutely no difference to the gist of the projections. We assume a 60:40 ratio based on two main ideas. First, gender differences in labor in-migration patterns into Israel vary significantly by industry. Over the last few years, most labor migrants have entered Israel officially through bilateral agreements regulating their employment in three key industries: construction, agriculture, and care of the elderly. The last of these groups, by far the largest, is disproportionately female — in 2016, 80 percent of migrant workers from Sri Lanka, a major sending country of carers, were women (Kushnirovitch & Rajman, 2017), which makes sense given that most elderly in need of care are women, and women are much more likely to be cared for by female carers. We therefore assume that even if the rates of remaining are the same for migrant men and women, there are simply more women migrants, so more will stay. The second factor underlying the 60:40 ratio is that post-marital international migration patterns also tend to be patrilocal — i.e., women moving toward the husband's family instead of the wife's. In other words, if Israelis meet people overseas, Israeli men will be more likely to bring non-Israeli female partners back to Israel than is the case among their Israeli women counterparts.

2. Six projection scenarios

The range of assumed values of future levels of mortality, fertility and migration are combined in six discrete projection models:

Scenario 1 — The main model: Assumes mortality change in accordance with data in Table 1, fertility reduction in line with first two rows in Table 2, and migration parameters described in the prior section.

Scenario 2 — Slower pace of mortality change: Fertility and migration assumptions are the same as in Scenario 1, but we assume mortality change is at half the speed of Table 1.

Scenario 3 — Zero net migration model: Mortality and fertility assumptions are the same in Scenario 1, but we assume zero net migration.

Scenario 4 — Slow mortality change and no migration: Combines the assumption of slow mortality change in Scenario 2 with zero net migration of Scenario 3, and fertility reduction in accordance Scenario 1.

Scenario 5 — Faster fertility reduction: Assumes ASFRs associated with the third and fourth rows in Table 2, and mortality and migration in line with Scenario 1.

Scenario 6 — No fertility reduction: Assumes ASFRs associated with the final two rows in Table 2, and mortality and migration in line with Scenario 1.

3. Projections

Current age structure

Before describing the mechanics of the projection, it is helpful to point to a key insight of demography as a discipline: the age structure of a population — that is, the relative size of different age cohorts — reflects that population's past, and that this in turn shapes its future. We have already touched on this in relation to fertility. Before proceeding to the actual projections, we expand on this, since “echo” effects associated with bulges and depressions in the current age structure will have important effects on Israel's population in the future.

Figure 4 presents the age structure of Israel's male and female population, by Jewish and Arab sectors, using data from mid-year 2017. We see that both sectors have characteristic age structures of growing populations, with much larger cohorts at younger than older ages. There are, for example, about

140,000 infants in the Jewish sector (age less than 1), relative to about 94,000 people aged 35, and 60,000 people aged 70. The equivalent numbers in the Arab sector are 42,000, 22,000, and 5,300, pointing to an even younger population.

Figure 4. Age structure, mid-year 2017

a. Jews/Others

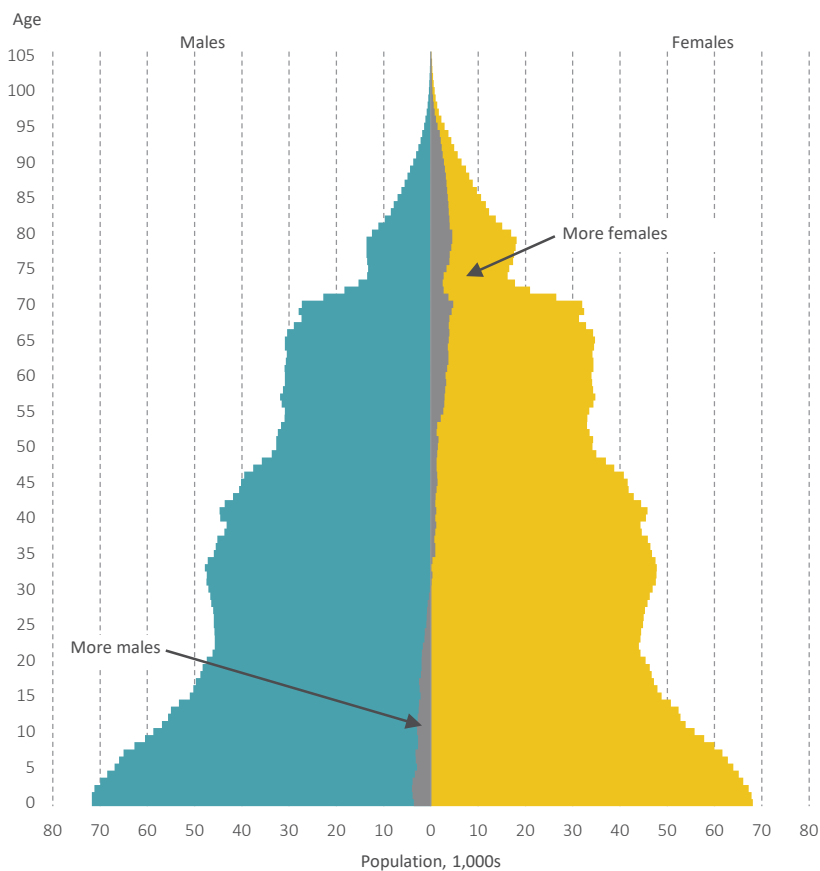
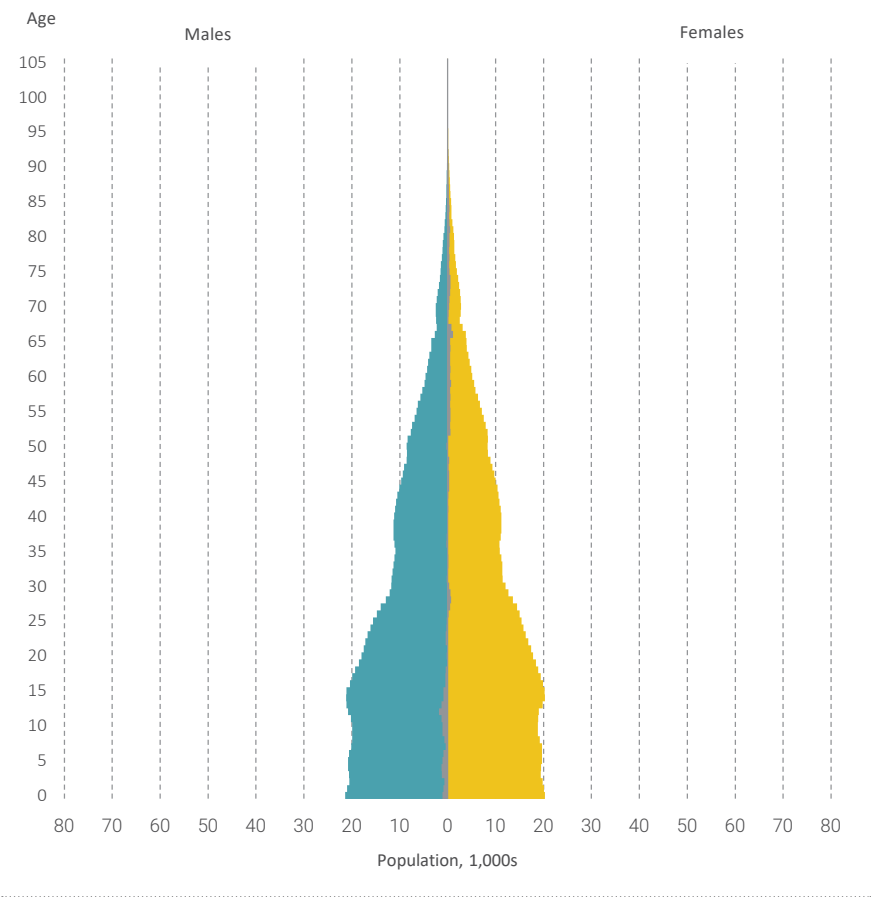


Figure 4 (continued). Age structure, mid-year 2017

b. Arab Israelis



Source: Alex Weinreb, Taub Center | Data: CBS, *Statistical Abstract of Israel 2018*

Likewise, in both populations we see the expected excess in males at younger ages — reflecting the standard sex ratio at birth of around 105 males per 100 females — before a gradual reversal in that ratio, leading to an even larger excess of elderly women, especially in the Jewish sector. This change in sex ratio across the life course reflects higher age-specific mortality rates among men than women at almost every age. The cumulative effect of these differential rates is the reason that women’s life expectancy is higher than men’s.

Here we point to three notable differences in age structure between the Jewish and Arab populations. Later we show how each leaves its mark on the projected future population.

First, the Jewish population has grown at a slower pace overall, but more steadily. Over the last 20 years, in particular, each successive birth cohort in the Jewish population has been larger than its predecessor. This is not the case in the Arab Israeli population. There we see a sharp reduction in the number of births, beginning in 2004, which has led to relative stability in the size of birth cohorts over the last 15 years. This means that whereas the ratio of children aged 0–4 to those aged 10–14 is 1.26 in the Jewish population, it is only 1.03 in the Arab Israeli population.

A second difference is that whereas the Jewish population has distinct waves, with “echo” effects every 30 years or so, the Arab Israeli age pyramid looks more stable, at least for people born between the 1930s and early 2000s. The differences in these patterns across these two subpopulations reflect their distinct histories. The large age bulge among 55–70-year-olds in the Jewish population are a product of a post-WWII baby boom, massive in-migration of children and youth into Israel in the early years of statehood, and the large migration of prime-age adults (25–50) from the Soviet Union in the early 1990s. The first echo of that initial bulge — people aged late 20s to early 40s — are the children of those older individuals. Likewise, the more recent echo — the bulge extending from age 3 to early teens — are the grandchildren of the initial bulge, though their higher number also partly reflects the marginally higher fertility rates of the non-Haredi Jewish population, mentioned above.

In contrast, there has been little in-migration into the Arab population, so its age structure primarily reflects fluctuations in fertility. There are small temporary reductions associated with the immediate aftermath of the War of Independence and the Six-Day War, a sharper though temporary fall in the early 1980s, and then the most recent reductions since 2004. Note that the drop in TFR in the Arab sector over the last 15 years has been sharp enough to outweigh the rapid increase in the number of women entering reproductive ages, leading to relative stability in the number of children born.

The third notable age-structure difference between the Jewish and Arab Israeli populations is the relative impact of aging in these communities. We can see more direct signs of this in Table 3. In 2017, whereas 7.7 percent of Jewish men and 10.1 percent of Jewish women were at least 70 years of age, the same was true of only 2.6 and 3.3 percent of Arab men and women.

This also affects the relative size of cohorts in both populations. Thus, for every Jewish man and women aged 55–59, there were 1.58 men and 1.38 women aged 15–19. In the Arab Israeli population, the equivalent ratios were more than double: 3.33 for men, and 3.08 for women.

Table 3. Selected statistics from the *Statistical Abstract of Israel 2017*

	Jews		Arabs	
	Men	Women	Men	Women
Percentage of population aged 70+	7.72	10.06	2.64	3.33
Ratio population aged 15–19: 55–59	1.58	1.38	3.33	3.08

Source: CBS, *Statistical Abstract of Israel 2017*

The mechanics of the projections¹¹

For illustrative purposes, we first focus on Jewish males. We take the mid-year (i.e., June 30) population of Jewish males in Israel in 2017, divided into single ages. To estimate the mid-year population of Jewish males in 2018 we subject each age group of Jewish males to its age-specific mortality rate in 2017 from age 0 to 105, while also adding the expected number of (net) in-migrants at each age. We then add the number of Jewish/Other male births plus a small number of infant in-migrants, reducing the latter by expected infant mortality rates in the first six months (assuming 75 percent of infant mortality rate between birth and age 1).¹² We repeat each of these steps for each year up to 2040, generating year-on-year population estimates by age. We then replicate the whole series of steps for each of the other three subpopulations — Jewish women, Arab Israeli men, Arab Israeli women.

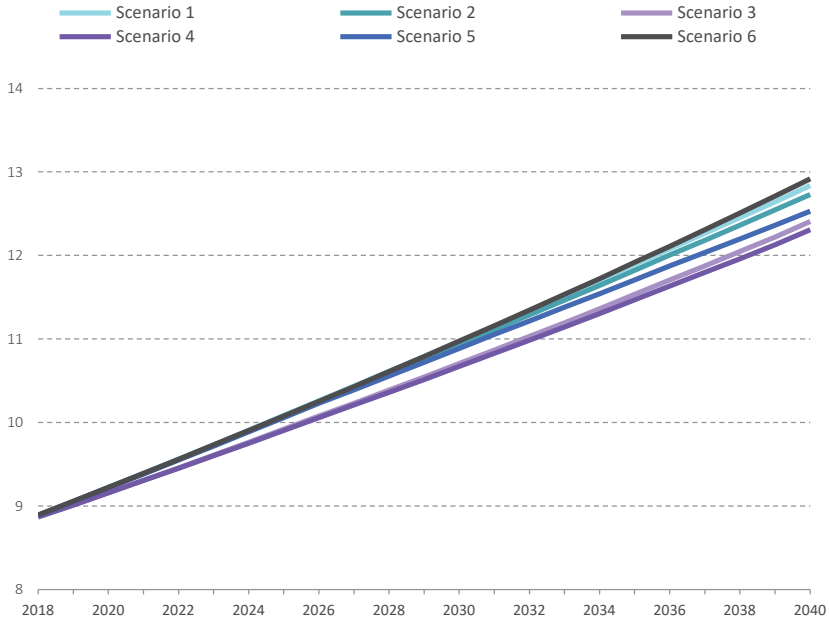
They suggest that Israel’s population will increase from around 9.05 million in mid-2019 (projection from 2017) to 12.83 million in 2040, with the annual

11 The projections are described in more formal terms in Appendix 1.

12 Mortality before age 1 occurs disproportionately in the first few months. Here we assume that infant in-migrants arrive on average at age 6 months, so should be subject to only a portion of the age-specific mortality rate for age 0–1.

growth rate falling from 1.87 percent to 1.52 percent across that period.¹³ This projection is graphed as the lightest blue line (Scenario 1) in Figure 5.¹⁴

Figure 5. Projected population of Israel, 2018–2040, by scenario



Source: Alex Weinreb, Taub Center, Population projections

Estimates based on other projection scenarios described above — allowing for a more modest reduction in mortality, assuming sharper fertility reduction or, unrealistically, setting migration to net zero and fertility as stable with no reduction at all — change the overall estimated population. Putting aside these last two (Scenarios 4 and 6), the projected overall size ranges from 12.4 to 12.8

¹³ The full projections by single age and year for Scenario 1 are made available in online Appendix 3.

¹⁴ In comparison, Israel's 2018 *Statistical Abstract* projects 13.22 and 12.27 million in 2040, respectively, in its medium and low variants, and Paltiel et al. (2012) projected 13.55 and 11.95 million, respectively, in its high and medium variants of 2040 (interpolated from the pace of change between the 2039 and 2044 projections).

million. In each case, this also leads to a slight reduction in the proportion of the population that is Jewish: from 79.0 percent to 77.7 percent in Scenario 1, with similar reductions in the other scenarios.

However, the different scenarios do not substantively change the compositional shifts in the population that are our central interest here. Signs of these changes can be seen in Figure 6, which graphs the projected age structure of the population in 2017, 2027 and 2037 using the Scenario 1 projections. We focus on three main findings.

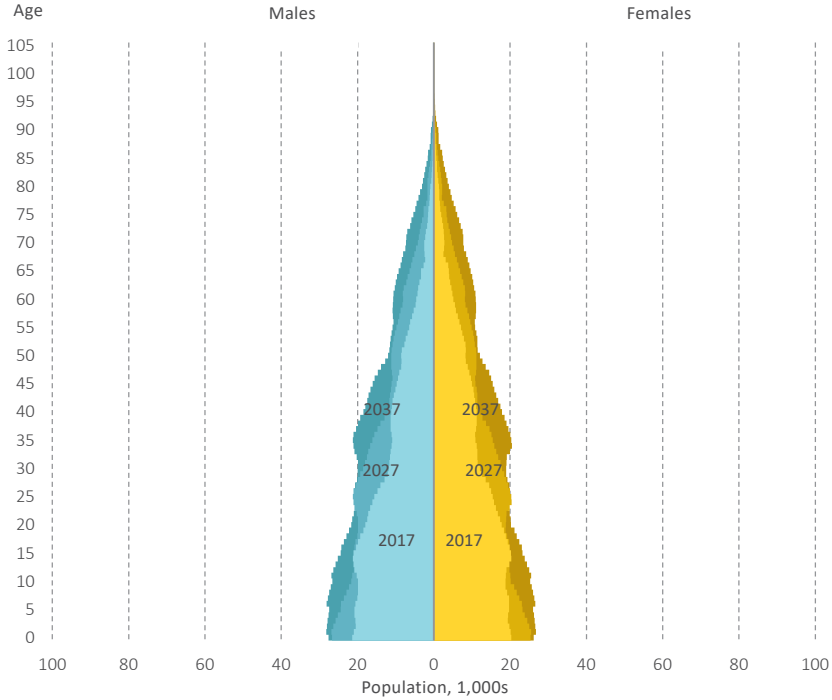
Figure 6. Projected age structure of population in 10-year intervals, 2017–2037

a. Jews/Others



Figure 6 (continued). Projected age structure of population in 10-year intervals, 2017–2037

b. Arab Israelis



Source: Alex Weinreb, Taub Center, Population projections

4. Main results

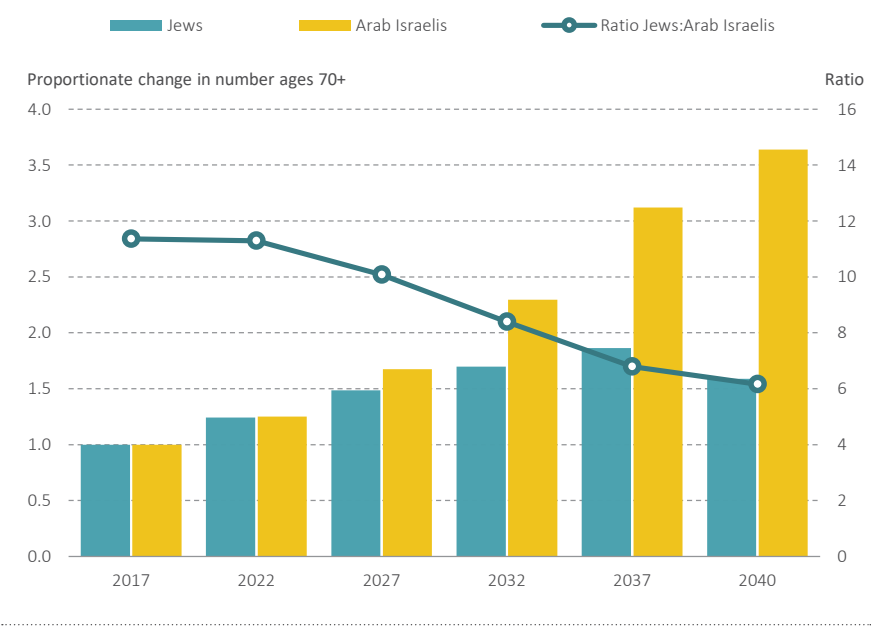
The elderly population

There will be substantial growth in the population older than 70: from 669,000 in 2017 to 1.326 million in 2037 (and 1.411 million in 2040). The pace of aging will be rapid for the next 15 years, driven by the large age bulge among current 55 to 70-year-olds in the Jewish population, discussed above. It will then slow in the mid-2030s, and remain quite slow until the prime-age bulge — currently in their 30s and early 40s — begin to age into their 70s in the late 2040s.

Note, too, that this population of people older than 70 will be disproportionately female, though marginally less so over time as ongoing reductions in male mortality push more men past that threshold: the ratio of women to men in the 70+ age group is projected to fall from 1.34 to 1.30 among Jews/Others and from 1.23 to 1.18 among Arab Israelis.

More notable, as shown in Figure 7, the pace of growth in the aged will be much higher among Arab Israelis than Jews. Among Jews the population aged 70 or above will increase 88 percent, from about 615,000 to 1.214 million. Among Arabs, it will increase almost four-fold, from 54,000 to 197,000. These different rates of growth will transform the relative numbers of elderly in the two sectors. Whereas in 2017 there were 11.4 Jews aged at least 70 for every Arab Israeli of the same age, by 2040, that ratio will shrink to 6.2. This change points to emerging issues regarding elderly work and welfare in the Arab Israeli sector over the next couple of decades.

**Figure 7. Proportionate change in the size of population aged 70+
In 5-year intervals, by sector**



Source: Alex Weinreb, Taub Center, Population projections

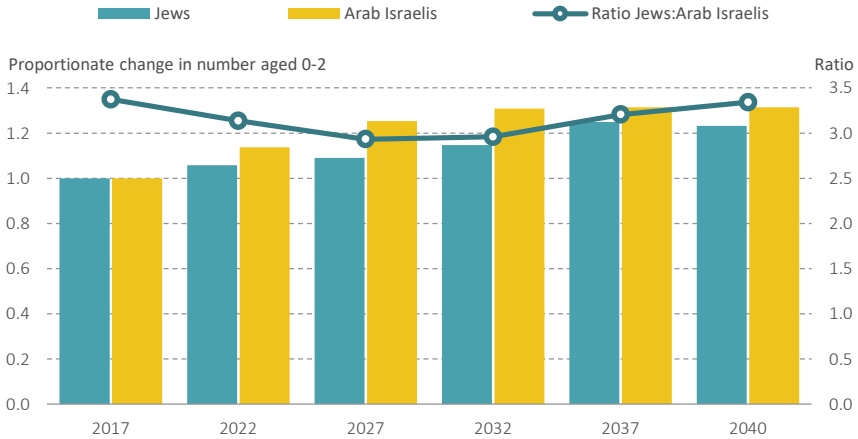
Children

Moving to the other end of the age distribution, we see an initial slowdown in the rate of growth of the number of children born over the next 10 years in the Jewish sector, despite our assumption that age-specific fertility rates will remain relatively unchanged. The cause of the slowdown is the relatively small number of women in their early- and mid-20s entering peak fertility ages of late 20s and early 30s. By the early 2030s, however, this will change, giving rise to a more rapid increase in the annual number of births in the Jewish sector.

Trends look quite different in the Arab Israeli sector. The large cohorts born from the late 1980s to early 2000s have now begun to enter peak ages of fertility. Even with ongoing reductions in the age-specific fertility rates, this will generate substantial increases in the number of children born in the sector, which will only begin to taper off as the smaller successor cohort — currently aged 0 to early-teens — matures into their mid-20s and 30s.

In Figure 8, these trends are combined, expressed as both proportionate growth in the number of children aged 0–2 in 5-year intervals, and the ratio of these children between the Jewish and Arab Israeli sectors. The figure confirms the faster initial increase in the Arab Israeli sector, leading to a sharp reduction in the ratio of Jewish to Arab Israeli children between 2017 and 2027 — from 3.4 to 2.9 — before the relative increase in the number of Jewish women entering peak reproductive ages, and continued reductions in ASFR in the Arab Israeli sector, flip this ratio back up to 3.3 by 2040.

Figure 8. Proportionate growth in the number of children aged 0–2
In 5-year intervals, by sector



Source: Alex Weinreb, Taub Center, Population projections

The productive middle

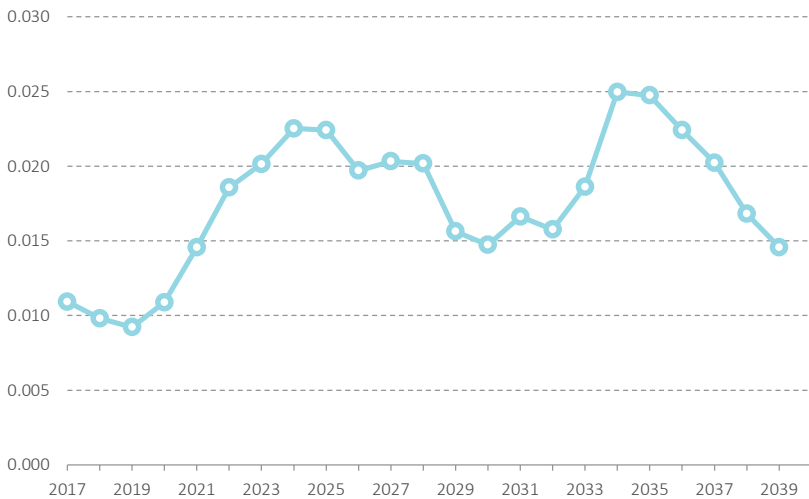
Moving to the middle of the age distribution, over the next twenty years, the prime-age bulge will age into its 50s, the peak productivity and earnings ages. The largest single-year birth cohort in this bulge is currently (2019) aged 35. They outnumber all younger birth cohorts in the 25–34 age group.

Although macroeconomic benefits associated with this large age bulge should not be considered a full “demographic dividend”¹⁵ — there is merely a

15 A demographic dividend refers to a period in the demographic transition in which a large cohort of working age individuals support a relatively small number of elderly and small number of children. It generally occurs only once in a given population: when a cohort reduces its fertility to around or below replacement. Because that working-age population greatly outnumbers the number of elderly and has relatively few children to support, there is more money to support other things in the economy: government investments in infrastructure that has little to do with children or the elderly, public and private investments in human capital, consumer spending on leisure, etc. On the flipside, when that larger cohort is un- or underemployed, it can become both an economic and political drag on the country. From this perspective, it is likely not a coincidence that the large cohort currently centered around age 35 was in its mid- to late-20s during Israel’s 2011 (“Cottage Cheese”) social protests.

delay until the next bulge of children — the surfeit of people in their early 30s over people in their late 20s has implications for consumption, economic growth in general, taxes, and housing stock. This is in addition to the implications for fertility already discussed. On the flipside, it also means that the year-on-year increase in the number of people entering the labor force — and the army and higher education — will increase over the next 15 years, relative to what it has been over the last several years. This can be seen in Figure 9, which graphs the annualized growth rate of the total (Jewish and Arab Israeli) population aged 25–29 for the 2017 to 2039 period. We see sharp increases in the early-to-mid 2020s to more than 2 percent per year — more than double the current 1 percent growth per year. In the late 2020s, this growth rate will slowly fall to around 1.5 percent — this is still a significant rate of growth in absolute terms — but then rapidly increase in the early 2030s, peaking by 2035 at 2.5 percent growth per year, before dropping sharply in the late 2030s. These are very significant rates of increase that will pose significant challenges to the Israeli economy in terms of higher education, employment, and housing.

Figure 9. Projected annual growth rates of the population aged 25–29, 2017–2040



Source: Alex Weinreb, Taub Center, Population projections

Conclusion

Israel's population is exceptional in a number of ways. It has an unusual combination of very high fertility, very low mortality, net in-migration — though this has fluctuated dramatically over time — and substantial circular migration. These generate rapid rates of growth, with 80 percent from the excess of births and deaths, and the rest from net positive in-migration.

In the projections presented here, we have tried to move beyond merely showing that Israel's population will increase from around 9.1 million today to approximately 12.8 million in 2040. Although that absolute number is important, it is equally important for social and economic policy to show how discrete age groups and subpopulations increase at different speeds and at different times over that period. This variation is a foreseeable product of current age structures in addition to likely rates of fertility, mortality, and migration.

In this vein, three key findings arise in these projections, irrespective of the specific scenario.

First, until the mid-2030s, there will be rapid growth in the population older than 70 among both Jews and Arab Israelis, with the pace of growth particularly strong in the Arab Israeli sector. This will demand a parallel increase in the amount of funds devoted to cash benefits and associated services for the elderly — from pension arrangements to home-based and institutionalized care to branches of geriatric medicine — before a slowdown in this expansion from the mid-2030s until the late 2040s.

Second, until about 2027, the number of young children in the Jewish sector will grow at a much slower rate than has been the case over the last 10 years. In fact, until then, the pace of growth in this age group will be faster in the Arab Israeli sector, even with continued reduction in Arab Israeli fertility rates. Only after the late 2020s will the rate of increase in number of children become higher in the Jewish sector. In either case, these different rates of growth have implications for the timing of investments in schools in the two sectors. It also has implications for the year-over-year increase in the number of people subsequently entering the labor force, higher education, and the housing market.

Finally, Israel is now entering a period with a relatively large cohort in its peak productivity and earnings years. As implied above, the excess size of cohorts in their early 30s over late- and mid-20s can act as a mild demographic dividend, assuming continued high rates of employment, and rising labor force participation in the Arab Israeli and Haredi sectors. Yet, on the negative side,

this also means that there will be more pressure on the Israeli economy to provide enough labor opportunities and housing for the relatively large incoming cohorts currently in their teens. The concentration of poverty in the Haredi and Arab Israeli sectors makes it particularly important that Israel does not waste the opportunities associated with these large incoming cohorts.

Together, these projected changes across the age distribution will modify the child- and old-age dependency ratios over the next 20 years. By this we refer, respectively, to the number of children and elderly per working-age adult, conventionally understood as people in the 18–65 age range. Israel currently has the highest total dependency ratio in the OECD — that is the sum of child- and old-age dependency ratios. For every 100 working-age adults in Israel in 2019, there were 60.0 children aged 0–17 and 21.7 people aged 65 or more. The respective OECD averages (in 2015) were 35.0 and 25.1, yielding a total dependency ratio of 60.1. Our projections suggest that this total dependency ratio in Israel will continue to increase over the next several years, peaking at around 60.2 children and 24.2 elderly per 100 working-age adults in 2026, before stabilizing and falling marginally by 2040, by which time reductions in the child-dependency ratio (to 56.3 children:100 working-age adults) will have outweighed ongoing increases in the old-age dependency ratio (27.5 elderly: 100 working-age adults). All in all, however, these remain very high dependency ratios. Relative to their peers in other developed countries, the working-age population in Israel will continue to support more children and retirees.

These projections are not, of course, the final word on the near- and medium-term future of Israel's population. Forthcoming elaborations will focus on how these projections vary by educational status and religiosity, and how they intersect with other trends in marriage, co-residence, divorce and widowhood. Those elaborations will allow us to identify areas that require investment in much more concrete ways, and project the impact on the labor and housing markets.

For now, however, we return to our basic conclusion. By 2040, all signs point toward Israel's population falling in the 12.4 to 12.8 million range. Due to Israel's current age structure, that growth will occur at different speeds in different age-groups and subpopulations. We can anticipate those differential growth patterns within the population and we can use that to shape preemptive rather than reactive public spending on key services for Israel's rapidly growing population.

References

English

- Booth, H., Hyndman, R. J., Tickle, L., & de Jong, P. (2006). [Lee-Carter mortality forecasting: A multi-country comparison of variants and extensions](#). *Demographic Research* 15, 289–310.
- Chason, M. (2006, October 25). [Emigrants: 5 times as many immigrants as those born in Israel](#). *Ynet*.
- Foreman, K. J., Marquez, N., Dolgert, A., Fukutaki, K., Fullman, N., McGaughey, M., ... Murray, C. J. L. (2018). Forecasting life expectancy, years of life lost, and all-cause and cause-specific mortality for 250 causes of death: Reference and alternative scenarios for 2016–40 for 195 countries and territories. *The Lancet*, 392(10159), 2052–2090.
- Kushnirovitch, N., & Raijman, R. (2017). *The impact of bilateral agreements on labor migration in Israel: A comparison between migrant workers who arrived before and after the implementation of bilateral agreements*. Jerusalem: Center for International Migration and Integration.
- Preston, S., Heuveline, P., & Guillot, M. (2000). *Demography: Measuring and modeling population processes*. Malden, MA: Wiley-Blackwell.
- Raleigh, V. (2019). [What is happening to life expectancy in the UK?](#) The King's Fund website.
- Wakid, Y. (2018, March 22). [Israelis are now the majority at this Palestinian university](#). *Haaretz*.
- Weinreb, A., & Blass, N. (2018). [Trends in religiosity among the Jewish population in Israel](#). Policy Paper No 02.2018. Jerusalem: Taub Center for Social Policy Studies in Israel.
- Weinreb, A., Chernichovsky, D., & Brill, A. (2018). [Israel's exceptional fertility](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2018* (pp. 271–312). Jerusalem: Taub Center for Social Policy Studies in Israel.
- Weinreb, A., Shavit, Y., & Blass, N. (2021). *The projected effect of population and enrollment growth on the number of students in higher education in Israel, 2020–2040*. Jerusalem: Taub Center for Social Policy Studies in Israel (in preparation).
- Woolf, S. H., & Schoomaker, H. (2019). Life expectancy and mortality rates in the United States, 1959–2017. *JAMA*, 322(20), 1996–2016.

Hebrew

- CBS (2017). *Statistical Abstract of Israel 2017*, Number 68. Jerusalem: Central Bureau of Statistics.
- CBS (2018). Media releases (2018, July 30). *At the end of 2017 there were 166,000 foreign workers in Israel, about 100,000 of them came into Israel on a work visa, and about 67,000 as tourists*. Jerusalem: Central Bureau of Statistics.
- CBS (2019a). *Statistical Abstract of Israel 2018*, Number 69. Jerusalem: Central Bureau of Statistics.
- CBS (2019b). Media releases (2019, August 13). *Entrance and exit of Israelis living abroad continuously for more than one year, 2017*. Jerusalem: Central Bureau of Statistics.
- CBS (2019c). Media releases (2019, December 16): *Data for International Immigrant Day*. Jerusalem: Central Bureau of Statistics.
- CBS (2019d). *Tourists and departures of Israelis for abroad*. Jerusalem: Central Bureau of Statistics.
- CBS (various years). *Statistical Abstract of Israel*. Jerusalem: Central Bureau of Statistics.
- Paltiel, A., Sepulchre, M., Kornilenko, I., & Maldonado, M. (2012). *Long-Range Population Projections for Israel: 2009–2059*. Demography and Census Department. Jerusalem: Central Bureau of Statistics.
- Shvardron, D., & Abramson, S. (2017). *Regional population scenarios for Israel, 2015–2040*. Jerusalem: Prime Minister's Office, The National Economic Council.

Appendix

Cohort component projection model

The projections are estimated using a standard cohort component model applied discretely to Jews/Others and Arab Israelis, disaggregated by gender. The models include migration at all ages up to 90.

The baseline data is the mid-year population in 2017 (June 30) for each of these groups, by single year of age. We project each of them in single years to 2040, adapting methods described by Preston, Heuveline and Guillot (2000). For all ages 1 to 89, the projected population N aged x in year $t+1$ is equivalent to the number of people aged $x-1$ in year t , plus half the number of net in-migrants aged $x-1$ (in-migrants minus out-migrants) that arrived between t and $t+1$, and half the net in-migrants that arrived age x . This total sum of prior residents in year t and recent migrants is reduced by q_x the age-specific probability of death at age x (described in more detail below).

$$N_x(t+1) = \left(N_{x-1}(t) + \frac{I_{x-1}[t,t+1] + I_x[t,t+1]}{2} \right) \times (1 - q_x[t, t+1]) \quad (1)$$

For all people in the 90-104 age range, the projected population assumes zero migration — that is, a closed population — so uses a simpler estimate:

$$N_x(t+1) = N_{x-1}(t) \times (1 - q_x[t, t+1]) \quad (2)$$

Anyone surviving to age 105 is assigned a probability of death of 1.0.¹⁶ At the other extreme of the age distribution, we use a different procedure. We estimate the number of people below their first birthday as:

$$N_0(t+1) = B[t, t+1] \times (1 - q_0[t, t+1]) + \frac{I_0[t, t+1]}{2} \quad (3)$$

That is, the number of people aged 0-1 is equivalent to the number of births, B , between t and $t+1$, reduced by an infant mortality rate q_0 , and augmented by net in-migration of infants. Here we also see the dual impact of migration

16 Since we are projecting in single years and not estimating life expectancy, we ignore person-years lived within each of these age groups, implicitly assuming equal distribution of mortality in both halves of the year.

on population growth, since the number of births B in the period t to $t+1$ is a function of age specific fertility rates multiplied by the number of women of reproductive age in the population, where the latter includes both native born and in-migrants. More formally:

$$B_x[t, t + 1] = F_x \times (N_x^f(t) + \frac{I_{x-1}^f[t, t+1] + I_x^f[t, t+1]}{2}) \quad (4)$$

where F is the age-specific fertility rate, superscript f indexes female, and all other terms are as defined above.

Two patterns of mortality change

As described in the main body of the paper, two different patterns of future mortality are used in these projections. The baseline for each is age-specific probabilities of death published in *Israeli Life Tables* covering the period 2013 to 2018.

To project the future mortality pattern in these age-specific probabilities, we estimate the annualized change in age-specific probability of death from 2007 to 2015, Δ_x^q , for each 5-year age group up to age 89, as in:

$$\Delta_x^q = \frac{\ln\left(\frac{q_x[2015]}{q_x[2007]}\right)}{8} \quad (5)$$

Estimating change in 5-year age groups smooths fluctuations that arise from very low mortality in Israel's relatively small population, especially at young ages.

For ages 90 to 105 we estimate the annualized change in probability of death between 2012 and 2015.

The main mortality pathway, used in projection scenarios 1, 3, 5 and 6, applies this rate of change to the relevant age-specific mortality rate every five years — that is, 2018–2022, 2023–2027, 2028–2032, 2033–2037, and 2038–2040 — such that:

$$q_x^{Main}[t + 5, t + 10] = q_x[t, t + 5]e^{\Delta_x^q t} \quad (6)$$

The secondary mortality pathway, used in projection scenarios 2 and 4, applies half this rate of changes in:

$$q_x^{Second}[t + 5, t + 10] = q_x[t, t + 5]e^{0.5 \times \Delta_x^q t} \quad (7)$$

The Non-Observed Economy in Israel

Labib Shami

1. Introduction

Estimating the size of the non-observed economy (NOE), or as it is more commonly known the “black economy,” is a daunting task. This is explained not just by the elusive nature of its components, but also by the efforts of those active in the NOE to hide their tracks, which makes it particularly challenging to obtain data.

Determining the size of the NOE is an important step in estimating the scope of tax evasion in an economy and in choosing the tools to combat it. Non-compliance with a country’s laws and regulations has a major effect on the economy and reduces the efficiency of its systems. Furthermore, economic activity that goes unreported erodes the tax base, which is liable to enlarge the size of the public debt and reduce the size and quality of the public services provided to the country’s citizens.

The need to estimate the size of a country’s NOE and its trend over time also stems from its political relevance and its economic effect on our lives. Moreover, reliable measurement of total economic activity, including both the formal and informal production of goods and services, is essential in order to formulate economic policy that will respond optimally to economic fluctuations and developments over time.

Despite the ample body of literature on the NOE and the broad consensus regarding the importance of understanding it, there is no accepted definition of the term. The differences in classification have a direct impact on the optimal method for estimating the size of the NOE. Nonetheless, it is agreed that the NOE includes all of the economic activity that should have been reported to the tax authorities and required the payment of taxes by law.

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Therefore, we have chosen to use the most common definition, according to which the NOE is composed of “those economic activities and the income derived from them that circumvent or otherwise avoid government regulation, taxation or observation” (Dell’Anno & Schneider, 2003).

The current paper is structured as follows: Section 2 describes the most common methods used in the economic literature to estimate the size of the NOE. Section 3 reviews previous attempts to estimate the size of the NOE in Israel, with emphasis on the drawbacks of the estimation methods used. Section 4 presents an alternative estimation model that is modified for the Israeli economy. Section 5 presents the estimation results and Section 6 includes a short summary and possible ways to deal with the phenomenon.

2. Methods for estimating the size of the NOE

In general, there are three main approaches to measuring the size of the NOE: the direct approach, the indirect approach, and the model approach. Each one of these has advantages and disadvantages and each leads to different results, even for the same country. However, when estimating the size of the NOE in one particular country, and in view of the fact that each country has its own methods of data gathering and data recording, the indirect approach has a clear advantage over the others based on its ability to use explanatory variables that are modified to each country.¹

This is a particularly important advantage when using the currency demand approach (CDA), which was first suggested by Cagan (1958). His approach was adapted to the US economy by Tanzi (1980, 1983) and has since served as the theoretical basis for many studies (Ferwerda, Deleanu & Unger, 2010). According to this approach, the size of the NOE is measured in two stages. In the first, the aggregate demand equation for money (cash) is estimated econometrically with the inclusion of a specific parameter related to the use of cash in NOE transactions; in the second stage, the value of the NOE transactions is calculated using the quantity theory of money.

In the first stage of the estimation, the main assumption is that all transactions in the NOE are carried out in cash in order to hide revenue and evade taxation. The aggregate demand for cash is estimated using variables that can be attributed to both the formal economy (such as the interest rate

1 See the discussion in the report of the OECD survey to estimate the size of the NOE in each of its member countries (Gyomai, Arriola, Gamba & Guidetti, 2012, pp. 11–12).

on deposits) and the NOE (such as the tax burden). The calculation of the demand for cash that results from NOE transactions relies on the gap between the estimated demand for cash in the full model (which includes all of the variables related to the demand for cash) and the estimated demand for cash on the assumption that the coefficients of the variables related to the NEO are equal to zero.²

In the version used by Tanzi (1980; 1983) in his study of the NOE in the US, the dependent variable in the estimation equation for the demand for cash is the ratio between cash and the supply of money in the economy. According to his method, the ratio is dependent on four variables that determine the demand for cash: the share of wages paid in cash within national revenues; the interest rate on savings and deposits; income per capita in the country; and average rate of taxation on labor income. According to his assumption, the average tax rate on labor income is the only factor that drives cash transactions in the NOE. This assumption relies on the understanding that a higher tax rate encourages tax evasion which leads to an increased demand for cash. The assumption is then that there is a positive relationship between the tax rate (the tax burden) and the size of the NOE.

In the second stage, the share of the NOE within GDP is calculated by choosing a base year in which, according to the assumption, the contribution of the NOE to total GDP is equal to zero and the velocity of money is calculated according to the Fisher equation.³ On the assumption that the velocity of money is identical in the two economies — both formal and informal — the size of the NOE is calculated as the product of the velocity of money and the “surplus” demand for cash, as calculated in the first stage.

This approach has, unsurprisingly, received a fair amount of criticism, primarily due to the assumptions on which the econometric estimation is based. Schneider and Enste (2000) and Enste and Schneider (2002) described three of its major disadvantages: the assumption that the velocity of money is identical in the formal economy and in the NOE; the determination that the average tax rate (the tax burden) is the only explanation for the existence of the NOE; and the assumption that the contribution of the NOE to GDP is negligible in the base year.

2 For further details, see Section 5.

3 The Fisher equation poses parity between the demand for money and the supply of money: $M \cdot V = P \cdot T$ where M is the money supply, V is the velocity of money, P is the price level and T is total transactions (goods and services).

In order to overcome these disadvantages, we will make use of an updated version of the currency demand approach, which was formulated for the Italian economy (Ardizzi, Petraglia, Piacenza & Turati, 2014). The model has two innovative components:

1. The dependent variable in the demand for money (cash) equation is the ratio between total cash withdrawn by the public from bank checking accounts (including by way of ATMs) and total non-cash transactions. This method makes it unnecessary to use the Fisher equation and consequently also the assumption that the velocity of money is identical in both economies.
2. In addition to the tax burden, this version takes into account another important component in measuring the size of the NOE, namely the number of crimes that involve the use of cash (such as trading in drugs and prostitution). According to the OECD, these crimes rely to a large extent on cash and therefore they constitute an important component of the NOE (Gyomai et al., 2012).

3. Previous attempts to measure the NOE in Israel

According to estimates, the NOE constitutes about 12 percent of all economic activity in the Anglo-Saxon countries, between 20 and 30 percent in the Southern European countries (Schneider & Williams, 2013) and close to 40 percent in the developing countries (Schneider, 2008). Furthermore, in several countries, and even some OECD countries, the size of the NOE comes close to that of government consumption (Hassan & Schneider, 2016). It appears, therefore, that the existence of unreported economic activity is widespread, a fact that reduces government revenues and leads to distortions in important economic indicators, such as the measurement of GDP and the distribution of income in the economy.

In 2011, the OECD conducted a survey of its member countries to estimate the size of the NOE in each of them. Most of the member countries provided the information for 2008 or 2009. According to the OECD definitions, the NOE includes four main components (Gyomai et al., 2012):

- a. **Underground production:** Although this type of productive activity is legal, it is concealed from the tax authorities in order to avoid the payment of taxes or the regulations applying to it.

- b. **Illegal production:** Productive economic activity that generates or supplies illegal goods and services or goods produced by illegal means.
- c. **Informal sector production:** Productive economic activity by unregistered agents that belong to households but which produce beyond their own needs.
- d. **Statistical underground:** This component involves unreported economic activity that is not included in the calculation of GDP due to defects in the government's data collection.

According to the survey, the NOE in Israel in 2008 could be broken down as follows: 21.8 percent informal production; 32.8 percent underground production; and 45.6 percent unreported due to data collection defects (see Table 1). The data for Israel were gathered for various industries. In the construction industry, for example, estimates are based on surveys carried out by the Ministry of the Interior to evaluate the extent of illegal building and combined with data on the average cost of building a home during the relevant year. In the car repair industry, data are based on Central Bureau of Statistics estimates of expenditure on private and public consumption. In addition, the data included, among other things, taxi services, private tutoring, fruits and vegetables sold in open markets, the internal economic activity of the kibbutzim, gardening services, and tips in the food and lodging industry.

The survey indicates that the extent of the NOE in Israel in 2008 was only about 6.6 percent of GDP (close to NIS 70 billion in 2008 prices), a surprising result that gives Israel a favorable ranking relative to other countries. A possible explanation for this figure is that Israel did not include the component of illegal activity (such as the drug trade and prostitution) in its NOE.

Table 1. The composition of the non-observed economy in the OECD countries

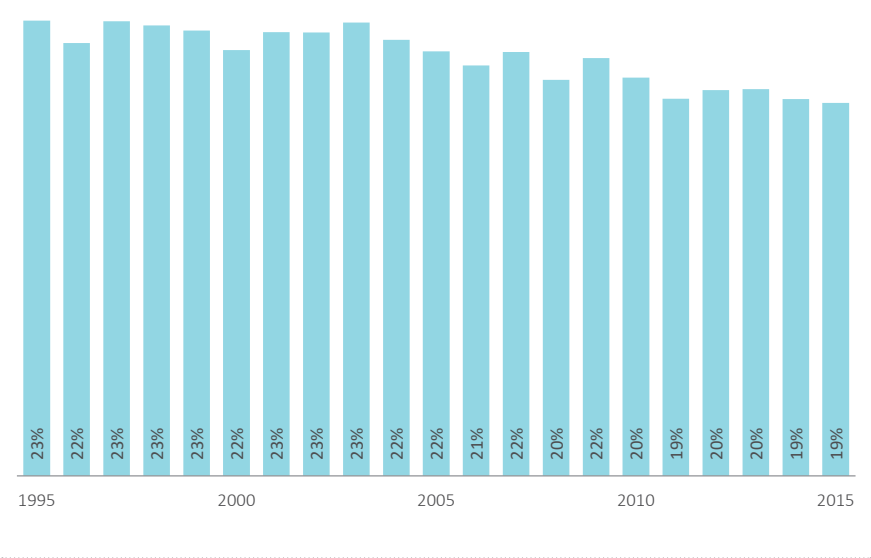
Share of GDP, in parentheses the share of the non-observed economy

Country	Underground production	Illegal production	Informal production	Statistical underground	Total
Austria	2.4% (31.7%)	0.2% (2.1%)	1.5% (19.4%)	3.5% (46.8%)	7.5% (100%)
Belgium	3.8% (83.8%)			0.7% (16.2%)	4.6% (100%)
Canada	1.9% (88.2%)	0.2% (8.2%)		0.1% (3.6%)	2.2% (100%)
Czechia	6.3% (77.6%)	0.4% (4.5%)	1.3% (15.6%)	0.2% (2.3%)	8.1% (100%)
France	3.7% (54.7%)		2.9% (42.7%)	0.2% (2.7%)	6.7% (100%)
Hungary	3.1% (27.9%)	0.8% (7.5%)	3.1% (28.6%)	3.9% (36.0%)	10.9% (100%)
ISRAEL	2.2% (32.6%)		1.4% (21.8%)	3.0% (45.6%)	6.6% (100%)
Italy	16.2% (92.8%)			1.2% (7.2%)	17.5% (100%)
Mexico	5.5% (34.7%)		10.4% (65.3%)		15.9% (100%)
Netherlands	0.8% (36.6%)	0.5% (20.1%)	0.5% (20.0%)	0.5% (23.2%)	2.3% (100%)
Norway	0.5% (51.5%)	0% (0.3%)	0.5% (43.8%)	0% (4.4%)	1.0% (100%)
Poland	12.7% (82.6%)	0.9% (6.0%)		1.8% (11.4%)	15.4% (100%)
Slovakia	12.1% (77.3%)	0.5% (3.0%)	2.9% (18.7%)	0.2% (1.0%)	15.6% (100%)
Slovenia	3.9% (38.2%)	0.3% (3.2%)	2.8% (27.7%)	3.1% (30.9%)	10.2% (100%)
Sweden	3.0% (100%)				3.0% (100%)
UK	1.5% (65.6%)		0.5% (22.9%)	0.3% (11.4%)	2.3% (100%)

Source: Labib Shami, Taub Center | Data: OECD

Medina and Schneider (2018) estimated the size of the NOE in 158 countries (including Israel) and arrived at markedly different estimates. According to them, Israel’s “shadow economy,” as they called it, ranged from 23 percent of GDP in 1995 to 19 percent in 2015 (Figure 1).⁴ Figure 2 presents the share of the NOE in the OECD countries in 2015. The calculations were conducted by the researchers using the Multiple Indicators Multiple Causes (MIMIC) model.

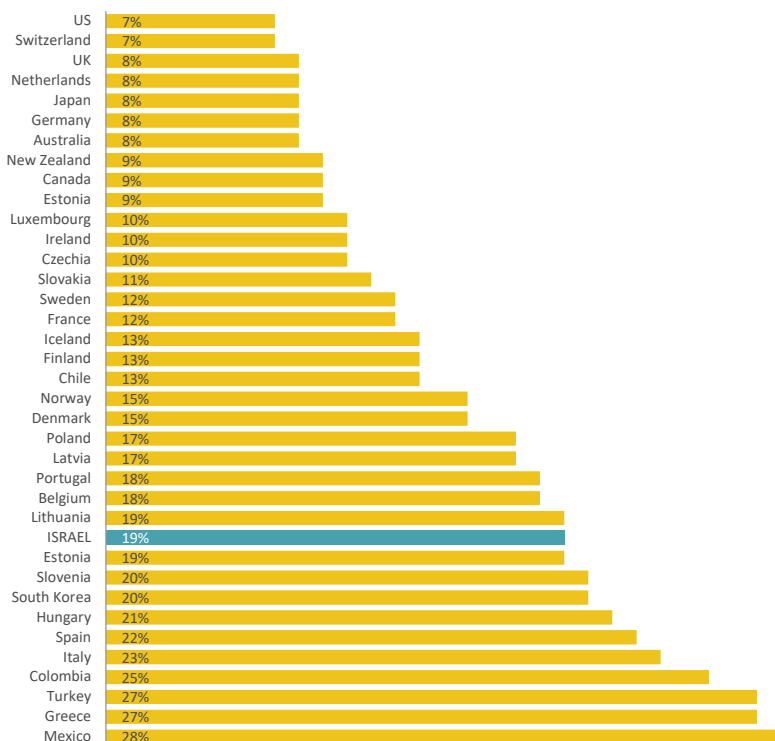
Figure 1. The share of the non-observed economy out of GDP in Israel
MIMIC model



Source: Labib Shami, Taub Center | Data: Medina and Schneider, 2018

4 It is worth mentioning that in most of the other OECD countries, similar differences were observed between the estimates generated by Medina and Schneider and the OECD estimates.

Figure 2. The share of the non-observed economy out of GDP in the OECD MIMIC model



Source: Labib Shami, Taub Center | Data: Medina and Schneider, 2018

Criticism of the MIMIC model

The MIMIC model is based on the work of Frey and Weck (1983) who developed it in order to analyze psychometric factors in the measurement of intelligence. This approach is based on the idea that the correlation between observed variables is explained by unobserved (hidden) variables. The MIMIC approach assumes that the NOE is an unobservable (hidden) phenomenon that can be estimated using the measurable factors that generate it, such as the tax burden.

In contrast to this assumption, Breusch (2005a) points out that, unlike psychological variables, the NOE is not a hidden variable or a hypothetical phenomenon like intelligence and it should be estimated using the same methods employed to measure the formal economy, rather than using a model such as MIMIC. Breusch raises some additional technical issues to explain his opposition to the use of the MIMIC model to estimate the NOE, including, among others, the instability of the coefficients when the size of the sample or the specification changes and the difficulty in obtaining reliable data on variables that are unrelated to taxes. Another disadvantage of the MIMIC model is that it is not based on any microeconomic foundation. The MIMIC model is almost entirely a statistical model, with very little economic-logical basis (Breusch, 2005b). This may lead to uncertainty with respect to the estimated value and to overestimation of the dimensions of the NOE.

4. The currency demand approach modified for the Israeli economy

The current research estimates the size of the non-observed economy in Israel using the currency demand approach (CDA) modified to the Israeli economy. In the first and most basic version of the CDA model, we use the stock of liquid assets in the economy as the dependent variable in a demand for cash (stock variables).⁵ This requires the use of the Fisher equation and the assumption that the velocity of money is identical in both economies, namely the formal economy and the NOE. In contrast, in the modified version of the model, the ratio between two flow variables is used: the dependent variable in the demand for cash equation is the ratio between total cash withdrawals from the public's checking accounts (CW — cash withdrawals) and total non-cash transactions (VOP — value of payments). This approach allows the measurement of the demand for anonymous payments against every shekel used for payment in a traceable transaction (such as transactions in which the payment is by bank transfer, check, or credit card).

5 A stock variable relates to a specific point in time, such as the amount of money in the economy as measured in NIS on a specific date. A flow variable, in contrast, relates to some period of time, such as in the case of GDP measured in NIS for a period of a year or a quarter.

The decision to use total cash withdrawals from checking accounts in order to estimate the size of the NOE is based on the assumption that in order to conceal income and to evade taxation, all transactions in the NOE are cash. This is the basic assumption used in all approaches that calculate the size of the NOE (Rogoff, 2015). Of course, the assumption is not that all cash withdrawals are used in NOE transactions since obviously some cash is used for transactions in the formal economy.⁶ We believe that there are three main components in the demand for cash payments: structural variables, tax evasion, and crime.

Structural components of the demand for cash

Krueger and Goodhart (2001) describe a number of variables that are identified with the structural component of the demand for cash payments. These include technologies for payments and macroeconomic variables, such as GDP, private consumption, disposable income, inflation, and the interest rate in the economy. In the current model, we considered the use of two macroeconomic variables: the ratio between aggregate consumption and GDP (RATIO1) and the ratio between aggregate disposable income and GDP (RATIO2). The assumption that disposable income and private consumption affect the demand for cash is based on the understanding that the higher an individual's income, the greater will be the level of expenditure and, therefore, the greater the desire to hold a larger amount of cash. It is worth emphasizing that all of the explanatory variables have a complex connection to the demand for cash and that the effect of this relationship on demand may be in opposite directions. A rise in GDP or in private consumption, for example, may also lead to a drop in the demand for cash where the result is dependent on individuals' preferred method of payment (Schneider & Enste, 2000). This relationship is influenced by, for example, the level of technology and the use of electronic means of payment, which in the current model are represented by total non-cash payments (VOP).

The economic literature points to a negative relationship between the interest rate in an economy and the demand for cash. It is assumed that the higher the interest rate and the higher the income earned on money "invested" in financial assets, the higher will be the opportunity cost of holding cash.

6 Finlay, Staib and Wakefield (2020) show that 15 to 35 percent of the total cash in circulation in Australia is used in transactions in the formal economy, between 4 and 7 percent is used in the NOE, and the rest is inactive and for the most part simply accumulated by the public. Their study did not include the accumulation of cash in estimating the size of the NOE.

In order to represent the effect of the interest rate on the demand for cash, the nominal interest rate on deposits (IOTD — interest on total deposits) is used. In addition, the model includes the rate of annual inflation (INF) and the annual rate of population growth (PG).

Tax evasion

There is expected to be a positive connection between the overall tax burden (apart from transfer payments, which are a type of negative tax) and the demand for cash. This assumption rests on the understanding that the higher the tax burden, the more individuals will engage in transactions that make it possible to evade taxation. Also, in this case, the effect of the tax burden on the demand for cash may be the opposite of what is claimed above, such that a higher tax burden may lead to a drop in the disposable income of households and thus to a drop in the use of cash. Furthermore, an increase in transfer payments (TR) and in particular the child allowance, unemployment benefits, and income support payments is liable to induce recipient households to shift to the NOE in order not to lose their eligibility should their formal income rise (Mazar & Reingewertz, 2018; Romanov & Zussman, 2001).

In order to determine the effect of the tax burden on the demand for cash, the net direct tax burden (TD — direct tax) and the indirect tax burden (the taxation of domestic production; TOG — tax on goods and services) are used. In addition, we isolate some transfer payments to households from the rest of the transfer payments and examine their effect on the demand for cash, in particular, child allowances, unemployment benefits, and income support payments (group TR1). The rest of the transfer payments were classified into a separate group (TR2). To the best of our knowledge, this is unique to the current research.

Crime

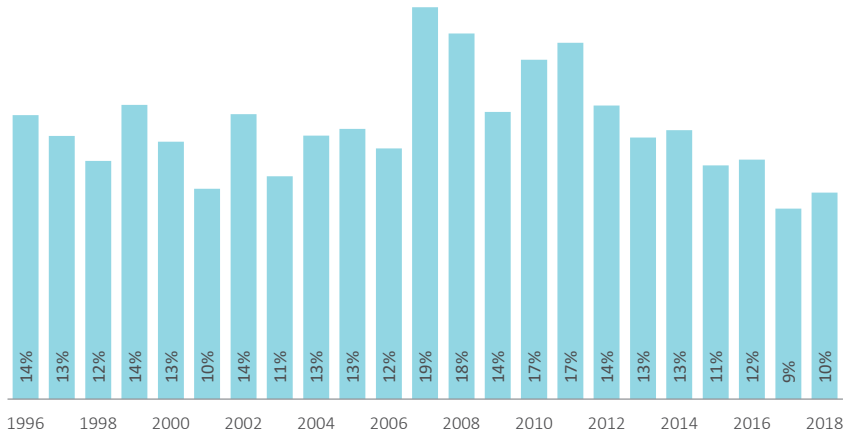
The NOE also includes components related to crime, such as trade in drugs. In order to isolate these components from simple tax evasion, two variables are used in the current model: the total annual number of police investigations (IF — investigation files) and the total annual number of vice investigations, including prostitution and trade in drugs (IFM — vice investigation files) and calculated the ratio between them (RIF). We chose vice, which includes prostitution and trade in drugs, in view of the need to include crimes of an economic nature that are the result of relations between a seller and a buyer

and that involve cash payment. Accordingly, a positive relation is expected between crime and the demand for cash. However, the level of crime in the country may have a negative effect on the desire of individuals to hold cash.

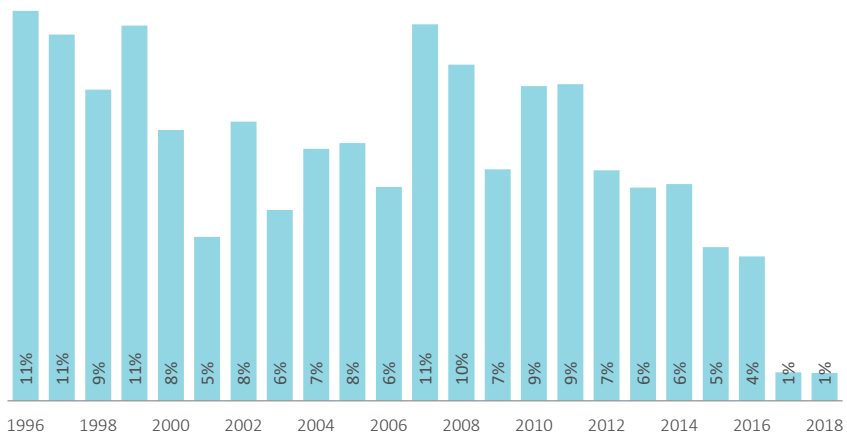
5. Results of estimating the NOE in Israel

Unlike the estimations from the MIMIC model, the size of the NOE in Israel has fluctuated over the years and has been characterized by a clear downward trend in recent years (see Figure 3). According to the model used in this study, the share of the NOE in Israel fell from 14 percent in 1996 to 10 percent in 2018, while GDP itself grew by about 260 percent during that period. These rates reflect an NOE of about NIS 49 billion in 1996 as opposed to NIS 134 billion in 2018. Relative to the results of the OECD survey in 2011, which estimated the size of the NOE in Israel in 2008 at 6.6 percent of GDP, the estimates in this study show the size of the NOE in Israel to be 18 percent of GDP in 2008. The NOE peaked in 2007 to 2008, during the global economic crisis, when it reached 19 percent of GDP (in 2007). These years were characterized by a sharp drop in total non-cash payments and a slowdown in the growth of GDP, in contrast to the continuous growth in the amount of cash withdrawals in Israel (Figure 6). This trend points to a higher-than-average use of cash that is not reflected in reported GDP and which leads to an increase in demand for untraceable payments in contrast to every shekel used for payment in a traceable transaction (such as a bank transfer, check or credit card). This accounts for the high share of the NOE during those years.

With respect to the components of the NOE in Israel, it appears that over the last decade the share of the tax evasion component within the NOE has been on a downward trend (Figure 4), in contrast to the clear upward trend in the share of the crime component within the NOE (Figure 5). Moreover, the share of tax evasion has been low in recent years: 4 percent in 2016 and only 1 percent in 2017 and 2018. The explanation can be found in Figure 6, which shows that cash withdrawals from checking accounts have been characterized by an upward trend over the years, in contrast to a mixed trend for non-cash transactions. However, in 2016, the trend in cash withdrawals reversed and at the same time the total amount of non-cash transactions grew. This reversal in trend, alongside the reduction in the tax burden that characterized the last decade in Israel, can be seen in the sharp drop in the share of the tax evasion component within the NOE during those years.

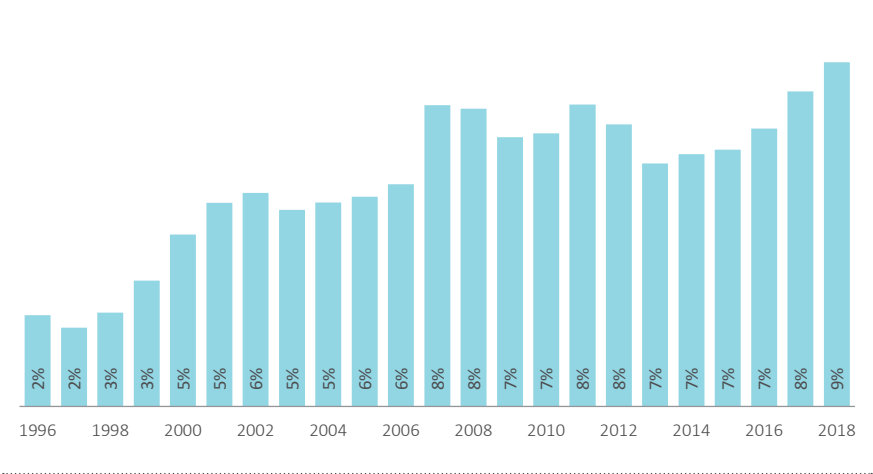
Figure 3. The share of the non-observed economy out of GDP in Israel

Source: Labib Shami, Taub Center, based on data from the Bank of Israel, CBS, and the OECD

Figure 4. The share of tax evasion in the non-observed economy out of GDP in Israel

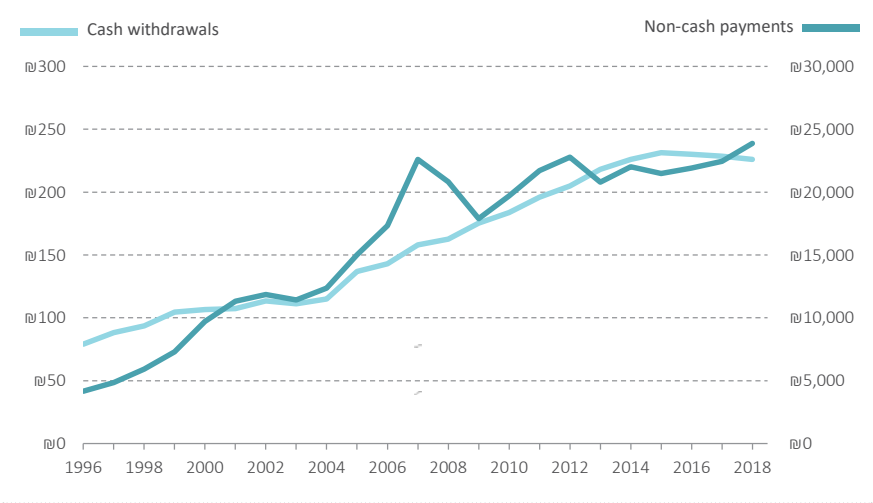
Source: Labib Shami, Taub Center, based on data from the Bank of Israel, CBS, and the OECD

Figure 5. The share of criminal activity in the non-observed economy out of GDP in Israel



Source: Labib Shami, Taub Center, based on data from the Bank of Israel, CBS, and the OECD

Figure 6. Cash withdrawals from bank accounts and non-cash payments
NIS billion



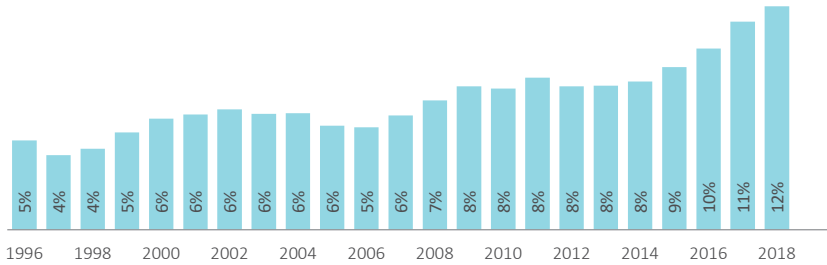
Source: Labib Shami, Taub Center | Data: Bank of Israel, the Regulator for the Bank

As mentioned, breaking down the total tax burden (indirect taxes, net direct taxes, and transfer payments) allows an examination of the effect of each variable on the size of the NOE in Israel. According to the model, indirect taxes and the child allowance, unemployment benefits, and income support payments have a positive effect on the size of the NOE. In other words, they contribute to the expansion of the NOE. These results support the conclusions of other studies examining this issue in Israel (Mazar & Reingewertz, 2018; Romanov & Zussman, 2001). According to these studies, assistance that is conditional on a means test (such as income support payments) and that involve an offset of the assistance or part of it against labor income is liable to create a poverty trap. A means test that also takes into account the benefits that accompany assistance (such as discounts and exemptions from payment for goods and services) leads to a reduction in the supply of labor among assistance recipients and, in essence, encourages them to conceal income. The contribution of indirect taxation to the expansion of the NOE may be the result of its contribution to reducing total non-cash transactions (a variable that appears in the denominator of the model's dependent variable) and the preference of individuals for paying in cash for goods and services. Therefore, it essentially contributes to increasing the value of the dependent variable in the model and the share of the NOE in the economy.

In contrast, net direct taxation and transfer payments (without the child allowance, unemployment benefits, and income support payments) have a negative effect on the size of the NOE, or in other words they lead to a reduction in its size. The negative effect of net direct taxation on the size of the NOE may be the result of its contribution to reducing individuals' labor income. This effect reduces total transactions both in cash and by electronic means and thus contributes to reducing the value of the dependent variable in the model (in the event that the numerator is reduced more than the denominator) and the share of the NOE in the economy.

The sharp increase that characterizes the share of the crime component within the NOE in Israel during the last two decades is consistent with the rise in the share of vice investigations (trade in drugs and prostitution) within total police investigations. According to Figure 7, this rate rose from 5 percent in 1996 to 12 percent in 2018 and, during the last two years, the share of the crime component within the NOE in Israel stood at 90 percent.

Figure 7. The ratio between investigations of vice crimes and the total number of investigations opened



Source: Labib Shami, Taub Center | Data: CBS

6. Summary and solutions

In recent years, policy makers worldwide have been promoting the idea of eliminating the use of cash, with the goal of limiting unreported economic activity (the NOE). Many studies offer support for this policy. Rogoff (2015) claims that the use of cash makes it possible to carry out transactions anonymously and to conceal them from the tax authorities and the law, thus helping individuals avoid taxes and violate the law. According to Rogoff's estimates, a large share of the cash in most countries — often in excess of 50 percent — is used to conceal financial transactions from the authorities.

When there is no restriction on the use of cash, income from illegal activity can be used to purchase goods from the formal sector of the economy. Thus, for example, drug dealers can purchase a car or a home. Countries that are able to diminish the use of cash should be able to mitigate this situation. Thus, in order to buy a car, for example, one would need income that is registered in a formal banking system; income that cannot be registered in the formal economy will have no economic value (Cohen, Rubinchik & Shami, 2019).

Indeed, many countries are currently shifting to a policy of reducing the use of cash in view of its expected positive effects and, in particular, the limits it will impose on various types of illegal activity and the reduction in money laundering and tax evasion. In addition to its contribution to limiting the NOE, reducing the use of cash will also positively affect economic growth in these

countries, will contribute to strengthening the central banks in the presence of economic shocks, and will lead to an improvement in the social and economic benefits that citizens can expect to receive in the future.

This type of policy has been adopted by, for example, Indian Prime Minister Narendra Modi who declared on November 8, 2016, that all 500 and 1,000 rupee notes would have no value within 50 days. These notes constitute about 86 percent of the total stock of coins and notes in India, a country in which about 90 percent of all transactions until then were in cash (*ibid*). The motive for adopting this measure was the desire to end the counterfeiting of these notes for the purpose of financing terror and also to reduce the amount of black money in the country (Dash, 2017). In other countries, such as Sweden, households are increasingly moving to the use of electronic methods of payments, such as bank cards and Swish, and are reducing their use of cash to a large extent, even without government intervention (Sveriges Riksbank, 2018).⁷

In contrast, there are places that refuse to shift to a cashless economy. The legislature of New Jersey and the city council of Philadelphia have imposed financial sanctions on stores that refuse cash as a means of payment, based on the claim that they are discriminating against both individuals who do not have sufficient access to financial services and the services that are usually offered by the banks (underbanked) and individuals who do not have a bank account at all (unbanked).

In the US, cash is still the most common method of payment and is used in 30 percent of all transactions and 55 percent of transactions under \$10. According to the America's Federal Reserve, the quantity of cash has grown during the last 17 years, although currently, the number of \$100 bills is larger than the number of \$1 bills. Despite new methods of payment, payment in cash is still the simplest method of carrying out a transaction in the US since it does not require remembering a username and password.

George Osbourne, the former Chancellor of the Exchequer in the UK, related to the question of a cashless economy at a Fintech conference held at the end of 2018. Although he claims to have always supported a cashless economy he also proposed that it not be implemented in Britain in view of its impact on low-income individuals (Mavadiya, 2019).

7 Swish is a service of the European Mobile Payment Systems Association. The service works through a smartphone application where the user's phone number is connected to their bank account, making it possible to transfer money in real time.

