

THE HERBERT M. SINGER  
ANNUAL REPORT SERIES



# STATE OF THE NATION REPORT

SOCIETY, ECONOMY AND POLICY IN ISRAEL

# 2021



EDITOR: AVI WEISS

**The Herbert M. Singer Annual Report Series**

# State of the Nation Report

## Society, Economy and Policy in Israel 2021

**Avi Weiss, Editor**



**Taub Center for Social Policy Studies in Israel**

**Jerusalem, December 2021**

## **Taub Center for Social Policy Studies in Israel**

Established in 1982 under the leadership and vision of Herbert M. Singer, Henry Taub, and the American Jewish Joint Distribution Committee (JDC), the Center is funded by a permanent endowment created by the Henry and Marilyn Taub Foundation, the Herbert M. and Nell Singer Foundation, Jane and John Colman, the Kolker-Saxon-Hallock Family Foundation, the Milton A. and Roslyn Z. Wolf Family Foundation, and the JDC.

The Taub Center is an independent, nonpartisan, socioeconomic research institute based in Jerusalem. The Center conducts high-quality, impartial research on socioeconomic conditions in Israel, and develops innovative, equitable and practical options for macro public policies that advance the well-being of Israelis. The Center strives to influence public policy through direct communications with policy makers and by enriching the public debate that accompanies the decision making process.

This volume, like all Center publications, represents the views of its authors only, and they alone are responsible for its contents. Nothing stated in this book creates an obligation on the part of the Center, its Board of Directors, its employees, other affiliated persons, or those who support its activities.

Layout: Laura Schreiber

Translation: Julie Rosenzweig/Sagir Translations, Ltd.; David Simmer;  
Shaul Vardi

Copyright © 2021 Taub Center for Social Policy Studies in Israel

All rights reserved

ISBN 978-965-92790-6-7

Center address:

15 Ha'ari Street, Jerusalem, Israel

Tel: 972 2 567 1818

Email: [info@taubcenter.org.il](mailto:info@taubcenter.org.il)

Fax: 972 2 567 1919

Website: [www.taubcenter.org.il](http://www.taubcenter.org.il)

## **Board of Directors**

### **Chair: Jim Angell**

Dennis W. Carlton (Vice Chair, Planning and Resource Development), John Davison (Vice Chair, Budget and Finance), Miri Eisin (Vice Chair, Governance and Administration), Helen Abeles, Penny Blumenstein, John Dunn, Martha Freedman, Anat Gafni, Alan H. Gill, Ellen M. Heller, Steve Lieberman, Michael P. Lustig, Michael S. Saxon, Mark Sisisky, Caryn Wolf Wechsler, Ariel Zwang

## **General Assembly**

### **Chair: Helen Abeles**

Penny Blumenstein, Zvi Feine, Amir Halevy, Ellen M. Heller, Steve Lieberman, Stanley Rabin, Michael S. Saxon, Mark Sisisky, Steven Taub, Caryn Wolf Wechsler, Ariel Zwang

## **International Advisory Council**

Henry Aaron (Brookings Institution), David Autor (MIT), Mario Blejer (Banco Hipotecario), Aaron Ciechanover (Technion), Stuart Eizenstat (Covington), Han Entzinger (Erasmus University), Adam Gamoran (William T. Grant Foundation), Edward Glaeser (Harvard University), Eric Hanushek (Stanford University), James J. Heckman (University of Chicago), Peter S. Heller (Johns Hopkins University), Daniel Kahneman (Princeton University), Robert E. Litan (Korein Tillery), Burton A. Weisbrod (Northwestern University)

## **Center Staff**

### **President: Avi Weiss**

### **Director General: Suzanne Patt Benvenisti**

### **Senior Director of Strategic Partnerships: Michal Pozmanter**

### **Research Director: Alex Weinreb**

### **Chief Financial and Operating Officer: Liora Bowers**

Arielle Avraham (Grants and Donor Relations Coordinator), Rachel Arazi (Guest Researcher), Dudu Barazani (Maintenance), Benjamin Bental (Principal Researcher; Chair, Economics Policy Program), Carmel Blank (Senior Researcher), Nachum Blass (Principal Researcher; Chair, Education Policy Program), Haim Bleikh (Researcher), Nadav Davidovitch (Principal Researcher, Chair, Health Policy Program), Michael Debowy (Research Assistant), Hedva Elmackias (Office Manager), Gil Epstein (Principal Researcher), John Gal (Principal Researcher; Chair, Welfare Policy Program), Casey Girard (Deputy Director, Strategic Partnerships), Racheli Gresser (Marketing and Government Relations Coordinator), Ella Itkin (Content Manager), Ayelet Kamay (Publications Director), Baruch Levi (Guest Researcher), Yuval Levy (Research Assistant), Shavit Madhala (Researcher), Lior Morag (Digital Media Associate), Yael Navon (Senior Researcher), Talia Peckerman (Governance and Operations Manager), Laura Schreiber (Senior Publications Manager), Anat Sella-Koren (Director, Marketing, Communications and Government Relations), Labib Shami (Senior Researcher), Yossi Shavit (Principal Researcher; Chair, Taub Center Initiative on Early Childhood Development and Inequality), Kyrill Shraberman (Researcher), Dana Vaknin (Researcher), Tamar Friedman Wilson (Content Manager), Noam Zontag (Researcher)

**Past Directors:** Israel Katz (z"l), Yaakov Kop (z"l), Dan Ben-David

## Policy Program Fellows

### Economics

**Benjamin Bental (Chair)**, Yarom Ariav, Gilad Brand, Adi Brender, David Brodet, Doron Cohen, Naomi Feldman, Reuben Gronau, Jack Habib, Moshe Mandelbaum, Dan Peled, Assaf Sarid, Haim Shani, Eytan Sheshinski, Shmuel Slavin, Avia Spivak, Michel Strawczynski, Shlomo Yitzhaki, Ben Zion Zilberfarb

### Education

**Nachum Blass (Chair)**, Shlomit Amichai, Shlomo Beck, Rami Benbenishty, Carmel Blank, Yigal Douchin, Yariv Feniger, Isaac Friedman, Eli Eisenberg, Meir Kraus, Orit Levin, Ariel Levy, David Maagan, Zmira Mevarech, Yael Navon, Yoel Rapp, Rita Sever, Yossi Shavit, Edna Shimoni, Rami Suleimani, Eran Tamir, Yulie Tamir, Yuval Vurgan, Zvi Yanai

### Health

**Nadav Davidovitch (Chair)**, Dorit Adler, Anat Arbel-Shamir, Alexander Aviram, Uri Aviram, Ran Balicer, Shlomo Barnoon, Yitzhak Berlowitz, Nakhle Beshara, Bishara Bisharat, Orna Blondheim, Adi Brender, Shay Brill, David Chinitz, Keren Dopelt, Tal Dovev, Asher Elhayany, Miri Endeweld, Leon Epstein, Ronni Gamzu, Yigal Ginat, Dan Greenberg, Itamar Grotto, Eitan Hai-Am, Jonathan Halevy, Eran Halperin, Michael Hartal, Avi Israeli, Orit Jacobson, Avigdor Kaplan, Galit Kaufman, Rachel Kaye, Muhammad Khatib, Shira Kislev, Maya Leventer-Roberts, Baruch Levi, Jacob Menczel, Shlomo Mor-Yosef, Roi Ben Moshe, Adi Niv-Yagoda, Gabi Ben Nun, Meir Oren, Baruch Ovadia, Eran Politzer, Sigal Regev-Rosenberg, Bruce Rosen, Yehudit Shamion, Shani Paluch Shimon, Amir Shmueli, Haim Silber, Varda Soskolne, Yohanan Stessman, Aviad Tur-Sinai, Leah Vefner, Salman Zarka, Dan Zeltzer

### Labor

Einav Aharoni-Yonas, Hagai Atkas, Rani Dudai, Gil Epstein, Mark Feldman, Daniel Gottlieb, Nitsa Kasir (Kaliner), Yaakov Loupo, Miki Malul, Guy Mundlak, Dalia Narkiss, Tali Regev, Dmitri Romanov, Moshe Semyonov, Ofer Setty, Sigal Shelach, Arie Syvan, Yossi Tamir, Aviad Tur-Sinai

### Social Welfare

**John Gal (Chair)**, Michal Almog-Bar, Ofer Arian, Uri Aviram, Avishai Benish, Orly Benjamin, Nissim Cohen, Israel Doron, Rani Dudai, Zvi Feine, Boni Goldberg, Daniel Gottlieb, Anat Herbst-Debby, Roni Holler, Nitsa Kasir (Kaliner), Chana Katz, Michal Koreh, Michal Krumer-Nevo, Lihi Lahat, David Levi-Faur, Ibrahim Mahajne, Miki Malul, Ronen Mandelkern, Menachem Monnikendam, Baruch Ovadia, Nadav Perez-Vaisvidovsky, Yekutiel Sabah, Talia Meital Schwartz-Tayri, Shmulik Sheintuch, Sigal Shelach, Roni Strier, Yossi Tamir, Aviad Tur-Sinai, Idit Weiss-Gal, Uri Yanay, Amos Zehavi

# A Message from the Chair



As Chair of the Board of Directors of the Taub Center for Social Policy Studies in Israel, I am extremely proud to present the Singer Series *State of the Nation Report 2021*. A year ago, when the Taub Center published its *State of the Nation Report for 2020*, many had hoped that the profound economic and societal disruptions of the Covid-19 pandemic would be largely behind us by now. Obviously, this was not to be. But while the virus and its myriad mutations remain with us, many of the papers in this volume demonstrate that Israel has moved

beyond the stage of paralyzing shutdowns towards one in which the country's population and institutions are evolving to accommodate life alongside the virus. Several chapters in this *State of the Nation Report* explore this evolution by analyzing the impacts of the pandemic on macroeconomic forces in Israel, exploring the cascading effects on society of the dramatic growth in remote work in some industries, considering the challenges to Israel's welfare system posed by Covid-19 and its aftermath, and assessing how the country's public health system performed in the face of the pandemic and how it is being reshaped by it.

While the Taub Center pivoted quickly over the past two years to confront the dramatic impacts of the pandemic, its research teams also have continued their preexisting, long-term research efforts concerning Israeli institutions and the challenges posed by the country's unique demographics. Of particular note is the Center's concentrated look in several chapters below at the performance of Israel's education system and, in particular, at the availability and impacts of early childhood education. This exciting and already-influential body of work typifies the Center's academic and non-partisan rigor, as well as its determination to provide the public and government the data they need as they consider policy initiatives.

Happy reading and good health to all!

**Jim Angell**

*Chair, Taub Center Board of Directors*



# A Message from the Director General



Over the past year, the Taub Center for Social Policy Studies in Israel has continued to work tirelessly to fulfill its mission of positively influencing public policy in Israel. While the country continues to operate in “emergency” mode in the midst of the Covid-19 pandemic, we are balancing the immediate need to understand short-term issues with research on long-term trends that remain the core focus of the Taub Center and provide the country with an important basis for its long-term strategic planning. Our dedication to

this mission enables us to ensure that we are constantly expanding the impact of the Taub Center and our research.

The Taub Center staff is composed of talented individuals who consistently dedicate themselves to excellence in their respective areas, from research to government relations, from publications production to marketing, from strategic partnerships to governance and operations. Even more critically, the stellar collaboration of these individuals and teams enables us to grow our impact from one year to the next, with innovative research ideas and creative new ventures. As we learn from our efforts and track their fruits, we have recognized our role in bringing key issues to the policy agenda and providing much-needed independent, non-partisan guidance to policy makers from across the political spectrum. Examples of recent impact that have resulted in part from the Taub Center’s research and dissemination include the raising of the mandatory retirement age for women in Israel and legislation mandating reporting on the gender wage gap. Moreover, the Taub Center has engaged in proactive dissemination campaigns related to its recent research on demographic trends in the South, alongside many other areas of research, with an eye toward endowing policy makers with important data to inform their work.



We are proud of the critical impact our research is continuing to make, and we are grateful to our many supporters — from foundations to Board of Directors and General Assembly members to philanthropic individuals — for their commitment to supporting the Taub Center in its pursuit of a better-informed Israeli public and well-designed public policy. This year's Herbert M. Singer Series *State of the Nation Report* is undoubtedly another step forward in this pursuit, and I wish you great pleasure as you dive into these pages and learn more about some of the most pivotal and fascinating challenges the country is facing.

**Suzie Patt Benvenisti**

*Director General, Taub Center for Social Policy Studies in Israel*

# Contents

Editor's Introduction	11
Abbreviations	18
<b>1. Macroeconomic Trends</b>	
Macroeconomic Trends: An Overview <i>Benjamin Bental and Labib Shami</i>	21
<b>2. Labor Markets</b>	
The Israeli Labor Market in the Wake of Covid-19: An Overview <i>Michael Debowy, Gil Epstein, and Avi Weiss</i>	57
Returns to Education and Labor Market Experience in Israel <i>Michael Debowy, Gil Epstein, and Avi Weiss</i>	89
<i>Executive Summary</i>	
Employment and Level of Happiness: The Effect of Employment on the Level of Happiness Among Israelis Ages 60–80 <i>Hila Axelrad, Israel Luski, and Arie Sherman</i>	121
<b>3. Health</b>	
The Health Workforce in Israel During the Covid-19 Pandemic: An Overview <i>Nadav Davidovitch, Baruch Levi, and Rachel Arazi</i>	127
<i>Executive Summary</i>	
Variation in Covid Testing, Infections and Hospitalization by Town and Population Sector <i>Alex Weinreb</i>	161
<i>Executive Summary</i>	
Excess Mortality and Life Expectancy in Israel in 2020 <i>Alex Weinreb</i>	165
How Many Deaths Could Be Avoided in Israel? A Comparative Analysis of Cause of Death Across 37 Countries <i>Alex Weinreb and Elon Seela</i>	169

## 4. Social Welfare

The Social Welfare System in Transition: An Overview <i>John Gal and Shavit Madhala</i>	193
--------------------------------------------------------------------------------------------	-----

### *Executive Summary*

Enrollment of Arab Children in Supervised Daycare <i>Shavit Madhala, Labib Shami, John Gal, and Elon Seela</i>	225
-------------------------------------------------------------------------------------------------------------------	-----

### *Executive Summary*

The Relationship Between Parental Stress and Young Children's Screen Time During a Covid-19 Driven National Lockdown <i>Yael Navon, Liora Bowers, Carmel Blank, Dana Vaknin, and Yossi Shavit</i>	231
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

## 5. Education

The Education System: An Overview <i>Nachum Blass</i>	237
----------------------------------------------------------	-----

### *Executive Summary*

Preschool Attendance to Age 3 and Its Impact on Academic Achievement in Grade 4 <i>Hai Vaknin and Yossi Shavit</i>	271
--------------------------------------------------------------------------------------------------------------------------	-----

## 6. Demography

Demographic Trends in Israel: An Overview <i>Alex Weinreb</i>	277
------------------------------------------------------------------	-----

### *Executive Summary*

A Sociodemographic Profile of the South <i>Alex Weinreb</i>	293
----------------------------------------------------------------	-----

### *Executive Summary*

Youth Bulge, Violent Crime, and Shortages in the Israeli Arab Marriage Market <i>Alex Weinreb</i>	299
---------------------------------------------------------------------------------------------------------	-----

# Editor's Introduction



It is once again a pleasure for me to bring you the Taub Center for Social Policy Studies in Israel's annual Herbert M. Singer series – the *State of the Nation Report 2021*, focused on presenting a wide-ranging overview of Israel's economy and society.

Unfortunately, Covid-19 still affects our day-to-day lives in many ways, but to a large extent we have learned to live alongside the virus. Discussion of the virus and its implications dominate portions of this year's book, but in many ways the focus is less on what has

happened and more on where we are going. The book concentrates on presenting a thorough overview of where we are, what has changed, where our difficulties lie, and what has and should change going forward. This is presented in chapters on macroeconomics, the labor market, health, welfare, education, and demographics. Two additional new research papers are included on related issues — one on excess morbidity in Israel and one on the labor market returns to schooling. In addition, the book contains eight executive summaries of papers released earlier this year. The reason to include these in this book is twofold: first, to give those who missed these publications an opportunity to learn of the work and, if they find it interesting, to download the complete study, and, second, to give those who did see it a short reminder.

The first chapter on macroeconomics, co-authored by *Prof. Benjamin Bental* and *Dr. Labib Shami*, takes a careful look at the effects of the pandemic on Israel's economy to date and on projections for the future. As they show, while the economy initially took a heavy blow from the pandemic, 2021 was a year of strong recovery, stronger than anticipated, with the level of GDP per capita basically returning to where it would have been had this never happened. The economy demonstrated a great deal of resilience and even flexibility. For instance, there has been a robust move towards remote work in some industries which, it seems, is here to stay. This change alone could potentially have profound effects on a myriad of issues, such as geographic distribution,

housing prices, and congestion. While Israel's debt-to-GDP has increased, the low ratio prior to the pandemic means that Israel is still in a comfortable situation vis-à-vis the international capital market. As a result, Israel can afford to maintain a high debt-to-GDP ratio, as long as the funds are allocated to growth enhancing investments.

The next chapter is a natural continuation of the discussion of macroeconomic developments, taking a deeper dive into the labor market and how it fared through the pandemic thus far. This chapter, co-authored by *Michael Debowy*, *Prof. Gil Epstein*, and *me*, looks at employment levels and work hours in different economic sectors during the pandemic, and shows the differences by gender, population sector, and district. Although the labor market has come a long way towards recovery — in fact, employment has returned to the level it was at prior to the pandemic — unemployment rates remain higher than they were in 2019, and it seems that it will take a few more years before unemployment returns to the historically low rate it was at pre-Covid-19. The chapter also analyzes the ability to work from home, both by occupation and by economic sector, in an attempt to determine where investment in vocational training is most needed. In addition, it demonstrates the changes that occurred during the pandemic with regard to investment in higher education and in vocational training programs.

Following this is a study of the returns to schooling conducted by *Michael Debowy*, *Prof. Gil Epstein*, and *me*. This paper updates estimates carried out by other scholars in the past few decades. In particular, two substantial changes have occurred in the market that raise the question whether earlier estimates are still valid. The first is the large increase in labor force participation that has occurred since 2003 among all sections of the population, but in particular among Arab and Haredi (ultra-Orthodox Jewish) women. The second is the large increase in the number of people who acquire post-secondary school education. The analysis shows that while most previous findings continue to hold, there are some surprises. For instance, while some earlier studies have shown no or decreasing returns from doctoral studies, our analysis demonstrates a growing return at all levels for schooling. Getting a bagrut (matriculation) certificate, however, does not increase one's salary over what one would get by finishing high school without a bagrut. In addition, the paper shows that the largest return to academic studies are reaped by Mizrahi Jews, with the lowest achieved among non-Jewish employees.

Next, we present our first executive summary, published in February. In this paper, *Dr. Hila Axelrad*, *Prof. Israel Luski*, and *Dr. Arie Sherman* consider the effect of employment on the level of happiness among Israelis ages 60–80. Among other findings, they show that the effect of work on happiness levels depends on the type of work being carried out, with employment in stimulating fields as well as volunteer activity found to have a significant and positive effect on happiness levels, while employment in high-stress jobs has a clear negative effect. The highest happiness levels were found among those who are married or in a relationship (whether employed or not), and the levels rise with the number of children. In addition, the authors analyze the factors that affect the decision to retire.

Turning to health, *Prof. Nadav Davidovitch*, *Dr. Baruch Levi*, and *Rachel Arazi* take a close look at health workforce and facilities in Israel, compare these with those in other countries, and discuss how these impacted Israel's successes and failures in dealing with the pandemic. A fascinating Spotlight discusses the success of the vaccination program in Israel, showing how the choice to get vaccinated is correlated with the individual's socioeconomic level. The chapter shows how the pandemic led to the adoption of new technologies that will affect healthcare in the future, but also focuses on shortages that could come into play in the future, imploring the government not to be shortsighted.

Next is an executive summary of a paper that takes a deeper dive into how Covid-19 affected different parts of the Israeli population. This study, conducted by *Prof. Alex Weinreb* and published in October, looks at testing, infection, and hospitalization rates in 205 yishuvim (cities/towns) in Israel, covering about 88% of the Israeli population. The yishuvim are classified by their dominant residential population into one of seven groups: Jewish non-Haredi; Haredi; Arab; Bedouin; Druze; mixed Jewish and Arab; or mixed Haredi and non-Haredi. Among other findings, the paper shows that the highest testing rates are in Jewish non-Haredi yishuvim while the lowest were in Bedouin yishuvim; the highest infection rates were in Haredi yishuvim, and the highest hospitalization rates in Arab yishuvim.

We follow this with another executive summary of a paper by *Prof. Alex Weinreb* related to the pandemic, published in March. This paper calculates “excess mortality” in Israel during 2020 by using long-term trends in mortality throughout the calendar year, and calculating the difference between actual and expected mortality in each month of the year. This method identifies the existence of excess mortality, but does not pinpoint the underlying reason,

since it could have been caused by the failure to deal with other medical situations because of the pandemic. The study shows that in early 2020 mortality rates were actually quite low, but that excess mortality picked up in March and even more so from July through September. The paper also looks at the age profile of mortality and calculates that life expectancy in Israel fell by about 2.5 months in 2020.

The health section finishes with a new paper that expands the view of mortality in Israel beyond Covid-19. This paper, by *Prof. Alex Weinreb* and *Elon Seela*, considers the impressive longevity in Israel, and asks what can be done to increase longevity yet further. It breaks down mortality by cause, and compares how Israel has done relative to other OECD countries in each of 30 discreet causes of death. It shows where Israel has done well and where it has not, and argues that by adopting the best practices in other countries for the medical conditions in which Israel performs poorly, many deaths could be avoided and longevity increased.

Moving to welfare, an overview chapter by *Prof. John Gal* and *Shavit Madhala* addresses the welfare challenges facing the country in the transition from a country under the vise of a pandemic in 2020 to one learning to live alongside the pandemic in 2021 and beyond. After the social security system and the social welfare services provided a comprehensive security net and an immediate response to the needs of the Covid victims, and in particular the jobless, changes now are geared toward improving the security net for elderly people living in poverty and distress and improving the social security system for people with disabilities. As they show, however, there are indications that the transitional trends in social welfare will not generate sufficient progress to mitigate social distress and to avoid growth in poverty in Israel.

Two executive summaries are next presented looking at welfare issues involving early childhood. The first, published in November and penned by *Shavit Madhala*, *Dr. Labib Shami*, *Prof. John Gal*, and *Elon Seela*, looks at the low level of enrollment of birth to 3-year-old children in supervised daycare despite the importance of such participation for children from low-income families in the Arab community. It digs deep to uncover the underlying reasons for this phenomenon, uncovering various barriers facing Arab families. The paper offers alternative solutions that can be implemented to try to alleviate the problem.

The second executive summary considers what occurred in Israel during the first shutdown in early 2020 with respect to the amount of time children spent in front of screens. There is wide consensus among researchers and professionals that unsupervised screen time has generally negative effects on the cognitive and emotional development of children. Among other findings, this paper, written by *Dr. Yael Navon, Liora Bowers, Dr. Carmel Blank, Dana Vaknin, and Prof. Yossi Shavit*, and published in May, shows that screen use increased with the age of the child, there was a negative correlation between parents' education level and screen use, and there was a significant and positive correlation between parental stress and screen use.

Education is next, with *Nachum Blass* presenting an overview of the education system. After presenting a demographic composition of the system and analyzing the budget and how this was affected by the pandemic, the paper dives deeply into the fundamental variables of the education system, i.e., teachers and students. It looks carefully at changes in the number of students per full-time teacher position and at the impact of this variable, as well as other teacher characteristics and the question of whether there is a shortage of teachers.

The book then turns back to an executive summary that addresses early childhood — ages birth to three — but this time from an education perspective. In a paper released in November, *Hai Vaknin and Prof. Yossi Shavit* consider the impact of attending early childhood education and care (ECEC) frameworks on academic achievements in Grade 4. The research shows that when controlling for family background, the achievements of children who attended an ECEC framework from birth to age three are no different than those of children who did not attend; this is in contrast to the positive relationship between attendance in preschools in ages 3–6 and future academic achievement. These results hold for both Jews and Arabs and do not differ by socioeconomic status.

A demography overview is next, with *Prof. Alex Weinreb* showing that the epidemic has had moderate effects on Israel's demography into the final quarter of 2021. Life expectancy will be marginally lower in 2021, likely falling to levels last seen in 2016–2017. Jewish-Arab differences in life expectancy will also likely increase given the higher Covid-related mortality in the Arab sector. Fertility trends also appear to have diverged, with Jewish women's fertility rising over 2020 levels, whereas among Arab women, fertility remained at the historic lows seen in 2020. Finally, 2021 migration climbed back toward its level in the pre-Covid years.



Next is an executive summary of a paper that takes a fairly comprehensive look at the sociodemographic and economic profile of Israel's southern region — the Negev. This paper was authored by *Prof. Alex Weinreb* and originally published in June. Among the many findings, the paper shows that the South has experienced substantial growth over the last 20 years, especially among people currently in their teens and 20s, and that after many years of net negative migration out of the South, migration has become positive over the last few years. The South appears to attract first-generation university educated migrants, in particular. In addition, people in the South have higher levels of economic satisfaction than their counterparts in any other district.

Finally, an executive summary of a paper released in December and authored by *Prof. Alex Weinreb* looks at two important demographic issues that have combined in recent years, have likely contributed to the ongoing increases in violence in Arab communities in recent years, and are likely to intensify in the near future. The first is a youth bulge (a large cohort of 18–22-year-olds among Arab Israelis), which, when combined with low levels of employment, enrollment in higher education, and singlehood lead to violence world-over. Young cohorts in Israel's Arab population are smaller. The second concerns expected shortages in the Arab marriage market. Arab men tend to marry considerably younger than themselves (the average gap is six years). This, combined with the smaller number of younger females in the population of the “desired” age, the existence of polygamy among many Bedouin, and the significantly higher levels of education of women in Arab society (creating a cultural divide between men and women) raise concerns about the sustainability of traditional marriage practices that underlie the fabric of Arab society. Of particular concern: a growing number of Arab men could remain single.

\* \* \*

I would like to thank all the employees of the Taub Center for the outstanding work they have done in this, the second year of the pandemic. Your work ethic and ability to function under uncertain and trying conditions is not taken for granted. I would again like to thank a number of people who have specifically been instrumental in publishing this book. First and foremost, to Ayelet Kamay and Laura Schreiber who worked day and night on editing, graphics, layout, and more. Your dedication is admirable. To Prof. Alex Weinreb and Prof. Gil Epstein

for their invaluable assistance in reviewing the studies throughout the year for content. To Anat Sella-Koren and her staff who make sure that our findings are disseminated to achieve maximum effectiveness. To the authors who put up with my comments and suggestions and deserve all the accolades for the high-quality research they produce on a regular basis. To Director General Suzie Patt Benvenisti, my partner in crime. And perhaps most importantly, to the Taub Center Board of Directors and General Assembly members who support us and our efforts throughout the year, and especially our new chair, Jim Angell, and our outgoing chair, Helen Abeles.

Once again it has been a privilege bringing these studies to you, and, as in the past, I wish you pleasant reading. With the hope that the research carried out at the Center will continue to inform policy makers in Israel and will contribute, even if indirectly, 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*

# Abbreviations

ALMP	Active labor market policies
ASCMR	Age-standardized cause-specific mortality rate
BOI	Bank of Israel
CBS	Central Bureau of Statistics
EAG	<i>Education at a Glance</i> , annual publication of the OECD
ECEC	Early Childhood Education and Care
EU	European Union; 28 member states
FTE	Full-time equivalent, a unit of workload equal to a full-time position
GBD	Global Burden of Disease project, Institute for Health Metrics and Evaluation (IHME), University of Washington
GDP	Gross domestic product
GFR	General Fertility Rate
ILO	International Labor Organization
IMA	Israel Medical Association
IMF	International Monetary Fund
MOF	Ministry of Finance
NII	Israel's National Insurance Institute
NIS	New Israeli shekel, ₪
OECD	Organisation for Economic Co-operation and Development
PISA	Programme for International Student Assessment; OECD administered exams
STW	Short-term work model
TFR	Total Fertility Rate

# MACROECONOMIC TRENDS

1



# Macroeconomic Trends: An Overview

**Benjamin Bental and Labib Shami**

The “Year of Corona” — 2020 — was a challenging year in Israel and around the world. The preventative actions taken by governments to try to get the unfamiliar and frightening pandemic under control were extreme, and included internal closures, lengthy restrictions on gatherings, and the closing of borders. All these had a grave effect on the scope of economic activity. However, in order to overcome the restrictions on movement, mechanisms to mitigate the damage soon developed, most notably the transition to remote working. This solution was used in sectors in which it was feasible, but in many other sectors there was no way to bypass the restrictions and serious damage was caused — particularly in the tourism, leisure, and recreation sectors. The extent of damage sustained in different countries to a large extent reflects the size of sectors in which it was possible to adopt remote working, at least partially, relative to that of the more vulnerable sectors. In this respect, the Israeli economy enjoyed an advantage: the share of the high tech sector, which was able to continue to function despite the restrictions, is significantly greater in Israel than in other developed countries, while tourism, which was severely damaged, has a relatively smaller share.

Governments around the world did their best to soften the severity of the shock. Economic policy steps included extensive direct support for workers who had to leave their jobs and businesses hit by the crisis. In addition, the central banks adopted expansive monetary policy intended to stabilize the financial markets. This included lowering interest rates, the massive acquisition of public debt in the secondary market, the purchasing of financial assets of the private sector, and the removal of restrictions on activities of private banks in order to increase private credit.

---

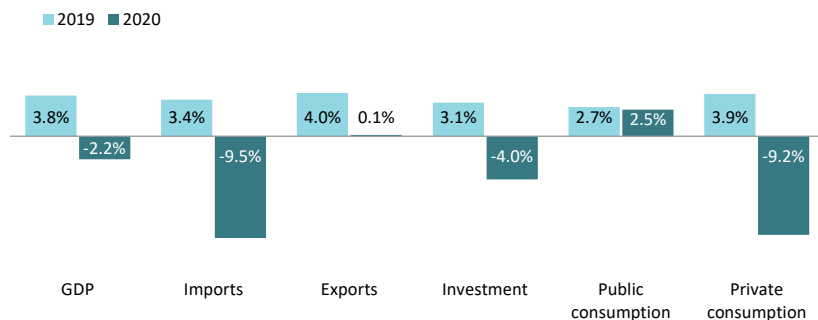
\* Prof. Benjamin Bental, Principal Researcher and Chair, Taub Center for Social Policy Studies in Israel Economic Policy Program; Professor Emeritus, University of Haifa. Dr. Labib Shami, Senior Researcher, Taub Center; Economics Department, Western Galilee College; Department of Economics, Haifa University.

The recovery of the Israeli economy, which began during 2020 and picked up in 2021, was more rapid than anticipated both by the Bank of Israel and by international bodies such as the OECD and IMF. The hope is that this recovery, together with amenable conditions in the global capital markets, will yield a sufficient fiscal margin to allow the government to make massive investments to improve infrastructures and create a foundation for continued growth.

## GDP growth and its components

Figure 1 presents a comparison between growth rates (in real terms) in the components of GDP in 2020 and 2019. This comparison enables a more reliable estimate of the damage caused by the Covid-19 crisis. For example, in 2019, GDP rose by 3.8%, while in 2020 it fell by 2.2%. Thus the Israeli economy lost about 6% of GDP due to the Covid-19 crisis relative to what it would have been had growth in 2020 been similar to that in the preceding year. Private consumption, which largely reflects the standard of living of citizens, showed a dramatic decline of 13.1% compared to the level of consumption that would have been recorded without the Covid-19 crisis.<sup>1</sup> The only item in which 2020 was similar to 2019 was growth in public consumption. This growth, together with the sharp fall in imports, ultimately moderated the rate of the fall in GDP.

**Figure 1. GDP growth and its components, 2019 and 2020**



Source: Benjamin Bental and Labib Shami, Taub Center | Data: CBS

- 1 Since the rate of population growth in both years was very similar, these figures also closely approximate the fall in per capita consumption compared to the level that was expected had 2020 been similar to 2019.

The four parts of Figure 2 highlight the differences between the response of GDP components in Israel and that of these components in other OECD countries.<sup>2</sup> The vertical axis in these charts represents the change (in percent) in private consumption, public consumption, investments, and the trade balance (the difference between exports and imports) for each country. The horizontal axis shows the damage (in percent) of GDP in these countries. For each variable, the rate of change relates to the data in 2020 relative to its value in 2019.

**Figure 2. Change in GDP components versus change in GDP, 2020 relative to 2019**

**a. Private consumption**



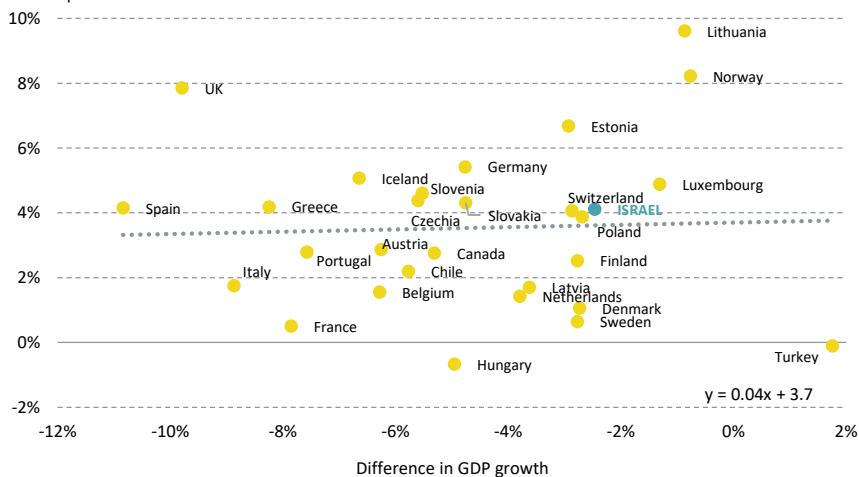
2 The figure shows countries for which data on GDP components are available for 2020, with the exception of Ireland, which uses a unique national accounting method that results in very significant fluctuations.



**Figure 2 (continued). Change in GDP components versus change in GDP, 2020 relative to 2019**

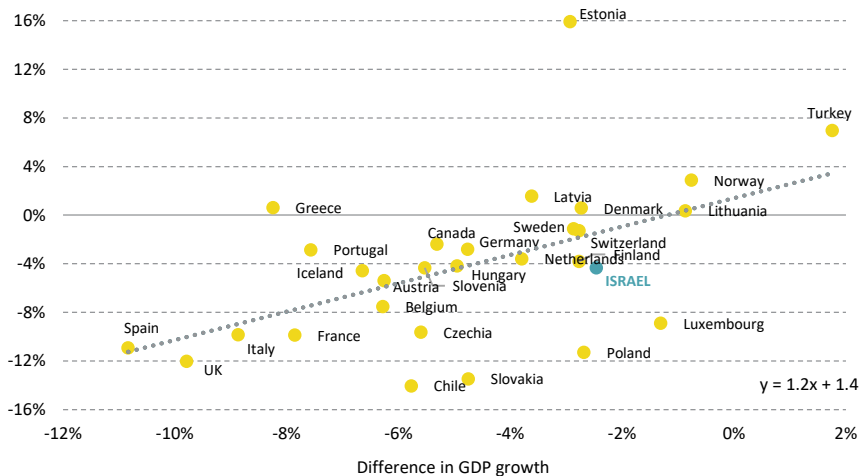
**b. Public consumption**

Difference in public consumption



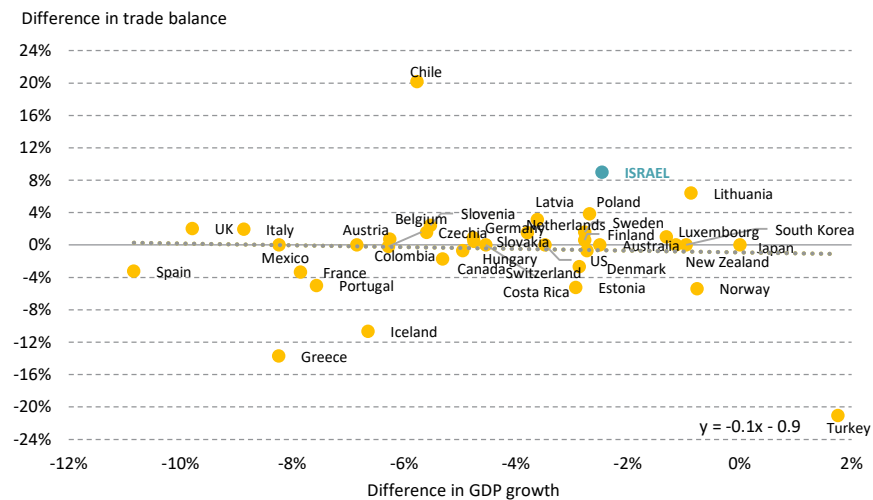
**c. Investment**

Difference in investment



**Figure 2 (continued). Change in GDP components versus change in GDP, 2020 relative to 2019**

**d. Trade balance**



Source: Benjamin Bental and Labib Shami, Taub Center | Data: OECD

For each of the GDP components, the straight line in Figure 2 reflects the average relationship between the rate of fall in GDP and the rate of change in the given component.<sup>3</sup> As can be seen, there is a strong correlation between the rate of fall in GDP and the rate of fall in private consumption. However, consumption fell almost twice as much in Israel as it did in other countries in which the GDP loss was similar. The correlation between the reaction of public consumption and GDP loss is weak, and, in Israel, the rate of change for this variable is very similar to the average rate for the countries reviewed here. Like consumption, the reaction of investment to the crisis in the countries reviewed was strong, and again, in Israel, the rate of decline was twice that of countries where the overall damage to GDP was similar. Lastly, and regardless of the level of damage to GDP, no significant change was seen in the balance

3 There are minor differences between the OECD data and the CBS data reflected in Figure 1. These are due to the updating of the data in Israel.

of trade in most of the countries reviewed. Israel is quite exceptional in this regard from an international perspective. As noted, this occurred because of a sharp fall in imports. Since the share of imports in consumption, and particularly in investment, is very large, there is a close connection between these trends.

The exceptional fall in private consumption in Israel may be related to the stringency of the preventive measures taken by the government. Figure 3 describes the Stringency Index for six countries in which the degree of damage to GDP was similar to that in Israel: Denmark, Estonia, Finland, Poland, Sweden, and Switzerland. The index, which yields values between 0 (no stringency) and 100 (total stringency), was constructed by experts from Oxford University and weighs nine stringency mechanisms applied by governments (such as restriction on movement, work place closures, and school closings; see Hale et al., 2021). As can be seen, throughout 2020, Israel tended to adopt a stricter approach than the other six countries, in some cases by a substantial margin. Over the year, the Stringency Index for Israel averaged 61, while the other countries' averages were 48, 38, 41, 50, 52, and 45, respectively.

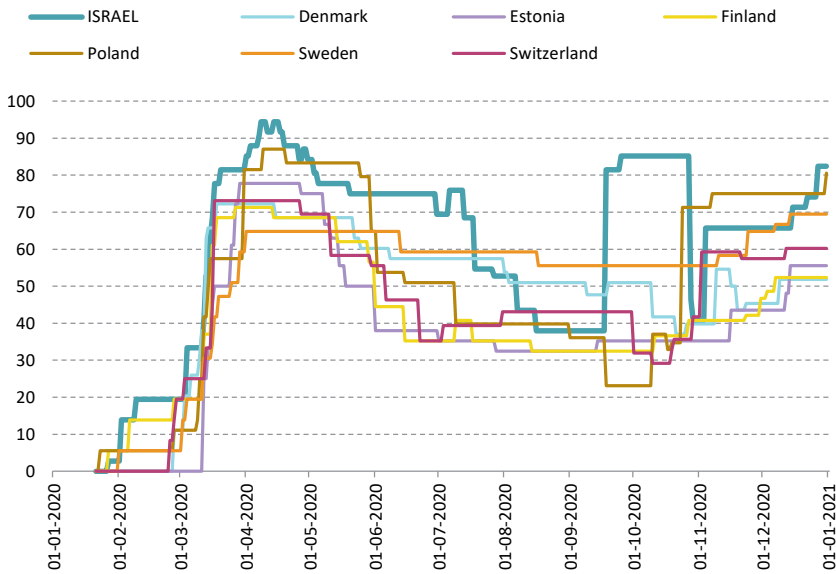
Further evidence of the impact of the preventive steps taken by the government on private consumption is seen in the change in gross disposable private income. In 2020, this income rose by 3.9%, so that together with the fall in private consumption, gross private savings recorded a rise of 8.6% of national income.<sup>4</sup> It is reasonable to assume that this rise is due mainly to forced savings due to imposed restrictions on the consumption of services in “proximity sectors” (sectors with a high potential for infection due to physical proximity of those engaged in the activity). However, it is possible that the rise in savings resulted from other rational considerations. According to the Ricardian equivalence proposition, individuals increase their savings when they anticipate future tax increases. Given the high deficit in the government budget (see below), such an expectation seems very rational. Moreover, uncertainty also grew, as reflected, for example, in the consumer confidence indicator, which averaged -21% in 2020, compared to -6.3% in 2019.<sup>5</sup> One of the chief components of this index is the intention to undertake large purchases over the coming year compared to the previous one. Therefore,

4 See the Bank of Israel Report for 2020, [Chapter 2 — Aggregate Activity: Product and Employment](#).

5 See CBS, [Consumer Confidence Indicator and Constituent Balances, March 2011 through December 2020](#) (in Hebrew).

a sharp fall in the consumer confidence indicator may also partially explain the rise in private savings due to so-called precautionary savings, as a form of self-insurance occurring in response to uncertainty concerning future income.

**Figure 3. Stringency Index in selected countries**



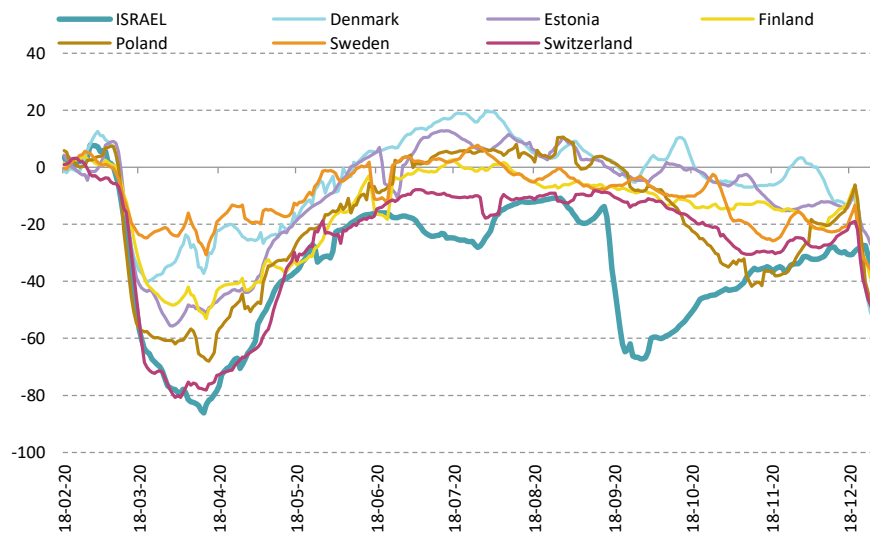
Source: Benjamin Bental and Labib Shami, Taub Center | Data: Our World in Data

Figure 4 presents an additional indicator of the impact of restrictions on movement — the Google Mobility Index for the category “retail and recreation.”<sup>6</sup> The index compares (in percentiles) the physical presence of consumers at sites defined as retail and recreation sites by comparison to base data collected between January 3–6, 2020. The impact of the crisis and the shutdowns in Israel was more serious than in other countries with similar GDP loss. In Israel, presence at retail and recreation sites fell by an average of 34% over 2020, while the figures for the other countries — Denmark, Estonia,

6 This index is based on cell phone and GPS data. See, for example, Muoio, 2020.

Finland, Poland, Sweden, and Switzerland — showed a fall of 5%, 10%, 16%, 18%, 10%, and 26%, respectively.<sup>7</sup>

**Figure 4. Google Mobility Index, retail commerce and recreation**

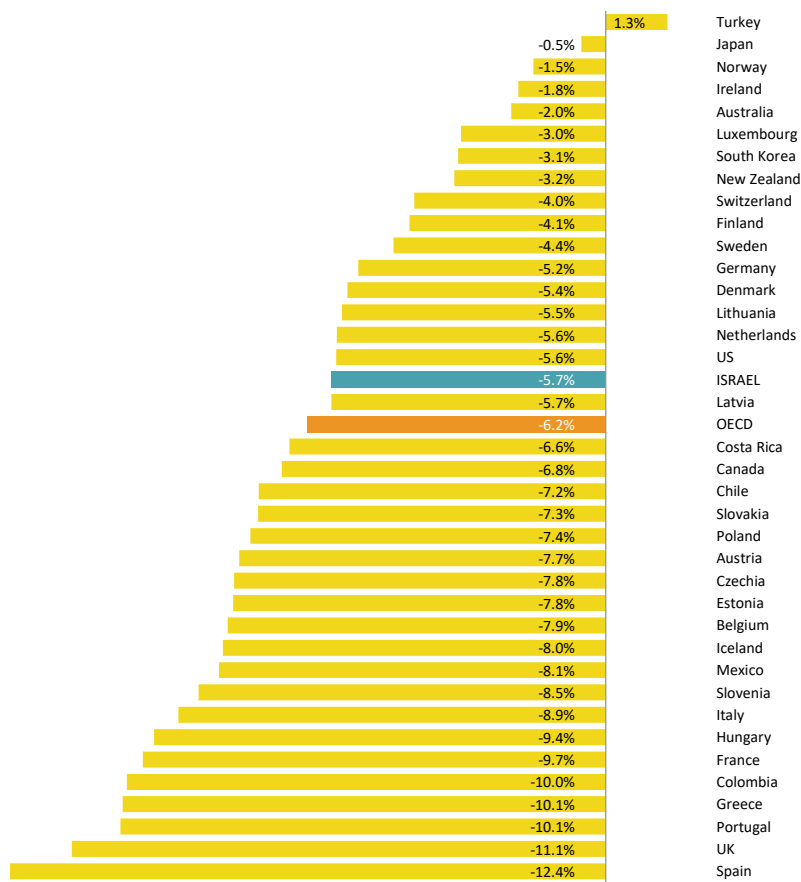


Source: Benjamin Bental and Labib Shami, Taub Center | Data: Our World in Data

Lastly, regarding the economic growth data, an international comparison is best based on per capita growth data. In particular, it is important to take into account the exceptional annual population growth rate in Israel (1.9%) relative to the average for the OECD countries (0.8%). This gap in itself increases the GDP growth rate in Israel relative to other developed countries. Figure 5 compares the damage to per capita GDP growth less the growth rate in 2019, in other words — the difference (in percentage points) between the per capita GDP that would have been reached had the growth rate in 2020 been identical to that in 2019 and the growth rate actually seen.

7 The Kendall-Tau correlation between the Stringency Index and the Mobility Index is -0.65 for Israel, -0.31 for Denmark, -0.56 for Estonia, -0.64 for Finland, -0.50 for Poland, -0.10 for Sweden, and -0.65 for Switzerland. The particularly low correlation for Sweden, and to a lesser extent Denmark, is probably due to the reliance of these countries on “soft” guidelines rather than formal restrictions.

Figure 5. Loss of per capita GDP in the OECD countries



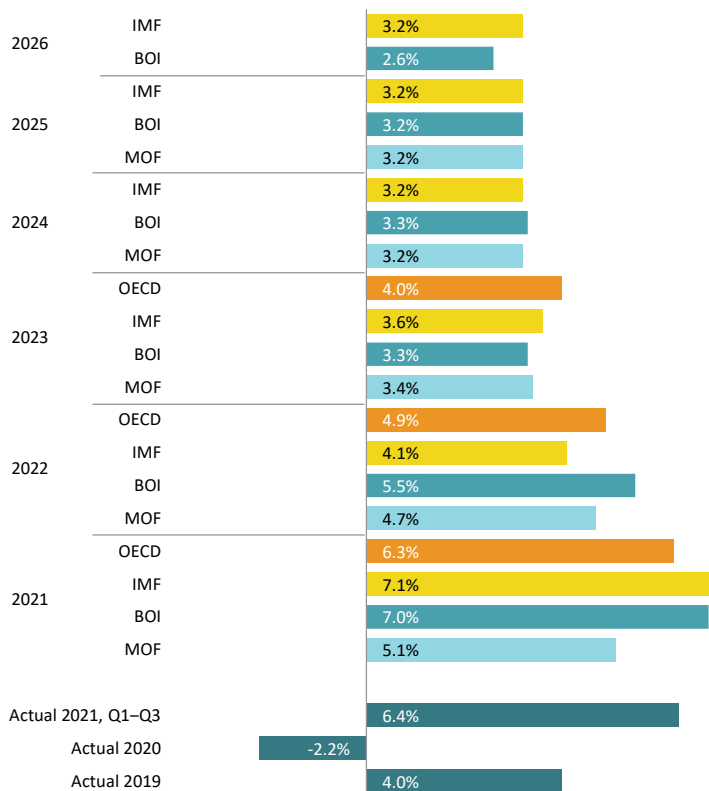
Source: Benjamin Bental and Labib Shami, Taub Center | Data: OECD

As Figure 5 shows, the loss of per capita GDP in Israel (5.7%) was very close to the weighted average for the OECD countries (6.2%). Countries with particularly high damage to per capita GDP include those where tourism is an important and prominent source of income, such as Spain, Portugal, and Greece. The UK is also among the worst-affected economies. Countries that were relatively mildly affected include New Zealand, South Korea, Australia, and Japan, which implemented particularly successful strategies for preventing morbidity.

## Growth forecasts

Figure 6 presents actual growth and four sets of growth forecasts for GDP in Israel published towards the end of 2021: two Israeli agencies (the Ministry of Finance (MOF) and the Bank of Israel (BOI)) and two international ones (the IMF and the OECD).

**Figure 6. GDP growth forecasts for Israel**



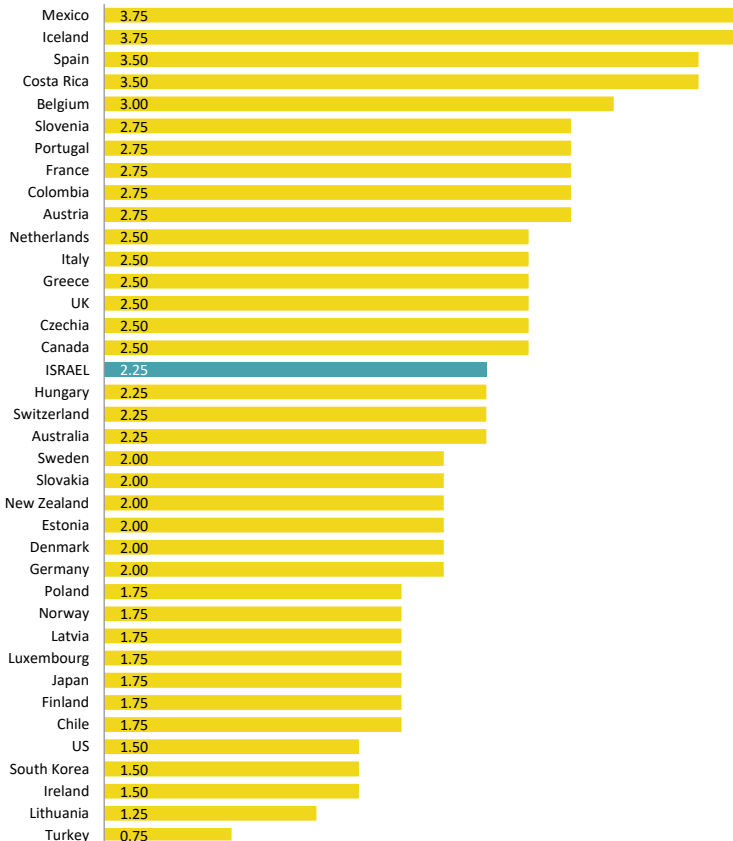
Source: Benjamin Bental and Labib Shami, Taub Center | Data: [Ministry of Finance](#); [Bank of Israel](#); [IMF](#); [OECD](#)

The actual real GDP in the first three quarters of 2021 was 6.4% higher than the same period in 2020, which saw the most serious damage to GDP due to the pandemic. Bank of Israel growth forecasts until the end of year are even

higher. Figure 6 indicates a gap between actual growth and the expectations of forecasters. Even these forecasts, however, are not identical. In particular, the Bank of Israel's optimism is notable when compared with the Ministry of Finance's forecast. The models used to prepare the forecasts are not transparent to the public, though, so we were unable to identify the sources of these differences.

In the past few months, growth forecasts have changed dramatically. In May 2021, the OECD published an estimate of the time (in years) from January 2020 that will be required to bring per capita GDP back to its level as of the fourth quarter of 2019. Figure 7 presents the OECD's estimates.

**Figure 7. Time required (in years) to restore per capita GDP to its level as of the fourth quarter of 2019**



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



According to the previous OECD estimate, Israel was only expected to return to the per capita GDP level of the fourth quarter of 2019 by the first quarter of 2022. In reality, the recovery in Israel was much more rapid, and per capita GDP reached this level in the second quarter of 2021, i.e., within eighteen months.<sup>8</sup> Nevertheless, the finding reflects a shortfall of around 2% in per capita GDP in mid-2021 relative to the level that would have been reached were it not for the Covid-19 crisis. If the growth rate in 2022 is indeed around 5%, as expected, per capita GDP will return to the level it would have reached were it not for the crisis by the beginning of 2023.

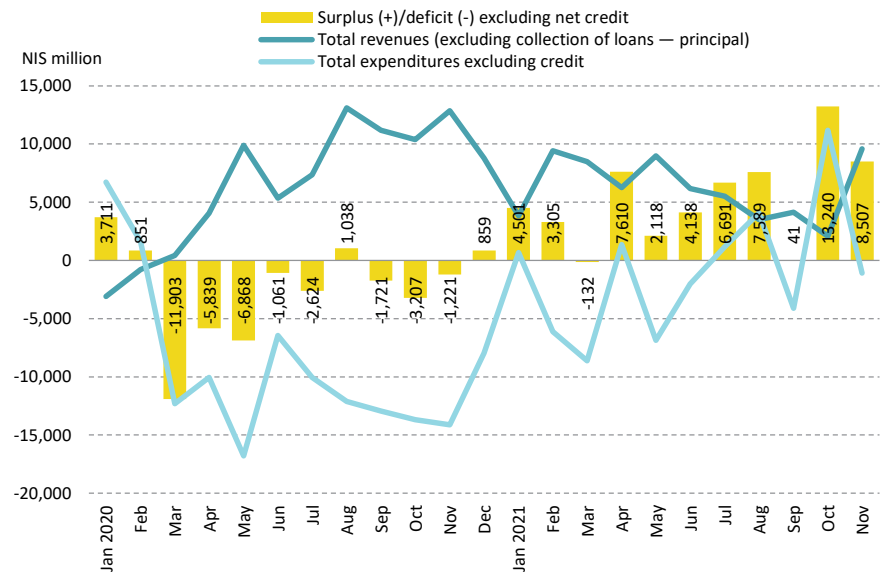
## Government activity

Figure 8 shows the difference between government revenue, expenditure, and budgetary surplus for each month in 2020 and 2021 relative to the analogous data for 2019. The comparison highlights the gravity of the crisis in the first half of 2020, when government expenditure rose sharply while revenue dropped. The result was a dramatic increase in the deficit relative to 2019. Thanks to the rapid recovery in the economy, the trend in government revenue changed significantly in the last quarter of 2020, and revenue in the first half of 2021 even tended to be higher than the figures for 2019. At the same time, as the vaccination campaign progresses and morbidity falls, a downward trend in expenditure by government ministries is emerging alongside a rise in revenues. Due to this, there is a narrowing of the difference between the monthly deficits for 2021 and those for 2019. At the end of the third quarter of 2021, the cumulative deficit rate relative to GDP was only 4.6%, relative to 2.9% in the first three quarters of 2019.

---

8 Per capita GDP in the fourth quarter of 2019 was NIS 38,171.2 at 2015 prices. This figure had already risen to NIS 38,455.9 by the second quarter of 2021.