In Israel, the mandate of the Locker Committee which was created in 2013 was to reduce the use of cash, as part of the efforts to limit and reduce the scope of the NOE. The Committee published its recommendations in 2014 and the Law for Reducing the Use of Cash went into effect on January 1, 2019. The law is meant to reinforce efforts to reduce the size of the black economy and the amount of black capital. The law limits the amount that can be paid in cash to NIS 11,000 for payments to a business and NIS 50,000 for payments to a private individual. Since endorsed and open checks are similar in their characteristics to cash, the law established restrictions on their use as well. The law treats a business and a private individual separately and, for the first time, the law imposes financial sanctions also on the payer and even imprisonment for recurring violations. In July 2019, restrictions went into effect that prohibit the cashing of checks with no beneficiary or checks whose amount exceeds NIS 10,000 and which were endorsed more than once.⁸

There is no doubt that a policy to reduce the use of cash has positive effects. Nonetheless, a misguided implementation of the policy may have undesirable effects on certain groups and will thus miss the point of the legislation. The social consequences of a policy to reduce the use of cash can be illustrated using the example of countries like India, where the effects have been felt for a number of years. Apart from the fact that the reduction in the use of cash is liable to widen the gap between rich and poor, in India, it generated substantial chaos. Companies did not manage to pay salaries and millions of individuals without bank accounts could not purchase food and medicine. Moreover, the economy in India has been in recession for the past two years, during which time the population has spent long hours in lines at the banks in order to open an account and deposit their old notes.⁹

The destructive impact of the coronavirus pandemic did not bypass the NOE and its participants. The government of Israel, like many other governments, adopted a policy of social distancing in order to limit the spread of the virus. This policy also dampened business activity immediately in both the formal economy and the NOE. In order to limit the economic harm to its citizens and to the economy as a whole, the government provided, among other things, a budgetary safety

8 [*The Law for Reducing the Use of Cash*](#) on the Bank of Israel site and also Aviv (2018).

9 See [*A Cashless Economy to Root Out Theft and Petty Crime?*](#) the Cashless Economy site.

net in 2020 of NIS 135.5 billion.¹⁰ This money is designated for assistance to the unemployed, support for small businesses, and the creation of growth engines for a rapid recovery. However, receipt of the grant had a number of conditions, including a drop of at least 25 percent in turnover during the period March to June 2020 relative to the same period in 2019. This condition is liable to encourage small businesses to conceal income in order to meet the threshold and, thus, it will contribute to expanding the NOE (Klingbail & Peretz, 2020).

On the other hand, small businesses operating in the NOE and the unemployed who were previously employed in the NOE did not receive these grants, since their income is not reported to the authorities. Although it seems fair to deny support to someone who has not in the past contributed to state revenues, it is reasonable to assume that the economic harm caused to these individuals will also affect businesses in the formal economy and will reduce their revenues. Even though it is not possible to ascertain the exact number of workers in the NOE in Israel and in particular the number who were fired in the NOE as a result of the coronavirus crisis, there were likely to have been tens of thousands of such layoffs, based on the estimates of the International Labor Organization (ILO).

According to the ILO, two billion individuals, who constitute more than 60 percent of all workers in the world, are employed informally. Informal employment is particularly common in the developing countries, but also exists in the developed countries (accounting for 25 percent of the employed in Europe) (ILO, 2018). These workers lack rights and a basic social security net and since the economic rescue plan ignores them, it is almost certain that they will be among the main victims who have lost their livelihood as a result of the coronavirus crisis. In Italy, for example, the government has already made an unprecedented announcement that it intends to provide assistance to the unemployed who up until the crisis were part of the NOE, based on a fear that these workers would riot (Follain, 2020). One way or another, this problem is liable to create a complex economic challenge for decision makers.

10 As of the beginning of August, the total extent of the economic program of Israel's government for 2020 for dealing with the coronavirus crisis stands at NIS 135.5 billion. It is important to note the latest amendment made to the Basic Arrangements Law: the State economy including budgets for use in 2021 (like extensions of unemployment benefits and bi-monthly assistance to the self-employed and business owners through the end of June 2021). These budgets do not appear in the economic budget plan for dealing with the coronavirus crisis in 2020.

References

English

- Ardizzi, G., Petraglia, C., Piacenza, M., & Turati, G. (2014). Measuring the underground economy with the currency demand approach: A reinterpretation of the methodology, with an application to Italy. *Review of Income and Wealth*, 60(4), 747–772.
- Breusch, T. (2005a). *Estimating the underground economy using MIMIC Models*. Working Paper, Canberra, Australia: National University of Australia.
- Breusch, T. (2005b). The Canadian underground economy: An examination of Giles and Tedds. *Canadian Tax Journal*, 53(2), 367–391.
- Cagan, P. (1958). The demand for currency relative to the total money supply. *Journal of Political Economy*, 66(4), 303–328.
- Cohen, N., Rubinchik, A., & Shami, L. (2019). Towards a cashless economy: Economic and socio-political implications. *European Journal of Political Economy*, 61.
- Dash, A. (2017). A study on socio economic effect of demonetization in India. *International Journal of Management and Applied Science*, 3(3), 13–15.
- Dell’Anno, R., & Schneider, F. (2003). The shadow economy of Italy and other OECD countries: What do we know? *Journal of Public Finance and Public Choice*, 21(2–3), 97–120.
- Enste, D., & Schneider, F. (2002). *The shadow economy: Theoretical approaches, empirical studies, and political implications*. Cambridge: Cambridge University Press.
- Ferwerda, J., Deleanu, I., & Unger, B. (2010). *Revaluating the Tanzi-Model to estimate the underground economy*. Discussion Paper Series no. 10–04. Utrecht, The Netherlands: Utrecht University, Tjalling C. Koopmans Research Institute.
- Finlay, R., Staib, A., & Wakefield, M. (2020). Where’s the money? An investigation into the whereabouts and uses of Australian banknotes. *The Australian Economic Review*, 53(1), 22–34.
- Follain, J. (2020, March 31). [Italy readies emergency cash for workers in underground economy](#). *Bloomberg*.
- Frey, B. S., & Weck, H. (1983). Estimating the shadow economy: A “naïve” approach. *Oxford economic papers*, 35(1), 23–44.
- Gyomai, G., Arriola, C., Gamba, M., & Guidetti, E. (2012). *Summary of the OECD Survey on measuring the non-observed economy*. Working Party on National Accounts. Paris: OECD.
- Hassan, M., & Schneider, F. (2016). Size and development of the shadow economies of 157 worldwide countries: Updated and new measures from 1999 to 2013. *Journal of Global Economics*, 4(3).

- ILO (2018). [*More than 60 per cent of the world's employed population are in the informal economy*](#). International Labour Organization, April 30, 2018.
- Klingbail, S., & Peretz, S. (2020, May 9). [*Drubbed by coronavirus, small Israeli businesses demand cash — and shadow economy grows*](#). *Haaretz*.
- Krueger, M., & Goodhart, C. (2001). [*The impact of technology on cash usage*](#). London: London School of Economics.
- Mavadiya, M. (2019, February 24). [*The US will not be cashless anytime soon*](#). *Forbes*.
- Mazar, Y., & Reingewertz, Y. (2018). [*The effect of child allowances on labor supply: Evidence from Israel*](#). Discussion Paper 2018.07. Jerusalem: Bank of Israel.
- Medina, L., & Schneider, F. (2018). *Shadow economies around the world: What did we learn over the last 20 years?* Working Paper 18/17. Washington DC: International Monetary Fund.
- Rogoff, K. (2015). Costs and benefits to phasing out paper currency. *NBER Macroeconomics Annual*, 29(1), 445–456.
- Romanov, D., & Zussman, N. (2001). Income maintenance allowance and its impact on labor supply and income evasion. *The Economic Quarterly*, 48(4), 607–647.
- Schneider, F. (2008). Shadow economies and corruption all over the world: Empirical results for 1999 to 2003. *International Journal of Social Economics*, 35(9), 4.
- Schneider, F., & Enste, D. H. (2000). Shadow economies: Size, causes, and consequences. *Journal of Economic Literature*, 38(1), 77–114.
- Schneider, F., & Williams, C. (2013). *The Shadow Economy*. London: Institute of Economics Affairs.
- Sveriges Riksbank (2018). [*Payment patterns in Sweden 2018*](#). Stockholm, Sweden: Sveriges Riksbank.
- Tanzi, V. (1980). The underground economy in the United States: Estimates and implications. *PSL Quarterly Review*, 135(4), 427–453.
- Tanzi, V. (1983). The underground economy in the United States: Annual estimates, 1930–80. *IMF Staff Papers*, 30(2), 283–305.

Hebrew

- Aviv, M. (2018). [*Limiting the use of cash: What does the new law say about reducing the use of cash and it does it affect you?*](#) *LawGuide*, 27.12.2018.

Appendix

The data were for 1996 to 2018. We chose 1996 as the starting point since in August 2014, the Central Bureau of Statistics updated the National Accounts system beginning in 1995, according to the SNA 2008 guide. The data were taken from the Bank of Israel, CBS, and the OECD websites.

The estimation was carried out using the following equation:

$$\begin{aligned}
 RCWVOP_t &= \beta_0 + \beta_1 \cdot RATIO1_t + \beta_2 \cdot RATIO2_t + \beta_3 \cdot IOTD_t + \beta_4 \cdot INF_t \\
 &+ \beta_5 \cdot PG_t + \beta_6 \cdot RIF_t + \beta_7 \cdot TOG_t + \beta_8 \cdot TD_t + \beta_9 \cdot TR1_t \\
 &+ \beta_{10} \cdot TR2_t + \varepsilon_t
 \end{aligned}$$

where:

$$t = 1, 2, \dots, 23$$

RCWVOP	The ratio between cash withdrawals from checking accounts and total non-cash payments
RATIO1	The ratio between aggregate private consumption and GDP in current prices
RATIO2	The ratio between aggregate disposable income and GDP in current prices.
IOTD	The nominal rate of interest on the public's deposits
INF	The annual rate of inflation
PG	The rate of population growth
RIF	The ratio between number of vice cases and the total number of cases investigated by the police
TOG	The indirect tax burden as a percent of GDP
TD	The net direct tax burden as a percent of GDP
TR1	The child allowance, unemployment benefits, and income support payments as a percent of GDP
TR2	Other transfer payments as a percent of GDP

In order to achieve optimal results, we used an estimation technique based on stepwise regression.¹¹ The procedure yields the following model:¹²

$$RCWVOP_t = \beta_0 + \beta_1 \cdot RATIO1_t + \beta_2 \cdot RATIO2_t + \beta_3 \cdot RIF_t + \beta_4 \cdot TOG_t + \beta_5 \cdot TD_t + \beta_6 \cdot TR1_t + \beta_7 \cdot TR2_t + \varepsilon_t$$

where: $t = 1, 2, \dots, 23$

Appendix Table 1. Regression results

	The Model
(Intercept)	0.053*** (0.017)
RATIO1	-0.152*** (0.022)
RATIO2	0.044*** (0.013)
RIF	0.043** (0.018)
TOG	0.289*** (0.072)
TD	-0.034* (0.017)
TR1	0.170*** (0.056)
TR2	-0.394*** (0.080)
R ²	0.96
Adj. R ²	0.94
Number of observations	23
RMSE	0.001

Note: *p<0.1; **p<0.05; ***p<0.01. | Source: Labib Shami, Taub Center

11 Stepwise regression is a method for creating an optimal regression equation by choosing independent variables whose unique contribution to predicting the dependent variable has the strongest statistical significance. The method includes a number of steps: First, the independent variable which has the highest **simple** correlation — and the most significant coefficient — with the dependent variable is chosen. Second, the independent variable with the highest **partial** correlation — and the most significant coefficient — with the dependent variable is chosen, while excluding the effect of the independent variable chosen in the first stage. And so on. If the independent variable chosen in some stage is not statistically significant, then the process is halted.

12 The residuals are distributed normally with equal and fixed variance.

The size of the NOE in Israel is obtained by estimating the “excess demand” for cash, namely the demand that is not the result of the structural components of the demand for cash. This excess demand is calculated as the difference between the values generated from the model’s equation and those obtained by setting the value of the variables related to the NOE (i.e. RIF, TOG, TD, TR1 and TR2) to zero. In order to arrive at the share of the NOE within the formal economy (GDP), we take the number obtained from the estimation and multiply it by the total payments in non-cash transactions (VOP) and then divide the result by GDP each year. To illustrate, the following is the calculation of the size of the NOE for 2006:

1. First, the ratio RCWVOP which is obtained from the estimation equation is calculated. The result is 0.0082.
2. The ratio RCWVOP is calculated and obtained when the values of the variables correlated to the NOE are set to zero. The result is 0.0034.
3. The difference between the two results obtained above is calculated. The result is 0.0048.
4. The result from step 3 is multiplied by total payments in non-cash transactions during 2006. The result is 83.16, which is the surplus demand for cash in NIS billions for 2006. This stage relies on the assumption that the denominator (total payments in non-cash transactions) in the RCWVOP ratio is not affected by transactions in the NOE.
5. The result from step 4 is divided by GDP with the result that the share of the NOE in 2006 was 12 percent. The assumption here is that every shekel of surplus demand is equivalent to a shekel channeled to final uses.

In order to obtain the rate of tax evasion in the NOE, the same process is repeated, except that in the second stage, only the variables related to the tax burden, i.e. TOG, TD, TR1 and TR2, are set to zero.

In order to analyze the results of the linear regression, three tests that indicate the model’s ability to represent the real data are used. Following is a description of the tests:

a. Identification of serial correlation

It is well known that serial correlation in a time series describes a situation in which the residuals are correlated with their lagged values. In this study, the Durbin-Watson test is used to identify the existence of first-order serial correlation. If the statistic obtained is higher than a critical level or alternatively the p -value is lower than 5 percent, then the null hypothesis that there is no first order serial correlation is rejected. The conclusion is then that there is a problem of serial correlation. The test was conducted and the null hypothesis was not rejected (i.e., there was no evidence found of serial correlation in the residuals).

The following is the output for the model:

Durbin-Watson test

Data: the Model

DW = 2.67, p -value = 0.627

b. Heteroscedasticity (varying variance)

The assumption of constant variance of the random disturbances is called homoscedasticity. In the event that this assumption is not fulfilled, then the observations are not distributed evenly around the regression line, a problem that is referred to as heteroscedasticity. Heteroscedasticity leads to bias in the variance of the estimates and also a bias in the joint variance between the estimators and therefore the tests of the significance of the estimates are invalid. In this study, the Breusch-Pagan-Godfrey test is used in order to test for heteroscedasticity.

If the statistic obtained is higher than the critical value or alternatively the p -value is less than 5 percent, the null hypothesis of homoscedasticity is rejected and the conclusion is that there is a problem of heteroscedasticity. The test was conducted and the null hypothesis was not rejected. Therefore, the assumption that the variation is identical for all the random disturbances is valid.

The following is the output for the model:

Studentized Breusch-Pagan test

Data: The Model

BP = 13.811, $df = 7$, p -value = 0.05465

c. The normal distribution of the residuals

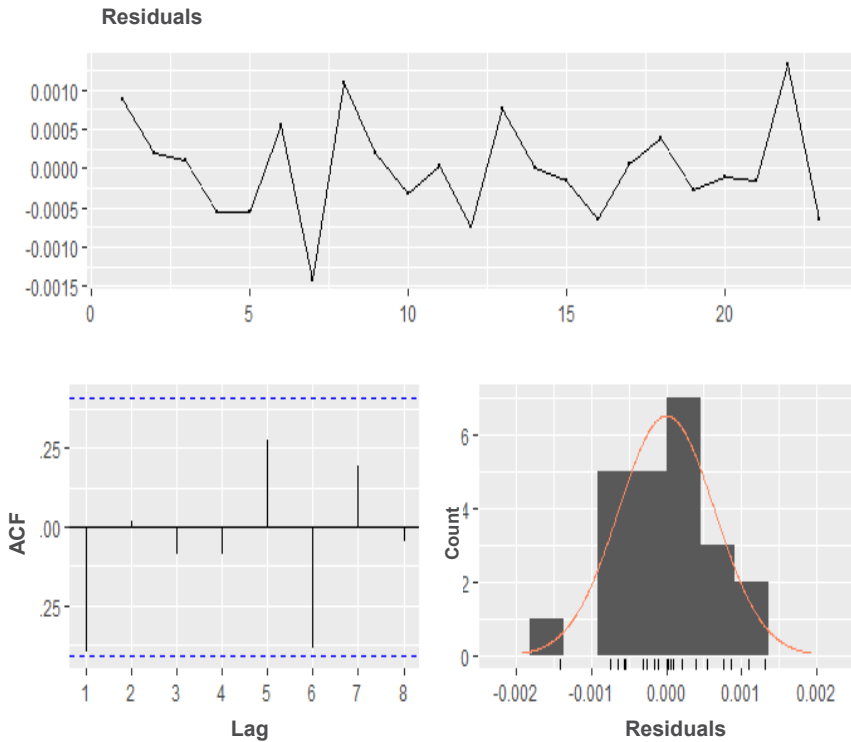
The assumption of normally distributed random disturbances is essential in order to obtain linear and unbiased estimates with the least squares method. The validity of this assumption was examined using the Shapiro-Wilk Normality Test. According to this test, the distribution of the random variations is normal if the p -value is above 5 percent.

The following is the output for the model:

Shapiro-Wilk normality test

Data: residuals (The Model)

$W = 0.98018$, p -value = 0.9093



Source: Labib Shami, Taub Center

LABOR MARKETS

3

The Israeli Labor Market Under the Coronavirus: An Overview

Noam Zontag, Gil Epstein, and Avi Weiss

Labor markets around the world experienced substantial disruption in 2020 with the outbreak of the coronavirus pandemic. Social distancing rules intended to reduce the spread of the pandemic significantly restricted economic activities, and, as a result, cut profitability in businesses and labor markets. Israel, which entered the crisis with a resilient labor market, very low unemployment rates, and high rates of employment and labor force participation, also sustained serious damage due to the employment crisis created by the pandemic. The damage to the labor market appears to have been associated with consumer concern of exposure to the virus; falling domestic demand due to the reduction in household incomes; falling demand for exports; and heightened uncertainty, including uncertainty regarding employment (Achdut, Gera, Zussman & Kamintzky, 2020). Despite the development of vaccines for COVID-19 and the start of inoculations at the end of 2020, the employment crisis is not expected to end anytime soon, and the process of returning to full employment could take a number of years. According to the expectations of the Ministry of Finance, the average broad unemployment rate¹ in 2020 will be slightly over 15 percent² and in the fourth quarter of 2021 it will fall to 7.2 percent under the optimistic scenario and 10.2 percent under the pessimistic scenario.³

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- 1 The definition of the broad unemployment rate includes workers who were dismissed during the crisis and are not seeking employment.
- 2 See the [Macro-Economic Forecasts](#), Chief Economist Division, Ministry of Finance (in Hebrew).
- 3 See the presentation by the Chief Economist Division, Ministry of Finance, [A Status Report on the Labor Market](#), Eli Hurvitz Conference on Economics and Society, December, 2020 (in Hebrew). For a broad review of the macroeconomic ramifications of the crisis, see Bental and Shami, 2020.

As the crisis erupted, a policy decision was adopted allowing employers to place workers on unpaid leave; during this period, the workers are entitled to unemployment benefits without the need to prove dismissal or the termination of the contractual relationship between the workers and their employers. In light of the uncertainty and fall in economic activity, many employers chose to use this option to place workers on temporary unpaid leave. The extensive use of this tool created a new reality in which the conventional indices used to describe the labor market, and particularly the unemployment rate, became less relevant. This stems from the fact that workers on unpaid leave, albeit sometimes for many months, are not defined as unemployed, since they have not been dismissed from their workplace and still plan on returning to work. Another group of workers whose employment has been affected during the crisis who are not reflected in the unemployment rate are workers who were dismissed during the crisis and are not looking for work. This group is not conventionally included in the unemployment rate, which, by definition, includes only workers who are actively seeking employment. In practice, the main impact of the crisis on the labor market, particularly during periods when strict social distancing rules were imposed, was manifested in the high rate of workers temporarily absent from their work.

Labor market data in Israel are collected by three official bodies: the Central Bureau for Statistics (CBS, in its Labor Force Survey and other surveys); the National Insurance Institute (NII); and the Employment Service. The data files from these three bodies are not identical, but the principal trends they reflect are broadly similar. The differences between the data from the NII, the Employment Service, and the CBS are due mainly to substantive differences in the definitions. While the former two bodies issue administrative files intended primarily for their operational use, the CBS files are based on the official statistical definitions and are intended for research and other purposes. In order to ensure uniformity throughout this overview, we have chosen to base our analysis on the CBS data, which offer diverse variables that allow for analyses of the labor market and estimates of the impacts on Israeli society.⁴

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- 4 The CBS data from the Labor Force Surveys allow differentiation between three groups of unemployed: a) the “standard” unemployed (those who are labor force participants but are not employed); b) those temporarily absent from their jobs (for at least a week) for reasons related to COVID-19; and c) those who were employed before the crisis but as a result of the crisis are neither employed nor seeking employment. These categories differ from those of the NII for those who receive unemployment benefits (see Bental & Shami, 2020) and from job seekers who register with the Employment Service. Not all those workers who are temporarily absent from their work are on unpaid leave, and not all those on unpaid leave are eligible for unemployment benefits.

At the time of writing, the crisis is still at its height, and accordingly this overview reflects the reality at the time of writing alone. It is important to bear in mind that this reality may change in accordance with the development of the crisis.

The labor market in Israel in 2020: A status report

Prior to the outbreak of the coronavirus pandemic, the labor market in Israel was tight, resilient, and characterized by full or near-full employment (Fuchs & Weiss, 2018; Fuchs & Epstein, 2019). As of the end of the fourth quarter of 2019 — the last quarter before the outbreak of the crisis — the rate of non-employed in the principal working ages (25–64) was extremely low, at 3.3 percent.⁵ The rates of labor market participation and employment were high and stable, at 81 percent and 78 percent, respectively. Real wages were continuing to rise, as in previous years, increasing by about 3 percent over the year preceding the crisis. Although the share of vacant job positions fell slightly, from 3.6 percent at the end of 2018 to 3.4 percent at the end of 2019, it remained high until the outbreak of the crisis.

Following the start of the pandemic and the imposition of strict social distancing rules during March, the Israeli labor market sustained a serious shock. At the beginning of the crisis, from mid-March through mid-May, strict social distancing rules were imposed in Israel, significantly restricting economic activity and leading to the closure of large sections of the Israeli economy. Many workers were placed on indefinite unpaid leave, and many public sector workers took mandatory paid vacation. As a result of this situation, in April, which marked the peak of the first part of the crisis (the “first wave”), about 31 percent of workers were absent from their work for reasons connected to the coronavirus crisis, in addition to about 3 percent who were unemployed.⁶

5 Unless otherwise noted, the employment figures in this chapter relate to the principal working ages, 25–64.

6 According to the CBS, workers who were temporarily absent from their work due to the crisis are workers who were absent throughout the surveyed week due to a reduction in the scope of work, labor disputes, strikes, or closures. This group does not include workers absent from their work for other reasons, such as reserve duty, parental leave, and the like.

From mid-May through mid-September, some restrictions were lifted in the social distancing rules, educational institutions resumed their activities, and substantial sections of the economy returned to full or near-full operations. During this period, many workers who were absent from their place of work returned to work, although during the same period the unemployment rate rose, reaching 4.5 percent in August. However, certain sectors — particularly those that typically involve considerable physical proximity between people (such as the culture and airline industries) — remained closed to a large degree even during this period.

Rising morbidity rates led once again to the imposition of strict distancing rules from mid-September (the Jewish High Holidays) through mid-October, followed by a staged relaxation in the rules. This pattern of rising and falling severity in the required level of social distancing is connected to the fluctuations in the morbidity rates (“waves”) and may be repeated as the crisis continues.

Figure 1 shows the rates of labor force participation and employment according to the groups of workers whose employment was affected during the course of the crisis. As the graph shows, while during the early months of the crisis the impact on the labor market was seen mainly in the rising rate of workers who were temporarily absent from their place of work, as of May, the rate fell substantially, with a parallel rise in the unemployment rate.⁷ The rate of labor force participation, which fell by 1 percentage point between February and March, did not change significantly from March through October. During September and October, the period of the second shutdown, the rate of workers temporarily absent from work (unpaid leave) rose again; however, this increase was milder than that during the first shutdown.⁸

7 The unemployment rate is described in Figure 1 as the differential between the curve representing the employment rate and the curve representing the rate of labor force participation.

8 The figures in this chapter are based on the data from the Labor Force Survey without “permanent samples,” i.e., excluding residents of institutions and the Bedouin geographic dispersion. For details, see the introduction to the CBS Labor Force Survey for 2018 (CBS, 2020).

Figure 1. Rates of labor force participation and unemployment by categories of workers affected, January to October 2020

Ages 25–64



Note: The employment rate excluding workers who were temporarily absent from their place of work includes workers who actually worked, excluding workers temporarily absent from their work for reasons connected to the coronavirus. Conversely, this employment rate includes workers absent from their work for other reasons not connected to the coronavirus, such as vacation, reserve duty, and the like.

Source: Zontag, Epstein, and Weiss, Taub Center | Data: CBS, Labor Force Survey

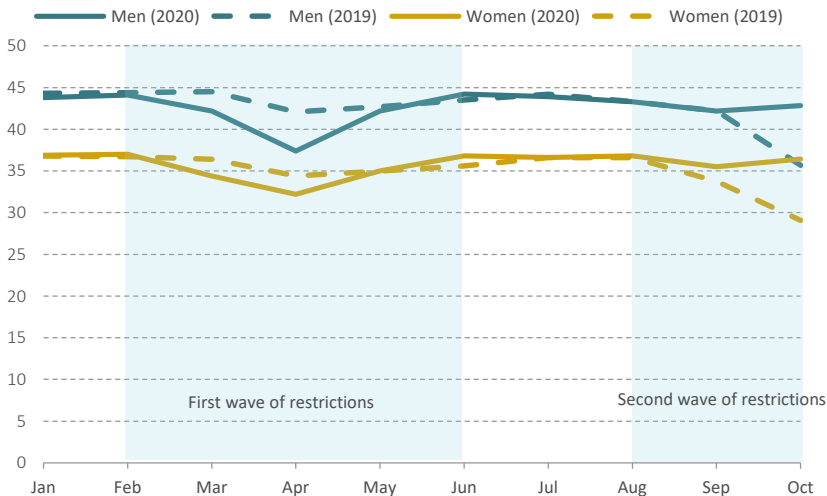
Changes in the number of weekly work hours during the crisis

The impact of the crisis on the labor market is not confined to the share of workers who stopped working; it also affected the average number of hours worked. During the first shutdown, the average number of work hours fell (Figure 2). The fall peaked in April when the average number of hours worked was about 14 percent lower than in February, prior to the impact of the crisis on the labor market, and about 9 percent lower than in April 2019.⁹ The fall in the average number of work hours between April 2019 and April 2020 was greater among men (11 percent) than among women (6 percent).

9 In addition to the reduction in work hours due to the shutdown, April also included Passover and Ramadan, both of which influenced the fall in the average number of work hours.

In March and May, too, the average number of work hours was relatively low.¹⁰ During the second shutdown, and in particular during October, the average number of work hours increased relative to the year before. The number of work hours depends on additional variables unrelated to the crisis, such as holidays and legal vacation days during the month in question, so it is difficult to determine the extent to which the changes between the two shutdowns were the result of the shutdowns and other issues.

Figure 2. Average number of weekly work hours per employee, January to October 2019 and 2020



Note: Among employees who worked that week, not including those absent from work temporarily or permanently due to the coronavirus crisis.

Source: Zontag, Epstein, and Weiss, Taub Center | Data: CBS, Labor Force Survey

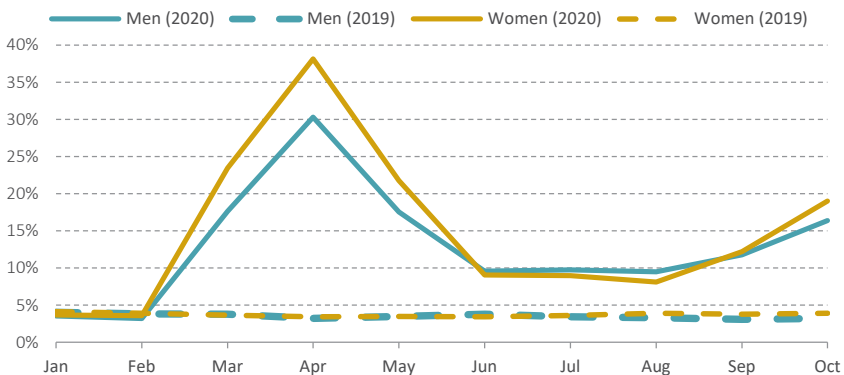
10 Two reasons can be suggested for the high average number of work hours in June 2020 relative to June 2019: 1) The festival of Shavuot fell during June in 2019, but not in 2020; 2) A desire on the part of workers to make-up for lost work hours during the first shutdown, when many of them could only work a limited number of hours.

Breaking down the employment effects of the crisis

In many respects, the impact on employment due to the crisis was not uniform across all employees in the economy. A number of variables influenced the probability that a worker would leave the labor market temporarily or permanently. Regarding gender, the share of women who were temporarily absent from their place of work as a result of the crisis during the early months of the crisis, when strict distancing rules were imposed, was higher than that of men (Bowers, 2020; Ministry of Finance, 2020b). This gap may have been due to the high share of women in the ancillary educational professions (teaching assistants, instructors, and ancillary functions), a large share of whom were placed on unpaid leave. Another possible explanation is that more women than men took unpaid leave in order to stay home with their children following the shutdown of educational frameworks (Israeli Employment Service, 2020). The gender gaps that characterized the early months of the crisis narrowed during the period of relaxations in the social distancing rules, and as of the beginning of June the share of workers who were temporarily absent from their place of work and the unemployment rate were slightly higher among men (Figure 3). As occurred during the first shutdown, from the onset of the second shutdown in September the broad unemployment rate rose more sharply among women than among men, and in October the share of unemployed women was 3 percentage points higher than that of men.

Figure 3. Broad unemployment rate among labor force participants by gender, January to October 2019 and 2020

Ages 25–64



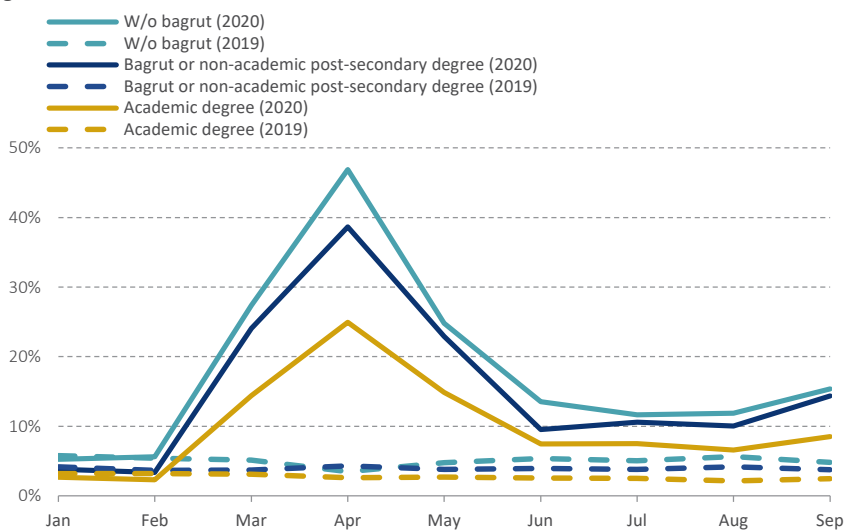
Note: The broad unemployment rate in the figure includes unemployed persons and those temporarily absent from work (unpaid leave) for reasons associated with the crisis, as defined by the CBS.

Source: Zontag, Epstein, and Weiss, Taub Center | Data: CBS, Labor Force Survey

When the changes in the unemployment rates are examined for different education levels, it appears that during the course of the crisis, and particularly at its beginning, the gaps in the employment rates between different income levels widened. From February to April, the crisis had a stronger impact on workers with a low education level; many of these workers were temporarily released from their place of work, and, accordingly, the fall in their employment rate was steeper than that among workers with a higher education level (Achdut et al., 2020;¹¹ Ministry of Finance, 2020b). In June, as the rules began to be relaxed, unemployment rates among these workers fell and the gap narrowed considerably (Figure 4). Nonetheless, since the second shutdown began in September, the gap has widened again.

Figure 4. Broad unemployment rate among labor force participants, by education level, January to October 2019 and 2020

Ages 25–64



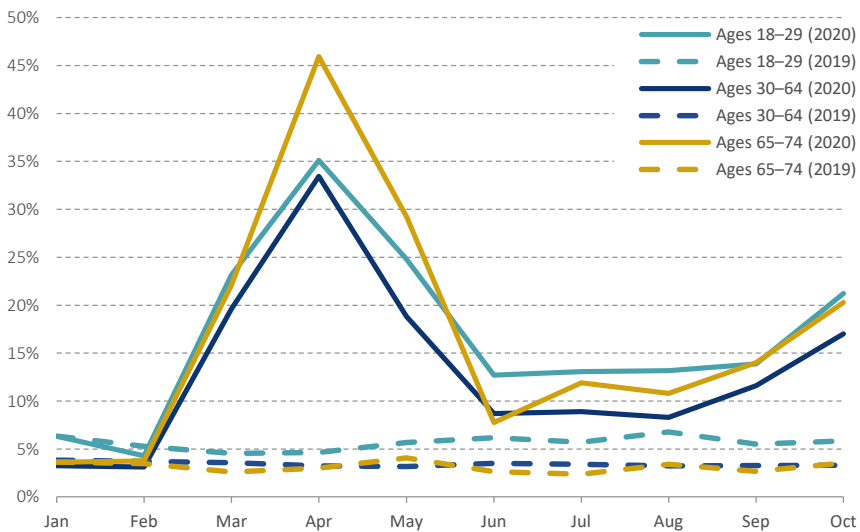
Note: The broad unemployment rate in the figure includes unemployed persons and those temporarily absent from work for reasons associated with the crisis, as defined by the CBS.

Source: Zontag, Epstein, and Weiss, Taub Center | Data: CBS, Labor Force Survey

11 Achdut et al.'s survey relates solely to the unemployment rate in the business sector.

With regard to age groups, the impact of the crisis was particularly severe among young workers and among older workers above retirement age (Achdut et al., 2020). During the early months of the crisis, the growth in the broad unemployment rate was steeper among young people ages 18–29 and among older workers ages 65–74 than among those ages 30–64 (Figure 5). The gaps between the age groups continued to be significant during the period of relatively relaxed social distancing rules in July and August and even during the second shutdown. One possible explanation for the severe impact on the employment of older people is that they may belong to a health risk group, or may be close to belonging to this group in terms of the age-based definitions used by the Ministry of Health. The longer the crisis persists, the greater the probability that many of the workers in this group, some of whom continued to work beyond the official retirement age, will leave the labor market permanently. If this scenario transpires, the labor force in Israel may lose workers who would have continued to work for several more years were it not for the crisis.

Figure 5. Broad unemployment rate among labor force participants by age groups, January to October 2019 and 2020



Note: The broad unemployment rate in the figure includes unemployed persons and those temporarily absent from work for reasons associated with the crisis, as defined by the CBS.

Source: Zontag, Epstein, and Weiss, Taub Center | Data: CBS, Labor Force Survey

The impact of the crisis on employment in the Haredi and Arab Israeli sectors

The employment crisis following the outbreak of the coronavirus crisis had a greater impact on workers from the Haredi sector than on non-Haredi Jews (Achdut et al., 2020; Ministry of Finance, 2020b). This finding is particularly true for Haredi men, among whom the broad unemployment rate in April was significantly higher than among non-Haredi Jews (48 percent and 28 percent, respectively); the rate remained relatively high over the following months, after the introduction of the relaxations in the shutdown and during the second shutdown (Figure 6). A study of employment patterns in the Haredi sector suggest that the decision by men to go to work rather than continuing their yeshiva studies is in many cases due to financial constraints (Malach & Gorbat, 2020). Past crises, such as the crisis in 2003 and the cuts in budgets for the sector in 2013, were accompanied by the entry of Haredi men and women into the labor market. Similarly, it may be that following the coronavirus crisis an increase can be anticipated in employment rates or in the number of work hours in this sector (Hermann & Anabi, 2020).

Among workers in the Arab Israeli sector, by contrast, the picture is more complex. During the early months of the crisis, the unemployment rates in this sector were higher than among non-Haredi Jews (Somekh et al., 2020). However, this gap narrowed over the following months, and since June the unemployment rates among Arab Israelis, men and women, were lower than among non-Haredi Jews in some months (Figures 6 and 7).

Figure 6. Broad unemployment rate among male labor force participants by sector, January to October 2019 and 2020

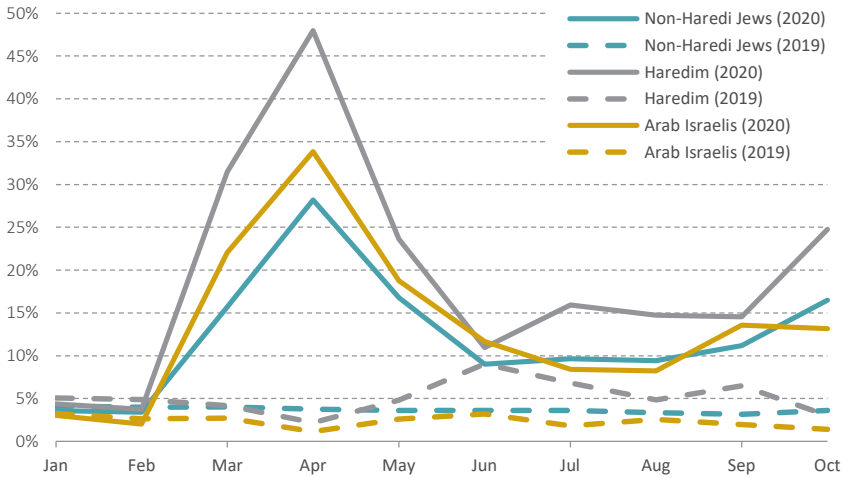
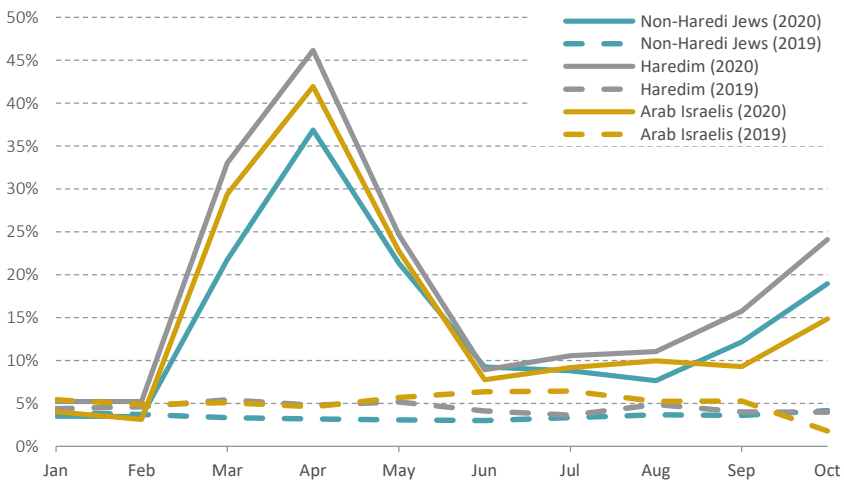


Figure 7. Broad unemployment rate among female labor force participants by sector, January to October 2019 and 2020



Note for Figure 6 and 7: Data are for the period until October 2020; the Haredi sector is by self-definition. In addition to the unemployed, the unemployment rate in the figure also includes workers who did not work temporarily due to the crisis.

Source for Figure 6 and 7: Zontag, Epstein, and Weiss, Taub Center | Data for Figure 6 and 7: CBS, Labor Force Survey

Breaking down the impact of the crisis during the period of relaxations in the distancing rules by variables connected to the nature of the employment

As already mentioned, while many workers were absent from their work temporarily during the period of tight restrictions, a smaller group of workers remained without work even after relaxations were introduced in the distancing rules in May. For many members of this group, the impact on employment, which extended beyond a limited period, may be more significant. Figure 8 examines the share of non-employed in June 2019 and June 2020 among those who were employed in June in the preceding year, by the job characteristics in the preceding year. The definition of “non-employed” in the figure includes those who did not work at all in June (neither in a full-time nor a part-time position) and who were defined in this month as unemployed or as workers temporarily absent from their work due to the crisis. The graph is based on data from Labor Force Surveys using their sampling method,¹² which surveys the same respondent in the same month with an interval of one year. June was chosen since it is a representative month for the period of relatively relaxed rules, while it is not influenced by the seasonal fluctuations in the labor market that characterize the summer months.

As the figure shows, the impact on public sector workers was less pronounced, and most of the impact was borne by the business sector (see also Achdut et al., 2020). It also emerges that there was a substantial increase in the share of self-employed who stopped working in 2020 relative to 2019; this increase was significantly higher than that among salaried workers.¹³ The share of full-time employees who stopped working rose more sharply than the share of those employed on a part-time basis. The share of workers who stopped working in both groups was substantially higher in June 2020 than in June 2019.

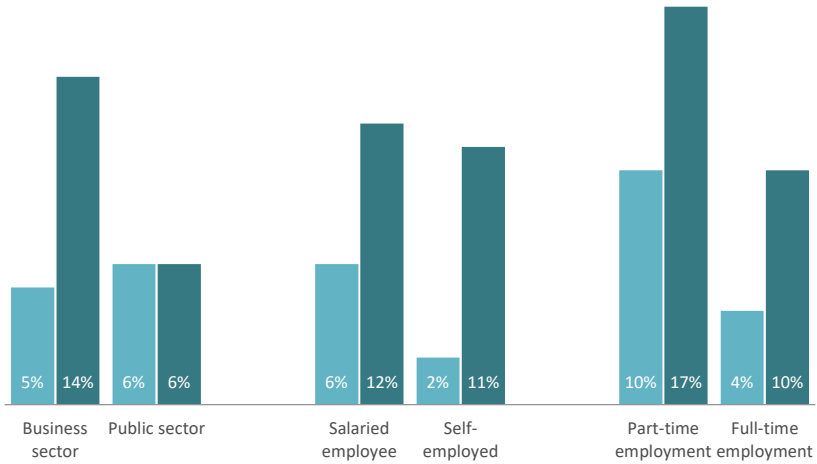
12 The sampling method in the Labor Force Survey is on the household level, including a review of each individual in the household ages 15 and above over eight periods (months). Respondents are sampled for four consecutive months, not sampled for the following eight months, and then sampled again for four consecutive months.

13 The non-employed group, both among salaried workers and the self-employed, includes only those who did not work at all during the relevant month (June 2019 or June 2020), with the exception of salaried workers who became self-employed over this year and self-employed who became salaried workers over this year.

Figure 8. Share of non-employed in June 2020 (2019) among persons employed as of June 2019 (2018), by pattern of employment in previous year

Ages 25–64

■ 2018–2019 ■ 2019–2020



Note: A full-time position is defined as 35 weekly work hours or more.

Source: Zontag, Epstein, and Weiss, Taub Center | Data: CBS, Labor Force Survey

SPOTLIGHT A

The wage paradox during the coronavirus period

The rise in real wages in Israel that has characterized recent years continued in 2019 and at the beginning of 2020. From February 2019 through February 2020, the last month for which the figures were not significantly influenced by the crisis, average real wages among salaried workers in the Israeli economy rose by about 3 percent.¹⁴ This rise follows the rapid rise in wages since 2014 — wages for all salaried workers rose by about 16 percent between 2014 and 2019.

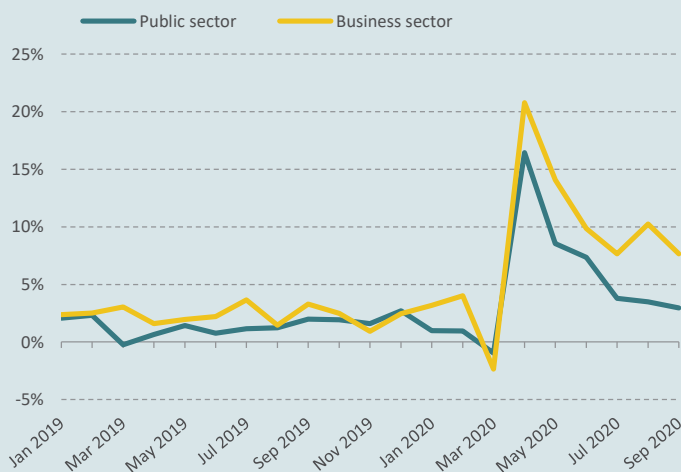
While average real wages fell in March, the month when the first shutdown was imposed, an unusually sharp rise was recorded in April (Figure 9). In order to understand this paradox — a sharp rise in wages at a time when the Israeli and global economies were affected by a pandemic — it is important to recall that the average wage is calculated for employees who actually worked during the entire month, and does not include those who, for any reason, did not work in that month. Thus, changes in the average wage level are also influenced by changes in the mix of workers, and not only by changes in the wage level of any particular worker. The exceptional rise in April is associated with the fact that many of the workers who were temporarily

14 The real wage figures are based on Bank of Israel data. The figures are after adjusting for seasonal fluctuations and refer to the average monthly wage for a salaried position, regardless of whether it is full-time or part-time employment.

absent from their place of work during this month earned relatively low wages (Heller, 2020; Ministry of Finance, 2020b). There are various reasons for this, one of which is the relatively low wage levels in the sectors that were worst affected by the crisis; even in sectors characterized by high wages, the wages of those let go or who were temporarily absent from their place of work were lower than the sector average (Ministry of Finance, 2020a). Another possible explanation relates to gaps in the average number of work hours: workers who were temporarily absent from their place of work tended on average to work fewer hours than those workers who continued to work (Ministry of Finance, 2020c).¹⁵ Since April, real wages showed a downward trend, although even in August, several months after the relaxations in the social distancing rules, and in September, when the second shutdown began, real wages were higher than in the months preceding the crisis, particularly in the business sector.

15 The Ministry of Finance study compared the typical average work hours of workers temporarily absent from work with the typical average work hours of workers who worked during that month, based on the Labor Force Survey data for August.

Figure 9. Rate of change in real wages of salaried employees in the business and public sectors relative to the same month in the previous year



Note: The average real wage shown in the figure refers to the average wages of workers who actually worked in the relevant month. Accordingly, in addition to changes in wages themselves, the figure is also influenced by changes in the mix of workers. The figures are after adjusting for seasonal fluctuations, and include workers in full-time and part-time positions.

Source: Zontag, Epstein, and Weiss, Taub Center | Data: Bank of Israel

The exceptional rise in average wages has broad budgetary ramifications, including in terms of the minimum wage and the wages of senior level workers. In order to prevent the ramifications of this artificial rise in average wages, the Legislative Memorandum: Average Wage (Temporary Provision), 5781-2020 was published in November 2020:

In the wake of the coronavirus crisis, a sharp rise is anticipated this year in the level of the average wage in the economy, which is calculated by the National Insurance Institute in January on the basis of data from the Central Bureau of Statistics, due to the fall in the number of active workers, and since those workers placed on unpaid leave or dismissed generally earned wages below the average wage in the market. This is liable to lead to the creation of distortions, budgetary costs, and ramifications that will impede the economy's recovery from the coronavirus crisis. Thus, it is proposed that the substantive updates due to be applied on the publication of the average wage in the market by the National Insurance Institute in January 2021 be frozen [...].

Remote work

In addition to the impact on employment and wages, the coronavirus crisis is also expected to have significant additional ramifications for the labor market. One of the most significant of these ramifications is the adoption of remote work for employees in positions and industries where this is feasible (Madhala & Bental, 2020). The social distancing rules led many employers to introduce remote work technologies and to expand their use in businesses where they had already been in use prior to the crisis. During the crisis, remote work allowed businesses to continue to function even under conditions that prevented all or some workers from reaching the workplace on a regular basis. In the State of Businesses survey prepared by the CBS following the crisis, 16.5 percent of employers who allowed their workers to work remotely stated that they were interested in increasing the share of home employment substantially or very substantially (CBS, Survey of Businesses During the Coronavirus, 3rd Wave).¹⁶

Work from home reduces the importance of geographical proximity between the place of residence and the workplace, thus facilitating access to high-quality employment among residents of the immediate and distant periphery as well as among people with disabilities and broadening their employment options. Furthermore, remote work reduces pressure on the roads and permits greater flexibility in work hours, potentially helping workers who require such flexibility (such as parents). Conversely, some recently-published studies around the world have noted a negative correlation between remote work and the level of business productivity, particularly for businesses in the financial sector (Xiao, 2020) and for small companies that do not export and are not involved in research and development (Monteiro, Straume, & Valente, 2019). This correlation has not yet been examined in the Israeli context.

Remote work rates throughout the crisis, and particularly during the first shutdown, were high in the high tech and finance sectors, and to a lesser extent in the field of professional and technical services (see Madhala & Bental, 2020, Fig. 3). In high tech companies, a high share of workers continued to work

16 Following the outbreak of the coronavirus crisis, the CBS began to conduct flash surveys among employers. These surveys sampled businesses employing five or more workers in selected industries. The employers were asked “How many workers worked from home?” without reference to the full-time or part-time status of the employee. Since these surveys were only conducted in 2020, it is not possible to compare the results to data from previous years.

remotely even after the relaxations in the social distancing rules (from May through August) which suggests a relatively high level of openness to this work modality in this sector.

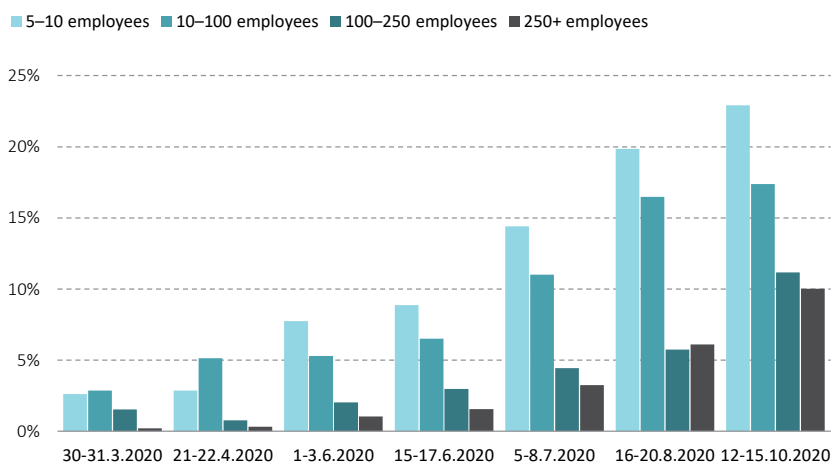
How did businesses cope with the coronavirus crisis?

Different employers and industries coped with the coronavirus crisis in different ways. Businesses that can operate fully or partially by means of remote work were able to utilize this modality during the crisis, thereby mitigating its negative impact. Companies and industries in which flexible wage contracts are common were able to undertake wage adjustments. It is also possible that some companies took advantage of the crisis in order to implement efficiency measures that do not necessarily relate to the impact of the crisis as such. As Figure 10 shows, small businesses dismissed a higher share of their workers than businesses with a larger number of employees. In the State of Businesses survey conducted in October, small businesses employing 5 to 10 workers reported that since the beginning of the crisis they had dismissed over one-fifth of the workers they had employed prior to the crisis. Naturally, industries that can base their operations on a higher share of remote work, such as the high tech and finance sectors, dismissed a relatively low share of their workers (Figure 11) and a smaller percentage of their workers were temporarily absent from their place of work (Figure 12). In contrast, in the food and beverage industry, the CBS surveys show that around one-fourth of workers were dismissed or resigned (as of October). Despite the large gaps between different industries, the rising rate of dismissals due to the crisis was reflected across the economy, including in industries that were not significantly affected by the social distancing rules. The reasons for this probably include falling demand, the uncertainty created during the crisis, and the difficulty in raising capital — a particularly significant factor for start-up companies or other companies at an early stage that require financing for their operations. It is important to reiterate, however, that the employer surveys were conducted for the first time during the crisis, so that it is not possible to compare their findings to those for previous years to understand the gaps relative to non-crisis years.

Figure 12 compares the share of workers who were temporarily absent from their place of work in the first two weeks of the shutdowns in March and September. As the graph shows, in September employers in many industry sectors were less inclined to use the tool of unpaid leave than they had been

in March, by a substantial margin. Since the rise in the narrow unemployment rate (excluding those temporarily absent from their place of work) between March and September was just over 1 percentage point, while the rate of labor force participation did not change substantially, it can be concluded that the employment impact of the second shutdown, at least in its initial stage, was weaker than that during the initial stage of the first shutdown in March. This difference may be due to a moderate decline in the level of uncertainty regarding the coronavirus crisis or to the fact that businesses had become accustomed to functioning in the new circumstances. However, other reasons can also be suggested for this difference, including factors concerning seasonal fluctuations and the Jewish High Holidays. October's data also show that the detrimental effect on employment during the second wave was not as extreme as during the first wave.

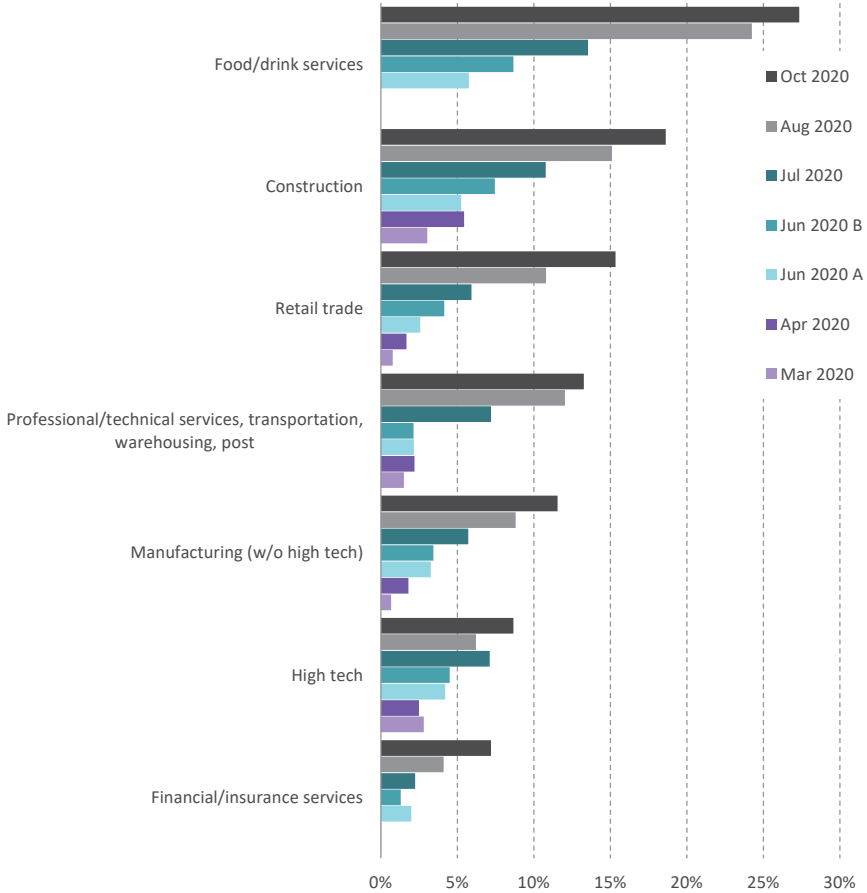
Figure 10. Share of employees dismissed since the beginning of the crisis, by number of workers in the business and survey date



Source: Zontag, Epstein, and Weiss, Taub Center | Data: CBS, Survey of Businesses During the Coronavirus, Waves 2-3, 5-9

Figure 11. Share of workers dismissed since the beginning of the crisis

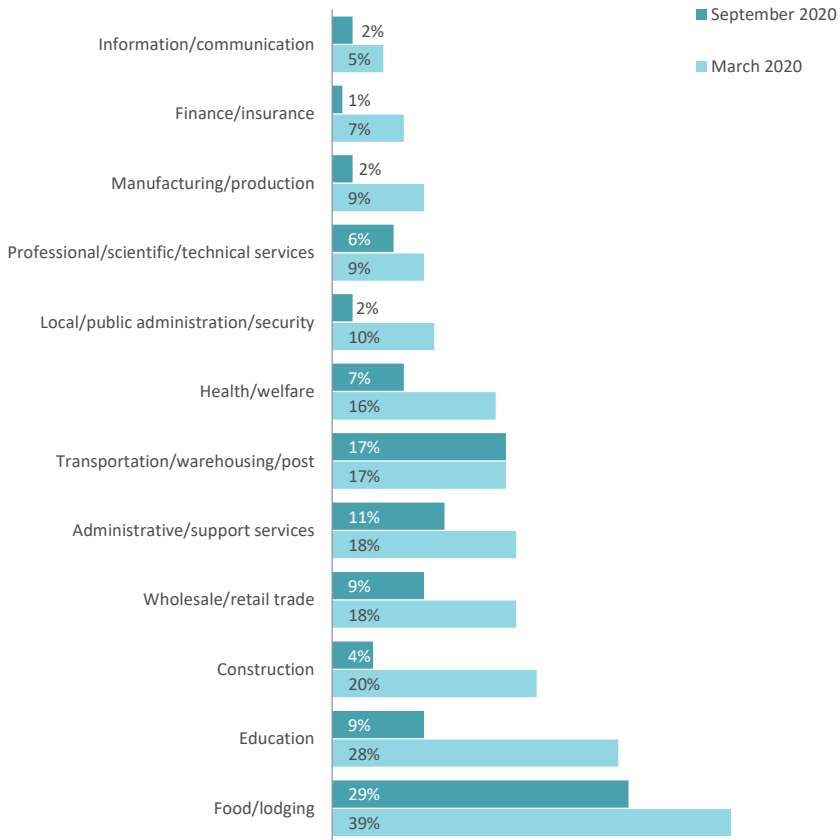
By industry and survey date



Source: Zontag, Epstein, and Weiss, Taub Center | Data: CBS, Survey of Businesses During the Coronavirus, Waves 2–3, 5–9

Figure 12. Share of workers who were temporarily absent from their place of work during the first two weeks of the shutdowns in March and September 2020

By industry, ages 25–64



Source: Zontag, Epstein, and Weiss, Taub Center | Data: CBS, Labor Force Survey

SPOTLIGHT B

The Beveridge Curve: The relationship between unemployment and job vacancies

The Beveridge Curve describes the relationship over time between the share of job vacancies in the economy and the unemployment rate, and it should generally have a negative slope. Intuitively, a tight labor market is characterized by low unemployment and a high number of job vacancies; that is, workers can easily find a job, but it is difficult for employers to find workers. In a loose labor market, the situation is reversed: a large number of workers compete for a small number of vacant jobs. Accordingly, movements along the curve are conventionally regarded as indications of changes in the condition of the economy relative to the business cycle. In contrast, movements of the curve (i.e., a shift closer to or further from the origin) are usually indications of structural changes relating to changes in the extent of the correlation between the skills required to meet the vacant jobs and the skills of jobseekers, or indications of changes in the efficiency of the search process.¹⁷ For example, a move towards the origin means that for a given share of job vacancies the unemployment rate fell. Intuitively, this change means that the matching of workers to employers is more efficient.

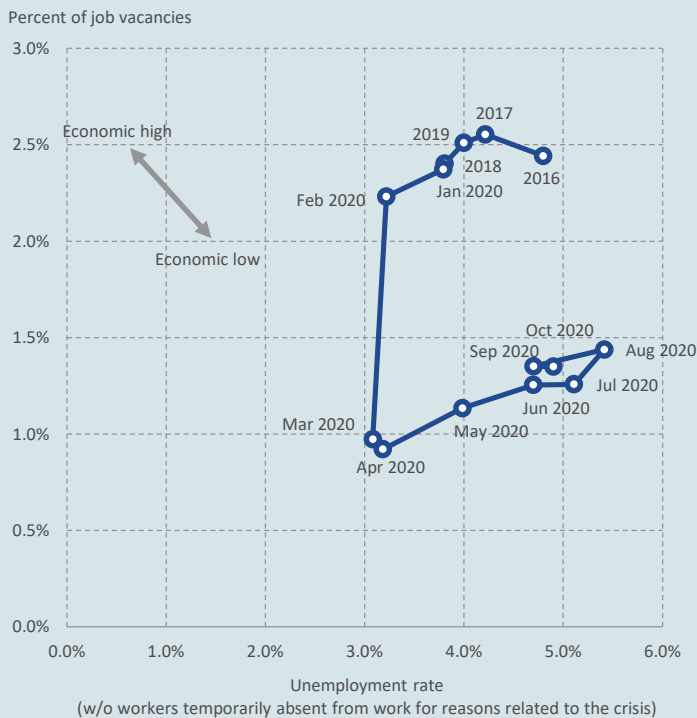
17 The extent of the correlation is influenced by both the extent of the correlation between the workers' skills and the requirements of the vacant jobs and by the extent of the geographical correlation between the place of residence of the workers and the location of the suitable workplaces.

This improvement may be due to a better correlation between the workers' skills and the employers' requirements, or to a more efficient search process that accelerates the matching of workers to employers.

Figure 13 presents the curve for the Israeli economy between 2016 and 2020. As the figure shows, between 2017 and 2019, the fall in the unemployment rate was accompanied by a moderate fall in the job vacancy rate. This may reflect enhanced efficiency in the search process or an improvement in the extent of the correlation between jobseekers and jobs. Between February and March 2020 a significant fall occurred in the share of vacant jobs — from 2.2 percent to 1 percent. This fall was not immediately accompanied by a rise in the unemployment rate (according to its narrow definition). From this point through August, the unemployment rate began to rise, with a parallel rise in the share of vacant jobs. A simultaneous rise in both dimensions indicates a weakening of the correlation between workers and job vacancies. A possible explanation for this weakening is a gap between the vacant jobs and the occupations of workers exiting employment, particularly in the service sectors, and the skills sought by employers in less-affected sectors, such as the ability to work from home (Madhala & Bental, 2020).

In September and October, the period of the second shutdown, a fall occurred in the unemployment rate, as well as a more moderate fall in the share of vacant jobs. The fall in the unemployment rate during the second shutdown, and to some extent also during the first shutdown, may have resulted, among other things, from delaying firing workers, and, instead, putting them on unpaid leave.

Figure 13. Percentage of job vacancies and unemployment rate, 2016–2020, Beveridge Curve
Ages 15 and over



Note: The percentage of job vacancies is the number of vacant jobs divided by the number of labor force participants.
Source: Zontag, Epstein, and Weiss, Taub Center | Data: CBS, Labor Force Survey and Survey of Vacant Jobs

Discussion and conclusions

In terms of employment, the coronavirus crisis affected different groups of workers in different ways. The share of workers who stopped working, particularly during the early months of the crisis, was high among low-wage workers, and among workers with relatively low levels of education. Two additional groups that were severely affected by the crisis were older workers, close to or beyond retirement age, and young workers. In addition, particularly during periods of strict restrictions, women were worse affected in terms of employment and gender gaps in employment widened. In the Haredi sector, the crisis appears to have had a relatively severe impact on the employment of men, a group whose employment rates were already low. During the early stages of the crisis, the Arab Israeli sector also sustained a relatively severe impact. An examination of the groups of affected workers by employment characteristics prior to the crisis also yields an unequal picture: the principal impact was clearly sustained by the business sector, rather than the public sector, and there are also indications of a severe impact on the self-employed.

It is important that these gaps, in terms of the impact sustained by workers, be reflected in the formulation of appropriate policies for addressing each group. There is room for concern that workers who stopped working for an extended period may lose hope and not attempt to re-enter the market. As a result, the Israeli economy will lose workers who, were it not for the crisis, would have continued to work. This point is particularly important in the case of older workers. Furthermore, given the rise in the unemployment rate and the reduced ability of businesses to maintain full operations, there is a growing risk of an expansion in unreported economic activity (Shami, 2020). It is important that this factor be addressed when formulating policy and defining criteria for assistance.

Nevertheless, this crisis — like others — presents opportunities as well as difficulties. Wide-ranging dismissals among workers earning low wages may offer a chance to improve the level of training and wages among these workers. A first sign of the utilization of this opportunity is the enormous increase (20 percent) in the number of candidates for higher education ahead of

the 2020–2021 academic year.¹⁸ The adoption of appropriate policies for addressing the employment crisis, including the utilization of periods of unemployment and unpaid leave for relevant vocational training, upgrading of infrastructures, and policies to support employment, could contribute to an improvement in the rates and quality of employment and a rise in productivity. In addition, expanding the use of technologies allowing full or part-time work from home could not only secure potential financial savings, but also enhance access to high-quality employment among diverse workers.

18 One possible reason for the significant growth in the number of candidates for higher education is a growth in the number of young applicants who, due to the crisis, cannot take the customary overseas trip after completing military service, and who accordingly prefer to start their academic studies. If this is indeed one of the explanations, we can expect to see a concomitant offsetting of these students in the registration for academic institutions over the next few years.

References

English

- Bental, B., & Shami, L. (2020). The Israeli economy: An overview. In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2020*. Jerusalem: Taub Center for Social Policy Studies in Israel.
- Bowers, L. (2020). [*The coronavirus crisis and women in the labor market: Permanent damage or a short-term setback with a long-term potential*](#). Viral Economics Series. Jerusalem: Taub Center for Social Policy Studies in Israel.
- Fuchs, H., & Weiss, A. (2018). [*Israel's labor market: An overview*](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2018* (pp. 85–104). Jerusalem: Taub Center for Social Policy Studies in Israel.
- Fuchs, H., & Epstein, G. (2019). [*The labor market: An overview*](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2019* (pp. 139–162). Jerusalem: Taub Center for Social Policy Studies in Israel.
- Madhala, S., & Bental, B. (2020). [*The ability to work from home among workers in Israel*](#). Jerusalem: Taub Center for Social Policy Studies in Israel.
- Malach, G., & Gorbati, R. (2020). [*Integration of the ultra-Orthodox in the wake of the coronavirus*](#). Jerusalem: Israel Democracy Institute.
- Monteiro, N., Straume, O. R., & Valente, M. (2019). [*Does remote work improve or impair firm labour productivity? Longitudinal evidence from Portugal*](#). CESifo Working Paper No. 7991.
- Shami, L. (2020). [*The non-observed economy in Israel*](#). Jerusalem: Taub Center for Social Policy Studies in Israel.
- Xiao, H. (2020). [*Does working from home decrease profitability and productivity? Evidence from the Mutual Fund Industry*](#).

Hebrew

- Achdut, L., Gera, R., Zussman, N., & Kaminsky, S. (2020). [*The coronavirus crisis and the labor market in Israel*](#). Jerusalem: Bank of Israel.
- Bank of Israel (2020). [*Macro-economic forecast of the research division, October 2020*](#). Jerusalem: Bank of Israel.
- Heller, O. (2020). *Who is hurt by the coronavirus crisis? Characteristics of the salaried employees who were fired or put on unpaid leave during the coronavirus crisis by industry*. Jerusalem: National Insurance Institute, Research and Planning Authority.
- Hermann, T., & Anabi, O. (2020). [*The consequences of the coronavirus on Haredi society*](#). Israeli Voice Index. Jerusalem: Israel Democracy Institute.

- Israeli Employment Service (2020). [*The pulse of the labor market — Monthly publication: September 2020*](#). Jerusalem: Israeli Employment Service.
- Ministry of Finance (2020a). [*An analysis of the characteristics of job seekers during the coronavirus — May 2020*](#). Jerusalem: Chief Economist Division, Ministry of Finance.
- Ministry of Finance (2020b). [*Characteristics of workers on leave — June 1, 2020*](#). Jerusalem: Chief Economist Division, Ministry of Finance.
- Ministry of Finance (2020c). *Characteristics of workers on leave — October 4, 2020*. Jerusalem: Chief Economist Division, Ministry of Finance.
- Somekh, S., Tirosh, O., Keshet, N., Miiari, S., Sabbah-Karkabi, M., Loewenthal, A.,... Hassan, S. (2020). [*Employment among the Arab population during the coronavirus: Challenges, opportunities and spheres of influence*](#). Jerusalem: Myers-JDC-Brookdale.

The Ability to Work From Home Among Workers in Israel

Shavit Madhala and Benjamin Bental

Abstract

This study seeks to examine which workers in Israel have characteristics that enable them to work from home and which do not. Based on the Programme for the International Assessment of Adult Competencies (PIAAC) survey carried out by the OECD in Israel in 2014 and 2015, we estimate the potential ability of workers in the Israeli labor market to work from home. The findings indicate that there are significant differences in the ability to work from home across different occupational groups, where workers in more prestigious occupations have a greater ability to work from home. In contrast, workers with a low ability to work from home tend to be the young (ages 16 to 25), those with less education, workers from the Arab Israeli sector, the self-employed, and those living in cities with low socioeconomic rankings and/or in the North.

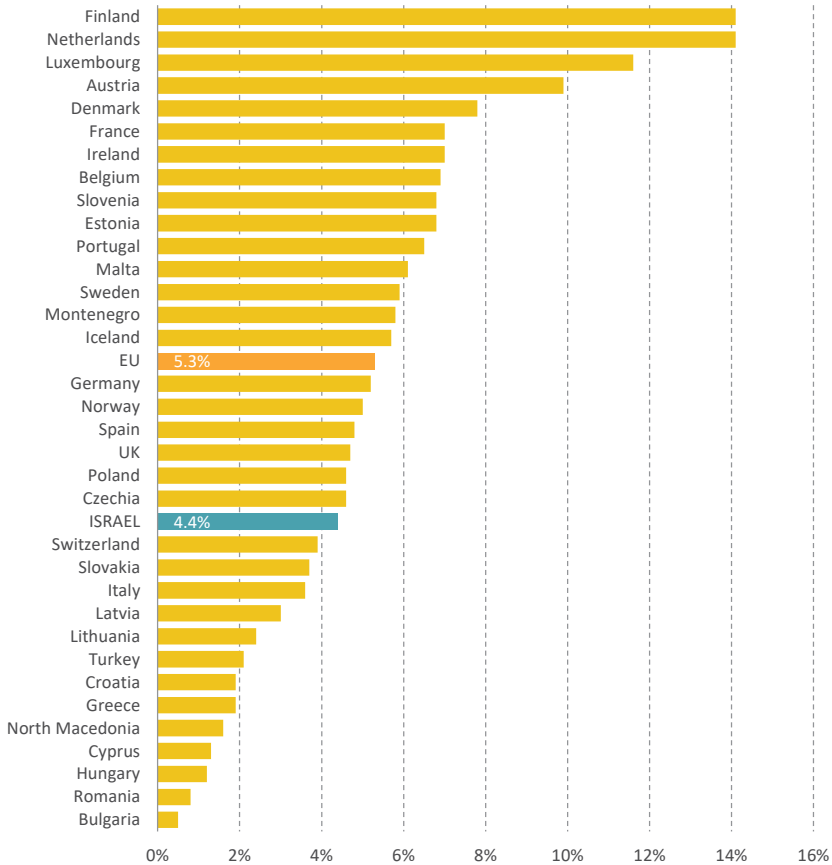
The frequency of digital work is apparently the most relevant factor determining the ability to work from home. The findings indicate that workers in low-paying occupations use digital work to a lesser extent as well as workers ages 16 to 25 and women relative to men. The limited use of digital work is also characteristic of the Arab Israeli sector and even more so of the Haredi (ultra-Orthodox) sector. These findings emphasize the importance of assimilating the use of technology among these weaker groups and among populations that face barriers to integration into the labor market.

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Introduction

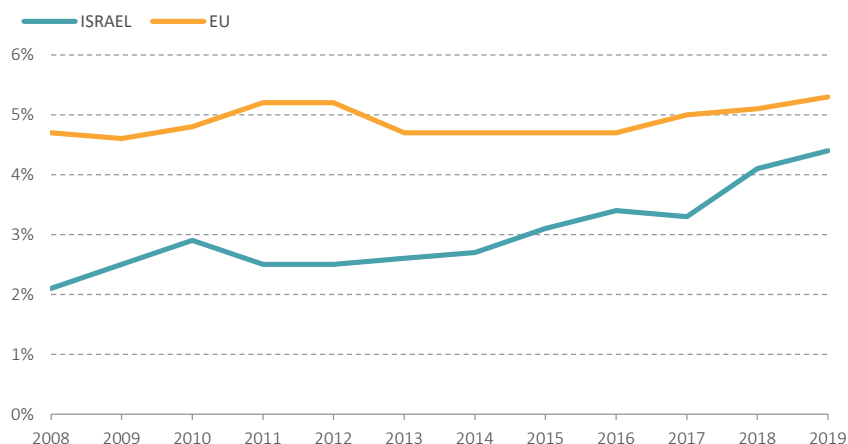
The spread of the coronavirus pandemic and the accompanying social distancing policy have had substantial effects on employment and its characteristics, both in Israel and worldwide. Many businesses have been forced to adopt employment models that enable working from home. This situation raises a number of questions regarding the ability of the economy to transition to such models. This study seeks to determine the identity of workers in the Israeli labor market whose employment characteristics are conducive to working from home and those with little chance of working from home.