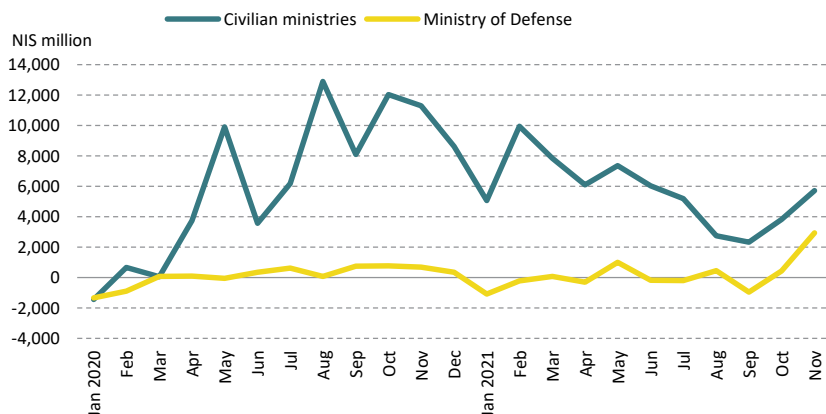
**Figure 8. Government expenditure, revenue, and budget surplus relative to 2019**



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

These trends are still apparent even if the expenditure of civilian ministries is separated from that of the Ministry of Defense, and the former expenditure is then compared to the same data for 2019. Figure 9 reflects the lack of any particular trend in expenditure on defense (except for in November 2021, when there was a substantial increase in defense expenditures). In contrast, civilian ministry expenditures showed an upward trend until the end of 2020, after which this trend was reversed. Nonetheless, all in all, ministry expenditures for the first three quarters of 2021 are still higher by about NIS 52 billion than those of the same period in 2019.

**Figure 9. Change in expenditure of the civilian ministries and the Ministry of Defense, relative to 2019**



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

## Distinct expenditures for the Covid-19 crisis

The economic impact of the Covid-19 crisis forced the Israeli government to take various steps, including an economic aid program at a cost of almost NIS 188 billion (as of the end of September 2021) that included direct assistance and the provision of credit for businesses that were harmed. The total expenditure earmarked for aid in 2021 and subsequent years, as of September 2021, is about NIS 82.5 billion. Throughout 2020, implementation of the plan totaled over NIS 105 billion (about 7.5% of GDP in 2020).<sup>9</sup>

As Figure 10 shows, as of the end of September 2021, implementation of the economic aid program, including agreements and undertakings, amounted to 88% of the allocated budget. A look at implementation in the four portions of the program yields a mixed picture. Implementation for the “social security” item was 96%; for “health and civil response” 83%; for “business continuity” 85%; and for “market stimulus and development” just 61%.

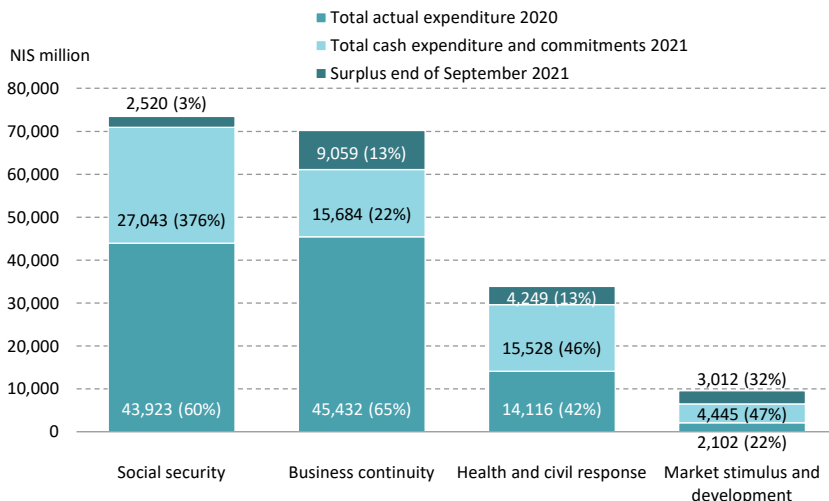
9 The Proposed Budget for 2021/22 stated that “Amendment No. 18 of the Frameworks Law restricts government expenditure for financing expenses for the Covid-19 crisis in 2021 to 12.69% of total government expenditure in the 2020 budget year” (Prime Minister’s Office, 2021).

Particularly low implementation levels were found for the sub-categories “extending suppliers’ credit insurance” and “postponement/reduction on business license fees” (0% implementation); “reimbursement of prepayments to the Tax Authority” (2%); “accelerated depreciation benefit” (35%); “encouraging institutional investments in high tech” (44%); “digitization, including remote learning” (42%); and “vocational training programs” (41%).

Under-implementation of the latter categories, which constitute the items intended to ensure business continuity and economic development, is liable to impair the economy’s efforts to recover and return to a track of growth. Some possible reasons for the under-implementation can be found in the category “vocational training programs.” In April 2020, as part of the economic plan for dealing with the Covid-19 crisis, the government allocated approximately NIS 700 million for vocational training. In practice, however, due to arguments about the division of responsibility between the government ministries, the vocational training budget was only released in December 2020, thereby leading to limited implementation of the budget in 2020. Moreover, of the NIS 277 million implemented in cash during 2020 in this category, approximately NIS 250 million was allocated to the Council for Higher Education to support scholarships and specialized training for students — this despite the fact that the majority of people who lost their jobs in 2020 due to the Covid-19 crisis did not have a post-secondary diploma.<sup>10</sup> In conclusion, out of approximately NIS 1.5 billion allocated for vocational training in 2020 and 2021, only 19% was implemented in 2020.

---

10 See: Ministry of Finance, Chief Economist Division, [\*Impact of the Coronavirus Crisis on the Job Market as of August 2020\*](#). (Hebrew)

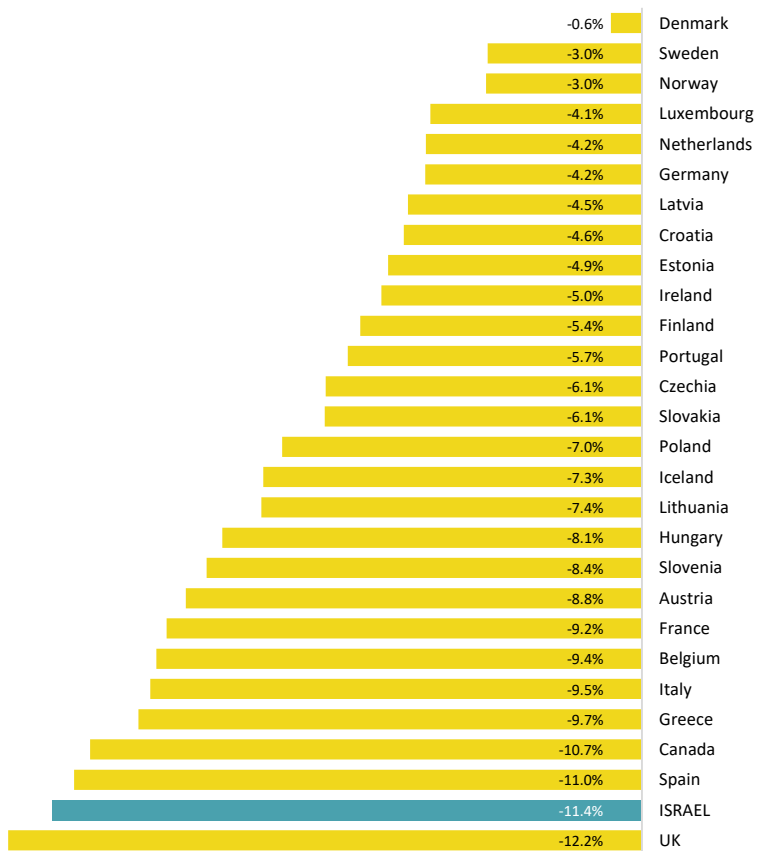
**Figure 10. Aid plan, as of November 2021**

Source: Benjamin Bental and Labib Shami, Taub Center | Data: Ministry of Finance, Comptroller General's Division

## Deficit and debt

Israel entered the Covid-19 crisis with a fiscal deficit (government expenditure, including interest payments, less tax revenues) of 3.7% of GDP in 2019. This deficit was 1.2 percentage points above the target set in accordance with expenditure rules. In 2020, the deficit increased rapidly to 11.4% of GDP, due mainly to the government's investment in a Covid-19 plan on a scale of 7.5% of GDP. As Figure 11 shows, even if the deficit prior to the crisis had been lower, the deficit for 2020 would still have been one of the highest among the OECD countries, despite the relatively limited damage to the Israeli GDP.

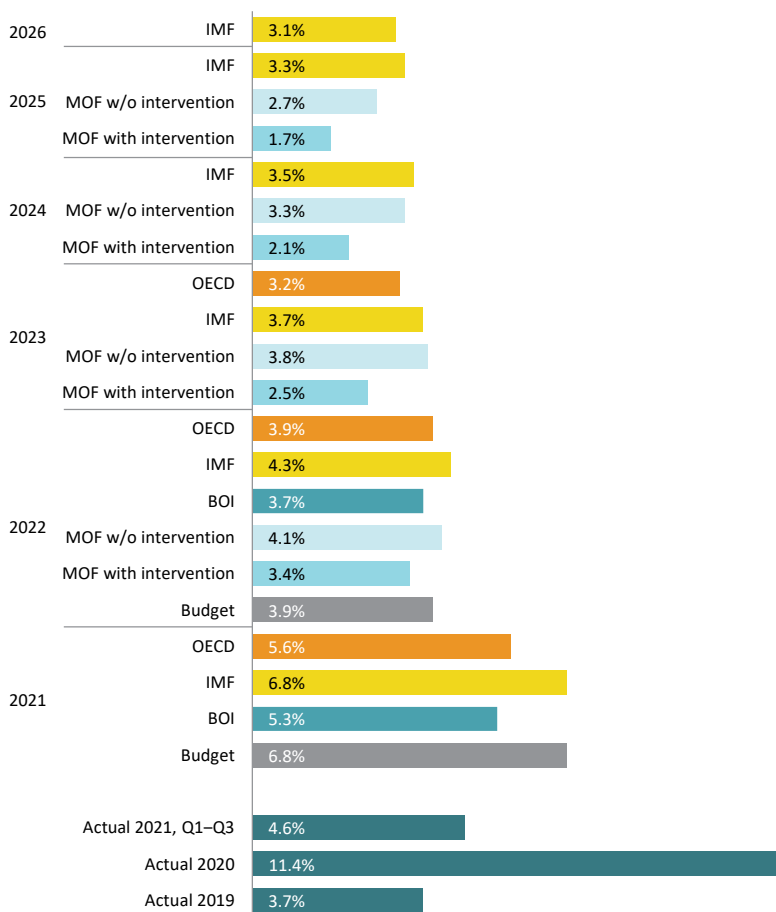
Figure 11. Fiscal deficit in Israel and other OECD countries as a percent of GDP in 2020



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

Figure 12 shows the deficit relative to GDP, including actual figures through the third quarter of 2021 and forecasts based on several estimates.

**Figure 12. Actual deficit and expected deficit as a percent of GDP for the coming years**

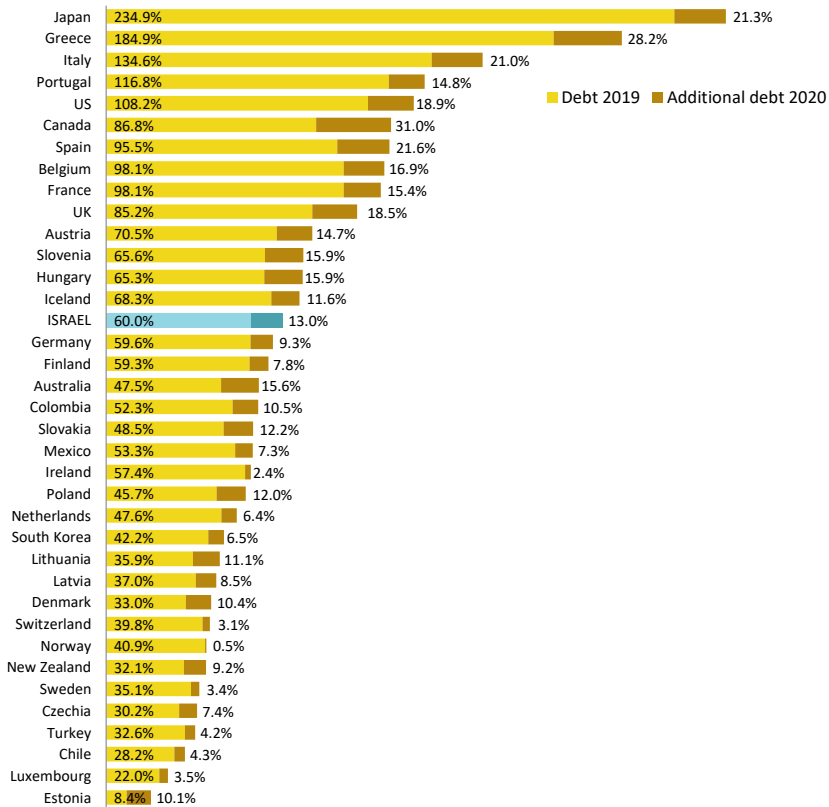


Source: Benjamin Bental and Labib Shami, Taub Center | Data: [Ministry of Finance](#); [Bank of Israel](#); IMF

The proposed budget for 2021/2022 is based on a fiscal deficit of 6.8% of GDP in 2021 and 3.9% in 2022. The Chief Economist Division in the Ministry of Finance has prepared two scenarios for the development of debt. The first

is based on aggressive steps to cut expenditure and increase revenue, while the second assumes that no such steps will be taken. The discrepancies in the estimated deficit according to these two scenarios are extremely large, and these also influence the estimate of the size of the national debt relative to GDP. Figure 13 shows the debt-to-GDP ratio in 2019 and the growth of this ratio in 2020 in Israel and the other OECD countries.

**Figure 13. Debt-to-GDP ratio in 2019 and 2020 in the OECD countries**



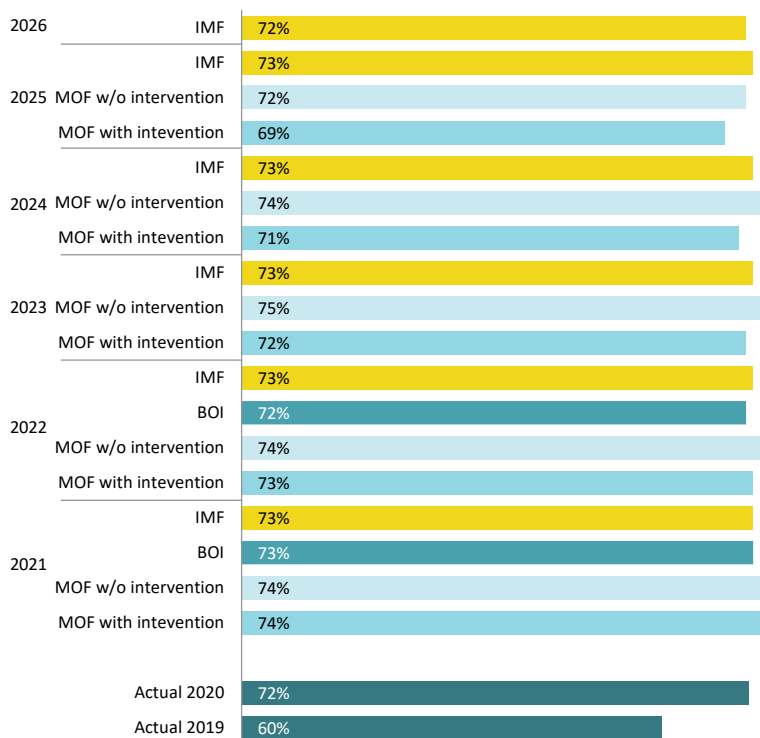
Source: Benjamin Bental and Labib Shami, Taub Center | Data: IMF



As Figure 13 shows, countries with a high debt-to-GDP ratio in 2019 tended to increase their debt in 2020 more sharply than countries with a lower debt-to-GDP ratio.<sup>11</sup> Israel seems to be close to the center of the distribution in this respect, both with regard to debt-to-GDP ratio for 2019 and with regard to the growth of this debt.

As expected, the forecasts for the debt development are consistent with the projected deficit over the coming years. As Figure 14 shows, the forecasts of the Chief Economist Division in the Ministry of Finance suggest that if more aggressive adjustment steps are taken, the debt-to-GDP ratio will eventually return toward the benchmark of 60%. The IMF does not forecast such movement, and estimates that debt-to-GDP will remain at around 73%.

**Figure 14. Expected debt-to-GDP ratio over the coming years**



Source: Benjamin Bental and Labib Shami, Taub Center | Data: Ministry of Finance; IMF

11 The correlation between the size of debt in 2019 and incremental debt in percentiles is 0.72.

The appendix to this chapter describes the relationship between the primary debt (government expenditures after deducting debt service, less revenue), the economic growth rate, and nominal interest rates. As long as the growth rate is greater than the interest rate, the debt-to-GDP ratio will converge to a finite size. However, in order not to burden the economy with high interest rates and in order to avoid high risk levels, the usual approach is to set a desired target for national debt relative to GDP. In Israel, this target was 60%; this was achieved prior to the Covid-19 crisis, but it was breached as a result of the pandemic. As Figure 15 shows, nominal interest on the Israeli debt for repayment in 10 years averaged just under 1%. By way of comparison, the average annual nominal growth rate during the five years preceding the crisis was about 4.9%. Based on these figures, Israel can afford a *primary* deficit of 2.2% of GDP while maintaining a long-term debt-to-GDP ratio of 60%, which would bring the fiscal deficit to 2.8%. Accordingly, it would seem that the Israeli economy can withstand a temporary increase in the deficit and in the debt-to-GDP ratio, particularly if the resources raised in this manner are directed towards growth-enhancing investments.

**Figure 15. Interests over the past year on debt for repayment in 10 years**

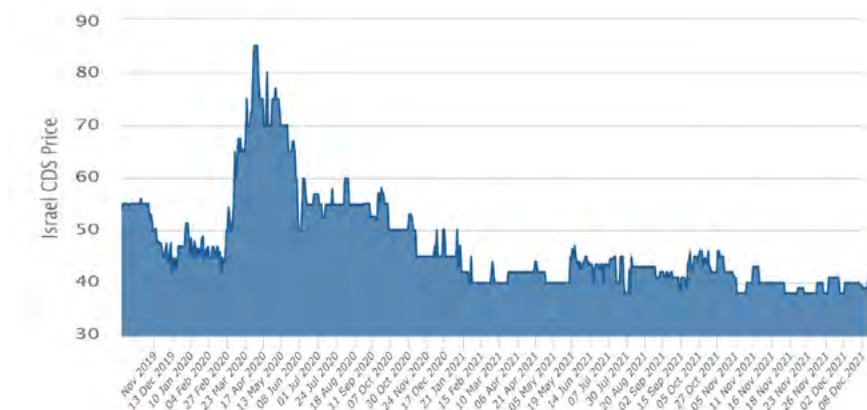


Source: Benjamin Bental and Labib Shami, Taub Center | Data: [Trading Economics](#)

Turning to risk, the global markets do not seem to be concerned with the possibility of an economic collapse in Israel. The premium on credit default

swap (CDS) deals, which allow the holders of State of Israel five-year bonds to sell their risk and thereby effectively insure themselves against debtor bankruptcy, has fallen consistently since its temporary peak in April 2020 and recently reached a historic low of about 40 base points (see Figure 16).<sup>12</sup> This price suggests that the global market estimates the risk of bankruptcy of the State of Israel at about 1% per annum (based on the conventional assumption that the insurer undertakes to pay the insured 60% of the value of the debt in the event of bankruptcy).

**Figure 16. CDS premium for five-year State of Israel debt**



Note: World Government Bonds data were used to calibrate the scale.

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

## Labor market

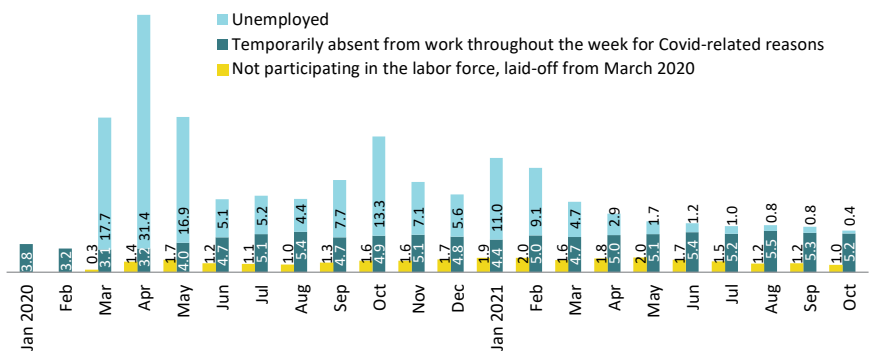
The chapter by Debowy et al. (2021) in this book discusses the labor market in detail. We will confine ourselves here to noting the main development in employment since the beginning of 2020.

Figure 17 divides the population that is unemployed but in the workforce into two groups: “standard” unemployed — workers who are not employed but who are actively looking for work — and workers who according to the CBS were “temporarily absent from work throughout the week for Covid-related

<sup>12</sup> This figure is lower than that for Italy (73.6), similar to that for Canada (38.5), and higher than the CDS for the US (13.0) and Germany (9.0).

reasons.” The figure also shows the number of those laid off from work in 2020 who are not participating in the labor force as a percentage of the population aged 15 and above.

Figure 17. Unemployment, absence, and non-participation in the labor force



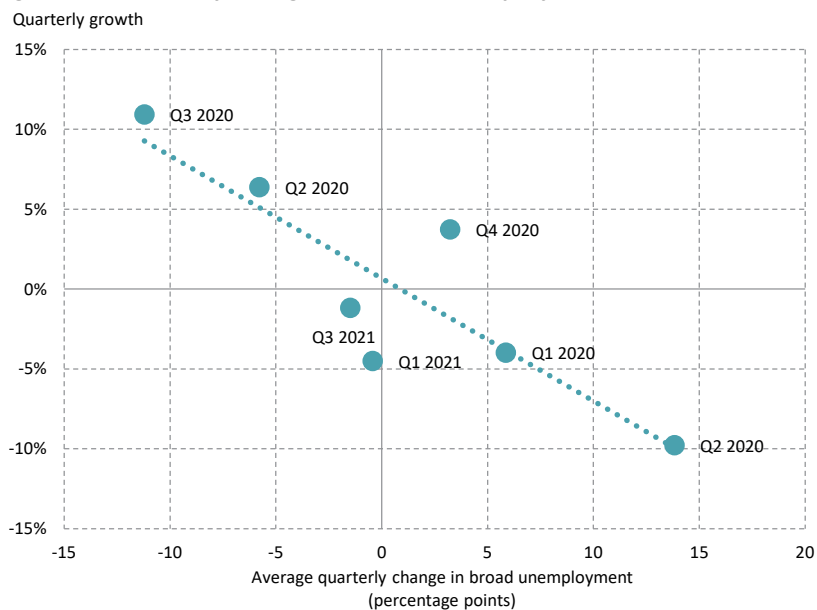
Source: Benjamin Bental and Labib Shami, Taub Center | Data: CBS

The shutdowns imposed on the population in Israel are seen in the figure by the increase in the rate of those temporarily absent from work for Covid-related reasons in April and October 2020 and in January 2021. However, it is notable that with each consecutive shutdown these rates fell significantly, both due to the fall in compliance and enforcement and due to the adjustment of the economy to remote work (see Madhala et al., forthcoming). The vaccination campaign (prior to the fourth wave) and the end of the unpaid leave program in June 2021 reduced the share of those temporarily absent to less than 1%. By contrast, a consistent upward trend can be seen in the rate of standard unemployment, by about 2 percentage points for the entire Covid period thus far. Another phenomenon worth noting is the rising rate of those who have left the labor market, which had reached 2% of the working-age population. Here, too, some improvement can be seen: in recent months some 54,000 workers have returned to the labor market (about 0.8% of the working-age population).

Figure 18 highlights the close correlation between developments in the labor market and growth. The figure shows the change (in percentage points) in the quarterly average for the broad unemployment rate compared to the preceding

quarter and the change in the GDP growth rate for the same quarters.<sup>13</sup> The second quarter of 2020 saw particularly high broad unemployment relative to the previous quarter, and accordingly the fall in GDP was very sharp. In the third quarter of 2020, after the end of the first closure, a substantial correction was seen in economic performance, both regarding unemployment and GDP growth. Another exceptional period was the second quarter of 2021, which reflects the impact of vaccinations on the recovery of the labor market and on growth. Nevertheless, it is important to note that some 65,000 workers have still not returned to the labor market. Moreover, relative to the corresponding figures for the period before the crisis, an additional 100,000 workers remain in the labor force but remain unemployed. It can be assumed that most of the workers in this group were employed prior to the crisis in sectors that were particularly badly affected, such as entertainment, tourism, and recreation.

**Figure 18. Quarterly changes in broad unemployment and GDP**

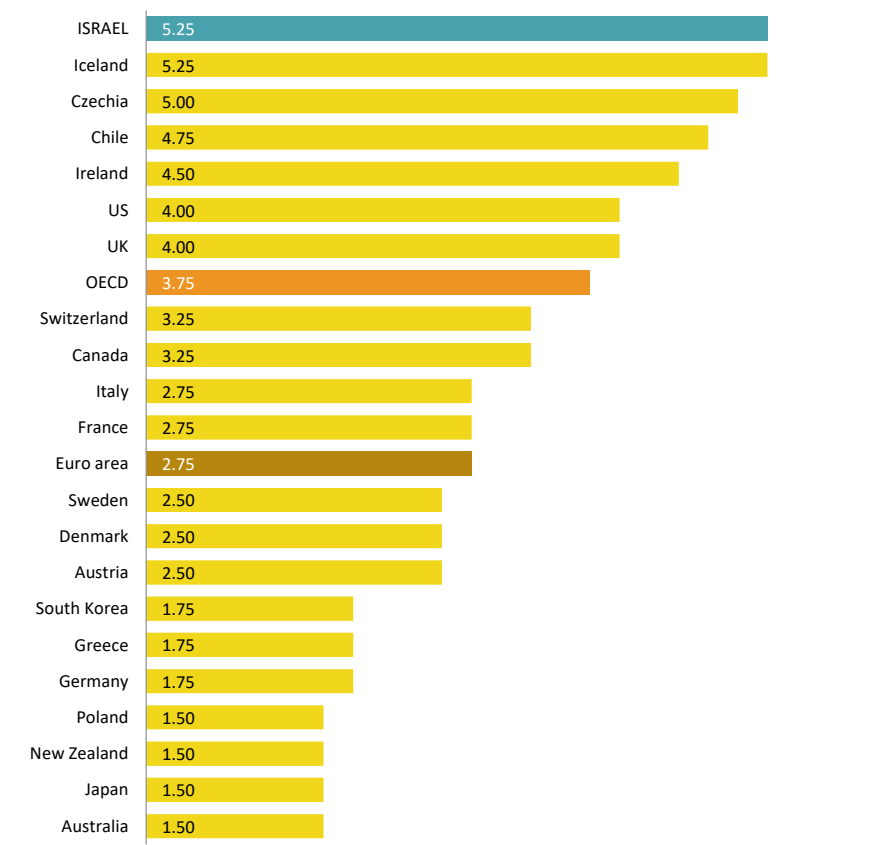


Source: Benjamin Bental and Labib Shami, Taub Center | Data: CBS

- 13 This correlation is known in the literature as Okun's Law. For annual data, the usual assumption is that a change of 1% in the unemployment rate is associated with a change of 2% in the opposite direction in growth. The curve in Figure 18 shows that a change of 1% in the quarterly unemployment rate was associated with a change of 0.8% in quarterly growth (about 3.2% in annual terms).

As shown in Figure 6, the OECD economists were rather pessimistic regarding the recovery rate of the Israeli economy. Figure 19 reflects their estimate from the summer of 2021 that the Israeli labor market will only return to the level of activity recorded in 2019 in the first quarter of 2025.

**Figure 19. Expected time (in years) for the labor market to return to its level of activity in 2019**



Source: Benjamin Bental and Labib Shami, Taub Center | Data: OECD

Based on personal correspondence between the authors and the OECD economists, their pessimistic forecast was based on the data for the first quarter of 2021, which showed that the employment rate was 3 percentage points lower than that before the Covid-19 crisis, that is, before the trend toward improvement emerged. The figures for the second and third quarters indeed show an improvement, as is also apparent in Figure 17, and accordingly it can be anticipated that the labor market will return to its previous state more rapidly. It should be recalled, however, that, prior to the crisis, unemployment was at a historic low. Thus, it is possible that difficulties in the adjustment of the labor force to the structural changes in the economy may make it more difficult for the economy to return to the level of activity prior to the crisis.<sup>14</sup>

---

14 See also the Report on Monetary Policy for the First Half of 2021 on the Bank of Israel website.

# SPOTLIGHT

## The Coronavirus Crisis and Insolvency

The Israeli economy faced serious challenges in 2020. Many citizens and businesses suddenly found themselves facing financial difficulties, and some were forced to begin insolvency and bankruptcy proceedings. The Administrator General, and the Official Receiver in the Ministry of Justice is the unit responsible for insolvency and economic recovery proceedings, including insolvency proceedings for individuals and corporations; bankruptcy of individuals; liquidation of companies; recovery plans for companies; and creditor arrangements. The division's final report for 2020 shows a slight fall of 0.7% in the number of active cases following the granting of a receivership order or the initiation of bankruptcy and insolvency proceedings for individuals, relative to 2019 (Figure 20). Moreover, although the number of applications for receivership orders or for the initiation of individual proceedings rose by 36% in 2020 relative to 2019, the number of receivership and instigation of proceedings orders *actually granted* fell by 13% during this period — a significant decrease by any standard (Ministry of Justice, 2021).

The increase in the number of applications for receivership orders and orders for the initiation of proceedings for individuals in 2020 may reflect the enactment in September 2019 of the Law for Insolvency and Economic Recovery, 5778-2018.<sup>15</sup>

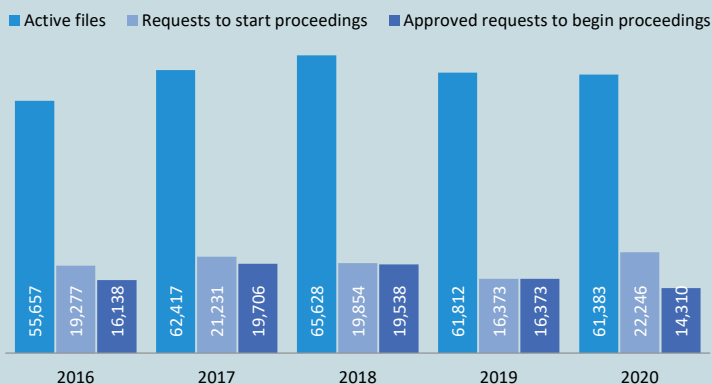
---

15 See Insolvency and Economic Recovery (Bankruptcy) on the Kol Zchut website.



This law replaced the Bankruptcy Ordinance, aiming to shorten the proceedings and make them more efficient, to limit their duration, and to balance the interests of the debtor and the creditor. According to the law, the insolvency proceeding begins with the granting of an order to initiate proceedings, followed by an inspection period intended to create a factual infrastructure regarding the debtor's financial condition and the conduct that led to insolvency. The second stage includes the granting of a financial recovery order whose provisions guide the realization or management of the individual's assets in order to repay the debts to the creditors. The debtor is also required to make periodic payments from current income in order to pay off the debts. The impact of the new law can be gauged from the fact that while 4,401 applications for bankruptcy were submitted in the last quarter of 2019, this figure rose to 6,286 in the first quarter of 2020 — an increase of 42% even before the beginning of the Covid crisis.

**Figure 20. Active cases, applications, and orders granted for receivership and the initiation of proceedings for individuals**



Source: Benjamin Bental and Labib Shami, Taub Center | Data: Ministry of Justice, The Administrator General and the Official Receiver

In 2020, moreover, 154,066 debt claims were submitted totaling NIS 33.33 billion, including 32,885 claims for the liquidation of companies and 121,181 bankruptcy proceedings. These figures reflect a fall in the number of debt claims in 2020 relative to 2019 (159,187 claims) and 2018 (183,285 claims). The number of exemption orders (orders freeing bankrupt individuals from their debts) also fell from 7,633 in 2019 and 7,325 in 2018 to 7,056 in 2020.

In 2020, 1,200 applications for the liquidation of corporations were opened (compared to 1,179 applications in 2019 — a rise of about 2%); of these, 880 liquidation orders were actually granted, compared to 872, 739, and 778 in 2019, 2018, and 2017, respectively. This figure reflects a rise of just 0.9% in 2020 relative to 2019.

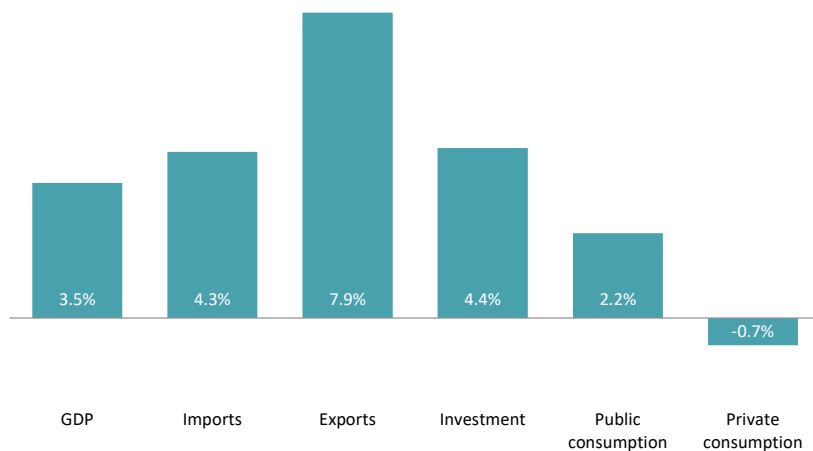
In conclusion, 2020 did not see a sharp increase in insolvency and bankruptcy, despite the Covid crisis and the enactment of the new insolvency and economic recovery law. While the number of applications for individual insolvency rose by 36%, the increase among companies was just 2%. Moreover, a fall was seen in 2020 in the number of active cases, orders actually granted, and debt claims.

One possible explanation for the low number of applications for insolvency is that business owners preferred to keep their businesses operational in order to receive the grants and benefits offered by the State throughout the year, thereby mitigating losses unrelated to the Covid crisis (Minnes, 2021). If this explanation is correct, we can expect an increase in insolvency in companies over the coming years, unless these businesses manage to recover.

## Conclusion

In Israel, as in most countries, 2020 was full of challenges due to the global Covid-19 pandemic. GDP in Israel shrank by 2.2% in 2020 compared to 2019, while private consumption fell by 9.2%. Meanwhile, broad unemployment (including workers placed on unpaid leave) rose to unprecedented levels during the first shutdown and remained high for most of the year. The recovery, however, was much more rapid than anticipated. Figure 21 compares GDP and its components in the first three quarters of 2021 relative to the same time period in 2019, in real terms. The figure indicates an impressive economic recovery: in the first half of 2021, GDP was 3.5% higher than two years earlier, and, accordingly, per capita GDP effectively returned to its pre-pandemic level. This recovery was possible thanks to the rapid fall in the unemployment rate. With this, there was a notable slight decline in private consumption, which resulted in a fall of 4.1% in per capita private consumption. As noted above, this behavior increased household savings and allowed a diversion of resources towards investment despite the increase in exports.

**Figure 21. Rate of change in GDP and GDP components in the first three quarters of 2021 relative to the same period in 2019**



Source: Benjamin Bental and Labib Shami, Taub Center | Data: CBS

The rapid exit from the Covid crisis and the global environment that the economy faces create a real opportunity. The flourishing of the high tech sector and the low interest rates available to the state and to citizens for borrowing permit a significant expansion of private investments, as well as of public investments, specifically in transportation and communication infrastructures, without fear of creating pressures on the balance of payments. Even a slightly elevated fiscal deficit does not pose a strategic threat, provided the resources are directed to channels that enhance growth. The expected return from these investments should be much greater than the debt burden, and within a few years it should even permit a lowering of the debt-to-GDP ratio to the levels that prevailed prior to the pandemic.

## References

### English

- Debowy, M., Epstein, G., & Weiss, A. (2021). The labor market in Israel following Covid-19: An overview. In A. Weiss (Ed.), *State of the nation report: Society, economy and policy 2021*. Taub Center for Social Policy Studies in Israel.
- Hale, T., Angrist, N., Goldszmidt, R., Kira, B., Petherick, A., Phillips, T., Webster, S., Cameron-Blake, E., Hallas, L., Majumdar, S., & Tatlow, H. (2021). [A global panel database of pandemic policies \(Oxford COVID-19 Government Response Tracker\)](#). *Nature Human Behaviour*, 5, 529–538.
- Madhala, S., Zontag, N., & Bental, B. (forthcoming). *Work from home among Israeli workers*. Taub Center for Social Policy Studies in Israel.
- Muoio, D. (2020). [Google mobilizes location tracking data to help public health experts monitor COVID-19 spread](#).

### Hebrew

- Ministry of Justice (2021). [The Administrator General, the Commissioner of Insolvency Proceedings and the Succession Cases Registrar unit: A summary of activities — 2020](#).
- Minnes, O. (2021). [How grants and assistance to businesses unbalanced the free market](#). *Mida*, 21 April 2021.
- Prime Minister's Office (2021). [Budget proposal for financial years 2021–2022 and accompanying explanations, Pamphlet 3](#).

## Appendix

### The deficit, growth, the interest rates, and the debt-to-GDP ratio

For the sake of simplicity, let us assume an economy in which the nominal interest rate ( $r$ ) is fixed, and in which the annual nominal growth rate in GDP ( $g$ ) is also fixed. Given these assumptions, national debt develops according to the following formula:

$$B_t = B_{t-1} + rB_{t-1} + P_t$$

In this formula,  $B_t$  is the debt in year  $t$ , while  $P_t$  is the *primary* debt in the same year (the difference between government expenditures after deducting debt service, and its income) — both expressed in nominal values. This formula implicitly assumes that the government recycles all the debt each year, so that only the interest payments on the existing balance of indebtedness are added. In addition, the government raises new debt to finance the surfeit of expenditure over income.

In order to avoid calculations for the *debt level* in monetary terms, the customary approach is to examine the development of the *debt-to-GDP ratio*. Accordingly, if nominal GDP is labeled by  $Y_t$ , the following formula for the debt-to-GDP ratio is obtained:

$$b_t = \frac{1+r}{1+g} b_{t-1} + p_t$$

In this formula, the lower case letters represent the quotient obtained from the division of the periodic nominal value labeled by the equivalent capital letter by the value of nominal GDP for that year (for example:  $b_t = \frac{B_t}{Y_t}$ ). The quotient  $\frac{1+r}{1+g}$  is obtained by dividing the entire equation by  $Y_t$ , as well as by dividing the first expression on the rise side by  $Y_{t-1}$  and multiplying it by this factor. We will label the expression  $\beta = \frac{1+r}{1+g}$ . The development of the debt-to-GDP ratio from an initial time point (defined by “0”) for a given year  $t$  is obtained through a recursive substitution:

$$b_t = \beta^t b_0 + \sum_{k=1}^t \beta^{t-k} p_k$$

where  $b_0$  represents the debt-to-GDP ratio during the initial period. The formula shows that if the primary deficit is positive at a constant rate  $p$  relative to GDP, and if the nominal interest rate is higher than the nominal GDP growth rate (i.e.,  $\beta > 1$ ), then the debt-to-GDP ratio rises without limit. Such a path is,

of course, unsustainable, and accordingly the primary debt must decline and even become negative (i.e., a primary surplus must be created) in order to stabilize the debt-to-GDP ratio.

Conversely, as long as the nominal interest rate ( $r$ ) is below the nominal GDP growth rate ( $g$ ), the debt-to-GDP ratio converges to a finite size. If the deficit remains fixed relative to GDP, this relationship converges to  $\frac{1+g}{g-r}p$ . Based on reasonable assumptions regarding the parameter values, the debt-to-GDP ratio may reach values greater than 1, resulting in an unreasonably high burden of interest payments. In order to prevent this burden, it is conventionally assumed that the debt-to-GDP ratio must remain significantly below 1. For example, the decisions of the Maastricht Treaty imposed a limit of 0.6 on this ratio. However, if the interest rate is lower than the rate of economic growth, the primary deficit may be increased and debt may be allowed to rise temporarily, up to a reasonable limit for the debt-to-GDP ratio (e.g. 0.85). Only when the ratio reaches this limit will it be necessary to act to reduce the ratio by cutting the primary deficit (through tax increases and/or cuts in government expenditure). Such a policy is viable if the resources recruited raised by increasing debt are allocated to investments in infrastructure aimed at increasing growth.

# LABOR MARKETS

2





# The Israeli Labor Market in the Wake of Covid-19: An Overview

**Michael Debowy, Gil Epstein, and Avi Weiss**

## Introduction

As happened the world over, the Covid-19 pandemic that erupted in Israel in March 2020 caused, and continues to cause, disruption in all areas of life, and in the labor market in particular. The lockdowns, furloughs, demand shocks, and macroeconomic downturn generated by the crisis (see Bental & Shami, 2021), made the labor market seem like a roller coaster ride in terms of employment and unemployment levels, the definition of which was expanded in the pandemic's wake. The worst blow was sustained in early 2020, when over a million Israelis stopped working. Although the general trend at present is one of improvement, rising employment and declining unemployment, full employment has yet to be regained, and most projections indicate that it will not be in the coming years (see also Bental & Shami, 2021).

In this chapter, we will review what happened in the labor market and try to determine what may be expected going forward. We will look at employment levels and work hours in different economic sectors, and show the differences by gender, population sector, and district. We will analyze the ability to work from home, both by occupation and by economic sector, in an attempt to determine where investment in vocational training is needed. Subsequently, we will present the changes that occurred during the pandemic with regard to investment in higher education and in training programs, ending with a summary and conclusions.

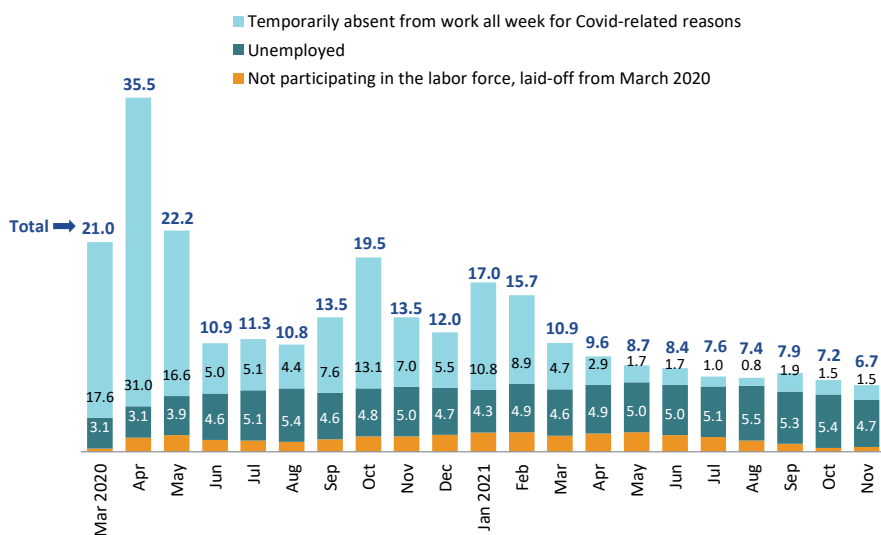
---

\* Michael Debowy, Research Assistant, Taub Center for Social Policy Studies in Israel; doctoral student, Department of Economics, Ben-Gurion University of the Negev. Prof. Gil Epstein, Principal Researcher, Taub Center; Department of Economics, Bar-Ilan University. Prof. Avi Weiss, President, Taub Center; Department of Economics, Bar-Ilan University.

## Unemployment, employment, and wages in the Israeli economy

During the first lockdown, imposed early in the pandemic, uncertainty about the disease and its ramifications was at its height. Usually, unemployment rates are measured as the percentage of non-employed job seekers out of the total civilian labor force (employed persons and non-employed job seekers). This was expanded during the pandemic to include two additional groups: workers placed on furlough, and non-employed persons who left the labor force due to Covid-19. The expanded unemployment share (encompassing all three groups) out of the civilian labor force plus non-employed persons who left the labor force due to the pandemic, jumped from 3.8% to 35% (Figure 1).

**Figure 1. Unemployment, absence, and non-participation in the labor force due to Covid-19**

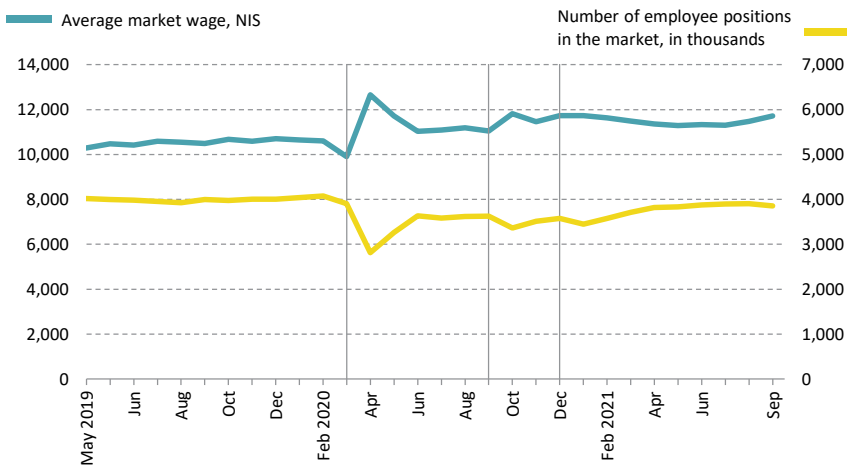


Note: The data were computed as a percentage of the civilian labor force plus non-employed persons who left the labor force due to the Covid-19 pandemic.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

The damage caused by the pandemic to the employment market was not evenly spread over labor force participants; rather, specific kinds of workers were disproportionately affected — generally those with less education and lower incomes (Zontag et al., 2020). This had far-reaching effects on the loss of work and long-term unemployment, on inequalities after the period of government support for workers on unpaid leave lapsed, on the types of training programs that are required, and more. Figure 2 shows the number of salaried positions and the average wage in the Israeli economy since the beginning of 2020. We can discern the opposite trends in these two measures since the pandemic's outbreak: since the average wage is computed solely on the basis of persons who are actually employed, and since it was largely (on average) those with low wages who were placed on furlough, the average wage of employed persons rose when employment dropped, and dropped when employment rose. Recall that as a result of this phenomenon, the Israeli government froze the average wage index for National Insurance purposes in December 2020.<sup>1</sup>

**Figure 2. Average monthly wage and salaried positions in the economy**



Note: The three vertical lines in the graph represent the start of the lockdowns in March, September, and December 2020.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

1 See: [Average Wage Law \(Temporary Order — the Novel Coronavirus\), 5781-2020, December 29, 2020](#). [Hebrew]

# SPOTLIGHT

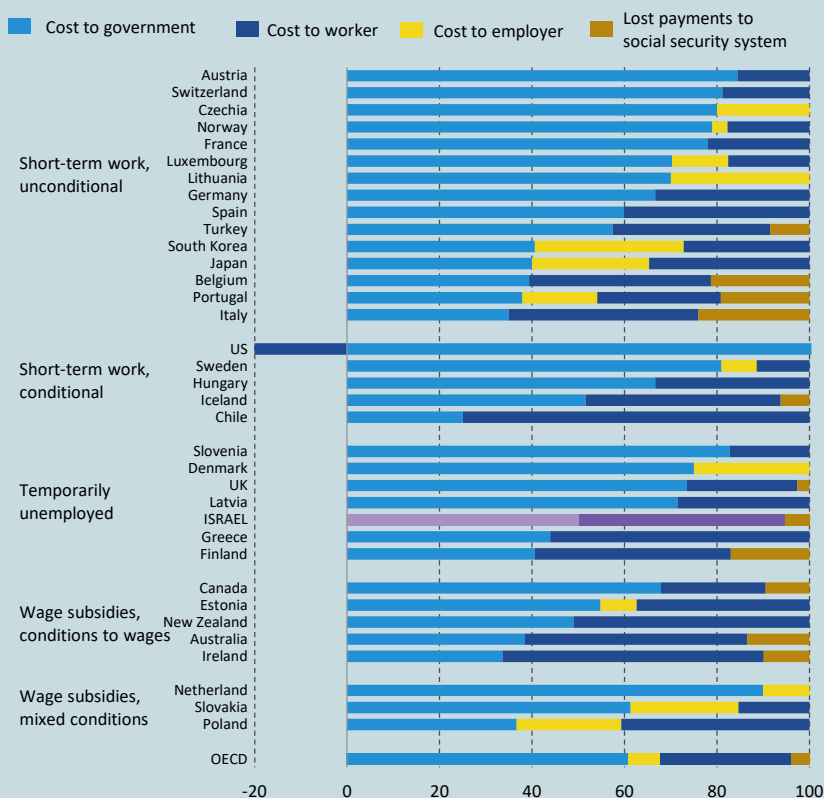
## The Furlough Model

Countries around the world adopted different mechanisms for addressing the collapse of employment during the pandemic, aiming to ease the shock to employed persons and employers while stabilizing the labor market in anticipation of a post-crisis recovery. Israel and other countries adopted the furlough model, which allowed workers placed on unpaid leave (i.e., those whose work hours were reduced by 100%) to receive unemployment insurance, with no assistance given for partial work hour reductions. This effectively created an incentive for workers whose hours were cut beyond a certain threshold to leave work completely. Other countries, including Germany, adopted an STW (short-term work) model, which allows for a “partial subsidy” of work hours — i.e., compensation for workers whose hours were reduced, with some workers actually choosing partial wage subsidies. This model was designed to maintain the employer-employee relationship and the work routine, making it easier for the labor market to recover once the crisis passed. There were also countries such as Canada and the Netherlands that chose direct subsidies of wages for some workers, sometimes dependent on the decline in business activity.

Each model has advantages and disadvantages, which are partially reflected in how the “cost burden” of the employment downturn is distributed between the worker, the employer, and the government.<sup>2</sup> Figure 3, taken from the OECD website, presents a calculation of this distribution in various OECD countries, based on the status in May–June 2020. Based on these calculations, Israeli workers bore 45% of the cost burden of the work hour reductions versus a 28% burden, on average, in the OECD and other countries, and a 24% burden in countries that adopted the “German model,” i.e., the unconditional STW model. By contrast, Israeli employers did not have to pay anything to employees on leave, while their counterparts in the OECD bore 7% of the cost (9% in the German model countries) — payments whose primary objective was to avoid moral hazard (exploitation of the situation by the employers). The fact that employers in these countries could have fired their employees and thereby avoid this cost, but instead chose to bear it, testifies to the value employers received from retaining their workers, even if in a reduced-work-hour capacity. Moreover, in Israel, the state bore 55% of the cost (unemployment insurance for those on leave without pay along with the loss of National Insurance Institute contributions), versus 65% in the OECD countries. Ultimately, compared with other developed countries, Israel placed a larger share of the burden of reduced business activity on the shoulders of workers, thereby easing the burden on employers (who could not allow their employees to work part-time) and on the public coffers.

- 
- 2 Compensation for a worker whose hours have been reduced, when paid by the employer or by the National Insurance Institute, means that the employer and the government are those bearing the cost burden, while non-compensation means that the workers are the ones bearing the burden.

**Figure 3. Distribution of the cost burden of maximum work hour cutbacks, May-June 2020**

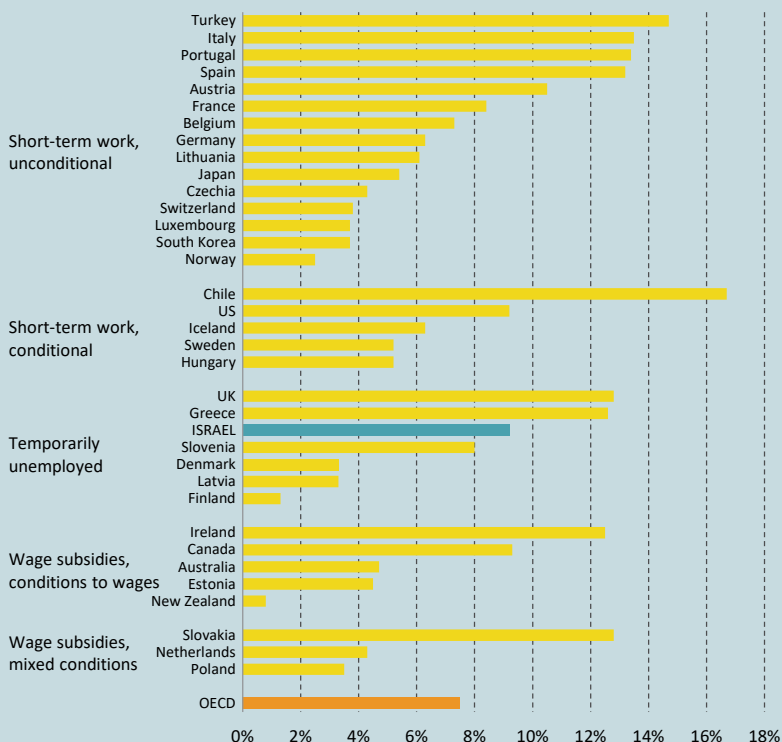


Note: The graph shows the distribution of the burden of work hour reductions among different agents in the OECD countries. The countries are grouped according to the job retention schemes they adopted.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: OECD Employment Outlook 2021

Economists have tried to estimate the impact of the various models in terms of coping with, and exiting, the crisis (Autor et al., 2020; Bartik et al., 2020; Chetty et al., 2020; Faulkender et al., 2021; Hubbard & Strain, 2020). Clearly, the choice of employment model had a major effect in terms of the differences observed between countries, though it is hard to distinguish between the effect of the employment model chosen and those of other factors, such as labor market differences, the differing ways in which healthcare systems dealt with the pandemic, and more. Figure 4 shows the percentage of work hours that countries lost due to the pandemic, as calculated by the International Labor Organization (ILO). While the average loss in the OECD countries was 7.5%, and most of the German model countries lost 6.3% or less, Israel recorded a 9.2% work-hour loss relative to the end of 2019. Since Israel dealt quite effectively with the pandemic from a medical and economic perspective, it is reasonable to assume that this relatively large work-hour loss stemmed in part from the structure of the leave without pay policy, which, as noted, did not allow for part-time employment. It appears that, should there be additional lockdowns due to new outbreaks of Covid-19 or another disease, abandonment of the furlough policy in favor of the German model (or another wage subsidy model) would likely benefit the labor market and ensure that the crisis is more effectively addressed.



**Figure 4. Loss of work hours in 2020 due to the Covid-19 crisis**

Source: Michael Debowy, Gil Epstein and Avi Weiss, Taub Center | Data: ILO

## Employment by economic sector

The unique features of the Covid-19 crisis translated into differential impacts on various sectors of the economy (see, for example, Bental & Shami, 2021). The demand shocks merged with background technological and economic processes (automation, online work, the exporting of jobs) in a way that strongly influenced developments and recovery trends in each sector. Table 1 shows the change in the number of jobs in each quarter compared with the same quarter in 2019 in different sectors (the data include workers on furlough). In most economic sectors, worker numbers declined during the crisis; the tourism and restaurant sectors (“accommodation and food services”) were the hardest hit. Also, although the big retailers thrived, the retail sector suffered greatly and showed an 8% job loss between late 2019 and late 2020, followed by a continued stagnation throughout 2021.

However, not every economic sector was hurt by the pandemic. Sectors that almost exclusively employ white-collar workers — such as administrative and support services, professional services, real estate, and information and communication — showed almost no reduction in employment. Given the health and social aspects of the crisis, there was an increase in the number of jobs in the healthcare, social and welfare service fields. There was also a rise in the number of those employed in predominantly “public” sectors, such as local and public administration and infrastructure supply.