The practice of working from home existed prior to the outbreak of the coronavirus epidemic, although its scope varied from country to country. Figure 1 presents the share of workers who, in general, worked from home in 2019. As can be seen, there are countries in which working from home is more common, such as the Netherlands and Finland, where the rate is about 14 percent of the workforce. In contrast, this practice is almost unknown in countries like Bulgaria and Romania where less than 1 percent of the workforce responded affirmatively to the question whether they generally work from home. In Israel, according to data from the Central Bureau of Statistics (CBS) Social Survey, in 2019, about 4.4 percent of workers responded that they work from home “most days of the week,” which is less than the European average of about 5.3 percent.

Figure 1. The share of workers who usually work from home, 2019

Source: Shavit Madhala and Benjamin Bental, Taub Center | Data: Eurostat; CBS, Social Survey 2019

Even if the share of workers working from home during normal times was relatively low in Israel, there has been an upward trend during the last decade and with the share doubling from about 2 percent in 2008 to its 2019 level (Figure 2). A similar trend can be discerned in most of the EU, where in countries like the Netherlands and Finland, for example, the share of workers working from home rose to its 2019 level from about 10 percent and 9 percent, respectively in 2008. The share of workers working from home in the EU during the past decade has increased by about 13 percent on average.

Figure 2. The share of workers who generally work from home

Source: Shavit Madhala and Benjamin Bental, Taub Center | Data: Eurostat; CBS, Social Survey 2008–2019

These processes reflect the endogenous response of the labor market to gradual changes in information and communications technologies (ICT), which has expanded the possibilities of working from home. This expansion has had an effect on the supply of labor both at the intensive margins — an increase in work hours with workers' improved ability to adapt their work to their family needs — and, at the extensive margins — the entry into the labor market of those not previously working, since there is a reduced need to commute to the workplace. Nonetheless, the effect of this development on labor productivity is unclear. On the one hand, productivity may rise because working from home reduces the conflict between work demands and other uses of time. On the other hand, it is harder to monitor the activity of workers working from home and to prevent distractions. Accordingly, the effect of expanded possibilities of working from home on wages is also ambiguous. First, it is likely to increase the supply of suitable workers which allows employers to reduce the wage they offer. Second, if working from home is advantageous to workers, they are likely to settle for a lower wage. In contrast, if employers are interested in having workers working from home in order to reduce costs or in order to facilitate non-conventional work hours, then they may offer higher compensation to their workers.

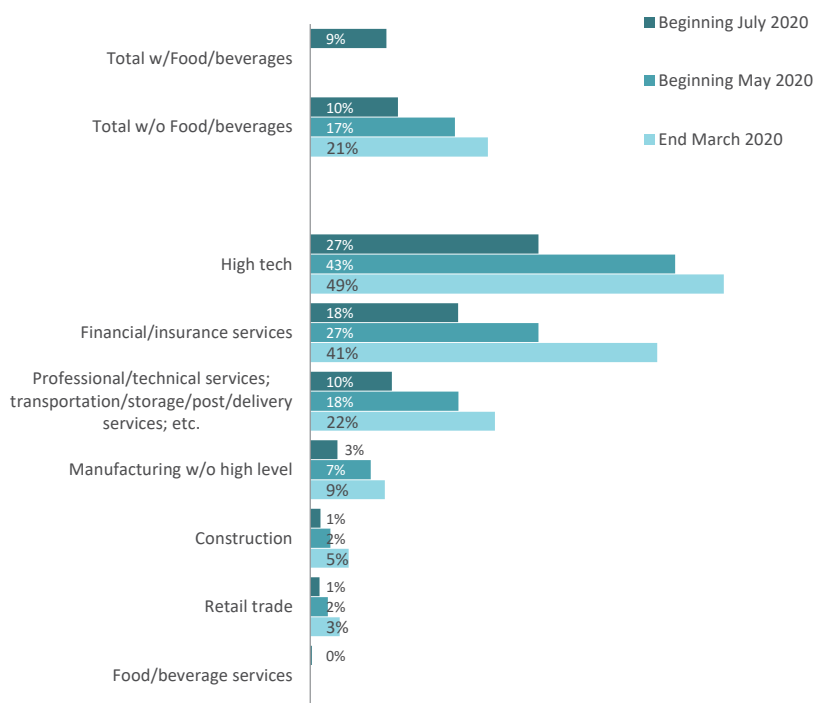
In a study published just prior to the outbreak of the coronavirus crisis, Arntz, Ben Vahmed, and Belingieri (2019) examined these issues on the basis of the German Socioeconomic Survey (SOEP) which included, in a number of surveys starting from 1997, a question about the frequency of working from home (though it did not ask about number of hours worked at home). According to the results, up until the last survey in 2014, the share of men working from home in Germany rose from 5 percent to 9 percent while the share of women rose from 5 percent to 10 percent. Among women, the share of mothers with young children who work from home rose from 5 percent to 15 percent. Moreover, it was found that the birth of a first child has a large effect on the shift of women to working from home. With respect to wages, the study found that both male and female workers without young children chose to work from home primarily in order to increase their overtime hours without any change in their hourly wage. In the case of workers with young children, and women in particular, working from home was a way to increase both their contracted work hours as well as their hourly wage.

The coronavirus pandemic brought with it an exogenous shock to the labor market, particularly during the total lockdown where most workers were prevented from physically going into work. Even during relatively more relaxed periods, there is a fear of being exposed to the virus while commuting or at the workplace itself. As a result, there has been an acceleration in the shift toward working from home in many countries. The data for the US show that about 35 percent of the workforce are working from home (Bick, Blandin & Mertens, 2020) and in the Netherlands, about 50 percent of work hours are at home, as compared to about 12 percent prior to the pandemic (von Gaudecker, Holer, Janys, Siflinger & Zimpelmann, 2020). The data from a flash survey conducted by the CBS, which covered about a third of the economic activity in the Israeli economy showed that during the first lockdown (March 2020) about 21 percent of workers worked from home (Figure 3). In the high tech sector and financial services and insurance sector, a particularly high share of workers worked from home: 49 percent and 41 percent respectively, while in industries such as construction and retail commerce, very low rates of working from home have been seen.¹ With the loosening of restrictions, it appears that in

1 The survey data are for selected industries which make up about 30–34 percent of employees in the economy. The data are based on the response of employers to the following question: *“How many of your workers are currently working from home?”* The survey did not ask about the number of hours worked from home (CBS, 2020a).

many businesses there was a drop in the share of workers working from home. In May, the rate dropped in the industries surveyed to about 17 percent and at the start of July to only 9 percent (when including the food industry and about 10 percent without it). Despite the downward trend, it appears that the high tech industry has embraced the possibility of working from home and even after the end of the lockdown the rate of working from home in this industry remained relatively high, at about 27 percent. Furthermore, the survey data reveal that about 24 percent of businesses developed or enhanced their technological possibilities for working from home providing remote access to the companies' systems as part of the response to the crisis.

Figure 3. The share of workers working from home during the lockdown and following it in selected industries



Note: The food and beverage service industry did not participate in the first waves of the survey. The survey includes selected industries and businesses with five salaried employees or more.

Source: Shavit Madhala and Benjamin Bental, Taub Center | Data: CBS 2020a, Waves 1, 4, and 7

These trends naturally raise the question concerning the impact of the coronavirus crisis on the increased share of workers working from home. Alipour, Fadinger, and Schymik (2020) relate to this question in their study. Their starting point was a 2018 survey of workers carried out in Germany which also looked at the extent of working from home. According to this survey, prior to the coronavirus crisis, 9 percent of respondents frequently worked from home, 26 percent worked from home occasionally, and 56 percent reported that, in principle, they had the option of working from home. A survey of employers carried out in April 2020 in Germany showed that employers quickly adjusted by raising the share of employees working from home, both at the intensive margins (among those who were already working from home) and at the extensive margins. Moreover, employers who increased the share of their employees working from home participated less in the *Kurzarbeit* partial employment program, which supplements the wages of workers by the amount that their work hours have been reduced. The researchers also point to a health benefit to working at home: even prior to the imposition of the total lockdown in Germany there was a negative relationship between the share of workers working from home and the incidence of illness in the various districts of the country. These results highlight the economic and health benefits of working from home.

Estimating the potential of working from home

In view of all this, it is worthwhile estimating the ability of a given economy to make the shift to remote work. One of the pioneering studies on this issue is Dingel and Neiman (2020) which provides the basis for many subsequent studies. Their research is based on data gathered in the US on about 1,000 occupations using the Occupational Information Network (O*NET), an information source developed by the US Department of Labor to help jobseekers identify occupations that fit their abilities, and in particular young people in the process of choosing a profession. The occupations are characterized according to the required skills and knowledge, the personal traits required, experience and licensing, and a forecast of demand, including expected salary. The researchers used their best judgment to identify occupations which are unlikely to be performed from home. Belonging to this group are professions characterized for example by infrequent use of email, those involving frequent meetings with violent people, occupations that are physically demanding, or

those using mechanical equipment. Based on this classification, the researchers arrived at the conclusion that 37 percent of workers are in occupations that can be done from home, whereby the salaries of these workers account for 46 percent of the total wage bill in the US.

Bick et al. (2020) used the results of a survey carried out in May in the US among 2,000 workers who were asked about their commuting habits. The results indicate that 35.2 percent of respondents worked full-time from home in May, as opposed to only 8.2 percent in February. The increase was particularly large among the well-educated and high-earning white population. In contrast, most of the workers who had lost their jobs were members of minorities, had low skill levels, and were employed in industries where the work required physical contact with other people. However, it is worth mentioning that there is no major difference in the share of job loss between those who were working from home prior to the crisis and those who were not. What is unique about the coronavirus crisis is also manifested in the fact that in February there was no variation in the share of workers working from home across industries, while in May there was a high level of variation, which is also related to, among other things, the level of employment that has been maintained. In entertainment and leisure, accommodation and food, and retail there was a significant decline in total employment with only a few workers working from home, as compared to industries such as financial services and insurance, information services, and professional and business services which lost far fewer jobs and experienced an increase in the share of workers working from home. Comparing their findings to Dingel and Neiman's, Bick et al. found that 71.7 percent of employees in those jobs that Dingel and Neiman identified as being potentially executable remotely were, in fact, working from home in May.

Dingel and Neiman's estimate is based on a-priori (without any empirical confirmation), though reasonable, categorizations of the characteristics of occupations that cannot be done from home. Nonetheless, the results of Bick et al. show that the intuition they used provides a reasonable prediction. However, Hatayama, Viollaz, and Winkler (2020), in their critique of Dingel and Neiman's methodology, raise a number of concerns. First, they claim that the study relate only to the US and to the characteristics of occupations in the US labor market. Second, in addition to the differences between occupations across countries they claim that there is variation in the tasks assigned to workers in the same occupational category, even in the same country. Third,

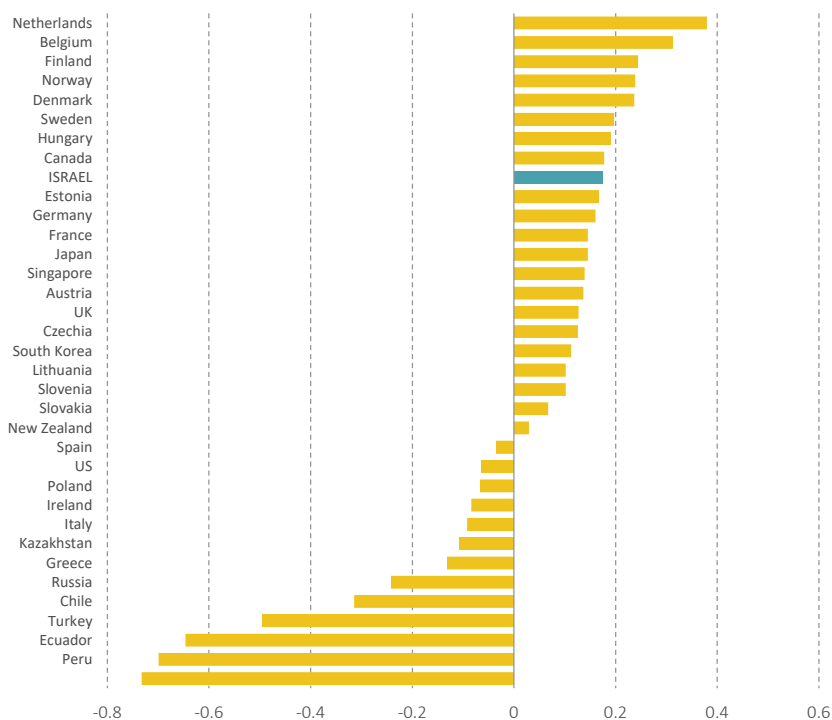
they claim that it is problematic to predetermine the list of characteristics that prevent working from home, particularly in light of adjustments that have been made to tasks as a result of the lockdowns and the lack of information about those adjustments. In particular, Hatayama et al. claim that the more traits are defined as preventing working from home, the more occupations will be found to be inappropriate for working from home. As an alternative, they suggest focusing on workers rather than their occupations and on estimating the worker's ability to work from home rather than the share of workers who are able to work from home.

The estimation of the ability of a worker to work from home is carried out using the data gathered in the PIAAC survey. The survey data identify individual characteristics of each worker, such that workers with the same occupational classification can have different results according to their individual characteristics and those of their specific job. This kind of measurement makes it possible to take into consideration variation in required tasks, as well as gaps in use of technology between different individuals, even those belonging to the same occupational category.

Hatayama et al. focus on four groups of task characteristics in their survey, which apparently are related to the ability to work from home (see Appendix Table 1). The first group relates to the extent to which the tasks are physically demanding and require manual skills. It is assumed that the more the tasks require physical skills, the more difficult it will be to work from home. The second group is related to the requirement of face-to-face interactions. Here again, to the extent that the task requires such work, it will be more difficult for the worker to work from home. The third group relates to the use of digital technology at work while the fourth relates to the use of digital technology at home. It is assumed that a high index in the last two criteria raises the ability of the worker to carry out work tasks from home.

The researchers focused on an estimation of the relative ability of a worker in a specific job to work from home, where the measurement is relative to the average worker in the OECD, in terms of standard deviation units. This international comparison of the ability to work from home according to Hatayama et al.'s index is described in Figure 4. The graph indicates that, relative to other countries, the Israeli labor market is characterized by a somewhat higher than average ability to work from home, by 0.17 of a standard deviation relative to the average in the OECD countries.

Figure 4. The index of the ability to work from home in the OECD countries
According to Hatayama et al., in standard deviation units



Source: Hatayama et al., 2020

As stated above, in the current study we identify workers in the Israeli labor market who are employed in occupations whose characteristics allow them to work from home and those who are not able to do so. The goal is to highlight gaps in the relevant skills required to work from home and the barriers that widen them. A further goal is to create a basis of knowledge that can be used in the formulation of policy, particularly during this complicated period. To this end, we adopted Hatayama et al.'s approach and carried out an estimate of the potential ability of workers in the Israeli labor market to work from home, based on the PIAAC survey carried out in Israel between 2014 and 2015.

The ability to work from home in the Israeli labor market

As in the case of Hatayama et al., we use a list of relevant variables from the PIAAC survey, except for those variables representing the use of digital technology at home (Appendix Table 1).² However, unlike them, we chose the technique of factor analysis in order to categorize the underlying variables into identifiable factors. Intuitively, this technique divides variables into a number of categories, grouping variables which are highly correlated with one another while insuring low correlations with variables belonging to other groups. This method of analysis makes it possible to categorize the various variables into intuitive common hidden factors.

In our case, this method produced seven factors, three of which were found to be significant from a statistical standpoint. The meaning of these factors, interpreted according to the composition of the variables assigned to them, was found to be similar to the categories defined by Hatayama et al. (for further details about the composition of the variables assigned to the three factors, see Appendix Table 2). The first factor, which is composed primarily of variables describing physical and manual demands of the occupation, corresponds to the first group of tasks according to Hatayama et al. The second factor is composed primarily of variables such as teaching, sales and promotion which require social interaction (the face-to-face category in Hatayama et al.). The third factor is composed of variables related to the digital nature of the work, such as use of email and computer programs and participation in online conferences. This method confirms the intuitive division of variables determined by Hatayama et al., but at the same time fine-tunes it using statistical identification of the variables in each factor and of their respective weights, as opposed to the uniform weight given to variables by Hatayama et al.

After combining the three factors, we defined a summary index that represents the ability of each individual to work from home relative to the average worker (in standard deviation units).³ Specifically, every individual receives a standardized score based on his employment characteristics as they appear in the PIAAC survey, and this score represents his relative ability to work from home. It should be mentioned that the study is based on data

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- 2 Observations on the variables representing the use of digital technology at home were not available in full for a large share of the sample in Israel and therefore we did not use them in this study.
 - 3 The index is created by adding up the three factors and normalizing the sum, such that the measurement is carried out in terms of standard deviations from the average.

gathered between 2014 and 2015; since then, there have been major changes in the use of digital technologies, which have accelerated during the last year due to the coronavirus pandemic. Nonetheless, the goal of the research is to identify the existing gaps and barriers among populations in Israel with the assumption that if they are found in the data, they will still be relevant today.

The results by occupation and industry

Figure 5, which shows the aforementioned index across occupational groups, indicates that in prestigious occupations, which are characterized by a high hourly wage, there is, on average, a greater potential for working from home. An exception is the group of managers, who are characterized by the highest average hourly wage but a low ability to work from home (standard deviation of about 0.18 from the average worker) relative to other prestigious occupations, namely academics and technicians (standard deviation of 0.47 and 0.40, respectively). In contrast, clerical occupations are characterized by a relatively low hourly wage but a high ability to work from home (standard deviation of about 0.46 from the average worker).

Figure 5. The index of ability to work from home by occupational group relative to the average worker

In standard deviation units



Note: Occupations are shown in descending order according to hourly wage.
Source: Shavit Madhala and Benjamin Bental, Taub Center | Data: PIAAC, 2015

Table 1 presents the results of the study at a higher level of detail. The table presents the occupations with the highest ability to work from home and those with the lowest.⁴ At the top of the table are software developers and application analysts — occupations with a male majority — which had about 120,000 employees in 2018. Following that are clerical occupations, financial occupations, and writers, reporters, and linguists. In contrast, the occupations with the lowest ability to work from home include waiters and bartenders, workers in the food industry, the fitness industry, construction, and, as expected, salespeople in stores, a category which had 135,000 employees in 2018.

Table 1. Occupation according to the ability to work from home

Occupations with the <i>highest ability</i> to work from home			
	No. of employees in 2018 (1,000s)	Share of men in the field	Share of women
Computer programmers/app analysts	119.2	70%	30%
Data, database and network workers	9.8	17%	83%
Data input (numeric) workers	22.8	15%	85%
Finance professionals	50.3	58%	42%
Finance associated work/mathematicians	81.0	19%	81%
Writers/journalists/linguists	18.0	48%	52%
Occupations with the <i>lowest ability</i> to work from home			
	No. of employees in 2018 (1,000s)	Share of men in the field	Share of women
Waiters/Bartenders	56.2	49%	51%
Workers in food preparation	44.6	65%	35%
Cooks	23.1	68%	32%
Sports and fitness workers	21.0	44%	56%
Finishers in construction/similar work	38.8	100%	—
Salespeople	135.2	43%	57%

Note: Occupations at the level of secondary group (3 digits) with at least 5,000 employees in 2018.

Source: Shavit Madhala and Benjamin Bental, Taub Center | Data: PIAAC, 2015; CBS, 2020a

4 The full list of occupations with a ranking of ability to work from home is available from the researchers and can be requested by contacting the Taub Center.

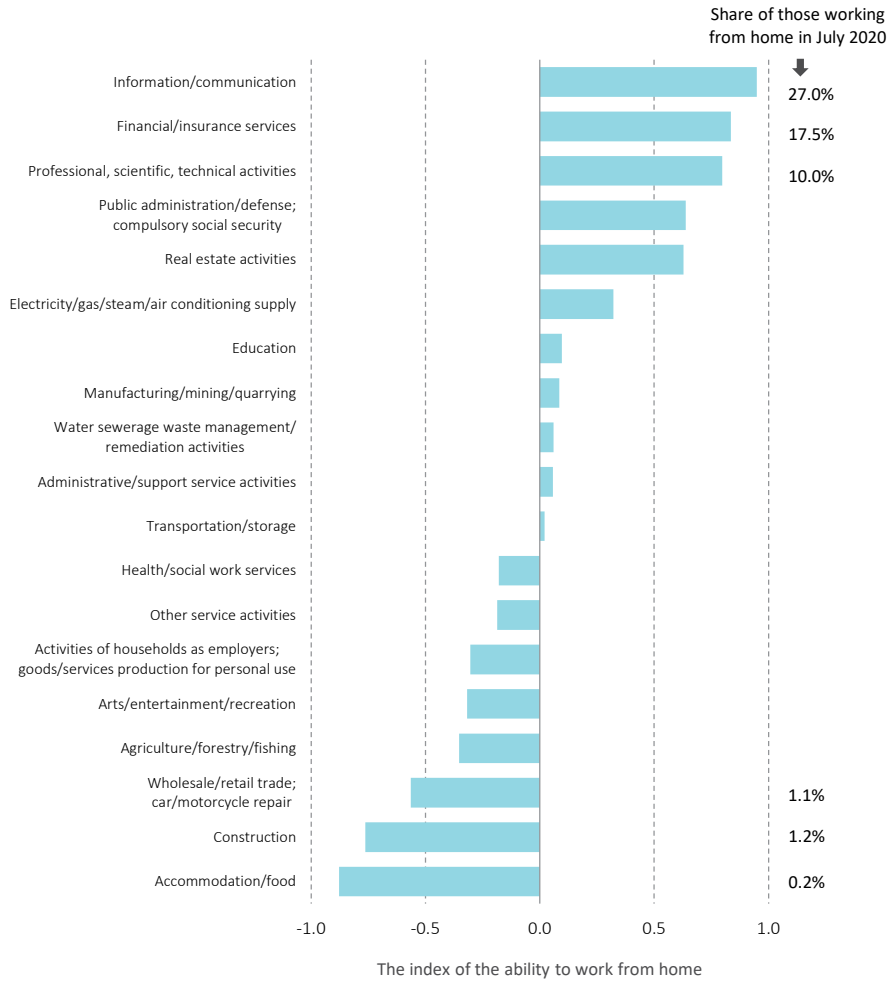
Figure 6 shows a comparison of the average index by industry. The figure shows that in information and communication, financial services and insurance, and professional, scientific and technical services there is the highest potential for working from home. The data of the CBS Survey of Businesses During the Coronavirus confirms this hypothesis: with respect to the number of workers who are able to work from home, in these three industries there is a relatively high share of workers that meet this criterion according to the survey data: 27 percent, 18 percent, and 10 percent, respectively.⁵ In contrast, in wholesale and retail commerce, construction, and accommodation and food services, the potential ability to work from home as predicted by the model is particularly low. Here again, the CBS survey confirms this result and presents rates of about 1 percent for wholesale commerce and construction and a negligible rate for accommodation and food services.⁶

5 According to the results of the Survey of Businesses During the Coronavirus (Wave 7) carried out by the CBS in July 2020. See CBS (2020a).

6 Ibid.

Figure 6. The index of ability to work from home by industry relative to the average worker

In standard deviation units



Source: Shavit Madhala and Benjamin Bental, Taub Center | Data: PIAAC, 2015; CBS, 2020a

The results by population group

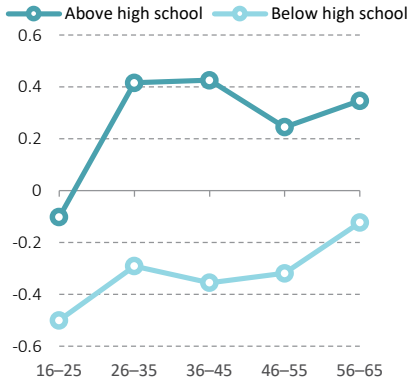
Having noted the differences in the ability to work from home by occupational group and industry, we now look at worker characteristics by population group. The main goal is to identify those groups characterized by a lower ability to work from home. In this context, it is worth noting that the results for the index of ability to work from home do not reflect only the differences in worker characteristics but other factors as well, and in particular, the initial choice of employment that allows working from home (see below).

Figure 7 looks at the ability to work from home among various population groups. The non-Haredi (non-ultra-Orthodox) Jewish population has the greatest ability to work from home, followed first by the Haredi population and then by the Arab Israeli population, which lags far behind the others. At least in part, this gap is likely the result of the fact that the distribution of occupations in the Arab Israeli population group clearly tends toward production and construction, which are physically demanding and rely on manual skills, with little ability to work from home. The findings also indicate that among the Jewish population in Israel there is a jump in ability to work from home after the age of 25, as is the case in the OECD countries; however, among workers in the Arab population, there is no such jump. A look at the ability to work from home by socioeconomic status, as measured by worker's education and hourly wage decile, shows that the higher a worker's socioeconomic status, the higher will be his ability to work from home. Another characteristic that was found in the literature to be linked to working from home (Alipour et al., 2020) is having young children, particularly in the case of mothers. The average of the index reflects the fact that in comparison to other men and women, mothers with children under the age of 6 have a greater ability to work from home. In general, it appears that women — with or without children — are employed in jobs with characteristics that are related to a higher ability to work from home, relative to men.

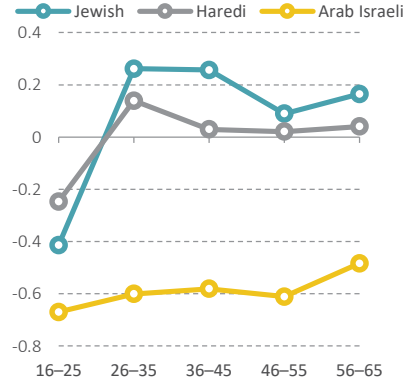
Figure 7. The index of the ability to work from home by sociodemographic variables relative to the average worker

In standard deviation units

By education level and age group



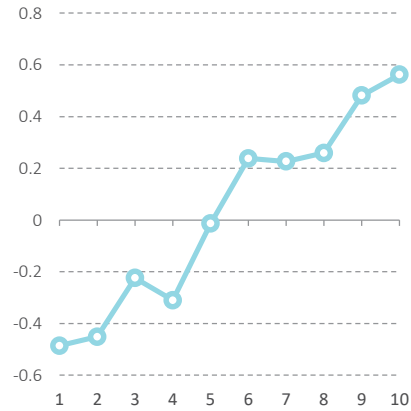
By population sector and age group



By gender and age of youngest child in the family



By wage per hour decile



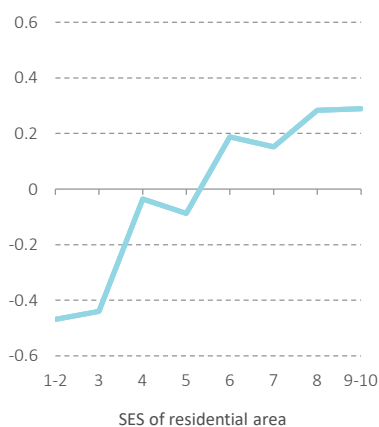
Source: Shavit Madhala and Benjamin Bental, Taub Center | Data: PIAAC, 2015

A look at the average index also shows that the ability to work from home rises with the socioeconomic ranking of the worker's residential locale (Figure 8a). Thus, for example, the ability to work from home for a worker living in a residential area with a socioeconomic ranking of 1–2 (the lowest) is lower by about 0.5 standard deviations relative to the average worker. In contrast, the ability to work from home for a worker living in a city with a ranking of 9–10 (the highest) is higher by about 0.3 standard deviations relative to the average worker. By breaking down the index into components (Figure 8b), it appears that in residential areas with a low socioeconomic ranking, the jobs are more physically demanding and use more manual skills, which make it more difficult to work from home, and as the socioeconomic ranking of the city rises, the use of physical and manual skills diminishes. In contrast, to the extent that a worker resides in an area with a higher socioeconomic ranking, there appears to be an increase in the use of social interaction skills and an even steeper rise in digital work, where the latter makes it easier to work from home.

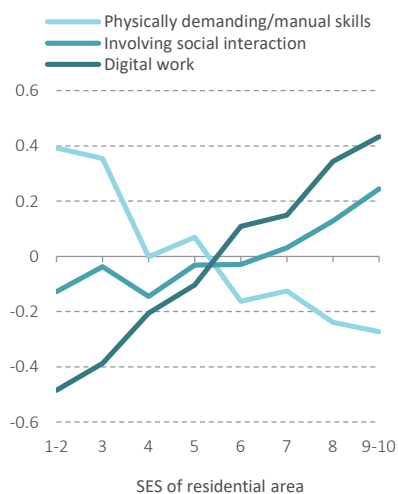
Figure 8. The index of the ability to work from home and its components by socioeconomic ranking of residential area relative to the average worker

In standard deviation units

a. Index of the ability to work from home



b. Index components



Source: Shavit Madhala and Benjamin Bental, Taub Center | Data: PIAAC, 2015

Multivariate analysis

In order to identify more precisely the characteristics of workers with low ability to work from home, we ran a linear regression to test for the effect of sociodemographic characteristics on the index of ability to work from home. The characteristics that were examined included gender, a woman with a child under the age of 6, age group, sector (non-Haredi Jews, Arab Israelis, and Haredim), residential area, education, commuting, type of employment (self-employed vs salaried employee), public vs private sector, occupational group, and industry. The results of this analysis are presented in Appendix Table 3.

The analysis shows that, in general, women have a greater ability to work from home, as do women with children under the age of 6. Arab Israelis were found to have less ability to work from home relative to non-Haredi Jews, and for Haredim, the differences were not statistically significant. With respect to age group, statistically significant differences were found only between workers in the 16–25 age group and those in the 56–65 age group, where the latter had a higher potential for working from home. The test for residential area found that workers living in the Center had a greater ability to work from home than those living in the North.

With respect to education, it appears that the ability to work from home increases with the level of a worker's education. Another finding shows that workers who work outside their residential area have a greater ability to work from home than those working close to home. This finding may provide evidence of a potential saving in traffic congestion and pollution as working from home becomes more widespread. Salaried workers were found to have a higher ability to work from home than the self-employed. As found in other studies (Adams-Prassl, Boneva, Golin & Rauh, 2020), the current research found that academics and technicians had a greater ability to work from home and that the difference is statistically significant. In contrast, workers in sales and services, skilled workers in manufacturing, construction, and agriculture, and workers in elementary occupations were found to have a low ability to work from home, with the latter group having the lowest ability among them. As for the industries, workers in the information and communication industry have the highest ability to work from home while those in accommodation and food services, arts, entertainment and leisure, wholesale and retail commerce, and health and welfare services have the lowest.

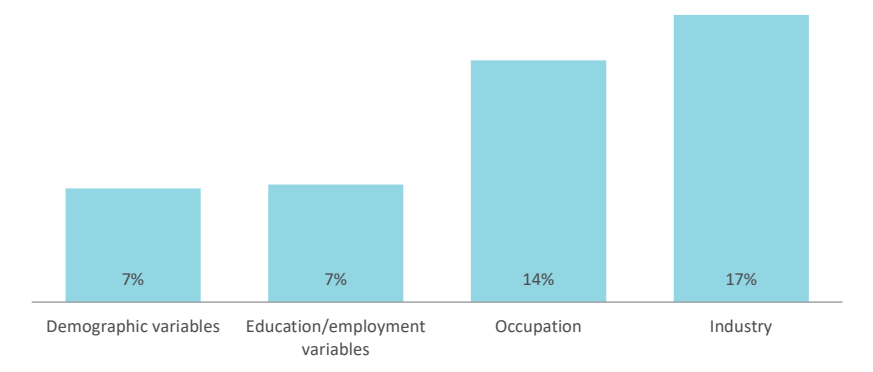
As noted, it is likely that the findings at least partially reflect workers' choices. In particular, it may be that the model's result that women (and in particular women with young children) have a greater ability to work from home is a result of their choice of employment which allows them to work from home. A similar assumption can be made with regard to the positive association between ability to work from home and commuting distance. In other words, for a worker with the ability to work from home, it is easier to choose a residential location that is farther away from his place of work.

In view of these findings, the question arises as to how much the variables contribute to explaining the variation in the ability to work from home. The model that includes all of the aforementioned variables explains 44 percent of the variation in the ability to work from home (see Appendix Table 3 for the R^2 , the coefficient of determination). In order to measure the contribution, we divided the variables into four groups: demographic variables — gender, a woman with a child under 6, age group, sector and area of residence; education and employment variables — education, commuting, type of employment, and public sector vs private sector; occupation; and industry.

Using these groups, we employed a statistical procedure allowing quantification of the contribution of the variables to explaining the ability to work from home.⁷ Figure 9 shows that the demographic variables and education and employment variables explain about 7 percentage points each while occupation and industry contribute 14 and 17 percentage points, respectively. In other words, occupation and industry have the largest weight in determining the ability of a worker to work from home and together they contribute about 70 percent of the explanatory power (R^2 with a value of 44 percent). The other components have a weight of about 30 percent in the explained variance of the ability to work from home.

7 The procedure for evaluating the contribution of the variables to explaining the variation was carried out using the Shapley decomposition.

Figure 9. The explanatory contribution of groups of variables to the ability to work from home



Source: Shavit Madhala and Benjamin Bental, Taub Center | Data: PIAAC, 2015

Decomposition of the index into its components

In order to identify the barriers to working from home and the source of the gaps among the groups, we estimated separate regressions for the three factors that comprise the index of ability to work from home: jobs that are physically demanding or use manual skills, those requiring social interaction, and jobs using digital technology. The results are presented in Appendix Table 4. They show that women have jobs requiring less physical and manual skills and carry out fewer tasks that require social interaction relative to men. However, they also make less use of digital technology in their work. Workers aged 26 to 45 use digital skills in their work more frequently than workers aged 16 to 25, and workers aged 56 to 65 carry out fewer tasks that are physically demanding or that require social interaction. It is interesting to note that relative to the non-Haredi Jewish sector, gaps in digital work exist also among workers in the Arab Israeli sector and among Haredim, although they are more pronounced among the Haredim. In contrast, jobs that are physically demanding and that require manual skills are more prevalent among the Arab Israeli population and less so among Haredim, with the differences being statistically significant. Education is positively correlated with digital work and negatively correlated with jobs requiring physical and manual skills while social interaction is required in particular from workers with a high level of education.

With respect to residential area, workers who work outside their residential area make greater use of digital work. It also appears that in the North and the South, there is more work requiring physical and manual skills relative to the Center. Additionally, social interaction at work is more common in the North than in the Center while in the Jerusalem region it is less so. Another interesting finding is that relative to the self-employed, salaried workers are characterized less by tasks that require social interaction or the use of physical and manual skills, but they also use digital skills to a lesser extent.

With respect to occupation, managers rely most heavily on digital work and that is also the case with respect to tasks that require social interaction. With respect to the use of physical and manual skills, it appears to be more common, relative to managers, among workers in service and sales, skilled workers in manufacturing and construction, and, in particular, among elementary occupations workers.

SPOTLIGHT

Estimating the share of workers who are able to work from home

Since the onset of the coronavirus crisis, the CBS has been carrying out surveys to look at businesses in the economy during the pandemic. As part of this survey, which is carried out in the main industries of the economy, employers are asked about the share of their workers who are working from home. For the purposes of the current research, we used the data on working from home that appear in the survey for the month of July (CBS, 2020a; Wave 7), when there was no lockdown. According to the distribution of employees by industry, we examined the index of ability to work from home that corresponds to the share of workers working from home according to the survey (see Table 2, Column 2).⁸ Based on these scores and the weights of the industries, we calculated the average threshold score for the ability to work from home (1.49). Given this average, we examined the share of workers whose score is higher in each industry and weighted the result by the relative share of workers in that industry (Table 2, Column 3). We obtained the result that about 6 percent of workers are able to work from home in Israel.

This share reflects an averaging between the industries in which the ability to work from home is negligible, such as, accommodation and food services, and health and welfare services, and industries in which it is high, such as, information

8 In other words, we found the critical standardized score for which the share of those with a score exceeding that critical value is equal to the share of workers working from home according to the CBS survey.

and communication and financial services, in which the share of workers who can work from home is about 19 percent and 23 percent, respectively. These industries, and in particular information and communication, are particularly dominant with respect to both prestige and the possibility of working from home, although their weight in total employment is relatively low — only about 6 percent in information and communication and about 3 percent in financial services. Another industry which includes many of the workers in the public sector (public administration and defense and compulsory social security) accounts for about 10 percent of the workers in the economy, and is characterized by a substantial share of workers who can work from home (about 14 percent). In contrast, it is clear that wholesale trade, education, health, and welfare services, which represent about one-third of the workers in the economy, are characterized by a very low share of workers who are able to work from home.⁹

The cumulative distribution function of the standardized scores in information and communication and financial services, in which there is a particularly high ability to work from home, and health and welfare services, in which there is a particularly low ability to work from home, captures the variation between the industries (Figure 10). Indeed the figure shows that the former two industries are very similar to one another and the share of workers in them who can work from home is higher throughout the distribution than in health and welfare services. In particular, it can be seen that at the average threshold standardized score (1.49), the cumulative distribution in information and communication and financial services is about 80 percent,

9 Recall that according to Figure 1, 4.4 percent of employees in Israel already worked from home in 2019. According to the findings of the Survey of Businesses in July (CBS, 2020a; Wave 7), the figure stood at 9 percent, but it covered only 30 percent of total employees and included industries in which the share of workers working from home is particularly high.

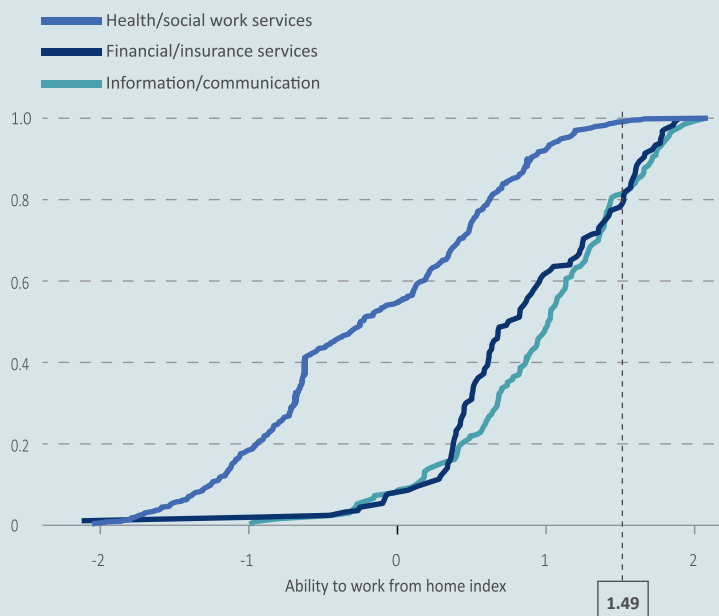
which means that the remaining approximately 20 percent of the workers are above this threshold and are defined as having the ability to work from home. In contrast, in health and welfare services only about 1 percent are above the threshold score at this point and are defined as being able to work from home.

Table 2. The share of workers who can work from home by industry

Industry	Share working from home (July)	Index score in intercept points	Share who can work from home	Employment share of industry (2019)
Agriculture, forestry, fishing			0%	1%
Manufacturing	3%	1.57	4%	10%
Electricity, gas, steam, air conditioning supply			8%	0%
Water, sewage, waste management			0%	0%
Construction	1%	1.40	1%	5%
Wholesale/retail trade, car/motorcycle repair	1%	1.71	2%	11%
Accommodation/food services	0%	0.97	0%	4%
Information/communication	27%	1.39	19%	6%
Financial/insurance services	18%	1.57	23%	3%
Real estate activities			9%	1%
Professional, scientific, technical activities	10%	1.50	10%	12%
Administrative/support service activities			4%	4%
Public administration/defense, compulsory social security			14%	10%
Education			4%	12%
Health/social work services			1%	11%
Arts/entertainment/recreation			2%	2%
Other services			3%	3%
Household employment			0%	1%
Total		1.49	6%	100%

Source Shavit Madhala and Benjamin Bental, Taub Center | Data: PIAAC, 2015; CBS 2020a, Wave 7

Figure 10. Cumulative distribution of scores for the ability to work from home by selected industries



Source: Shavit Madhala and Benjamin Bental, Taub Center | Data: PIAAC, 2015

One reservation concerning the estimates is based on two main limitations. First, as noted above, the PIAAC survey, which is the basis for the examination of all the industries of the economy, was carried out between 2014 and 2015 and reflects the situation of digital work five years ago. It is reasonable to assume that more up-to-date data of this type would produce results with a higher share of workers who are able to work from home. Second, as also noted previously, the ability to work from home is likely to be a consideration in choosing an occupation. This will result in selection bias and will affect the distribution of standardized scores in each industry.

Summary and conclusions

Advancements in digital work increased the possibilities for working remotely even before the outbreak of the coronavirus pandemic; however, with the spread of the pandemic, many businesses were forced to adopt this employment arrangement and to allow their workers to work from home. Apart from its economic importance and health considerations, the expanded opportunities to work from home have many advantages also in normal periods. These benefits are expected to have an impact on the economy and the labor market, both socially and economically, and include, among other things, a reduction in traffic congestion and pollution emissions, the narrowing of gender gaps, the expansion of employment opportunities in the periphery, the improvement of workers' welfare, an increase in labor productivity, and even a saving in the costs of employment for employers. The spread of the coronavirus, together with the many advantages of working from home naturally raise the question of whether to expand the use of this employment model. This study has examined the relative ability to work from home in the Israeli labor market and the findings can serve as a basis for policy to increase remote work and to reduce gaps in this ability between population groups.

The findings of the research reveal statistically significant differences in the ability to work from home among various occupational groups, where workers in more prestigious occupations have a greater ability to work from home. It appears that working from home is a bonus enjoyed primarily by workers with a high socioeconomic status, which provides them with a significant advantage in normal times and even more so during the current coronavirus crisis. The results of the analysis show that workers with a lower ability to work from home are the 16–25 age group relative to the 56–65 age group, those with a low level of education, those in the Arab Israeli sector, the self-employed, and those living in areas with a low socioeconomic ranking and/or in the North.

Measuring the contribution of various variables to explaining the variation in ability to work from home shows that the occupation and industry in which a worker is employed have a significant weight in determining the ability to work from home. It was found that together they are responsible for about 70 percent of the explained variation.

An examination of the three factors that determine the ability to work from home — high use of physical and manual skills, high levels of social interaction, and high amounts of digital work — makes it possible to identify accurately the source of the gaps between workers in the labor market. It appears that the

latter factor, namely the frequency of use of digital skills, is the most important one with respect to the ability to work from home. Moreover, the data indicate that workers employed in relatively low-earning occupations are also those who rely less on digital skills in their work. Two additional groups of workers who use digital work to a lesser extent are 16 to 25-year-olds relative to 26 to 46-year-olds and women relative to men. The gaps characterizing the younger age group are less of a concern since the workers in this group tend to be employed in temporary non-digital jobs. In contrast, the lower share of digital work by women is liable to exacerbate gender gaps in the labor market. A particularly notable finding is the lesser use of digital work in the Arab Israeli sector and the very low use among Haredi workers. In these groups, the technological gaps constituted a barrier to opportunities in the labor market even before the crisis. Currently, when there is a need to expand the ability to work from home and in light of our findings, the importance of encouraging the use of technology among weaker populations and among populations facing barriers to employment is even greater.

The examination we carried out to estimate the share of workers with a potential ability to work from home in various industries shows that about 6 percent of employees overall are able to work from home, with significant variation across industries. Due to reasons explained previously (see the *Spotlight*), it may be that this is an underestimate and that the share of workers able to work from home is larger.

In summary, the acceleration of the trend to work from home appears to be more important than ever at this point in time and the limited ability of weaker populations to work from home raises a real concern that gaps in the labor market, which existed even before the onset of the pandemic, will widen. During this period of uncertainty, and particularly in view of the restrictions on employment imposed on workers as part of lockdowns, weaker populations are more vulnerable than ever before.

The findings of this research can assist in the formulation of a differential policy to encourage the acquisition of skills enabling more individuals to work from home among various population groups and in assembling designated assistance packages that focus on the unique characteristics of each group. Apart from that, the government can adopt a number of policy measures that will help to expand the opportunities for working from home, including upgrading of internet infrastructure in economically depressed regions, the adoption of a model that facilitates working from home among public sector

workers, and the encouragement of businesses to adopt a model of working from home by means of economic incentives and grants for the assimilation of the relevant technology. This is an investment opportunity that will benefit the economy not only during the crisis but for many years after it has passed.

References

English

- Adams-Prassl, A., Boneva, T., Golin, M., & Rauh, C. (2020). *Work that can be done from home: Evidence on variation within and across occupations and industries*. IZA Discussion Paper No. 13374.
- Alipour, J. V., Fadinger, H., & Schymik, J. (2020). *My home is my castle: The benefits of working from home during a pandemic crisis — evidence from Germany*. CEPR Discussion Paper No. DP14871.
- Arntz, M., Ben Yahmed, S., & Berlingieri, F. (2019). *Working from home: Heterogeneous effects on hours worked and wages*. ZEW Discussion Paper No. 19–015.
- Bick, A., Blandin, A., & Mertens, K. (2020). *Work from home after the Covid-19 outbreak*. CEPR Discussion Paper No. DP15000.
- CBS (2020b). [*Labor force survey 2018, Publication no. 1782*](#). Jerusalem: Central Bureau of Statistics.
- CBS (various years). *Social Survey*. Jerusalem: Central Bureau of Statistics.
- Dingel, J. I., & Neiman, B. (2020). *How many jobs can be done at home?* NBER Working Paper No. 26948.
- Hatayama, M., Viollaz, M., & Winkler, H. (2020). *Jobs' amenability to working from home: Evidence from skills surveys for 53 countries*. Washington DC: The World Bank.
- PIAAC (2015). *OECD Survey of Adult Skills 2015*.
- von Gaudecker, H. M., Holler, R., Janys, L., Siflinger, B. M., & Zimpelmann, C. (2020). [*Labour supply in the early stages of the COVID-19 pandemic: Empirical evidence on hours, home office, and expectations*](#). Bonn, Germany: IZA Institute of Labor Economics.

Hebrew

- CBS (2020a). *Survey of businesses during the coronavirus*. Jerusalem: Central Bureau of Statistics.

Appendix

Appendix Table 1. Details of variables that comprise the index by Hatayama et al.

Task Index	Variables	Type of variable
Physical & Manual index	How often does your job usually involve working physically for a long period?	Frequency
	How often does your job usually involve using skill or accuracy with your hands or fingers?	Frequency
Face-to-face index	How often does your job usually involve sharing work-related information with co-workers?	Frequency
	How often does your job usually involve instructing, training or teaching people, individually or in groups?	Frequency
	How often does your job usually involve making speeches or giving presentations in front of five or more people?	Frequency
	How often does your job usually involve selling a product or selling a service?	Frequency
	How often does your job usually involve advising people?	Frequency
	How often does your job usually involve persuading or influencing people?	Frequency
	How often does your job usually involve negotiating with people either inside or outside your firm or organisation?	Frequency
Low ICT at work index	Do you use a computer in your job? This includes cell-phones and other hand-held electronic devices that are used to connect to the internet, check emails, etc.	Yes/No
	In your job, how often do you usually use email?	Frequency
	In your job, how often do you usually use the internet in order to better understand issues related to your work?	Frequency
	In your job, how often do you usually conduct transactions on the internet, for example buying or selling products or services, or banking?	Frequency
	In your job, how often do you usually use spreadsheet software, for example Excel?	Frequency
	In your job, how often do you usually use a word processor, for example Word?	Frequency
	In your job, how often do you usually use a programming language to program or write computer code?	Frequency
	In your job, how often do you usually participate in real-time discussions on the internet, for example online conferences, or chat groups?	Frequency

Appendix Table 1 (continued). Details of variables for the index by Hatayama et al.

Task Index	Variables	Type of variable
Low ICT at home index	In every day life, how often do you usually use email?	Frequency (all of them)
	In every day life, how often do you usually use the internet in order to better understand issues related to, for example your health or illnesses, financial matters, or environmental issues?	
	In every day life, how often do you usually conduct transactions on the internet, for example buying or selling products or services, or banking?	
	In every day life, how often do you participate in real-time discussions on the internet, for example online conferences or chat groups?	
	In every day life, how often do you use spreadsheet software, for example Excel?	
	In every day life, how often do you use a word processor, for example Word?	
	In every day life, how often do you use a programming language to program or write computer code?	

Source: Hatayama et al., 2020

Appendix Table 2. Variable groupings according to Factor Analysis

Variable name	Factor 1	Factor 2	Factor 3
Physical work	0.9521		
Manual skills	0.9521		
Uses email			0.8663
Uses computer			0.7445
Uses the internet			0.8121
Conducts business online			0.3021
Uses Excel			0.7978
Uses Word			0.8725
Programming			0.3466
Participates in online conferencing			0.4506
Shares information			
Teaches people		0.3831	
Selling		0.5703	
Presenting			0.3562
Advising		0.7149	
Persuading		0.7864	
Negotiating		0.6857	

Source: Shavit Madhala and Benjamin Bental, Taub Center | Data: PIAAC, 2015

Appendix Table 3. Estimates of the ability to work from home

	Variable name	M ^a b
Gender relative to man	Woman	0.114**
Woman w/ young child relative to w/o young child	With a child under 6	0.117*
Age group relative to 16–25	26–35	0.068
	36–45	0.044
	46–55	0.033
	56–64	0.201***
Population sector relative to non-Haredi Jews	Arab Israelis	-0.278***
	Haredim	-0.068
Residential area relative to Center	North	-0.135**
	Haifa	-0.018
	Jerusalem	0.051
	Tel Aviv	-0.002
	South	-0.087
	Judea/Samaria	-0.118
Education level relative to less than high school	High school	0.055
	Above high school	0.207***

Appendix Table 3 (continued). Estimates of the ability to work from home

	Variable name	M ³ b
Employment status relative to self-employed	BA degree	0.187***
	MA degree or higher	0.372***
	Salaried employee	0.251***
Workplace relative to working in residential area	Commuting to work	0.072*
Employment sector relative to private/non-profit	Public sector	-0.039
Occupation relative to managers	Professionals	0.139**
	Technicians and associate professionals	0.175**
	Clerical support	0.147
	Service and sales	-0.525***
	Skilled workers	-0.581***
Industry relative to Agriculture	Elementary occupations	-0.669***
	Manufacturing/mining/quarrying	-0.059
	Electricity/gas/steam/air conditioning supply	0.131
	Water sewerage waste management/remediation activities	0.052
	Construction	-0.303
	Wholesale/retail trade; car/motorcycle repair	-0.528**
	Transportation/storage	0.094
	Accommodation/food	-0.688***
	Information/communication	0.490**
	Financial/insurance activities	0.256
	Real estate activities	0.232
	Professional, scientific, technical activities	0.315
	Administrative/support service activities	0.178
	Public administration, defense, compulsory social security	0.311
	Education	-0.306
	Human health/social work activities	-0.493**
	Arts/entertainment	-0.586**
	Other service activities	-0.215
	Household employment	-0.004
Constant		-0.13
R ²		0.437
Number of observations		3,286

Note: Significance levels: * p < 0.05; ** p < 0.01; *** p < 0.001.

Source: Shavit Madhala and Benjamin Bental, Taub Center | Data: PIAAC, 2015

Appendix Table 4. Estimates for occupations that are physically demanding or use manual skills, social interactions, or digital work

	Variable name	Digital work	Social interaction	Physical/ manual skills
Gender relative to men	Woman	-0.060*	-0.091*	-0.152***
Woman w/ young child relative to w/o young child	With a child under 6	0.055	-0.033	-0.098
Age group relative to 16–25	26–35	0.140***	0.028	0.004
	36–45	0.124**	0.01	0.043
	46–55	0.009	-0.051	0.007
	56–64	-0.028	-0.165**	-0.186**
Population sector relative to non-Haredi Jews	Arab Israelis	-0.187***	0.038	0.219***
	Haredim	-0.303***	-0.078	-0.116*
Residential area relative to Center	North	-0.001	0.129**	0.086
	Haifa	0.001	0.018	0.012
	Jerusalem	0.05	-0.095	0.064
	Tel Aviv	-0.013	-0.055	0.046
	South	-0.019	0.018	0.101
	Judea/Samaria	-0.108	-0.023	0.103
Education level relative to less than high school	High school	0.215***	0.143**	-0.016
	Above high school	0.312***	0.129*	-0.149**
	BA degree	0.508***	0.333***	-0.124*
	MA degree or higher	0.620***	0.357***	-0.333***
Employment status relative to self-employed	Salaried employee	-0.083*	-0.371***	-0.115*
Workplace relative to working in residential area	Commuting to work	0.103***	0.032	-0.044
Employment sector relative to private/non-profit	Public sector	0.022	0.026	0.058

Appendix Table 4 (continued). Estimates for occupations that are physically demanding or use manual skills, social interactions, or digital work

	Variable name	Digital work	Social interaction	Physical/ manual skills
Occupation relative to managers	Professionals	-0.113*	-0.330***	-0.005
	Technicians and associate professionals	-0.101*	-0.319***	-0.062
	Clerical support	-0.422***	-0.632***	-0.026
	Service and sales	-1.001***	-0.688***	0.527***
	Skilled workers	-1.125***	-0.957***	0.763***
	Elementary occupations	-1.313***	-1.352***	1.109***
Industry relative to Agriculture	Manufacturing/mining/quarrying	-0.123	-0.294*	0.265
	Electricity/gas/steam/air conditioning supply	0.267	-0.31	0.367
	Water sewerage waste management/remediation activities	0.053	-0.291	0.26
	Construction	-0.171	-0.111	0.426*
	Wholesale/retail trade; car/motorcycle repair	-0.191	0.328*	0.326
	Transportation/storage	-0.248	-0.317*	-0.081
	Accommodation/food	-0.325*	0.069	0.706***
	Information/communication	0.353**	-0.173	-0.259
	Financial/insurance activities	0.156	-0.03	-0.223
	Real estate activities	0.064	0.001	-0.307
	Professional, scientific, technical activities	0.081	-0.310*	-0.112
	Administrative/support service activities	0.011	-0.218	-0.057
	Public administration, defense, compulsory social security	0.098	-0.309	-0.091

Appendix Table 4 (continued). Estimates for occupations that are physically demanding or use manual skills, social interactions, or digital work

	Variable name	Digital work	Social interaction	Physical/ manual skills
	Education	-0.186	-0.148	0.453*
	Human health/social work activities	-0.392**	-0.197	0.595**
	Arts/entertainment	-0.412**	-0.159	0.686**
	Other service activities	-0.099	-0.042	0.286
	Household employment	-0.470***	-0.734***	0.27
Constant		0.348*	0.831***	-0.274
R ²		0.592	0.27	0.352
Number of observations		3,286	3,286	3,286

Note: Significance levels: * p < 0.05; ** p < 0.01; *** p < 0.001.
Source: Shavit Madhala and Benjamin Bental, Taub Center | Data: PIAAC, 2015

Overeducation Among Academic Degree Holders in Israel

Haim Bleikh

1. Introduction and objectives

The last few decades have seen a substantial rise in the educational level of individuals, both globally and in Israel (OECD, 2018). The standard view is that investment in higher education increases innovation, employment, productivity, and wages, which in turn boosts economic growth (Hanushek, 2016). It is also a pivotal contributor to a wide set of social benefits, from improved health, higher participation in elections and political awareness in general, to lower levels of crime, poverty, and reliance on government support (Münich & Psacharopoulos, 2018; OECD, 2018). Set against this singularly positive view is a more sober assessment, which suggests that the expansion of higher education can, and has in many countries including Israel, led to overeducation, a situation in which a worker's acquired education level exceeds that required for the job. According to the terminology of labor economics, this is considered a vertical mismatch, as opposed to horizontal mismatches where workers are choosing jobs with requirements outside the scope of their field of study. Research on this topic goes back at least to Freeman's (1976) *The Overeducated American*, who argue that the increased supply of graduates was characterized with a significant reduction in returns to higher education.

On an individual level, as documented below, overeducation is associated with earning losses, relatively low job satisfaction and motivation which can be expressed in more frequent absenteeism and higher job turnovers. These adverse consequences may affect employee's productivity and thereby reduce an organization's aggregate output (Quintini, 2011). In a broader sense, overeducation is potentially costly to the economy as a whole since it points to a waste of educational resources, and to the fact that employers do not fully utilize the full productive capacity and capabilities of their employees.

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Estimates of overeducation reported in different studies (based on a variety of measurements) vary widely (ILO, 2014). According to the OECD definition, the rate of overeducation in Israel **for the entire population** stands at 32 percent, and ranges from 10 to 33 percent in the other countries.

This study looks at overeducation among Israeli **workers with an academic degree whose jobs do not generally require a degree**. As described below, one of the main determinants of overeducation is field of study. The aim of this paper is to bring attention to other important determinants of overeducation in Israel, which have not as yet been thoroughly examined:

- A. Hebrew proficiency – the lack of Hebrew language proficiency has a large influence on overeducation among immigrants.
- B. Age and tenure – the incidence of overeducation is related to age, in particular for workers with low job tenure. The problem is particularly acute for workers who change jobs at a later age since many of them experience a period of temporary unemployment.
- C. Spatial flexibility – Worker mobility, as measured by the length of time a worker is willing to commute to work and the availability of a private car, may affect the matching of workers' educational characteristics and employers' preferences.

The current paper is organized as follows. Section 2 presents a brief literature review. Section 3 describes the methodology behind the definition of overeducation. Section 4 then addresses, in order, each of the three contributing factors of overeducation in Israel mentioned above. A multivariate analysis of overeducation is presented in Section 5, and the paper concludes with a summary and discussion.

2. Literature review

In the economics literature, a number of explanations for overeducation are posited.¹ According to human capital theory, investment in both formal education and experience acquired through on-the-job training (OJT) provided

1 There are somewhat different theories of overeducation (and its causes) in research in other social sciences. In sociology, for example, it is usually framed as a social stratification problem, making it part of larger debates about intergenerational mobility (Torche, 2013; Capsada-Munsech, 2017).

at the workplace (whether that training is specific to the job or more general) increases worker productivity, and therefore the wages in the marketplace (Becker, 1962). Within this framework, overeducation occurs when there is a temporary mismatch. In career mobility theory, this is framed as a temporary mismatch resulting from worker anticipation of acquiring useful skills through OJT as a career investment (Sicherman & Galor, 1990).

Signaling theory offers yet a different perspective on education. It views education as a worker's signal to potential employers of latent or unobserved abilities (such as motivation, higher learning skills, etc.) (Spence, 1973). Due to the asymmetry in information regarding a worker's traits, employers set educational minimums as a way of sorting candidates (Weiss, 1995).

An important distinction between human capital theory and signaling theories relates to the role of investing in higher education and its effect on worker productivity. Human capital theory views higher education as an essential component of human capital that increases worker productivity. On the other hand, in Spence's signaling theory model, an investment in higher education does not change worker productivity, and so all higher education is overeducation, and is a waste of resources from a social perspective.

Contextual factors, in particular related to spatial location, can also play a role in the appearance of the overeducation phenomenon. Some workers find themselves in less-than-desirable jobs in a particular geographic location as the result of family responsibilities. An early version of the spatial-based explanation for overeducation was introduced by Frank (1978) in the context of coupled households. He asserted that the job seeking process of the partner with the highest earning capabilities is carried out in a larger geographical area (global market) while the secondary wage earner is limited to seeking employment within a smaller geographical area (local market). As a result, the secondary earner may accept employment with lower educational requirements in order to remain closer to home. Büchel and van Ham (2003) present a more general framework for a spatial-based explanation for overeducation that takes into consideration all workers, that is, not just coupled households (discussed in Section 4). Over the years, an extensive body of literature has developed that links the phenomenon of overeducation with variables such as spatial characteristics (e.g., job dispersion relative to residential location), commuting time and distance, and the availability of a car for commuting (Jauhiainen, 2010; Devillanova, 2012; Ramos & Sanroma, 2011).

In addition, overeducation can be a short-term phenomenon although in certain circumstances it may be a long term situation. Sicherman's research (1991), for example, finds that overeducated workers tend to have lower job tenure on average. This is consistent with workers' self-reports and their recognition that there is a poor match between their job and their education level. On the face of it, on the job training which is of use in the worker's career, is likely to improve occupational mobility. But the findings show that overeducation — and its implications on wage levels — tends to be a more long-term phenomenon. Büchel and Mertens (2004), for example, found that overeducated workers in Germany experienced less upward occupational mobility (relative to well-matched counterparts), and their wage growth rates were not above the average.

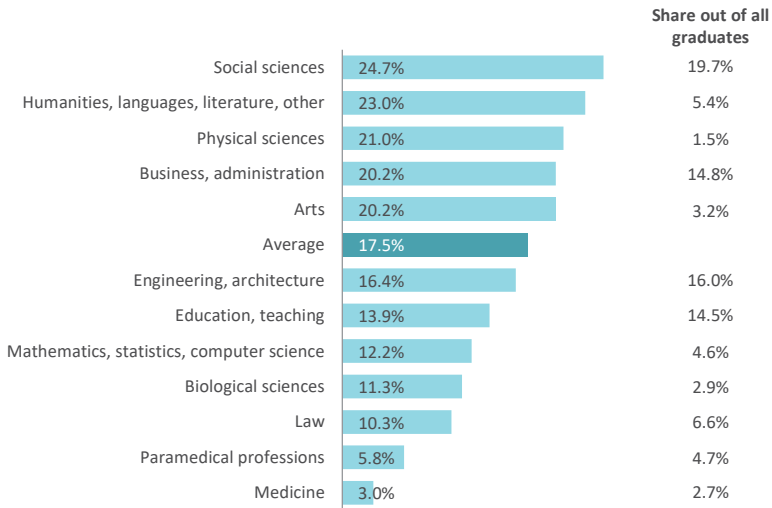
What is clear throughout the literature is that overeducation affects employees and employers negatively. While overeducated workers tend to earn more than well-matched colleagues in the same job, they earn less than workers of the same educational level who have jobs that match their education level (Quintini, 2011; ILO, 2014; McGuinness & Pouliakas, 2016). Likewise, organizations that cannot offer their "graduates in non-graduate occupations" career opportunities may end up with an uncommitted staff (Blenkinsopp & Scurry, 2007). Hersch (1991) takes this one step further, showing that while both overeducated men and women are less satisfied with their jobs than properly matched employees, men articulate clearer intentions to leave their positions. In the same research, Hersch shows that overeducated workers get less OJT. At least some of this, she argues, is driven by employers' expectations that overeducated workers see their job mismatch as temporary and intend to leave the workplace within a relatively short period of time.

Overeducation in Israel

There has been some research on both the determinants and consequences of overeducation in Israel. In terms of determinants, overeducation in Israel varies significantly by field of study (Romanov, Eizman & Tur-Sinai, 2008; Katz, 2017; Lipiner, Rosenfeld & Zussman, 2019). Subject to the definition of overeducation used in this work (as will be clarified below), a basic breakdown can be seen in Figure 1. Broadly speaking, individuals who studied humanities and social sciences are more likely to be overeducated. On the other end, graduates from medical studies, law faculties, mathematics, statistics and computer sciences are associated with the lowest rates of overeducation.

Figure 1. Overeducation and field of study, 2017–2019

Academic degree holders ages 25–64



Note: The percentages are the relative shares of each field of study out of all degree holders ages 25–64. Data for graduates in agriculture do not appear in the figure because of their small sample size.
 Source: Haim Bleikh, Taub Center | Data: CBS, Social Survey 2017–2019

Regarding the implications of overeducation, Romanov, Tur-Sinai and Eizman (2008) analyzed graduates who received their first degree between 2001 and 2002. They found that wages of overeducated workers were 11 percent lower and the pace of their wage increases was slower than for adequately matched workers. They interpret that result as evidence that the wage effects of overeducation are long-lasting.

Lazarus and Miaari (2015) linked education and employment incompatibility to wage gaps among different groups based on ethnic identity (Ashkenazi, Mizrahi, immigrants from the former Soviet Union (FSU), and Arab Israelis). They conclude that occupational mismatch due to overeducation and undereducation is one component of the mechanism that explains wage gaps among the groups.

Katz (2017) examines the implications of the expansion of higher education in Israel. He finds that, relative to other countries, there is a surplus of academically educated individuals in Israel who do not find work commensurate with their level of education (even when new immigrants are excluded from the analysis). Katz argues that this is partly driven by an inflationary process in higher education that results in a devaluation of academic degrees. The resulting tendency of young graduates to work in occupations that do not match their education represents a serious issue for the economy since significant resources are invested in acquiring what ultimately proves to be non-productive education (at least as measured by labor market outcomes).

A recently released study by the Bank of Israel examines the probability of overeducation and mismatch when workers choose jobs with requirements outside of their chosen field of study (Lipiner et al., 2019). The authors analyze its implications for earnings among graduates born between 1978 and 1985. A major contribution of this work is that it examines differences among graduates from a variety of higher education institutions: public colleges, private colleges, and universities. The study finds that levels of overeducation are the highest among graduates from public colleges, followed by universities, and the lowest among graduates of private colleges. This ranking remains even when the sample is limited to fields of study that are more relevant for the labor market.

3. Measuring overeducation

The empirical literature includes both objective and subjective measures of overeducation, though the former are more common.² Objective measures are based on an assumed correspondence between occupations and education level, as determined by criteria set by job analysts or statistical measures conducted by researchers.³ Use can also be made of the International Standard Classification of Occupations (ISCO) developed by the International Labour Organization (ILO). The assumption is that each occupation requires a specific level of education, and that anyone working in that occupation with a higher level of education than required is designated as overeducated. A second

2 For a more extensive discussion of methods and use of various measures of overeducation see Alpin, Shackleton and Walsh, 1998; Quintini, 2011; and ILO, 2014.

3 An example: *The Dictionary of Occupational Titles* in the US, created as a collaboration between the National Academy of Sciences and the US Bureau of Labor, details the requirements of various types of jobs in the labor market.

objective measure is based on the distribution of education levels in a given occupation. Workers are defined as overeducated if their years of schooling are above the mean (mode) education level of workers in their occupation by more than some ad-hoc value, usually one standard deviation.

The subjective approach to measuring overeducation is based on workers' self-reported match between their education level and their job. This approach may also ask the workers for an assessment of how much education is necessary to get the job and to do the job.

Each of these approaches to measuring overeducation, the objective and the subjective, has advantages and disadvantages. For example, the first objective approach assumes homogeneity in skills and ignores the possibility that workers with the same or similar job title might do very different jobs. The second objective approach, which is based on the distribution of occupational levels in any given occupation, is relatively easy to implement due to data availability. The downside of this method is its arbitrary nature, and its susceptibility to the influence of a rapid expansion of higher education within a given age group (the cohort effect), without a significant change in job requirements.

The subjective approach also has the potential for bias. For example, respondents may overstate their job requirements in order to inflate the status of their position. Job requirements are also likely to be influenced by changes in hiring standards (e.g., a requirement of a higher level of schooling without changes in the position itself). On the other hand, self-reporting has the advantage that it takes into account all of the most up-to-date information about the job, or at least, the most up-to-date information known to the worker.

What is clear is that there is no single, universally accepted measurement tool for overeducation and each method yields different estimates of the phenomenon. Many times, the choice of methodology is based on data availability.

Data and methods for defining overeducation

This study uses data collected from the 2015 to 2019 Israel Social Survey (ISS) conducted by the Central Bureau of Statistics (CBS). The analysis is restricted to respondents with academic degrees between the ages of 25 and 64. Based on this selection procedure, the sample includes 8,186 observations.

The significant advantage of the ISS is that it includes a wide range of data including personal characteristics, employment history, commuting patterns, language skills, and more. In addition, the use of ISS for this analysis enables

identification of individuals who are overeducated for their jobs through a combination of both objective (correspondence between occupations and education level) and subjective criteria, and it does this for a representative sample of university and college graduates.⁴

In the first step of the study, occupations are separated into three groups: those that usually require an academic degree (graduate jobs), jobs that do not usually require a degree (non-graduate jobs), and a third group that has some of both.⁵ Graduate jobs include managers and academic professionals (74.2 percent of graduate workers based on data from 2017 to 2019), and workers in these occupations are not considered overeducated. The non-graduate jobs include clerical workers, skilled workers in manufacturing, construction, and other sectors, agents, sales and service workers, and unskilled workers (13.8 percent of graduate workers). Graduates in all of these occupations are considered overeducated. The final, mixed group work as “professionals, technicians or associate professionals” (12.0 percent of graduate workers). Overeducation within this group is assessed using the subjective criterion of the self-reported match between the worker’s field of studies and their job.⁶ For example, a response that there is no relation at all between the job and the respondent’s fields of study, assumes that the workplace does not require an academic degree. Using this criterion, an additional 3.6 percent of graduates are identified as overeducated. For this reason, regression analyses were performed with and without this third (subjectively-defined) group. Inclusion or exclusion of the third group does not change the results either substantively or statistically. It is important to emphasize that using self-assessment in this way allows us to control to some extent for both workers’ skill and occupational heterogeneity. This is important because job requirements are often dynamic and subject to changes in the labor market and the advent of new technologies.

4 Chevalier (2003) also uses a mixed approach.

5 About 30 percent of workers from this group hold an academic degree.

6 The question used to identify this subjective match is: To what extent is your work in the main workplace related to your academic or post-secondary studies? Respondents are given four possible answers: *Yes, to a large extent*; *Yes, to some extent*; *Not so much*; *Not at all*.

It should be stressed that this question is meant to identify mismatches in general. In other words, there is little way to distinguish between cases of overeducation, undereducation, or work that is simply outside the respondent’s field of study.

To sum up, this study identifies overeducated graduates as those employed in an occupation that typically does not require an academic degrees — 13.8 percent of degree holders between 2017 and 2019 (using the objective measure of overeducation); those employed in the occupational group of associate professionals, technicians and agents as well as supporting occupations who reported a mismatch between their level of education and their work — 3.6 percent between 2017 and 2019 (using a subjective measure of overeducation). Based on this combined definition, between 2017 and 2019, about 17.5 percent of workers in Israel with academic degrees were overeducated.

4. Causes of overeducation in Israel

Language proficiency

Language skills are the basis of everyday communication. As such, they are a vital component of human capital and are considered critical to social and economic integration (Yao & van Ours, 2015). Individuals with good language skills can be more effective in their job searches, and so have increased chances of finding lucrative and suitable jobs that matches their skills. In contrast, a lack of adequate language skills can hinder integration into suitable employment and is likely to be a severe obstacle to career success.

The research literature points to several main factors that ultimately influence immigrant proficiency in the host language (Chiswick, 1998). Probably the most decisive factor is the age of arrival in the host country. The level of exposure to the host language is also central. Exposure levels are influenced by several factors:

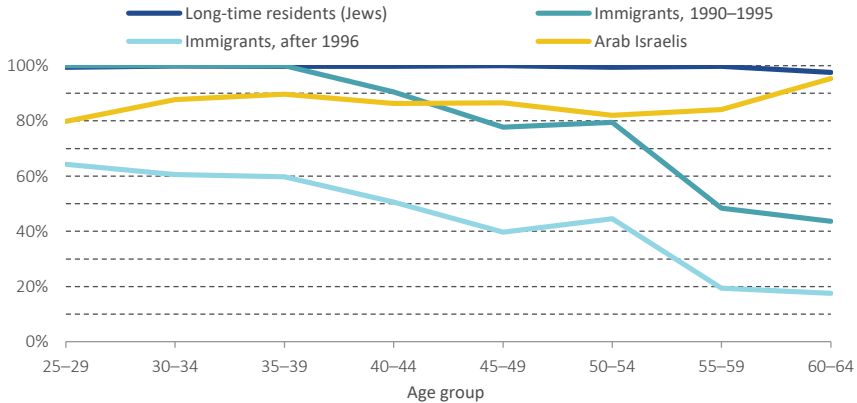
- Language spoken at home and the level of mix of different languages. These two factors are among the most influential in determining the speed of language acquisition.
- Exposure to language content in the media, written literature, television, etc. in the host language.
- Geographic distribution of immigrants. The more immigrants there are in the neighborhood, the more interaction there will be in the mother tongue rather than in the host language.
- “Mixed marriages” versus marriage within the immigrant community.