**Table 1. The rate of change in the number of jobs (including workers on furlough) since the same quarter in 2019, by economic sector**

Quarter	2020				2021				Percent of all positions in the labor market in January 2020
	1	2	3	4	1	2	3	4	
Overall	1%	-1%	-2%	-3%	-3%	-1%	1%	1%	100%
Agriculture, forestry, fishing	8%	2%	-10%	-7%	-8%	-5%	-20%	-27%	1%
Manufacturing, mining, quarrying	-7%	-7%	-8%	-3%	-7%	-8%	-1%	3%	10%
Construction	1%	-10%	-3%	-4%	-3%	-13%	-6%	-2%	5%
Wholesale/retail trade, motor vehicle repairs	1%	1%	-3%	-8%	-5%	-1%	-2%	-7%	15%

**Table 1 (continued). The rate of change in the number of jobs (including workers on furlough) since the same quarter in 2019, by economic sector**

Quarter	2020				2021				Percent of all positions in the labor market in January 2020
	1	2	3	4	1	2	3	4	
Local, public, defense administration; water supply, sewage, waste management; electricity supply, gas, steam, air conditioning	5%	1%	3%	6%	9%	7%	7%	7%	11%
Accommodation, food services	-6%	-18%	-20%	-36%	-38%	-22%	-14%	-16%	4%
Administrative, support services; professional, scientific, technical activities; real estate; information, communication	3%	2%	-1%	0%	0%	0%	5%	5%	22%
Education	0%	-2%	-1%	0%	-1%	3%	1%	3%	13%
Human health, social work activities	2%	5%	4%	7%	3%	-1%	-1%	6%	11%
Other services	7%	0%	-1%	-5%	-2%	5%	2%	-4%	7%

Note: Data for the fourth quarter 2021 are until the end of October.

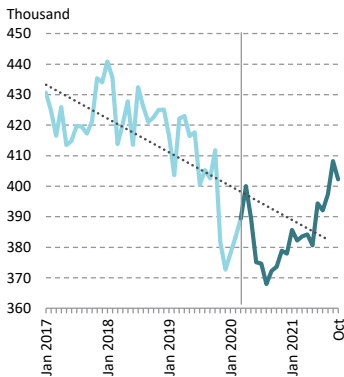
Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Nevertheless, it is likely that some of the changes in the number of job positions in specific economic sectors reflect deep-seated processes taking place in the economy alongside the effects of the pandemic. In other words, a portion of the employment downturn in certain sectors may well have occurred even without the crisis. In order to try and identify the pandemic's major negative effects, we can compare developments during the crisis with the monthly employment trend that preceded it. Figures 5a–5j show actual employment and the trend in each sector based on 2017–2019 data, before the crisis, and projects these trends forward. It is clear that employment in the accommodation and food services sector (5e) collapsed immediately in

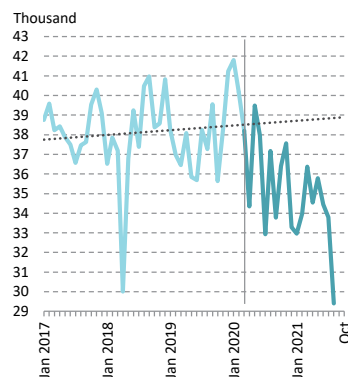
March 2020. The construction sector (5c) also saw a substantial decline in employment during 2021, which may have been partially driven by a decline in demand for commercial construction as parts of the economy adapt to online retail and remote work (see Figure 10). The damage to this particular economic sector disproportionately affects Arab men — who are over-represented among construction workers — and may have played a part in the long-term decline in employment in this particular population (see Figure 7). In the trade and transport sectors (5d), by contrast, it is hard to discern a significant change until the fall of 2020, when the seasonal increases anticipated on the basis of recent data did not occur. Moreover, changes in the employment rates in the healthcare and social work sector (5h, especially from late 2020) and local and public administration, and infrastructure sectors (5i) lie well within the confidence interval (95%), making it difficult to identify a significant effect of the crisis on these sectors over time.

**Figure 5. Actual employment versus the pre-crisis trend, by economic sector**

**a. Manufacturing, mining, quarrying**

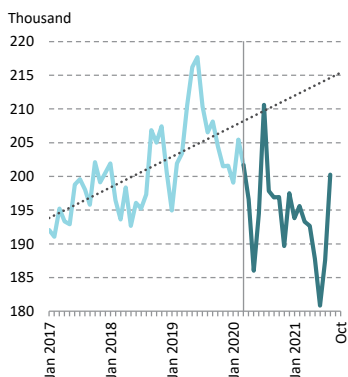


**b. Agriculture, forestry, fishing**

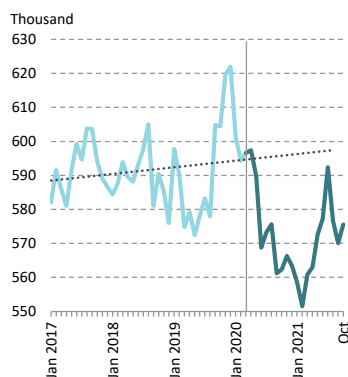


**Figure 5 (continued). Actual employment versus the pre-crisis trend, by economic sector**

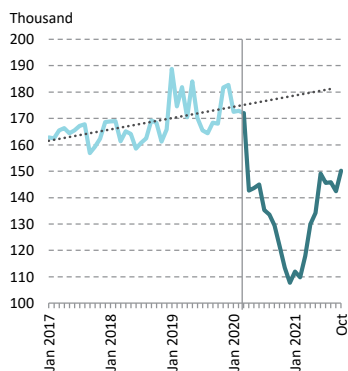
**c. Construction**



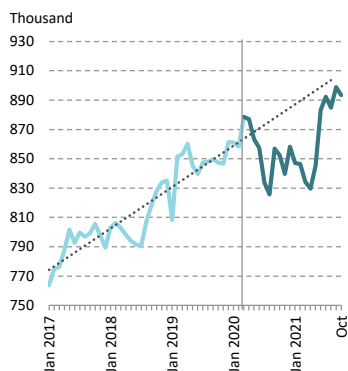
**d. Wholesale/retail trade, motor vehicle repairs; transport, storage, postal, courier activities**



**e. Accommodation, food services**

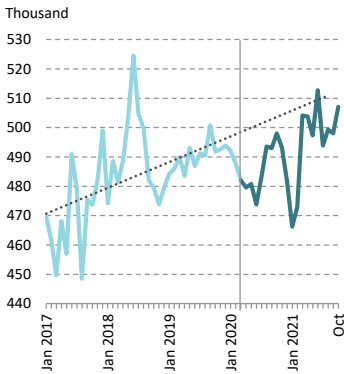


**f. Information, communication; financial, insurance activities; real estate; professional, scientific, technical activities; administrative, support services**

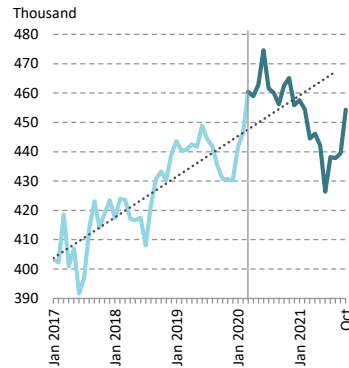


**Figure 5 (continued). Actual employment versus the pre-crisis trend, by economic sector**

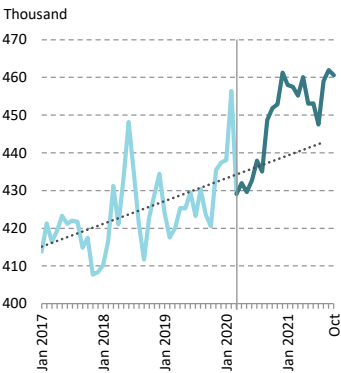
**g. Education**



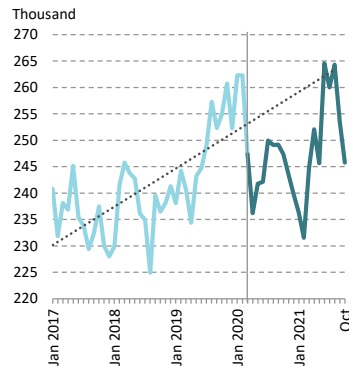
**h. Human health, social work activities**



**i. Local, public, defense administration; infrastructure, waste management**



**j. Other economic sectors**



Note: The vertical line marks the beginning of the pandemic.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

The number of jobs is only one measure of the scope of employment. When we add the average number of work hours per worker to the analysis, a more complex picture is obtained. Table 2 presents the change in work hours per worker in the various sectors from the beginning of 2020 to October 2021 relative to the same quarter in 2019. It is clear that, until the summer of 2021,

the average number of weekly work hours per worker increased in nearly all economic sectors (meaning, apparently, that the negative impact on production in these sectors was smaller than the negative impact on positions). We also see that the agricultural, manufacturing, and mining sectors, which experienced only limited employment reductions, showed an increase in work hours for those workers who remained as early as the second half of 2020, meaning that the output of these sectors was almost unaffected by the crisis. The distinctly “public” sectors (local and public administration, infrastructure supply) also experienced increases in hours per worker alongside employment increases — evidence of growing activity. The trade and the accommodation and food services sectors, which lost the highest percentage of jobs, also suffered the greatest drop in work hours per employee, indicating an even more substantial decline in their activity. It is interesting to see the impressive rebound in hours per worker in accommodation and food services in the second quarter of 2021, although we should bear in mind that the number of jobs in this sector remained dramatically lower than it was two years earlier (a fact that, in and of itself, constitutes an underestimation of economic damage, as it does not take natural population growth during those two years into account).

**Table 2. Change in average weekly work hours per worker relative to the same quarter in 2019, by economic sector**

Quarter	2020				2021			
	1	2	3	4	1	2	3	4
Agriculture, forestry, fishing	-3%	3%	8%	7%	1%	0%	0%	4%
Manufacturing, mining, quarrying	-6%	-10%	3%	2%	-5%	3%	-2%	-1%
Electricity supply, gas, steam, air conditioning; water supply, sewage, waste management; local, public, defense administration	-3%	-4%	3%	2%	0%	3%	0%	3%
Construction	-9%	-14%	1%	-3%	-8%	5%	1%	0%
Wholesale/retail trade, motor vehicle repairs; transportation, storage, postal, courier services	-9%	-23%	-7%	-9%	-13%	-1%	0%	3%
Accommodation, food services	-17%	-47%	-19%	-42%	-42%	-3%	-3%	-2%
Information, communication; financial, insurance activities; professional, scientific, technical activities; real estate; administrative, support services	-8%	-15%	0%	-2%	-8%	3%	1%	1%

**Table 2 (continued). Change in average weekly work hours per worker relative to the same quarter in 2019, by economic sector**

Quarter	2020				2021			
	1	2	3	4	1	2	3	4
Education	-13%	-20%	6%	0%	-11%	5%	8%	3%
Human health, social work activities	-9%	-12%	1%	0%	-7%	6%	3%	4%
Other economic sectors	-12%	-26%	-6%	-11%	-15%	2%	6%	7%

Note: Data for the fourth quarter 2021 are until the end of October.

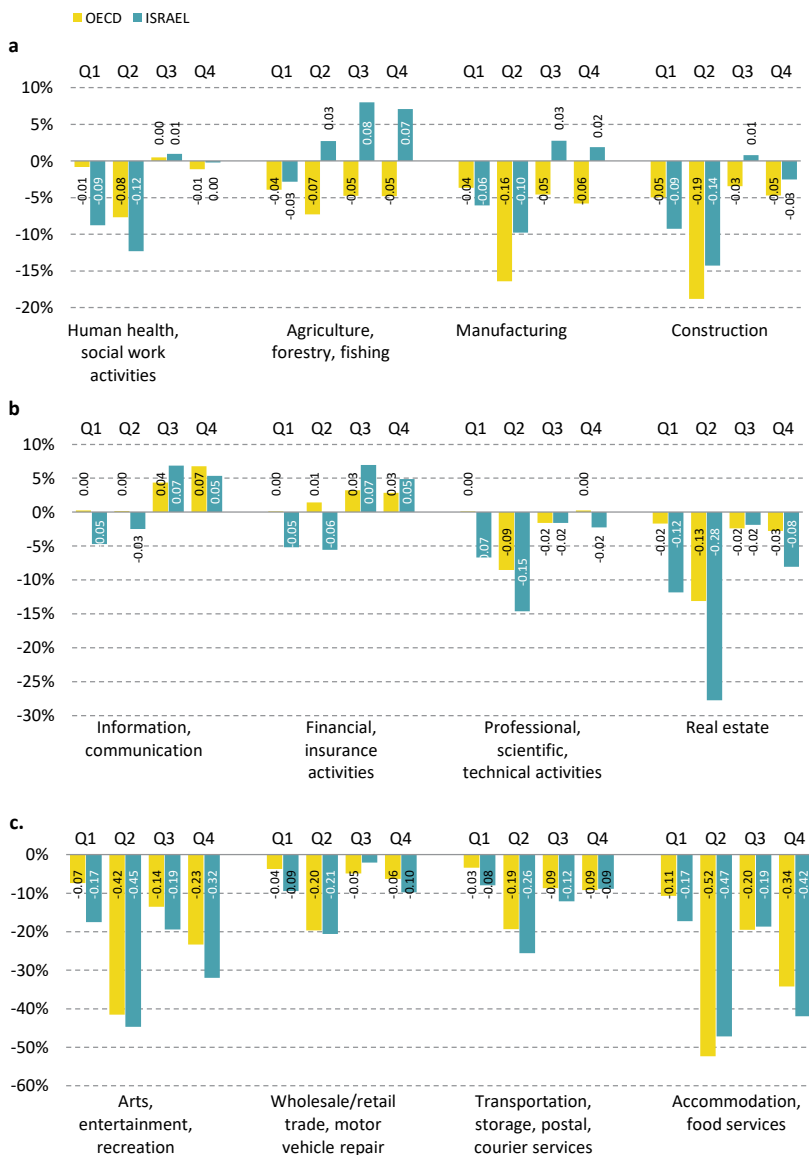
Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

The general picture obtained from an examination by sector indicates that the polarization in the Israeli labor market worsened during the crisis and the subsequent recovery period. Sectors already characterized by high wages and a highly educated labor force, such as high tech and public services, experienced minimal declines in employment and recovered rapidly. By contrast, sectors characterized by low wages and low human capital, such as agriculture and accommodation and food services, showed larger declines in employment, and their recovery has lagged behind the rest of the economy. The labor market's "middle layer" (in both human capital and wage terms), encompassing sectors such as manufacturing, construction, trade and transport, also sustained a harsh blow from which it is struggling to recover — that is, even when the sector itself rebounds, it does so with fewer workers. These differences require differential public policy thinking with regard to varied sectors and workers.

In an international comparison, work hour trend changes in the various economic sectors in Israel and other developed countries were largely similar. Figures 6a–6c show the annual change in work hours over the course of 2020 in different economic sectors, in Israel and the OECD countries. Israel's agricultural, manufacturing, and construction sectors recovered very rapidly, while its information, communication, financial, and insurance service sectors were hit harder than these sectors in other countries during the first half of 2020, but recovered quickly. The trade, transport, recreation, restaurant, and tourism sectors, both in Israel and abroad, suffered the greatest damage in 2020 in terms of work hours, and have had trouble recovering.



**Figure 6. Annual percent change in work hours between 2019 and 2020, by quarter and economic sector, Israel and the OECD**

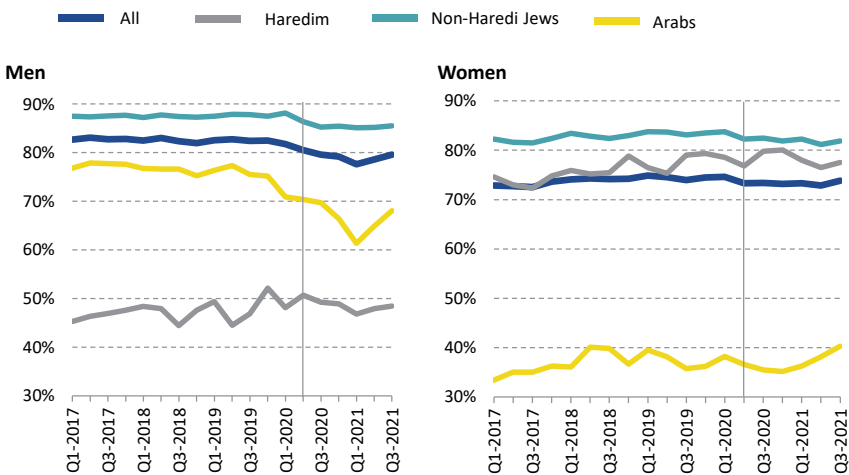


Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS, OECD

## Employment by population sector, gender and geographic district

Figure 7 shows the employment rates of men and women ages 25–64 in different Israeli population groups over the past several years (including workers on furlough). The graph shows that, for women, employment rates have remained stable since their initial drop in the spring of 2020, though these aggregate data conceal a continued slight decline in Arab Israeli women's employment until recently, alongside rapid recovery and a rise in the employment of Haredi women. Men's employment rates show continuous erosion throughout the pandemic among Haredim, and even more so in the Arab sector. Note, however, that the decline in Arab men's labor market participation rates started before the Covid-19 crisis. This decline appears to stem from a variety of causes, including skill and human capital disparities, the replacement of Israeli construction workers with foreign workers, rising employment among Arab women (Geva et al., 2021), and demographic growth among Arab males under the age of 35 (Weinreb, 2020; 2021). However, the third quarter of 2021 broke this trend, with rising employment rates among Arab men and women.

**Figure 7. Employment rates for ages 25–64, by sector and gender**

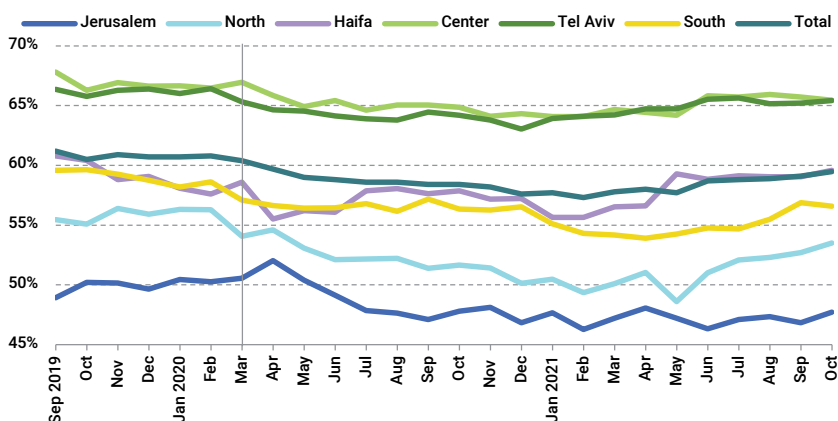


Note: Including workers on furlough. The vertical line marks the beginning of the pandemic.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Figure 8 shows the employment rate for ages 15 and over by geographic district. In the Tel Aviv and Central Districts, where half of Israeli employment is concentrated, a modest decline was discerned, reaching a low at the end of 2020 of 4%–5% below 2019 levels,<sup>3</sup> but by the summer of 2021 this had moderated to 1%–2% below the 2019 levels, remaining at that level until October. In the Haifa District, a similar trend was seen. The Jerusalem and Southern Districts registered declines of 7% and 9% respectively, which narrowed to 4% (for both districts) by October 2021. The Northern District sustained the greatest damage: between December 2019 and May 2021, there was a 13% drop in the employment rate, although by October 2021 the decline had moderated to 4%.

**Figure 8. Employment rates for ages 15 and over, by geographic district**



Note: Including workers on furlough. The vertical line marks the beginning of the pandemic.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

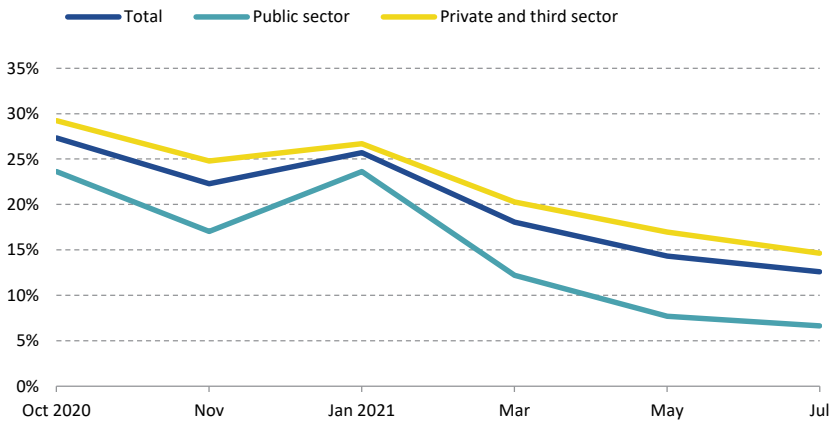
## Working from home

The crisis led to a dramatic rise in the amount of work conducted from home throughout the economy, especially at times of peak morbidity and during the ensuing lockdowns. The ups and downs of the extent of work from home

3 This refers to the average of the last four months of 2019, the reference point for all data in the paragraph.

during 2020 are well documented, and the phenomenon persisted through 2021. Figure 9 presents the share of those working from home by economic sector. The year started with a lockdown (working from home was then at a peak of 26% of the labor force), and continued with a moderate decline in working-from-home percentages over time. The decline in the public sector (where the share of those working from home dropped below 10% in March) was steeper than that in the private and third sectors (where the share of those working from home remained over 10% until the autumn).

**Figure 9. Share of those working from home, by economic sector**



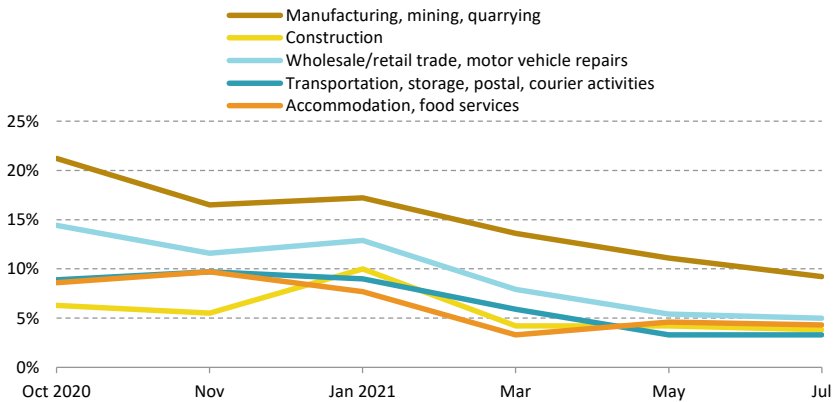
Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Breaking it down by economic sector, we find a more complex picture. Figures 10a, 10b, and 10c display the share of those working from home in different sectors. Figure 10a indicates that in all of the “tangible” manufacturing and service sectors, the share of those working from home was much lower than in the economy as a whole, throughout the period. Moreover, volatility in these sectors was low compared with the economy as a whole (except for the construction sector, where working from home doubled in volume during the third lockdown). Figure 10b shows that the situation in the “intangible” production and service sectors was diametrically opposed: except for administrative and support services, all of these sectors were characterized by work-from-home-rates that exceeded the overall average, and over half of those in the information and communication sector worked from home until

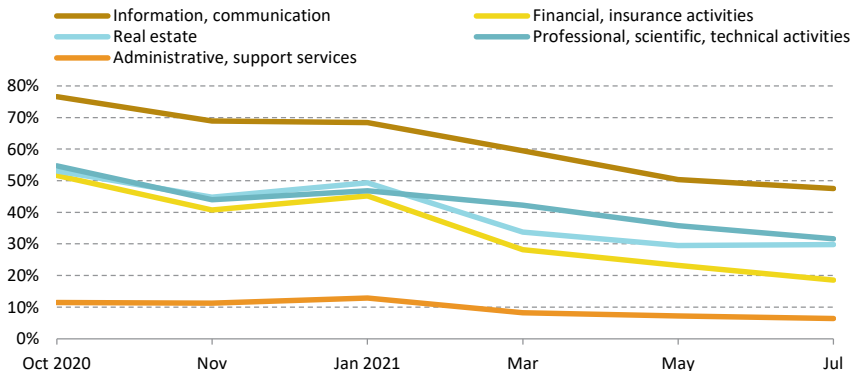
the summer of 2021. Not only that, but the decline in work-from-home rates that these sectors displayed over the course of the year was exceedingly slow. This would seem to reflect adjustment to a new reality in which working from home is a central feature of employment regardless of the pandemic.

**Figure 10. Share of those working from home in by employment sector**

**a. “Tangible” employment sector**



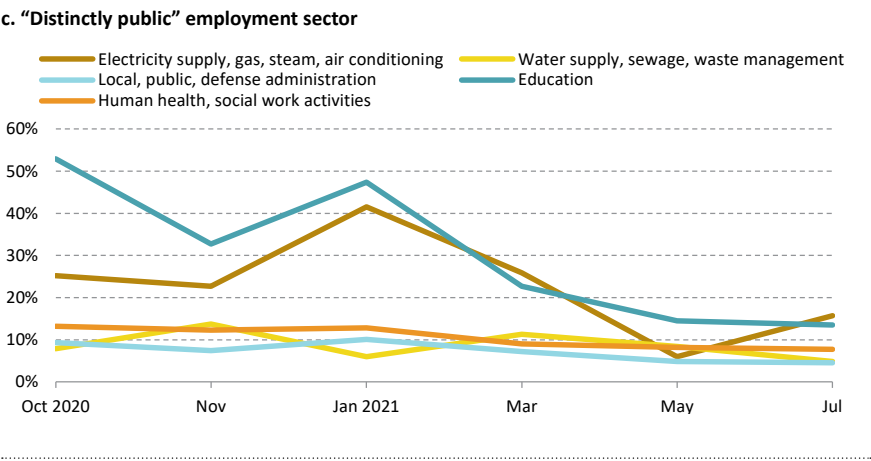
**b. “Intangible” employment sector**



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

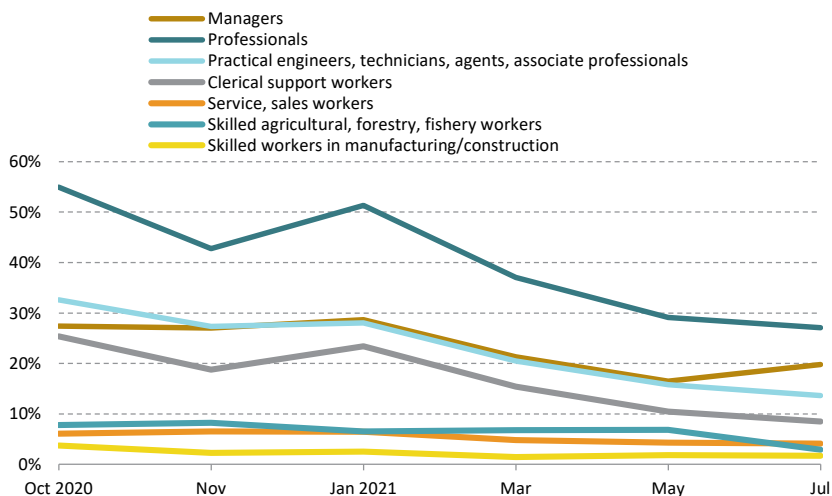
Figure 10c shows the share of those working from home in the “distinctly public” economic sectors. The graph indicates tremendous and quite noticeable volatility in work-from-home volumes in the education sector, and, more surprisingly, volatility in the energy supply and air conditioning sector.

**Figure 10 (continued). Share of those working from home by employment sector**



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Figure 11 presents the complementary picture, showing the share of those working from home by occupation rather than by economic sector. We see that the amount of online work (and its volatility) were highest among those in occupations requiring academic training, less high among managers, practical engineers, and clerical workers, and low (and stable) among persons employed in manufacturing, trade, and services.

**Figure 11. Share of those working from home by occupation**

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

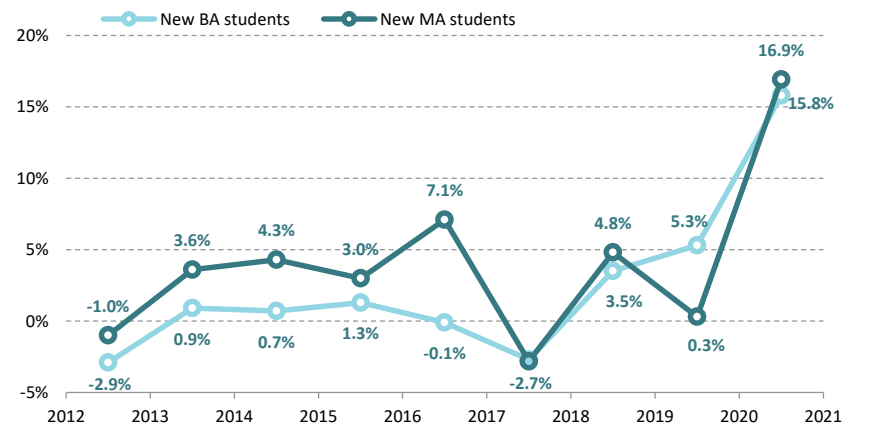
## Higher education and vocational training

### Higher education

For years the economic literature has documented the phenomenon whereby an increase in unemployment drives rising enrollment in higher education or vocational training (Barr & Turner, 2015; Hillman & Orians, 2013), especially when the state offers unemployment insurance on generous terms (Sievertsen, 2016). The present crisis has confirmed the existence of this phenomenon in Israel as well, and in the absence of employment and foreign travel possibilities, young unemployed persons have been increasingly enrolling in higher education programs (Frankel, 2020; Ilan, 2020). Figure 12 shows the annual rate of change in the number of new bachelor's and master's degree students over the past decade. The graph clearly shows a surge in the share of new students during the 2020/2021 academic year, when the growth in the number of new bachelor's and master's degree students was more than 15 and 14 percentage points greater than the average growth in the previous eight years, respectively. Although some of the increase may possibly be attributed

to deep-seated processes such as improved access to higher education and the growing importance of it in today’s knowledge-based economy, there can be no doubt that the sharp rise in the annual growth rate stems largely from the conditions created by the crisis.

**Figure 12. Percent change in the number of new bachelor’s and master’s degree students**

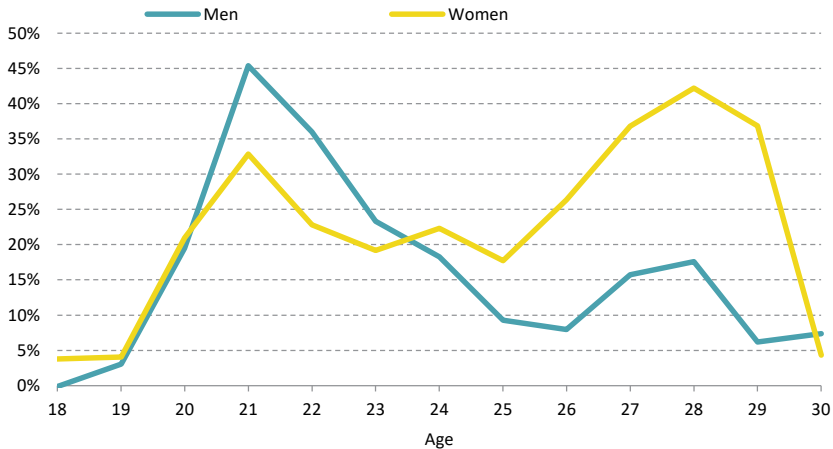


Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Figure 13, which shows the distribution of new bachelor’s and master’s degree students over the past two years by age and gender, supports this explanation. For both men and women, the greatest increases occurred among those in the 20–24 and 27–28 age ranges. This finding points to large numbers of discharged soldiers unable to work or travel, as well as young adults with low skill levels who lost their jobs during the crisis. Moreover, the data show that the change among women was greater in the 25–29 age range, while for men it grew more in the 21–23 age range — mainly because in the preceding years a larger percentage of women in their early twenties and men in their late twenties began their studies. In absolute terms, there was, in fact, no major difference in the age distribution between the genders among all newly-enrolling students in the 20–30 age group, but in percentage terms the changes were substantially different.



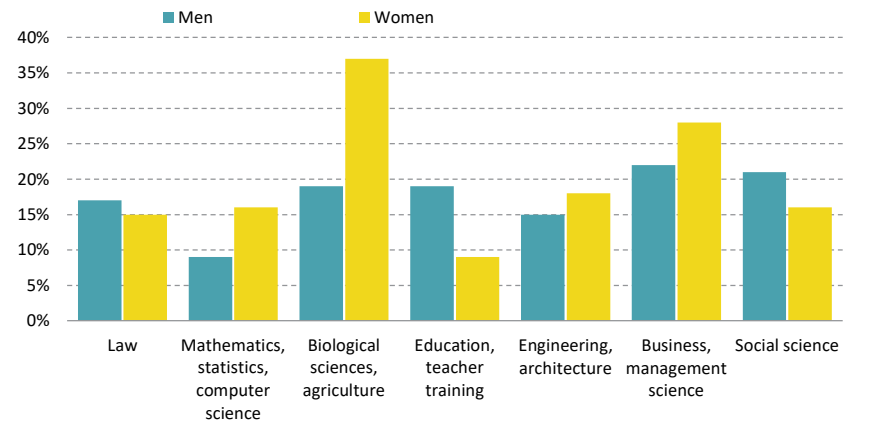
**Figure 13. Rate of change in the number of new bachelor's degree students between 2019/2020 and 2020/2021, by age and gender**



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

It is interesting to consider how the crisis has affected the study majors of new students. Figure 14 presents the change in the number of those starting undergraduate studies by gender and major. For women, the sharpest increases occurred in the biological sciences (37%), business (28%), and engineering (18%), while the most modest enrollment increase was in education and teaching (9%). For men, the sharpest increases were in business (22%), the social sciences (21%), and the biological sciences (19%), while the most modest rise in enrollment was in mathematics, statistics, and computer science (9%). It may be that the “biological” character of the crisis, along with the shock sustained by the business sector, contributed to a rise in demand for life science and business studies. It should be noted that, although in percentages the increase among women in these fields was larger, it translated into a smaller rise in absolute numbers. The gender difference in the relative rise in demand seems to be connected with the fact that, in previous years, these subjects were thought of as relatively “masculine.”

**Figure 14. Rate of change in the number of new bachelor's and master's degree students between 2019/2020 and 2020/2021, by study major and gender**



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

### Vocational training

The ongoing crisis has made it very difficult to help unemployed persons with job placement and vocational training. Despite the steep rise in demand for such training, the Israeli Employment Service was unable to provide most of the aid and tools due to social distancing guidelines and the cancellation of in-person activity. Many vocational training programs require that participants be physically present, and thus could not be offered during the lockdowns. Programs that can be conducted remotely, such as high school equivalency studies and vocational Hebrew, depend on the availability of internet infrastructures to unemployed participants; for many of these participants the infrastructures at their disposal (especially in the geographic periphery and in the Arab sector) are dubious at best. Moreover, many unemployed persons probably hoped to return to work quickly, and so did not take advantage of all the tools available to them.

Table 3 shows the change in the number of participants in placement and vocational training activities between 2019 and 2020 (Israeli Employment Service, 2021, p. 85). Despite a large rise in the number of unemployed persons (nearly tenfold, per the expanded definition), program participant numbers rose by only 13%, with the increase occurring in the assistance, counseling,

workshops, and fundamental skills program areas. In the vocational training and skill-improvement programs there was a 35% decline in participant numbers, mainly due to the difficulty of holding classes while the health restrictions were in force at the pandemic's peak.

Most of the increase in these programs was in Ma'agalei Ta'asuka ("Circles of Employment") (103%) and BiShvil HaKariera ("On the Path to a Career") (643%) — the Employment Service's flagship programs, which combine counseling, personal coaching, and job search workshops. Most of the decline in vocational training and skills-improvement courses was in core programs in the areas of in-service training (-74%), vocational Hebrew (-62%), and vocational training (-34%), along with a decline that was comparatively steeper — though modest in absolute numbers — in high school equivalency studies, in Hakhshara B'Hatama (specific training based on employer needs) and in the Shovarim L'Ma'asikim (Employer Vouchers) program, which was not utilized at all.

**Table 3. Rate of change in the number of participants in Employment Service programs between 2019 and 2020**

	2019	2020	Percent change
Ma'agalei Ta'asuka	15,881	32,312	103%
Ashkelon College Work & Age	1,680	1,530	-9%
BiShvil HaKariera and job search	483	3,591	643%
IAM	5,933	4,914	-17%
Psychological counseling	1,408	547	-61%
<b>Total assistance, advice, workshops, and fundamental skills programs</b>	25,385	42,894	69%
<b>Remote work grants and bonuses (support tools)</b>	7,879	633	-92%
Vocational training and skills improvement	3,680	2,418	-34%
Vocational Hebrew	516	197	-62%
Vouchers	2,540	2,597	2%
Continuing education program	3,491	1,245	-64%
High school equivalency studies	57	15	-74%
Employer vouchers	419	0	-100%
Personalized training	55	9	-84%
Advanced Microsoft	467	442	-5%
Basic Microsoft	1,722	1,547	-10%
<b>Total professional training and skills improvement programs</b>	12,947	8,470	-35%
<b>Total of all programs</b>	46,211	51,997	13%

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data and definitions: Israeli Employment Service

With this, there is a sense that the opportunity afforded by people's confinement at home was largely squandered. It would have been possible to offer online training on a large scale to many different populations, thereby substantially upgrading their skills — which would then have translated into improved labor productivity and higher wages for these workers once the economy re-opened; however, this failed to happen.

As the population became vaccinated and the closures were lifted in the course of 2021, placement and vocational training activities returned in full force. Since unemployment rates remained relatively high, we may reasonably assume that the demand for these activities stayed high as well. However, because a large majority of workers returned to work, fewer people are likely to benefit from the training programs than would have benefited during and between the lockdowns in 2020. We may hope that the online format devised for some of the placement activities will be incorporated into the array of employment assistance services once things return to normal, thereby promoting access for residents of the periphery and for other populations that have trouble coming for in-person services.

## Projections for full employment

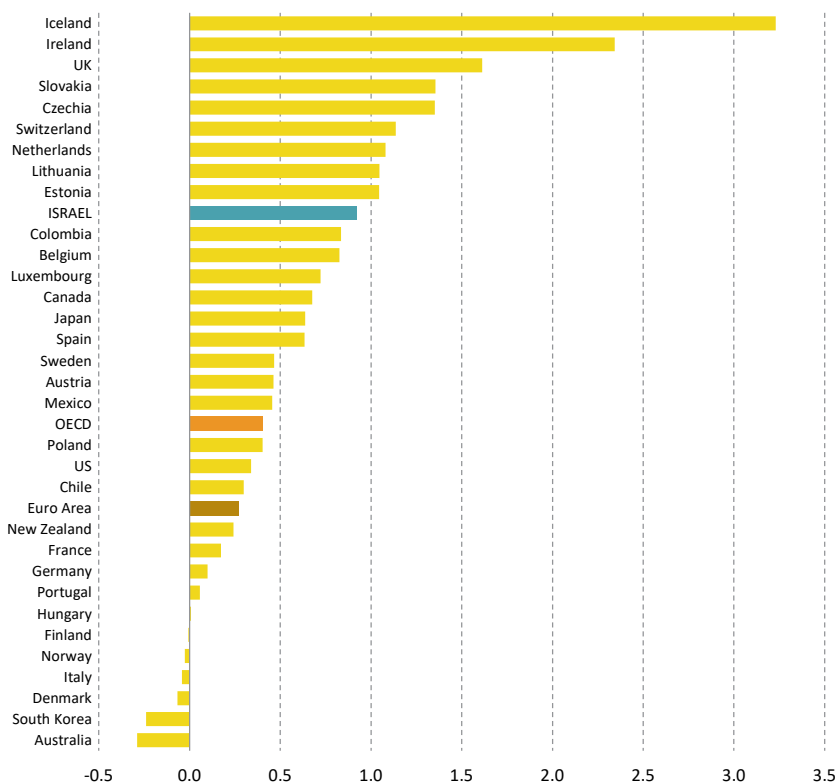
As noted in the Introduction, Israel's labor market was at full employment in 2019, with unemployment rates at a historic low of 3.8%. During the crisis, unemployment — redefined to include workers on furlough, and workers who left the labor market due to Covid-19 — reached a peak of 36% in April 2020. By the end of 2020, the unemployment rate (with the expanded definition) reached 15.9%, and by mid-November 2021 the rate had dropped to 6.7%, while the rate of unemployment per its original definition was 4.7%. In addition, CBS Labor Force Surveys show that the employment rate has returned to 61.8% in November — its level before the pandemic. This finding, combined with the number of job seekers (higher than before the pandemic), implies that participation rates have increased over the last two years. As far as what is to be expected in the coming years, expectations vary.

According to a Bank of Israel projection from this October, the expanded-definition unemployment rate may be expected to drop by late 2022 to 5.2% (Bank of Israel, 2021). A more optimistic short-term projection emerges from OECD calculations (Figure 15) that put Israel's employment rate in late 2022 at less than 1 percent above its rate at the end of 2019 — i.e., below 5%.

However, the gap predicted for Israel is higher than that forecast for most OECD countries. Moreover, the OECD predicts that the Israeli economy will not return to full employment until 2025 at the earliest — later than in most other countries. According to the organization, this projection is based on Israel's lack of policy measures focused on the hardest-hit populations (see Bental & Shami, 2021). We may assume that this OECD forecast is also based on the high employment bar that was set in 2019, when unemployment in Israel was historically low, and far below the developed-country average.

**Figure 15. OECD projection for unemployment in the fourth quarter of 2022 relative to the fourth quarter of 2019**

Percentage points



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: [OECD](#)

## Conclusion

The Covid-19 pandemic is one of the greatest shocks ever experienced by the Israeli labor market. The crisis peaked in 2020, while 2021 witnessed a gradual recovery as well as adjustment to a new reality in the labor market. Although the unemployment rate is still falling, it will likely take a few more years for the labor market to return to the impressive unemployment rate that characterized it prior to the pandemic.

The various sectors of the Israeli economy were affected differently by the crisis, and coped differently with it as well. Predominantly “public” sectors such as healthcare, education, and public administration did not suffer major activity or employment disruptions, while other sectors, such as trade, transport, accommodation and food services, and, in particular, tourism, were hit hard; the latter is still struggling to recovery. In terms of geography, the Tel Aviv, Central and Haifa Districts exhibited a high degree of employment recovery, while in the Jerusalem, Northern, and Southern Districts employment has remained far below its pre-crisis level. At the same time, Arab men exhibited the largest decline in employment rates (a substantial, though more modest, drop was observed among Haredi men as well). With respect to this finding, it is important to keep in mind two important things. First, this reflects ongoing processes that were underway before the pandemic, and, second, there have been signs of some recovery of late. Women in all sectors sustained a more moderate blow in employment terms, but as Zontag et al. (2020) show, the damage to them was greatest during the lockdowns, both in terms of the share of women placed on leave and in terms of work hours.

The combination of ongoing processes and pandemic-driven constraints accelerated structural changes in the labor market, whose long-term impact is still hard to predict. The crisis opened the door to remote work in those occupations and sectors that allow it — in some fields the share of those working from home in late summer 2021 was around 50%. This was particularly true of academic, managerial, and technical occupations, and in “intangible” sectors where educated workers of high earning ability are concentrated (see Debowy et al., 2021). At the same time, there was an exceptional rise in the share of those enrolling in higher education programs, apparently driven by two factors: labor market incentives/returns to education, and a lack of alternatives for young adults due to the closing of the borders and reduced economic activity. Additionally, during the crisis there was a rise in Employment Service placement activity (alongside a drop in vocational training due to the lockdowns), and this increase may be expected to continue during 2022.

Regarding the degree of unemployment that persists, and how to address it in the foreseeable future, emphasis should be placed on focused measures vis-à-vis disadvantaged populations. The recovery of these populations — less-educated workers and workers in the geographical periphery and among the Haredi and Arab Israeli populations — has been much more modest than in the rest of the economy, and, so, requires a focused effort. Vocational training should be expanded, while higher education and relevant skills should be made accessible to these populations. The remote work revolution should be leveraged and online vocational training and study promoted where professionally and technically feasible (including investment in broadband infrastructures in the periphery as a central labor market policy tool).

To conclude, the vaccination campaign and the rapid reopening of the economy promoted a swift recovery of the labor market as a whole. The general recovery, however, conceals starkly differing trends between economic sectors, geographic districts, and population sectors. In order to help the economy reach its full potential, and to adjust the nation's labor force to changing market needs (related or unrelated to the pandemic), we need to adopt a proactive policy of investment in human and physical infrastructures, and in the development of skills and qualifications among all Israeli workers.

## References

### English

- Autor, D., Cho, D., Crane, L. D., Goldar, M., Lutz, B., Montes, J., & Yildirmaz, A. (2020). *An evaluation of the paycheck protection program using administrative payroll microdata*. Unpublished manuscript.
- Bank of Israel (2021). [Research department staff forecasts, October 2021](#).
- Barr, A., & Turner, S. (2015). Out of work and into school: Labor market policies and college enrollment during the Great Recession. *Journal of Public Economics*, 124, 63–73.
- Bartik, A. W., Cullen, Z. B., Glaeser, E. L., Luca, M., & Stanton, C. T. (2020). *The targeting and impact of paycheck protection program loans to small businesses*. National Bureau of Economic Research.
- Bental, B., & Shami, L. (2021). Macroeconomic trends: An overview. In A. Weiss (Ed.), *State of the nation report: Society, economy and policy 2021*. Taub Center for Social Policy Studies in Israel.
- Chetty, R., Friedman, J. N., Hendren, N., & Stepner, M. (2020). *The economic impacts of COVID-19: Evidence from a new public database built using private sector data*. National Bureau of Economic Research.
- Debowy, M., Epstein, G., & Weiss, A. (2021). Returns to education and labor market experience in Israel. In A. Weiss (Ed.), *State of the nation report: Society, economy and policy 2021*. Taub Center for Social Policy Studies in Israel.
- Faulkender, M., Jackman, R., & Miran, S. (2021). The job preservation effects of Paycheck Protection Program Loans. *SSRN Electronic Journal*.
- Hillman, N. W., & Orians, E. L. (2013). Community colleges and labor market conditions: How does enrollment demand change relative to local unemployment rates? *Research in Higher Education*, 54(7), 765–780.
- Hubbard, R., & Strain, M. (2020). *Has the Paycheck Protection Program succeeded?* National Bureau of Economic Research.
- Sievertsen, H. H. (2016). Local unemployment and the timing of post-secondary schooling. *Economics of Education Review*, 50, 17–28.
- Weinreb, A. (2020). [Population projections for Israel 2017–2040](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2020* (pp. 129–162). Taub Center for Social Policy Studies in Israel.
- Weinreb, A. (2021). *Youth bulge, violent crime and shortages in the Israeli Arab marriage market*. Taub Center for Social Policy Studies in Israel.
- Zontag, N., Epstein, G., & Weiss, A. (2020). [The Israeli labor market under the Coronavirus crisis: An overview](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2020* (pp. 191–219). Taub Center for Social Policy Studies in Israel.



## Hebrew

Etkes, H., & Adnan, W. (2021). [\*Illegal trade in work permits for Palestinian workers in Israel: The current status and plans for reform\*](#). Bank of Israel.

Frankel, B. (2020, 29 August). [\*Young people are streaming to the universities: There is no work, so let's go study\*](#). *Ynet*.

Geva, A., Amaria, N., Tehawkho, M., Larom, T., & Moskalev, K. (2021). [\*Employment of Arab men: Transition programs from high school to further education and employment\*](#). Aaron Institute, Aaron Institute for Economic Policy, IDC-Herzliya; Chief Economist Division, Ministry of Finance; Ministry of Welfare and Social Affairs.

Ilan, S. (2020, 19 May). [\*A degree instead of a trip: A rise of 30% in the number of those applying for higher education\*](#). *Calcalist*.

Israel Employment Service (2021). [\*Annual report 2020\*](#).

# Returns to Education and Labor Market Experience in Israel

**Michael Debowy, Gil Epstein, and Avi Weiss**

## Introduction

Estimating the relationship between human capital and earnings has been a focal point of economic research for many years. Since the studies by Mincer (1958; 1974) and Becker (1964), thousands of articles have dealt with the relationship between education and wage levels in different countries, including Israel, and estimated them in a variety of ways. The current study continues the tradition of investigating this relationship. The goal is to provide current estimates of the returns to education for different population groups in Israel's labor market, and to see whether the anticipated return has changed substantially due to major developments that have occurred in Israel, both in labor market participation rates and in the educational levels of numerous population segments. Additionally, the study looks at whether educational, employment, and wage disparities found in the past between Jews of different ethnic backgrounds have remained unchanged.

Unsurprisingly, education and experience play a key role in determining employment and wages. Both wage levels and the likelihood of being employed rise significantly with each rung on the educational ladder, meaning that the benefits from education are never exhausted at any stage. The positive impact of occupational experience on the probability of working and on expected earnings is exhausted after 22 and 31 years, respectively, and then diminishes.

We will show that these relationships between human capital factors, employment, and wages vary between workers of different ethnicities, sectors, and genders. The highest returns to years of experience are enjoyed by Mizrahi Jewish men and women, while non-Jewish men and women have to content themselves with a much more modest return.

---

\* Michael Debowy, Research Assistant, Taub Center for Social Policy Studies in Israel; doctoral student, Department of Economics, Ben-Gurion University of the Negev. Prof. Gil Epstein, Principal Researcher, Taub Center; Department of Economics, Bar-Ilan University. Prof. Avi Weiss, President, Taub Center; Department of Economics, Bar-Ilan University.

## Literature review

Although this question has been explored thousands of times, it should be noted that the relationship measured in the various studies is not always causal. Finding a correlation between wage and education levels, for example, does not mean that education is what caused the high wages. Another explanation for this finding could have to do with unmeasurable factors that affect both education and earnings. For instance, a person who is highly talented and highly motivated may be more successful in his studies and earn more, but he would have earned more even without higher education. In other words, it may be that education only signals a person's ability level (Spence, 1973). Indeed, most of the articles on this topic note only a correlation, but there are also articles that estimate a causal relationship. It should be noted that the results of the causal and the non-causal studies are not essentially different. This finding justifies continued study of correlations only, even without causal evidence. In the current study we measure correlations only, while controlling for many other variables, but without determining causality.

In the Israeli context, Frish (2009) looked at both the relationship between education and wages, and the causal effect of education in Israel. Frish estimated the education-earnings relationship on the basis of 1995 population census data and household income surveys from 1996 to 2005. He focused on people from disadvantaged populations in age ranges affected by the 1979 amendment to the Compulsory Education Law, which expanded compulsory education to Grade 10, and free education to Grade 11. He found that there was no real difference between the various estimation findings, and that the returns to an average year of schooling, in wage terms, ranges from 9% to 12%. Frish also showed that the returns to the various levels of education rise until the master's degree (with the most significant jump occurring with the bachelor's degree), and that those with doctorates earn, on average, less than those with master's degrees.

Achdut et al. (2019) relied on administrative data to estimate the returns to education at various institutions of higher education. To isolate the causal effect of education, they employed three different methods: multi-factor analysis; two-stage analysis with the use of geographic proximity to the education institution as an instrumental variable; and the estimation of discontinuity arising from the various institutions' admissions processes. In general, the researchers found that higher education produces a handsome return compared with high school education only. It likewise emerged that

Israel's universities and private colleges give their graduates higher returns than do the country's public colleges, though in each discipline the institution types rank differently in terms of anticipated future wage levels.

Meltzer (2014) looked at returns to education based on 2008 population census data. She focused on a number of different populations, using both of Frish's methods (Frish, 2009) with the addition of the Heckman correction (which we employed in this study). Her findings showed that, in 2008, the average return per year of schooling was 10%, with Mizrahi Jews enjoying a higher return per year of schooling than Ashkenazi Jews, and men receiving a higher return than women. Meltzer also showed that the return from each additional year of schooling is positive through the doctoral level, in contrast with Frish's findings.

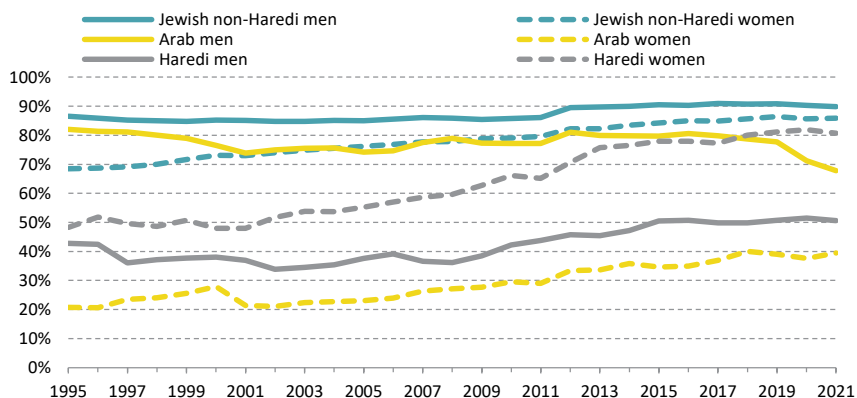
Internationally, Montenegro and Patrinos (2014) investigated the relationship between education and earnings across the globe. Relying on a huge dataset amassed by the World Bank, containing observations from household surveys around the world from the years 1970 to 2013 (75% of the observations are from after 2000), they found an average return of 10% per average year of schooling. When the findings were broken down, it emerged that a year of primary school has a return of 10%, a year of post-primary school has a return of 7%, and a year of study at an institution of higher education has a return of 15%. They also showed that the returns to a year of schooling at any level are slightly higher for women than for men.

## Background data

The past two decades have witnessed major changes, both in labor market participation rates of some segments of Israel's population, and in education levels and academic study rates. These developments will likely alter returns to education in general, and returns from academic education in particular, but it is unclear in which direction. Israel's rising percentage of those pursuing university and college studies, for example, may stem from different sources. On the one hand, if more people are deciding to study without an increase in employer demands, then this may be expected to lead to a decline in the returns to academic education. On the other hand, if the higher academic study rate is being driven by demand for educated workers on the part of employers, then the expected outcome would be an increased return. The degree of change has been such that estimating the effect's direction and size may be critical for setting policy, as we shall see in the conclusions below.

We begin with the changes in labor market participation rates. Figure 1 displays the labor market participation rates of different segments of the population since 1995. As the graph shows, during the second half of the 2000s (from around 2003), there was a turnaround that may have stemmed from social benefit cutbacks, including child allowances, which forced many more people to enter the labor market. The trend change occurred primarily in the Arab and Haredi (ultra-Orthodox Jewish) populations, and among women more than men (in both populations). In the Arab population, the share of employed women doubled, from 20% to 40%, while in the Haredi sector there was a 60% increase in the number of working women — from 50% to nearly 80%. That massive a penetration of new workers could clearly have a major impact on returns to education and experience.

**Figure 1. Labor market participation rate for ages 25-64, by gender and sector**



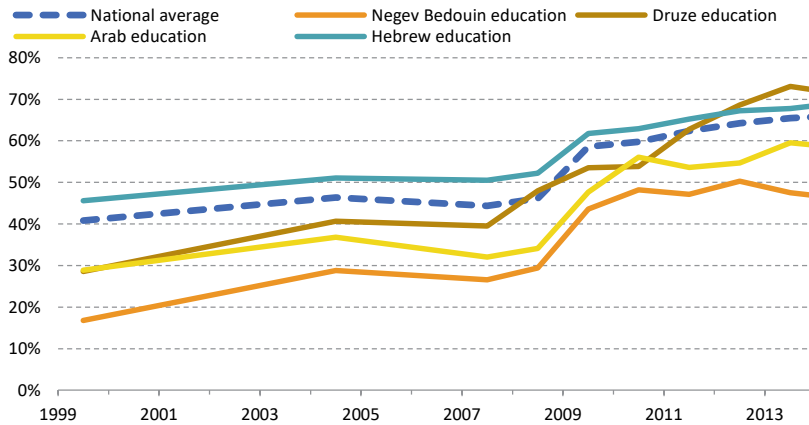
Note: 2021 figures refer to the first three quarters of the year.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Additionally, Figure 1 shows a steep drop in Arab men's participation rates in recent years, a trend that started even before the Covid-19 pandemic and intensified during it. There are a number of social and economic explanations for this development, including the displacement of Israeli construction workers (the vast majority of whom are Arabs) by foreign and Palestinian workers (see Etkes & Adnan, 2021; Geva et al., 2021). With this, recent months have seen an increase in Arab men's employment rates.

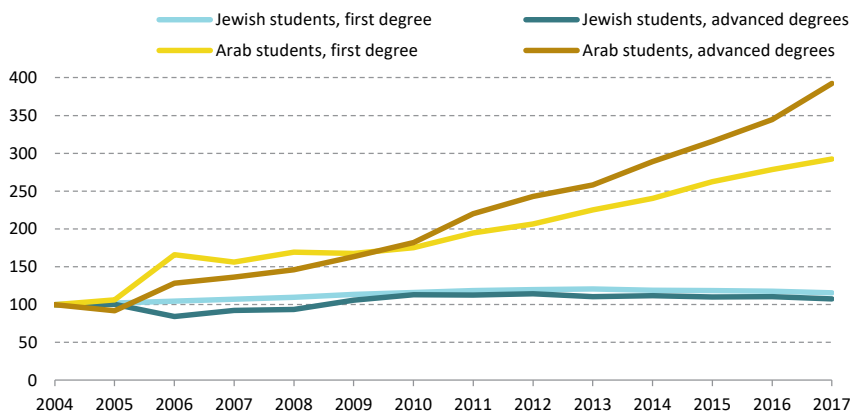
A similar development can be seen in education levels. For example, since the beginning of the 21<sup>st</sup> century, the share of those eligible for a bagrut (matriculation) certificate has risen substantially, from less than half of 17-year-olds to 70% (Figure 2). This rise in the share of those eligible for a bagrut certificate has occurred in all sectors, but Druze students show the largest increase.