The “tribal reality” of Israeli society is reflected in different cultural, political, and socioeconomic characteristics. While the largest share of the Arab Israeli population reside in separate Arab Israeli localities, new immigrants are dispersed throughout the country, though there are certain areas with larger concentrations of immigrants. Even 25 years after the large wave of immigration from the former Soviet Union, many immigrants continue to live in areas with large concentrations of immigrants — something that stands out even more when examined at the statistical area level.⁷ These residential patterns have implications for language exposure and the speed of language acquisition.

Figure 2 shows the relationship between language skills and age for individuals with an academic degree. The vertical axis indicates the percent of those who responded that their level of proficiency in Hebrew is either good or very good (their combined score of self-reported proficiency in reading, writing, and speaking). It is important to note that immigrants who arrived in Israel after 1990 are divided into only two groups due to data limitations: those who arrived between 1990 and 1995 and those arriving from 1996 onwards (more detailed immigration data are not available). As can be seen, the Hebrew language proficiency of immigrants who arrive before adolescence (younger cohorts arriving before 1996) is almost equal to that of native speakers. For older immigrants, the process of language acquisition is more complicated. It depends on a host of factors including investment of effort, time, as well as personal abilities. For adults, investing resources in learning a language may also come at the expense of earning a living. It is important to remember that there is marked difference between generations: most of the younger immigrants have acquired their higher education in Israel, while their parents (the older generation) are much more likely to have immigrated to Israel with a certificate of higher education from their country of origin.⁸

7 According to the CBS, the statistical areas are relatively small and homogeneous, and can be used to reflect the unique characteristics of areas within the locality. A statistical area usually numbers 3,000–5,000 residents.

8 For example, between the years 2017 and 2019, among immigrants ages 25–29, the percent of those holding an academic degree in Israel stood at about 75 percent, compared with 29 percent in the 45–49 age group, and much lower in older age groups.

Figure 2. Hebrew proficiency at the good or very good level, 2017–2019**Academic degree holders**

Note: Data are for all academic degree holders including those who do not work.

Source: Haim Bleikh, Taub Center | Data: CBS, Social Survey 2017–2019

A similar phenomenon can be found among Arab Israelis, among whom almost a fifth of graduates received their degrees abroad. For those who studied abroad, their levels of Hebrew proficiency are significantly lower compared to those who studied in Israel.⁹ Hebrew language proficiency is very important for those wishing to continue on to higher education in Israel. At the same time, higher education acquired in Israeli institutions may be a vital element for improving proficiency in the Hebrew language. In either case, having Hebrew skills broadens labor market opportunities that further augment mastery of Hebrew (in the form of on-the-job training and the accumulation of human capital) since it brings contact with Hebrew speakers. In contrast, working exclusively in Arab Israeli localities (where little Hebrew is spoken) affects Hebrew language proficiency and restricts labor market prospects in the future.¹⁰

9 Between 2017 and 2019, 93 percent of Arab Israeli academic degree holders who received their degree in Israel responded that their level of proficiency in Hebrew is either good or very good. The corresponding number of graduates who received their degree abroad is only 74 percent.

10 This is more likely a problem for Arab Israeli women's employment prospects than men's. Most Arab Israeli women in the geographic "triangle" area and in the North work in exclusively Arab Israeli localities (Bleikh, 2017, p.22).

In the context of overeducation, the lack of Hebrew language proficiency can be an obstacle to optimal integration into the labor market. This can be seen in Table 1, which shows the percent of those who are overeducated by level of Hebrew proficiency, sector/immigration status, and age group. Overall, high proficiency in Hebrew is associated with substantially lower rates of overeducation for almost all population groups. Among younger workers, in particular, there are very minor differences between immigrants and native-born Israelis — Jewish and Arab Israelis — when the level of Hebrew proficiency is high. In contrast, much higher rates of overeducation can be seen among younger and older immigrants with poor language skills who came to Israel after 1996. For working-age adults with poor Hebrew skills, overeducation levels differ between population groups and are highest among immigrants from both immigration waves (immigrants between 1990 and 1995 and those who have arrived since 1996). Of course, there are additional factors that are likely to contribute to differences in the levels of overeducation between these population groups, so an adequate level of Hebrew proficiency may be a necessary but not sufficient condition for matching education levels and jobs.

Table 1. Level of overeducation by Hebrew proficiency, population group, and age

	Hebrew proficiency <i>Less than good</i>	Hebrew proficiency <i>Good or Excellent</i>	Total
Ages 25–64			
Veteran Jews	—	13%	14%
Immigrants 1990–1995	44%	13%	20%
Immigrants after 1996	62%	27%	45%
Arab Israelis	31%	18%	20%
Total	52%	15%	18%
Ages 25–44			
Veteran Jews	—	14%	14%
Immigrants 1990–1995	—	12%	12%
Immigrants after 1996	55%	26%	37%
Arab Israelis	—	21%	23%
Total	46%	16%	17%
Ages 45–64			
Veteran Jews	—	12%	12%
Immigrants 1990–1995	46%	15%	27%
Immigrants after 1996	67%	29%	55%
Arab Israelis	—	10%	11%
Total	56%	13%	19%

Note: Some of the cells have no data due to small sample size.
Source: Haim Bleikh, Taub Center | Data: CBS, Social Survey 2017–2019

Age and job tenure

There is general agreement that overeducation is more common among younger people in entry level positions in the labor market due to their lack of suitable professional experience. By taking jobs for which they are overeducated they may be avoiding unemployment scarring, that is, the negative long-term effect that unemployment has on future labor prospects, since many employers consider periods of unemployment a sign of low productivity (Lockwood, 1991). However, with time, workers are expected to

improve their job match (Sicherman & Galor, 1990) although, as discussed previously, there is evidence that shows that overeducation has continuous negative effects on earnings (Romanov et al., 2008).

Other explanations for overeducation include labor market conditions as well as personal circumstances, such as periods of unemployment, family responsibilities (including childcare), decisions to migrate, and geographical restrictions (or mobility issues). All of these factors may push some individuals to voluntarily accept positions for which they are overeducated. Other workers may compromise on less desirable jobs due to fierce competition among highly educated candidates — a direct result of rising education levels across successive cohorts entering the labor market. Each of these factors may also interact with age, including workers nearing retirement, as some people choose to modify their labor patterns in efforts to improve their quality of life (for example, to devote more time their family).

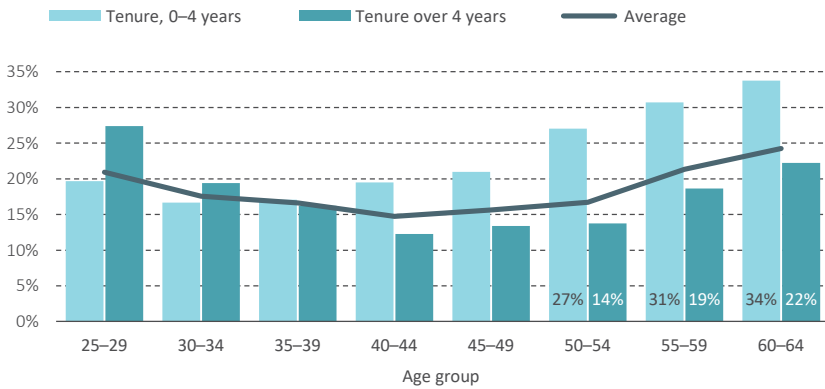
Figure 3a shows the level of overeducation across age groups, and length of current job tenure: those with tenure of 4 years or more (high tenure) and those with less than 4 years (low tenure). Overall, the data display a non-monotonic relationship between overeducation and age. Notably, this is true also after excluding immigrants from the sample (Figure 3b), for whom the risk of overeducation is naturally higher in older age groups. It should be noted that the data presented here describe a sample of individuals at a single point in time (cross-sectional data) which makes it difficult to say how much of this relationship is a product of variables like age, the timing of the survey, or cohort effects.¹¹ Having said that, the non-monotonic relationship between age and overeducation has been documented in previous research (Alpin et al., 1998; Farooq, 2016). As for the data that do not include immigrants (Figure 3b), among younger individuals (up to age 40), the prevalence of overeducation appears to be higher relative to older age groups. This is possible evidence that overeducation is higher for younger people at the very early stages of their career trajectory, but, as time passes, workers on average improve their job match. On the other hand, for workers who change jobs

11 Briefly, age effects are linked to changes in individuals' characteristics over their lifetime; period effects describe changes caused by something that occurs at a specific period of time (e.g. economic crisis, economic reforms, etc.); cohort effects describe changes that result from differences between age groups. Under certain circumstances, and dependent upon data availability, these variables can be controlled for (Yang, 2004; Powers, 2012).

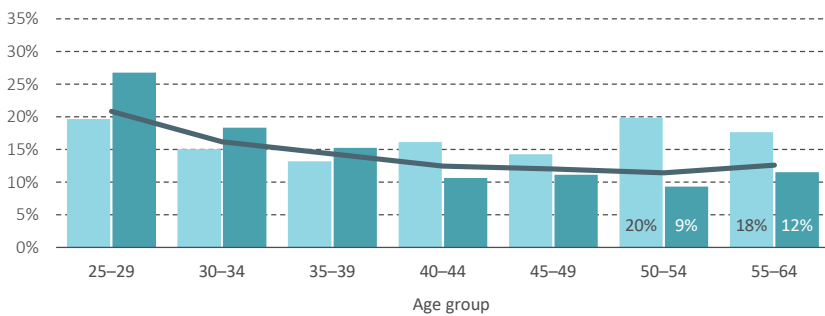
after the age of 45, the likelihood of being overeducated increases with age. It is plausible that skills obsolescence is more pronounced at older ages due to the intense pace of technological changes, a lack of up-to-date knowledge of new skill requirements and a lack of appropriate training. An additional factor contributing to overeducation levels is likely to be ageism, that is, employment discrimination on the basis of age. All of these factors are likely to lead workers to accept employment that is not commensurate with their level of education.¹²

Figure 3. Overeducation by age and job tenure, 2017–2019

a. With immigrants



b. Without immigrants



Note: Age groups 55–59 and 60–64 are combined in Figure 3b due to small sample sizes.

Source: Haim Bleikh, Taub Center | Data: CBS, Social Survey 2017–2019

12 For more details, see Cedefop, 2010; 2012.

Spatial flexibility

A spatially-based explanation for overeducation was originally proposed by Frank (1978) in the context of coupled households. A more general framework for all workers in the labor market was examined in research by Buchel and van Ham (2003). Generally speaking, commuting costs, and especially time spent commuting, can also explain overeducation since job-seeking behavior is affected by two main factors: the spatial distribution of jobs relative to place of residence, and the individual's spatial flexibility, that is, the willingness to relocate or their commuting tolerance. A worker who is willing to relocate or who has a high tolerance level for commuting is less likely to be overeducated than someone who has neither of these traits. In other words, when individuals search for a job, they likely face one of three possible scenarios: a) unemployment (i.e., continuing the job search); b) employment closer to home with the risk of being overeducated; c) longer commutes or relocation in order to find employment that matches their abilities.

Table 2 describes the relation between overeducation and commuting time. The table shows this relationship separately for different modes of transportation. Overall, there is a negative relationship between commuting time and overeducation. The rates of overeducation are substantially lower among workers who travel to work by car or train whereas among users of public buses, overeducation rates are the highest. The increased use of cars for commuting suggests that it improves the spatial mobility of individuals. In particular, for jobseekers, this allows an increased "search radius" of potential workplaces.

Table 2. Overeducation and commuting patterns

By commuting mode and commute time

	Car	Bus	Train	Organized transportation	By foot/ bicycle	Other motorized vehicle
Up to 1/2 hour	17%	34%	—	—	23%	19%
30–45 minutes	13%	38%	—	—	—	17%
45–60 minutes	9%	16%	—	—	—	11%
Over an hour	8%	22%	9%	—	—	12%
Average	14%	28%	15%	28%	26%	16%
Relative size of grouping	75%	11%	4%	3%	8%	100%

Note: For workers employed outside of the home. Empty cells reflect small sample size.

Source: Haim Bleikh, Taub Center | Data: CBS, Social Survey 2017–2019

The relationship between commuting patterns and overeducation is complex and multidimensional. Table 3 shows the relationship from an additional perspective, and adds information about the measure of worker satisfaction with commuting time, income, and place of employment. As can be seen, those who are overeducated are less satisfied with their place of employment as well as their income relative to workers with education levels commensurate with their employment. In contrast, commute-time satisfaction of those who are overeducated is greater than those who are not overeducated. This suggests that for some workers who are overeducated, there is a trade-off between job satisfaction (including income) and commuting costs. This is an additional perspective to the central explanation which states that distance or long commute times are likely to be an obstacle to workers in their job search.

Table 3. Satisfaction with time spent commuting, income from work and workplace

	Car	Bus	Train	Organized transportation	By foot/ bicycle	Total
Satisfied with the commute time						
Job/education match	60%	41%	34%	56%	98%	60%
Overeducation	71%	60%	—	—	100%	71%
Total	61%	46%	32%	61%	98%	62%
Satisfied with income from work						
Job/education match	69%	60%	75%	70%	71%	68%
Overeducation	57%	38%	—	—	42%	52%
Total	67%	54%	72%	63%	64%	65%
Satisfied with workplace						
Job/education match	93%	91%	95%	88%	94%	93%
Overeducation	88%	77%	—	—	84%	85%
Total	92%	87%	93%	85%	91%	91%

Note: Empty cells reflect small sample size.
Source: Haim Bleikh, Taub Center | Data: CBS, Social Survey 2017–2019

5. Multivariate analysis

To this point, the analysis has focused on the relationship between key explanatory variables and overeducation. This section examines the combined impact of these variables through multivariate regressions. To those variables already discussed (Hebrew language proficiency, age, job tenure, commute time, and means of transportation to work) were added variables known to influence labor market behavior and demographic variables. These variables include gender, academic major, employment sector, residential sub-district, marital status, and disability status.

It is important to note that the data may be subject to a sample selection bias: overeducation is only observed for those who work, while some individuals may choose unemployment rather than accept an occupational mismatch. In such a case, a standard regression analysis would underestimate overeducation. In contrast, other workers may choose employment despite their overeducation with the anticipation of acquiring useful skills through on-the-job training, and view it as an investment in their careers. This would make the measure an overestimate. In order to avoid such biases a Probit regression with correction for sample selection is used (Van de Ven & Van Praag, 1981).¹³ Regression results are presented in Appendix Table 1. Examination of the data reveals that in some equations it is subject to a selection bias, and hence the use of this statistical procedure ensures more accurate estimates.

A number of key points stand out from the multivariate analysis:

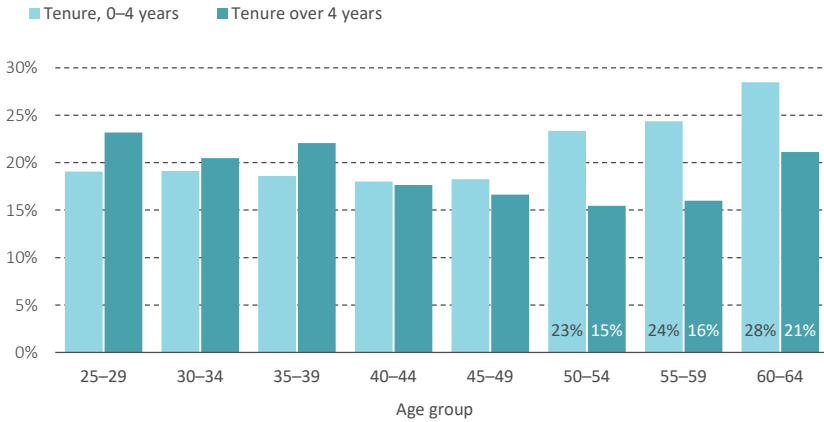
Age and job tenure. Figures 4a and 4b present the results for the total population and for the sample that excludes new immigrants, respectively. The regression results are in Appendix Table 2. As can be seen, the “timing” of switching jobs is an important variable. From the figures it can be concluded that switching jobs after age 45 increases the chance of being in a situation of overeducation.¹⁴ This is also the case among the population that does not

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- 13 The procedure includes estimating two equations: an employment equation (i.e., the selection equation) and an overeducation equation. To properly identify the model, it is necessary to find a variable that has an influence on the employment status (i.e., the selection equation) but can be excluded from the overeducation equation. Finding such a variable is difficult because most variables affect both employment and overeducation. The variable selected in this study includes the interaction between gender and the dummy variable for children up to age 5 in the household.
 - 14 In the framework of this study, separate calculations were done for men and women and the results were very similar. The results do not appear in this work.

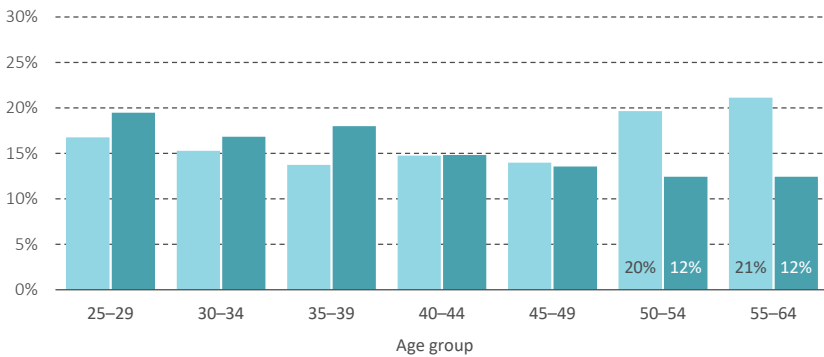
include the new immigrants, although the rates of overeducation among those age 45+ in this population are lower than those of the general population.

Figure 4. Overeducation by age and job tenure, expected probabilities

a. With immigrants



b. Without immigrants



Note: For Figure 4a: The calculation is based on the interaction between age and job tenure in the last place of work. The remaining variables that are controlled for appear in column 1 of Appendix Table 1. The differences between the light and darker columns for the age groups 50 to 64 are statistically significant.

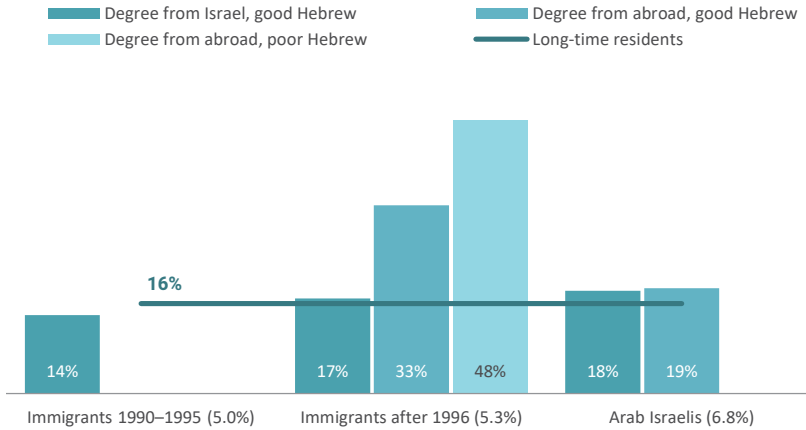
For Figure 4b: The calculation is based on the interaction between age and job tenure in the last place of work. Age groups 55-59 and 60-64 are combined due to small sample sizes. The remaining variables that are controlled for appear in column 7 of Appendix Table 1. The differences between the light and darker columns for the age groups 50 to 64 are statistically significant.

Source: Haim Bleikh, Taub Center | Data: CBS, Social Survey 2015-2019

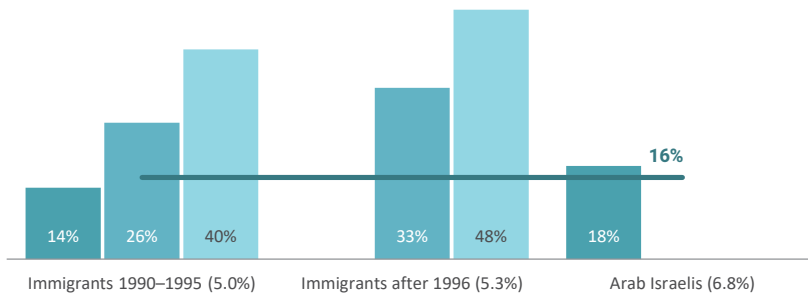
Language skills and country of higher education. Figures 5a and 5b divide workers from different population groups by language proficiency, the country where their degree was earned, and age group. The regression results are in Appendix Table 3. Missing groups in the table reflect small sample sizes. The veteran Jewish population group is the reference group marked by the horizontal line. Unlike new immigrants and Arab Israelis, only a negligible share of veteran Jews received their education abroad and there are no issues regarding their language proficiency (as shown in Figure 2). As can be seen, low Hebrew proficiency levels are associated with higher rates of overeducation among immigrants. Immigrants who were educated abroad and do not have a good knowledge of Hebrew have the highest rates of overeducation. This is the case for all older immigrants and for young immigrants who arrived after 1996. The rates of overeducation among the Arab Israeli population are not different from those of the veteran Jewish population. Another prominent group is the group of new immigrants who have good Hebrew language skills and earned their degree abroad. The rate of overeducation among this group is lower than that of foreign-degree recipients with poor Hebrew, but significantly higher than those who acquired their education in Israel with a good knowledge of the language. This result is valid for both older immigrants and younger immigrants who arrived after 1996. This figure actually reflects two influences: the influence of language and the influence of having a foreign degree. It is possible that some of the workers in this group, despite their good knowledge of Hebrew, work in a workplace that does not match their level of education because their academic degrees are not recognized in Israel. Other employees in this group are individuals who were accepted into the workplace after showing good proficiency in Hebrew. Overeducation that is influenced by poor Hebrew proficiency sounds logical when it comes to immigrants who have come to Israel at a relatively older age, but the data show that this phenomenon also exists among young age groups who have many years of work ahead of them. The fairly constant flow of immigrants to Israel highlights the importance of this finding that language skills are crucial for both entering the Israeli labor market and for competing successfully in it.

Figure 5. Overeducation, Hebrew proficiency, and country where academic degree was earned, expected probabilities

a. Ages 25–44



b. Ages 45–64



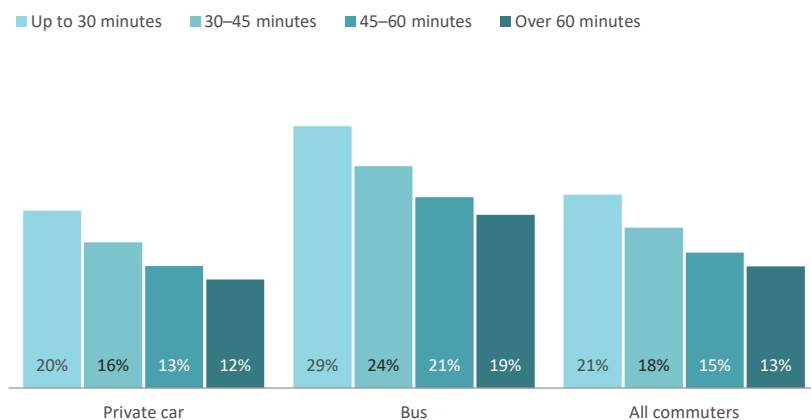
Note: The calculations are based on the interaction between dummy variables of the population group and country where the academic degree was earned. In place of a dummy variable for age groups, a dummy variable for two age groups (25–44 and 45–64) was used. The remaining variables that are controlled for appear in column 1 of Appendix Table 1.

In parentheses, the relative share of the population group out of all salaried employees with an academic degree between the ages of 25 and 64. The share of long-time residents in the younger age group (25–44) out of all employees with an academic degree is 45 percent and their share in the older age group (45–64) it is 26.2 percent. Missing groups reflects a small number of observations.

Source: Haim Bleikh, Taub Center | Data: CBS, Social Survey 2015–2019

Spatially-based determinants. The data presented in Figure 6 are for car and bus users: groups for which the number of observations is large enough to allow this analysis. As expected, access to a car for commuting purposes increases the spatial mobility of workers and, as a result, contributes to a reduction in overeducation levels. In addition, workers with shorter commute times are more likely to experience overeducation. This result indicates that the costs of spatial mobility (especially commuting time) is another potential explanation for overeducation.

Figure 6. The relation between overeducation and commute time, expected probabilities, 2015–2019



Note: The calculation is based on the regression coefficients from column 1 of Appendix Table 1.

Source: Haim Bleikh, Taub Center | Data: CBS, Social Survey 2015–2019

Gender. Overeducation levels are higher among women. There is a gap of about 3 percentage points, both for a sample that includes the entire population and without new immigrants. This result can be explained by the fact that women may attribute more weight to occupational characteristics that allow for a better combination of work and activities related to household management. For example, 61 percent of married women with an academic degree work within a half-hour drive of the place of residence, compared to 49 percent of men.

6. Conclusion

The rise in higher education levels in Israel has any number of social and economic implications. The advantage is that people with more education are generally healthier and have higher employment rates as well as higher incomes. From an economic perspective, an investment in higher education is counted among the factors that contribute to increased labor productivity as well as economic growth. Nevertheless, in Israel, in the past few years, about 17.5 percent of those with an academic degree are classified as overeducated, that, is employed in a position that does not require a higher degree. This means that private and public resources are invested in earning and accessing higher education which is not later used optimally in the labor market, actually decreasing the return on investment.

Following the notable rise in education levels in the past decades, the issue of overeducation has become more and more relevant in public discourse especially surrounding the issue of study majors and the implications for future graduates. This study, however, focuses on three other explanations for the phenomenon. The following is a brief review of the study findings.

Hebrew language proficiency is of critical importance to employment as well as entrance and optimal integration into the labor market. Israel is particularly aware of this issue since the country constantly welcomes new immigrants. This research focuses on younger immigrants (ages 25–44) who arrive in Israel with a foreign degree. The findings indicate that overeducation among young immigrants arriving with a higher degree and good Hebrew language skills is expected to be about 15 percentage points lower than for those with poor language skills. This is a particularly important finding since immigrants arriving at a young age to Israel can expect to work for many years.

Changing jobs after the age of 45 substantially increases the likelihood of overeducation in this population group. This is the case even after immigrants arriving to Israel in the 1990s are removed from the sample. It is likely that the intensive pace of technological changes, as well as the lack of new skills and continuing training, cause some of these individuals to take positions that are not commensurate with their education levels. An additional factor contributing to overeducation levels is likely to be ageism, that is, discrimination on the basis of age.

Accessibility to employment opportunities is dependent to a large extent on spatial matching between suitable employment and residential location and the spatial flexibility of workers (that is, whether an individual is willing to relocate or spend more time commuting). This study examines the relationship between overeducation and commuting characteristics. The results indicate that the level of overeducation decreases with a rise in commuting time. For those using private cars, the level of overeducation is the lowest. The increased use of private cars shows that this mode of transportation improves the spatial mobility of individuals increasing the radius of the job search and improving the likelihood of finding employment that requires an education level that matches those seeking employment.

References

English

- Alpin, C., Shackleton, J. R., & Walsh, S. (1998). Over- and undereducation in the UK graduate labour market. *Studies in Higher Education*, 23(1), 17–34.
- Becker, G. S. (1962). Investments in human capital: a theoretical analysis. *Journal of Political Economy*, 70(5), pp. 9–49.
- Bleikh, H. (2018). [Back and forth: Commuting for work in Israel](#). Policy Paper 05.2018. Jerusalem: Taub Center for Social Policy Studies in Israel.
- Blenkinsopp, J., & Scurry, T. (2007). “Hey GRINGO!”: The HR challenge of graduates in non-graduate occupations. *Personnel Review*, 36(4), 623–637.
- Büchel, F., & Van Ham, M. (2003). Overeducation, regional labor markets and spatial flexibility. *Journal of Urban Economics*, 53, 482–493.
- Büchel, F., & Mertens, A. (2004). Overeducation, undereducation, and the theory of career mobility. *Applied Economics*, 36(8), 803–816.
- Capsada-Munsech, Q. (2017). [Overeducation: Concept, theories, and empirical evidence](#). *Sociology Compass*, 11(10), 1–17.
- Cedefop (2010). *The skill mismatch challenge: Analysing skill mismatch and policy implications*. Luxembourg, EU Publications Office.
- Cedefop (2012). *Preventing skill obsolescence: Briefing note*. Luxembourg, EU Publications Office.
- Chevalier, A. (2003). Measuring overeducation. *Economica*, 70(279), 509–531.
- Chiswick, B. R. (1998). Hebrew language usage: Determinants and effects on earnings among immigrants in Israel. *Journal of Population Economics*, 11(2), 253–271.
- Devillanova, C. (2013). Overeducation and spatial flexibility: New evidence from Italian survey data. *Papers in Regional Science*, 92(3), 445–464.
- Farooq, A. (2016). *The U-shape of overeducation? Human capital dynamics & occupational mobility over the lifecycle*. Washington, DC: Center for Equitable Growth.
- Frank, R. H. (1978). Why women earn less: The theory and estimation of differential overqualification. *The American Economic Review*, 68(3), 360–373.
- Freeman, R. (1976). *The overeducated American*. Academic Press, New York: Academic Press.
- Hanushek, E. A. (2016). Will more higher education improve economic growth? *Oxford Review of Economic Policy*, 32(4), 538–552.
- Hersch, J. (1991). Education match and job match. *The Review of Economics and Statistics*, 73(1), 140–144.

- ILO (2014). *Skill mismatch in Europe: Statistics brief*. Geneva: ILO Publishing.
- Jauhainen, S. (2010). Overeducation in Finnish regional labour markets. *Papers in Regional Science*, 90(3), 573–588.
- Lockwood, B. (1991). Information externalities in the labour market and the duration of unemployment. *Review of Economic Studies*, 58(4), 733–753.
- McGuinness, S., & Pouliakas, K. (2016). *Deconstructing theories of overeducation in Europe: A wage decomposition approach*. Discussion Paper No. 9698, IZA-Institute for the Study of Labor.
- Münich, D., & Psacharopoulos, G. (2018). *Education externalities What they are and what we know*. European Expert Network on Economics of Education (EENEE), Analytical report No.34.
- OECD (2018). *Education at a glance 2018: OECD indicators*. Paris: OECD Publishing.
- Quintini, G. (2011). *Over-qualified or under-skilled: A review of existing literature*. OECD Social, Employment and Migration Working Papers, No. 121, Paris.
- Ramos, R., & Sanroma, E. (2011). *Overeducation and local labour markets in Spain*. Discussion Paper No. 6028, IZA- Institute for the Study of Labor.
- Romanov, D., Tur-Sinai, A., & Eizman, G. (2008). *Overeducation, job mobility, and earnings mobility among holders of first degrees in Israel*. Working Paper Series No. 39. Jerusalem: Central Bureau of Statistics Publishing.
- Sicherman, N. (1991). Overeducation in the labor market. *Journal of Labor Economics*, 9(2), pp. 101–122.
- Sicherman, N., & Galor, O. (1990). A theory of career mobility. *Journal of Political Economy*, 98(1), pp. 169–192.
- Spence, M. (1973). Job market signaling. *Quarterly Journal of Economics*, 87(3), 355–374.
- Torche, F. (2013). Is a college degree still the great equalizer? Intergenerational mobility across levels of schooling in the United States. *American Journal of Sociology*, 117(3), 763–807.
- Van de Ven, W., & Van Praag, B. (1981). The demand for deductibles in private health insurance: A Probit Model with sample selection. *Journal of Econometrics*, 17(2), 229–252.
- Weiss, A. (1995). Human capital vs. signalling explanations of wages. *Journal of Economic Perspectives*, 9(4), pp. 133–154.
- Yang, Y., Fu, W. J., & Land, K. C. (2004). A methodological comparison of age-period-cohort models: The intrinsic estimator and conventional generalized linear models. *Sociological Methodology*, 34(1), 75–110.
- Yao, Y., & Van Ours, J.C. (2015). Language skills and labor market performance of immigrants in the Netherlands. *Labour Economics*, 34, 76–85.

Hebrew

CBS (2016). [*Selected data on the immigrants from the former Soviet Union, on the occasion of 25 years to their Aliyah*](#). Jerusalem: Central Bureau of Statistics.

Katz, O. (2017). [*Overeducation in Israel*](#). Policy Paper No. 36. Jerusalem: Kohelet Policy Forum.

Miaari, S., & Lazarus, A. (2015). [*Educational occupational mismatch as a generator of income inequality in Israel*](#). Jerusalem: The Israel Democracy Institute.

Zussman, N., Lipiner, I., & Rosenfeld, D. (2020). [*Over-education and mismatch between occupation and major subject among university and college graduates*](#). Research paper. Jerusalem: Bank of Israel.

Appendix

Appendix Table 1. Regression analysis: Factors affecting overeducation and employment

Probit model with correction for sample selection

	Overeducation equation, all workers (1)	Selection equation, all workers (2)	Overeducation equation, men (3)	Selection equation, men (4)	Overeducation equation, women (5)	Selection equation, women (6)	Overeducation equation, without immigrants (7)	Selection equation, without immigrants (8)
Age (Base: 25–29)								
30–34	-0.0093	0.436***	-0.117	0.696***	0.0167	0.278**	-0.0747	0.465***
35–39	0.033	0.436***	-0.0337	0.814***	0.0307	0.175	-0.0715	0.505***
40–44	-0.0917	0.595***	-0.166	0.789***	-0.0514	0.438***	-0.142	0.649***
45–49	-0.0963	0.670***	-0.22	0.828***	0.0349	0.510***	-0.185*	0.654***
50–54	-0.0458	0.723***	-0.206	0.667***	0.172	0.765***	-0.121	0.722***
55–59	0.0101	0.497***	-0.216	0.652***	0.290**	0.332**	-0.17	0.482***
60–64	0.260**	-0.0204	0.232	0.106	0.364**	-0.256	-0.00117	-0.0631
Population group (Base: Long-time residents)								
Immigrants 1990–1995	0.0314	0.403***	0.0249	0.495***	0.04	0.357***		
Immigrants from 1996	0.349***	0.284**	0.450***	0.0382	0.346***	0.414***		
Arab Israelis	0.132	-0.15	0.213*	0.178	-0.0215	-0.424***	0.224**	-0.103
Women	0.171***						0.154***	
Married	-0.0902	-0.359***	-0.291***	0.0565	-0.0326	-0.597***	-0.159**	-0.357***

Appendix Table 1 (continued). Regression analysis

	Overeducation equation, all workers (1)	Selection equation, all workers (2)	Overeducation equation, men (3)	Selection equation, men (4)	Overeducation equation, women (5)	Selection equation, women (6)	Overeducation equation, without immigrants (7)	Selection equation, without immigrants (8)
With disabilities	0.205**	-0.581***	0.396***	-0.893***	0.0352	-0.390***	0.273**	-0.584***
Full-time employment	-0.271***		-0.260*		-0.289***		-0.266***	
Employee	0.0628		-0.072		0.14		-0.00851	
Job tenure (Base: Less than 1 year)								
1–4 years	-0.0258		0.0201		-0.0174		0.00565	
5–9 years	-0.0382		-0.00661		-0.0494		0.0102	
10–14 years	-0.00187		0.143		-0.118		0.0454	
15–19 years	-0.0672		-0.0472		-0.114		0.0618	
20–24 years	-0.17		-0.0387		-0.312**		-0.0666	
25 years or more	-0.353***		-0.317*		-0.424**		-0.232	
Academic degree (Base: BA)								
MA	-0.568***	0.158***	-0.540***	0.0972	-0.560***	0.187**	-0.683***	0.126*
PhD	-0.982***	0.537***	-1.107***	0.374*	-0.932***	0.612**	-0.822***	0.716***
Degree earned abroad	0.364***	-0.526***	0.311***	-0.622***	0.347***	-0.461***	0.103	-0.470***
Hebrew proficiency good or excellent	-0.593***	0.175*	-0.734***	-0.0751	-0.462***	0.305**	-0.328*	0.526***

Appendix Table 1 (continued). Regression analysis

	Overeducation equation, all workers (1)	Selection equation, all workers (2)	Overeducation equation, men (3)	Selection equation, men (4)	Overeducation equation, women (5)	Selection equation, women (6)	Overeducation equation, without immigrants (7)	Selection equation, without immigrants (8)
Additional wage earners in household (Base: no wage earners)								
1	-0.155*	1.592***	-0.235***	0.886***	0.104	2.041***	-0.0277	1.613***
2+	0.0531	0.164**	-0.00149	-0.0787	0.197*	0.222***	0.0413	0.236***
Commute time (Base: Up to 30 minutes)								
30–44 minutes	-0.188***		-0.146*		-0.222***		-0.166**	
45–59 minutes	-0.345***		-0.453***		-0.220**		-0.285***	
60+ minutes	-0.443***		-0.371***		-0.593***		-0.360***	
Mode of transportation (Base: car)								
Bus	0.419***		0.377***		0.441***		0.341***	
Train	0.231*		0.409**		0.112		0.317**	
Organized transportation	0.260**		0.314**		0.128		0.0139	
By foot/bicycle	0.216***		0.260**		0.242**		0.0872	
Academic field of study (Base: Humanities, languages, literature, other)								
Education and teaching	-0.359***	0.313***	-0.669***	-0.19	-0.207*	0.436***	-0.353***	0.326***
Arts	-0.592***	0.096	-0.719***	-0.423	-0.489***	0.305	-0.618***	0.0978
Social sciences	-0.231**	-0.0484	-0.316**	-0.34	-0.158	0.0362	-0.236**	-0.0123

Appendix Table 1 (continued). Regression analysis

	Overeducation equation, all workers (1)	Selection equation, all workers (2)	Overeducation equation, men (3)	Selection equation, men (4)	Overeducation equation, women (5)	Selection equation, women (6)	Overeducation equation, without immigrants (7)	Selection equation, without immigrants (8)
Business, administration	-0.435***	0.128	-0.532***	-0.126	-0.311**	0.15	-0.435***	0.191
Law	-0.700***	0.011	-0.556***	-0.136	-0.888***	-0.0364	-0.830***	0.0258
Medicine	-1.319***	0.226	-1.575***	0.149	-1.203***	0.256	-1.541***	0.0748
Paramedical professions	-1.120***	0.504***	-1.328***	0.434	-1.019***	0.545***	-0.913***	0.453***
Academic field of study (Base: Humanities, languages, literature, other)								
Mathematics, statistics, computer science	-0.575***	-0.0156	-0.731***	-0.375	-0.457**	0.215	-0.664***	-0.104
Physical sciences	-0.341*	0.0133	-0.613**	-0.133	-0.0697	0.0441	-0.342	-0.124
Biological sciences	-0.133	0.0339	0.0111	-0.48	-0.223	0.203	-0.0296	0.0218
Engineering, architecture	-0.640***	0.258**	-0.783***	0.113	-0.526***	0.201	-0.829***	0.303**
Industry (Base: Manufacturing)								
Wholesale/Retail trade; vehicle repair	0.549***		0.535***		0.507***		0.477***	
Information, communication	-0.911***		-0.782***		-1.088***		-0.872***	
Financial and insurance services	0.332***		0.179		0.373***		0.304***	
Professional services, science and technicians	-0.930***		-1.169***		-0.817***		-0.948***	
Local administration, public administration and security; National insurance Institute	0.328***		0.603***		0.027		0.337***	

Appendix Table 1 (continued). Regression analysis

	Overeducation equation, all workers (1)	Selection equation, all workers (2)	Overeducation equation, men (3)	Selection equation, men (4)	Overeducation equation, women (5)	Selection equation, women (6)	Overeducation equation, without immigrants (7)	Selection equation, without immigrants (8)
Education	-1.164***		-1.060***		-1.292***		-1.184***	
Healthcare and welfare services	-0.569***		-0.345**		-0.731***		-0.726***	
Other	0.450***		0.573***		0.249**		0.461***	
District (Base: Jerusalem district)								
Safed, Kinneret, Golan	0.0139	0.358*	-0.0465	0.247	0.0356	0.453*	-0.149	0.234
Jezreel	0.0611	-0.032	0.00247	-0.169	0.0844	0.0215	-0.0522	-0.174
Acco	-0.00685	-0.186	-0.0203	-0.262	-0.0186	-0.112	-0.224	-0.273
Haifa	0.168*	0.034	-0.00751	0.313	0.263**	-0.13	0.0463	-0.0966
Hadera	0.213*	-0.103	0.131	0.0126	0.239	-0.224	0.107	-0.234
The Sharon	0.0104	-0.0816	-0.0316	-0.101	0.0394	-0.128	-0.0917	-0.194
Petah Tikvah	0.0722	0.00094	0.108	0.173	-0.0102	-0.0966	0.0331	-0.0583
Ramla	-0.0571	-0.00521	-0.125	0.126	0.0157	-0.167	-0.172	-0.174
Rehovot	0.01	-0.00339	0.136	0.181	-0.0883	-0.107	-0.0694	-0.141
Tel Aviv	-0.137	-0.0489	-0.231*	0.168	-0.105	-0.199	-0.231**	-0.162
Ashkelon	0.0619	0.062	0.176	0.0673	-0.0184	0.054	-0.0726	0.0572
Be'er Sheva	0.00413	-0.00727	0.137	-0.166	-0.116	0.191	-0.119	-0.199
Judea, Samaria	0.0739	-0.0593	0.166	-0.272	0.00702	0.0728	0.0475	-0.0816

Appendix Table 1 (continued). Regression analysis

	Overeducation equation, all workers (1)	Selection equation, all workers (2)	Overeducation equation, men (3)	Selection equation, men (4)	Overeducation equation, women (5)	Selection equation, women (6)	Overeducation equation, without immigrants (7)	Selection equation, without immigrants (8)
Survey year (Base: 2015)								
2016	0.0938	-0.0579	0.0184	0.187	0.136	-0.201**	0.0904	-0.0449
2017	0.0177	-0.0908	-0.167*	0.0626	0.145*	-0.213**	0.0156	-0.101
2018	-0.0302	7.143***	-0.135	7.302***	0.0636	7.262***	-0.0484	6.988***
2109	-0.0147	0.00271	-0.156*	0.117	0.0658	-0.0593	-0.0216	-0.0147
Selection variable								
Women		-0.233***						-0.272***
With children under age 5		0.533***		0.272**		-0.229**		0.548***
Women x children under age 5		-0.792***						-0.756***
Constant	0.652***	0.361*	1.304***	0.568*	0.284	0.238	0.601**	0.0844
rho (p)	-0.336*		-0.645***		0.057			-0.185
Number of observations	8,186		3,525		4,661		6,465	

Note: Significance levels: * p < 0.1; ** p < 0.05; *** p < 0.01.
Source: Haim Bleikh, Taub Center | Data: CBS, Social Survey 2015–2019

**Appendix Table 2. The influence of timing of job change on overeducation:
The interaction between job tenure and age**

Overall population		
	Low tenure (up to 4 years)	-0.201
Age	30–34	-0.130
	35–39	-0.0519
	40–44	-0.278*
	45–49	-0.335**
	50–54	-0.403**
	55–59	-0.372**
	60–64	-0.0972
Interaction	Low tenure x 30–34	0.132
	Low tenure x 35–59	0.0256
	Low tenure x 40–44	0.223
	Low tenure x 45–49	0.292
	Low tenure x 50–54	0.613***
	Low tenure x 55–59	0.629***
	Low tenure x 60–64	0.532**
Number of observations		8,186
Without immigrants		
	Low tenure (up to 4 years)	-0.140
Age	30–34	-0.136
	35–39	-0.0741
	40–44	-0.247
	45–49	-0.324*
	50–54	-0.394**
	55–64	-0.395**
Interaction	Low tenure x 30–34	0.0547
	Low tenure x 35–39	-0.0981
	Low tenure x 40–44	0.135
	Low tenure x 45–49	0.166
	Low tenure x 50–54	0.543**
	Low tenure x 55–64	0.614***
Number of observations		6,465

Note: Controlled variables as per the model in Appendix Table 1, columns 1 and 7.

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Source: Haim Bleikh, Taub Center | Data: CBS, Social Survey 2015–2019

Appendix Table 3. The influence of Hebrew language proficiency and country where academic degree was earned on overeducation

Hebrew proficiency	Good or excellent	-0.526***
Academic degree	Earned abroad	0.0604
Immigrant status	Immigrants 1990–1995	-0.0446
	Immigrants after 1996	0.12
	Arab Israelis	0.188**
Interaction	Immigrants 1990–1995 x Degree abroad	0.550***
	Immigrants after 1996 x Degree abroad	0.648***
	Arab Israelis x Degree abroad	-0.0371
Number of observations		8,186

Note: Controlled variables as per the model in Appendix Table 1, column 1.

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Source: Haim Bleikh, Taub Center | CBS, Social Survey 2015–2109

Appendix Table 4. Research variables: Descriptive statistics among degree holders, ages 25–64

	Relative frequency (%)	Number of observations
Gender		
Men	44.9	3,504
Women	55.1	4,306
Age group		
25–29	10.3	801
30–34	17.7	1,384
35–39	16.8	1,314
40–44	16.4	1,278
45–49	13.1	1,025
50–54	9.9	775
55–59	8.8	688
60–64	7.0	545
Population group		
Long-time residents	69.4	5,421
Immigrants 1990–1995	11.2	875
Immigrants after 1996	9.4	733
Arab Israelis	10.0	781

Appendix Table 4 (continued). Research variables: Descriptive statistics

	Relative frequency (%)	Number of observations
Family status		
Married	76.5	5,975
Unmarried	23.5	1,835
Physical limitations or disabilities		
No disabilities	95.6	7,463
With disabilities	4.4	347
Employment status		
Full-time position	85.4	6,594
Part-time position	14.6	1,126
Employment status		
Employee	86.0	6,715
Self-employed	14.0	1,092
Tenure at current place of employment		
Less than a year	9.1	707
1–4 years	34.2	2,665
5–9 years	20.8	1,623
10–14 years	13.1	1,023
15–19 years	8.8	686
20–24 years	7.1	553
Over 25 years	6.8	532
Academic degree		
BA	62.3	4,867
MA	34.5	2,692
PhD	3.2	251
Country where academic degree was earned		
Israel	83.3	6,422
Abroad	16.7	1,286
Hebrew language proficiency		
Good or excellent	91.2	7,121
Less than good	8.8	689
Wage earners in household		
No wage earners	21.2	1,653
1	67.1	5,243
2+	11.7	914
Commute time to work		
Up to 30 minutes	52.0	4,040

Appendix Table 4 (continued). Descriptive statistics

	Relative frequency (%)	Number of observations
30–44 minutes	17.3	1,343
45–59 minutes	13.0	1,012
Over 60 minutes	10.9	844
Work from home, no set amount of time	6.9	537
Mode of transportation to work		
Car	71.0	5,519
Bus	10.6	822
Train	3.3	259
Organized transportation	3.1	238
By foot/bicycle	7.3	564
Other, work from home	4.9	377
Academic field of study		
Social sciences	18.8	1,449
Humanities, languages, literature other	5.9	454
Physical sciences	1.9	144
Business administration	14.9	1,145
Arts	3.4	262
Engineering, architecture	16.1	1,240
Education, teaching	14.5	1,117
Mathematics, statistics, computer science	5.0	383
Biological sciences	3.1	236
Law	6.4	494
Paramedical professions	4.9	376
Medicine	2.9	226
Industry		
Manufacturing	9.6	739
Wholesale/Retail trade; vehicle repair	6.7	511
Information and communication	8.6	663
Financial and insurances services	5.6	427
Professional services, science and technicians	13.5	1,039
Local/public administration/security; NII	6.4	493
Education	21.7	1,668
Healthcare and welfare services	14.3	1,097
Other	13.6	1,048

Source: Haim Bleikh, Taub Center | Data: CBS, Social Survey 2015–2019

SOCIAL WELFARE

4

The Social Welfare System and the Coronavirus Crisis: An Overview

John Gal and Shavit Madhala

Abstract

After two years of stability with no major initiatives in social welfare policy in Israel, this year of the coronavirus crisis has led to a dramatic change in the response to social problems. The protective measures taken against the pandemic and the accompanying mass unemployment created economic and social distress among many groups in Israeli society. The lack of economic and social security will apparently be with us for a long time to come. It is already clear that the crisis has increased levels of poverty and inequality, which were already high prior to the crisis, and for the foreseeable future, the unemployment rate is expected to continue to be much higher than previously. As the data in this chapter show, one of the groups most affected is young adults, and it appears that the solutions being provided to them are insufficient. As part of the welfare state's response to the social distress caused by the coronavirus crisis, the expenditure on social security and on social welfare grew in 2020 to about NIS 183 billion, an exceptionally large increase of 47 percent relative to the previous year. As in the case of other welfare states, Israel has focused primarily on providing social protection. The safety net extended by the State of Israel involved the expansion of coverage by the social security system, and in particular the program for unemployment insurance (after years of this program being whittled down), an increase in disability pensions, the provision of financial assistance to the self-employed who are not eligible for unemployment insurance, and an expansion of the

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wage subsidy program. Social investment programs with the goal of providing opportunities for suitable employment, such as the expansion of vocational training and employment support, were promised, but have not been implemented on a significant scale.

Introduction

The coronavirus pandemic and the response to its social and economic fallout have generated a dramatic turnaround in the various components of the social welfare system in Israel, particularly in how it deals with the unemployed and the provision of a social security safety net. After two years that were characterized by stagnation in the area of social welfare (Gal & Bleikh, 2019), during which there was a lack of any significant changes or initiatives in the system, this year the social welfare system has faced a unique phenomenon it had not previously encountered. The economic recession that resulted from the pandemic and the massive unemployment that accompanied it have had a deleterious effect on the incomes of hundreds of thousands of families over a period of many months. The main victims are populations with a weak labor market status who have few support systems and little economic cushion. As will be discussed, this is particularly true of younger workers. Moreover, the social distancing and quarantine that has been imposed on various groups in the population, and primarily the elderly, the ill, and those with serious disabilities, has exacerbated their distress. The response of the social security and social welfare systems to this reality and the attempt to provide a safety net and assistance to those returning to the labor market constitute a formidable task that requires not only significant resources but also modifications to the existing systems in order to meet the new challenges and to find solutions to an unexpected reality. Even after the expansion of these systems and their level of generosity, the response is clearly insufficient and does not encompass all victims of the pandemic and the economic crisis. It is already clear that the adverse effects of the crisis will be felt for a long time and that they are likely to increase the incidence of poverty and worsen inequality — two facets of Israeli society that were exceptionally high prior to the crisis (OECD, 2020).

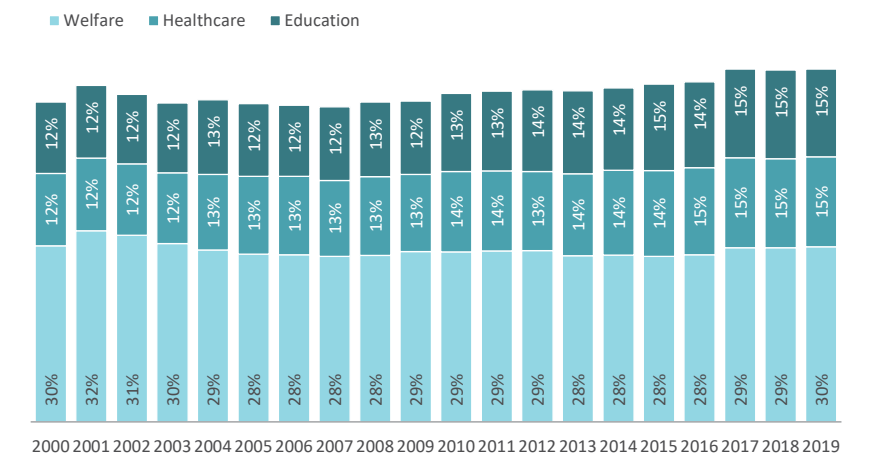
In this chapter, we describe the response of the social welfare system in Israel to the social reality created in 2020 by examining the social welfare policy over time and in comparison to other countries. In addition, we highlight the impact of the crisis using available preliminary data. We first present the

data for social expenditure and how it changed during 2020. Following that, we focus on the main social welfare policies adopted this year following the onset of the coronavirus pandemic by examining the activities of the National Insurance Institute, the Ministry of Finance, and other relevant ministries. We then examine the implications of the crisis for Israel’s citizens and, in particular, the young. Finally, and as in previous reports, we present an update on the implementation of the recommendations of the Elalouf Committee for the War Against Poverty.

Social expenditure before and during the coronavirus crisis

In 2019, a year in which Israel was characterized by political instability and the absence of a clear economic policy, overall social expenditure was basically unchanged relative to the two preceding years (Figure 1). The social expenditure in that year totaled about NIS 251 billion, of which about NIS 124 billion was devoted to welfare (about NIS 19 billion to social services and about NIS 106 billion to social security).

Figure 1. Social expenditure in Israel by category
As a percentage of total government expenditure

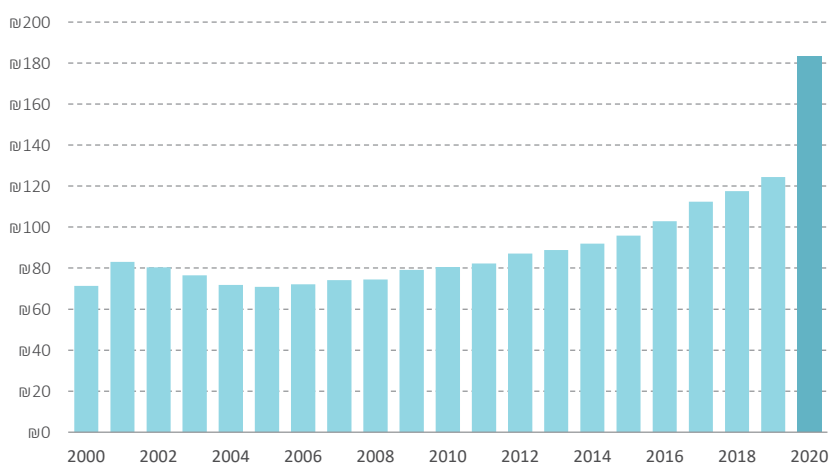


Source: John Gal and Shavit Madhala, Taub Center | Data: Ministry of Finance

Figure 2 clearly shows the dramatic change in the trend of expenditure on welfare in Israel. The economic and social impact of the coronavirus crisis and the social welfare policy in response to it are clearly visible in the budgetary additions in 2020. On the basis of the NII expenditure data and the planned allocations, we estimate that the budget expenditure on welfare in 2020 will reach about NIS 183 billion — NIS 58 billion more than in the previous year. Of that, about NIS 7 billion represents a natural increase in the budget (on the basis of the growth in the budget from 2018 to 2019) and an addition of about NIS 900 million following an agreement with people with disabilities to raise the level of their cash benefits, while the rest — about NIS 50 billion — is composed of budget additions to deal with the coronavirus crisis. Overall, this represents a 47 percent increase in welfare expenditure, as compared to about 6 percent in the previous year.

Figure 2. Expenditure on welfare in Israel

NIS billions, 2019 prices



Source: John Gal and Shavit Madhala, Taub Center | Data: Ministry of Finance

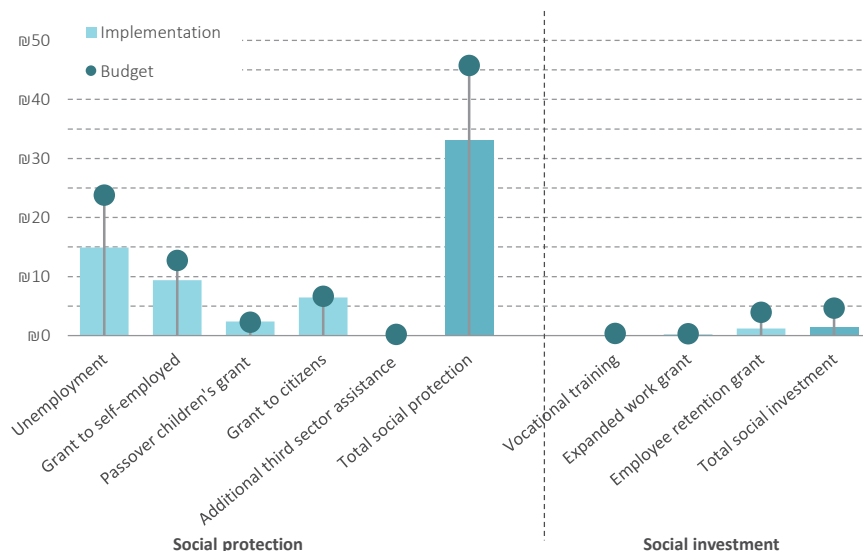
Social investment versus social protection

Not only did the expenditure on welfare in 2020 increase significantly, but the characteristics of that increase represented a deviation from recent trends, which reflected a balance between the components of expenditure focusing on the present and those focusing on the future. This is based on the distinction between expenditure for social protection, namely responses meant to ease financial and social distress in the present, and expenditure intended as social investment to help individuals develop their skills and human capital so as to better integrate into the labor market (Gal, Madhala & Yanay, 2020). During the past decade, there has been a major increase in social expenditure in Israel for purposes of social investment; however, the current crisis has led to a dramatic turnaround in this trend. Most of this year's additional social expenditure is directed at strengthening the safety net for individuals in the present and only a small share is directed to nurturing and upgrading employment skills for the future. Figure 3 presents the welfare expenditure on the assistance program in response to the coronavirus crisis, broken down according to expenditure characterized as social protection and expenditure characterized as social investment.¹ The graph shows a large gap between expenditure on social protection, which provides a safety net and which totaled about NIS 46 billion in terms of planning and about NIS 33 billion in terms of execution (up until the end of October), and expenditure on social investment, which in terms of planning stood at about NIS 4.7 billion, but was only NIS 1.5 billion in terms of execution (up until the end of October). The implication is that, as of now, even the modest budget that was allocated for investment, such as vocational training and expansion of employment programs aimed at specific populations, has hardly been used, despite the declarations of economic policy makers.

1 It is worth mentioning that the assistance program includes other items that are not related to social welfare and are not included in the above analysis, such as grants to businesses and exemptions from municipal taxes for businesses.

Figure 3. Expenditure on welfare within the assistance program in response to the coronavirus crisis, by category

NIS billions



Note: The data are up to the end of October 2020.

Source: John Gal and Shavit Madhala, Taub Center | Data: Ministry of Finance

Social policy during the coronavirus crisis

An international comparison

As in Israel, policy makers in other welfare states have chosen to invest primarily in social protection during the crisis, employing a wide variety of policy tools (ILO, 2020a). This is intended to ease the distress of individuals, while at the same time encouraging them to return to the labor market. The policy measures adopted in each country diverge due to the nature of the countries' social security systems, the characteristics of their labor market, and political and conceptual considerations. Nonetheless, the process was also characterized by rapid cross-national learning during the initial months of the crisis. An examination of the policy adopted in the various welfare states, including Israel, highlights two of these trends: the similarity between the measures adopted alongside a certain amount of variation across countries.

As can be seen in Table 1, almost all of the countries surveyed made adjustments to their unemployment insurance program during the coronavirus crisis. Nevertheless, the scope of the adjustments and also the extent to which the program served as the main policy tool to deal with the social and economic impact of the crisis differed from country to country. In Israel, the adjustments were on a particularly large scale (see below for further details). This is related both to the fact that the Israeli unemployment insurance program prior to the crisis was “lean” in that it offered limited protection and support to the unemployed, and the fact that it has become the main safety net during the crisis. Two countries that took a similar route are the US, in which the Congress adopted legislation that lengthened the period of eligibility for unemployment insurance and increased the unemployment insurance benefits by \$600 per week, and Spain, in which the conditions for eligibility for unemployment insurance were temporarily canceled and the program was expanded to include domestic workers. In contrast, in other countries, such as France, the changes in the unemployment insurance program were marginal and focused primarily on lengthening the period of eligibility or shortening the required qualification period for eligibility for unemployment insurance benefits. Unlike Israel, in which workers on unpaid leave received unemployment insurance, in the social democratic welfare states (Sweden and Denmark), in the conservative welfare states (Germany and France), and even in the UK, greater emphasis was placed on compensation through employers. In these countries, part of the employees’ wages were paid for even during their leave of absence from work, in order to maintain the continuity of their link with the labor market. Thus, for example, in Denmark, the state covered 75 percent of the salaries of furloughed employees if the company was forced to reduce its total manpower by at least one-third, while in Germany the *Kurzarbeit* program allows businesses to reduce the work hours of their employees (instead of firing them), and in exchange, they receive government funding in the amount of 60 to 70 percent of the salaries for the work hours that were cut, which is then passed on to the worker.

Only a few of the surveyed countries adopted one-time assistance payments to individuals during the crisis. In the US, the federal government distributed an amount of \$1,200 to every adult resident who earned an annual salary of up to \$75,000 and \$500 for each of their children. In Italy, the government adopted a similar program of assistance but only for workers in specific sectors (such as domestic workers) who were not eligible for

unemployment insurance. Israel adopted this policy tool in two rounds (see below for further details). Unlike in the welfare states, in many developing countries that lack an unemployment insurance scheme with broad coverage of the population, selective safety nets were the main tools for dealing with the coronavirus crisis (Gentilini, Almenfi, Dale, Lopez & Zafar, 2020). Apart from Spain, which allocated additional resources to its welfare services and to assistance payments, none of the surveyed welfare states, including Israel, made significant adjustments to programs of this type and they acted as a system aimed solely at the unemployed who are not eligible for unemployment insurance payments for one reason or another. With respect to workers who were forced to be in quarantine as a result of infection or suspected infection, the welfare states either made use of existing sick pay programs (as in the case of Germany, Denmark, Sweden, Israel, and the UK), modified those programs (as in the case of France and the US) or modified the worker compensation program (as in the case of Spain).

Table 1. A comparison of social protection policies during the coronavirus crisis

	Extension of unemployment benefits	Extension of work subsidy programs	One-time, universal assistance programs	Extension of selective assistance programs	Direct assistance to workers/ coronavirus patients	Economic assistance to the self-employed
ISRAEL	X		X		X	X
US	X		X		X	X
UK	X	X			X	X
Germany	X	X			X	X
France	X	X			X	X
Sweden	X	X			X	
Denmark		X			X	X
Spain	X			X	X	X
Italy	X				X	

Source: John Gal and Shavit Madhala, Taub Center | Data: OECD Country Policy Tracker, The NII Safety Net

The National Insurance Institute's safety net

In order to deal with the consequences of the coronavirus crisis, the government assigned the main responsibility to the National Insurance Institute (NII) for providing a safety net to the hundreds of thousands of individuals who had been laid off or sent on unpaid leave. The limitations of the unemployment insurance program and the huge burden of the claims that the NII officials were required to process impeded the functioning of the system, at least during the early part of the crisis. The months following the onset of the crisis were characterized by efforts to adapt the unemployment insurance program to the emerging reality and efforts to complement it with additional measures to provide a safety net to the general population, particularly in the case of individuals not eligible for unemployment insurance. These measures were required in order to modify the unemployment insurance program in Israel — which had been one of the less accessible and less generous programs relative to other welfare states — to the evolving reality. Among the measures taken:

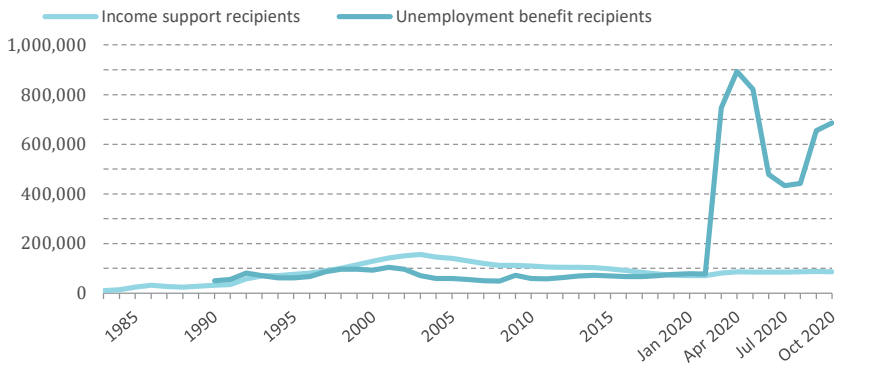
1. **The maximum period of eligibility.** Prior to the crisis, the maximum eligibility period for unemployment insurance benefits ranged from 50 to 175 days (according to age and number of dependent family members). A few months after the onset of the crisis, the eligibility period for all recipients was extended until the end of June 2021, both for individuals who had exhausted their period of eligibility in the months prior to the crisis and those whose period of eligibility was meant to end during 2020. The only qualification to this is that should the unemployment rate drop below 7.5 percent of the labor force, the extension will be terminated within 30 days.
2. **The qualification period.** Prior to the crisis, the qualification period (the period during which an individual had to have worked and paid the national insurance premium before being laid off) was 12 months and an individual who did not fulfill this condition was not eligible for unemployment insurance. This period has now been cut in half — to six months.
3. **Dual benefit payments.** In the past, there was no possibility of receiving multiple benefits. It has now been decided that an individual who receives other government cash benefits (such as the old age pension, alimony, income support, and general disability allowance) and was laid off or sent on unpaid leave as a result of the crisis could receive unemployment insurance and it will be considered as income.

4. **The waiting period.** The original unemployment insurance law specified a five-day waiting period in every four-month period. Thus, someone who was defined as eligible for unemployment insurance was forced to wait five days until receipt of the unemployment insurance payment at the beginning of the eligibility period and a similar period after four months had passed. Currently, it has been decided that the five-day waiting period at the beginning of the period of eligibility is sufficient.
5. **The age criterion.** The level of the unemployment insurance payment in Israel varied according to the beneficiary's age. An individual under age 28 received less than someone over age 28 (Gal & Madhala-Brik, 2016). It has now been decided that an individual younger than 28 with a child is eligible for unemployment insurance at a similar level to individuals over 28.
6. **Vocational training.** In 2002, it was decided to reduce the benefit level of unemployment insurance recipients participating in a vocational training program from 100 percent to 70 percent. As a result of the crisis, it was decided that individuals in vocational training will receive the full unemployment insurance payment.

In addition to these modifications, in November, the Knesset Labor, Welfare, and Health Committee approved a grant of NIS 2,000 for veteran unemployment insurance recipients during this crisis. Similarly, in order to encourage a more rapid return of unemployment insurance recipients to the labor market, the government introduced a grant intended to increase the income of unemployed individuals who return to the labor market at a lower wage than their previous one.

The rising unemployment and the modifications to the unemployment insurance program that were meant to provide a safety net to those hurt by the crisis led to a steep and exceptionally large increase in the number of unemployment insurance recipients, which was the largest since the program was introduced in 1973. The data in Figure 4 show an 13-fold increase in the number of unemployment insurance recipients — from a monthly average of about 70,000 in recent years to about 900,000 in April 2020.

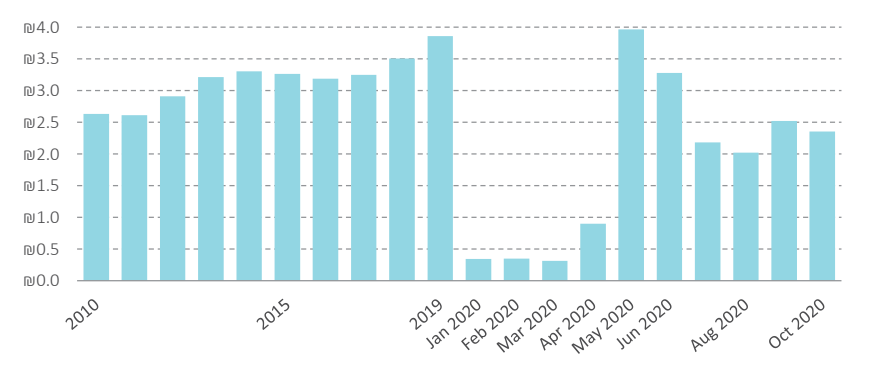
Figure 4. Recipients of unemployment insurance benefits or income support
Monthly average



Source: John Gal and Shavit Madhala, Taub Center | Data: NII

This increase in the number of unemployment insurance recipients is also evident in the level of funding of unemployment insurance, which reflects this year's exceptional reality. Thus, the total cost of unemployment insurance payments to eligible individuals during the first half of 2020 reached NIS 9.2 billion. The dramatic increase is well illustrated by the fact that the total expenditure of the NII on unemployment insurance during the month of May 2020 alone exceeded the expenditure during the entire year of 2019 (see Figure 5).

Figure 5. Total expenditure on unemployment insurance
NIS billions, 2019 prices



Source: John Gal and Shavit Madhala, Taub Center | Data: NII

A breakdown of the recipients of unemployment insurance according to wage level (Figure 6) shows a change in their composition. Prior to the crisis, the share of unemployment insurance recipients whose wage was up to one-half of the national average stood at less than 20 percent while during the months of April–May it doubled to about 40 percent. This statistic reflects the adverse effect on employees in low-paying sectors (Heller, 2020), as well as low-earning employees in sectors that were less affected by the crisis (Ministry of Finance, 2020a). A breakdown of the unemployment data for June shows that even after the first month of the lockdown the unemployed were still characterized by significantly lower wages than those who remained employed (Ministry of Finance, 2020b). However, it should be taken into account that unemployment insurance does not fully compensate for the loss in wages. A Bank of Israel study revealed that the income from labor and from unemployment insurance of households that had at least one salaried employee prior to the crisis and at least one jobseeker during the month of June declined by about 20 percent (Bank of Israel, 2020).

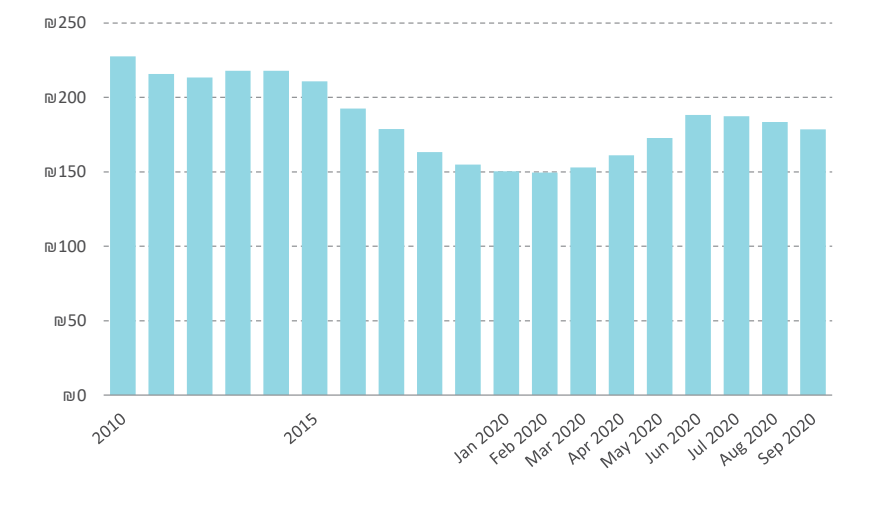
Figure 6. Recipients of unemployment insurance according to wage level



Source: John Gal and Shavit Madhala, Taub Center | Data: NII

The income support program — the traditional safety net of the social security system in Israel — did not undergo a similar increase to that in unemployment insurance. As seen in Figure 4 above, from the adoption of the income support benefit in 1982 and up until 2003 there was a continuous rise in the number of recipients, followed by a sharp decline (the result of cutbacks in the benefit level and eligibility requirements), which continued during recent years. With the onset of the current crisis, this decline has been curbed, and, as can be seen in Figure 7, there was somewhat of an increase in the number of recipients of income support benefits. However, the scope of the increase is unlike the dramatic jump in the number of unemployment insurance recipients. The number of income support recipients rose during the first few months of the year by only about 17 percent — from about 72,000 prior to the crisis to about 84,000 in April. Indeed, the average monthly expenditure on this program during the crisis is still lower than that during the first half of the 2010s. This is apparently related to the relative ease of access to unemployment insurance during this period, to the difference in levels of generosity between the programs, and to the stigma that receipt of the income support benefits carries relative to the normative image of unemployment insurance.

Figure 7. Total income support payments, monthly average
NIS millions, 2019 prices



Source: John Gal and Shavit Madhala, Taub Center | Data: NII

Alongside the expansion of the existing social security systems, the NII was responsible for the implementation of two rounds of government decisions to award universal one-time grants to a large share of the population, in April and in August. In the first round, parents with children received NIS 500 per child, up to a maximum of NIS 2,000 per family. The elderly also received NIS 500 while those with a low income received NIS 950. The recipients of subsistence allowances, i.e., income support, alimony and disability pensions, received a grant of NIS 500. In the second round, a one-time grant of NIS 750 was received by all residents aged 18 or older whose annual income did not exceed NIS 650,000. The recipients of the subsistence pensions (income support, alimony, general disability, and long-term nursing care) received a larger grant of NIS 1,500. In addition, parents of children up to the age of 18 received a grant of NIS 500 for each child up to the fourth and NIS 300 each from the fifth child. The total cost of the two rounds is estimated at NIS 9 billion.

Another interesting development involving the NII this year is the implementation of the agreement with the organizations representing persons with disabilities, which was signed in 2017 and was to be implemented in a number of rounds. In September, the government approved an addition of about NIS 900 million for 2020 which was a continuation of these agreements. As part of the agreement, it was decided to continue raising the level of the general disability allowance and to make changes to the disregard (the maximum income allowed that does not affect eligibility for the disability benefit) for those in the labor force. As the planned increase in the disability allowance was not implemented in 2020 due to the lack of an approved budget, it was decided that the NII would provide a grant to disability pension recipients in the amount of the addition that was agreed upon. The grant was provided in two rounds — in October and in December. Thus, for example, the recipients of a full general disability pension will receive a total of about NIS 2,280 this year. The implementation of the agreement in 2021 is meant to be included in the state budget for 2021.

SPOTLIGHT

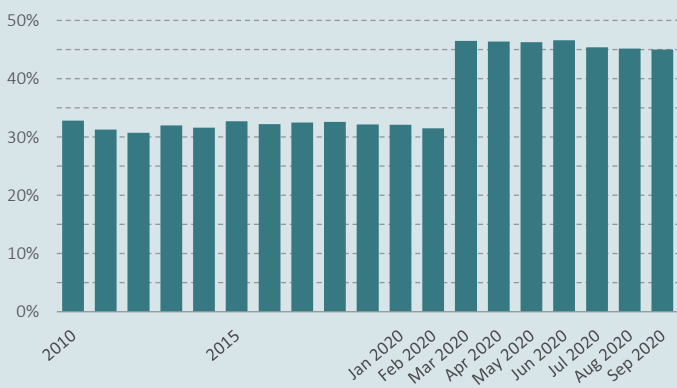
Young adults during the coronavirus crisis

In Israel, as in the rest of the world, the young are the main casualty of coronavirus induced unemployment. This is due to their relatively weak position in the labor market, their tendency to be employed in sectors that have been particularly affected by the crisis, and the lack of an economic cushion in the form of savings. In contrast to the older unemployed, their access to the social security nets is limited in the various countries (ILO, 2020b). In Israel, it was clear from the beginning of the crisis that the employment of young adults would be more impacted. In April, which saw a peak in unemployment, about half a million young adults up to the age of 34 were registered with the Employment Service as jobseekers, out of a total of 1.15 million jobseekers. In other words, about 44 percent of all employed workers who had been fired or furloughed were young adults, while they only constitute about 38 percent of the labor force (according to the 2019 Labor Force Survey). Even after the first lockdown and the return to routine, there remained a particularly high share of young unemployed. The rate of unemployment in July among salaried employees who had been employed in the business sector prior to the crisis was particularly high among young adults and individuals without children (Bank of Israel, 2020).

The figures for unemployment insurance also indicate greater need among young adults. Almost one-half of the recipients of unemployment insurance during the crisis were under the age

of 35, as compared to about 30 percent during the decade prior to the crisis (Figure 8). In numbers, over 400,000 young adults received unemployment insurance payments in April and with the recovery of the economy and the return to routine that number fell to about 200,000 in July, while their share out of total recipients of unemployment insurance remained relatively unchanged.

Figure 8. Share of unemployment recipients under the age of 35



Source: John Gal and Shavit Madhala, Taub Center | Data: NII

The changes in unemployment insurance as a result of the crisis, such as equating payments for individuals up to the age of 28 with a child to those over the age of 28 and the shortening of the qualification period to six months, undoubtedly expanded the number of young eligible recipients and raised the benefits that they received; however, since about 85 percent of the applicants for unemployment insurance under the age of 28 do not have a child,² a large share of them are not benefiting from this expansion and as of now they are eligible for unemployment

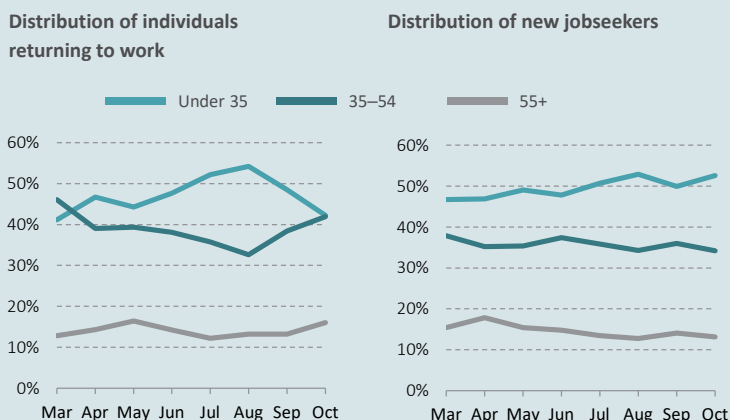
2 Based on NII figures for unemployment insurance applicants during the period March 1, 2020 to May 10, 2020.

insurance benefits of between 25 and 65 percent of their wage, as opposed to between 30 and 80 percent for recipients over 28 or those with a child. With respect to the shortening of the qualification period, the NII figures for May indicate that about 16 percent of unemployment insurance recipients aged 20 to 27 fulfilled the shortened qualification period condition and without the change would not have been eligible for unemployment insurance benefits.

Despite the relative stability reflected in the share of young adults among recipients of unemployment insurance, the figures of the Employment Service for the months following the first wave of the crisis (May to August) with regard to new jobseekers and workers who returned to the labor market indicate relatively large fluctuations among young workers. Figure 9 presents the trends by age groups according to the two parameters. It can be seen that the share of new jobseekers up to age 34, which stood at about 47 percent of total registered jobseekers in March, rose somewhat during the period of the crisis up to October. In parallel to this increase, the share of young adults among workers returning to the labor market rose from 41 percent in March to 54 percent in August. This trend was halted in September with the imposition of the second lockdown, which led to a decline to about 42 percent in the share of young adults among those returning to work.

The high share of young people among both unemployment insurance recipients and new jobseekers registered with the Employment Service is evidence of the upheaval being experienced by young adults. The fluctuations in their share of those returning to the labor market is further evidence of this population's sensitivity to labor market policies adopted during this crisis. Nonetheless, their relatively high share among those returning to the labor market between the two lockdowns may indicate the greater ease with which they can return to work relative to other age groups.

Figure 9. Breakdown of new jobseekers registered with the Employment Service and individuals returning to work by age group



Source: John Gal and Shavit Madhala, Taub Center | Data: Employment Service

Yet, it appears that apart from the adverse effect on their employment situation, a large share of those young adults who were not sent on unpaid leave or fired experienced a drop in their wages. A survey carried out by the Israel Democracy Institute in June indicates that wages declined the most among the 18–24 age group — by about 53 percent relative to the sample average of about 34 percent (Aviram-Nitsan & Keidar, 2020).

In view of the persistence of the crisis, consideration should be given to its future impact on the younger adult population. A prolonged slump in employment, and the employment of young adults in particular, will have long-term effects, such as a reduction in employment experience and pension savings, given that saving at a younger age has the highest return and a large effect on the level of the pension paid out at retirement.

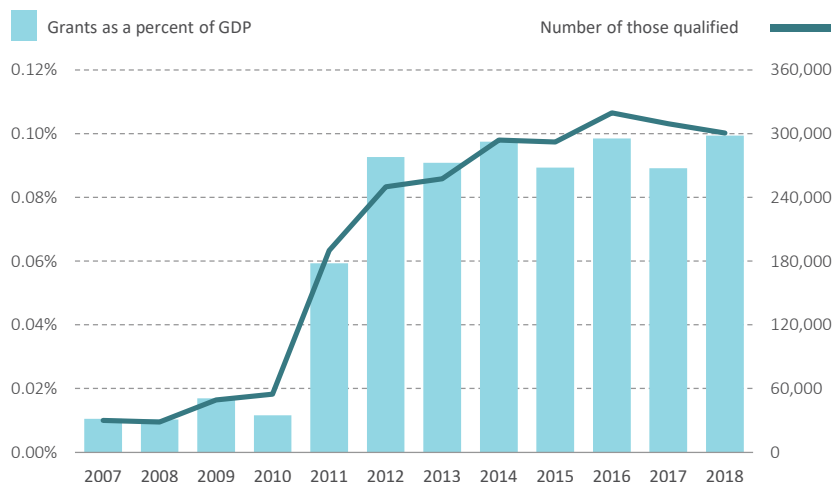
The Ministry of Finance during the coronavirus crisis: A safety net for the self-employed and grants for low-wage earners

During the early months of the coronavirus pandemic, it was clear that the impact on the self-employed, freelancers, and small business owners would be particularly severe, due to both the effects of the economic slowdown and the lockdowns and the fact that they are not covered by the unemployment insurance program. Massive public pressure, including protest activity, led to the creation of a social safety net for this population as well. The safety net included a cash grant for the self-employed which is provided on a bi-monthly basis to self-employed individuals with an annual income of up to NIS 640,000 who were adversely affected by the crisis. Allocation for this funding was about NIS 12.7 billion and, as of October, about 74 percent of that (about NIS 9.4 billion) had been paid out. In addition, assistance grants were provided to cover some of the fixed costs of businesses whose turnover had declined, and an exemption from municipal taxes on businesses for a period of three months was provided to sectors that were particularly affected.

Another tool used to assist those workers whose employment has been adversely affected by the coronavirus is a grant for low-wage earners. This benefit is essentially an implementation of a negative income tax and is a way of increasing the income of low-wage earners with families. This program was introduced in 2011 by the Tax Authority (after a four-year pilot). The expenditure on the program as a percentage of GDP has been relatively stable in recent years at between 0.09 and 0.1 percent (Figure 10). The share of eligible workers who avail themselves of the grant is relatively low at 70 percent, a figure that has also been quite stable in recent years.

The grant is also one of the tools that is part of the government program to deal with the impact of the coronavirus crisis. As part of this program, it was decided to increase the grant by 62 percent for the months of April to December. The cost of this component of the program is estimated at about NIS 320 million, of which NIS 210 million was paid out by the end of October.

Figure 10. Total grant payments as a percentage of GDP and the number of eligible workers



Note: Data for 2018 are not final and are correct as of May 7th, 2020.

Source: John Gal and Shavit Madhala, Taub Center | Data: Ministry of Finance

The Ministry of Labor, Social Affairs and Social Services

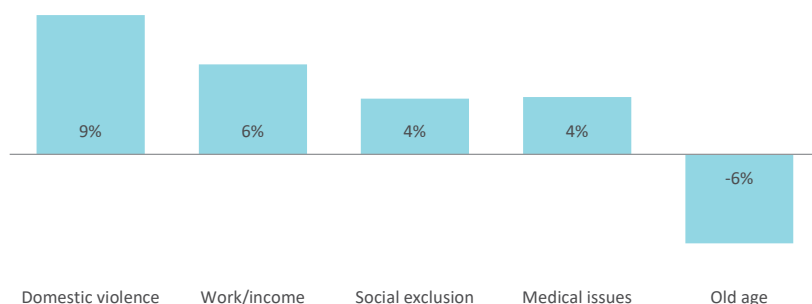
The responsibility for providing assistance to those affected by the coronavirus crisis was assigned to the Ministry of Labor, Social Affairs and Social Services and its social workers. At the same time, the Ministry, through its employment branch, was meant to take a leading role in the process of preparing the newly unemployed to enter the labor market and adapting their skills to match the labor market's needs. During the first six months of the crisis, the main effort was directed toward providing initial assistance to those harmed by the crisis and to adapting the systems operated under the responsibility of the Ministry in local municipalities and the various care institutions to the new reality. This task was particularly daunting in view of the rapid development of distress among the populations dealt with by the Ministry, the heavy burden that the social workers had to deal with, the difficulties being experienced by the non-profit organizations that provide outsourced social services to the Ministry's clients, and the need to adapt care institutions to the crisis and to take extraordinary precautionary measures to prevent infection among the elderly and those with disabilities.

During the early months of the crisis, the need for psychosocial support and material assistance from the social services departments in local municipalities rose. In July, a 47 percent increase was reported in the number of requests received by the departments relative to the previous July and there was an increase of 10 percent in the number of new requests from individuals who were previously unknown to the welfare authorities (Ministry of Labor, Social Affairs and Social Services, 2020). At the same time, there was a large increase in the reports received by welfare services of domestic violence during the crisis. The economic difficulties resulting from the lack of employment, the increased violence within the family due to financial difficulties and lockdown, and the difficulties facing the elderly in need of assistance who cannot leave their homes, are reflected in the number of active welfare cases in October 2020 versus December 2019 (Figure 11). An analysis of the data indicates an increase of 9 percent in the number of active cases of violence, from about 15,000 cases at the end of 2019 to about 16,500 cases in October 2020. There has also been an increase in the number of active case files related to work and income, social exclusion (see details in the figure), and medical issues. In contrast, the only area where there was a notable decline in the number of active cases in this period was among the elderly — from about 134,000 to 126,000 cases. This decline is clearly not indicative of an improvement in the quality of life of the elderly during the last year but more likely is due to limitations on their freedom of movement and obstacles to their actually getting to the social service offices.

Dealing with the new clients and the needs of those with disabilities, the sick, and the elderly confined to their homes or who live in institutions but are cut off from family support systems, has resulted in a particularly heavy workload for social workers and for the non-profit organizations that provide assistance or implement social programs. The workload is intensified by the frustration among social workers with respect to their working conditions and their unreasonable workloads, which undermined even more the already fragile financial situations of a large share of the non-profit organizations. On July 6th, social workers declared a strike that lasted 17 days. The agreement that was finally reached promised a coronavirus grant of NIS 9,000–11,000 per worker. Similarly, it was agreed that during the first months of 2021 a new salary agreement would be negotiated and that in July 2021 social workers would receive additional income totaling NIS 200 million. This is in addition to

the general salary increase to all public sector workers. Finally, it was decided to establish a secure environment for workers at a cost of NIS 70 million per year, which will be incorporated into the state budget.

Figure 11. Rate of change in the number of active welfare cases by main area between December 2019 and October 2020



Note: Social exclusion distress is related primarily to relations between parents and children, youth, and issues of social isolation.

Source: John Gal and Shavit Madhala, Taub Center | Data: Ministry of Labor, Social Affairs and Social Services

Regarding non-profit organizations, the government decided in May to establish an assistance fund for non-profit organizations in the amount of NIS 5.2 billion. The fund provided a one-time grant of NIS 400,000 to non-profit organizations requiring support. In the following month, it was agreed that the Ministry of Labor, Social Affairs and Social Services would provide additional assistance to non-profit organizations involved in social welfare and in assistance to disadvantaged populations in the amount of NIS 53 million.

The social ministries

Aside from the Ministry of Labor, Social Affairs and Social Services, there are two other social ministries that are dealing with the effects of the coronavirus crisis. The first is the Ministry for Social Equality which promotes the interests of the elderly, the young, women, and minorities. As a result of the coronavirus crisis, the needs of these populations have grown and in particular those of the elderly. As a result, the Ministry received an additional budget of NIS 55.5 million in September that is intended primarily for the elderly in

the community. This includes an expansion of the assistance call-lines for the elderly; the expansion of psychosocial solutions for the elderly suffering from loneliness; the telephone mapping of the needs of about half a million elderly individuals; and the organization of activities in public spaces in a safe manner and according to the rules of social distancing.

In addition, the Ministry for Community Empowerment and Advancement — a new ministry established following the formation of the government in May — focused on the recruitment and management of volunteers. The Ministry has two main branches: one that deals with prevention and treatment of extreme phenomena (drugs, alcohol, and violence), and the other that deals with advancement of volunteerism and community building initiatives.

The effects of the crisis on distress and poverty

In a situation in which almost one-quarter of the workforce in Israel has been without work and a source of labor income for an extended period and many of those in need of assistance from the welfare authorities are quarantined without a supportive social environment, it is only natural to see signs of deterioration in the economic, physical, and mental states of many individuals. The scope of the crisis' effects on the population has been estimated by various organizations. The NII has run a number of simulations to estimate the effects of the crisis on poverty and inequality. According to these estimates, in a situation with an average unemployment rate of 20 percent and in the absence of government assistance, there would be an expected rise in the incidence of disposable income poverty of about 14 percent (from 18 percent to 20.5 percent of families according to the CBS Household Expenditure Survey) to 30 percent (from 22.5 percent of families to 29.3 percent according to the administrative dataset).³ This increase is cut in half by unemployment benefits and various grants provided throughout the crisis (up to May 2020). Estimates are that with the assistance the incidence of poverty will rise between 8 and 14 percent (to 19.4 percent and 25.6 percent of families according to the two sets of data, respectively). According to the NII simulations, even with

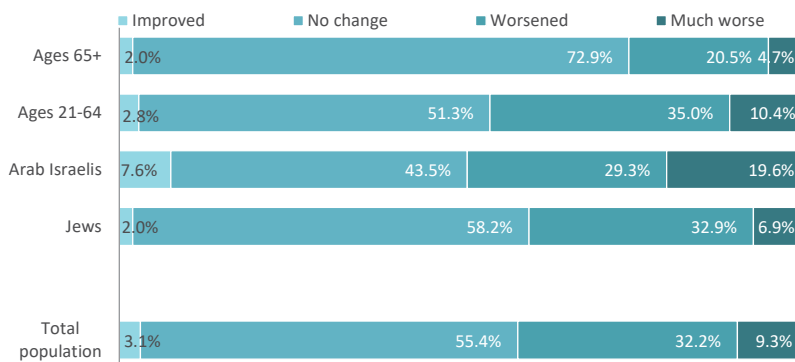
3 The ranges presented are from various simulations based partly on the CBS Household Expenditure Survey and partly on administrative data. According to the CBS data, the incidence of poverty among families is 18 percent while for simulations based on the administrative data, the incidence of family poverty is 22.5 percent. For additional details, see Endeweld, Heller and Karady, 2020.

unemployment insurance payments and grants, those primarily harmed by the crisis are working families, single-parents, and young families. The increase in the Gini index of inequality of disposable income is cut in half by benefits with an expected increase of between 1.5 percent and 4 percent (from 0.356 to 0.361, and from 0.405 to 0.420, according to the two sets of data, respectively) (Endeweld, Heller & Karady, 2020).

Surveys carried out by the Central Bureau of Statistics during the crisis provide a more comprehensive picture of its negative effects.⁴ As shown in Figure 12, over 40 percent of the respondents to the survey in July reported a deterioration in their economic situation as a result of the coronavirus pandemic. Among the working age population (aged 21 to 64), a higher share reported a deterioration in their economic situation than among the 65+ population. It is reasonable to assume that this is related to the fact that a low share of the older adult population are still in the labor market or have income that is dependent on the labor market, and those who continue to work tend to be in more senior positions that have been less affected and their economic situation has not been as impacted. In the Arab Israeli sector, a large share of the respondents — almost 20 percent — reported that their economic situation is particularly grave, relative to about 7 percent in the Jewish sector.

Figure 12. Change in economic situation as a result of the crisis

Ages 21 and over



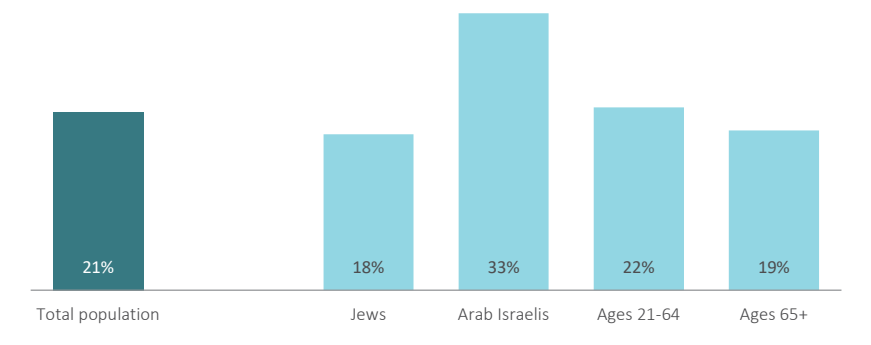
Note: The estimates for the share of those who reported that their situation had improved have a relatively high sampling error and therefore a low level of reliability.

Source: John Gal and Shavit Madhala, Taub Center | Data: CBS, Survey of the Civilian Resilience, July 2020

- 4 The Survey of the Civilian Resilience During the Coronavirus Crisis was conducted in April, May, and July among respondents aged 18 or over. About 2,300 individuals were contacted in July, of which 1,400 responded.

The reduction in income as a result of the crisis has had an effect on the standard of living of much of the population, as well as on their fears for the future and their emotional state. Figure 13 shows that 21 percent of the respondents or someone in their household cut back on their food consumption or their number of daily meals as a result of the crisis. Here also the effect on the Arab Israeli population has been greater.

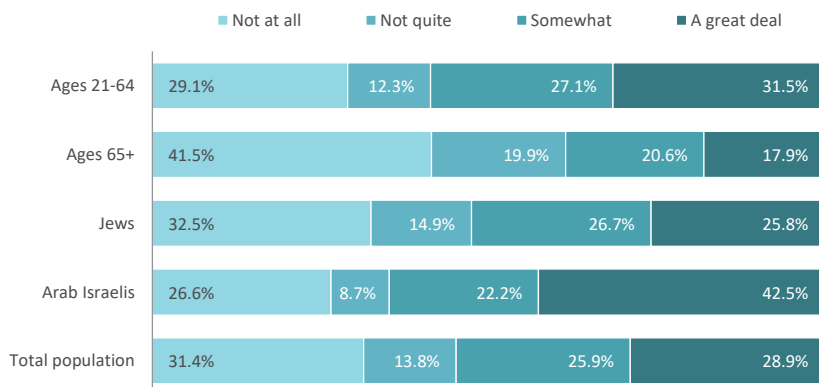
Figure 13. Share of individuals who have cut back their food consumption or their number of meals as a result of the crisis
Ages 21 and over



Source: John Gal and Shavit Madhala, Taub Center | Data: CBS, Survey of the Civilian Resilience, July 2020

As shown in Figure 14, there is concern about an inability to cover expenses among more than half of the population (about 29 percent “a great deal” and about 26 percent “somewhat”).⁵ This concern is greater among Arab Israelis than Jews and among the 21 to 64 age group relative to the 65+ age group.

5 According to the data from the 2019 Social Survey, which asked a similar question, about 6 percent of respondents answered that “they are not managing at all” to cover their monthly expenses and 24 percent answered that “they are not quite managing.”

Figure 14. Fear of not covering expenses**Ages 21 and over**

Note: The estimates for the share of Arab Israelis who answered “not quite” have a relatively high sampling error and therefore have a low level of reliability.

Source: John Gal and Shavit Madhala, Taub Center | Data: CBS, Survey of the Civilian Resilience, July 2020

The implications of the crisis can also be seen in emotional parameters. About 42 percent of the population reported that they are experiencing a feeling of pressure and anxiety and about 26 percent reported that their emotional state had deteriorated or deteriorated to a great extent during the crisis.

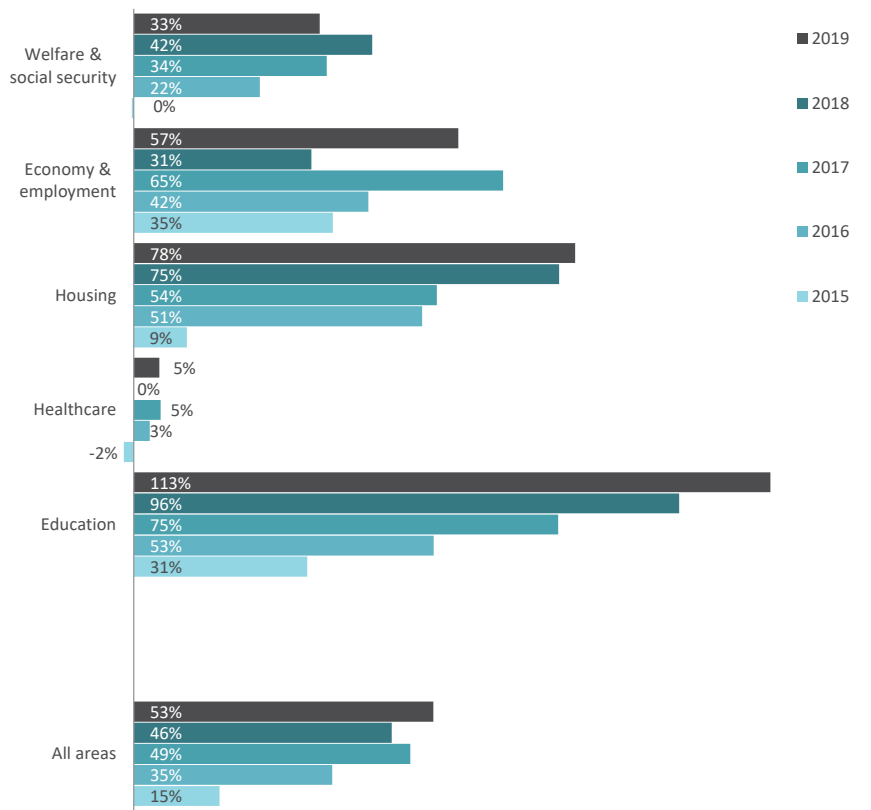
Monitoring the recommendations of the Elalouf Committee

In 2014, the Committee for the War Against Poverty in Israel (the Elalouf Committee) published comprehensive recommendations for reducing the incidence of poverty in Israel within a decade, that is, from 19 percent of households in 2012 to the average level in the OECD countries of about 11 percent (Elalouf Committee Report, 2014). The Taub Center has been following the implementation of the Committee’s recommendations for about five years, since they were approved by the government. This process shows that the additional expenditure on the areas included in the Committee’s final recommendations stood at about NIS 3.9 billion in 2019, which is about 53 percent of the annual expenditure that was recommended by the committee (NIS 7.4 billion) (Figure 15). During the last two years, there does not appear to

have been any significant increase in the expenditure devoted to implementing the Committee’s recommendations; in fact, in the area of welfare and social security there has been a drop in expenditure.

The Committee’s recommendations refer to a number of programs including the Savings for Every Child program, although this program was not allocated a budget and was not included in the overall budgetary calculations. The inclusion of the additional expenditure for this program would increase the total addition devoted to the implementation of the Committee’s recommendations to about NIS 7.5 billion in 2019.

Figure 15. Additional expenditure for the implementation of the recommendations of the Elalouf Committee for the War Against Poverty



Source: John Gal and Shavit Madhala, Taub Center | Data: Ministry of Finance, State budget, various years

Conclusion

The year 2020 was an outlier — a year in which the Israeli welfare state was forced to deal with illness, unemployment, and distress on an unprecedented level. The health and economic crisis required that the state's systems invest significant financial resources in order to provide solutions for hundreds of thousands of those harmed by the pandemic. Following several years of stagnation in social welfare spending, this year witnessed a dramatic increase in welfare expenditure of NIS 58 billion relative to the previous year, a growth rate of 47 percent. The response to the crisis included an expansion and modification of existing programs, alongside the creation of new ones. The unemployment benefit program was at the center of the effort to mitigate the effects of unemployment on hundreds of thousands of individuals.

Despite the various programs implemented and the additional resources devoted to the effort, the data so far paint a picture of major distress among large groups in the population and particularly among young adults and marginalized populations. It is expected that the effect of the crisis will also contribute to an increased incidence of poverty and greater inequality, at least in the short run. The long-term effects of the crisis on the Israeli welfare state and on the welfare of its citizens are difficult to predict; but there is no doubt that they are largely dependent on the social policies that will be adopted by the government both during the crisis and after it has passed. In any case, any retrenchment of welfare budgets due to the pandemic and its repercussions, or because of political instability and the lack of an approved state budget for 2020, is likely to further hurt those vulnerable populations who will most need support as the crisis continues and in its aftermath.

References

English

- Gal, J., & Bleikh, H. (2019). [The welfare system: An overview](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2019* (pp. 61–86). Jerusalem: Taub Center for Social Policy Studies in Israel.
- Gal, J., & Madhala-Brik, S. (2016). [Unemployment benefits for young adults in Israel](#).
- Gal, J., Madhala, S., & Yanay, G. (2020). *Social investment in Israel*. Jerusalem: Taub Center for Social Policy Studies in Israel.
- Gentilini, U., Almenfi, M., Dale, P., Lopez, A.V., & Zafar, U. (2020). [Social protection and jobs responses to COVID-19: A real-time review of country measures](#). Washington DC: World Bank.
- ILO (2020a). [Unemployment protection in the COVID 19 crisis. Country responses and policy considerations](#). Geneva: International Labour Office.
- ILO (2020b). [ILO monitor: COVID-19 and the world of work](#). Fourth edition. Geneva: International Labour Office.
- OECD (2020). [OECD economic surveys: Israel](#). Paris: OECD Publications.

Hebrew

- Bank of Israel (2020). [The coronavirus crisis and the labor market in Israel](#). Jerusalem: Bank of Israel.
- CBS (2020). *Survey of the civilian resilience during the coronavirus crisis, Third wave, July 2020*. Jerusalem: Central Bureau of Statistics.
- Elalouf Committee Report (2014). [The report of the Committee for the War Against Poverty](#). Jerusalem: Ministry of Welfare and Social Services.
- Endeweld, M., Heller, O., & Karady, L. (2020). [The influence of the recession following the coronavirus crisis on the standard of living, poverty, and inequality](#). Jerusalem: National Insurance Institute.
- Heller, O. (2020). *Who is hurt by the coronavirus crisis? Characteristics of salaried workers who were fired or are on leave without pay during the coronavirus crisis by industry*. Jerusalem: National Insurance Institute.
- Ministry of Finance (2020a). [An analysis of the characteristics of job seekers during the coronavirus crisis](#). Jerusalem: Chief Economist Division, Ministry of Finance.
- Ministry of Finance (2020b). *Characteristics of the unemployed in June 2020*. Jerusalem: Chief Economist Division, Ministry of Finance.
- Ministry of Labor, Social Affairs and Social Services (2020, July 14). [Press Release: During the first week of July: A rise of 47% in the number of those turning to the social services departments relative to the same week in 2019](#). Jerusalem: Ministry of Labor, Social Affairs and Social Services.

Social Investment in Israel

John Gal, Shavit Madhala, and Guy Yanay

Abstract

Traditionally, the main role of the welfare state has been to ensure social protection for individuals with insufficient income and resources to meet their needs. An alternative approach to the role of welfare states is that of social investment, which underscores the capacity of welfare states to not only redistribute resources, but to contribute to their creation. The social investment approach assigns the welfare state an important role in enhancing human capital, so that individuals can realize their full potential and, in so doing, it promotes economic growth. Although the idea of social investment has not yet become entrenched in Israeli public discourse, an array of social initiatives undertaken in recent years — investment in early childhood education and care, active labor market policies that promote work force integration, and the Saving for Every Child program — promote social investment on a practical level. Indeed, the findings of the current study suggest that the share of social expenditure devoted to social investment in Israel has grown over the past decade, and is higher than that of other welfare states. However, because total social expenditure in Israel is low, social investment spending is still relatively low as well. This study looks at the advantages and limitations of social investment in Israel and in other welfare states. The emphasis is on how the adoption of social investment policies affects efforts to fight poverty and inequality. The tendency of social investment programs to benefit stronger populations, rather than those living in poverty, is also examined. The study conclusions highlight the potential embodied in social investment policy, but these programs need to be accessible to marginalized populations, and the welfare state's role as social protection provider should not be compromised.

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Introduction

The crisis sparked by the coronavirus pandemic has underscored the welfare state's importance in times of trouble, when the free market is unable to meet the needs of individuals and families. The crisis also highlights issues pertinent to the welfare state's role in more normal times. Should its primary function be to ensure economic security for those whose income, for a variety of reasons, is inadequate, or is it no less important to cultivate the individual's skills and abilities to ensure their optimal integration into the labor market? Should the welfare state adhere to its traditional role of correcting the negative effects of market failure on individuals and families **after the fact**, or should it also engage in **preparation and prevention** by, for instance, creating systems that enable individuals to realize their full potential and navigate smoothly through periods of crisis, until they can once again actively participate in the labor market and the economy? Should the welfare state play a role in encouraging growth and development, rather than simply providing social protection? Is it even possible to tackle inequality and poverty while also promoting skills acquisition and the upgrading of human capital? And if so, where is the policy balance between these two goals?

In recent years, these issues have been central to public discourse on the welfare state. They relate to the way in which society's resources are distributed among population groups and social programs, and to priorities regarding the features and operating modes of these programs. This discussion focuses on the need to adapt the welfare state and its myriad systems to the post-industrial age and to the dramatic demographic changes currently underway; it also relates to the social, economic, and labor market impact of these processes. Those who favor transforming the structure of the welfare state seek to go beyond the traditional focus of extensive resource allocation for social protection, mainly through, or under the responsibility of, public systems. They advocate correcting the neo-liberal trends of the past few decades such as the shrinking of the role of the state, a sweeping adoption of free market mechanisms, and the assignment of responsibility to individuals for their own welfare. Instead, they argue, we should strive for a welfare state that puts the idea of social investment front and center.

Social investment

The social investment approach emerged in response to difficulties faced by the traditional welfare state. These difficulties resulted from social risks created by economic and demographic processes that challenged the welfare state's central programs, which were oriented toward providing social protection and advancing social equity. The processes included the aging of the population with its implications for the pension and social benefit systems; technological developments and their impact on the labor market, especially its effects on the employment of low-skilled workers; and changing family structures, e.g. a greater prevalence of single-parent families, women's growing participation in the labor market, and delays in childbearing — issues that pose work-life balance difficulties.

A number of studies and policy papers published in the early 2000s by social investment advocates (Esping-Andersen, Gallie, Hemerijck & Myles, 2002) propose changes to the welfare state to help it meet these challenges. An underlying premise is that it is wrong to view social policy as a burden on the economy. Rather, the welfare state can be a productive factor vital to economic growth and the expansion of employment. Supporters of the emerging social investment approach seek to address features of the post-industrial economy and labor market, with their associated social risks. Two main paths toward handling these issues are proposed: the adoption of social policies that focus on the individual throughout their lifespan, and the realization that social policy tools are a vital means of dealing with gender-related aspects of family and work life.

Over the two decades that have passed since the social investment idea was first formulated, three major goals have been defined for it (Van Kesbergen & Hemerijck, 2012). The first goal is that of investing in the development of human capital throughout the individual's lifespan, from early childhood on. The second goal is to make the most effective possible use of this human capital, through systems that encourage full employment for both women and men, and through labor market regulation and protections that make it possible to enter and leave the market place easily. The third goal is to encourage social inclusion through a concentrated effort to integrate marginalized social groups. A variety of policy fields have been identified where this approach can be adopted and where policies can be implemented that differ from classic welfare state policy and from those inspired by the neo-liberal outlook. These areas include: early childhood education and care;

schooling and higher education; lifelong learning; programs to facilitate the work-life balance and women's employment; programs to encourage active aging; and improving occupational skills. The programs promising access to quality education systems from early childhood through higher education are intended to enhance human capital so as to ensure optimal integration in the knowledge and service economies. The programs that focus on the labor market, such as those offering vocational training and activation, aim to maintain workers' abilities and upgrade their skills with changes in the world of work, enable workers to navigate job changes as well as the possibility of leaving and reentering the labor market, and to allow individuals who have officially left the labor market to continue to contribute to their communities in their old age. Additionally, social investment programs focus on women and the family, with systems of childcare and care for the infirm, and generous parental leave, aiming for the optimal integration of women into the labor market as well as a reasonable work-life balance for all parents (Morel, Palier & Palme, 2012).

Social investment is regarded as a cornerstone of the modern welfare state by the European Union and the OECD and this is reflected in a variety of policy documents produced by these organizations (European Commission, 2013; OECD, 2015). Moreover, supporters of the approach describe it as a new paradigm capable of offering an alternative both to the traditional welfare state and to the form of welfare state that emerged under the influence of neo-liberalism (Hemerijck, 2018). However, critics of the social investment approach raise doubts (Cantillon & Van Lancker, 2013). They note the difficulty of shifting from policies that emphasize social protection to ones oriented toward social investment, and cast doubt on the benefits to be gleaned from the adoption of social investment policy. Above all, however, the critics are concerned that an emphasis on social investment could potentially undermine one of the welfare state's main goals — fighting poverty and inequality. They are worried that a policy focused on human capital and labor market integration prioritizes those population groups that are capable of promoting economic growth and are perceived as productive (at least theoretically), thereby having an adverse impact on populations that are unable, for various reasons, to participate in the labor market. Moreover, in an era characterized by chronically limited resources and major difficulties in fighting inequality, allocating funds for social investment at the expense of social protection has the potential to widen existing gaps and intensify social distress.

Social investment in Israel

Unlike European welfare states, where there has been lively public and academic debate for the past two decades on the advantages and limitations of social investment, social investment discourse in Israel is still in its infancy. The term “social investment” has yet to become a major presence in Israeli social policy discussions, and research on social investment has been very limited. Nevertheless, major elements of the social investment approach, such as devoting more resources to the development of early childhood frameworks (Vaknin, Shavit & Sasson, 2019; Bank of Israel, 2019), creating dedicated systems to encourage labor market integration for marginalized populations or, alternatively, to support social mobility (Yashiv & Kasir Kaliner, 2018; Malach, 2018), have made it onto the Israeli social agenda and, over the past decade, have even been promoted by the country’s social and economic decision makers. Evidence that central components of the social investment outlook have been adopted can be found in two interesting recent studies. These studies show how ideas and attitudes associated with the social investment approach are gaining traction with Israeli economic policy makers, and call attention to manifestations of the approach in policies relating to early childhood services and the Arab Israeli sector (Maron, 2019; Zehavi & Breznitz, 2018). However, there has as yet been little focused thought about social investment and its advantages and limitations, nor has the adoption of this policy outlook in Israel been studied empirically.

Research goals

The current study aims to place social investment at the center of Israeli social policy discourse, and, in doing so, to encourage thinking about welfare policy goals, about the allocation of social funding and the extent of that funding. We will also look at the concerns raised by critics of social investment through the prism of Israeli data. To this end, we examine social expenditure patterns in Israel, assess the share of social investment spending out of all social expenditure, and identify the characteristics of this form of investment.

Accordingly, the following questions lie at the heart of this study: What are the dimensions of Israeli social investment, and which target population benefits from it? What is the scope of Israel’s social investment expenditure relative to other welfare states? What recent social investment trends can be identified in Israel and other parts of the world? And, what are the disadvantages as well as limitations of policies based on social investment?

Definitions and data

In order to assess the extent of social investment in Israel and other welfare states, we need to distinguish between social investment and social protection. This distinction will not always be clear-cut. For example, there are programs (such as unemployment insurance) that can be considered both as social investment and as social protection. The research literature offers several theoretical and functional definitions of social investment and what policy measures are included in it. These definitions are shaped not only by theoretical ideas about what constitutes social investment but also, by the constraints of the available data.

In the current study, we distinguish between three categories of social expenditure (Kuitto, 2016):

Social protection encompasses programs that provide protection through cash benefits and in-kind services (i.e., non-monetary) to those whose income from the free market does not afford them a reasonable standard of living or the ability to meet their needs and their family's needs. Social protection programs include social assistance and old-age pensions; assistance with childrearing expenses (child allowances); and funding for disability care (e.g., the Long-Term Care Law).

Social investment programs aim to strengthen the abilities of individuals, to promote social mobility, to help individuals find their place in the work world, or to increase their labor income. Examples are: investment in education from early childhood through higher education, research and development spending, and programs that help individuals find work (active labor market policies — ALMP), or that increase compensation for labor (work grants).

Other expenditures refers to programs that do not fit into either of the two categories, and are thus excluded from our analysis. Healthcare system expenditures are an example of the type of welfare state activity that does not clearly belong to the category of social protection or social investment.

As a rule, there is a distinction between public social investment and social protection expenditure based on the type of benefit provided: cash benefits generally belong to social protection, while services and non-monetary benefits are usually considered to be social investment. In this study, we employ Ronchi's (2016) classification. He classifies government expenditures of various kinds as social investment, social protection, and other spending, and

also distinguishes between benefits and social services intended for different population groups — children and families, working-age individuals, and the elderly. For the purposes of this study, a few changes to this classification scheme were made to adapt it to the Israeli context. The final breakdown is shown in Table 1.

Table 1. Social expenditure categories

	Social protection	Social investment
Children and families	<ul style="list-style-type: none">• Child and family allowances	<ul style="list-style-type: none">• In-kind services• Early childhood education and care, primary and post-primary education• Saving for Every Child program
Working-age adults	<ul style="list-style-type: none">• Early retirement• Housing assistance• Disability allowances• Unemployment insurance• Income support	<ul style="list-style-type: none">• ALMP — programs for labor market integration• Vocational retraining• Negative income tax (work grants)• R&D• Higher education
Elderly	<ul style="list-style-type: none">• Old-age allowances• Survivor’s allowances• Long-term nursing care	<ul style="list-style-type: none">• In-kind services

Source: John Gal, Shavit Madhala, and Guy Yanay, Taub Center, based on Ronchi, 2016

Social spending data is based on OECD data. The data on the Saving for Every Child program are taken from the National Insurance Institute (NII). The data on higher education rates and the characteristics of day care centers and home daycare use (*mishpachtonim*) are taken from the Central Bureau of Statistics.

Is there social investment in Israel?

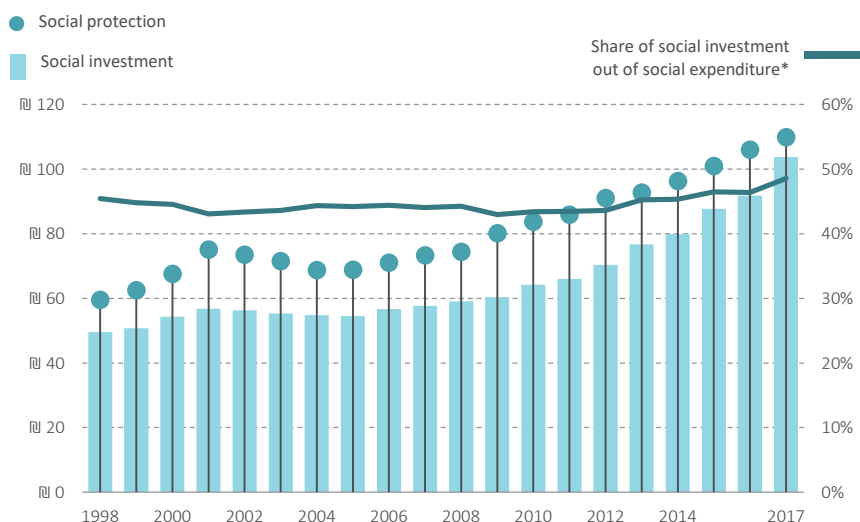
A quick glance at Israeli social expenditure over the past two decades reveals growth in spending on both social protection and social investment.¹ The share of social protection out of the budget has grown, although not by much (Figure 1). In recent years, spending on social investment in Israel has been rising

1 Social expenditure in this paper is defined as the total public expenditure for social protection and social investment and includes spending on the programs as detailed in Table 1. Other programs not delineated in the table, like public spending on health, are not included in the definition of social expenditure.

rapidly due to programs such as Saving for Every Child. This accelerated growth brought Israel, in 2017, to a 20-year peak in the share of social investment out of social expenditure — 48.5 percent.

Figure 1. Public expenditure on social investment and social protection in Israel from 1998 to 2017

NIS billions, 2017 prices



Note: Social expenditure is defined as the total expenditure on social protection and social investment, without other budgetary line items.

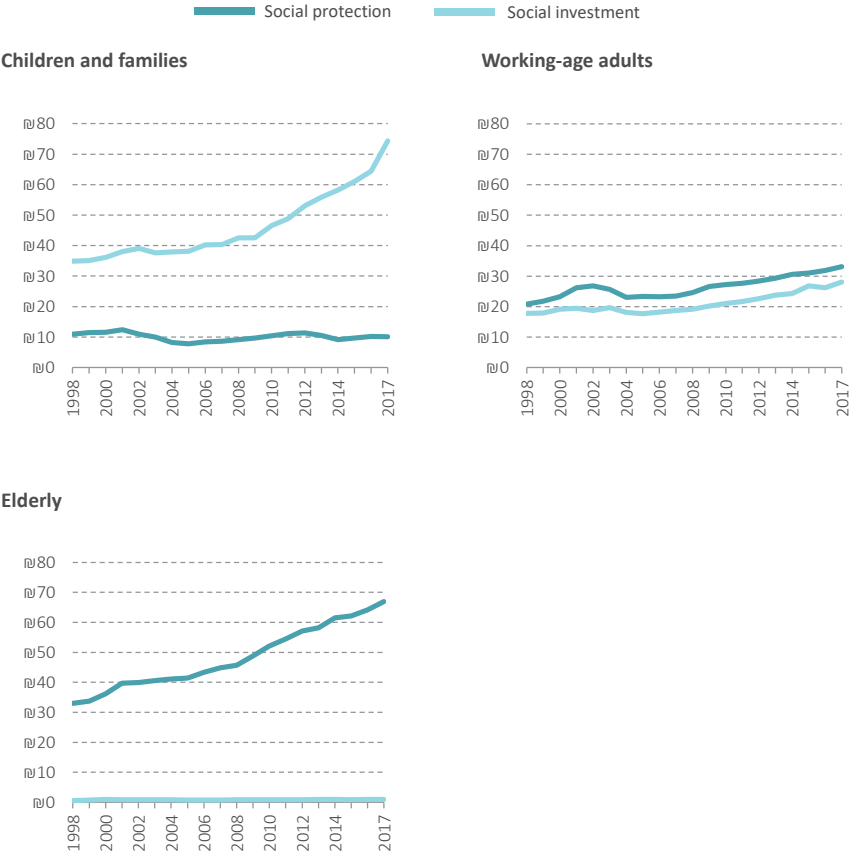
Source: John Gal, Shavit Madhala, and Guy Yanay, Taub Center | Data: Ministry of Finance; OECD

Focusing on the various groups targeted by Israeli social policy (Figure 2) shows that the increases in social investment and social protection spending went toward different programs. While the social protection budget grew mainly for programs directed towards the elderly (from NIS 33 billion in 1998 to NIS 67 billion in 2017), most of the social investment spending increase benefited children and families (from NIS 35 billion in 1998 to NIS 74 billion in 2017). Figure 3 illustrates the growing emphasis on social investment with regard to the budgeting of younger populations. If, in the late 1990s and early 2000s, Israel's child allowances and cash benefits for families —

policy measures associated with social protection — constituted nearly a quarter of the budgeting intended for this population group, in 2017, these programs accounted for less than 12 percent of such budgeting. Regarding the working-age and the elderly populations, there appears to have been almost no change in the share of social spending out of the budget earmarked for these populations, which have remained at 46 percent and 2 percent, respectively.

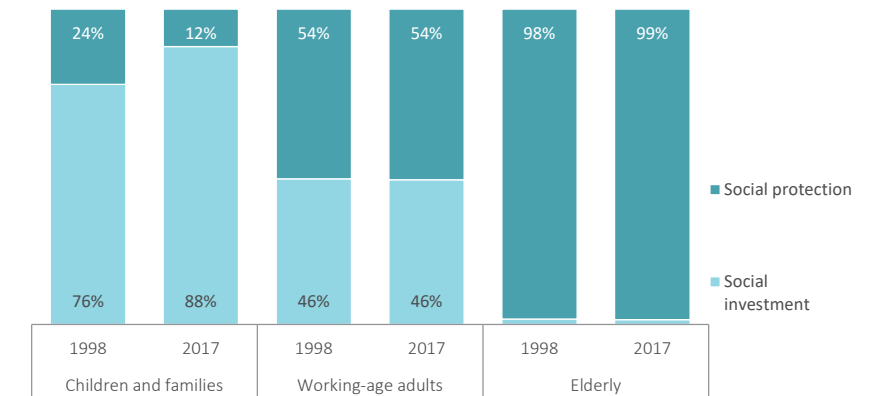
Figure 2. Social expenditure by target group

NIS billions, 2017 prices



Source: John Gal, Shavit Madhala, and Guy Yanay, Taub Center | Data: Ministry of Finance; OECD

Figure 3. Share of social investment and social protection out of total social expenditure for each target group



Source: John Gal, Shavit Madhala, and Guy Yanay, Taub Center | Data: Ministry of Finance; OECD

Social investment: An international comparison

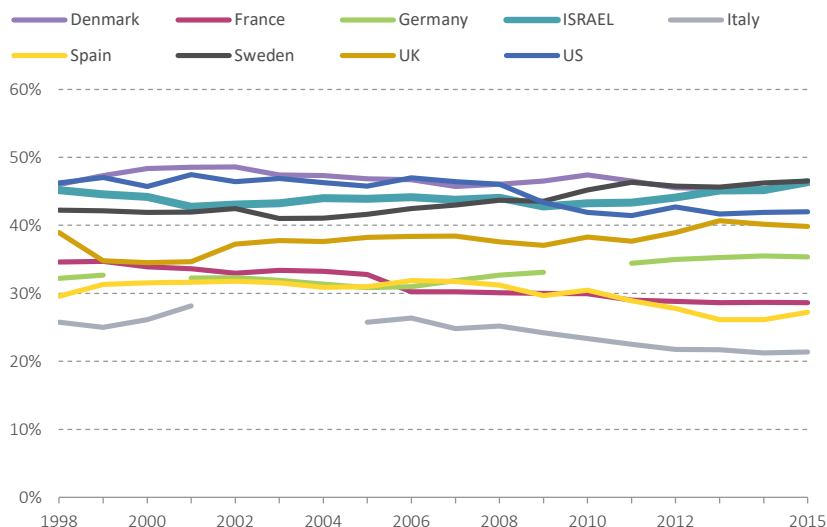
A look at expenditure on social investment in other countries offers a different perspective on Israel’s social investment. In addition to Israel, this comparison includes countries representing different types of welfare states (Tarshish, 2017): the US and the UK (liberal welfare states); Germany and France (conservative welfare states); Sweden and Denmark (social-democratic welfare states); and Spain and Italy (Mediterranean welfare states). Although the Israeli welfare system has features similar to those of each of these types, especially the liberal welfare state, it is generally considered to belong to the Mediterranean welfare state category (Gal, 2010).

The comparison data in Figure 4 indicate that, over the years, Israel’s budgetary emphasis on social investment has been very strong, placing the Israeli welfare system at the top of the list, alongside the social-democratic welfare states (Sweden and Denmark) that are characterized by universal and generous social policies and high, progressive taxes. Even when public expenditure on education and research and development is excluded, which in Israel accounts for a considerable share of social expenditure, Israel still devotes a large share of its spending to social investment — more than do most countries examined here (see Appendix Figure 1).

Interestingly, despite the vigorous debate in European countries and the European Union about the importance of social investment, no major trend can be detected over time toward a higher share of social investment spending out of total social expenditure in these countries. Similar findings are documented by Kuitto (2016), who looked at 23 European welfare states during the 2000s and discovered no clear upward trend in the share of social investment programs out of total social expenditure.

Nevertheless, certain changes in trend can be discerned. For instance, in France, the share of social investment declined throughout the period in question, due to a more massive rise in spending devoted to social protection programs. In the UK, by contrast, the opposite trend was observed: in the early part of the period, the share of spending on social investment dropped, but later rose, thanks to a substantial increase in nominal spending on social investment programs. The 2008 economic crisis sparked an interesting turning point, reflected in a number of different patterns of change in the comparison countries. For instance, the Mediterranean welfare states, Spain and Italy, showed a decline in the share of social investment spending, due to a rise in nominal spending on social protection programs, especially unemployment benefits. The US also showed a decline in the share of social investment; although social investment increased overall, particularly for ALMP programs, the really massive growth occurred in the social protection area. By contrast, Germany, the UK, Sweden, and Israel placed greater emphasis on social investment programs during the post-crisis years.

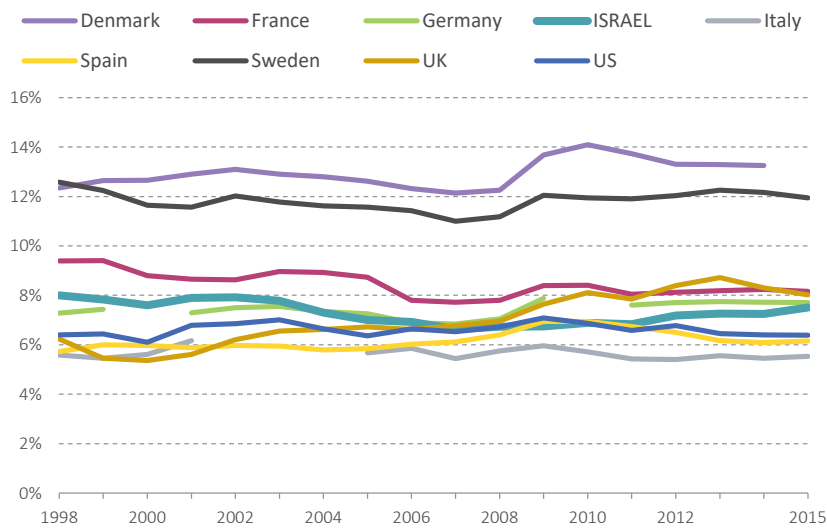
A recent study (Kim & Choi, 2019) examines the relationship between the two types of spending, social protection programs and social investment programs, in OECD countries. The study examines these countries' spending patterns between 1980 and 2010 seeking to determine whether the expansion of one type of spending necessarily leads to contraction of the other type. The findings point to a positive relationship between the two types of spending, indicating that a rise in expenditure on social protection programs is usually accompanied by an increase in spending on social investment programs, though during the later years of the research period this relationship weakened considerably. The trends detected among the OECD countries were mixed: during periods of increased social spending, comprehensive welfare states such as Sweden and Norway augmented both kinds of spending, while more limited welfare states, such as Japan, did not. However, when increased social spending reaches its limit, whether for political or financial reasons, a rebound effect is noted, and one type of spending is reduced to augment the other.

Figure 4. The share of social investment out of total social expenditure

Source: John Gal, Shavit Madhala, and Guy Yanay, Taub Center | Data: OECD

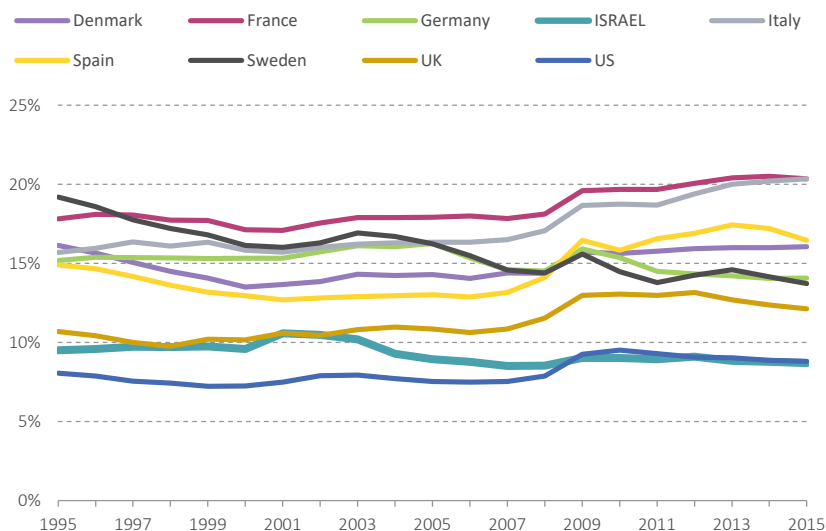
In comparison to the welfare states shown in Figure 4, Israel ranks among those countries that dedicate a larger share of their social expenditure to social investment programs. However, a look at the total sum of spending dedicated to social investment, shows that there is a substantial gap between Israel and the social-democratic welfare states that allocate a great deal of resources to social investment. This large disparity is reflected in the share of social investment spending as a percent of GDP (Figure 5): while Denmark and Sweden consistently spend over 11 percent of their GDP on social investment, Israel's social investment expenditure ranges between just 6.7 percent and 8 percent of GDP. This gap reflects political and social decisions regarding taxation, and the way in which the government chooses to allocate those revenues. Regarding taxation, it should be noted that Israel's share of revenue from taxes is lower than that of most welfare states, and substantially lower than that of the social-democratic welfare states.

Figure 5. Social investment as a percent of GDP



Source: John Gal, Shavit Madhala, and Guy Yanay, Taub Center | Data: OECD

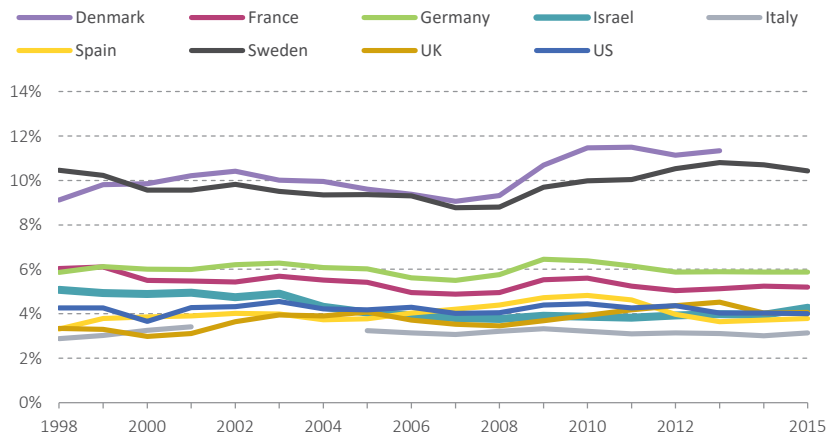
A clearer picture of the gap between Israel and the other welfare states emerges with a look at social protection spending as a percent of GDP (Figure 6). Israel's expenditure patterns more closely resemble those of the liberal welfare states (the UK and the US), and the high degree of expenditure on social investment programs out of total social expenditure is due mainly to the low levels of social protection spending. Essentially, since 2009, Israel has been spending a smaller percentage of its GDP on social protection programs than any of the other comparison countries, including the US. Although some of the increased spending in the other countries was spurred by the economic crisis of 2008, which affected Israel to a lesser degree, Israel's relative position on this scale was low even before the crisis, and has not been trending upward.

Figure 6. Social protection as a percent of GDP

Source: John Gal, Shavit Madhala, and Guy Yanay, Taub Center | Data: OECD

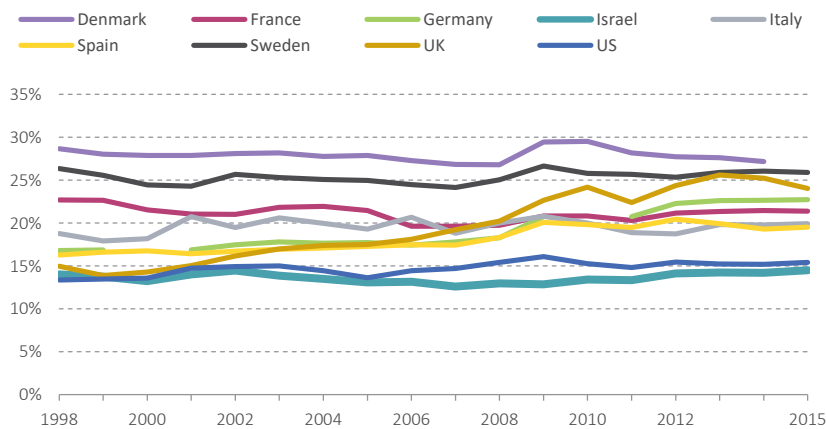
In Israel, it appears that the relatively large share of social investment out of social expenditure stems, to a considerable degree, from the country's low level of expenditure on social protection. This point becomes especially clear when social investment spending per capita is examined. For those of working age (ages 20–64), Israel spends just 4 percent of GDP on social investment per capita, like the Mediterranean welfare states (Italy and Spain) and the liberal welfare states (US and UK), which rank lowest in terms of social investment (Figure 7). The situation worsens when social investment per capita for children and youth (ages 0–19) is examined. Israel ranks lowest, with a social investment of just 15 percent of GDP per capita since the early 2000s (Figure 8). This finding reflects both the relatively large share of children in Israel's total population, and the low level of social spending.

Figure 7. Social investment per capita for ages 20–64
As a percent of per capita GDP



Source: John Gal, Shavit Madhala, and Guy Yanay, Taub Center | Data: OECD

Figure 8. Social investment per capita for ages 0–19
As a percent of per capita GDP



Source: John Gal, Shavit Madhala, and Guy Yanay, Taub Center | Data: OECD

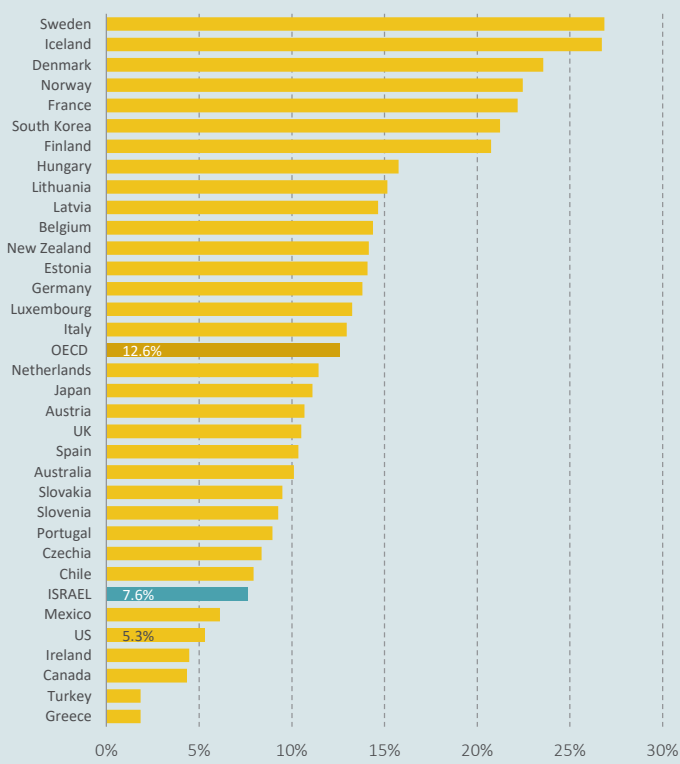
SPOTLIGHT

Social investment in Israel: Early childhood education and care and employment programs

An examination of two major spending areas identified with social investment — early childhood education and care (ECEC), and active labor market programs (ALMP) — highlights the limitations of actual spending on social investment in Israel. Out of all of the social investment elements, ECEC may be expected to yield an especially large return. Skills acquisition at this stage of life has the potential for major lifelong impact on the individual, in terms of education, employment, future wages, and more (Shavit, Friedman, Gal & Vaknin, 2018). In addition to the long-term benefit, investment in the creation of a subsidized education system for young children has an immediate positive effect — it incentivizes parents (mothers especially) and gives them the opportunity to join the labor market. Despite the clear importance of expenditure on ECEC, a comparative look at the OECD countries reveals major gaps in the level of investment between the countries (Figure 9). Public spending on ECEC for children ages birth to 4-years-old as a percent of GDP in the social-democratic welfare states is among the highest in the world, reaching levels of 27 percent of GDP per capita. In Israel and the US, by contrast, spending in this area is particularly low, amounting to just 8 percent and 5 percent, respectively. Moreover, Israel's level of spending on the education of very young children (from birth to age 2) places it even lower on the scale. The policy aimed at extending free education entitlement,

adopted in the wake of the 2011 social protests, applies only to children ages 3 and older, while most children in the birth to 2-years age range are still cared for in private frameworks.

Figure 9. Public expenditure on early childhood education and care per child ages 0–4, 2015
As a percent of per capita GDP

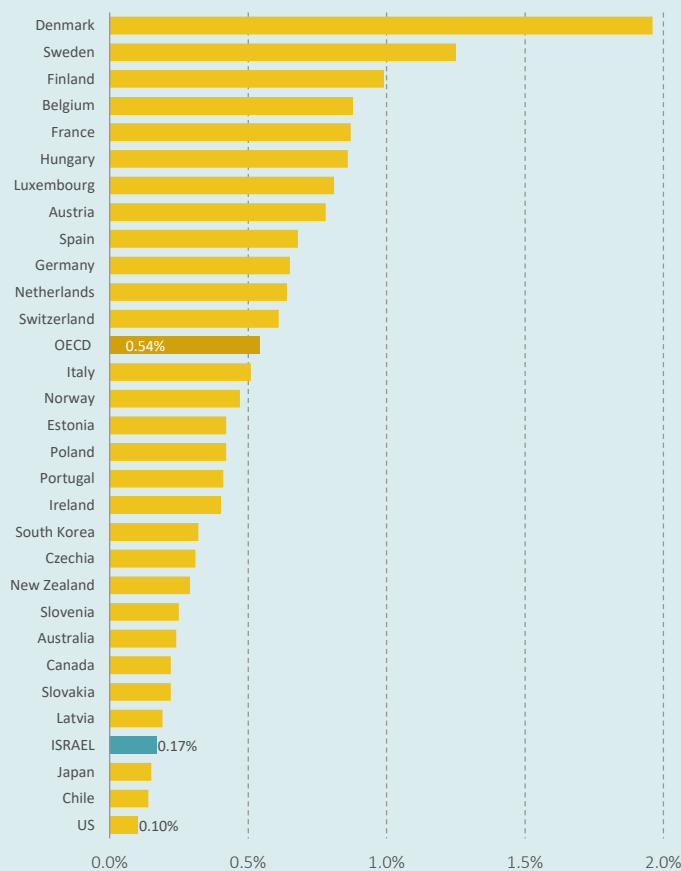


Source: John Gal, Shavit Madhala, and Guy Yanay, Taub Center | Data: OECD

Another element of social investment that has been gaining traction over the past few decades is that of ALMP. These programs focus on helping working-age populations find employment, and encompass vocational training, job search assistance programs, work incentives, and the like. Cross-country comparisons suggest that Israel's level of investment in this area is among the OECD's lowest, amounting to just 0.17 percent of GDP (Figure 10).

In contrast to the main investment element for those of working age (subsidized higher education) ALMP programs are oriented primarily toward assisting weaker populations that find it hard to enter the labor force. The need for larger scale subsidies in this area is highlighted by survey findings that show the reasons given by those interested in study and training frameworks who do not ultimately end up participating in a program. Compared with the OECD countries, Israel has a higher non-participation rate due to overly high costs; this, it turns out, is the main problem for those whose labor market status is the most vulnerable (Madhala, 2019).

Figure 10. Expenditure on active labor market policies (ALMP), 2017
As a percent of GDP



Note: For New Zealand and Italy, the data are for 2016 and 2015 respectively.
Source: John Gal, Shavit Madhala, and Guy Yanay, Taub Center | **Data:** OECD

Limitations of social investment

Critics of social investment underscore various limitations involved in its adoption by welfare states, and warn of the potential consequences. The criticism focuses on the efficacy of allocating resources to social investment, the negative impact of channeling funds toward social investment rather than other welfare state goals (fighting poverty and inequality through social protection) and, in connection with this latter issue, the fear that social investment programs actually help socioeconomically stronger groups, sometimes described as the “Matthew effect.”

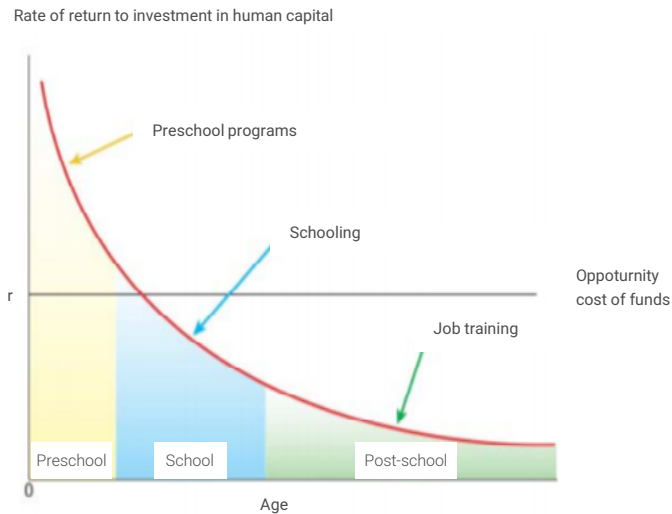
Is social investment effective?

The social investment idea assumes that investing in elements of human capital at early ages (and, to a certain degree, throughout the human life cycle), and maintaining systems that promote the individuals’ optimal integration into the labor market, will benefit both the individual and society as a whole. Moreover, such measures will not only augment the resources available to individuals and to society at large, but will also reduce the need for public funding to improve the individual’s status after the fact — i.e., when they lack sufficient income to support themselves and their families and require social protection. In other words, by adopting a social investment policy, welfare states promote economic growth and increase the sum total of available societal resources.

The work of James Heckman (e.g., Heckman, 2006) on the economic utility of investing in early childhood education provides a key rationale for the argument that social investment benefits individuals and society as a whole. In his research with Jorge Luis García, Heckman looked at the social and economic effects of two education programs (ABC and CARE) on children from the age of 8 weeks to 5 years from disadvantaged communities, and monitored the participants until their mid-thirties. The findings show that the programs had a positive impact on the participants’ health, education, employment, and income from labor, and even enhanced their ability to learn cognitive and social skills later in life. Heckman and Garcia also demonstrate that these programs have an effect on the children’s parents, some of it immediate. Access to free early education has a substantial positive impact on parents’ employment rates, income, and education levels. The investigators estimate that the return on such an investment over the course of a participant’s lifetime is 14 percent per year; in cost-benefit terms, every dollar invested returns a profit of 7.3 dollars (Garcia, Heckman & Ziff, 2018; Garcia, Heckman, Leaf & Prados, 2019).

Heckman argues not just that investment in early childhood brings a high positive return, but also that, when compared with programs that invest in other age groups, investment in early childhood shows a greater economic payoff. Heckman demonstrates that the return on investment in children from disadvantaged populations declines over time with the progression through the individual's life cycle (Figure 11).

Figure 11. Return on investment in human capital at different life-cycle stages



Source: Heckman, 2006

Claims regarding the utility of social investment programs are countered by theoretical and empirical criticisms. Supporters of the traditional welfare state argue that the welfare system exists primarily to address failures of the free market and their adverse implications, and to help individuals deal with social distress of various kinds. This role has been seen clearly during the coronavirus crisis, when the social protection systems of Israel and other welfare states provided income assistance for large numbers of people who became involuntarily unemployed and were suddenly left with no income. Relatedly,

Nolan (2013) asks whether promoting economic growth or proper economic functioning is an appropriate measure for assessing programs whose main goal should be to advance social justice and to ensure social rights.

Doubts have also been raised about the empirical basis for the long-term utility of specific social investment programs. Researchers' attempts to assess key elements of specific programs in this sphere, such as those aimed at helping people from marginalized populations join the labor force or increase their income from work, have not clearly demonstrated such utility (Bonoli, 2012). This is partly due to methodological limitations; however, findings also suggest great variability in the efficacy of these programs for different population groups. For example, one study that looked at the utility of ALMP programs in 14 different countries found that training frameworks for low-skilled individuals were of limited benefit (Bonoli & Liechti, 2018).