**Figure 2. Share of those eligible for the bagrut certificate, by sector**



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: Ministry of Education, Facts and Figures 2015; Facts and Figures 2019

A focus on higher education shows large differences between the Arab and Jewish populations. Ultimately, over the two decades that have passed since the turn of the century, the number of students studying for undergraduate degrees has grown by 50%, and the number of those pursuing graduate degrees by 80%. However, as shown in Figure 3, this increase all but bypassed the Jewish population (the share of those enrolled in academic programs was already high in that sector); it was concentrated, rather, in the Arab population. For example, between 2005 and 2017, the number of Arab undergraduate students tripled, while the number of Arab graduate students quadrupled.

**Figure 3. Index of the number of students in the higher education system, by degree****2004 = 100**

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: The Council for Higher Education, Fidelman, 2009

## Sources and methodologies

To analyze the wage distribution, we used data from Household Expenditure and Income Surveys conducted by the Israel Central Bureau of Statistics (CBS) for the years 2017 and 2018. This dataset includes information on employment, wages, and work hours, as well as background data at the individual level. Most of the data are based on self-reporting by survey respondents (notable exceptions in this regard are the data on income and employment, which are taken from pay slips). The dataset contains some 32,000 observations of individuals ages 17–67, of whom about 22,100 are salaried employees who reported working at least 10 hours a week, the same criterion we used for including the individual as employed in this study.<sup>1</sup>

1 The descriptive and deductive findings presented here remain almost unchanged if the working hours criterion is lowered to just one hour per week, or if self-employed individuals are also included in the sample.

Since we also wanted to look at differences between Ashkenazim and Mizrahim, we divided the Jewish survey respondents as follows: those whose parents were both born in “Europe/America” were marked as Ashkenazim; those whose parents were both born in “Asia/Africa” were marked as Mizrahim; and all other Jews were designated as Israeli-born or as natives of different continents. Individuals whose nationality was “other” were included with those whose nationality was “Arab” (rather than with Jewish individuals, as is done in most other studies).

The estimation procedure used Mincer equations (Mincer, 1958; 1974) to examine the relationship between workers’ earnings and their characteristics, such as education (years of schooling or educational attainment), experience, occupation, and demographic background. In order to take into account the effect of these characteristics on the individual’s decision whether to work, a two-stage estimation model was used utilizing the Heckman correction (Heckman, 1974; 1976). Specifically, this model first estimates the effect of various factors on the probability that individuals will be employed, and then, taking the first stage results into account, estimates the effect of those same factors on earnings.

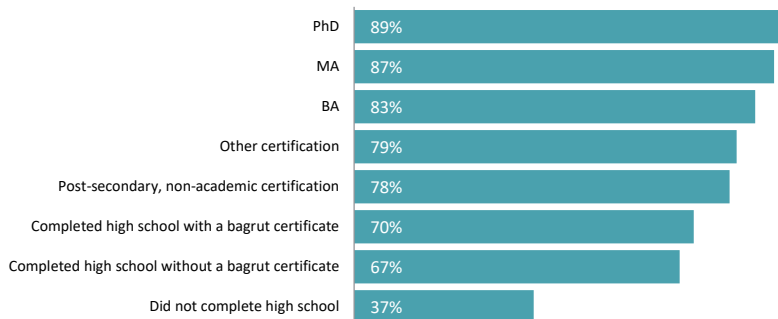
## Description of the data

We start by presenting averages without controlling for other variables. The full analysis is in the next section.

Figure 4 shows the 2017–2018 employment rates by educational attainment. Employment rates rise consistently with education levels, but level off, of course, as full employment is approached. For those who did not complete high school, the labor market participation rate is less than 40%; the rate climbs to 70% for high school graduates, and to over 80% for those with academic degrees. The highest employment rate is for doctorate holders, nearly 90% of whom are employed. Employment rate differences also exist between different population groups, and between different geographic districts (see Appendix Figure 1 and Appendix Table 1).



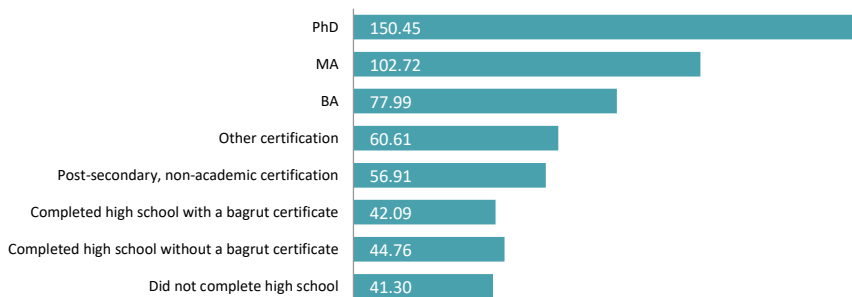
**Figure 4. Employment rates for ages 17–62, by educational attainment, 2017–2018**



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Similarly, average wages tend to rise with education levels. Figure 5 shows the average gross hourly wage for different levels of educational attainment, with the average wage increasing substantially with each degree beyond high school. However, for those with a high school education or less, the differences are small and not always monotonic. In this context, it is interesting to note that the average wage of those with a bagrut certificate is lower than that of high school graduates who did not earn the certificate, though the difference is not significant (the mean values lie in a range of less than one standard deviation from each other). This finding may indicate that the bagrut certificate has little value when unaccompanied by further study.

**Figure 5. Average gross hourly wage, by educational attainment, 2017–2018 NIS**

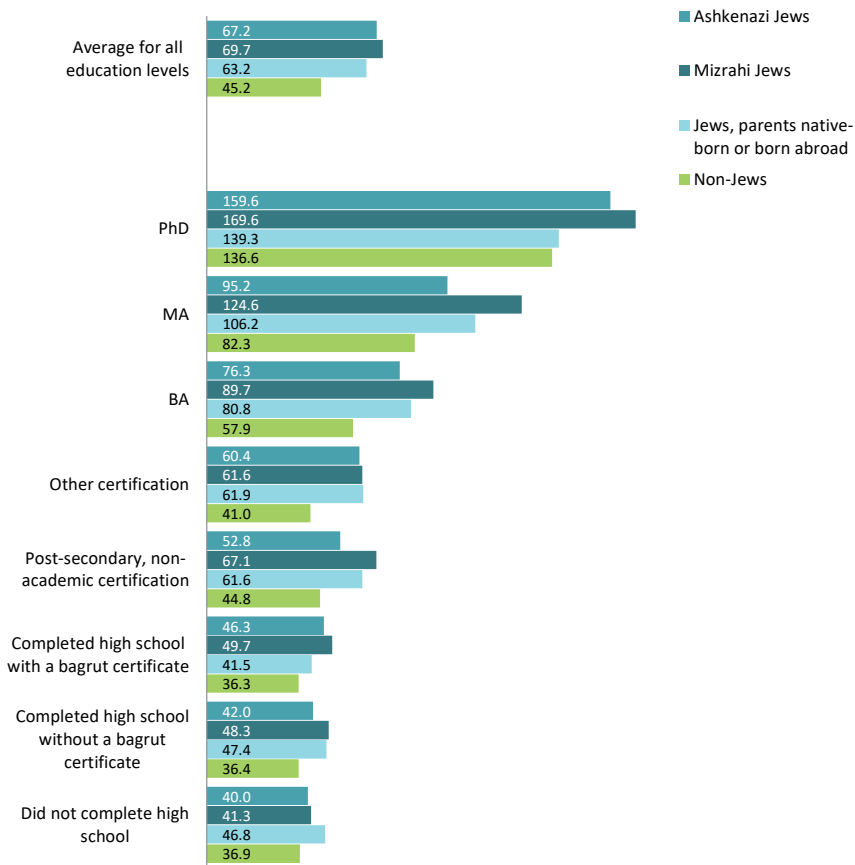


Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

The average wage of individuals with different degrees, broken down by ethnicity and sector, is shown in Figure 6. More complete information is provided in Appendix Table 2, which includes average wage, standard deviation, and number of observations for each degree-ethnicity-sector category.

**Figure 6. Average gross hourly wage of workers, by ethnicity and sector, 2017–2018**

NIS



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Firstly, at each education level, non-Jewish workers earn substantially less than their Jewish peers. This is even more true when we look at the average for the population as a whole, as the Arab sector's education level is lower on average (see the distribution in Appendix Table 2). Secondly, at most education levels Mizrahi Jews earn, on average, more than other Jews, especially Ashkenazi Jews, though the differences are not significant. The sole exceptions are workers without high school education, and Jews with "other degrees," the difference being minor for the latter group. All told, at least on the surface — before controlling for other variables — there seem to be no statistically significant wage differences between Jews of different ethnicities whose education levels are similar. In this context, it is interesting to note that the percentage of non-high-school-graduate workers among Mizrahi Jews is double that of non-Mizrahi Jews, and the percentage among the Arab population is almost double that of Mizrahi Jews (see Appendix Table 2).

However, earnings are not influenced solely by education level, ethnicity, and sector. The relationship between education and earnings is also affected by occupational choice, and by the economic employment sector. To examine this, workers were classified into occupation-economic-sector categories. The correlation between the share of workers with an academic degree and the average wage in each category is shown in Figure 7. As seen, there is a very close relationship between the two. A weighted least squares regression shows that the relationship is significant, with variance in the share of academic degree holders explaining 60% of the average hourly wage difference between occupation-economic-sector categories (see Appendix Table 3).

**Figure 7. Average gross hourly wage and percentage of academic degree holders by occupation, 2017–2018**



Note: Bubble size indicates the category share from the entire labor force.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

## Results of the empirical investigation

To estimate the relationship between wages and their determinants while controlling for the other factors that affect earnings, a multiple regression analysis was conducted using a two-stage framework. In the first stage, the relationship between personal factors and the probability that the individual would work (at least 10 hours a week) was measured. The explanatory variables included were education, experience,<sup>2</sup> occupation, economic sector, geographic location, gender, family status, ethnicity, sector (including separate

- 2 The experience measured is potential experience, equal to age minus number of years of schooling, minus 6 (age of entry to Grade 1). For people with fewer than 10 years of schooling (only a small number of observations), potential experience equals age minus 16.

dummy variables for “others”<sup>3</sup> and Arabs), and level of religious observance. All of these variables were also included in the second stage. Two additional variables were included in the first stage only as instrumental variables — the value of the home owned by the family, and the number of children under the age of 10 at home.<sup>4</sup> The expected effect of these instrumental variables on the probability of working differs fundamentally from their effect on wage. The full findings of the model can be found in Appendix Table 4. The first column contains the basic model, while the second column contains interactions between potential experience and gender, between potential experience and a dummy variable indicating academic education, and between the education variables and gender. The third column contains interactions of ethnicity and sector with experience and education level.

Overall, the model supports the descriptive findings and the predictions. Regarding employment and education, for example, most of the labor market participation differences described in Figure 4 are also valid when the remaining factors are taken into account. Thus, compared with those who did not finish high school, high school graduation raises the likelihood of working by 16%; the bagrut certificate increases it by 20%; a vocational certificate by 23%; a bachelor’s degree by 25%; a master’s degree by 27%; and a doctorate by 28%. Additionally, women work less than men even when controlling for the other variables, while Ashkenazim (and non-Jews even more so) work less than other Jews. By contrast, there is no substantial difference between the employment rates of Mizrahi Jews and mixed Jews or third-generation Israelis.

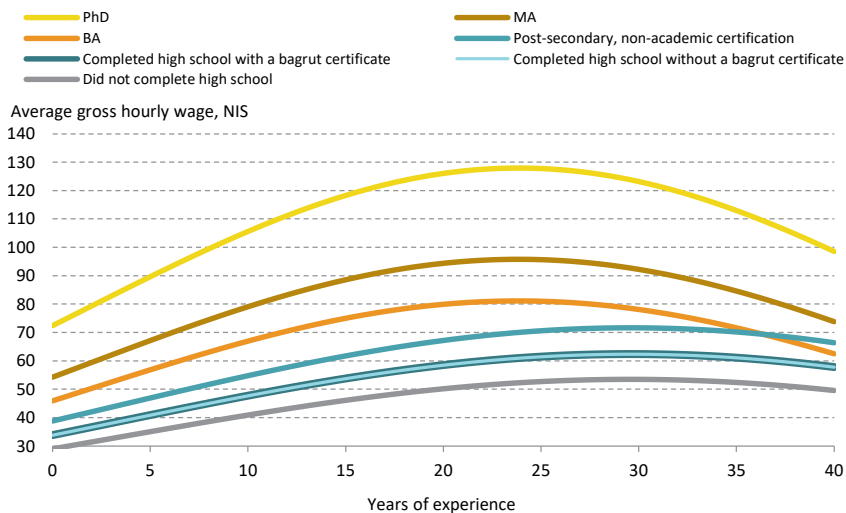
The main findings of this study are obtained in the second stage, which estimates the effect of the factors on hourly wage. These findings are shown in Appendix Table 5. The table’s three columns correspond to the columns in Appendix Table 4, which shows the probability of working results. Regarding the effect of education, there is a growing return to each level of educational attainment, but after controlling for the other variables, as well as for the probability of working, the differences are smaller than those shown in Figure 5. Compared with the lack of a high school diploma, high school

3 The Arab population account for slightly more than three-quarters of the non-Jews, while “others” are slightly less than a quarter.

4 Children are a commonly-used instrumental variable in this context, and home value has a specific advantage in that it is correlated with *lower* probability of working and *higher* earnings, while also serving its purpose as a source of occupational variance that *does not correspond with wage variance*.

graduation (without a bagrut) yields a 12% higher wage (8% in Figure 5); a non-academic vocational certificate — 26% (38%); a bachelor's degree — 45% (89%); a master's degree — 61% (149%); and a doctorate yields a 90% higher wage (264%). That is, the other variables, and in particular the likelihood of working given the individual's other characteristics, explain a substantial portion of the wage differences.

As many have shown, starting with Mincer (1974), experience has a strong effect on wage levels. The model indicates that the positive returns to each year of experience approach their limit after 31 years, while wages are 60%–70% higher at their peak than at the start of one's career. However, when we looked at academic degree holders separately, we found that they actually reach the limit in terms of returns to their experience after 24 years, with a similar rise in earnings. This may reflect their late career start due to additional years of schooling; alternatively, it may reflect depreciation of the human capital acquired through academic study, which happens more quickly than depreciation of the human capital acquired in high school (see Neuman & Weiss, 1995). Nevertheless, it should be emphasized that academic degree holders reach their peak earnings with less experience than do less-educated workers, and thus enjoy the same maximum return within a shorter time frame. Figure 8 shows the earnings anticipated over the course of workers' years of experience by education level, based on the findings of the multi-factor two-stage analysis.

**Figure 8. Effect of years of experience on wage, by education level**

Note: The figure shows the expected hourly wage per years of experience by highest degree, based on the Mincer two-stage model that accounts for the likelihood of the individual working.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

These findings differ from corresponding past estimations, though methodological differences make it hard for us to directly compare different studies. However, the changes in the estimates over the years may be interpreted as evidence of structural changes in the labor market. Table 1 presents estimations of the marginal returns to different degrees in wage terms, as indicated by this study and by flagship studies conducted in the field over the past few decades. Taken at face value, it would appear that the returns to high school education have declined over the years, but remained stable during the past decade. Likewise, the returns to a bachelor's degree have remained the same throughout the period. By contrast, the returns to a master's degree, and especially to a doctorate, have grown significantly. This description is consistent with the phenomenon of "education inflation," whereby credentials lose their *comparative* advantage as they are acquired by larger portions of the labor market. The dramatic decline in the number of citizens without a high school education at the end of the past century, along with the Israeli college revolution, inundated the labor market with high school graduates and undergraduate degree holders, and these education

levels in turn became the “starting point” for the Israeli worker. The major increase in the return enjoyed by doctorate degree holders testifies to the importance of a high level of expertise or to the growth of credentialism in the modern world.<sup>5</sup>

**Table 1. Marginal rate of return for each additional level of educational attainment**

Research study	Year of data	Completed high school	Bagrut certificate	Non-academic certificate	BA	MA	PhD
Frish 2009	1995	20%	15%	10%	29%	7%	-2%
Meltzer 2014	2008	12%	11%	12%	32%	9%	3%
Current study	2017–2018	12%	0%	13%	32%	16%	29%

Note: The marginal rate of return to the bachelor’s degree is computed relative to the bagrut certificate.  
Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS; Meltzer, 2014; Frish, 2009

A gender breakdown does not significantly change the results (Appendix Table 5, Column 2), with similar returns expected for men and women at different education levels. It should be recalled, however, that women’s monthly wages are lower, on average, than those of men.<sup>6</sup>

With regard to ethnic and sector gaps, our findings correspond with the extensive body of literature produced by Israeli researchers over the years. Cohen et al. (2021) looked in depth at the education and income gaps between Ashkenazi and Mizrahi Jews of different immigrant generations in Israel, based on administrative data from the National Insurance Institute for 1.3 million people. They found that the significant education gaps that had existed between second-generation Mizrahim and Ashkenazim *did not diminish* in the third generation, but rather persisted. It was also found that Israeli-born Jews of “mixed” ethnicity more closely resemble Ashkenazim in their educational characteristics than they do Mizrahim. Moreover, with regard to income it was found that male Mizrahim in the younger age groups enjoy a slight advantage (due, apparently, to lower rates of post-secondary education and the acquisition of work experience at earlier stages), but that after age 30, Ashkenazim gain a continued advantage that approaches 20% by

5 Credentialism is the valuation (sometimes the overvaluation) of a person on the basis of the degrees they hold. For a review of the topic, see Bills & Brown, 2011.

6 For in-depth analyses of gender wage gaps see Fuchs, 2017, and Fichtelberg-Barmatz, 2016.

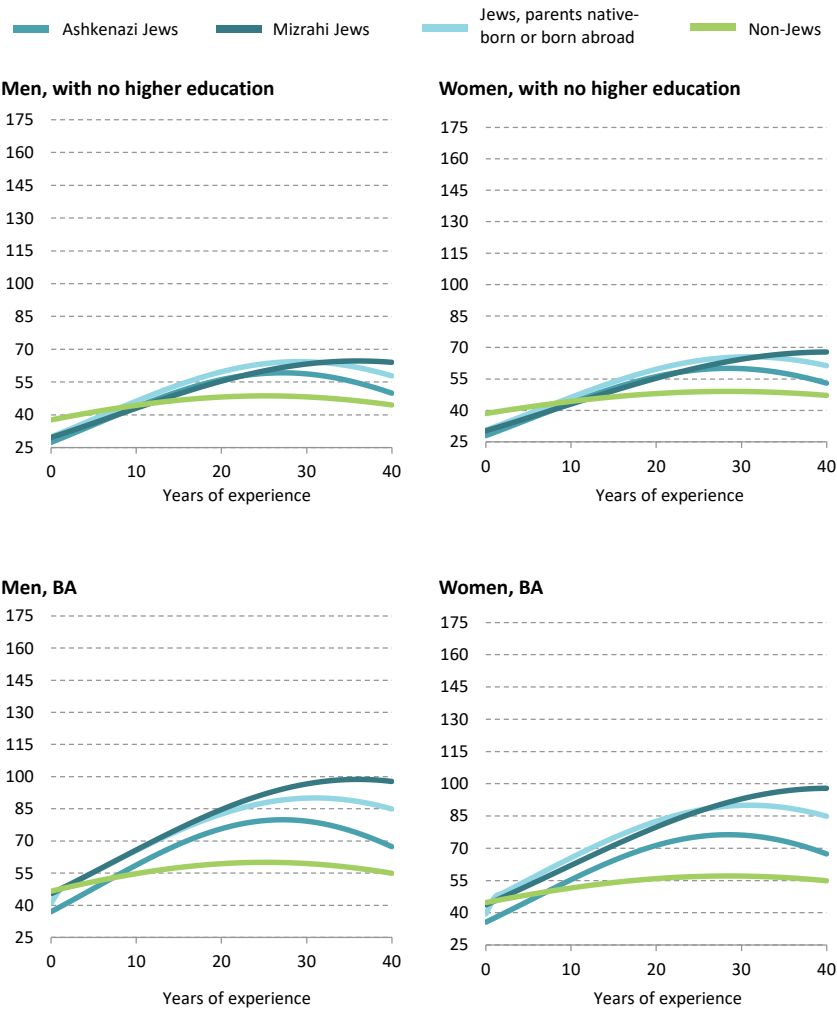


age 43 — among third-generation as well as second-generation immigrants. These findings are consistent with earlier literature on the topic (e.g., Cohen & Habersfeld, 2003; Dahan et al., 2002; Friedlander et al., 2002).

Some of our findings (Appendix Table 5, Column 3) differ from those findings, while others are similar. Almost no significant differences were found between Jews of different ethnicities (though Mizrahim enjoy a higher return, on average, from vocational and doctoral degrees), nor were significant differences found between Jews and non-Jews in terms of returns to education; however, non-Jews' wage levels are substantially lower than those of Jews, though the earnings ratio is similar at all education levels.

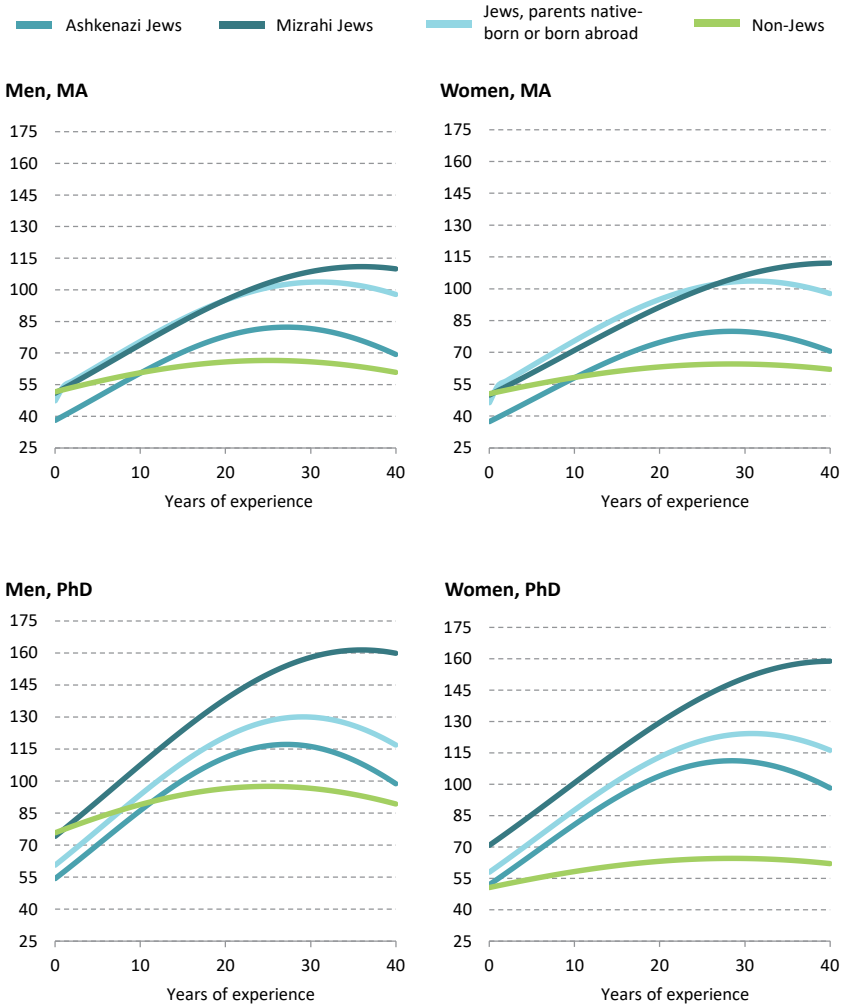
With regard to experience-driven increases in earnings, there are major differences between the populations. Mixed and third-generation Jews enjoy a rise in earnings that continues over 30 years and peaks at 76%. By contrast, the experience of Mizrahi workers is exhausted only after 36 years, with a maximum rise of 78%, while Ashkenazim exhaust their experience after 37 years with a return of 105%. The return from experience of non-Jews reaches its apex after 25 years, with a maximum increase of just 25%. There is no significant difference in wage increase rates between women and men. Figure 9 shows the expected wage development for men and women from different groups and with different education levels. One can see that Jewish workers tend toward similar earnings throughout their careers, though Mizrahim accumulate higher returns from their experience and education (on average, as these are not statistically significant differences). It is also clear that among the less-educated (and the highest-educated), the initial situation of non-Jewish workers is actually better than that of their Jewish peers, but not among those with bachelor's and master's degrees.

**Figure 9. Effect of years of experience on wages, by gender, education, ethnicity, and sector**  
NIS



**Figure 9 (continued). Effect of years of experience on wages, by gender, education, ethnicity, and sector**

NIS



Note: The figures display the expected hourly wage by years of experience and by educational attainment, given occupation, geographic location, status (self-employed or wage earner), family status, sector, and level of religious observance, based on a two-stage model that accounts for the probability of the individual working.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

## Summary of findings and socioeconomic implications

In this chapter, we saw that there is a significant and steady relationship between human capital factors and employment and earnings. Our findings indicate that the marginal returns to education rise at all education levels, that is, that the completion of an additional educational stage correlates with a rise in wages at any given stage, except for a bagrut certificate, which does not correlate with a higher income than does a high school diploma. In this context, it seems that the contribution of high school graduation or the completion of the bagrut certificate is marginal if not followed by investment in the next stage — higher, academic education. In particular, there is a high premium conferred in the modern world to advanced degrees, especially a doctorate, which was formerly perceived as non-lucrative.

Years of experience also make a major contribution to earnings, though their marginal return diminishes over time. Earnings peak after 31 years on average, with academic degree holders reaching their peak wage after fewer years than the rest of the working population. The likelihood of working also rises with years of experience, whose peak contribution to employment arrives after 22 years on average. These findings are robust in a multi-factor analysis that takes a variety of background variables into account.

As is well known, there are gaps in employment rates and wages among different population groups. Accordingly, we show how education narrows gaps: when education levels are similar, Jews from different population groups resemble their peers in employment and wage levels (that is, the wage and employment disparities between the groups stem from education gaps). Nevertheless, we show the moderate returns to education received by non-Jewish men; for them, the wage gaps remain the same even when they are better-educated, and they are widest precisely for those with post-secondary education (vocational or academic), except for those with doctorates.

It is thus clear that, for many Israelis of working age, the path to employment and to an occupation that makes optimal use of one's skills runs through formal higher education. The greater the weight accorded to academic degrees in terms of the options available to the Israeli worker, the more worthwhile it becomes to increase access to higher education for all those who wish to pursue it. Given education's externalities, and the economic, geographic, and other conditions that make it hard for certain populations to acquire academic education, it is worth considering ways to support disadvantaged populations and to focus on solutions in the area of economic and geographic accessibility,

while also addressing language and cultural difficulties. In the meantime, it is important to increase access to studies in the geographic periphery, whether by opening new institutions (or branches of existing institutions), or by expanding online learning (while investing in broadband infrastructures).

Regarding the non-Jewish population, our findings are not encouraging. The returns on education for non-Jewish men and women are lower than those enjoyed by their Jewish peers, particularly for vocational, undergraduate, and graduate degrees. The Arab and Jewish populations' economic separateness — which makes it difficult for non-Jewish workers to realize the full potential of their education and experience — provides at least a partial explanation for this finding. It is reasonable to assume that additional background factors (that lie beyond the scope of this article) play a role as well, especially given our findings regarding labor market gender differences among Arabs. One way or another, policies designed to draw different populations into the labor market will benefit the economy and improve the utilization of human capital within it.