There is insufficient data on the direct and long-term utility of ECEC programs in Israel. In the employment sphere, by contrast, efforts have been made to evaluate social investment programs instituted in recent years, and to determine their efficacy. These studies have noted the utility of programs for Haredi (ultra-Orthodox) men (Cave & Aboody, 2011), employment programs operated by JDC-Tevet, such as *Eshet Chayil*, *Mafteach*, and *Strive* (Levy & Deutsch, 2016), and the *Ma'agalei Ta'asuka* ("Employment Circles") programs operated by the government Employment Service (Brown, 2015; Schlosser & Shanan, 2018). It is worth noting, however, that the way in which these programs are implemented, and certain limitations pertaining to the evaluation methods, still make it very hard to reach unequivocal conclusions regarding the program participants' status over the long term.

Does social investment have an impact on poverty and inequality?

Beyond the doubts regarding social investment's utility, one of the main arguments against it is that a focus on upgrading individual human capital and ensuring optimal labor market integration could potentially undermine the welfare state's efforts to address poverty and inequality. At the heart of the critique are two main contentions. First, an emphasis on social investment means that resources formerly channeled (or that could be channeled in the future) into social protection programs are diverted to programs focusing on human capital. This indicates a preference for "active" programs, those directly connected to labor market integration, over "passive" programs aimed at increasing the income of population groups that do not participate in the labor

market. Second, if social investment's underlying assumption is that we must strive to bring everyone into the labor market, then there is a concern that this would not only upgrade human capital, but would also create mechanisms for pressuring participation in the labor market at any price. The direct outcome of such pressure could be stricter eligibility criteria and less generous benefits for non-employed working-age individuals.

In order to examine these criticisms of social investment policy, we review the research literature for evidence of a relationship between increased social investment spending and higher labor market participation rates/lower unemployment rates. We also look at whether there has been a decline in the incidence of poverty, or in inequality levels. Studies that assess the situation in European countries, mainly through 2010, point to rising employment levels in these countries — accompanied, however, by constant or rising poverty and inequality rates (Cantillon, 2011; Vandenbroucke & Vleminckx, 2011). These studies appear to indicate, that social investment has not made a real contribution, in the short term, to the fight against poverty and inequality; it may even have made the situation worse. Nevertheless, later studies that examine the depth of the relationship between social investment and anti-poverty measures (Taylor-Gooby, Gumy & Otto, 2014) have not reached unequivocal conclusions regarding the nature of this relationship. Although they affirm that, at least in the short term, social investment does not help lower the incidence of poverty, they find no empirical basis for any contribution to a rise in poverty (Van Vliet & Wang, 2015).

An examination of the share of social investment out of total social expenditure relative to poverty rates in the countries covered in this study (Figure 12) shows no evidence of a relationship between the two. Alongside those countries that have high investment ratios and low poverty rates, such as the social-democratic countries, there are also countries with relatively high investment ratios whose poverty rates are high as well, such as Israel and the US.

Figure 12. The share of social investment out of social expenditure and the poverty rate among families, 2000–2015



Note: Social expenditure is defined as the total expenditure on social protection and social investment, without other budgetary line items. For those years where data were available.

Source: John Gal, Shavit Madhala, and Guy Yanay, Taub Center | Data: OECD

By contrast, poverty rates relative to social investment as a share of GDP shows a clearer pattern (Figure 13). Although a clear-cut relationship between the two cannot be established, higher social investment spending levels do appear along with lower poverty rates in, for example, the conservative welfare states and even in the UK for some of the years. This is especially notable when examining spending levels in the social-democratic welfare states, where there is high investment and low poverty rates.

Figure 13. The share of social investment out of GDP and the poverty rate among families, 2000–2015

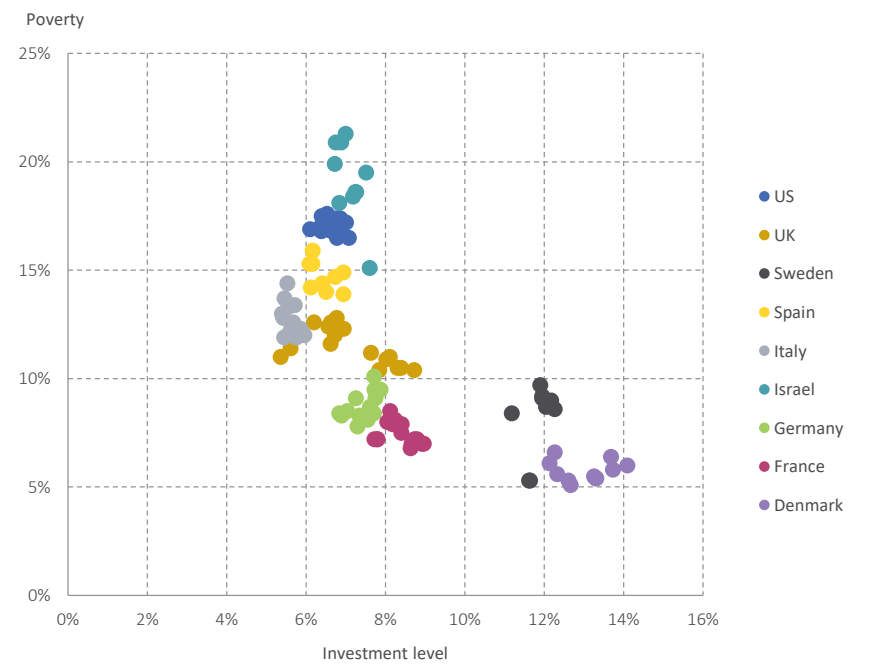
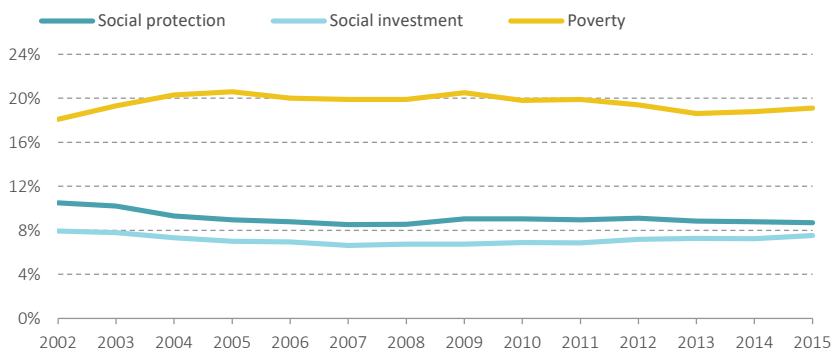


Figure 14. Social protection and social investment expenditure as a percent of GDP and the poverty rate among families in Israel

Source: John Gal, Shavit Madhala, and Guy Yanay, Taub Center | Data: NIL; OECD

Despite the trends seen in Israel, the changes have been relatively small and it is hard to discern an unequivocal connection between social investment levels and poverty. Nor is the picture clear on the international level, at least in the short term. On the macro level, a policy aimed at encouraging labor market participation seems insufficient to lower poverty levels to any substantial degree. However, the data from the social-democratic welfare states indicate that low poverty rates can be found in countries with high social investment spending levels.

Is social investment better for the middle classes (the Matthew effect)?

Critics of social investment often invoke the Matthew effect, a phenomenon identified over three decades ago, according to which the welfare state's main beneficiaries may not be those living in poverty but, rather, the middle classes. The Matthew effect has been identified in the social security system and in the welfare, education, and healthcare services of a number of countries, including Israel (Gal, 1998). The phenomenon is driven by a host of factors. Sometimes it occurs because social programs are also — or primarily — intended for the middle classes; universal programs, for instance, are clearly meant to serve not just the poor, but also the middle classes. In other cases,

it is an unintended outcome of programs aimed at other population groups, but from which the middle classes also benefit. Beyond programs with specific features, clearly there are population groups that are better able to utilize social programs or programs in the education and healthcare spheres. With the development of the social investment discourse, the Matthew effect has returned to center stage (Bonoli, Cantillon & Van Lancker, 2017). Although the goal of social investment programs is to improve the skills of disadvantaged population groups and to help them integrate optimally into the labor market, these programs often end up serving populations other than the target group. This gives rise to concerns that those belonging to the middle classes — individuals with higher skills and more extensive social capital who are already in the employment market — make better use of these programs. Below, we illustrate the Matthew effect in three areas in which the Israeli welfare state operates programs with a social investment rationale. These areas are: day care centers, the Saving for Every Child program, and the higher education system.

1. Day care centers

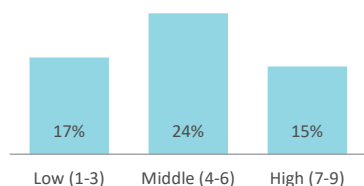
ECEC is the area of activity most closely identified with social investment. However, studies conducted in other welfare states show that, in some countries, the policy has produced a Matthew effect (Pavolini & Van Lancker, 2018). Data on the use of day care centers in Israel indicate a Matthew effect here as well. Despite a substantial increase in government investment, as seen in the creation of a day care infrastructure over the past decade (Gal & Madhala, 2018), the data show that Israel's most marginalized population groups do not make extensive use of this system. In Figure 15a, which shows the utilization data by socioeconomic cluster, there is a higher rate of utilization of recognized day care centers and home daycare frameworks (*mishpachtonim*) among the middle socioeconomic clusters. In the lowest clusters (1–3), 17 percent of households send their children to these centers; in the highest clusters (7–9), 15 percent of households make use of them — but in clusters 4–6, the utilization rate is 24 percent. Although these middle-class families constitute 31 percent of the population with children in the relevant age group (3 months to 3 years), their share of day care centers and home daycare utilization is 41 percent. Among families in the lowest clusters, the percentages are 35 percent and 31 percent, respectively. It should be noted that the subsidized participation in recognized day care centers and home daycare, and the preferential acceptance to them, depend on eligibility

tests designed for working women and low-income populations. The data indicate that the average wage of parents of children attending recognized day care centers is lower than that of all parents of children in this age group (half the wage for fathers, and 70 percent of the wage for mothers). However, the share of fathers and mothers with a gross monthly wage of less than NIS 5,000 among the entire population of families with children enrolled in day care centers is 30 percent (fathers) and 40 percent (mothers), while the rest of the families who utilize these services earn a higher monthly wage (Fichtelberg Barmatz, 2017).²

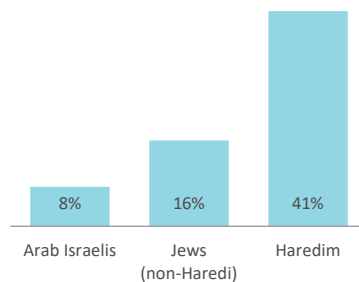
A breakdown by population group indicates that the group that makes the most substantial use of day care centers is the Haredim: 41 percent of Haredi households with children in the relevant age group send their children to day care centers or home daycare. By contrast, the figure for Jewish families (excluding Haredi families) is 16 percent, while for Arab Israeli families it is only 8 percent (Figure 15b).

Figure 15. Share of households with children in daycare out of all households with children ages 3 months to 3 years within the same group

a. By socioeconomic cluster



b. By sector



Source: John Gal, Shavit Madhala, and Guy Yanay, Taub Center, based on Fichtelberg Barmatz, 2017

² Wage data as of 2015.

We can assume that the day care system's current underutilization by disadvantaged populations is due to features of the policy relating to subsidies and participation of young children in this system (Holler & Gal, 2011), and to the way in which tax benefits are used to encourage utilization. Beyond that, underutilization may also stem from inadequate infrastructures, which is certainly the case with regard to the Arab Israeli population. Their underuse of day care centers can be attributed to, among other things, a lack of day care centers in Arab localities. Although 20 percent of the annual development budgets have been allocated to the construction of day care centers for the Arab sector, this is insufficient to reduce existing gaps.³

2. Saving for Every Child

One recently instituted Israeli social investment program aimed at reducing poverty and promoting social mobility is the Saving for Every Child program (Gal & Bleikh, 2019). The program seeks to encourage social mobility by ensuring that as individuals enter their early adult years (18–21), they have resources to help them integrate into the labor market, the higher education system, or training programs. The young people have savings in their name, state-funded with parental participation.

Saving for Every Child is a universal program in which, from the time a child is born, a sum of NIS 51 is deposited on a monthly basis into an account in the child's name. The accumulated sum is available to the child when they reach the age of 18, or alternatively, if they prefer (with the addition of a small amount of money) at age 21. Bank fees are paid by the National Insurance Institute. The child's parents are able to choose the investment track from a number of bank or provident fund options. The tracks are differentiated from each other by the savings level and the amount of anticipated yield on the savings. If the parents do not choose a specific savings track, the National Insurance Institute invests the children's savings funds in a conservative bank plan. Parents can also double the monthly savings amount by depositing an additional NIS 51 from the child allowance they receive into the savings account.

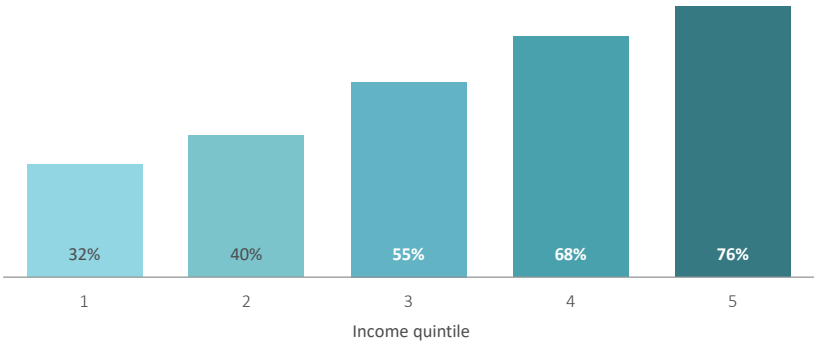
A recent NII analysis of Saving for Every Child program utilization patterns (Pinto & Gottlieb, 2019) calls attention to the difficulty of overcoming the

3 See the [*The Program to Integrate Arab Israelis into the Economy*](#).

Matthew effect in social investment programs.⁴ The study findings suggest that, although the program may be expected to provide each participating child with an average savings of NIS 24,000, there are major differences between different socioeconomic groups. A substantial correlation was found between parental socioeconomic status at the time the plan was activated, and the amount of money that accumulated for the child. Thus, the percent of parents who match the monthly savings plan deposit with an additional NIS 50 from the child allowance they receive,⁵ and the percent of parents who choose a higher yield investment track for their children, is greater among families in the highest quintile, dropping as family income drops. Figure 16 shows that less than a third of parents in the lowest quintile add to their children's monthly deposits, while for parents in the highest quintile the figure is over 75 percent. Regarding the investment track options, the study indicates that, the better the parents' economic status, the greater the chance that they will reject the default track in favor of a higher yield fund track (Figure 17).

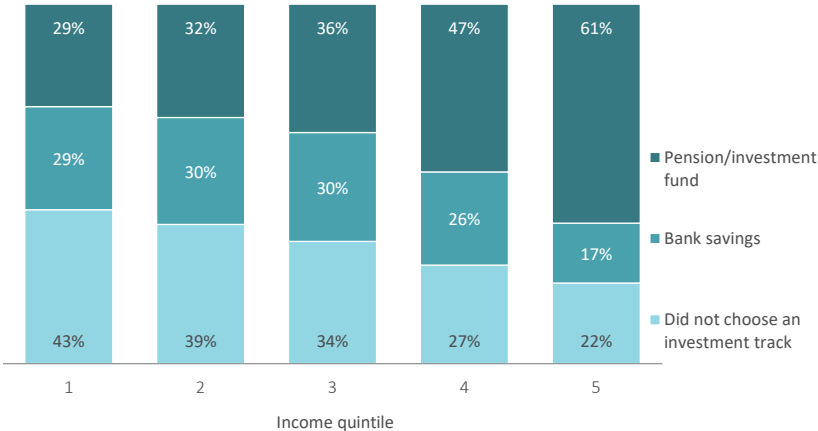
-
- 4 With regard to total spending on the Saving for Every Child program, one might think that lower-income households, which tend to have larger numbers of children, would ultimately "receive" a larger amount of money than other households. However, since the savings in this program are given to each child separately and can be realized only once the child reaches adulthood and may no longer be living in the original household, the savings cannot be considered a benefit that the household enjoys. Accordingly, the outcome has to be judged at the individual level, not at the household level.
 - 5 While this study was in preparation, the sum was NIS 50; it was increased to NIS 51 afterward.

Figure 16. Share of families who chose to add NIS 50 to the monthly investment program in 2017
By income quintile



Source: Gal and Bleikh, 2019, Figure 13

Figure 17. Share of families who chose a specific investment track in 2017
By income quintile



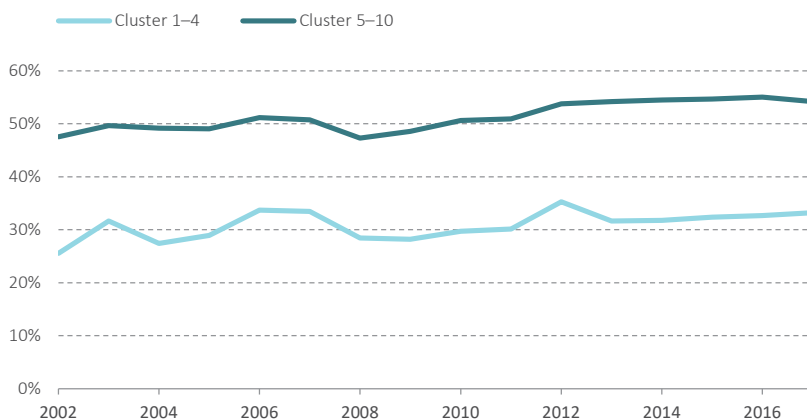
Source: Gal and Bleikh, 2019, Figure 14

3. Investment in higher education

Another major element of social investment is higher education. This accounts for 40 percent of social expenditure on the working-age population. Although investment in higher education clearly seeks not just to reduce gaps between population groups, but also to promote diverse goals such as skills and knowledge development, here, as well, we find a Matthew effect. As can be seen in Figure 18, social investment in higher education is not distributed equally across Israel's population groups. The share of those benefiting from subsidized higher education is consistently greater among those of higher socioeconomic status, and within the Jewish sector. Among high school graduates who grew up in localities belonging to clusters 5–10, the share of those who go on to higher education within 8 years of high school graduation is consistently higher by 20 percentage points than the share of such graduates from socioeconomically weaker localities. A similar picture emerges when the Jewish and Arab Israeli population are compared: in 2017, the share of Jews who went on to pursue higher education was about 50 percent, while the corresponding figure for Arab Israelis was barely above 30 percent.

Figure 18. Share of those who continue on to higher education within eight years of finishing high school

By socioeconomic cluster



Source: John Gal, Shavit Madhala, and Guy Yanay, Taub Center | Data: CBS

Conclusion

In recent years, social investment — the idea that the welfare state can and should allocate resources to human capital development, and encourage full and optimal participation in the labor force throughout the life cycle — has been a central issue in European social policy discourse. The idea's supporters call for a shift in emphasis from social protection, which aims to ensure citizens' financial income and standard of living in cases where their market income does not suffice, to a better balance between preventing the need for assistance and providing assistance where needed. Although the term "social investment" has yet to penetrate the Israeli discourse, the findings of this study indicate that social investment expenditures have lately been on the rise in the Israeli welfare state. Moreover, the share of expenditure on social investment programs out of all Israeli social expenditure is large, and comparable to that of the social-democratic welfare states (Sweden and Denmark). However, a look at the extent of Israeli social investment spending shows that both social investment and social protection spending are low relative to other welfare states, placing Israel in the same category as the Mediterranean welfare states (Italy and Spain). Under such circumstances, the welfare state's ability to fight poverty (by providing sufficient aid in times of distress) or to encourage future social mobility (by developing social investment systems, such as early childhood education and care, or active labor market policies), is very limited.

Although Israel has shown a steady rise in the resources allocated to social investment programs out of the relatively limited resources available for social issues, this has occurred without any substantial public discussion. No thought seems to have been given to the directions in which the social security and welfare systems should develop; in particular, there has been no consideration of the extent to which resources should be allocated, or how that allocation will look. This is troubling, as the research literature not only shows the advantages of social investment policy, but also raises questions about the outcomes of such policy should it be adopted. The long-term goals of social investment programs need to be well defined; their utility must be evaluated, and their features tailored to the goals set. Attention should also be paid to the Matthew effect, in which the main beneficiaries of welfare programs are not necessarily the target populations suffering social exclusion or poverty, but rather those of more means. Finally, this study emphasizes the importance of discussing the topic of social investment. Such discussion will help social policy decision makers balance their desire to improve individual social capital and welfare with the need to address poverty and inequality through social protection.

References

English

- Bonoli, G. (2012). Comment on Anton Hemerijck. *Sociologica*, 1, 1–5.
- Bonoli, G., Cantillon, B., & Van Lancker, W. (2017). Social investment and the Matthew effect. In A. Hemerijck (Ed.), *The uses of social investment*. Oxford: Oxford University Press.
- Bonoli, G., & Liechti, F. (2018). Good intentions and Matthew effects: Access biases in participation in active labour market policies. *Journal of European Public Policy*, 25(6), 894–911.
- Cantillon, B. (2011). The paradox of the social investment state: Growth, employment and poverty in the Lisbon era. *Journal of European Social Policy*, 21(5), 432–449.
- Cantillon, B., & Van Lancker, W. (2013). Three shortcomings of the social investment perspective. *Social Policy & Society*, 12(4), 553–564.
- Cave, L., & Aboody, H. (2011). [*The benefits and costs of employment programs for the Haredim \(ultra-Orthodox\) implemented by the Kemach Foundation*](#). Jerusalem: Myers-JDC-Brookdale Institute.
- Esping-Andersen, G., Gallie, D., Hemerijck, A., & Myles, J. (2002) *Why we need a new welfare state*. Oxford: Oxford University Press.
- European Commission (2013). *Towards social investment for growth and cohesion — including implementing the European Social Fund 2014–2020*. Brussels: European Commission.
- Gal, J. (1998). Formulating the Matthew Principle: On the role of the middle classes in the welfare state. *Social Welfare*, 7, 42–55.
- Gal, J. (2010). Is there an extended family of Mediterranean welfare states? *Journal of European Social Policy*, 20(4), 283–300.
- Gal, J., & Madhala, S. (2018). [*Israel's social welfare system: An overview*](#). In A. Weiss (Ed.), [*State of the nation report: Society, economy and policy in Israel 2018*](#) (pp. 315–334). Jerusalem: Taub Center for Social Policy Studies in Israel.
- Gal, J., & Bleikh, H. (2019). [*The welfare system: An overview*](#). In A. Weiss (Ed.), [*State of the nation report: Society, economy and policy in Israel 2019*](#) (pp. 61–86). Jerusalem: Taub Center for Social Policy Studies in Israel.
- García, J. L., Heckman, J. J., & Ziff, A. L. (2018). Gender differences in the effects of early childhood education. *European Economics Review*, 109, 9–22.
- García, J. L., Heckman, J. J., Leaf, D. E., & Prados, M. J. (2019). *Quantifying the life-cycle benefits of a prototypical early childhood program*. Working Paper No. 23479, National Bureau of Economic Research.

- Heckman, J. J. (2006). Skill formation and the economics of investing in disadvantaged children. *Science*, 312, 1900–1902.
- Hemerijck, A. (2018) Social investment as a policy paradigm. *Journal of European Public Policy*, 25(6), 810–827.
- Kim, Y. Y., & Choi, Y. J. (2019). Does social protection crowd out social investment? *Policy and Society*, 39(2), 208–225.
- Kuitto, K. (2016). From social security to social investment? Compensating and social investment welfare policies in a life-course perspective. *Journal of European Social Policy*, 26(5), 442–459.
- Madhala, S. (2019). [The risk of automation in the Israeli labor market](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2019* (pp. 163–196). Jerusalem: Taub Center for Social Policy Studies in Israel.
- Maron, A. (2019). Translating social investment ideas in Israel: Economized social policy's competing ideas. *Global Social Policy*, 20(1), 97–116.
- Morel, N., Palier, B., & Palme, J. (Eds.) (2012). *Towards a social investment welfare state?* Chicago: University of Chicago Press.
- Nolan, B. (2013). What use is “social investment”? *Journal of European Social Policy*, 23(5), 459–468.
- OECD (2015). *In it together: Why less inequality benefits all*. Paris: OECD.
- Pavolini, E., & Van Lancker, W. (2018). The Matthew effect in childcare use: A matter of policies or preferences? *Journal of European Public Policy*, 25(6), 878–893.
- Ronchi, S. (2016). *The social investment welfare expenditure data set (SIWE): A new methodology for measuring the progress of social investment in EU welfare state budgets*. University of Cologne, GK SOCLIFE.
- Shavit, Y., Friedman, I., Gal, J., & Vaknin, D. (2018). [Emerging early childhood inequality: On the relationship between poverty, sensory stimulation, child development, and achievement](#). Jerusalem: Taub Center for Social Policy Studies in Israel.
- Tarshish, N. (2017). [Israel as a welfare state: A visual essay](#). Jerusalem: Taub Center for Social Policy Studies in Israel.
- Taylor-Gooby, P., Gumy, J. M., & Otto, A. (2014). Can ‘New Welfare’ address poverty through more and better jobs? *Journal of Social Policy*, 44(1), 83–104.
- Vaknin, D., Shavit, Y., & Sasson, I. (2019). [Emerging early childhood inequality: Poverty and future academic achievement](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2019* (pp. 313–359). Jerusalem: Taub Center for Social Policy Studies in Israel.
- Van Kesbergen, K., & Hemerijck, A. (2012). Two decades of change in Europe: The emergence of the social investment state. *Journal of Social Policy*, 41(3), 475–492.

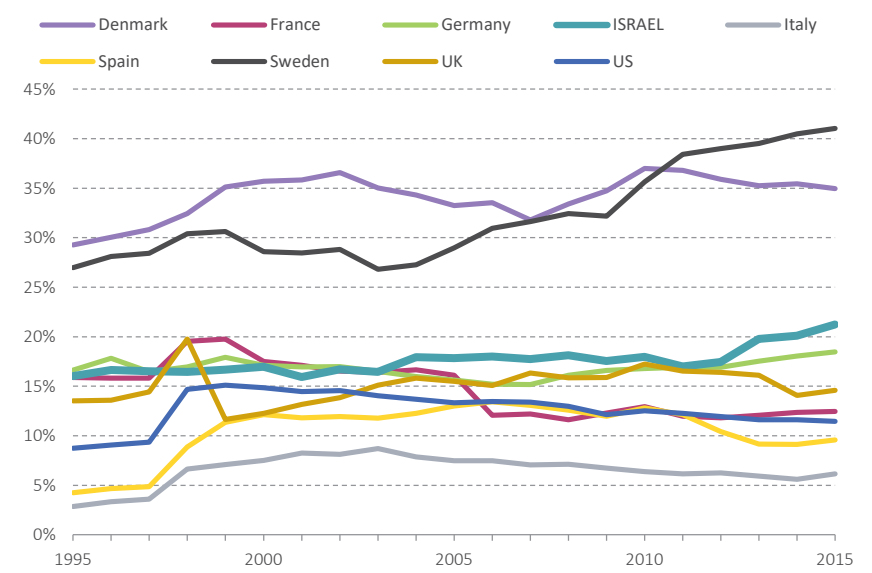
- Van Vliet, O., & Wang, C. (2015). Social investment and poverty reduction: A comparative analysis across fifteen European countries. *Journal of European Social Policy*, 44(3), 611–638.
- Vandenbroucke, F., & Vleminckx, K. (2011). Disappointing poverty trends: Is the social investment state to blame? *Journal of European Social Policy*, 21(5), 450–471.
- Zehavi, A., & Breznitz, D. (2018). The neoliberal targeted social investment state: The case of ethnic minorities. *Journal of Social Policy*, 48(2), 207–225.

Hebrew

- Bank of Israel (2019). [*Special report of the research department: Raising the standard of living in Israel through growing worker productivity*](#). Jerusalem: Bank of Israel.
- Brown, L. (2015). [*Active labor market policy: Estimating the “Employment Circles” program’s effect on Social Security beneficiaries*](#). Jerusalem: Bank of Israel.
- Fichtelberg Barmatz, O. (2017). *Characteristics of households using recognized daycare and family care facilities and those households with young children at home*. Jerusalem: Ministry of Labor, Social Affairs and Social Services.
- Holler, R., & Gal, J. (2011). [*Subsidies for early childhood education and care: The Israeli model in a cross-national comparative perspective*](#). *Social Security*, 87, 37–63.
- Levy, N., & Deutsch, Z. (2016). [*Cost-benefit analysis of innovative programs to integrate groups with low rates of employment*](#). Jerusalem: Myers-JDC-Brookdale.
- Malach, G. (2018). [*Integrating Haredi in employment, targets, and programs for 2030*](#). Jerusalem: JDC-Tevet and the Israel Democracy Institute.
- Pinto, O., & Gottlieb, D. (2019). *Saving for Every Child Program: Implications for inequality, and policy alternatives*. Jerusalem: National Insurance Institute.
- Schlosser, A., & Shanan, Y. (2018). [*Evaluation report on Employment Circles Program*](#). Tel Aviv University: The Foerder Institute for Economic Research.
- Yashiv, E., & Kasir Kaliner, N. (2018). *The economics of the Arab sector in Israel*. Jerusalem: The Haredi Institute for Public Affairs.

Appendix

Appendix Figure 1. Share of social investment out of social expenditure
Excluding expenditures for R&D and education



Note: Social expenditure is defined as the total expenditure on social protection and social investment, without other budgetary line items.
Source: John Gal, Shavit Madhala, and Guy Yanay, Taub Center | Data: OECD

EDUCATION

5

Opportunities and Risks to the Education System in the Time of the Coronavirus: An Overview

Nachum Blass

Introduction

The education system, like other social systems, in Israel and in other countries, is currently responding to the coronavirus crisis. The first stage of the crisis was characterized by a full lockdown as a result of the coronavirus pandemic, which included the closure of schools. The second stage was a brief respite and almost complete return to routine, in the belief that the crisis had passed. The third stage, which began with the second wave of the disease, and which is still ongoing at the time of writing, is a return to lockdown with varying levels of intensity and in which the pandemic is still not under control. There may be additional stages in the near, and perhaps far, future. Currently, the main effort is devoted to issues of immediate concern. However, attention should also be devoted to the future implications of the crisis, which differ significantly from previous ones.

This document relates primarily to the implications of the full lockdown, although large parts of it are also relevant to situations of partial or full operation of the education system during the pandemic and also after it has passed. The main change in the operation of the education system in light of the efforts to deal with the coronavirus pandemic is not the prolonged interruption of learning, since the schools operate for only nine months of the year in normal times, due to the summer vacation and breaks during the school year.

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The difference is in fact between the operating methods of the education system that have been the convention for hundreds of years, and the new situation, which can include periods during which the system must quickly adjust to developments with which it has little, if any, experience. This fact requires flexibility from the education system allowing it to adjust rapidly to changing conditions.

The first stage of the crisis — a full lockdown — had several unique characteristics that deserve a brief description:

- The totality of the situation. Normally, during a school holiday there are alternative activities available: summer camps, extracurricular activities, summer jobs in the case of older students, etc. During the general lockdown in the first wave, none of these activities were available.
- Being confined indoors for an extended period. Usually, adults and even more so children, spend time outside in the garden, in the park, on the beach, or simply out in the street. During the coronavirus lockdown, everyone was confined indoors.
- All of the family is at home. Normally, at least one parent is at home with the youngest children or they are in some type of daycare. During the coronavirus lockdown, everyone was at home.
- Uncertainty. In normal situations, everyone knows when things start and when they end, and they can plan their activities accordingly. No one knows when the current crisis will end.

In the short run, the most reasonable solution to maintain the functioning of the education system in lockdowns of this type — where the simplest goal is the imparting of knowledge — is remote teaching and learning. In the intermediate and long runs, and on the assumption that situations such as these will be rare but nonetheless possible, the solutions will involve the creation of an educational work environment that combines safety in the school with remote teaching and learning, allowing for a rapid shift from a complete lockdown to a partial one or to normal activity without any restrictions.¹

1 Remote teaching includes all types of teaching and learning that occurs outside the school, whether it is based on electronic means or any other. It is important to emphasize that this is not a new and unfamiliar phenomenon. Many organizations, both in Israel and abroad, have been evaluating and developing these methods for 20 years or more. The most prominent players in Israel are, of course, the Center for Educational Technology (*Matach* in Hebrew), which is working in partnership with the Ministry of Education and the Open University.

Preliminary insights into the effect of the coronavirus crisis on the education system

The full lockdown (and in most cases also the partial one) that was imposed to stop the spread of the coronavirus pandemic in most countries led to the closure of schools. At the beginning of April, the number of students not attending school stood at 1.16 billion in 194 countries (Ben Avot, 2020).

The lockdown also led to an increased use of remote teaching, which, in the absence of other solutions, constituted and continues to constitute an efficient temporary solution in certain locations and for certain age groups, though it is less efficient in other locations and for other age groups. The lessons that will be learned from the new educational reality, which can be viewed as an unplanned but nonetheless important socio-educational experiment, will have a decisive effect on the decision of whether remote teaching will continue to be an integral part of the education system once there is a return to normal times, and, if so, in what form and to what extent. As things look now, it is likely that remote teaching and learning, which is possible thanks to rapid technological innovations, will become part of the educational process and preparations should be made that will leverage its advantages and minimize its disadvantages.

This document will present preliminary insights into the Israeli education system's response to the coronavirus crisis particularly during the full lockdown. We will do so based on our limited ability to predict the future, focusing on four groups: students, teachers, the Ministry of Education, and parents.

A. The students

Dealing with general issues related to a general lockdown

The discussion of the implications of school closure in response to the coronavirus crisis can be divided into two: the implications of the school closure over time and the implications of using remote teaching as a tool to deal with the reality of school closures. The discussion is divided into two: the effect of school closure as a result of the lockdown imposed on the general population and the effect of the interruption of studies in the schools when the adult population is not in lockdown. We will start with the effect of being in lockdown for an extended period.

As mentioned, even in normal times, schools are closed for between three and three and a half months per year — two months during the summer and the rest during shorter school breaks. This reality is primarily the result of a long tradition shared with most other countries. In general, there is a consensus among researchers that the summer break is accompanied by a “summer learning loss” which is greater among students from weaker socioeconomic backgrounds (Anderson, 2020; Kuhfeld et al., 2020; Kuhfeld & Tarasawa, 2020). However, there have been studies published recently that question this widely held belief or at least present a more modest estimate of the educational loss (von Hippel, 2019).

The question is what effect a longer break, with its unique characteristics as described above, in addition to the “regular” breaks, will have over time. On the assumption that an extended closure of the education system — which according to its narrow definition includes Grades 1 through 12 (ages 6–17) and according to its broader definition also includes preschool and post-secondary education (ages 0–25) — can lead to a loss of knowledge and skills in the long run, it can have wide-ranging implications on the individual and national levels (although this widely accepted concept requires more evidence than is currently available).

Several studies have recently been published that attempt to estimate the long-term damage of the coronavirus pandemic. Many of them are based on earlier and recent work done by Hanushek and Woessmann (2015) who link academic achievement to the annual rate of growth in GDP per capita (Azevedo, Hasan, Geven, Goldemberg & Iqbal, 2020; Hanushek & Woessmann, 2020; Psacharopoulos, Patrinos, Collis & Vegas, 2020). Other studies have tried to estimate the damage to human capital as the result of war (in Germany and Austria) (Ichino & Winter-Ebmer, 2004; Akbulut-Yuksel, 2009); of extended closures of the education system due to the Cultural Revolution in China (Meng & Gregory, 2007); of long teachers’ strikes in Belgium, Canada, and Argentina (Belot & Webbink, 2010; Baker, 2013; Jaume & Willen, 2019); of extreme weather conditions (Goodman, 2014); and of natural disasters (Picou & Marshall, 2007; Andrabi, Daniels & Das, 2020). Most of the findings indicate that on an individual level, those who suffer from a prolonged interruption in their schooling study and have lower achievement levels in an academic or professional career. These outcomes apply to most students (at least in the short run), but students from strong backgrounds usually make up for the loss quite quickly, while students from weaker backgrounds have a hard

time making up for the loss, and as a result the damage remains long term. On a national level, the majority of studies indicate a slowdown in the annual growth of the economy.

A recent publication of McKinsey and Company, an American consulting firm, which twice examined the profile of countries that are more successful on the PISA exams, looked at the expected effect of the school closure and remote teaching. The examination related to three variables: the duration of the closure, the quality of remote teaching, and the background data of the students. The study describes several possible scenarios for school interruption starting in March 2020 as a result of the coronavirus crisis (Dorn, Hancock, Sarakatsannis & Viruleg, 2020):

1. A return to regular operation of schools in August 2020, January 2021, or August 2021, where learning continues remotely on a reasonable level during the interruption;
2. A return to regular operation of schools in August 2020, January 2021, or August 2021, where learning continues remotely on an intermediate level during the interruption;
3. A return to regular operation of the schools in August 2020, January 2021, or August 2021, where learning continues remotely on a low level during the interruption;
4. A return to regular operation of schools in August 2020, January 2021, or August 2021, without any remote learning.

The study findings indicate that the shorter the interruption of studies and the higher the level of remote learning, the smaller will be the loss in academic achievement. In the situation in which the return to school is only in January 2021 and there is no remote learning, the loss in academic achievement will range from 12 to 14 months of learning or in other words more than a full school year.

A more disturbing finding relates to the expected effect of an interruption of studies across various population groups where the gaps were found to be quite large. The average loss among white students is about six months of learning while among students from a weak socioeconomic background the loss is more than double that.

It is important to emphasize that losses resulting from school closures for long periods of time go beyond just the decline in academic achievement, and, as already said, are greater among students from weaker socioeconomic backgrounds (see Labaree, 2020). The damage done includes:

1. **Risk of violence.** For many students, and in particular (but not only) those from weaker socioeconomic backgrounds, the school is the space most protected from violence and other high-risk situations. Being forced to stay at home with their parents or older siblings can lead to a risk of physical, sexual, or verbal abuse. This danger intensifies with the level of economic stress that accompanies forced confinement at home. Indeed, there have been recent reports of an increasing number of requests for assistance to the welfare services (Lee, 2020a; 2020b).²
2. **Reduced auxiliary services.** Teachers, guidance counselors, and truancy officers who operate in the schools are an important source of information for welfare services and legal authorities about a student's level of distress in cases where intervention is necessary. School closures limit the efficacy of monitoring and the ability to provide assistance to at-risk students. This problem is exacerbated when those providing auxiliary services are also required to remain at home.
3. **Diminished social and other types of contact.** The school is one of the three frameworks in which children spend time during the day, the other two being home and after-school informal frameworks. The very ability to shift from one framework to another is important for mental health. Each of the other two frameworks meets social and emotional needs that are not met in the home environment — meeting with friends, playing with one's peers, and the like. If school closure is relatively brief, then the damage is perhaps not substantial but it increases with the duration of the lockdown.
4. **Less time devoted to learning activities.** Studies in England (Andrew et al., 2020) and Germany (Grewenig, Lergetporer, Werner, Woessmann, & Zierow, 2020) indicate that students who were at home during the lockdown devoted much less time to educational activity than during normal periods.

2 There are quite a few students who experience verbal and physical violence in school, but that is a separate issue that we will not deal with here.

This is particularly true among students from weaker socioeconomic backgrounds, as shown in the English study, and among the academically weaker students, as shown in the German study.

5. **Cancellation of school lunches, or in the best case a reduction in them.** In Israel, a large number of students participate in the school lunch program. For many of them, this is an important part of their daily nutrition and school closures represent a major loss for them (Tal-Spiro, 2017).³ The World Food Programme (WFP), which is involved in global food issues, has reported that during the coronavirus pandemic, 364 million children in 164 countries did not receive school meals.⁴
6. **Dropouts.** Even when a school is operating normally, there are students who are in danger of dropping-out for any number of reasons — poor school performance, poor social adjustment, and even economic factors. When schools are closed for a longer period, there is greater concern that these students will not return once schools open.⁵ One report presented the lessons learned from the closure of schools in Africa as a result of the Ebola crisis in 2014, according to which the drop-out rate increased, particularly among girls (Selbervik, 2020).
7. **School as a catalyst for social equality.** Labaree (2020) claims that school is usually also the main place where a student from a socioeconomically distressed background meets with students from stronger socioeconomic backgrounds and can enjoy a hygienic, well-maintained environment with normative conditions. It may also be the only environment where the student is the focus of attention.

3 According to Prof. Aron Troen who spoke on October 20th of this year before the Knesset Special Committee for the Rights of the Child, at this time there are 420,000 children and youth who are entitled to be a part of this nutrition program although not all of them participate in it. He noted that despite the rising need, in 2019, out of a total budget of NIS 929 million, only NIS 761 million was actually used (about 82 percent). With regard to program implementation during the lockdown, Prof. Troen said that at the time of the first lockdown, about 18,000 of those in need were provided for in their homes; at the time of the second lockdown, not a single child in need received assistance from the program.

4 See Global Monitoring of School Meals During COVID-19 School Closures at [WFP](#).

5 See Adverse Consequences of School Closures on the [UNESCO](#) website.

Dealing with academic difficulties by means of remote teaching and learning

In addition to the negative academic and social effects as a result of the loss of learning days, the steps taken by the system in order to overcome the forced interruption of learning — and in our specific case, remote teaching and learning — also have an effect on the situation. This influence is present even if learning takes place part of the time remotely and part of the time physically in the school (hybrid learning).

Remote teaching and learning — when carried out correctly and effectively — have many important advantages, both in a period of emergency and in normal times. In an emergency situation, when the schools are forced to close, remote learning is the primary solution that allows the schools to continue carrying out their most obvious function, namely the imparting of knowledge and academic skills. In normal times, it can be one of the main components in the process by which a student acquires self-learning skills and learns personal responsibility.

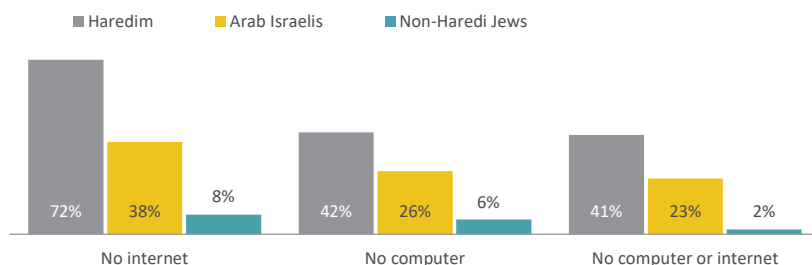
Nonetheless, it is important to be aware of the fact that under the currently prevailing conditions in Israel with respect to physical infrastructure and economic and educational capabilities, remote learning can only provide a solution — partial and imperfect — for students from stronger backgrounds. In contrast, it provides only a problematic solution or even an inferior one for large numbers of students, namely those from weak socioeconomic backgrounds.⁶ The reasons for this are clear. The access to remote learning, i.e., the number of computers in a home relative to the size of the household, the available bandwidth, the presence of quiet areas in which to concentrate, etc., is far more limited among families with a weak socioeconomic status; among some of them, there is no access at all.

Figure 1, which was presented in a document published by the Chief Economist of the Ministry of Finance, illustrates one aspect of the problem, even though it is not the only one nor perhaps the most important. It shows the differences in access to the digital infrastructure necessary for efficient remote learning across various population groups. It appears that even among non-Haredi Jews, there are groups without an internet connection (8 percent). Among the Haredi (ultra-Orthodox Jewish) population this rate reaches 72 percent while among Arab Israelis it is 38 percent. The share of students who

6 This is not unique to Israel. It was found in both the survey of Ben Avot (2020) and the report of the US National Academies of Sciences, Engineering and Medicine (2020).

have no access to either a computer or the internet is 2 percent among non-Haredi Jews, 23 percent among Arab Israelis, and 41 percent among Haredim.

Figure 1. Access to the internet and to a computer among non-Haredi Jews, Haredi Jews, and Arab Israelis



Source: Ministry of Finance, 2020, Figure 6s

It should be stressed that the increase in gaps that is the result of remote learning is not unique to Israel and has been reported worldwide. A concrete example of the inter-class differences in responses to the coronavirus crisis appears in an article that describes how private schools, which serve stronger populations, are able to stay open while public schools are forced to stay closed (Miller, 2020).

More well-off parents are better able to help their children understand the material conveyed by digital means. There are also reasons to believe that learning habits and the ability to concentrate and not be distracted when an adult is not present — abilities that are necessary in order to succeed at remote learning — are developed at an earlier age among students from stronger families. In view of these factors, the ability of students from weak families to benefit from remote learning is usually more limited and this is all the more so under the conditions of economic distress that characterize many households during periods of prolonged closures. Therefore, the ability of a less well-off household to meet the remote learning needs of a student is limited.

In sum, in the case of students, the safety net that online teaching provides in a crisis has some major gaps, and it is primarily students from weak socioeconomic backgrounds who fall by the wayside. This safety net is particularly flawed in the case of specific population groups, such as preschoolers, students with special needs, and youth at-risk. Among these

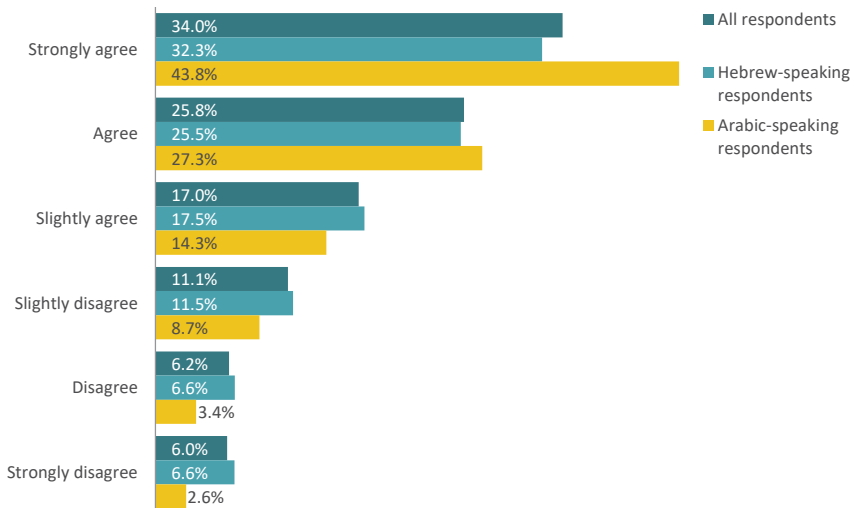
students, remote learning is hardly a substitute for the traditional school setting. The school, despite its deficiencies and the fact that it is a conservative institution whose goals include the continuity of the existing social regime, is still the institution with the greatest potential and ability to reduce social and academic gaps.

B. The teachers

The reality of remote learning can have far-reaching professional implications for teachers. We will describe a few of them as found during the crisis.

1. **Professional empowerment.** The advanced technology that is currently available and which facilitates online teaching, and primarily the necessity to use this knowledge, provides teachers with a more diverse toolbox than was previously available. This toolbox, if teachers continue to use it wisely after the crisis, can increase their professional skills and upgrade their professional status. Indeed, a survey carried out by the Taub Center, with the consent and assistance of the Israeli Teachers Union and which was answered by about 6,000 Jewish and Arab Israeli teachers, showed that 71 percent of the Arab Israeli respondents *“agreed”* or *“strongly agreed”* that remote teaching strengthens their professional abilities while only 6 percent *“disagreed”* or *“strongly disagreed”* (Figure 2). Among Jewish respondents, the figures were 58 percent and 13 percent, respectively (Taub Center, 2020).⁷

7 At this stage, we do not have an explanation for the relatively large difference between the Jewish and Arab Israeli respondents. The reason may be the lower average age of the Arab Israeli respondents.

Figure 2. The distribution of responses to the question:***“In retrospect, remote teaching has empowered me”***

Source: The Taub Center and Israeli Teachers Union survey

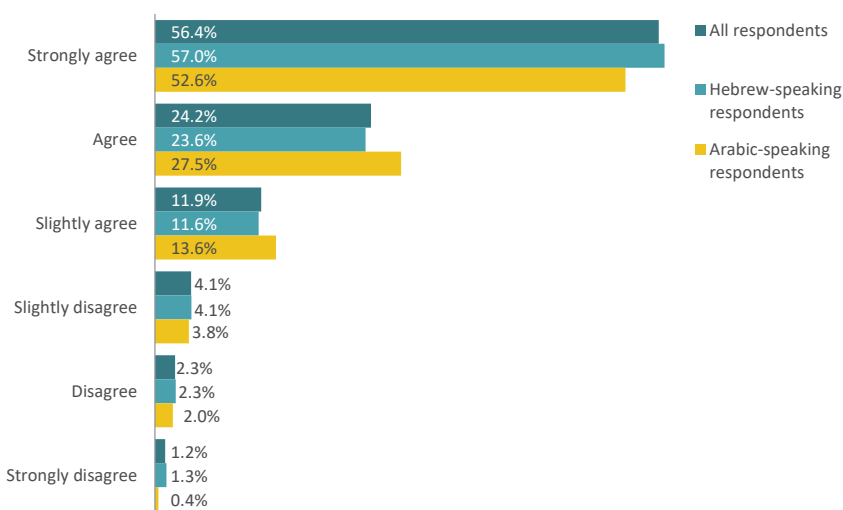
2. **Increased professional autonomy.** For many years, agencies such as *Matach*, the Open University, non-profit organizations, and commercial companies have been developing digital learning tools for the classroom and for online teaching. Despite their major investment and efforts, the tools they have developed have not become an integral part of the day-to-day educational experience in the education system. When the system shifted to remote learning and teaching, the principals and teachers were forced to adjust to the new conditions “on the fly.” To this end, they adopted — whether individually or as part of a group on the school level, the municipal level or the regional level — the methods that were most appropriate for them and for their students. This in practice led to a wide variety of approaches, lesson plans, and teaching methods unique to each teacher and group of students, and strengthened the teachers’ feeling of professionalism and autonomy. This was also confirmed in the teacher

survey. Most of the respondents (65 percent) feel that remote teaching strengthens their professional abilities and 43 percent feel that it reinforces their independence (Taub Center, 2020).

3. **A feeling of self-efficacy.** As a result of the teachers' efforts, many schools now have an inventory of teaching material and teaching aids for remote teaching. These can contribute to the formation of teacher groups in the same age group, in the same school or in some other setting who exchange knowledge and experience among themselves for the benefit of the students and in order to increase their professional abilities. In this context, it is interesting that more than 80 percent of both the Jewish and Arab Israeli respondents *"strongly agreed," "agreed," or "somewhat agreed"* with the statement *"I have learned to solve unexpected problems"* (Figure 3) (Taub Center, 2020).

Figure 3. The distribution of responses to the question:

"In retrospect, I have learned that I am able to solve unexpected problems"

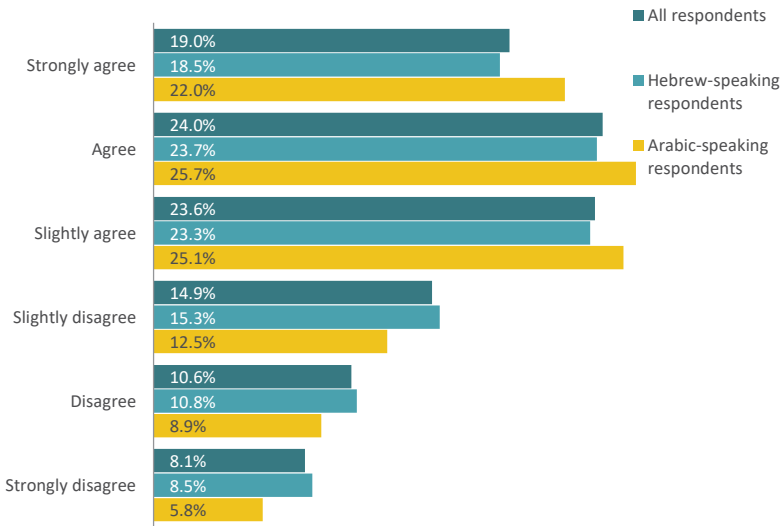


Source: The Taub Center and Israeli Teachers Union survey

4. **Creation of new channels of contact with students.** The transition to remote teaching, primarily in the case of online teaching, creates new opportunities for personal contact with students who the teacher may have been less attentive to in the regular classroom setting or who did not get the attention they needed in the classroom, due to the size of the class or for some other reason. Here, again, remote teaching had a positive impact overall, although it was less than in (2) and (3) above. About 48 percent of the Arab Israeli respondents felt that they are now more familiar with their students and their families while about 25 percent agreed with this to only a limited extent (Figure 4). In the Jewish sector, the figures were about 42 percent and about 23 percent, respectively. Interestingly, here again the opinions on remote teaching were more positive among Arab Israeli respondents.

Figure 4. The distribution of responses to the question:

“In retrospect, I became more familiar with my students and their families”

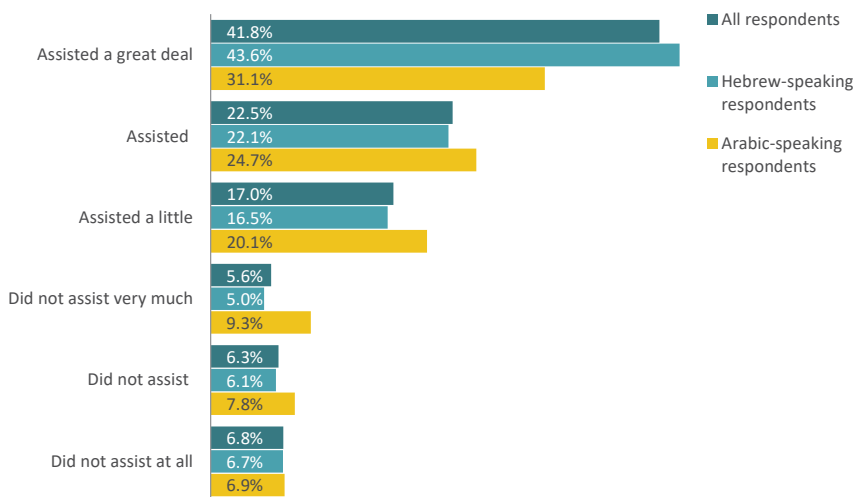


Source: The Taub Center and Israeli Teachers Union survey

5. **Teaching without disciplinary problems.** One of the biggest problems for teachers in general is dealing with disciplinary issues. Obviously, this problem does not exist in online teaching. But offsetting that huge advantage is perhaps an even bigger problem, namely that of maintaining the students' level of interest and their willingness to continue participating in class, to follow the instructions of the teacher, and to carry out assignments. This is a true test of the teacher's professionalism, relative to the ability to maintain discipline in the classroom. Although the survey did not include a direct question on discipline problems, 60 percent of the respondents stated that their students found it difficult to maintain a high level of motivation and interest (Taub Center, 2020).
6. **Working as part of a team.** Effective teaching requires a variety of skills that not every teacher possesses. The ability of a teacher to view the lessons given by other teachers in the same school and even to the same class, to get new ideas for presenting the material, and to share lesson plans and teaching aids makes it possible to learn from colleagues to a much greater extent. There is also a major advantage in the possibility for a teacher to observe the lessons given by colleagues in her free time. Indeed, the results of the survey indicate that teachers got the most assistance from their colleagues (Figure 5). About 66 percent of the Jewish respondents and about 56 percent of the Arab Israeli respondents reported that their colleagues *"assisted them"* or *"assisted them a great deal."* In contrast, about 21 percent of the Jewish respondents and about 25 percent of the Arab Israeli respondents reported that they received the same level of assistance from the Ministry of Education.

Figure 5. The distribution of responses to the question:

“To what extent did your colleagues help you in online teaching?”



Source: The Taub Center and Israeli Teachers Union survey

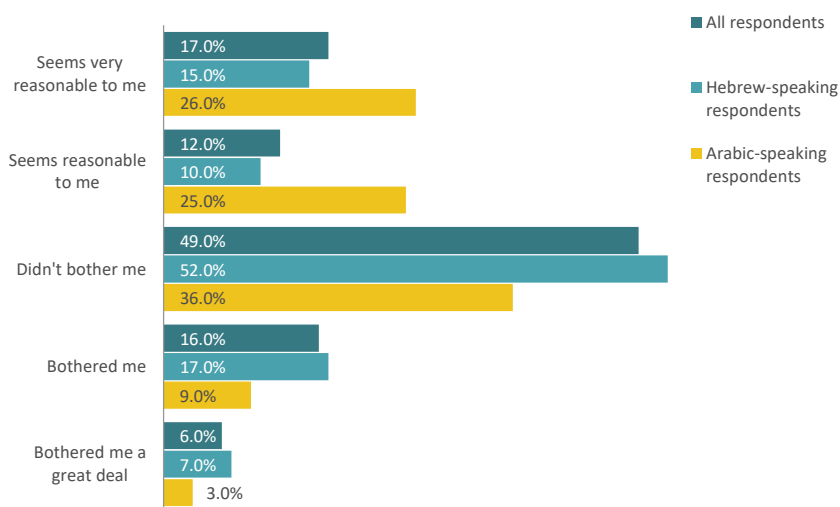
7. Elimination of the classroom door as a barrier. Online interaction, whether recorded or live, creates a new reality in which teaching activities, and sometimes also educational interactions, between teacher and student becomes visible — there are those who would say “exposed” — to the parents and even more so to others, including colleagues, principals, supervisors, and heads of education departments. This has major implications. With online teaching, the era of mystery of what is going on behind the classroom door has come to an end. The parent may be sitting behind the student and watching the lesson, and is able to evaluate the pedagogical approach and the material being taught. However, it is important to emphasize that, in many cases, the parent does not have the proper tools for such an evaluation. Even the principal and/or the supervisor cannot assess the work of a teacher on the basis of a one-time physical observation of a lesson; it requires multiple observations and the input of other professionals. Observing online lessons gives the relevant players —

teachers, parents, principals, and supervisory agencies — improved tools for dealing with unjust criticism on the one hand and demands for salary increases on the other.

In view of this, it is interesting to examine the responses of teachers to the question of whether it bothered them that parents have the possibility of observing the lesson. A decisive majority of the respondents answered that it does not bother them, and many answered that *“it seems reasonable”* or *“very reasonable”* to be observed (Figure 6). The positive attitude toward this possibility is especially evident among the Arab Israeli respondents, with more than 50 percent of them relating to the issue positively or very positively. The reason may be that, in Arab Israeli society, the socioeconomic status of teachers and the prestige of the profession are higher than in Jewish society, and therefore it is less common to find a situation in which the parent has a higher status than the teacher and has little respect for the work that they do.

Figure 6. The distribution of responses to the question:

“What is your attitude toward the possibility that parents and others can observe the lessons you are teaching?”



Source: The Taub Center and Israeli Teachers Union survey

8. **The changing character and function of the teacher.** The increased role of remote teaching as a result of the coronavirus crisis may have far-reaching implications for the character of schools and its highly important role as the primary social environment in a student's life. Such a change also requires a major transformation in the perception of the teacher's role, in the methods of teacher training, and in the teacher's work routine. Teachers will have to shift from being figures of authority who convey information, rely on oratory, with the ability to punish and reward, to being the "responsible adult" who provides guidance and mentoring and helps students acquire knowledge and skills, and deal with the processes of growth, adolescence, and personality development in this critical stage of their lives. The institutions that train teachers will need to provide them with the tools and knowledge that are required in their encounters with youth who are likely to be highly familiar with the ins and outs of communication technologies and innovative data mining, but who lack the knowledge and life experience they need in interacting with their peers and the world of adults.
9. **Anchoring of remote teaching as an integral part of the teacher's work.** The integration of remote teaching within the teaching process also requires defining the part of remote teaching in the teacher's job. It is suggested that an hour of remote teaching be considered equivalent to an hour of frontal teaching and that the division of a teacher's hours be determined by an agreement between the principal and the teacher according to rules to be determined by the Ministry of Education.

In sum, it appears that in the opinion of the teachers — at least those who participated in the survey carried out by the Taub Center — the experience of remote teaching has, as a whole, been positive and it has created a major opportunity for their empowerment and for strengthening their capabilities (Taub Center, 2020). However, it also creates a complex challenge to learn new skills and it exposes teachers to parents and to their professional and administrative superiors, an experience that they may view as threatening. In general, and not necessarily in the context of the survey discussed here, the conclusions with respect to the efficacy of remote teaching according to pedagogical measures, and to an even greater extent emotional and social measures, are mixed and uncertain.⁸

8 A recent example is the opinion of Prof. Yair Amihai-Hamburger (see Detel, 2020).

C. The effect on the character and nature of the future school

As already mentioned, school closures for a lengthy period of time occur every year and even closure due to strikes is not all that uncommon. Therefore, the recent closure — at least the one during the first wave of the coronavirus crisis — should not, on its own, have an impact on the character and function of the school, nor on educational and pedagogical outcomes in the long run. Without the rapid and dramatic transition to remote learning and teaching — which is the result of the unique nature of the crisis and the new technological possibilities for remote learning with their implications for society and the economy that have become available to principals and teachers — the coronavirus crisis might have been viewed as a passing event of high significance while it was happening, but with little impact on the future. However, as things appear today, and if the formal education system will need to continue to function in a substantially different way from how it has functioned for many decades and even centuries due to the threat of recurring long lockdowns, it will have to transition to totally new and unfamiliar spheres. This will involve a configuration in which there is no longer just one teacher facing several dozen students who are essentially a captive audience in a physically demarcated space for defined periods of time interrupted by short breaks. The new learning reality will apparently be implemented under varying combinations of learning in school and learning outside school (at home, in public institutions, and in the community). The adoption of remote learning and teaching as a structured part of school activity can bring about significant changes. For example:

1. **Strengthening the social element.** The study of academic material is possible and for some of the students — particularly those with good study skills, a high level of curiosity, a supportive home environment, and a convenient computer and learning setup — it occurs under better conditions and is even more efficient under remote learning than in the traditional school setting. But what is missing in remote learning, and particularly during a lockdown, is interpersonal contact among students and between students and teachers. This kind of contact cannot be replaced by online learning or by telephone. If it becomes clear that remote teaching is efficient in the imparting of knowledge and academic skills for a growing share of students, then the place and function of the classroom and the school in this landscape will diminish. At the same time, the school will become increasingly important as the primary and most significant location for

interpersonal social encounters where young people can acquire social and emotional skills. Such a change in the school's function will require analogous changes in the work methods of teachers and in the division of functions between them and the rest of the school staff,⁹ in the organization of timetables, and in physical infrastructure. These transformations will not happen overnight and not even over the course of a year or two. It will be a long process, but apparently an inevitable one.

2. **Preserving social unity.** The modern school has an important role to play in preserving solidarity and social unity. In the words of Labaree (2010), the key feature of the new community school is not the curriculum or its pedagogy but rather its sense of community. It brings together young people in one building in which they have shared social and economic experiences despite class differences between them. It is likely that this function of the school will grow in importance as remote learning, which highlights status, social and other differences between students, becomes increasingly common. Extended lockdowns and the increasing use of remote teaching constitute a complex challenge to the education system, and in particular the public education system, to hold on to educated and more well-off parents who are liable to flee to private education and homeschooling. This is a phenomenon that is already occurring in parts of the US.¹⁰
3. **Cooperation with informal frameworks.** Such a dramatic change in the way that schools operate is liable to have an adverse effect on the activity and functioning of informal frameworks that currently operate in the afternoon and evening hours, including youth movements, volunteer activities, etc. Naturally, it will be necessary to find a way of coordinating between the school and these other frameworks.
4. **The connection with parents.** During the long weeks when schools were closed and remote teaching was in use, many parents became active partners in their children's learning process. The parents — and in particular those of younger children — were asked, and sometimes almost required, to ensure that their children were carrying out the instructions

9 It is possible, for example, to think about a configuration in which every adult will be responsible for a small group of students in the same age group or even of different ages.

10 See BVSD school board hears back-to-school, enrollment updates at [Daily Camera](#).

from their teachers and completing their assignments. At the same time, they are able to observe firsthand the work of teachers in its complexity and the knowledge required to carry out that work. The deeper familiarity of parents with the work of the teacher on the one hand and that of the teachers with the reality in the homes of their students on the other may have a major impact. The direction of this influence on the parents is unclear. The impact might be highly positive, by means of what is generally known as “increased parental involvement” in school life, or less positive if “parental involvement” occurs in processes and activities that they were not trained in and in which they lack basic knowledge. The effect of greater familiarity with the students’ parents — particularly those who live in difficult economic conditions and with interpersonal stress that is amplified by the lockdown — is also unclear. On the one hand, it can help the teacher to understand the conditions that are hindering the student’s learning and on the other hand it can lead to a shedding of responsibility and the attribution of the student’s failures to the conditions in his home.

5. **Partnerships with agencies outside the education system.** Since the closing of the schools, dozens of public bodies, non-profits, and commercial companies have assisted the education system in quickly and efficiently switching to remote teaching. It is likely that at least some of these initiatives will be shown to be effective and as having real potential to improve remote teaching also in the future, once the crisis has passed. The continuation of collaboration among all of the players can undoubtedly help the education system in the gradual integration of remote teaching in normal times.

D. The Ministry of Education

The onset of the coronavirus crisis meant that the Ministry of Education had to deal with a situation of great uncertainty; in response to demands by the country’s leadership and the public, they had to provide immediate solutions to a situation that no one could have predicted. It should have been clear to the public that under these conditions — and as long as the country is under lockdown — there is no possibility of operating the education system in a way that will simultaneously fulfill all three functions of the school: teaching, social interaction, and allowing parents to be involved in other activities, primarily work. This crisis, and the growing trend toward remote teaching that it triggered, have also emphasized the importance and centrality of the Ministry

of Education as the agent that determines the rules for the education system on the one hand, and its limitations as the operating agent in the field, on the other. It became clear that the local authorities, the school principals, and the teachers were in need of clear and timely directions, as well as professional and financial guidance, but the Ministry of Education's response was limited. As a result, the local authorities, the principals, and the teachers had to implement and improvise solutions on the local level, and in general they accomplished this with a fair measure of success.

The greatest failure of the Ministry of Education, regardless of the coronavirus pandemic, was the system's lack of preparedness for a long period of activity in a crisis situation involving the closure of schools. The State of Israel has experienced emergencies in the past that required large parts of the education system to close, and the frequent warnings of what is expected for the home front if another war is forced on it leave no room for doubt as to the necessity of a solid infrastructure for remotely operating the education system. The tools have been available to the Ministry of Education for many years. The means for active, interactive, and hybrid instruction were well known and well understood and the Ministry of Education even used them on a number of occasions when school was interrupted in the South. The management of the Ministry of Education and the entire education community were also well aware of the significant pedagogical potential in the use of remote learning even in normal times. However, very little was accomplished up until the crisis, and what was accomplished was not of sufficient scope in order to train teachers, prepare curricula, strengthen the computing infrastructure in the schools, and ensure that students from weaker socioeconomic backgrounds and the schools they attend have the equipment necessary for remote learning. The system was unprepared from an organizational and conceptual perspective to make remote teaching an integral part of the educational process, one that can be expanded or contracted as needed, while ensuring that gaps between the various population groups are not widened. The results of this failure have become clear during the lockdown, and it appears that they will have an effect on the functioning of the system also in the near future.

The failure to prepare the education system for a lockdown pales in comparison to the failure in managing the system during the lockdown and in the transition period following the lockdown. Instead of using the forced interruption of school activity and joining forces with the directors of the education departments in the local authorities, the teachers unions, parent

committees, and school principals in order to prepare effectively for reopening the schools, it chose to ignore them, in the best case, and, in the worst case, it generated confrontations with them. This failure reached its peak in a series of hasty, and sometimes illogical, decisions regarding the exit from the closure, both from the first and the second lockdown. These decisions were made and conveyed to those responsible for carrying them out at the last moment and sometimes even on the day that the managers of the educational institutions were meant to carry them out. Moreover, there were instances in which decisions were announced in the morning and canceled by the evening. This occurred against the background of a long-term policy of non-transparency that has been maintained almost without exception. The public had no way of understanding the logic of these decisions, knowing who made them, and who was consulted.

What needs to happen in the future when a full or partial closure is again imposed on the education system as part of a lockdown of the economy as a whole?

1. The period of the closure should be used effectively in order to arrive at understandings with the relevant players and, in particular, the teachers unions, the local authorities, and the Ministry of Finance regarding teachers' employment arrangements both during and after periods of lockdown. A critical point in this context is the achievement of an understanding that an hour of remote teaching will be equivalent to an hour of frontal teaching. Teachers should not be required to teach full or part-time and be paid less than they would have earned under normal teaching conditions.
2. If a prolonged lockdown is imposed on the education system during the later months of the school year (say, around Passover), then agreement should be reached ahead of time with the teachers unions that the summer vacation and the month of the High Holidays will be appended to the end of the lockdown period in order to allow everyone to get organized prior to the renewal of studies.¹¹

11 The timing of the lockdown has additional significance with respect to the efficacy of remote teaching. When a decision on the lockdown is made during the school year or near its end, teachers already know the students and are better able to monitor them and their issues. When the decision is made at the beginning of the school year, teachers are not yet familiar with their students and it is also difficult for them to ensure that students get the maximum benefit from their studies.

3. As long as bagrut (matriculation) exams are still given, it should be determined ahead of time what changes will be made to them according to the duration of the lockdown, and agreement should be reached with the institutions of higher education regarding the validity of the modified exams and the implications for acceptance to higher education.
4. A budget reserve should be prepared to cover the implementation of programs such as the “Summer Vacation School” program, summer camps that operate within the social distancing framework, and other activities that will make it easier for parents to continue going to work.
5. The public should be involved in the decision making process and consultations should be held with past educators as to which measures are worth adopting.

The above is of course dependent on organized and sustained efforts to prepare the system for the day-to-day implementation of hybrid teaching and learning and the rapid narrowing of gaps in technological infrastructure on the level of the city, the school, and the individual student.

The coronavirus crisis: An opportunity for long-term change

Alongside the problems that have arisen and will continue to arise due to the coronavirus pandemic, it has also created an opportunity — perhaps a one-time opportunity — to make far-reaching changes in how the education system operates that can bring about a transformation in the system’s functioning. This section will present three changes of this type.¹² Of course, these are proposals and ideas that need broad and in-depth discussion and can serve as a platform for future discussion. They involve some significant obstacles and without a doubt will be opposed by some groups and some educators. They are not the only possible measures that can be adopted and may not even be considered the most important ones; other initiatives and projects may, of course, be no less beneficial. That being said, their implementation, in whole or in part, is worthy of consideration, or, at the very least, it is worth discussing their validity and efficacy in detail.

12 A fourth change relates to reducing the number of students per class, which is discussed in detail in the next chapter in this book.

A. Greater efforts to reduce educational gaps

The coronavirus crisis and the subsequent shift to remote learning has widened academic gaps, while, at the same time, it has increased awareness of the need to reduce them. This awareness is not new and the system has invested effort in this direction for many years. However, the coronavirus crisis has made it clear (to anyone for whom it was not yet clear) that the scope of these efforts is insufficient. Using a differential standard for budgeting as the sole policy tool implemented primarily through additional teaching hours for students from weaker socioeconomic backgrounds — without the possibility of converting it into money — cannot satisfy all the needs. It is necessary to adopt several complementary measures in order to reduce and even eliminate the harm caused to weaker students as a result of the lockdown and the shift toward remote teaching and learning.

First of all, governmental, public, and civil resources need to be mobilized for the purpose of improving and upgrading the technological infrastructure that facilitates remote learning and teaching, and they need to be focused on the most serious gaps among the weak populations. This includes providing a computer for every student, even at the expense of the state, if the student's parents are unable to afford one; providing internet connection with sufficient bandwidth, again at the expense of the state or some other source if the family does not have sufficient means; amplification of the internet strength in areas that require it; and the establishment of regional learning centers near student residential areas for those whose home conditions do not allow for remote learning. Efforts in this direction should be focused first on the older students, until the efficacy of remote learning for younger age groups is examined.

The damage caused by the waves of lockdowns on the one hand and the large scale implementation of remote learning on the other have increased the importance of the schools' support frameworks, both within the school and in the local municipality. The impact of the lockdown on students who are on the brink of dropping out from the system or who have already done so calls for an increase in the number of truancy officers and an expansion of their authority. In view of the difficult economic, family, and social reality created in some homes, it is critical to reinforce and expand the roles of the psychological support services, social workers, and guidance counselors. The fear of recurring health issues points to the need to restore the position of school nurse, an important service that was privatized in the past and essentially ceased to exist.

In addition to all of the above, it is worth considering the establishment of a legal foundation for efforts to increase equality in the education system. This will include differential budgeting, prioritizing compensation for teachers in schools that serve populations with a weak socioeconomic status, reinforcement of the support frameworks serving students from weak populations, and strengthening of the informal education frameworks aimed at these populations.

B. Fundamentally changing the bagrut (matriculation) exams

If there is any point of consensus among educators in Israel, it is the huge damage to the education system caused by the bagrut exams in their current format. Researchers, teachers, and public officials have written numerous articles, op-eds, and recommendations that claim that the bagrut exams lead to shallow learning, reduced autonomy of the teaching staff, superficial learning based on external motivation and learning by rote, and other adverse outcomes. Few educators today believe that the bagrut certificate is an indicator of intellectual, academic, emotional, and social maturity, achieved during 12 years of study, or even that it is an effective indicator of the scope and depth of the knowledge acquired during those years. The only justification for bagrut exams apart from the claim that students will not learn without a concrete target in the form of a bagrut certificate is the need for a tool that institutions of higher learning can use to select among applicants. All of the attempts to bring about a change in the role of the bagrut exams in the educational process in Israel and in their format have totally failed due to the opposition of two bodies with significant political power. The first is the institutions of higher education who are afraid of losing a selection tool that has become so entrenched in the public psyche and that eliminates the need for them to create a selection process. The second is the more amorphous fear that there will be a drop in motivation for students to study particular study majors.

The coronavirus crisis, whose end appears to be nowhere in sight, is creating a new reality in the education systems of Israel and other countries. Countries such as the Netherlands, France, Norway, and the UK have canceled year-end exams and replaced them with internal exams given by the schools in a variety of formats.¹³ The remote learning processes on the one hand and the massive

13 See UNESCO (2020). This report includes references to the official documents of various countries that relate to the need for changes in the national exams given at the end of high school.

penetration of innovative learning technologies on the other are liable to result in a complete undermining of the principles of supply and demand for institutions of higher learning and will require teaching methods that differ from those used in the past. As a result, it is very possible that the bagrut certificate will lose some of its importance and centrality in the new framework of relations between formal education and higher education and that a new way of thinking about the very need for bagrut exams will be adopted.

The Ministry of Education's solution to the situation created by the lockdown and the opening of the school year included the following: a) a reduction in the number of external exams (at the end of the first lockdown, a reduction to six exams, and at the end of the second lockdown, a reduction to five); b) a reduction in the required learned material for these exams; and c) the implementation of internal exams in other compulsory subjects that will be included in the bagrut certificate, and the provision of a weighted school score for those exams. This decision by the Ministry of Education, which was made ad hoc and under strong public pressure, is of critical importance. On the one hand, it strengthens the status of scores provided by the schools to replace the bagrut exams in "less important" subjects and on the other hand reduces the importance of the external bagrut exams. If the marks in "less important" subjects can be relied on, in particular when this involves a three-year average, then perhaps they can also be relied on in the "important" subjects.

The unique situation created by the lockdown in 2020, which is likely to arise again in possible future lockdowns, can be used to make changes in the bagrut exams and to replace them with a high school certificate. This change can contribute to deeper learning in the schools, greater autonomy for the teaching staff, and the modification of teaching methods and learning material to fit the characteristics of students and teachers, the specific conditions of each educational institution, and the needs of the 21st century. This need is amplified by the concern that under the conditions of a prolonged pandemic and without significant modification of the bagrut exams, their value as an indicator of long-term learning performance will diminish and their weight from the perspective of time devoted to them will increase, at the expense of other subjects.¹⁴

14 For a detailed proposal on this issue, see Blass (2014).

C. Creation of a National Education Council

The polarization in Israeli society, the rapid turnover of government ministers, and the gap between the visions of political leadership and the time required to implement those educational policies are all factors that emphasize the importance of establishing a body with professional and ethical authority, whether statutory or voluntary, which will periodically and critically examine the goals, principles, and rules that guide the education system, will monitor the main trends, and will decide on general proposals and policy directions that will promote positive trends and limit negative ones. The coronavirus crisis has revealed the importance of creating such a body and the harm caused by not having one.

This body — to be called the National Education Council, the Education Cabinet, or any other suitable name — must be independent and professional and must have an organizational and financial framework that will facilitate its day-to-day operations throughout the year. Every advisory committee to the Ministry of Education, even if it is composed of top educators, has, by definition only a few members and undefined authority and powers, and, therefore, is not a substitute for such a body. It is worthy for the new body to operate within the Prime Minister's Office, as do the National Security Council and the National Economic Council.

Conclusion

These are only preliminary insights and conclusions with respect to the education system during the first wave of the coronavirus crisis and what is expected of it in coming years. Only time will tell whether the predicted trends will be realized. The fact that they are based on hypotheses and forecasts, some of which will be borne out and others that will not, does not absolve the education system from taking steps to help mitigate the expected difficulties and promote activities with the goal of increasing and achieving positive outcomes. Each of the outcomes that we have described requires close monitoring, and the options we have presented call for in-depth discussions by educators and the public. Hopefully, that will indeed be the result.

References

English

- Akbulut-Yuksel, M. (2009). *Children of war: The long-run effects of large-scale physical destruction and warfare on children*. IZA Discussion Papers No.4407.
- Anderson, B. (2020). [*Learning loss and the coronavirus*](#). Harvard EdCast.
- Andrabi, T., Daniels, B., & Das, J. (2020). [*Human capital accumulation and disasters: Evidence from the Pakistan earthquake of 2005*](#). RISE Working Paper 20/039.
- Andrew, A., Cattán, S., Costa Dias, M., Farquharson, C., Kraftman, L., Krutikova, S., ... Sevilla, A. (2020). [*Learning during the lockdown: Real-time data on children's experiences during home learning*](#). Briefing Note. Institute for Fiscal Studies.
- Azevedo, J. P., Hasan, A., Geven, K., Goldemberg, D., & Iqbal, S. A. (2020). [*Learning losses due to COVID-19 could add up to \\$10 trillion*](#). Washington DC: Brookings Institution.
- Baker, M. (2013). Industrial actions in schools: Strikes and student achievement. *Canadian Journal of Economics*, 46(3), pp. 1014–1036.
- Belot, M., & Webbink, D. (2010). Do teacher strikes harm educational attainment of students? *Labour*, 24(4), 391–406.
- Blass, N. (2014). [*Bagrut exams: Issues and recommendations for reform*](#). Policy Paper No. 2014.02. Jerusalem: Taub Center for Social Policy Studies in Israel.
- Das, J., Daniels, B., & Andrabi, J. (2020). [*We have to protect the kids*](#). RISE Insight Series 2020/016.
- Dorn, E., Hancock, B., Sarakatsannis, J., & Viruleg, E. (2020). [*COVID-19 and student learning in the United States: The hurt could last a lifetime*](#). McKinsey & Company.
- Goodman, J. (2014). [*Flaking out: Student absences and snow days as disruptions of instructional time*](#). NBER Working Paper No. 20221
- Grewenig G., Lergetporer, P., Werner, K., Woessmann, L., & Zierow, L. (2020). *COVID-19 and educational inequality: How school closures affect low- and high-achieving students*. CESifo Working Paper Series 8648, CESifo.
- Hanushek, E. A., & Woessmann, L. (2020). *The economic impacts of learning losses*. Paris: OECD Publishing.
- Ichino, A., & Winter-Ebmer, R. (2004). [*The long-run educational cost of World War II*](#). *Journal of Labor Economics*, 22(1), 57–86.
- Jaume, D., & Willén, A. (2019). The long-run effects of teacher strikes: Evidence from Argentina. *Journal of Labor Economics*, 37(4), pp. 1097–1139.
- Kuhfeld, M., Soland, J., Tarasawa, B., Johnson, A., Ruzek, E., & Liu, J. (2020). [*Projecting the potential impacts of COVID-19 school closures on academic achievement*](#). Ed Working Paper No. 20–226. Providence, RI: Brown University, Annenberg Institute.

- Kuhfeld, M., & Tarasawa, B. (2020). [*The COVID-19 slide: What summer learning loss can tell us about the potential impact of school closures on student academic achievement April 2020*](#). NEWA Research, Collaborative for Student Growth.
- Labaree, D. (2010). Founding the American school system. In *Someone has to fail: The zero-sum game of public schooling* (pp. 42–79). Cambridge, MA: Harvard University Press.
- Labaree, D. (2020, July 17). [*What kids miss when they go without school*](#). *New York Daily News*.
- Lee, Y. (April 29, 2020, April 29). [*Calls to Israeli domestic violence hotlines soar under coronavirus lockdown*](#). *Haaretz*.
- Meng, X., & Gregory, B. G. (2007). [*Exploring the impact of interrupted education on earnings: The educational cost of the Chinese Cultural Revolution*](#). IZA Discussion Papers No. 2548.
- Miller, C. C. (2020, July 16). [*In the same towns, private schools are reopening while public schools are not*](#). *The New York Times*.
- National Academies of Sciences, Engineering, and Medicine (2020). *Reopening k–12 schools during the COVID-19 pandemic: Prioritizing health, equity, and communities*. Washington, DC: The National Academies Press.
- Picou, J. S., & Marshall, B. K. (2007). Social impacts of hurricane Katrina on displaced k–12 students and educational institutions in coastal Alabama counties: Some preliminary observations. *Sociological Spectrum*, 27(6), 767–780.
- Psacharopoulos, G., Patrinos, H., Collis, V., & Vegas, E. (2020). *Lost wages: The COVID-19 cost of school closures*. Policy Research Working Paper No. 9246. Washington DC: The World Bank.
- Selbervik, H. (2020). [*Impacts of school closures on children in developing countries: Can we learn something from the past?*](#) CMI Brief No. 5.
- Taub Center (2020). [*Press Release: Survey of teachers in the Israel Teachers Union*](#). Jerusalem: Taub Center for Social Policy Studies in Israel.
- UNESCO, 2020. [*COVID-19 organizing and conducting exams and assessments during school & university closures — resources & references*](#). UNESCO, Education Sector.
- von Hippel, P. T. (2019). [*Is summer learning loss real? How I lost faith in one of education research's classic results*](#). *Education Next*, 19(4), 9–14.

Hebrew

Detel, L. (2020, October 11). [Signs of depression in first grade: Learning by Zoom is making children feel helpless](#). *The Marker*.

Lee, Y. (2020, June 25). [Referrals to the Welfare Departments rose this month by 68% compared to the same time in 2019](#). *Haaretz*.

Ministry of Finance (2020). [Socioeconomic and sector gaps in preparedness for distance learning in the Ministry of Education](#). Jerusalem: Chief Economist Division, Ministry of Finance.

Tal-Spiro, O. (2017). [Data on the Ministry of Education nutrition program in schools](#). Jerusalem: Knesset Research and Information Center.

The Education System in Israel in the Time of the Coronavirus: Three Alternative Frameworks

Nachum Blass

Following the end of the first wave of the coronavirus pandemic and a short respite, Israel entered a second wave involving a second lockdown and a gradual lifting of restrictions. In what follows, we will relate to three frameworks. The Ministry of Education's framework and the problems arising from it, and two alternatives: the first proposed by others and the second proposed by the author.¹ It is worth mentioning that the three alternatives relate to a situation in which there is only a partial lockdown, in which it is possible to operate the schools under conditions of social distancing. A full lockdown — like the ones between March and April and September and October — requires a different analysis and we will discuss that situation in brief at the end of this analysis.

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A number of months ago, the plan proposed here was presented to the media (Shtarkman & Detel, 2020) and in various government forums, and just recently, parts of it were adopted by the Ministry of Education and some local authorities.

This paper was written prior to the start of the 2020/2021 school year, and updated mid-December, 2020. Since the Ministry of Education frequently changes its guidelines for opening schools or returning to learning after a full or partial lockdown, and adds or removes restrictions that often contradict each other, some of the remarks and statements included in the paper may seem wrong or inaccurate — they were, however, right and accurate at the time of their writing.

1 Among those suggesting a second shift were Dr. Gideon Ben-Dror and Dr. Avraham Frank who presented their views on an internet forum that I manage.

Framework A: The Ministry of Education framework

The Ministry of Education's framework, which relates to the opening of the school year on September 1st, 2020, included four main components:² strengthening the remote learning infrastructure (allocation of NIS 1.2 billion), the adoption of hybrid learning to varying degrees according to age group (NIS 2.6 billion), protection and hygiene (NIS 300 million), and solutions for special populations (NIS 200 million).

We will devote the analysis primarily to the hybrid learning component, since it has the greatest pedagogical and social impact. An official document published by the Ministry of Education (MOE) defined the learning configuration in the schools as follows:³

- Students in Grades 1–2 will learn in school in full classes for 5 days a week and for 5 lessons per day — for a total of at least 25 lessons per week (normally the standard is 29 lessons).⁴
- Students in Grades 3–4 will learn in school in groups of up to 20 students for 5 days a week (at least 25 lessons per week). One half of the lessons will be taught by untrained teachers (teaching assistants).⁵
- Students in Grades 5–6 will learn for 2 days a week (at least 9 lessons) in school in groups of up to 20 students. On the rest of the days, they will learn by remote teaching (the minimum standard during normal times was 32 lessons per week).

2 The framework set by the Ministry of Education was altered a number of times during the second wave of the pandemic.

3 See the Ministry of Education's Parent's Portal.

4 In the following discussion we will distinguish between "lessons" and "teaching hours." The term lesson refers to the time spent in class engaged in formal learning. The length of a lesson in Israel is usually 45–50 minutes. A teaching hour in the Ministry of Education terminology is usually a budgetary term that refers to the annual salary cost of 1 hour of the weekly workload of teachers in Israel. The workload of a teacher in elementary school is 36 teaching hours and in high school 40 teaching hours. Teaching hours are either frontal hours for the entire class, tutoring hours, or preparation hours. Upon the easing of restrictions following the second lockdown, these grades learned in "capsules." When Grades 5–6 returned to hybrid learning, capsules for Grades 1–2 were canceled to make space to open after school activities for the younger ages.

5 Without reducing the number of lessons per week, it will be necessary to double the number of teachers. The additional number of teachers will decline as the number of lessons per week and the allocation of teaching hours to other needs are decreased.

- Students in Grades 7–12 will learn for at least 2 days a week (at least 10 lessons) in groups of up to 20 students in school. On the rest of the days, they will learn by means of remote teaching (the minimum standard in middle schools during normal times is between 32 lessons per week per class of 20 students and 37 lessons per week per class of 40 students;⁶ in high schools, the number of lessons is not fixed and varies across individual students and study majors).

This framework raised a large number of questions at the time of its publication and questions continue to arise with its implementation at the end of the second lockdown. Many of these questions are unanswered:

- How many lessons will students learn? Students in Grades 1–4 will learn for 5 days a week, apparently for 25 lessons instead of between 29 and 32 lessons. Grades 5–12 will learn for 10 lessons a week in school and the rest — 20 lessons at least — by remote teaching. Even if the students will learn for the full number of lessons that they would have in normal times (a doubtful assumption), it is clear that for most of the students those hours will not be equivalent to frontal hours of instruction in the classroom. It is very important to stress that this calculation relates to the minimum required number of lessons as if they are the only teaching hours that the class receives. That is not a correct assumption, though. The fact that every class receives 60 teaching hours on average indicates that there is a significant number of allocated teaching hours that are not reflected in the standard minimum of lessons.⁷
- What will be taught in Grades 5–12 by means of frontal teaching and what by remote methods? According to one approach, while one-half of the class is learning in school the other half will be learning remotely, perhaps even taking an active part in the lesson by means of Zoom or some other application, and there will be no increase in the amount of homework

6 There is an implicit assumption in this directive of the Ministry of Education regarding the connection between class size and the required minimum number of lessons needed to achieve the goals set for the education system. It appears, on the face of it, that the Ministry assumes that an additional 5 lessons per week compensates, at least partially, for the addition of 20 more students per class.

7 A substantial share of these hours — like tutoring hours that are part of the teacher's workload and that are particularly important due to large classes and a desire to close gaps — can be "saved" in the third framework presented here.

beyond what is currently assigned. According to this approach, the students learning at home will have the ability to pay full attention to the teacher and will gain the same benefit as the students learning in the classroom — which seems oddly presumptuous. According to a different approach, while the students learning in school are being taught, the students at home will be doing other tasks. According to this approach, the teachers will have to teach the same material twice (once with one group and then again with the other group), and, therefore, the material to be taught by the teacher will only be one-half of what it is in normal times.

- The rationale behind the division by age groups does not appear to be particularly sound. Is it clear that children in Grades 3–4 are in greater danger of being infected or of infecting others than children in preschool and Grades 1–2 and in less danger than children in Grades 5–12?⁸ Or perhaps the considerations are strictly financial and administrative, since it is not feasible to allocate additional budget and to hire more teachers in order to execute a plan that splits all classes?⁹
- How many primary school teachers will have to be hired and what will their skill level be? In the 2020/2021 school year, the primary education system will have about 6,000 classes per grade. Table 1 describes the additional classrooms, teachers, and salary expenditure on the assumption that Grades 1–2 will learn as normal, Grades 3–4 will learn in capsules of up to 20 students, and Grades 5–6 will learn for 4 days at home and 2 days in school.¹⁰ It is clear from the table that, under current conditions, an additional 10,848 to 13,829 teachers will be needed in primary education and the cost of their salaries will range from NIS 1.8 to 2.4 billion.¹¹

8 Contradictory data has recently been published on the infection of very young children. At least one study indicates that there is no difference in the ability to infect between children ages 0–6 and children ages 7–9. See Arutz 7, 2020.

9 A new explanation has recently been given for the cancellation of the learning capsules for Grades 1–2: the need to run after school programs based on students from the grade and not a single class. For this reason, the educational welfare and health of these children was compromised so that their parents could go back to work; it could have been done effectively and with low risk by a subsidy to the after school programs.

10 The Ministry of Education's framework does not include additional teachers for teaching in capsules in Grades 5–12; it is not clear how it will be possible to have remote teaching in these grades without additional teachers.

11 The Ministry of Education apparently took into consideration that Grades 3–4 will be learning fewer hours than the minimum standard and have announced that they will need an additional 13,000 teachers.

Table 1. Required number of additional classes and teachers for Grades 1–6 in capsules in the system and in the official school system

Grade	Total additional classes required	Total additional classes required in the official system	Total additional teachers required	Total additional teachers required in the official system	Total additional cost (NIS thousands)	Total additional cost in the official system (NIS thousands)
1–2	None	None	None	None	None	None
3–4	6,342	4,954	10,528	8,224	1,789,712	1,398,019
5–6	5,967	4,743	3,302	2,624	561,296	446,158
Total	12,309	9,697	13,829	10,848	2,351,008	1,844,177

Note: The calculation is based on 2018 data. This is for regular education in the official and recognized school systems. In Grades 3–6, all classes of over 20 students were split. Grades 1–2 do not require additional classes or teachers. For Grades 3–4, an additional 1.33 of a teaching position was added for each additional class. For Grades 5–6, an additional 0.33 teaching position was added because the capsules will meet only twice weekly. The additional cost per teacher is NIS 170,000 per year which is the average teacher salary.

Source: Nachum Blass, Taub Center | Data: Ministry of Education, The Wide Perspective website

- How many additional teachers will be needed to facilitate learning in Grades 7–12 on days when those students are in school and what will be the cost of their salaries?
- Where will the new teachers and teaching assistants come from? In an article in *The Marker* newspaper, it was stated that the teachers will be recruited from unemployed university graduates, freelancers, pensioners, students in teachers colleges, and teacher-soldiers (Detel, 2020). Ignoring the implicit lack of respect for the teaching profession, we can say that the chance of recruiting retired teachers is minimal since the vast majority of them are in high-risk groups with respect to infection (whether because of age or because they retired due to some health condition). Moreover, there is a reasonable concern that the teachers currently in the system will refuse to teach if they are in a risk group. A hint of this can be seen in the demand of the Israeli Teachers Union (a demand that has already been met by the government) to give teachers considered at high-risk the option of not working (Ilan, 2020). Furthermore, there is little chance of recruiting university graduates and freelancers for a full year since most of them will prefer to retain the option of returning to work in their occupation. This leaves only students in teachers colleges and teacher-soldiers. Do they constitute the professional manpower that will be responsible for the education of Israel's children for a full year?

- The framework proposed by the Ministry of Education also creates a shortage of classrooms, an inability among principals to control and supervise, and a major inconvenience among all those involved, namely parents, teachers, and students. When Grades 1–2 are learning normally and Grades 4–6 are split, very little room will remain in the school for the capsules of Grades 5–6.¹² Therefore, it will be necessary to identify and adapt rooms for use as classrooms, both inside and outside the school. As will be discussed, there are indeed various ways to deal with this problem, but this still remains a difficult task.

All of this ignores the problems that arise with remote teaching, with respect to the quality of learning relative to conventional in-school learning and the widening of academic and social gaps, on the one hand, and the significant risks implicit in students being outside the normal learning environment for an extended period of time, on the other hand (see Blass, 2020). Even if the problem of disparities in physical infrastructure is solved — an extremely optimistic assumption in view of the lessons learned from the “Computer for Every Child” project — the decision to employ remote teaching for all students implies a conscious admission that this will be a lost school year for most of the Bedouin and Haredi (ultra-Orthodox Jewish) populations and a significant percentage of students in other populations as well. It also shows that the decision makers in the Ministry of Education are prepared to accept this situation, which will undoubtedly widen gaps and will roll back gains in academic achievement.

In sum, the implication of the Ministry of Education’s framework is the complete loss of the school year for a significant share of students in Grades 5–12, the widening of academic and social gaps, and a huge financial expenditure.

12 This is because the split of Grades 3–4 will make it necessary to use classrooms that are normally used for Grades 5–6.

Framework B: A second shift¹³

The first of the two alternative frameworks involves the operation of the school system in two shifts, one in the morning and one in the afternoon. Theoretically, this implies that each capsule will learn according to the regular timetable, a situation that would require doubling the number of teachers. However, in view of the difficulty in adding a second shift during the afternoon hours, the advocates of this framework say that in most cases the first shift will be from 8:00 to 12:00 while the second will be from 12:30 to 16:30.¹⁴ Since this proposal is not feasible for Fridays, essentially the framework involves 20 lessons per week. Even if each shift is 5 lessons — i.e., until 13:00 and from 13:30 on — there will be no more than 25 lessons per week. There are, of course, various possible additions and modifications to this basic proposal, including longer lessons and less time for recesses, to allow more learning time in each shift.

Supporters of this framework mention the well-known fact that in the early years of the State, the education system was forced to operate in this format and that other countries suffering from a shortage of classrooms have also adopted this solution. The main advantage of the proposal is, of course, that it does not require any additional construction. Its basic disadvantage is the need to double the number of teachers in its unmodified version, that is, where students learn in two shifts with the full timetable of lessons as in normal times. If students learn fewer lessons, fewer additional teachers will be needed, and the framework will become increasingly similar to the third alternative framework. Another very important disadvantage of this framework is the almost inevitable decline in teacher quality as a result of the need to increase the number of teachers significantly at a time when the number of certified and qualified teachers available is limited. Furthermore, this framework is only a short-term solution and does not deal with the other problems of the education system.

13 The two alternative frameworks do not provide a solution for preschoolers and students in special education, and additional thought is required in order to find good solutions for these important groups. They are also relevant for the period after the lockdown with the end of the second wave of the pandemic.

14 This is essentially a compromise that, from the perspective of lessons, makes this framework similar to the third framework to be described.

Although this framework is preferable from a pedagogical perspective since all students continue to learn in school, it is problematic to implement due both to the large number of teachers required in order to implement it and the high cost involved.¹⁵

Framework C: Reducing maximum class size

The second alternative framework is based on reducing the maximum class size. The opposition to decreasing class size is based on two claims (Ayalon, Blass, Feniger & Shavit, 2020). The first is the need for a large number of additional teachers and the accompanying drop in teacher quality. The second is the need for a large number of additional classrooms. These two requirements both involve a major expense. The conclusion of the opponents to reducing class size has been that the expected academic benefit of such a move does not justify the cost. There are two assumptions buried deep within the traditional educational approach in Israel that constitute an obstacle to reducing class size: (1) that decreasing class size will not be accompanied by a change in the number of classroom hours per class; and (2) that the additional classrooms needed in order to reduce class size will be located in existing schools, and that they will be similar in physical area to existing classrooms.

However, the educational-socioeconomic reality created as a result of the coronavirus crisis nullifies these assumptions. First of all, according to the framework that the Ministry is already implementing, the vast majority of classes (of those who continue to learn in school) actually learn for fewer hours and some of them are doing so in much smaller spaces and outside the school. The question is, therefore, how to get the greatest benefit from the constraints that have been imposed by this reality and transform them into something positive. In other words, how can we ensure that the positive elements of these changes will not be temporary? The answer to this question is connected to the system's ability to reduce average class size at a reasonable cost and without harming academic outcomes.

In order to examine the problem of reducing class size in an in-depth manner, it is worthwhile to first present, in brief, four factors that to a large extent determine the education system's operating methods. These four factors,

15 More details on the drawbacks of this framework in the section that compares it to Framework C.

which determine the lion's share of expenditure on education and in practice also determine the system's academic achievements to a large extent, are: (1) class size; (2) number of lessons (in other words teaching time) per class; (3) teachers' salaries; and (4) teachers' total teaching hours and their division between actual hours of teaching in the classroom ("frontal hours") and hours devoted to preparing lessons or to individual tutoring. In Israel, classes are large, the number of teaching hours per class is high, teachers' salaries are low, and the number of frontal teaching hours is high. Other countries have chosen a different mix.

Up until now, there has been no practical option to carry out a major change in any of these components. The approach proposed here suggests that it is feasible and desirable within the existing budget framework to reduce class size and the number of lessons per student, without changing the teachers' total workload or their salaries.¹⁶ Although the outcome will be an increase in the number of classrooms and the accompanying budgetary expenditure, the cost can be minimized to a large degree by means of fine-tuning between the number of lessons and class size on the one hand and the use of learning spaces inside and outside the schools on the other hand (in the case of a larger reduction in hours per class, a larger cut in class size for a given budget can be achieved and vice versa). Is it possible to get "a square peg into a round hole" by reducing class size without significantly increasing the number of teachers and the costs of employing them and without building, at least in the short run, more classrooms? In our opinion, it is.

How can the need to increase the number of teachers be avoided despite the reduction in class size?

According to the figures of the Central Bureau of Statistics, the number of teaching hours per class in primary education is about 60 (1.66 full-time teacher positions) while in secondary education, it is more than 80 (a bit more than two full-time teacher positions).¹⁷ The number of students per full-time teacher is 15 in primary education and 11.4 in middle schools.¹⁸

16 Clearly this does not support any particular position on teachers' current salaries and workload. The point being made is that changes can be made within the existing budget framework.

17 See Appendix Table 1.

18 See Appendix Table 2.

These numbers indicate that the total teaching hours per class is greater than the lessons of frontal instruction that the class receives. Some of the additional hours are used for a variety of other needs, such as tutoring weaker students, splitting of classes into smaller groups, and grouping students according to ability in some subjects. This should not be interpreted as “wasted time” that necessarily indicates poor or wasteful management, but rather as an administrative and organizational approach that is predominant in Israeli education and that gives preference to large classes with a large number of teacher hours over small classes with fewer hours. As proof, the OECD *Education at a Glance 2020 (EAG)* figures show that the number of students per teacher in Israel is similar to the OECD average in primary education and less than the OECD average in the middle schools. In these countries, the classes are small and the average number of teaching hours are lower than the average in Israel.

Therefore, according to the standards of the Ministry of Education as they are currently implemented, in primary schools there are 16 full-time teacher positions in a school with 10 classes. In a secondary school with 10 classes, there are 20 teachers. Since most of the teachers work about a three-quarters position, an average primary school has 21 teachers while a middle school has 27 teachers.

In theory, and according to the data, it is possible to double the number of classrooms while keeping the same number of teachers by lowering the number of lessons to 20, at the very least. If the number of lessons per class is larger, there will need to be an increase the number of teachers; if class size is reduced, then the number of additional classrooms required will rise. The question of the effect of a reduction in teaching hours on academic achievement is an open question and calls for additional research. One study that touched on this question reached the conclusion that the ratio of teaching time to academic achievement is a complex one and is sometimes characterized by declining marginal returns; however, in that study, the number of lessons was not related to class size.¹⁹ A partial answer to this question

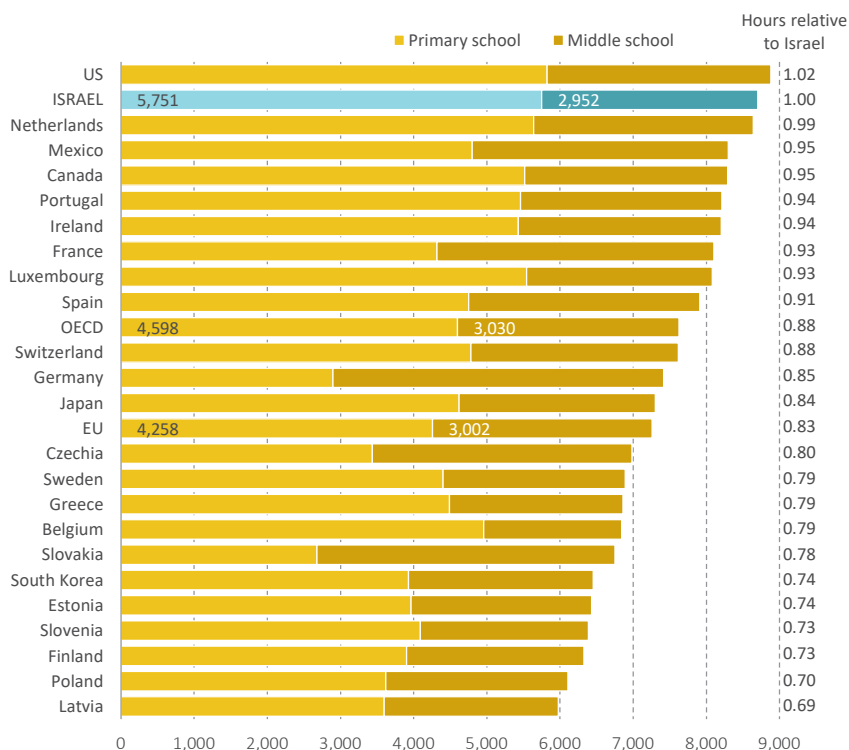
19 Innumerable studies have indicated that a reduction in class size will not bring about a large improvement in academic achievement. There are also any number of studies that point to the importance of the time devoted by a student to his studies. However, we are not aware of any research, and certainly not in Israel, that has looked at the effect of reducing the number of teaching hours on academic achievement as part of a move to reduce class size. An interesting study by the OECD relates to the issue of time devoted to studies (see Gromada & Shewbridge, 2016).

can be discerned from the data published by *EAG 2020*, according to which the number of compulsory hours in Israel in Grades 1–9 is higher than the OECD average by 12 percent and higher by 17 percent than the EU average. In primary education, the differences are 20 percent and 26 percent, respectively, while in the middle schools, the situation is reversed, although the gap is very small. Nonetheless, even though primary school students in Israel learn more hours than their counterparts in the OECD, their achievements are no higher. Overall, it is difficult to see any correlation between the minimum learning time (a concept used by the OECD in order to overcome differences between countries in the length of a lesson) and success on international tests, and many of the countries that are very successful on the PISA test are in fact located in the lower part of the table. Figure 1 presents the average number of compulsory hours that students in Israel learn relative to students in the OECD countries.²⁰

Overall, it can be concluded that as long as current organizational and administrative practices are maintained and the definitions and workload of a teaching position remain unchanged, a change in the school's organizational methods will make it possible to adopt a framework that is preferable to that of the Ministry of Education.

20 It is important to mention that the number of hours reported in the *EAG 2020* report is not consistent with the number of lessons that classes should receive according to the standard specified in the Director General Circular. The reason for this is that the *EAG 2020* report relates to an hour as 60 minutes while the Director General Circular relates to lessons as lasting 45–50 minutes.

Figure 1. Number of teaching hours in 9-year primary and middle schools (total) in OECD countries



Source: Nachum Blass, Taub Center | Data: EAG 2020, Table D1.1

Consider for example, a primary school with 10 classes, each of which has 30 students. According to the standards, each class is allocated 42 frontal teaching hours, 9 tutoring hours and 9 hours for teacher preparation. In practice, the minimum number of lessons in this school is about 30 and the rest of the hours are allocated to other educational and professional needs. According to the framework proposed here, each class would be split into two with each

receiving 21 lessons and 9 hours of tutoring and preparation hours,²¹ which would be accomplished without an increase in the number of teachers or an increase in the expenditure on salaries. This is also feasible, though to a lesser extent, in secondary education, based on a partial reliance on remote learning. At the end of the coronavirus crisis, it will be possible to return to larger classes and to begin an accelerated process of reducing maximum class size.

How can the need for additional classrooms as a result of the smaller class size be met?

Assuming that the problem of a shortage of teachers can be fully or partially solved (depending on the extent of the reduction in lessons per class) by reducing the number of lessons allocated per class, the remaining problem is the need to build new classrooms to accommodate the additional classes following the reduction. This problem is much more difficult to solve. In 2018, there were more than 61,000 classrooms. A maximum class size of not more than 20 would require an addition of about 36,000 classrooms.²² The addition would be about 20,000 classrooms for a maximum class size of 24, about 15,000 classrooms for a maximum class size of 26, and about 10,000 classrooms for a maximum class size of 28. (It is worth mentioning that the gradual process of reducing class size continued between 2018 and 2020, thus the data presented above regarding the need for additional classrooms is apparently biased somewhat upward.) Is this then a feasible project?

At first glance, it would appear to be an impossible task, particularly because when considering an addition to the number of classrooms it is generally assumed that the class size is in the vicinity of 30. However, when the class size is limited to 20 there will be a need to find solutions for classes whose average size is only about 16.6 in the immediate term (and if the maximum size will be 28 students per class, about 25 in the short and intermediate terms).

21 The Ministry of Education's framework, according to which 13,000 teachers will be required in order to split Grades 3–4, assumes that every split class will continue to receive the same number of hours (although a certain reduction in hours is taken into account — otherwise 19,000 teachers would be needed).

22 Not every split of a class that exceeds the maximum size requires a doubling of the number of classrooms. Thus, for example, two classes of 25 students will not be split into four classes of 12–13 each, but rather into only three classes of 16–17. Such a calculation, which takes into account the number of students in a grade and not necessarily in a single class, must be made for each scenario of a change in the maximum class size. See, for example, Appendix Table 3 for primary schools.

The size of such classrooms can be much smaller and therefore the problem is less difficult to solve. To illustrate, we will present a few possibilities for short-term and/or permanent solutions to the shortage in the number of classrooms.

Changes that do not require physical changes in the schools

- A. Using already existing space in the schools: According to the old Ministry of Education specifications, a primary school should have a classroom of 49 square meters for each homeroom class, an auxiliary classroom of 30 square meters for every 6 classes and a 10 square meter bomb shelter for every class (i.e., 60 square meters for every 6 classes, which is equivalent to two 30 meter rooms).²³ The new specifications are more generous and also include a science room and a library that can also serve as “safe” spaces, on the condition that there be a safe space of 15 square meters per class. This implies that for every 6 classes that need to be split, the school will have at least 1 classroom of 35 square meters that is used as an auxiliary classroom and another 30 square meters in the bomb shelter or 45 square meters of safe space. In the middle schools, there is additional space besides the homerooms. The task is not simple since they are probably used for other purposes, but it is possible.
- B. There are many schools that have shrunk in size over the years and in which there are unused classrooms. An investigation that we carried out revealed that in 2020, there were 519 schools, namely 10 percent of the total, in which the number of classes had fallen by at least three since 2010. It is likely that there are at least a similar number of schools in which the number of homeroom classes in 2020 is less than it was in 2010.
- C. Since 2010, 372 schools have been closed and those buildings are still standing today. Some of them have been converted to other uses while others are in locations that no longer have enough children. Some are in poor physical condition. To these should be added thousands of kindergartens in the same situation. In an emergency — like the current one — a significant number of these buildings can be put to use. This is worthwhile even if it necessitates the busing of children to the location.

23 These specifications, most which were drawn up decades ago, assumed — apparently on the basis of budget constraints and the educational reality at that time — that a class of up to 40 students can learn in a space of 49 square meters and a small class of up to 20 students can make do with 30 square meters. Currently, it is clear that these spaces do not support a reasonable quality of learning; nonetheless, this is the reality in most primary schools.

- D. A shift from a “homeroom classroom” to a “subject room” may also contribute to providing additional rooms for split classes (Blass, 1988).
- E. It is possible to organize secondary school such that each capsule of students will study six to seven lessons per day, three times a week in school; the remaining hours will be taught remotely.

Changes that require physical changes in the schools

- A. The closing-off of corridors and other spaces.
- B. The division of larger classrooms into smaller ones. If such a step is to be taken, then it is worthwhile thinking about smaller classes in order to prepare for a future reduction of classroom size.

Changes outside the schools that do not require changes in the nature of the schools’ activity

The working assumption here is that the inconvenience that results from learning outside the school — even if this involves busing — is far preferable to learning for only two to three days per week in school, some of which will be with uncertified teachers. In schools where students are in any case bused in (particularly in the regional authorities), it is possible to partially overcome the problem by staggering the start of the school day, such that the buses can do two rounds of pickups in the morning and also at the end of the school day.

The local authorities can distribute students between schools with large classes and schools with small classes, with the goal of reducing the number of classes that need to be split. For example, if in two schools combined there are 180 students in Grade 4, then if they are divided equally between the schools there will be a need for 10 classrooms. If one school has 95 students and the other 85, then 11 classrooms will be required: 6 in the first and 5 in the second. Thus, reallocation between schools by the local authority can save classrooms.

Changes outside the schools that require changes in the nature of the schools’ activity

- A. Although remote learning is not recommended, students in Grades 7–12 can learn for one day a week at home. In this case, their classrooms can be used by other students. Another option is that these grades will study for a few hours each day at school and complete the rest at home remotely (for example, a class of 20 students will learn for three hours in the morning in

school and another three hours in the afternoon at home, and the classes will switch with each other, as in Framework B above). In the middle and high schools, this solution is more feasible since the students are able to learn for more days and/or hours at home.²⁴

- B. A more radical solution, though, with a great deal of pedagogical potential, is that each class will learn for three weeks in school, and one week outside the school. The fourth week can be devoted to activities beyond the conventional school-based ones, such as learning in a museum for science and art, a tour of various national institutions, field trips in the immediate area, or more traditional learning. To this end, every school, in coordination with the local authority education departments, can make arrangements with public and private institutions in its vicinity. This change requires that the Ministry of Education and the local authorities create frameworks to formalize their responsibility for the security and safety of the students. Principals and teachers must feel confident that should something happen to a student, insurance coverage by the Ministry will be in place.
- C. A change in the structure of the school year with schools operating all year long. For example, the school year will be divided into four quarters and at every point in time 75 percent of the students will be learning in the school.

The proposals presented so far provide a solution for the school's regular hours of activity. Each of them involves some inconvenience and sometimes a drop in the level of service in the school, but in my opinion these are small relative to the benefit provided by this framework, namely the possibility of continuing operation of the entire educational system inside the schools with certified teachers during the entire week.

There will be a reduction in the number of lessons that students, especially the youngest ones, spend in school, so it is important to supplement these recommended steps with several additional measures to extend the school day and provide a solution for the hours following the end of formal learning. To this end, there are several possible frameworks, which can, of course, be implemented simultaneously.

24 Remote teaching as part of the teaching process also requires that the role of remote teaching within the structure of the teacher's workload be considered. It is suggested that a rule be adopted whereby an hour of remote teaching will be equivalent to an hour of frontal teaching. The division of a teacher's hours will be determined through agreement between the school's principal and the teacher, in accordance with the directives of the Ministry of Education.

Extracurricular activities are one of the main components of after-school activities. Teachers whose teaching hours have been reduced following the reduction in class size or who for various reasons have been forced to work part-time in “conventional” teaching in the school and wish to supplement their teaching hours) can be used for this as well as instructors in sports and art, youth movement counselors, volunteers, and older students. This part of the school day will not be compulsory, but will provide a solution for families that have young children and for parents who work full-time.²⁵ The expansion of extracurricular activity in the school for higher grades will compensate to a large degree for the lack of interpersonal contact in the event that the system is forced in the future to use remote instruction to a greater extent for one reason or another.

It is also possible to reconsider the possibility of a transition to a five-day school week, which will facilitate an addition of one lesson per day. Most of the economy already works a five-day work week (Committee to Examine the Structure of the Work Week, 2013). The shift to a five-day school week will not be immediate and it must be based either on a decision by the local authority or alternatively a survey among the parents. For those who are interested in having their children attend school on Fridays, a solution can be provided that is similar to the existing after-school frameworks.

Finally, it is also possible to imagine an interim solution that is a hybrid between the second-shift solution (Framework B) and the reduction-in-class-size solution (Framework C), such as a framework in which primary schools will operate during a “first shift” from 8:00 to 12:00 while secondary schools will operate from 14:00 to 18:00. The former will use the secondary school facilities in the morning while the latter will use the primary school facilities in the afternoon. This will provide a solution to the shortage of classrooms. Moreover, while the students in the lower grades are in school those in the higher grades can learn with greater efficiency at home, without their younger siblings distracting them.

25 The hours of extracurricular activity will be provided free of charge or with a large subsidy to be financed by the budget saved through the drastic reduction in the hiring of new teachers.

As can be seen, there are a variety of solutions to an acute shortage of buildings. These solutions are not always optimal and each of them entails organizational and pedagogical problems. At the end of the day, though, each student will have a place in a permanent or temporary classroom. The Ministry of Education's high level of flexibility in adapting to a shortage of buildings was impressively demonstrated during the large wave of immigration from Russia the late 1980s and early 1990s.

It is clear that such a major change is a transformative process and involves numerous obstacles. Some of these are objective, such as the shortage of buildings and teachers, while others are connected to the work habits that have become so deeply rooted over the centuries. Still others are genuine pedagogical and organizational problems. However, the chance of changing the reality of the school is so great that it is worth overcoming these obstacles.

The basic difference between operating a second shift (Framework B) and reducing the maximum class size (Framework C)

What is the difference?

On the simplest level, the difference between the two proposals can be characterized as follows: Framework B does not require additional classrooms. Framework C, in its perfect configuration, does not require additional teachers.

What are the advantages of the proposal to reduce class size over the second-shift solution?

The main advantage of the proposal to reduce class size is that it avoids the need for massive hiring of new teachers. The transition to two shifts in the entire education system in the "pure" configuration requires that the number of teachers be doubled. There is no practical way to fulfill that condition. The possibility of fulfilling even a less extreme condition with an addition of 50 percent to the teaching staff is also not realistic. It should also be kept in mind in the case of a long-term crisis, that some of the existing teaching staff are members of high-risk groups by virtue of their age or other health factors and others may be forced to spend time in quarantine after exposure to a confirmed patient or even stop teaching temporarily or permanently.

In view of all this, it is clear that the proposal to switch to two shifts is almost certainly untenable. Moreover, hiring teachers who do not have appropriate training or have not been teaching for a long time can lead to a major drop in the quality of teaching. In contrast to the proposal to operate a second shift, the proposal to reduce class size does not require any addition of teachers and, if an addition of teachers is nevertheless needed, it will involve only a small number of hires. It is clear that under the second-shift proposal, the greater the tendency to compromise on the number of learning hours and to change the employment conditions of the teachers, the closer the proposal will come to the principles of the third framework.

The second advantage is the required budget. According to Ministry of Education data, the cost of operating a class in a primary school is between NIS 400,000 and NIS 450,000 per year and the cost of building a classroom of 50 square meters is about NIS 250,000.²⁶ Even a cursory glance makes it clear that, at least from a budgetary perspective, it is preferable to split classes than to have a second shift, since the cost of splitting is much lower. This result becomes even more impressive if one notices that, in the case of multi-year changes, the cost of construction is only a one-time expenditure while the expenditure on the salaries of teachers and other workers on a second shift recurs every year. Moreover, there is the additional and significant cost of training new teachers in addition to the cost of salaries and the growth in the number of retirees that have to be replaced (retirees are in general a fixed share of the total number of teachers).

In addition to the pedagogical and budgetary advantages of the third framework, it is worth considering a number of additional problems with the framework that promotes learning in shifts, some of which are organizational while others are pedagogical, and which are avoided in the framework that centers on decreasing the number of students per class.

26 This is the net cost for a classroom of about 50 square meters. The cost of building a square meter in 2020 was NIS 5,000, according to the Building and Development Authority website. The cost is higher, of course, considering the accompanying gross meterage. In the case of building a new school, including all of the spaces it includes (administrative, public areas, corridors, and the like), the cost is much higher. However, we are dealing with an addition to an existing building in our context, rather than building new schools. See the website of the [Development Authority](#), Ministry of Education.

- The operation of the schools during the coronavirus crisis requires a significant increase in the school's maintenance staff, due to the need to disinfect and clean the washrooms and the common areas several times over the course of the school day. The introduction of a second shift requires a doubling of the number of cleaners in the schools.
- The operation of a school in two shifts also requires an increase in the number of managerial and administrative staff. It is not reasonable to assume that school principals will remain in the school for a second shift or that there will be two principals in the same school. Furthermore, if the function is assigned to the vice-principal, then it may be claimed that there is no need for that position in normal times.
- In places where the students are bused to school, there will be a need for two rounds of busing. In many locations, the buses have a long journey, sometimes almost an hour. Therefore, a long recess between shifts will be needed or alternatively a doubling of the number of buses will be necessary. This is a particularly large investment that is liable to become redundant with the return to routine.
- The need to allocate teachers and students between shifts will create organizational and professional problems. Which rules will be used to determine who will teach in the first shift and who in the second? How will the rules be determined for dividing the students between the shifts and how will the needs of the teachers be taken into account?
- Currently, classes in the various grades finish their school day at different times, with higher grades learning more hours. There is no possibility of a reasonable second shift (a first shift until 12:00 and a second shift that starts at 12:30) without cutting the number of learning hours by 20 percent in Grades 1–3, by 25 percent in Grades 4–6, and by 50 percent in Grades 7–12. Although this can free up teaching staff, the reductions are temporary and therefore will generate many professional problems. Which teachers will have their teaching hours cut? Which teachers will return more quickly to teaching full-time? And so on.
- If the school operates in two shifts, it will be impossible to have after-school frameworks or any other informal activity. This eliminates the possibility of providing solutions to keep children busy and in school in the afternoon hours. The operation of two shifts (particularly in primary education) does not provide a practical solution for parents who need to work, especially in the case of families in which both parents work.

What needs to be done when a full lockdown is imposed on the entire country or in certain cities?

Obviously, none of the solutions presented above are relevant in the case of a full lockdown, in which children do not have the option of attending school and most parents are forced to stay at home. Such a reality requires other solutions that can deal with both the educational and social loss. Weaker populations are especially vulnerable in this situation, as are students in Grades 11 and 12, as long as there is no dramatic change in the bagrut exams. The following are some measures that should be considered now:

- A. Reinforcement of the network of truant officers, guidance counselors, social workers, and public health nurses who can monitor the most vulnerable populations and stay in continual contact with them.
- B. Creation of a network of volunteers from among educators, both past and present, who will serve as mentors for students and will ensure that suitable solutions are provided to the problems they encounter as a result of their extended confinement at home.
- C. Recruitment of students in the higher grades as mentors of students in the lower grades.
- D. Generous funding of remote informal educational activities, such as art groups and even physical education, and the coverage of the salaries by the Ministry of Education.

SPOTLIGHT

A note on the interchangeability of class size and the number of teaching hours

The aim of education is first and foremost the nurturing of values and knowledge. For the most part, education relies on the economic infrastructure that society is willing to allocate to it. As in any other area, those who stand at the head of the education system are required to prove that the resources that are allocated are used in the most effective manner. The scope of those resources is determined by a number of variables, some of which are rigid and hard to change in the immediate or short term (the size of the student population, its geographic dispersion, the political-social circumstances and its implications), and some “policy variables,” which are relatively easier to manipulate (upper and lower limits for the number of students in a class, the minimum number of teacher hours per student, the size of a teacher’s teaching load and its composition, as well as teacher salaries). The mix of decisions on all of these variables — in economic terms, the production function of education — is particular to each country and its society. It is influenced as well by overall expenditure, and the style and character of the education system and its operation, and it affects, to a great extent, its results.

The coronavirus pandemic that is currently raging worldwide has an unprecedented impact on at least two of the variables mentioned above: the number of students per class and the number of learning hours. The number of students has dropped,

at times even drastically, due to the need to allow greater physical space and social distancing between students. The decrease in the number of students per class has meant that the number of classes has increased, and has also meant — other things unchanged — that the number of teachers has had to increase. All this at a time when the system was already suffering from a shortage of teachers in certain geographic areas and for certain subject areas. One way of surmounting the need for more teachers has been to reduce the number of teaching hours per class without reducing the workload per teacher.

How have these changes affected the education system? While recognizing that the education system has several very important functions other than that of imparting knowledge in terms of academic achievements, there are two possible and conflicting outcomes.

Decreasing the number of students per class: From the professional literature and accumulated educational experience it seems that there is a limited, positive impact to this, and there are apparently other good and less expensive ways to improve academic achievements. Thus, in strictly economic terms, the high price in reducing the minimum standard number of students per class is most probably not justified. It should be emphasized, though, that the majority of studies on this subject dealt with a reality that is not relevant to Israel where the upper limit of the number of students per class stands at 34 to 40 (depending on the age and socioeconomic characteristics of the class and school).²⁷ The work by Glass and Smith (Glass & Smith, 1979 p. 12) shows this clearly. In terms of Israel, the finding that there is little difference in achievements between classes of 40 students and those of 20 students turns every effort to reduce class size in

27 Despite the time that has elapsed since these studies, and the hundreds if not thousands of papers on the subject, it doesn't seem that the findings and conclusions drawn by the researchers differ greatly today.

order to improve academic achievements to unproductive — at least under the conditions that prevailed prior to the outbreak of the coronavirus.

Time allocated to teaching: The discussion on the relationship between time spent actively on learning (teaching hours) and achievement has been widely studied. One dominant study in the field, conducted many years ago, is that of Henry Levin (Levin, 1986). He compared several methods that are meant to improve academic achievements — additional teaching hours, reducing the number of students per class, personal tutoring by peers or adults, and learning by computer. He found that when the goal is improving achievement in mathematics, the least effective method is additional teaching hours, and when the improvement required is in reading comprehension, the least effective method is reducing the number of students per class.²⁸

Another study recently conducted by Victor Lavy finds that increasing the amount of time in class improves achievements, although the study measured the addition of relatively few hours (Lavy, 2020). An earlier study (Lavy, 1999) concluded that reducing the number of students by about 20 percent, from 30 to 25 students, brings about an improvement in achievements equivalent to an addition of 4.2 learning hours. In financial terms, reducing class size is more expensive than adding teaching hours, so the second option is preferable (Lavy, 1999, pp. 25–26). With a simple yet extreme assumption that Lavy's calculations were correct and hold today, then the damage to academic achievement caused by reducing class hours necessitated by the corona crisis will be overcome, or at least minimized, by the reduction in the number of students per class. Any change must be accompanied by changes in teaching methods to bring about an improvement in achievements.

28 Nevertheless, teaching by older students is a more effective method than either reducing the number of students or adding class hours.

Conclusion

We have outlined three alternatives to dealing with the coronavirus crisis. It is likely that there are others. Since they involve different approaches to dealing with the coronavirus reality that was forced onto the education system, it is proposed that the Ministry of Education present the various options to the local authorities and that each of them (and perhaps even each school) choose what they consider the most desirable alternative, in consultation with the teachers unions and the local parents. The following principles should be emphasized:

- A. Preference for learning in schools over remote teaching.²⁹
- B. Minimum hiring of additional teachers and avoidance of hiring individuals without classroom training (they can be hired for other roles).

We already know of more than a few local authorities that have deviated from the Ministry of Education framework and have increased the number of days of in-school learning. To this end, they have adopted many of the solutions presented in this document. For example, we know of one large local authority in which all of the primary schools began learning five days a week. In other locations, individual schools also found solutions that were suited to their specific reality. This situation constitutes proof that if the conditions are thoroughly evaluated, it is possible — even within the constraints imposed by the Ministry of Education and the Ministry of Health — to find solutions that enable students to study for additional days in school. Our recommendation to continue to use this unique opportunity to dramatically reduce the number of students per class, while intelligently and creatively combining studies in classrooms with remote learning cannot be overstated.

Finally, a warning: the solution of reducing class hours as a way of reducing class size might charm those wishing to cut the education budget. Certainly there are those who believe that class hours can be cut even without reducing class size and thus billions can be saved. In order to ensure that cuts in class hours will not harm educational and academic achievements, though, they must be accompanied by reductions in class size and additional steps like changes in pedagogical methods and frameworks for extracurricular activities.

29 We are not opposed to remote teaching in principle and we are not ignoring its many advantages. However, in our opinion, it should serve as a supplement to teaching in schools rather than a substitute. It is essential that caution be used in the use of remote teaching in view of the risks of the widening of academic and social disparities.

References

English

- Ayalon, H., Blass, N., Feniger, Y., & Shavit, Y. (2019). [*Educational inequality in Israel: From research to policy*](#). Jerusalem: Taub Center for Social Policy Studies in Israel.
- Blass, N. (2020). Opportunities and risks to the education system in the time of the coronavirus: An overview. In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2020*. Jerusalem: Taub Center for Social Policy Studies in Israel.
- Glass, G. V. & Smith, M. L. (1979). Meta-analysis of research on class size and achievement. *Educational Evaluation and Policy Analysis*, 1(1), 2–16.
- Gromada, A., & Shewbridge, C. (2016). [*Student learning time: A literature review*](#). OECD Education Working Paper No.127. Paris: OECD Publications.
- Lavy, V. (1999). [*Using dual natural quasi-experimental designs to evaluate the effect of school hours and class size on student achievement*](#). Jerusalem: The Hebrew University of Jerusalem.
- Lavy, V. (2020). Expanding school resources and increasing time on task: Effects on students' academic and noncognitive outcomes. *Journal of the European Economic Association*, 18(1), 232–265.
- Levin, H. M. (1986). Are longer school sessions a good investment? *Contemporary Economic Policy*, 4, 63–75.
- OECD (EAG) (2020). [*Education at a glance 2020*](#).

Hebrew

- Blass, N. (1988). *Optimizing and saving on school buildings*. Tel Aviv: Center for Research and Development of Educational and Welfare Institutes.
- CBS (2019, March 19). [*Media Release: Teachers in the education system, 2018/19*](#).
- CBS (2020, March 31). [*Media Release: Teachers in the education system, 2019/20*](#).
- Channel 7 (2020, October 21). [*Prof. Dov Schwartz: The return of children to preschool is dangerous*](#). Channel 7.
- Committee to Examine the Structure of the Work Week (2013). *The Committee to Examine the Structure of the Work Week: Committee Report*. Jerusalem: The National Economic Council
- Detel, L. (2020, August 11). [*Registration is closed: How to get accepted to be a teacher during the coronavirus time and how much you will earn — all the details*](#). *The Marker*.
- Ilan, S. (2020, July 29). [*Yaffa Ben David to school principals: Don't start planning on opening the school year*](#). *Calcalist*.
- Shtarkman, R., & Detel, L. (2020, August 14). Extend summer vacation until after the holidays, break up classes, cancel Friday school and the bagrut exams. *The Marker*.

Appendix

Appendix Table 1. Average number of weekly work hours per class by education sector

	1995/1996	2000/2001	2005/2006	2010/2011	2015/2016	2018/2019
Total	50.9	52.1	52.5	56.3	65.8	69.6
State	53.5	56.1	55.8	60.4	73.4	75.6
State-religious	54.0	55.3	56.9	61.0	71.9	76.1
Haredi	37.8	36.4	39.0	38.1	38.8	46.6
Arab	45.0	49.0	50.7	57.7	66.3	70.8
Primary school						
Total	45.3	44.4	45.6	54.6	57.9	56.6
State	47.8	47.6	47.6	59.7	63.6	60.7
State-religious	48.7	47.5	46.0	56.6	61.2	59.8
Haredi	32.6	31.2	35.6	38.4	40.3	41.0
Arab	41.5	44.6	48.7	58.0	60.6	60.9
Middle school						
Total	50.6	59.8	60.7	58.6	80.1	84.9
State	50.3	61.5	62.8	58.3	81.4	85.4
State-religious	51.1	60.6	67.7	60.0	82.9	84.3
Arab	50.8	52.9	50.6	58.3	76.2	84.3
High school						
Total	55.0	53.9	53.4	49.5	66.8	78.2
State	58.8	56.7	55.8	54.0	77.4	89.2
State-religious	56.2	54.0	60.2	59.6	78.0	97.6
Haredi	45.3	45.8	44.3	29.9	31.0	38.1
Arab	44.8	51.1	48.6	49.0	67.0	78.6

Source: Nachum Blass, Taub Center | Data: CBS, 2019

Appendix Table 2. Average number of students per full-time teacher (FTE)

Education level	Average number of students per teacher		Average number of students per FTE teacher	
	1999/2000	2019/2020	1999/2000	2019/2020
Total				
Primary school	13.0	11.8	17.1	15.0
Middle school	11.5	7.7	14.1	11.4
High school	9.1	8.4	11.7	11.4

Source: Nachum Blass, Taub Center | Data: CBS, 2020

Appendix Table 3. Additional classrooms needed for the alternatives proposed for the various reductions in student per class numbers in primary school

Grade	Existing classrooms	Addition needed to reduce to 24 students per class	Addition needed to reduce to 26 students per class	Addition needed to reduce to 28 students per class
1–3 Official ed	13,178	4,320	3,121	2,087
1–3 All	17,238	5,959	4,403	3,013
4–6 Official ed	11,805	4,456	3,381	2,413
4–6 All	15,400	5,963	4,566	3,296
Additional classrooms needed in percent relative to existing number				
1–3 Official ed		33%	24%	16%
1–3 All		35%	26%	17%
4–6 Official ed		38%	29%	20%
4–6 All		39%	39%	21%

Source: Nachum Blass, Taub Center | Data: Ministry of Education, A Wide Perspective

Expenditure Per Class and Per Student in the Primary School Education System

Nachum Blass and Haim Bleikh

Introduction

In 2018, the first of a series of papers was published on budgeting per class and per student (Blass & Bleikh, 2018). That paper analyzed expenditure per class and per student in the Official regular primary education system in 2017 (Grades 1–6 only). It focused on variables that determine the allocation per class and per student. The findings were that most of the budget is allocated to schools according to fixed and objective formulas which are intended to divide resources fairly and equally, according to selected school characteristics, such as the Nurture Index, participation in the long school day program, and school size.¹ As was shown, only a relatively small share of the differences in budget per class and per student between schools can be attributed to supervisory authority. Furthermore, it was found that the budget allocated to the Hebrew State-religious schools was the largest (due to, among other things, allocations for religious needs and other, sometimes unspecified, needs) while the budget allocated to Arab schools was the smallest, even after controlling for a variety of school characteristics.

The full project (subject to the accessibility of data) will include all of the education levels in the various frameworks — from preschool through to high school, in all of the Official education sectors and in Recognized education schools. In this work, primary school students are divided into three educational frameworks that are distinguished by their legal status. The three frameworks are:

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1 See the Appendix for a more detailed explanation of the Israeli education system in all of its complexities.

(a) Official education where about 74 percent of students learn. (b) Recognized education where about 13 percent of students learn. These are primarily Haredi institutions as well as a large group of State Arab schools and a small number of Hebrew State and State-religious schools. Exempt schools, although of a separate legal status, are included in the Recognized schools in this work. (c) Network schools are the two Haredi Networks. In terms of main budgeting criteria, these schools are similar to Official education; about 13 percent of students are in Network schools. The current paper also focuses on primary education as did the first one, although it expands the discussion in several ways:

- a. It relates to the entire primary regular education system and also includes the Recognized system and Exempt schools, which were not included in the previous paper.²
- b. It includes the changes that occurred between 2014 and 2018.
- c. It focuses on the issue of affirmative action or in terms of the Ministry of Education differential budgeting and its impact on inequality of resource allocation between the various sectors.

The primary school education system

The various education frameworks: The budget criteria

The declared intention of the Ministry of Education to give budgeting preference to the Official education system results in a different budget systems and budgeting criteria for primary schools in the Official system and Recognized system. There are several different frameworks within the Recognized education system: two Haredi networks — Independent education and Ma'ayan Hahinuch Hatorani education; other Haredi schools; Arab schools (most of them church-affiliated); Hebrew State schools (which are few in number); Hebrew State-religious schools (which are few in number); and Exempt schools.

2 The Official education system also includes a few Haredi schools as part of an effort by the Ministry of Education to create a Haredi stream in the Official education system, and, therefore, they enjoy a more generous budget allocation.

All of these systems are budgeted in a different way from Official education, and there are also differences in budgeting criterion between the different frameworks. In what follows, we will briefly review the criteria that differentiate between the budgeting of Official schools and the budgeting of Recognized schools. The discussion will be based primarily on publications of the Knesset Research and Information Center (Weisblau, 2016; 2017).

Most of the budgeting of teaching hours in the education system is by means of the allocation of “weekly work hours.”³ In the Official primary education system, payment is made by the Ministry of Education directly to teachers while in the Recognized schools it is by way of the school owners. The owners are allocated an amount that is a product of the number of weekly hours and the cost per weekly hour in the school (which is referred to as “cost of a work hour”) plus accompanying costs. According to Ministry of Education data, the average cost of a work hour in the Official education system in the 2015/16 school year was significantly higher (36 percent) than in the Recognized education system (Weisblau, 2016). The main reason for this is that the teachers in the Recognized schools were not included in the *Ofek Hadash* labor agreement.⁴ This budgeting system means that the budget available for the various schools’ operating needs is determined primarily by two variables: number of working hours allocated to the school and their cost. Therefore, it may be the case that schools with the same number of weekly working hours receive a different budget and schools with a different number of hours receive the identical budget. The number of teaching hours budgeted by the Ministry of Education to schools that are not Official schools is determined as a percentage of the budgets of Official schools, according to the following rules:

1. The Recognized schools that belong to the large Haredi Networks (Ma’ayan Hahinuch Hatorani education and the Center for Independent Education) are budgeted according to Paragraph 3a of the Budget Principles Law, 1985 and according to objective and uniform criteria, in the same way as the Official schools, as is the case for all children in Israel.

3 The accepted term in the Ministry of Education is “teaching hours”; nonetheless, we have chosen the term “work hours” since a teaching position includes, apart from actual teaching in front of a class or a small group, hours devoted to preparing class lessons, checking exams, meetings with parents, etc.

4 Although this is the main reason, there are other reasons which we will not detail here.

2. Recognized schools that do not belong to the Networks are budgeted at a rate of at most 75 percent of the basic standard for a similar Official school.
3. Exempt schools are budgeted at a rate of 55 percent of the basic standard for a similar Official school.

According to the Ministry of Education criteria, the budgeting of Recognized primary schools is conditional on meeting certain criteria, which vary from school to school, and include the extent to which core subjects are included in the curriculum, admission policies that do not discriminate between students based on ethnic group, gender and/or previous academic achievement, participation in the Meitzav exams.⁵

Descriptive statistics — 2018

Table 1a and 1b present the breakdown of students in the primary school system according to the school characteristics included in this study (Nurture Index quintiles, size of the school, long school day, and inclusion of special education students).

5 This is meant to be evaluated according to a comparison of the distribution of students in the school to that of a school in the same school district. The criterion is not meant to prevent the acceptance of students who do not fit the school's outlook and religious way of life.

Table 1. Distribution of students according to school characteristics, 2018

a. Official system	Hebrew State		Hebrew State-religious		Haredi	Arab	Druze	Bedouin
School Nurture Index quintile								
Strongest quintile	48%		21%		5%	—	—	—
2	22%		40%		29%	2%	—	—
3	15%		23%		28%	16%	16%	—
4	9%		13%		23%	25%	49%	7%
Weakest quintile	6%		3%		14%	57%	36%	93%
School size								
Small	2%		7%		59%	1%	1%	1%
Small to medium	19%		44%		41%	18%	44%	14%
Medium to large	39%		27%		—	43%	48%	45%
Large	39%		22%		—	37%	7%	41%
Long school day program								
No long school day	85%		68%		73%	74%	—	11%
Has a long school day	15%		32%		27%	26%	100%	89%
Special education								
No special ed classes	37%		44%		94%	10%	14%	16%
Has special ed classes	63%		56%		6%	90%	86%	84%
b. Recognized system	Hebrew State	Hebrew State-religious	Arab	Haredi	Haredi-Maayan Hahinuch	Haredi-Independent	Haredi-Exempt	Total
School Nurture Index quintile								
Strongest quintile	83%	—	2%	13%	1%	18%	16%	25%
2	13%	83%	22%	16%	14%	26%	21%	20%
3	—	17%	22%	20%	27%	37%	19%	19%
4	—	—	24%	33%	39%	12%	37%	17%
Weakest quintile	4%	—	30%	18%	19%	6%	6%	19%
School size								
Small	34%	34%	9%	21%	25%	8%	19%	6%
Small to medium	30%	66%	22%	42%	53%	19%	43%	26%
Medium to large	—	—	24%	22%	17%	15%	21%	33%
Large	36%	—	45%	14%	5%	58%	17%	35%
Long school day program								
No long day	100%	100%	100%	100%	48%	69%	100%	74%
Has long day	—	—	—	—	52%	31%	—	26%
Special education								
No special ed	100%	100%	100%	84%	67%	63%	100%	44%
Has special ed	—	—	—	16%	33%	37%	—	56%

Note: According to the definitions established in an earlier paper (Blass & Bleikh, 2018), a small school has up to 180 students; a small to mid-size school has 181–360 students; a mid-size to large school has 361–540 students; and a large school has over 540 students.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

The tables show the following:

1. **The distribution of students according to socioeconomic status in the Official education system.** In the Hebrew State education system, 70 percent of the students belong to the two higher socioeconomic quintiles (Nurture Index groups 1 and 2), 61 percent in the State-religious education system, and in the Arab education system there are almost no schools in these quintiles.
2. **The distribution of students according to socioeconomic status in non-Haredi schools in the Recognized education system.** Although there are only a few of these schools (27 in the Hebrew State education system and 4 in the State-religious education system), in general, their students belong to the higher socioeconomic status quintiles. The Recognized Arab education system is larger in size and the socioeconomic status of students is much higher than in the Official Arab education system. To illustrate, we would mention that in the Official Arab education system the number of students attending schools in the two highest socioeconomic quintiles is negligible while in the Recognized Arab education system, 22 percent of the students are in the second Nurture Index quintile.
3. **The distribution of students according to socioeconomic status in Haredi schools.** Students in the Independent education network of schools are the strongest in terms of socioeconomic status, while those in the Ma'ayan Hahinuch Hatorani education network are the weakest.
4. **Long school day.** In the Hebrew education system, 15 percent of the students in the State education system, 32 percent of those in the State-religious education system, and 27 percent of those in the Official Haredi education system benefit from a long school day. Students in the Recognized education system are not eligible for this through the Ministry of Education (this is not to suggest that they do not have a long school day; rather it means that they do not receive a budget for it from the Ministry of Education). All of the students in the Druze sector and almost all of those in the Bedouin sector have an extended school day, as opposed to 26 percent in the Arab State education system. The reason for the preference given to Druze and Bedouin students is their socioeconomic background and their residence in the northern and southern (periphery) districts.

5. **Special education.** It is worthwhile mentioning that the vast majority of students in the Arabic-speaking population attend schools with special education classes while this is the case for only 63 percent of the students in the Hebrew State education system and 56 percent of the students in the State-religious education system. In the Recognized schools, there are almost no special education classes, something for which there is no solid explanation. A possible reason, which is relevant in the case of the Arab education system, is the low number of special education schools in that sector. With respect to the Haredi education system, the reluctance to recognize the need for a solution for special needs' students has an effect on the number of them receiving special education services.⁶
6. **School size.**⁷ In the Official Hebrew education system, most of the students study in large or mid-size to large schools, although there is a significant difference between the State education system (78 percent) and the State-religious education system (49 percent). In the Haredi education system, the picture is more complicated. Most students in the Ma'ayan Hahinuch Hatorani network and in the Official Haredi education system attend small schools, while 58 percent of students in the Independent education network attend large schools. Students in the Recognized Haredi education system lie somewhere in the middle. Among the Arabic-speaking population, the vast majority of students attend large or mid-size to large schools.

6 In this context, see, for example, the statement by the State Comptroller in his report for 2001: "Based on conversations with the audit representative [...] it appears that, in Haredi society, placing a child in a special education framework is sometimes met by intense opposition from the parents and the audit showed that, as in the State education system, in the Haredi education system, the Ministry has not acted in a systemic way to train teachers and principals in the regular schools to integrate special needs students in their classes. In addition, students in the regular Haredi schools who are in need of paramedical treatment are not getting it." (State Comptroller, 2002, p. 224).

7 According to the definitions established in an earlier paper (Blass & Bleikh, 2018), a small school has up to 180 students; a small to mid-size school has 181–360 students; a mid-size to large school has 361–540 students; and a large school has over 540 students. Exempt schools are included with the Recognized schools for this work.

Table 2 shows that there is in general a positive correlation between school size and class size. The average class size in schools of the same size varies from one sector to another, particularly in the Arab sector, where classes are usually smaller than in the Hebrew sector. This is a phenomenon that has grown in recent years and is evidence of the improvement in the situation of Arab education relative to Hebrew education, a subject dealt with in a different publication (Blass, 2017).

Table 2. Class size according to school size, supervisory authority, sector, and legal status, 2018

	Small	Small- medium	Medium-large	Large	Total
Hebrew State	22.7	25.9	28.5	30.6	28.5
Hebrew State-religious	20.6	25.5	27.4	29.9	26.5
Haredi	15.7	23.7	—	—	18.2
Arab	21.7	24.4	25.8	27.9	26.2
Druze	17.6	24.4	25.8	27.1	25.1
Bedouin	22.5	24.4	25.0	27.4	25.8
Official	20.4	25.4	27.4	29.7	27.3
Hebrew State-Recognized	18.4	26.3	—	30.5	24.0
Hebrew State-religious-Recognized	23.2	24.7	—	—	24.2
Arab-Recognized	20.8	27.2	29.9	33.3	29.5
Haredi-Recognized	17.3	26.0	27.2	33.0	24.4
Haredi-Exempt	18.0	25.3	27.7	31.3	24.7
Recognized	18.2	25.8	28.3	32.5	25.8
Haredi-Ma'ayan Hahinuch Hatorani	16.7	23.9	25.3	27.7	22.0
Haredi-Independent	17.1	25.2	26.3	31.0	27.3
Haredi Networks	16.9	24.5	26.0	30.8	25.4
Total	18.5	25.3	27.3	30.1	26.8

Note: According to the definitions established in an earlier paper (Blass & Bleikh, 2018), a small school has up to 180 students; a small to mid-size school has 181–360 students; a mid-size to large school has 361–540 students; and a large school has over 540 students. Exempt schools are included with the Recognized schools for this work.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

The total budget in 2018

Figure 1 presents the total budget per class and per student on the basis of data published by the Ministry of Education on its Economic and Budget Authority site. The figures relate to the budget allocated only by the Ministry of Education and do not include the budgets provided to the schools by the local authorities, by fees collected from parents, and by non-profit organizations. The figures provide the following insights:

1. In the Official education system, the budget per class and per student grows as the school's socioeconomic level is lower (it has a higher Nurture Index). This is true both in the Hebrew sector and in the Arab education sector. Nonetheless, the budget gaps in favor of students with a low socioeconomic background are much larger in the Hebrew sector than in the Arab sector. In the Haredi education system, there is affirmative action in the Network schools. The main sources for budgeting the addition per student in weaker populations are as follows:
 - a. The Nurture Basket, which provides additional working hours according to the school's Nurture Index.
 - b. Differential class size which sets a lower maximum class size for budgeting purposes in schools with a higher Nurture Index (a weaker population).
 - c. A long school day which is provided to schools serving populations with a low socioeconomic status (an addition of 5 to 8 weekly hours, according to the grade level).

With respect to budget per class, the differences are less pronounced. On the student level, the gap between budget per student in the weakest and strongest quintiles was 34 percent in 2018 while on the class level the gap was only 15 percent.

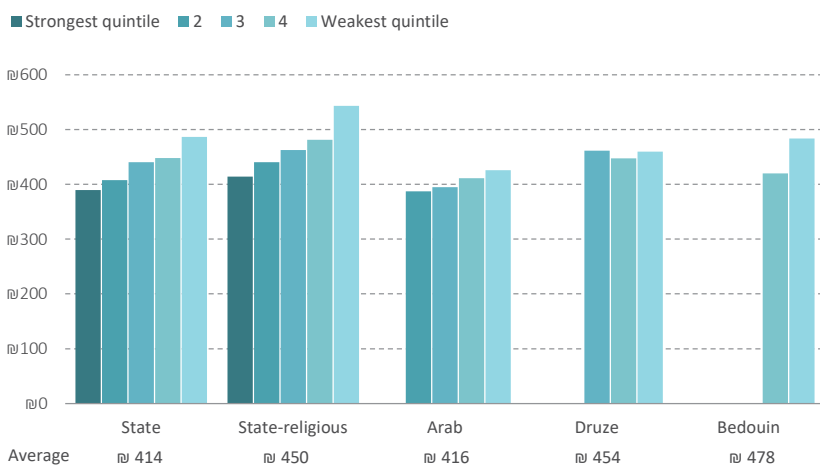
2. In the Official education system, it can be seen that the average expenditure per class and per student is the highest in the Druze and Bedouin sectors and the lowest in the Hebrew State education system. The expenditure per class and per student in the Recognized education system is significantly lower than in the Official education system as a result of the Ministry of Education policy to encourage the Official public education system.

3. In the Official education system and in the Nurture Index quintiles, the State-religious education system is budgeted on the highest level both per student and per class while the Arab education system is budgeted on the lowest level. In the Recognized education system, the Exempt schools are budgeted at the lowest level.

Figure 1. Budget per class and per student in primary school, 2018

NIS thousands

a. Budget per class, Official education



b. Budget per class, Unofficial education

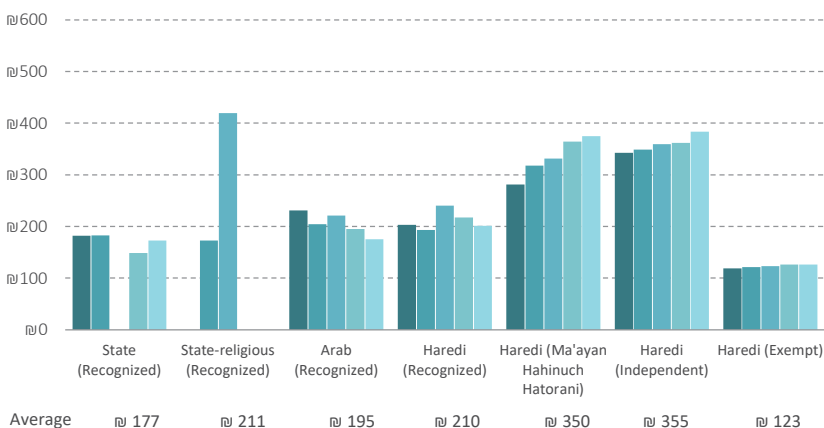
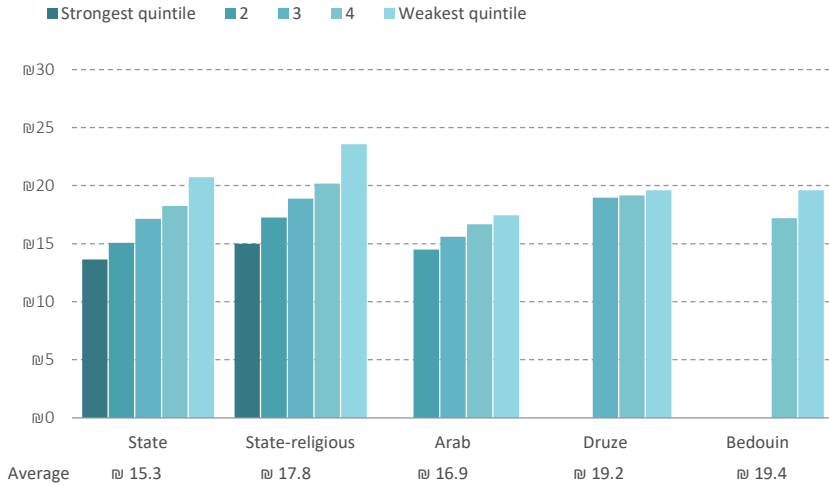
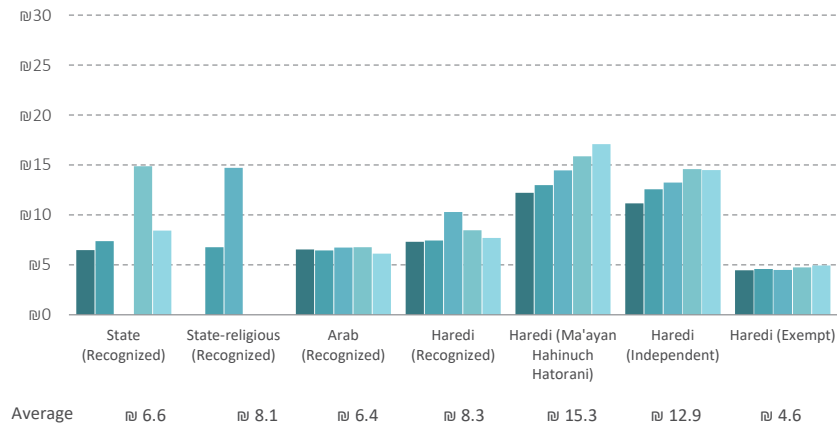


Figure 1 (continued). Budget per class and per student in primary school, 2018
NIS thousands

c. Budget per student, Official education



d. Budget per student, Unofficial education



Note: There is a low number of Recognized schools in the Hebrew Official education system (in the State-religious system, there are four schools that are in the second and third quintiles; in the Hebrew State education system there are only three that are in the fourth and fifth quintiles).

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education.

The changes in the primary school education system between 2014 and 2018

This section of the study focuses on the main changes that occurred in the primary education system between 2014 and 2018, which is the most recent year for which there is data. During this period, the Ministry of Education adopted two measures intended to increase affirmative action: a partial return to differential budgeting and the gradual lowering of the maximum number of students per class. Another process, which is independent of Ministry of Education policies and which also had an influence on the scope of affirmative action, involves the changing birth rates in the population and their implications for the numbers of students.⁸ In order to restore differential budgeting in primary education and in the middle schools, a sum of NIS 416 million was allocated in the Ministry of Education's budget for the years 2015 to 2018 (Appendix Table 1). In order to reduce class size by lowering the maximum number of students per class, a sum of NIS 317 million was allocated at the same time. It is important to mention that this is the budget approved for those purposes and not necessarily the budget that was actually spent, which is usually lower (Blass & Cogan, 2014). The following will examine the principal changes that occurred in the primary education system between 2014 and 2018.

Demographic changes

The distribution of students by sector, supervisory authority, and legal status in primary education in 2018 was not significantly different from that in 2014 (see Table 3), although there were some changes. The share of the Hebrew State education system (Official and Recognized) grew by 1 percentage point; the share of the State-religious education system, and the two large Haredi Networks grew by a little less than 1 percentage point each, while that of Arab education fell by about 2.5 percentage points. If this indicates the beginning of a trend, then these changes are not negligible.

8 A drop in birth rates, when it is not accompanied by changes in the number of classes, can affect average class size, which in turn affects budget per student.

Table 3. Distribution of students in primary school education according to sector, supervisory authority, and legal status

	2014	2018	Difference
Hebrew State	37.8%	38.9%	1.1%
Hebrew State-religious	13.5%	14.2%	0.7%
Haredi (State)	0.1%	0.5%	0.4%
Arab	14.4%	12.8%	-1.7%
Druze	1.8%	1.7%	-0.2%
Bedouin	6.0%	5.5%	-0.5%
Hebrew State-Recognized	0.6%	0.6%	0.0%
Hebrew State-religious-Recognized	0.2%	0.1%	-0.1%
Arab-Recognized	3.8%	3.5%	-0.3%
Haredi-Recognized	3.5%	2.6%	-0.9%
Haredi-Ma'ayan Hahinuch Hatorani	3.8%	4.5%	0.7%
Haredi-Independent	9.1%	10.0%	0.9%
Haredi-Exempt	5.3%	5.2%	-0.1%

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

Changes in class size

Class size has significant implications for allocation per class and per student.

SPOTLIGHT

What is meant by class size?

In any discussion of class size, a variety of definitions are often used with different impact on the results. Thus, a distinction should be made between “maximum class size,” “average class size,” “average size of a regular class,” “maximum class size for budget purposes,” and “actual class size.”⁹

Maximum class size is the number of students in a class beyond which — according to the agreements with the teachers unions — the class is to be divided (for example, if the number of students in the 4th grade is 81, there will be three classes and if the number of students is 41, there will be two).

Average class size is the total number of students divided by the number of classes, including students in special education classes.

-
- 9 When the former Minister of Education Naftali Bennett announced that class size had been lowered from 40 to 32 students, he was essentially referring to “maximum class size.” It is important that the declaration of a lowering of maximum class size is somewhat imprecise. In cases where the maximum was lowered, it was lowered to 34 students, and only with respect to class size for budgeting purposes in schools with a high Nurture Index (a weak population) was the maximum lowered to 32. For an in-depth discussion of the issue, see Sharon and Brill (2019).

Average size of a regular class is the total number of students divided by the number of classes, excluding students in special education.

Maximum class size for budgeting purposes relates to a situation in which it is difficult to divide classes with 34 to 39 students into two classes of 20 students or fewer. In such a case, the class will not be split and the class size for budgeting purposes will be between 32 and 40 (depending on the school's Nurture Index) and the standard hours per class will be increased to compensate for the class not being divided. Thus, for example, if a school has 40 students in Grade 4, then there will be one Grade 4 class; if the class belongs to a high socioeconomic level (Nurture Index of 1) it will be budgeted according to one Grade 4 class, and if it serves students at the lowest socioeconomic level it will budgeted as if it has two Grade 4 classes with 20 students in each class.

Actual class size is the most interesting and most important variable for public discourse (at a time when for purposes of evaluating per class and per student allocations it is important to consider the number of classes for budgeting purposes). Therefore, when describing developments in the education system, we refer to actual class size and when discussing trends in the inequality of allocations, we relate to size of class for budgeting purposes.

The average actual size of a regular class in the Official primary education system in Israel fell from 30 in 2000 to 27.5 in 2018, with the number varying across supervisory authorities and sector and also according to other criteria, such as the school's legal status, district, etc.¹⁰

10 See Ministry of Education data on the Wide Perspective site.

Table 4a and 4b present the changes in the actual size of classes in regular education between 2014 and 2018 in the primary education system as a whole.¹¹ First, the data are examined according to the school's Nurture Index and then according to school size. Naturally, there is a difference between the maximum number of students per class and the actual average numbers. The current maximum number of students per class (only in some of the grades) is 40 while the average number is about 28. Between 2014 and 2018, class size declined by 0.6 students per class. Reducing the maximum number of students per class to 32 at this pace, in accordance with the government decision,¹² will require a considerable amount of time to implement.¹³ Moreover, it can be seen that schools serving more affluent populations (the first and second quintiles) benefited from the Ministry of Education policy more than schools serving weaker populations. This is not surprising since these schools, and particularly those in the Hebrew State education system, were larger with the largest class sizes, as well. In this sense, the move to reduce the number of students per class benefited the populations with a higher socioeconomic status, while it also served to strengthen public education by reducing the temptation to send a child to Recognized schools, where classes are smaller.

As can be seen from Table 4a, the changes in class size were not uniform across sectors and supervisory authority. In the Hebrew State and State-religious education systems, class size decreased in schools with a higher socioeconomic status and, increased in schools serving weaker populations. In contrast, in the Arab education system, classes shrank in all the quintiles, although it should be recalled that there are almost no Arab schools serving affluent populations (the first and second quintiles). In the Haredi education system, the outcomes varied.

11 On the relative differences over time between all schools and those that have changed their status see the discussion on changes in budget inequality.

12 Government Decision 4275 (hk/159) from November 27, 2008.

13 Reducing the maximum size by 25 percent (from 40 to 32) is meant to also reduce the average number of students per class. Given the distribution of class size in Israel and without any changes in other characteristics of the system, the average will have to decline to about 23.5 students per class. Therefore, if during a period of four years it dropped by 0.6 students, almost 30 years will be required in order to reach the target.

Table 4a. Changes in actual class size between 2014 and 2018

By Nurture Index quintile

	Strongest quintile	2	3	4	Weakest quintile	Total change
Hebrew State	-1.5	-1.1	0.0	0.1	0.1	-0.9
Hebrew State-religious	-0.9	-0.2	-0.3	0.9	1.9	0.0
Arab	—	1.3	-1.5	-1.2	-1.4	-1.3
Druze	—	—	-1.7	-2.0	-1.5	-1.8
Bedouin	—	—	—	-2.7	-1.2	-1.3
Official	-1.4	-0.9	-0.5	-0.8	-0.9	-0.9
Hebrew State-Recognized	-1.7	2.4	—	-3.0	-4.7	-2.0
Hebrew State-religious-Recognized	—	3.2	-1.6	—	—	-2.6
Arab-Recognized	—	-0.7	1.5	-1.9	-2.6	-1.2
Haredi-Recognized	-0.9	-0.1	0.0	0.5	-0.3	0.1
Haredi-Exempt	0.0	0.8	0.6	1.1	-0.5	0.7
Recognized	-0.3	0.0	1.0	0.2	-1.2	0.0
Haredi-Ma'ayan Hahinuch Hatorani	1.1	1.2	2.0	1.9	0.4	1.5
Haredi-Independent	-0.8	-0.5	0.1	0.9	2.8	-0.2
Haredi Networks	-0.7	-0.4	0.8	1.6	1.3	0.4
Total change	-1.2	-0.6	0.1	-0.3	-0.9	-0.6

Note: Quintiles do not necessarily relate to the same schools in 2014 and in 2018, since the Nurture Index quintile of many of the schools changed in the interim. The quintile data for 2014 for schools in the Official Haredi education system were not available. Exempt schools are included with the Recognized schools for this work.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

A look at Table 4b, which describes the change in class size according to school size, indicates that here also there are those who benefit more and those who benefit less. As can be seen, those who benefited the most from the reduction in class size were students in large schools, and in particular in the Hebrew State education system and the State-religious education system and in both large and small Arab schools, where the changes were notable. There is no doubt that the most important factor in the reduction of class size in the Arab education system in this process was on the one hand a drop in the birthrate (as opposed to an increase among the National Religious population), and on the other hand, the difference in socioeconomic status that lent an advantage to schools serving weaker populations between the two groups, which contributed to a more effective implementation of the Ministry's policy.

Table 4b. Changes in actual class size between 2014 and 2018

By school size

	Small	Small - Medium	Medium - Large	Large	Total change
Hebrew State	-0.3	-0.2	-1.3	-1.7	-1.0
Hebrew State-religious	0.7	0.3	-0.9	-1.7	0.0
Arab	-3.5	-0.7	-0.8	-1.2	-1.3
Druze	-2.5	-1.4	-1.9	-1.6	-1.7
Bedouin	-1.2	-0.1	-1.2	-1.1	-1.3
Official	-0.3	-0.2	-1.2	-1.2	-0.9
Hebrew State-Recognized	0.9	0.3	0.0	-6.8	-1.4
Hebrew State-religious-Recognized	-0.1	—	—	—	-2.2
Arab-Recognized	4.2	-1.4	-0.1	-1.0	-0.6
Haredi-Recognized	0.1	1.2	1.3	0.8	0.3
Haredi-Exempt	-0.7	0.9	1.3	-0.7	0.8
Recognized	0.2	0.5	0.8	-0.9	0.3
Haredi-Ma'ayan Hahinuch Hatorani	0.6	1.2	0.9	-2.4	1.4
Haredi-Independent	-0.2	0.0	-0.4	-1.3	-0.2
Haredi Networks	0.2	0.6	0.0	-1.4	0.3
Total change	0.1	0.1	-1.0	-1.2	-0.5

Note: According to the definitions established in the earlier paper (Blass & Bleikh, 2018), a small school has up to 180 students; a small to mid-size school has 181–360 students; a mid-size to large school has 361–540 students; and a large school has over 540 students. The number of schools for which a calculation was made is not identical in each table since there data on Nurture Index quintiles were not available for all schools. Exempt schools are included with the Recognized schools for this work.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

Changes in per class and per student budgeting

The data in Table 5a show that the total budget per class grew in all groups and all quintiles, although not to the same extent. There are differences in relative terms between the various groups and the various quintiles. The group with the largest increase in budget per class is the Recognized schools which in 2018 constituted about 18 percent of schools and about 13 percent of students.

Table 5a. Changes in budget per class between 2014 and 2018

By Nurture Index quintile

	Strongest quintile	2	3	4	Weakest quintile	Total change
Hebrew State	4%	4%	9%	8%	13%	6%
Hebrew State-religious	4%	6%	7%	8%	7%	5%
Arab	—	3%	6%	7%	10%	8%
Druze	—	—	5%	5%	9%	7%
Bedouin	—	—	—	-1%	12%	11%
Official	4%	5%	8%	8%	10%	7%
Hebrew State-Recognized	14%	35%	—	13%	19%	16%
Hebrew State-religious-Recognized	—	15%	113%	—	—	18%
Arab-Recognized	—	34%	34%	33%	29%	32%
Haredi-Recognized	12%	19%	37%	31%	21%	26%
Haredi-Exempt	14%	18%	19%	22%	22%	19%
Recognized	16%	21%	29%	22%	28%	23%
Haredi-Ma'ayan Hahinuch Hatorani	3%	5%	9%	10%	11%	9%
Haredi-Independent	2%	4%	7%	5%	9%	5%
Haredi Networks	2%	3%	8%	8%	11%	7%
Total change	4%	7%	13%	8%	11%	8%

Note: Quintiles do not necessarily relate to the same schools in 2014 and in 2018, since the Nurture Index quintile of many schools changed. The quintile data for schools in the Official Haredi education system were not available for 2014. Exempt schools are included with the Recognized schools for this work.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

The changes in budget per student (Table 5b) were somewhat larger since in parallel to the budget increase there was also a drop in class size (primarily in the Arab education sector and somewhat less in the Hebrew State education system), which reinforced the effect of the changes in the allocation per student. Here again, one can see that budget per student grew in all the sectors and for all types of supervision. Furthermore, the increase in the budget of schools in the weak quintiles was larger than in the strong ones, and as in the

case of budget per class, the increase in budget per student in the Recognized education system is particularly large.¹⁴

Table 5b. Changes in budget per student between 2014 and 2018

By Nurture Index quintile

	Strongest quintile	2	3	4	Weakest quintile	Total change
Hebrew State	10%	7%	9%	9%	14%	10%
Hebrew State-religious	7%	7%	9%	6%	2%	6%
Arab	—	0%	13%	13%	16%	15%
Druze	—	—	16%	13%	17%	15%
Bedouin	—	—	—	13%	18%	17%
Official	9%	8%	11%	12%	15%	11%
Hebrew State-Recognized	26%	28%	—	80%	57%	29%
Hebrew State-religious-Recognized	—	13%	118%	—	—	25%
Arab-Recognized	—	40%	32%	38%	39%	37%
Haredi-Recognized	16%	13%	49%	34%	18%	28%
Haredi-Exempt	13%	17%	11%	19%	19%	16%
Recognized	19%	22%	25%	22%	31%	23%
Haredi-Ma'ayan Hahinuch Hatorani	12%	2%	4%	4%	9%	5%
Haredi-Independent	3%	7%	9%	3%	0%	7%
Haredi Networks	4%	6%	7%	4%	5%	7%
Total change	9%	10%	14%	10%	16%	11%

Note: Quintiles do not necessarily relate to the same schools in 2014 and in 2018, since the Nurture Index quintile of many schools changed. The quintile data for schools in the Official Haredi education system were not available for 2014. Exempt schools are included with the Recognized schools for this work.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

- 14 Between 2014 and 2018, there were a number of events that apparently affected the growth in the budgets of Recognized schools. The budget for Christian Arab schools was increased following a four-week strike (Weissblau, 2017). In addition and as a result of the 2015 elections, the Yesh Atid party left the government and the Haredi parties joined the government in their place, which led to a significant increase in the budgets of the Recognized Haredi schools. Additionally, there was a highly publicized dispute between the Hebrew Reali School in Haifa and the Ministry of Education that centered on the Ministry's opposition to the school's high entrance fees. This confrontation finally led to a compromise in which the budgets provided by the Ministry of Education to Recognized non-Haredi schools were increased.

Differential budgeting policy

Changes in the primary education system: General background

The Ministry of Education has two overarching goals that can, in certain circumstances, stand in opposition to each other. One is to reduce educational gaps, and the second is to encourage and strengthen public education. The first goal is achieved by differential budgeting that considers the socioeconomic characteristics of the student population, while the second is done through preferential budgeting of Official education over Recognized and Network schools. When Haredi students in Official and Network education come from weaker socioeconomic backgrounds, though, the two goals clash. One way to deal with and solve this clash (at least partially) is to require the Recognized education system to lessen the principle differences that distinguish it from Official education. For example, the Shoshani Committee, which examined the budgeting of primary education, recommended uniform budgeting of schools and that Recognized schools adopt at least some core curriculum as well as cease admission policies that prevent integration (Shoshani Committee, 2002). Additional requirements can be set, of course, like hiring of teachers according to national union agreements, setting limits on parent's contributions, etc.

By 2014, classes and students in the Official education system in schools with a high Nurture Index (implying that the students come from a weak socioeconomic background) already had a budget advantage. Accordingly, **an increase in budgeting inequality implies that the growth in budget per class and per student over time among students with weak socioeconomic backgrounds is higher than for students with strong socioeconomic backgrounds.** In other words, when the differential level (i.e., inequality) increases, the Ministry of Education's policy goal to strengthen affirmative action is achieved and vice versa. In contrast, from the perspective of the system as a whole, the Recognized education system (which is primarily made up of Haredi schools), whose students for the most part have a low socioeconomic status, receives a smaller budget.¹⁵ Therefore, a reduction in budgeting inequality between the

15 Recognized education is budgeted at a lower level than Official education for various reasons, starting from the absence of core subjects in the curriculum (in the Haredi education system) and their employment of teachers not in accordance with national labor agreements, and ending with discriminatory student admissions policies and tuition charges.

Official education system and the Recognized education system highlights the clash in goals — **giving budgetary preference to those institutions that serve the weaker segments of the population lessens the budgetary advantage of public education.**

For many years, budget per class, which includes a budget for the Nurture Basket of services, served as the main tool for implementing the Ministry's affirmative action policy, in which larger budgets are allocated to students from weak socioeconomic backgrounds. Since the establishment of the State, the budget system in the primary education system has differed substantially between Official schools and Recognized schools (see Blass, 2010; Blass, Zussman & Tsur, 2010). In 2014, it was again decided to utilize the differential standard per student — which is a budgeting system based on preferential allocation to students from weaker socioeconomic backgrounds — but differently than its implementation between 2004 and 2008, and changes were introduced in the method of calculating the basic standard per class, where the newer calculation takes into account class size and the school's Nurture Index. The goal of this study is to determine the effect over time of those changes on per class and per student budgeting.

Changes in the primary education system: An empirical analysis

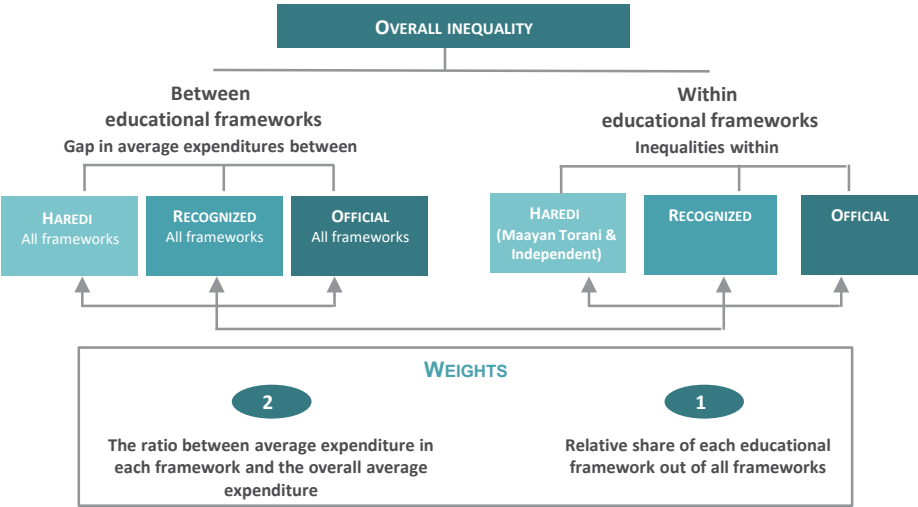
The index used to analyze inequality in budgeting per class and per student is the Theil Index (Theil, 1967).¹⁶ This index takes positive values (or zero in the case of full equality) and a higher value indicates greater inequality. The index makes it possible to divide the total population into subgroups (according to, for example, legal status, sector, supervisory authority, geographic region, etc.). In this study, we chose to examine the differential level in three education systems. As noted previously, the groups categorized are (a) Official education, with 74 percent of students;¹⁷ (b) Recognized schools, with 13 percent of students; (c) the two Haredi Networks of schools, where another 13 percent of students are educated. As shown in Figure 2, budget inequality can be broken down into two components:

16 For further details about the Theil Index, see the Appendix.

17 Official Haredi education, with relatively few students, is not included in this analysis.

1. Inequality **within** the education system. This type of inequality is the result of differences in budgeting (per student or per class) between schools belonging to the same subgroup. In the first stage the level of budgeting inequality is measured separately for each of the education systems (Official, Recognized, and Networks). Following that, the three inequality indexes are weighted (according to the Theil Index formula) in order to obtain a single index, which expresses the inequality within the three educational frameworks.
2. Inequality **between** the education systems. This type of inequality is the result of differences in average budgeting between the various education systems. This is calculated as the weighted sum of the gaps between the three education systems where only their average budget is taken into account.

Figure 2. Breakdown of inequality in expenditure within and between educational frameworks

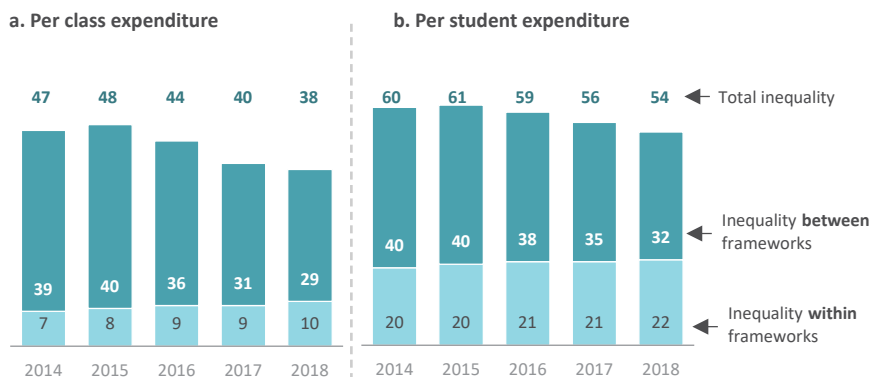


Source: Nachum Blass and Haim Bleikh, Taub Center

Figure 3 shows a drop in the level of budget inequality in the primary education system as a whole. However, this finding should be treated with caution. After breaking down total inequality into its components, it can be seen that:

1. The component of inequality **between** the three systems is significantly higher than that **within** education systems. This data reflects the significant differences in average budgeting levels between educational systems, and especially between Recognized education, which is characterized by low average expenditure, relative to other groups.
2. Over time, the component of inequality **between** the three education systems has declined substantially, which is essentially the explanation for the overall drop in inequality. This fact indicates that there has been a narrowing of gaps in the level of average budgeting.¹⁸ In this context, the rate of growth in the average budget per class and per student in the Recognized education system, which is characterized by low average expenditure, was substantially higher than for the other systems. Table 5a and 5b indicate that the rate of budget increase in the Recognized education system relative to the other education systems was higher not only on average but also in each nurture quintile.
3. The increase in inequality **within** education systems indicates an increase in the differential in budgeting within each education system. In other words, the increase in the budgets of schools serving students with a weak socioeconomic background was higher than for schools serving populations with a strong socioeconomic background.

18 The relative rate of inequality **between** the education systems within total inequality in expenditure per class dropped from 84 percent in 2014 to 75 percent in 2018. With respect to expenditure per student, the rate dropped from 67 to 60 percent during that same period.

Figure 3. Inequality in expenditure in the primary school education system, regular education

Note: According to the Theil Index, multiplied by 1,000.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

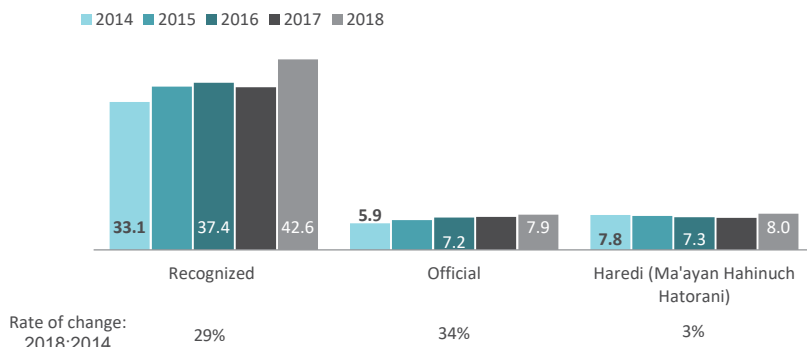
The question that arises is whether the increase in budgeting differential over time is characteristic of all three of the education systems or just some of them. Figure 4 presents the changes in levels of inequality over time within each of the three education systems. The figures show the following:

1. With respect to expenditure per class and per student, the differences in inequality between the groups (as represented by column height) reflect primarily the heterogeneity in the Recognized education system relative to the rest of the groups. As already noted, this is a relatively small group.
2. With respect to expenditure per class, there are various trends visible in differential within the various parts of the system. The figures for the Official education system indicate a consistent increase in budgeting inequality. In other words, larger budget additions were allocated to schools serving populations of students from a weaker socioeconomic background. The figures for the Recognized education system fluctuate more; nonetheless, in this group as well the differential is increasing over time. With respect to the two Haredi networks, it can be seen that between 2014 and 2017 there was a drop in the level of the differential while in 2018 the figures indicate a sharp rise.

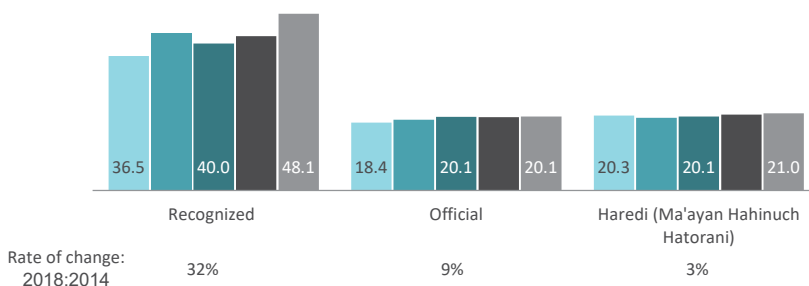
3. With respect to expenditure per student, the trends in differential levels are similar overall to the trends in expenditure per class. It is worth mentioning that in the Official education system the upward trend is more moderate than in expenditure per class. It is important to recall that, during this period, there was a reduction in class size in schools that serve stronger populations. Therefore, in terms of expenditure per student, this process moderated the Ministry of Education's differential budgeting policy to some extent.

Figure 4. Inequality in expenditure in the primary school education system, by legal status

a. Per class expenditure



b. Per student expenditure



Note: According to the Theil Index, multiplied by 1,000. Exempt schools are included with the Recognized schools for this work.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

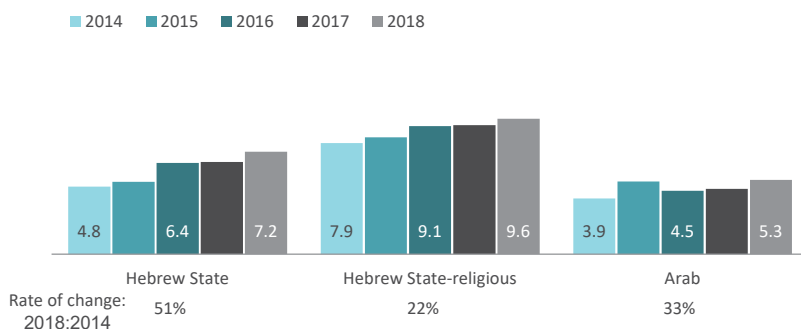
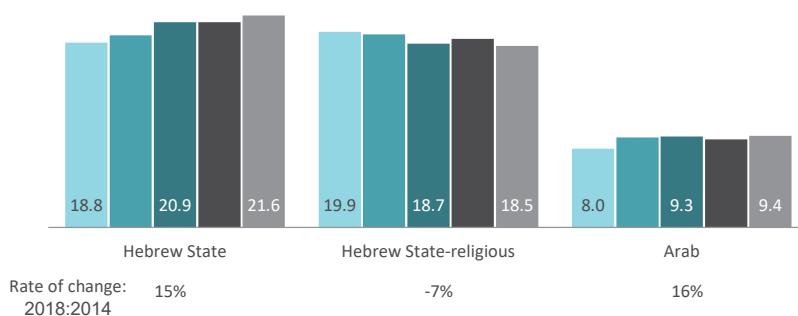
The education system is dynamic in some ways. Alongside demographic changes, there are also changes in the “status” of schools. This is seen primarily in changes in the Nurture Index and to a lesser extent in other characteristics.¹⁹ According to the data, these types of changes occurred in 40 percent of the schools operating in 2018 (37 percent in the Official education system, 53 percent in the Recognized education system and 42 percent in the two Haredi networks).²⁰ As part of this study, an analysis was carried out that is not presented here which examines the trends for schools in which no change in status occurred, which perhaps would have influenced their budgeting situation. In general, it can be said that among those schools with no change in status, the trends in differential levels are similar to those described above for all schools (see Appendix Figures 2a and 2b).

Trends in differential budgeting policy in the Official education system

As mentioned, most of the students in the primary education system attend schools in the Official system. This is a highly heterogeneous system, divided between Jews and Arabs and between State education, State-religious education and also Haredi education, although the latter accounts for only a negligible share. In the previous section, we saw that the differential level in the Official education system has risen. In this section, we look at the differential budgeting policy in the three components of the system — the Hebrew State education system, the State-religious education system, and the Arab education system. It should be emphasized that this analysis does not examine the differences in budget levels between the various parts of the system (i.e., the gap in average expenditure between the various education systems). Figure 5 describes the trends in inequality in the three education systems (Hebrew State and State-religious education and Arab education). First, it can be seen that the level of inequality in expenditure in Arab education is lower than that in Hebrew education. This is due to the fact that most of the Arab schools are budgeted in a fairly similar manner (most of them serve weaker populations).

19 There have also been changes in supervision and in legal status and there are also new schools.

20 If one relates to Nurture Index deciles rather than quintiles, the share of schools that experienced a change in one of the characteristics is much larger. For further details on schools that experienced a change in Nurture Index deciles and quintiles, see the Appendix Figure 1.

Figure 5. Inequality in expenditure in Official primary education**a. Per class expenditure****b. Per student expenditure**

Note: According to the Theil Index, multiplied by 1,000.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

Additionally, the differential level in expenditure per class is increasing in all of the systems. The differences in the rate of change to a large extent reflect demographic differences (a different distribution according to Nurture Index quintile).²¹ From the perspective of budget per student, the data reflect to a greater extent the changes in class size that occurred over the years (and

21 The changes in the level of budget inequality were also examined separately for schools serving populations that do not have a high socioeconomic status (quintile 4–5; the analysis is not presented here). The analysis shows that the trends over time, both per student and per class, are similar across all the quintiles, apart from in Hebrew State-religious education where there was an increase between 2014 and 2018 (although between 2016 and 2018 there was a decrease).

in particular in State-religious education). Between 2014 and 2018, classes in schools with students from strong socioeconomic backgrounds shrank in size, and increased in size in schools serving populations from weak socioeconomic backgrounds. As a result, the level of differential declined, as reflected in the figures for allocation per student in Hebrew State-religious education.

Conclusion

This study analyzes budgetary changes in primary school education, focusing on the issue of budget inequality between the various educational frameworks and within these frameworks. It also takes an in-depth look at whether the Ministry of Education policy to expand affirmative action by means of expenditure on populations with low socioeconomic status has been achieved.

An examination of the budgeting of the primary education system indicates that in the Official education system the average expenditure per class and per student is highest in the Druze and Bedouin sectors and that in the Hebrew State education system it is the lowest (see the graphs in Figure 1).²² The preferential budgeting enjoyed by the Bedouin and Druze education systems should be attributed primarily to their socioeconomic status and the affirmative action policy that is reflected in the allocation of the Nurture Basket, in the different class size for budgeting purposes, and in the prevalence of the long school day. However, when the budget is examined according to Nurture Index quintiles, it can be seen that, in the Official education system, the Hebrew State-religious schools are budgeted at the highest level both per class and per student, in almost all of the quintiles. The Recognized education system (apart from the two Haredi networks) is budgeted at a level that is tens of percent lower. This fact is explained by the desire on the part of the Ministry of Education to give preferential treatment to the public education system over the private.

The most substantial change between 2014 and 2018 occurred in the Recognized education system (not including the Independent education network and the Ma'ayan Hahinuch Hatorani network), whose budget per class and per student both grew by 23 percent, while the budget of the Official education system it shrank by 0.9 students. The explanation for this interesting development is worthy of a separate study. It can be hypothesized, though, that the changes in the government coalition following the elections of 2015,

22 We do not discuss the Official Haredi education system here since it is a very small group.

the agreements that the Ministry of Education signed with the Recognized schools following the strike of private Arab schools, and the dispute with the Hebrew Reali School in Haifa regarding the right to collect fees from parents were largely responsible for this outcome.

Apart from this particularly noticeable change, it is also worth mentioning that, in general, the growth in expenditure per class and per student was higher in schools serving weaker populations than in schools serving stronger ones.

Finally, the question arises as to how the Ministry of Education policy between 2014 and 2018 influenced the gaps in allocation per class and per student. The discussion of this issue is driven primarily by the large differences in budget size and in budgeting method between the three main parts of the primary education system: Official education, where 74 percent of students learn; Recognized education, with 13 percent of students; and the two large Haredi Network systems, with an additional 13 percent of students.

It appears, therefore, that inequality in budgeting between the three parts of the education system (Official, Recognized, and Network) has declined. In other words, there is now less preference given to the Official public education system, which is fully supervised, over the Recognized education system and the two Haredi networks, which are private and only partially supervised. In contrast, within each of the parts of the system budgeting inequality has risen. In other words, the affirmative action favoring students from weaker socioeconomic backgrounds that was in place at the beginning of the period has increased in scale.

References

English

- Blass, N., & Bleikh, H. (2018). [The determinants of school budgets: Per class and per student](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2018* (pp. 179–209). Jerusalem: Taub Center for Social Policy Studies in Israel.
- Theil, H. (1967). *Economics and information theory*. Amsterdam: North-Holland.

Hebrew

- Blass, N. (2009). *Inequality in resource allocation: The development of an affirmative action policy in primary education in Israel*. It's All Education — Movement for the Advancement of Education in Israel.
- Blass, N., Zussman, N., & Tsur, S. (2010). [Budgeting primary education 2001–2009](#). Jerusalem: Bank of Israel, Research Department.
- Sharon, D., & Brill, Y. (2019, July 6). [Refusing to learn from mistakes: Bennett bases his third campaign on spurious achievements](#). *Globes*.
- Shoshani Committee (2002). *Report of the Committee for Investigating the Funding of Elementary Education*. Jerusalem.
- State Comptroller and Ombudsman (2002). Integrating students with special needs in regular education. *Annual Report 52b (2001) and financial report for 2000* (pp. 224–243). Jerusalem: The State Comptroller and Ombudsman of Israel.
- Weissblau, E. (2016). [The value of a teaching hour in recognized unofficial primary education budgeting](#). Jerusalem: Knesset, Research and Information Center.
- Weissblau, E. (2017). [Budgeting recognized unofficial primary schools and comparative data on the socioeconomic status of primary schools from different sectors \(according to their student characteristics\)](#). Jerusalem: Knesset, Research and Information Center.

Appendix

The Theil Index of inequality

The index used in the analysis of inequality in this study is the Theil Index (Theil, 1967). The index takes positive values (or 0 in the case of full equality) and a higher value indicates greater inequality. The index is calculated as follows:

$$T = \frac{1}{n} \sum_{i=1}^n \frac{y_i}{\bar{y}} \ln \left(\frac{y_i}{\bar{y}} \right)$$

where:

n – number of schools.

y_i – expenditure on school i ($i=1....n$)

\bar{y} – average expenditure of all schools

One of the important properties of this index of inequality is that it can be decomposed. Thus, for example, the index makes it possible to decompose inequality into two components: (a) inequality **within** a group of schools (by sector, supervisory authority, and legal status), whose source is the variation in expenditure within groups; and (b) inequality **between** groups of schools, whose source is the variation in the average expenditure between groups. The following is the equation used for the calculation of the indices:

$$\begin{aligned} T &= \sum_{k=1}^m w_k \frac{\bar{y}_k}{\bar{y}} T_k + \sum_{k=1}^m w_k \frac{\bar{y}_k}{\bar{y}} \ln \left(\frac{\bar{y}_k}{\bar{y}} \right) = \\ &= \sum_{k=1}^m s_k T_k + \sum_{k=1}^m s_k \ln \left(\frac{s_k}{w_k} \right) = \\ &= T_{\text{within}} + T_{\text{between}} \end{aligned}$$

where:

T – Theil Index for all schools

w_k – the relative size of group k

\bar{y}_k – average expenditure of group k

T_k – Theil Index for group k

s_k – proportion of expenditure on group k out of total expenditure

T_{within} – inequality **within** the groups

T_{between} – inequality **between** groups

The left term in the equation, which is the within index, is the weighted sum of the inequality levels within a group of schools. The right term, which is the between index, focuses on gaps between the various groups. The basic assumption underlying the between index is that all the schools in a given group receive the average expenditure of the group. As a result, the ratio in the between term has special significance. When a particular group is budgeted at a higher rate than its share in the population (i.e., the ratio is greater than 1), its contribution to the index will be positive. When the ratio is less than 1, the contribution to the index will be negative²³ and if the ratio is equal to 1 then there is no inequality between the groups. Additionally, the fact that the between component of inequality is not negative, even though the contribution of certain groups can be negative, has another implication, namely that the groups for which the expenditure weight is higher than their proportion of the population generate a larger weight than the groups whose weight in expenditure is less than their share of the population.

Appendix Table 1. Ministry of Education budget for increasing the Nurture Basket and reducing number of students per class between 2015 and 2019

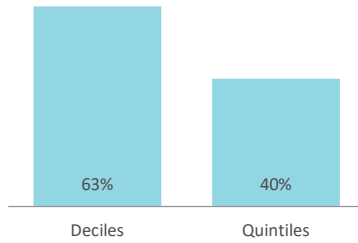
Year	Nurture Basket	Class size reduction
2015	125	55
2016	91	112
2017	90	100
2018	90	50
2019	70	50
Total	466	367

Note: The data are based on the sections relating to the main changes in transitions from one budget to the next, which appear in the Ministry of Education Budget Book for the relevant years. The two variables appeared for the first time in the Ministry of Education budget for the 2015 fiscal year. Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

23 When the ratio is between 0 and 1, the values of the logarithmic function will be negative. If the ratio increases within this range then its negative contribution will decline.

Appendix Figure 1. Schools experiencing a change in Nurture Index quintile and decile

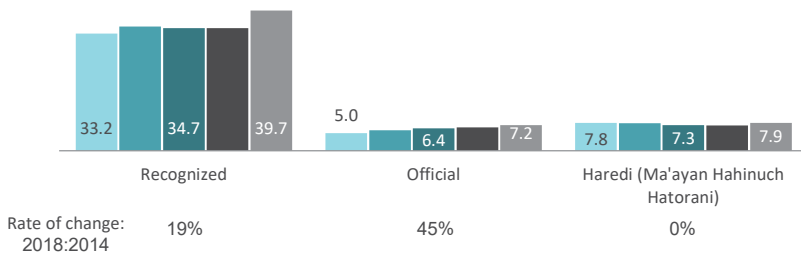
As a percent of all schools in 2018



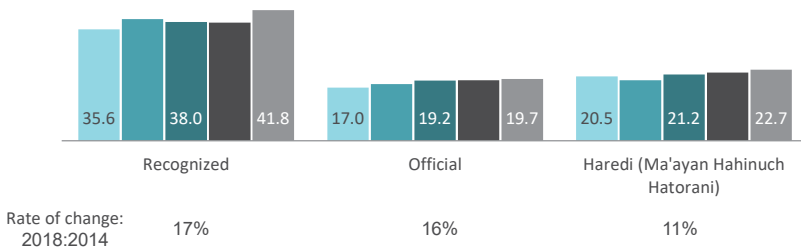
Appendix Figure 2. Inequality in expenditure

a. Per class expenditure

■ 2014 ■ 2015 ■ 2016 ■ 2017 ■ 2018



b. Per student expenditure



Note for Appendix Figure 2: In schools that did not experience a change in status (Nurture Index, legal status, etc.). Exempt schools are included with the Recognized schools for this work.

Appendix figures: Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

The structure of the Israeli education system

The Israeli education system serves students at every stage of their education, beginning in preschool through to higher education. It is impossible to examine any educational policy issue without a basic understanding of the structure of the system. The following lays out the main principles along which the system is divided:

1. Age

This division, termed “educational stage,” is the most well-known by the public, and is set by law under the Compulsory Education Law-1949 and various Knesset decisions for the reform of the education system. Students in the system are divided along the following lines:

- a. Preschool (from 2012, this includes children ages 3–4 in the Compulsory Education Law)
- b. Kindergarten (age 5)
- c. Primary school (Grades 1–6 — ages 6–11)
- d. Middle school (Grades 7–9 — ages 12–14)
- e. High school (Grades 10–12 — ages 15–17)
- f. Post-secondary and academic education (ages 18+)

These are the main educational stages. Aside from this division, there are a variety of frameworks at each stage. For example, there are preschools that have children ages 3–5 and there are those that divide the children by age; there are six year primary schools as well as those that extend to 8th grade; and at the high school level, there are some secondary schools that are four years.

2. Legal status

Education law in Israel recognizes three types of educational institutions that are distinguished by their level of state supervision: Official schools, Recognized but not official schools (henceforth: Recognized schools), and Exempt schools:

- a. Official schools are for the most part State Hebrew and Arab education as well as Hebrew State-religious schools, from preschool through middle school. In the past few years, a few Haredi Official schools have been established, but there are still very few of them.

- b. Almost all high schools are Recognized but not official schools. Other recognized schools include those schools in the Haredi Independent Networks, the Ma'ayan Hahinuch Hatorani Network schools, as well as other Recognized schools that are not necessarily religious. In this category, there is a distinction between the two Haredi Networks of schools, that are identified with Haredi political parties (the Haredi Independent Network is affiliated with Agudat Israel while Ma'ayan Hahinuch Hatorani is affiliated with the Shas political party), and other Recognized institutions. Haredi Network schools enjoy a special legal status codified in the Basic Budget Law of 1985, which affords them a school budget that is the same as Official schools.
- c. Exempt schools are Haredi and religious institutions that are exempt from Ministry of Education supervision under certain conditions, the main condition being that their educational curriculum includes at least 55 percent secular studies.

3. Sector

This division is principally one of national identity. The main division is Jewish and non-Jewish, while non-Jewish students are divided into three subgroups: Arab, Bedouin, and Druze. An additional subgroup is Circassian, although this is an exceptionally small group. There are those who classify all non-Jewish students as "Arab," although we prefer to use the distinction "Arabic-speakers." Israel's Central Bureau of Statistics chooses to avoid the national issue by dividing Israeli schools by language of instruction — Hebrew-speaking schools and Arabic-speaking schools. In this paper, whenever we are not referring to a specific Arabic-speaking subgroup, we refer to these schools as Hebrew and Arab schools and education systems. It is important to note that there are thousands of students classified as "Other," among them new immigrants or children of immigrants who are not halachically Jewish (i.e., their mother is not Jewish), the majority of whom study in the Hebrew State system.

4. Supervisory authority

This mainly distinguishes schools by religious orientation. There are three main groups:

- a. State schools, which include mainly institutions that are not classified as religious in both the Hebrew and Arab education system. The majority of primary and middle schools that are State schools are Official institutions,

although a portion of them, particularly in the Arab system, are Recognized schools. All high schools are Recognized schools.

- b. State-religious institutions and those with a National Religious orientation. Here, too, the majority of primary and middle schools are Official institutions, while all high schools are Recognized.
- c. Other schools are, for the main part, Haredi institutions.

There are two additional distinctions — socioeconomic level and ownership:

5. Socioeconomic status

The Ministry of Education ranks the student population by socioeconomic status. To this end, the Ministry created a “Nurture Index” that is based on four individual traits for each student. These four components and their respective weights are: the education level of the most educated between the two parents (40 percent), household per capita income (20 percent), school location (periphery — 20 percent), migrant students or those from countries in distress (20 percent). All students are ranked according to their score on this Index and divided into ten groups of the same size — Nurture deciles. Schools are also divided by their Nurture Index where the school’s Nurture Index is derived from the average Nurture Index of its student body. The school Nurture Index is the decile average of its student body. In the first decile are those schools with a student body of the highest socioeconomic status, while the tenth decile serves students of the lowest socioeconomic ranking, who are in need of additional resources. For convenience, in this work, we use a five-point scale — Nurture Index quintiles.

6. Ownership

This categorization is by school ownership.

- a. Schools owned by the State (Ministry of Education or Ministry of Labor, Social Affairs and Social Services).
- b. Schools owned by local authorities.
- c. Schools owned by educational Networks (Ma’ayan Hahinuch Hatorani, Haredi Independent Network, ORT, AMAL, AMIT, Horev, Noam-Tzviya, WIZO, Na’amat, and the like).
- d. Schools owned by a not-for-profit organization.
- e. Privately-owned schools.

EXECUTIVE SUMMARIES

6

Executive Summary

Achievements and Gaps in the Education System in Israel: A Status Report

Nachum Blass

This study examines educational achievement gaps by sector and socioeconomic background. Although the past few years have seen something of a slowdown, findings indicate a continuous improvement in student achievement for both Jews and Arab Israelis, as well as a narrowing of the gaps between them, especially within similar socioeconomic groupings. Nevertheless, the gaps between strong and weak students remain great, and in an international comparison, Israel ranks low for student achievement and high for achievement gaps.

Attendance rates

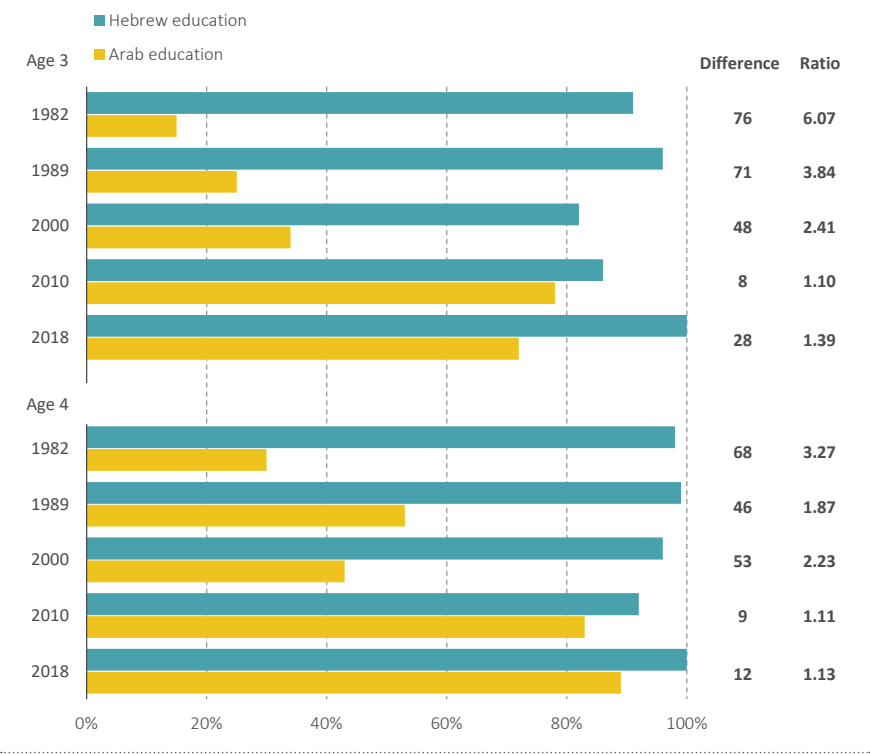
The education system attempts to allow parents and students a certain amount of choice between frameworks to meet their varied needs, while trying to maintain equality. In some instances, variety causes segregation and a widening of gaps.

* Nachum Blass, Principal Researcher, Taub Center for Social Policy Studies in Israel. The full study was published in February 2020.

Preschool education

- The gaps between attendance rates of 3–4-year-olds in Hebrew and Arab education have drastically declined over the past few decades: in the Arab education sector, attendance rates for 3-year-olds increased from 15 percent in 1982 to 72 percent in 2018 and for 4-year-olds from 30 percent in 1982 to 89 percent in 2018.

Figure 1. School attendance rates in Hebrew and Arab education, ages 3 and 4



Source: Nachum Blass, Taub Center | Data: CBS, *Statistical Abstract of Israel*, various years

- In the upper income quintiles, private expenditure on preschool education is much higher than in the lower ones, indicating the emergence of stratification. This did not change substantially after the implementation of the Compulsory Education Law for ages 3–4 in 2013.

Primary and middle school education

- The share of those seeking private schools within the Hebrew system is low, while the share is more than 25 percent within the Arab system.
- In the Arab system, there has been a rise in the number of parents choosing to send their children to schools in the Hebrew education system.
- In middle school, there is also tracking along educational criteria (which quite often coincide with socioeconomic background), creating segregation along socioeconomic lines.

High school education

- There are almost no Ministry of Education restrictions on admissions requirements and parents' payments in high school, leading to more parent freedom and creating differentiation reflected in the socioeconomic composition of schools' student bodies.
- Within schools, differentiation is expressed for the most part in tracking into academic and technological education tracks.

Achievements and educational gaps

Scores have been improving and gaps narrowing since the start of international testing in the early 2000s and in the Meitzav exams since 2007. The trend is especially notable among Arab Israelis, although gaps remain large.

Primary school education

- Between 2008 and 2017, student scores in the 5th grade Meitzav exams rose by about 13 percent in math and about 8 percent in English, with the greatest gains in the Arab education system — 22 percent and 13 percent respectively.
- Gaps between students in schools serving the most affluent population and those serving the weakest population have narrowed substantially — across the Hebrew and Arab education systems and within each system, in math and in English.
- On the PIRLS exam, Israel ranks relatively low — 29 out of 50 countries, and relatively high in terms of student gaps — 13. The main reason is the large gap between students in Hebrew education and those in Arab education.

Middle school education

- Achievement gaps on the 8th grade Meitzav exams are large between the Hebrew and Arab sectors in English, math, and science, although they have narrowed in all cases. Among those with similar socioeconomic backgrounds, gaps between the sectors are smaller and narrowing.
- The gaps have narrowed most substantially in the sciences: the average score rose by 110 points in Arab education and by 79 points in the Hebrew education system.
- On the TIMSS exams, scores increased at a faster rate than the average in other countries until 2011. This increase has since halted.

High school education

- Bagrut qualification rates rose substantially between 1990 and 2015.
- For bagrut qualification that fulfills requirements for admission to higher education, student achievement gaps grew between students from different socioeconomic groupings among Jews, but did not change and even narrowed between Arab Israeli students.
- Israel's students' PISA exam scores are lower than the overall OECD country average and the gaps between the strongest and the weakest students are the greatest.
- Hebrew-speaking students' scores on the 2018 PISA exams were higher than the OECD average (506 versus 487), while the achievements of Arabic-speakers were much lower (362) and declined by almost 40 points between 2006 and 2018.

Executive Summary

Early Childhood Education and Care in Israel Compared to the OECD

Enrollment Rates, Employment Rates of Mothers, Quality Indices, and Future Achievement

Dana Vaknin

This study presents data on the characteristics of early childhood education frameworks in Israel in comparison to other OECD countries, as well as their impact on children's later academic achievements. It is particularly important to pay attention to these trends because Israel's fertility is the highest in the OECD, standing at 3.1 (compared to 1.6 on average in the OECD), and the share of children ages 0–4 in the population is nearly double that of the OECD average: 10.3 percent compared to 5.8 percent, respectively.

Participation in early childhood education frameworks

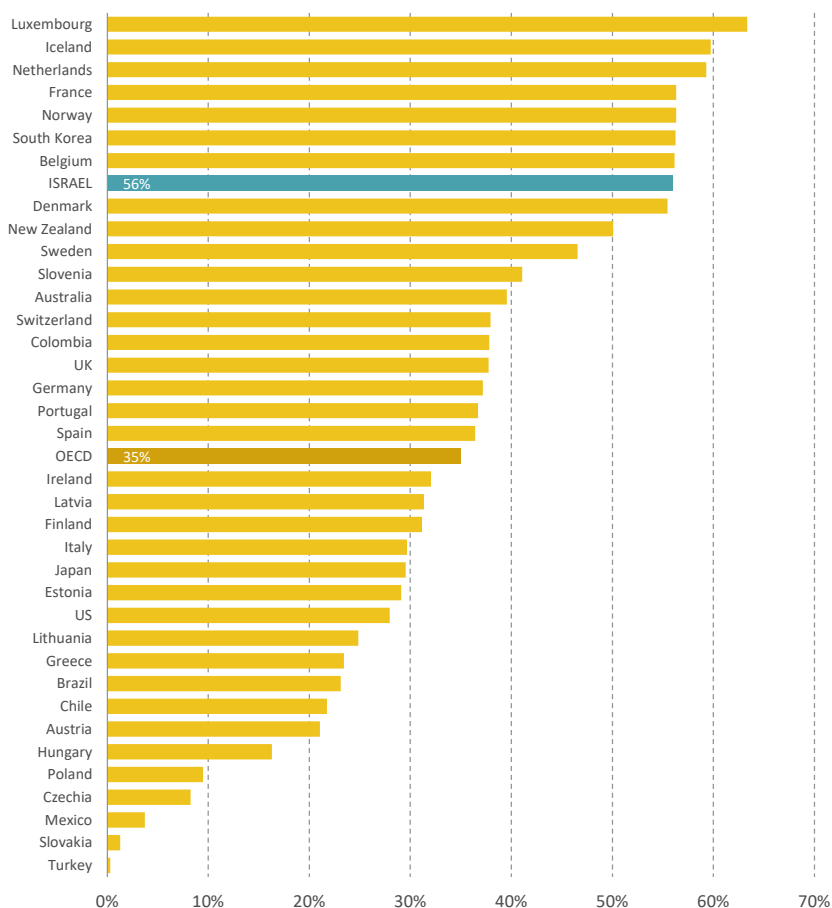
Young children in Israel spend more time in early childhood education frameworks than their counterparts in other developed countries. This appears to be related, among other things, to employment rates among mothers to young children, the length of paid maternity leave, and the share of the day children spend in these frameworks.

* Dana Vaknin, Researcher, the Initiative on Early Childhood Development and Inequality, Taub Center for Social Policy Studies in Israel. The research was published as part of the Taub Center Initiative on Early Childhood Development and Inequality. The activities of the Initiative are generously supported by the Beracha Foundation, the Bernard van Leer Foundation, and Yad Hanadiv. The full study was published in July 2020.

- The participation rate of children ages 0–2 stands at 56 percent in Israel, in comparison to 35 percent on average in the OECD. Israel also leads developed countries in the percentage of children below age 1 participating in early childhood education frameworks: 31 percent compared to 9 percent on average in the OECD.

Figure 1. The share of children ages birth to 2-years-old participating in educational institutions, 2017

The percent registered out of the relevant age group



Source: Dana Vaknin, Taub Center | Data: OECD, 2018

- The participation rate of children ages 3–5 is also particularly high in Israel, standing at 99 percent in 2017, compared to an OECD average of 87 percent.
- Unlike in other developed countries where the employment rate of mothers to 0–2-year-olds is lower than for mothers of 3–5-year-olds, employment rates in Israel are quite similar — 70 percent and 75 percent, respectively.
- Israel’s maternity benefits over a woman’s lifetime are relatively generous. While the length of paid and unpaid maternity leave is lower than in other developed countries — 15 weeks of paid leave compared to an average of 18 in the OECD — Israel’s benefit covers 100 percent of salary, instead of partial salary as in many OECD countries.
- Estimates are that Israeli children spend 30–40 hours a week in early childhood frameworks, while other estimates reach 50 hours. Any of these estimates show a particularly high number of hours per week in comparison to other OECD countries.
- Despite Israeli children’s high participation rates in early childhood frameworks, only 25 percent of children under the age of 3 were in frameworks supervised by the Ministry of Labor, Social Affairs and Social Services, whereas 75 percent were in private frameworks or at home.

Quality indices for early childhood education frameworks

Israel’s performance on quality indices for early childhood frameworks are worrying compared to a number of other developed countries. The quality of early childhood frameworks is generally evaluated as a function of the child-staff ratio, the educational and training level of the staff, and “process quality” — the quality of the educational processes that take place in the frameworks. The author analyzed results of the 2018 TALIS survey (Teaching and Learning International Survey) to evaluate Israel’s performance on these indices relative to other countries that participated in the survey — Denmark, Chile, Germany, Iceland, Japan, South Korea, Turkey, and Norway.

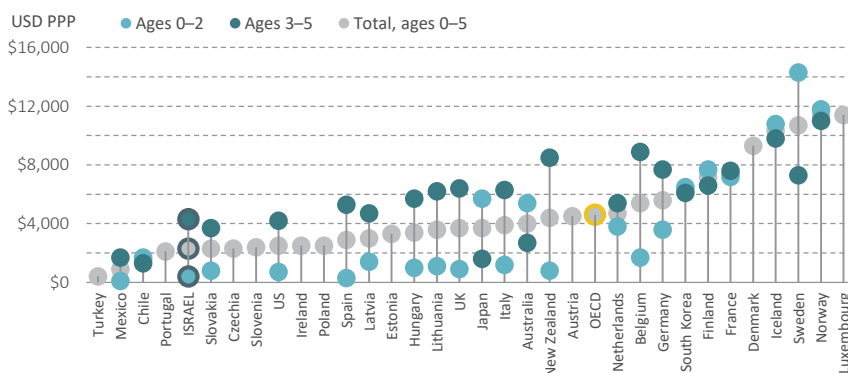
- The child-staff ratio in Israeli preschools — both Hebrew- and Arabic-speaking — is high compared to other developed countries: Israel has 50 percent more children and 23 percent fewer staff than the average in the comparison countries.

- Among the staff, Israel has the highest share of preschool aides (45 percent) and the lowest share of preschool teachers (34 percent) of any of the comparison countries.
- While an impressive 95 percent of preschool teachers in Israel are graduates of higher education, nearly 70 percent of preschool aides have a high school education or lower. Only 25 percent of preschool staff in the comparison countries have education levels of high school education or lower.
- The average seniority among preschool staff in Israel stands at 10 years and is low relative to the comparison countries. There is a substantial gap between the seniority of staff in Hebrew- and Arabic-speaking preschools: 11 and 7 years, respectively.

Public expenditure on early childhood frameworks is another important measure to evaluate, given that the academic literature shows that educational interventions and investment in the first years of life yield the greatest economic and educational returns.

- Public investment on early childcare for ages 0–2 in Israel is among the lowest in the OECD countries.
- Public spending in Israel for ages 3–5 is higher, but is still among the lowest in the developed countries.

Figure 2. Public expenditure per child on educational services and early childhood care, 2015



Note: Complete data are not available for all of the countries.

Source: Dana Vaknin, Taub Center | Data: OECD, 2018

Early childhood frameworks and future achievements

Studies show that children from low socioeconomic backgrounds may benefit more in terms of cognitive development from participating in early childhood education frameworks, but are less likely to be in such frameworks for over two years. The academic literature shows that the number of years children spend in early childhood education frameworks is a strong predictor of later academic achievement.

- Inequality between socioeconomic strata in participating in early childhood frameworks for more than two years is low in Israel compared to other countries: 87 percent of students from low socioeconomic backgrounds and 94 percent from high socioeconomic backgrounds were in these frameworks for over two years.
- When controlling for the socioeconomic background of students and schools, Israel's gap in PISA scores between students who were in early childhood education frameworks for at least two years and those who were not is among the largest in the OECD, standing at 39 points compared to an OECD average of 15 points.

With regard to the findings on future achievements, it is important to note that socioeconomic status is measured at age 15 and not during early childhood, and that the quality of early childhood education frameworks is not taken into account.

In future research conducted by the Taub Center Initiative on Early Childhood Development and Inequality, we intend to examine whether early childhood education frameworks in Israel promote children's academic achievements in the short- and long-term, whether there are differences between socioeconomic strata and population groups in the age of entry into early childhood education and type of framework, and whether there are differences between the types of frameworks in the relationship to children's achievements.

Executive Summary

Early Childhood Education in Israel and Academic Achievement

Noam Zontag, Yael Navon, Dana Vaknin, Liora Bowers, Carmel Blank, and Yossi Shavit

Early childhood is a critical period for human development, and gaps developed during these years tend to persevere into adulthood. Therefore, educational intervention and investment in early childhood yields great returns, primarily among children from weaker socioeconomic backgrounds. Participation in high quality early education programs can contribute to the development of abilities and skills that serve to improve later achievements — educational, economic, and health. Quality education for young children from weaker population groups can break intergenerational cycles of poverty and narrow inequalities in achievements between those from different socioeconomic backgrounds.

In Israel, enrollment rates in early education frameworks are very high, but the quality within these programs is low. This study analyzes three databases — data from the 2004 CBS Social Survey, which include scores on the Meitzav exams in math and science for children in Grades 5 and 8, scores from the PIRLS exam for reading literacy in 2016, and scores from the PISA exam in reading

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in 2018 — to examine whether participation in early childhood education and care (ECEC) frameworks is related to later scholastic achievements and the relationship between children's socioeconomic background and their participation in such programs.

Preschool education in Israel: Quantity and quality

In Israel, there is particularly high participation in ECEC, yet there are also a number of worrying indications about their quality.

- In 2017, the share of children between the ages of 3 and 6 who were in an ECEC framework stood at 99 percent, and among very young children (from birth to 3), the enrollment rate was 56 percent (versus 35 percent in the OECD).
- Israeli children spend a great deal of time in preschool — about 30 to 40 weekly hours — and the share of working mothers in Israel is high relative to the OECD average as well (70 percent versus 54 percent), with a strong association between the two.
- Nonetheless, Israel's public expenditure per child on ECEC frameworks is among the lowest in the OECD and the ratio of children to staff is very high.
- The preschool staff's level of formal education is relatively low in Israel — 39 percent of staff have a high school education or less (versus 19 percent on average in the other countries that took part in a comparative study), and only 46 percent have an academic education.

The Social Survey (2004) and the Meitzav exams

The Meitzav exams are a series of tests administered in Grades 5 and 8 throughout Israel. This database, consisting of the Meitzav exam scores and the CBS Social Survey data for 2004, is used to examine the effect of enrollment in preschool education on academic achievement on the Meitzav exams.

- Enrollment rates and length of tenure in ECEC are higher in higher socioeconomic groups, and among Jews than among Arab Israelis.
- Children between the ages of 2 and 4 who were in preschool or public daycare got substantially better grades on the Meitzav exams than those children who stayed at home at these ages.

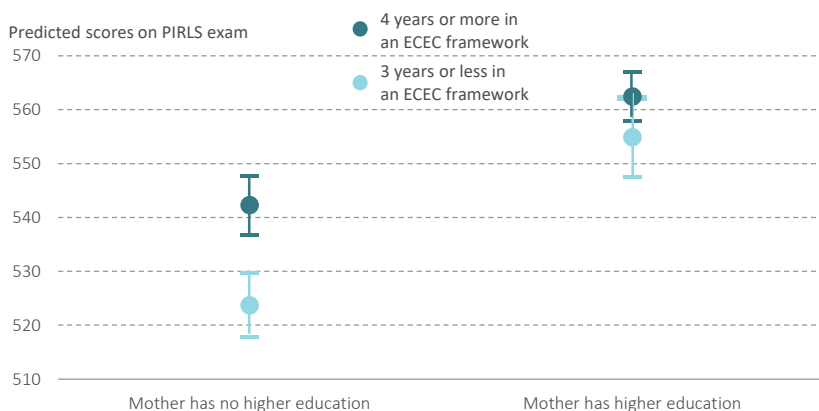
- Spending time in home daycare settings (*mishpachton*), nurseries (*peuton*), or in the care of a nanny (rather than supervised frameworks) during these years was found to be no different than care from a family member in terms of children's future achievements.

The PIRLS 2016 exam

PIRLS is an international exam in reading literacy taken in the fourth grade. An analysis of this database indicates that participating in early childhood frameworks is associated with future achievement in reading literacy among children from low socioeconomic backgrounds.

- Most of the children (63 percent) were in ECEC frameworks for 4 years or more; about 13 percent for 2 years or less.
- The number of years enrolled in an ECEC framework was high among children whose mothers have an academic education, among children whose fathers have prestigious occupations, and among Jews relative to Arab Israelis.
- Children of mothers without an academic education who were in ECEC for 4 years or more had significantly higher later achievements. In contrast, among children with mothers who have an academic education, 4 years in ECEC compared to less than 4 years does not have a significant impact on their later achievements.

Figure 1. Predicted scores by mother's level of education and the number of years in preschool



Source: Zontag et al., Taub Center | Data: [PIRLS 2016 International Database](#)

The PISA 2018 exam

The OECD's PISA exam is administered to 15-year-olds in reading, mathematics, and science. This database makes it possible to test the relationship between starting to attend early childhood frameworks at early ages and later academic achievement.

- Among Jewish children with mothers with an academic education, entering ECEC before the age of 2 does not significantly contribute to later achievements.
- Jewish children who entered into ECEC frameworks late (at ages 5–6) had lower reading scores compared to those who entered at ages 2–4.
- Among Arab Israeli children and Jewish children whose mothers do not have higher education, enrollment in ECEC before the age of 2 seems to be negatively associated with later achievements. This finding may reflect the low quality of ECEC for children under the age of 3 in the Arab sector and among the poorer segments of the Jewish sector.

The study shows that participation in supervised ECEC frameworks in Israel contributes to the later academic achievements of children, especially among children from low socioeconomic backgrounds — who, to begin with, have lower participation in these frameworks. Therefore, it is important to increase the participation of these groups in early childhood frameworks, particularly from ages 2 and up, where the greatest impact was observed.

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