## References

### English

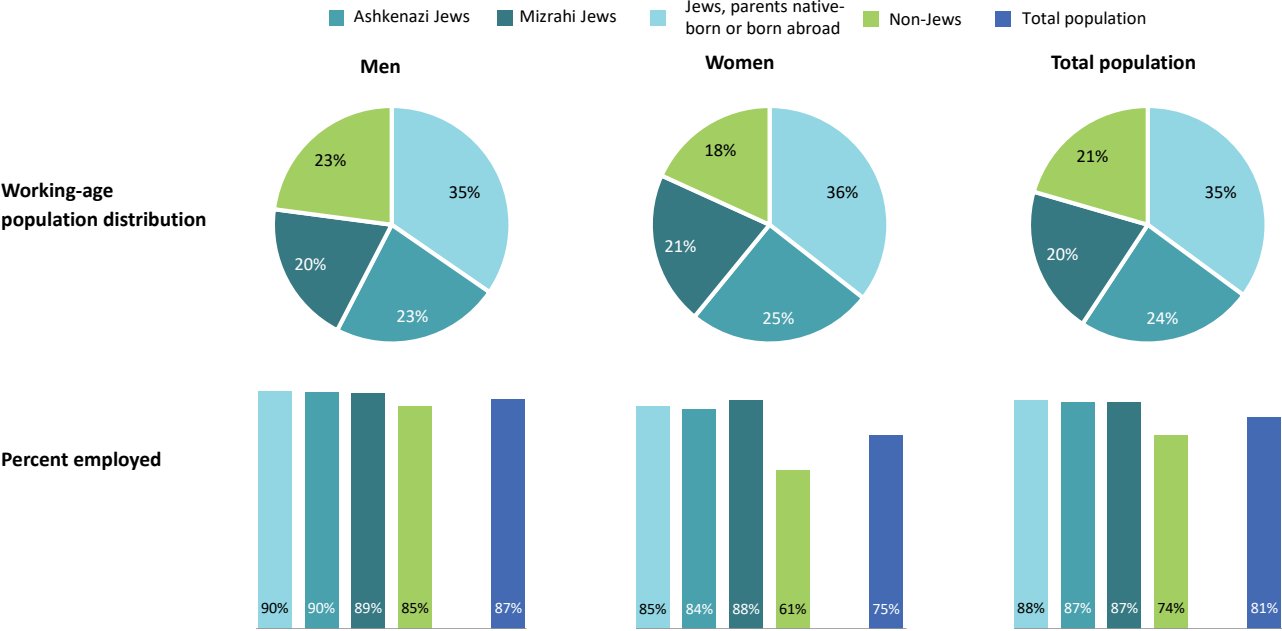
- Achdut, L., Gutman, E., Lipiner, I., Maayan, I., & Zussman, N. (2019). The wage premium on higher education: Universities and colleges. *Israel Economic Review*, 17(2), 29–99.
- Becker, G. S. (1964). *Human capital*. Columbia University Press for the National Bureau of Economic Research.
- Bills, D., & Brown, D. (2011). New directions in educational credentialism Introduction. *Research in Social Stratification and Mobility*, 29(1), 1–4.
- Cohen, Y., & Haberfeld, Y. (2003). [\*Gender, ethnic, and national earning gaps in Israel: The role of rising inequality\*](#). The Pinhas Sapir Center for Development, Tel-Aviv University.
- Cohen, Y., Haberfeld, Y., Alon, S., Heller, O., & Endeweld, M. (2021). [\*Ethnic gaps in higher education and earnings among second and third generation Jews in Israel\*](#). National Insurance Institute.
- Friedlander, D., Okun, B., Eisenbach, Z., & Elmakias, L. (2002). Immigration, social change, and assimilation: Educational attainment among birth cohorts of Jewish ethnic groups in Israel. *Population Studies*, 56(2), 135–150.
- Frish, R. (2009). The economic returns to schooling in Israel. *Israel Economic Review* 7(1), 113–141.
- Fuchs, H. (2017). [\*Education and employment among young Arab Israelis\*](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2017* (pp. 259–301). Taub Center for Social Policy Studies in Israel.
- Heckman, J. (1974). Shadow prices, market wages, and labor supply. *Econometrica*, 42(4), 679–694.
- Heckman, J. (1976). The common structure of statistical models of truncation, sample selection and limited dependent variables and a simple estimator for such models. *Annals of Economic and Social Measurement*, 5(4), 475–492.
- Mincer, J. (1958). Investment in human capital and personal income distribution. *Journal of Political Economy*, 66(4), 281–302.
- Mincer, J. (1974). *Schooling, experience, and earnings*. NBER Press.
- Montenegro, C. E., & Patrinos, H. A. (2014). [\*Comparable estimates of returns to schooling around the world\*](#). World Bank Group.
- Neuman, S. & Weiss, A. (1995). On the effects of schooling vintage on experience earnings profiles: Theory and evidence. *The European Economic Review*, 39, 943–955.
- Spence, M. (1973). Job market signaling. *Quarterly Journal of Economics*, 87(3), 355–374.

## Hebrew

- Dahan, M., Mironichev, N., Dvir, E., & Shye, S. (2002). Have educational gaps narrowed? *Economic Quarterly*, 49(1), 159–188.
- Etkes, H., & Adnan, W. (2021) *Illegal trade in work permits for Palestinian workers in Israel: The current situation and plans for reform*. Bank of Israel.
- Fichtelberg-Barmatz, O. (2016). *Are there jobs where women earn as much as men? Pay gaps between women and men by occupations*. Ministry of Economy and Industry.
- Fidelman, I. (2009). *Data on students from the Arab sector at higher education institutions*. Knesset, Research and Information Center.
- Geva, A., Amira, N., Tehawkho, M., Laromme, T., & Moskalev, K. (2021). *Employment of Arab men and programs for the move from high school to education and employment*. Aaron Institute for Economy Policy, Reichman University. Chief Economist Division, Ministry of Finance. Ministry of Welfare and Social Affairs.
- Meltzer, Y. (2014). *Education returns: Inequality between different populations in Israel*. Van Leer Institute Press.

# Appendix

Appendix Figure 1. Employment rate and share of working age in total population, by gender, ethnicity, and sector



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS



**Appendix Table 1. Employment rate by geographic district and gender**

District/ Employment rate	Jerusalem	North	Haifa	Center	Tel Aviv	South	Judea/ Samaria
Total	72%	72%	81%	88%	87%	79%	83%
Men	78%	86%	90%	95%	91%	88%	84%
Women	67%	60%	75%	83%	84%	72%	83%

Source: Michael Debowy, Gil Epstein and Avi Weiss, Taub Center | Data: CBS

**Appendix Table 2. Average gross hourly wage, by educational attainment, ethnicity, and sector**

NIS

	Jews			Non-Jews
	Ashkenazim	Parents native-born or born abroad	Mizrahim	
Primary or middle school	40.0 (27.0) [185, 4.9%]	46.8 (38.2) [663, 5.7%]	41.3 (45.4) [324, 11.6%]	36.9 (69.7) [777, 19.8%]
High school without bagrut	42.0 (28.7) [395, 10.5%]	47.4 (33.9) [2,045, 17.6%]	48.3 (43.3) [536, 19.2%]	36.4 (19.4) [735, 18.7%]
Bagrut certificate	46.3 (33.7) [686, 18.3%]	41.5 (54.6) [3,327, 28.6%]	49.7 (92.6) [618, 22.1%]	36.3 (21.9) [956, 24.4%]
Non-academic certificate	52.8 (41.0) [602, 16.0%]	61.6 (36.0) [1,085, 9.3%]	67.1 (47.0) [310, 11.1%]	44.8 (25.2) [471, 12.0%]
BA	76.3 (67.6) [953, 25.4%]	80.8 (57.3) [2,746, 23.6%]	89.7 (80.4) [576, 20.6%]	57.9 (30.8) [643, 16.4%]
MA	95.2 (106.1) [749, 20.0%]	106.2 (58.8) [1,357, 11.7%]	124.6 (89.3) [315, 11.3%]	82.3 (70.5) [295, 7.5%]
PhD	159.6 (247.9) [98, 2.6%]	139.3 (83.5) [139, 1.2%]	169.6 (115.3) [54, 1.9%]	136.6 (135.4) [27, 0.7%]
Other diploma	60.4 (36.9) [83, 2.2%]	61.9 (47.0) [282, 2.4%]	61.6 (36.0) [63, 2.3%]	41.0 (25.1) [21, 0.5%]

**Appendix Table 2 (continued). Average gross hourly wage, by educational attainment, ethnicity, and sector**  
NIS

	Ashkenazim	Jews Parents native-born or born abroad	Mizrahim	Non-Jews
Total	67.2 (79.0) [3,751, 100.0%]	63.2 (55.9) [11,644, 100.0%]	69.7 (78.3) [2,796, 100.0%]	45.2 (46.0) [3,925, 100.0%]

Note: Each cell in the second row contains the average value for the group, with the standard deviation in parentheses below it, and below that the number of observations in the sample (as number and as percentage of the group) in brackets.  
Source: Michael Debowy, Gil Epstein and Avi Weiss, Taub Center | Data: CBS

**Appendix Table 3. Results of weighted least squares model, percentage of academic degree holders by occupation and economic sector**

Dependent variable: Natural logarithm of average hourly wage	
Percent with a higher degree in the occupation	1.146*** (0.111)
Intercept	3.572*** (0.046)
R <sup>2</sup>	0.577
Number of observations	126

Significance level: \*\*\*p < 0.01.  
Note: Standard deviation in parentheses.  
Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

**Appendix Table 4. Results of the multi-factor analysis, probability of working**

	(1)	(2)	(3)
High school (without a bagrut certificate)	0.4550*** (0.02690)	0.4684*** (0.03798)	0.5605*** (0.03804)
Bagrut certificate	0.6141*** (0.02636)	0.6255*** (0.03754)	0.7911*** (0.03716)
Non-academic certificate	0.6946*** (0.03354)	0.6786*** (0.05234)	0.7719*** (0.04559)
BA	0.7791*** (0.03020)	0.8573*** (0.06360)	0.8971*** (0.04095)
MA	0.8414*** (0.03878)	0.8748*** (0.07870)	0.9169*** (0.04902)
PhD	0.9235*** (0.09913)	0.9222*** (0.14822)	0.9976*** (0.11932)
Other diploma	0.8801*** (0.06974)	0.5061*** (0.09949)	0.9733*** (0.08037)
Potential experience	0.0826*** (0.00226)	0.0956*** (0.00351)	0.0993*** (0.00389)
Potential experience squared	-0.0019*** (0.00005)	-0.0021*** (0.00007)	-0.0022*** (0.00008)
Potential experience X Academic degree		0.0129* (0.00565)	
Potential experience squared X Academic degree		-0.0007*** (0.00012)	
Potential experience X Female		-0.0229*** (0.00447)	-0.0191*** (0.00438)
Potential experience squared X Female		0.0005*** (0.00009)	0.0004*** (0.00009)
Potential experience X Ashkenazi			0.00917 (0.00480)
Potential experience squared X Ashkenazi			-0.00034** (0.00011)
Potential experience X Mizrahi			-0.00340 (0.00661)
Potential experience squared X Mizrahi			0.00005 (0.00013)
Potential experience X Non-Jew			-0.02197*** (0.00470)
Potential experience squared X Non-Jew			0.00026 (0.00011)

**Appendix Table 4 (continued). Results of the multi-factor analysis, probability of working**

	(1)	(2)	(3)
Female	-0.0931*** (0.02445)	0.5963*** (0.13301)	0.0084 (0.03148)
High school without bagrut X Female		-0.6693*** (0.13534)	-0.66522*** (0.13154)
Bagrut certificate X Female		-0.6510*** (0.13491)	-0.62107*** (0.13081)
Non-academic certificate X Female		-0.6076*** (0.13404)	-0.58932*** (0.13737)
BA X Female		-0.6080*** (0.14083)	-0.46249*** (0.13337)
MA X Female		-0.4622*** (0.13693)	-0.29555* (0.14085)
PhD X Female		-0.3351* (0.14546)	-0.25322 (0.21844)
Ashkenazi	-0.1203*** (0.02620)	-0.0766** (0.02680)	0.50411*** (0.08438)
High school without bagrut X Ashkenazi			0.15972 (0.09974)
Bagrut certificate X Ashkenazi			0.13790 (0.09222)
Non-academic certificate X Ashkenazi			0.19456 (0.09980)
BA X Ashkenazi			0.20664* (0.09489)
MA X Ashkenazi			0.12153 (0.10270)
PhD X Ashkenazi			0.31569 (0.19748)
Other diploma X Ashkenazi			0.04327 (0.17928)
Mizrahi	0.0146 (0.02751)	0.0386 (0.02747)	0.4878*** (0.07714)
High school without bagrut X Mizrahi			0.25169** (0.08062)
Bagrut certificate X Mizrahi			0.37500*** (0.08046)
Non-academic certificate X Mizrahi			0.39192*** (0.10431)
BA X Mizrahi			0.16198 (0.09022)

**Appendix Table 4 (continued). Results of the multi-factor analysis, probability of working**

	(1)	(2)	(3)
MA X Mizrahi			0.15896 (0.11420)
PhD X Mizrahi			0.48898* (0.24056)
Other diploma X Mizrahi			0.15526 (0.17220)
Non-Jew	-0.6186*** (0.02754)	-0.6001*** (0.02782)	-0.1450** (0.05562)
Sector "Other"	0.4541*** (0.05138)	0.4678*** (0.05229)	0.4792*** (0.05280)
High school without bagrut X Non-Jew			-0.18202** (0.06197)
Bagrut certificate X Non-Jew			0.34337*** (0.05284)
Non-academic certificate X Non-Jew			0.31544*** (0.05007)
BA X Non-Jew			0.62314*** (0.06935)
MA X Non-Jew			0.66816*** (0.06464)
PhD X Non-Jew			0.72544*** (0.09563)
Other diploma X Non-Jew			0.51313 (0.27740)
Number of children under age 10 in the household	-0.0457*** (0.00635)	-0.0459*** (0.00651)	-0.0440*** (0.00647)
Value of home owned (NIS million)	-0.0099*** (0.00068)	-0.0004** (0.00003)	-0.0021* (0.00069)
Intercept	-0.3237*** (0.04197)	-0.4237*** (0.04581)	-0.5927*** (0.04696)
Additional variables: occupation, industry sector, residential district, family status, level of religious observance, survey year	Yes	Yes	Yes
Number of observations	31,820	31,820	31,820
Working individuals out of total	22,103	22,103	22,103

Significance level: \*p &lt; 0.10; \*\*p &lt; 0.05; \*\*\*p &lt; 0.01.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

**Appendix Table 5. Results of the multi-factor analysis, wage equation**

	(1)	(2)	(3)
High school without bagrut	0.1195*** (0.01704)	0.1528*** (0.02080)	0.0569* (0.02597)
Bagrut certificate	0.1275*** (0.01889)	0.1540*** (0.02262)	0.0558* (0.02835)
Non-academic certificate	0.2623*** (0.01928)	0.2913*** (0.02340)	0.1766*** (0.02803)
BA	0.4458*** (0.02003)	0.4594*** (0.03340)	0.3709*** (0.02853)
MA	0.6100*** (0.02250)	0.6254*** (0.03718)	0.5127*** (0.03024)
PhD	0.8955*** (0.04171)	0.9148*** (0.06055)	0.7607*** (0.05125)
Other diploma	0.3156*** (0.03302)	0.3158*** (0.05232)	0.2616*** (0.03945)
Potential experience	0.0435*** (0.00156)	0.0414*** (0.00212)	0.0524*** (0.00233)
Potential experience squared	-0.0007*** (0.00003)	-0.0007*** (0.00004)	-0.0009*** (0.00005)
Potential experience X Academic degree		0.0063* (0.00254)	
Potential experience squared X Academic degree		-0.0003*** (0.00006)	
Potential experience X Female		-0.0011 (0.00224)	-0.0030 (0.00225)
Potential experience squared X Female		0.0000 (0.00005)	0.0001 (0.00005)
Potential experience X Ashkenazi			0.00413 (0.00234)
Potential experience squared X Ashkenazi			-0.0004* (0.00005)
Potential experience X Mizrahi			-0.0092** (0.00315)
Potential experience squared X Mizrahi			0.0003*** (0.00006)
Potential experience X Non-Jew			-0.0323*** (0.00256)
Potential experience squared X Non-Jew			0.0005*** (0.00006)
Female	-0.1264*** (0.01481)	-0.1064 (0.06097)	-0.0933*** (0.02183)

**Appendix Table 5 (continued). Results of the multi-factor analysis, wage equation**

	(1)	(2)	(3)
High school without bagrut X Female		-0.0547 (0.05980)	0.11193 (0.07785)
Bagrut certificate X Female		-0.0295 (0.05992)	0.00363 (0.07385)
Non-academic certificate X Female		-0.0516 (0.06041)	0.03638 (0.07366)
BA X Female		-0.0020 (0.05907)	0.05428 (0.07524)
MA X Female		0.0058 (0.06119)	0.07224 (0.07340)
PhD X Female		-0.0035 (0.09138)	0.04795 (0.07498)
Other diploma X Female		0.0504 (0.06261)	0.04483 (0.10308)
Ashkenazi		-0.0919*** (0.01133)	-0.0815*** (0.01127)
High school without bagrut X Ashkenazi			-0.00601 (0.06253)
Bagrut certificate X Ashkenazi			0.14695* (0.05974)
Non-academic certificate X Ashkenazi			-0.08118 (0.06074)
BA X Ashkenazi			-0.02199 (0.05986)
MA X Ashkenazi			-0.13457* (0.06091)
PhD X Ashkenazi			-0.02801 (0.10757)
Other diploma X Ashkenazi			0.16442 (0.09733)
Mizrahi	0.0208 (0.01230)	0.0246* (0.01223)	-0.0158 (0.04893)
High school without bagrut X Mizrahi			0.00523 (0.05219)
Bagrut certificate X Mizrahi			0.13016* (0.05417)
Non-academic certificate X Mizrahi			0.11911* (0.05751)

**Appendix Table 5 (continued). Results of the multi-factor analysis, wage equation**

	(1)	(2)	(3)
BA X Mizrahi			0.11522 (0.05903)
MA X Mizrahi			0.09082 (0.06204)
PhD X Mizrahi			0.21652* (0.10999)
Other diploma X Mizrahi			0.07557 (0.09165)
Non-Jew	-0.1131*** (0.01695)	-0.0912*** (0.01666)	0.2043*** (0.03804)
Sector "Other"	-0.0689** (0.02542)	-0.0814** (0.02498)	-0.0120 (0.02511)
High school without bagrut X Non-Jew			0.02598 (0.04533)
Bagrut certificate X Non-Jew			0.05419 (0.04736)
Non-academic certificate X Non-Jew			-0.02581 (0.05396)
BA X Non-Jew			-0.07840 (0.04787)
MA X Non-Jew			-0.11684 (0.06032)
PhD X Non-Jew			0.01750 (0.13632)
Other diploma X Non-Jew			-0.28652 (0.18773)
Intercept	3.3645*** (0.06120)	3.3680*** (0.06363)	3.3444*** (0.06735)
Additional variables: occupation, industry sector, residential district, family status, level of religious observance, survey year	Yes	Yes	Yes
Additional variables: adjusted probability of working	Yes	Yes	Yes
$\rho^s$	0.3931*** (0.05465)	0.2931*** (0.05200)	0.3203*** (0.06664)
$\sigma^s$	-0.5733*** (0.01002)	-0.5876*** (0.00880)	-0.5898*** (0.01039)



**Appendix Table 5 (continued). Results of the multi-factor analysis, wage equation**

	(1)	(2)	(3)
$\chi$	14,515.47	14,806.09	14,660.09
(p-value)	0.00000	0.00000	0.00000
Number of observations	22, 103	22,103	22,103

Significance level: \*p < 0.10; \*\*p < 0.05; \*\*\*p < 0.01.

§ The statistics displayed are a Fisher transformation of  $\rho$ , the correlation between the residuals of the first and second stages of the estimation, and the natural logarithm of  $\sigma$ , the standard deviation of the second-stage residuals. The product of these two is the coefficient of the “non-selection hazard” in the second-stage (commonly interpreted as the effect of the choice to work on the wage).

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

## *Executive Summary*

# Employment and Level of Happiness: The Effect of Employment on the Level of Happiness Among Israelis Ages 60–80

**Hila Axelrad, Israel Luski, and Arie Sherman**

Recent decades have seen significant advances in medicine that have substantially increased life expectancies and improved the quality of health in all age groups in Israel. Due to the gradual rise in health levels and retirement ages, the share of older adults participating in the labor market is also trending upward.

This study looks at the effect of employment on happiness levels among Israelis ages 60–80. In particular, we examine the effects of employment variables — work hours and retirement and, to a lesser degree, volunteer activity (which is actually unpaid employment) — and of sociodemographic variables on happiness levels.

---

\* Dr. Hila Axelrad, researcher in adult employment, School of Social and Policy Studies, Tel Aviv University and the Aaron Institute for Economic Policy, Interdisciplinary Center Herzliya (IDC). Prof. Israel Luski (ז"ל), was a researcher in industrial organization, economics and adult employment, West Galilee College; Professor Emeritus, Ben-Gurion University of the Negev. Prof. Luski passed away a short time after the completion of this paper. Dr. Arie Sherman, researcher in the economics of happiness and well-being, Economics and Management Department, Ruppin Academic Center. This study was conducted jointly with the Taub Center for Social Policy Studies in Israel. This study was first published in February 2021.

The study was based on two datasets: the Survey of Health and Retirement in Europe (SHARE), which includes data on social status, health, and employment between 2004 and 2016, and a database compiled by the researchers especially for the current study, using questionnaires aimed at tracing the effect of employment and work hours on happiness levels in 2019. Analysis of the questionnaires included consideration of the reasons for deciding whether or not to retire, work hour changes, and participant opinions about what Israel's retirement policy should be. The study focuses on individuals in the 60–80 age group, solely within Israel's non-Haredi Jewish population.

### Happiness levels and employment variables

- The effect on happiness levels depends primarily on the type of work. Employment in stimulating fields (jobs in areas such as development, management, and research that require cognitive skills), as well as volunteer activity, were found to have a significant and positive effect on happiness levels.
- By contrast, employment in high-stress jobs (jobs where there is constant pressure in terms of workload, multitasking, and deadlines) has a clear negative effect
- A large number of work hours in a stimulating job raises satisfaction levels.
- The opposite is also the case: long hours at a stressful job negatively affect happiness levels.

### Happiness levels and sociodemographic variables

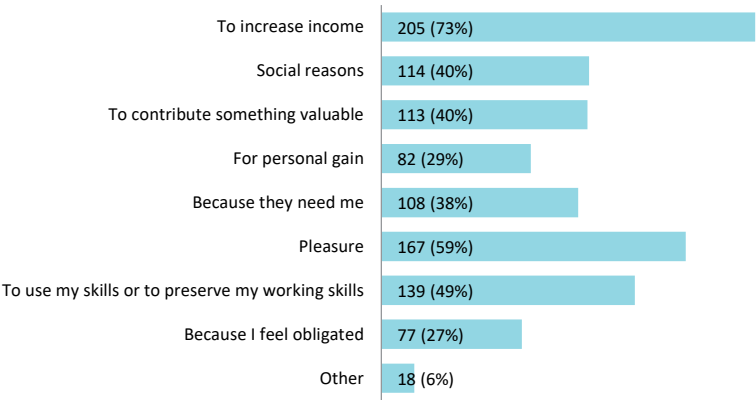
- The highest happiness levels were found among those who are married or in a relationship (whether employed or not), and the levels rise with the number of children.
- The lowest happiness levels were found among employed single individuals and among non-employed divorced people.
- Happiness rises with income and health levels.
- The employment variable's effect on women's happiness levels is not statistically significant.
- Likewise, no significant effect on happiness levels was found for employment in physically demanding jobs.

## Retirement age and the decision to retire or to continue working

- The average retirement age is 61 for men and 59 for women, although survey respondents expressed their intention to retire at older ages (70 for men and 67 for women). The study also found no opposition to raising the retirement age.
- The main reason for continuing to work after 60 is the desire to increase one’s income. Other reasons are: pleasure in one’s work, the desire to preserve one’s human capital and work skills, and the social factor — relationships with co-workers or clients. The data also show that over half of those who retire do so voluntarily, and that they have, on average, higher satisfaction levels.
- The decision to retire is driven by several factors: health reasons lower the retirement age to a significant degree, as do expectations of low pay and problems finding work in one’s field. Satisfaction with one’s current income is also a factor that lowers the retirement age.

### Reasons for continued employment among workers ages 60 to 80

The number of respondents and the percent out of all workers



Note: Respondents had the option of giving more than one reason for their decision; as a result, the total is greater than 100%.

Source: Axlerad, Luski, and Sherman, Taub Center | Data: Sample questionnaires

Our research indicates that health status is a major factor directly affecting both happiness and retirement age. Despite an overall improvement in healthcare and rising levels of physical and mental health awareness, government action in the healthcare and preventive medicine fields is justified. Regarding early retirement, in many cases, the decision stems from the employment problems faced by older adults, and from the fact that people tend to seek employment in their areas of expertise and at the wage levels that prevail in those fields. It would be appropriate to stiffen enforcement of the Employment (Equal Opportunities) Law, which prohibits age discrimination in the labor market, and to develop career retraining programs for older adults as well.

# HEALTH

3



# The Health Workforce in Israel During the Covid-19 Pandemic: An Overview

**Nadav Davidovitch, Baruch Levi, and Rachel Arazi**

## Introduction

Israel has now been dealing with the Covid-19 pandemic for over a year and half. With the end of the “fourth wave” in sight, fears of a “fifth wave,” and the campaign to vaccinate children under the age of 12 under way, Covid-19 is still rampant worldwide. Despite the successful vaccination campaign implemented by Israel, the complete eradication of Covid-19 is not on the horizon. The belief is that this disease is here to stay and we will have to adapt to a reality of “life alongside Covid-19.” This does not mean that we can take a passive approach to the pandemic. On the contrary, all of our systems must be strengthened to meet this on-going challenge — not just healthcare and medicine but also our social and economic systems. We must adopt a broader view of healthcare, including physiological, mental, and social components, and at the same time adopt an integrative approach of “health in all policies.”

This chapter looks at the medical staff in Israel’s healthcare system. It also considers technological changes that developed and were accelerated during the pandemic, with an emphasis on home care and digital medicine. In addition, it analyzes Israel’s unique vaccination program from the perspective of how it interacted with socioeconomic gaps.

Based on the scientific evidence that has accumulated so far, it is becoming increasingly clear that the best way, though perhaps not the only way, to fight the pandemic is through the development of vaccines and their

---

\* Prof. Nadav Davidovitch, Principal Researcher and Chair, Taub Center Health Policy Program; Director, School of Public Health, Ben-Gurion University of the Negev. Dr. Baruch Levi, Guest Researcher, Taub Center; Department of Health Policy and Management, Ben-Gurion University of the Negev. Rachel Arazi, Guest Researcher, Taub Center for Social Policy Studies in Israel; doctoral student, Faculty of Business and Management, Ben-Gurion University of the Negev.



distribution through a well-organized healthcare system that relies on a skilled workforce and on advanced information systems. The various components of the healthcare system work in tandem to ensure the proper functioning of the system as a whole. The processes that were dictated by the circumstances of the pandemic are dynamic, and things are being learned on the fly. With this, they also reflect deeply rooted processes that we have been monitoring for many years, including the widening of gaps between the geographic center and the periphery of the country, between various population groups, and between socioeconomic classes.

Investment in the healthcare system is an investment in Israeli society. According to the report of the Pan-European Commission on Health and Sustainable Development headed by Prof. Mario Montey, an economist and former prime minister of Italy, the pandemic has revealed a serious chronic illness that plagues public policy: shortsightedness. This is manifested in both the shift of the burden onto coming generations and by each country's attempt to solve global problems while focusing on its own narrow perspective alone. In view of upcoming challenges such as climate change, the aging of the population, and socioeconomic disparities, it is important that we understand how to cure this chronic illness (Pan-European Commission, 2021).

## Background

Manpower is the backbone of the entire healthcare system. More than anything else, the quality and quantity of it are what determine the system's resilience, performance, and level of functioning, both in an emergency and in normal times. Therefore, the planning, training, and cultivation of manpower are the most important and complex tasks facing the healthcare system.

In recent years, manpower in Israel's healthcare system has become increasingly important due to scarcities in various healthcare professions, and it appears that, as a result of the Covid-19 pandemic, greater attention is being paid to this issue. This is true primarily with respect to physicians. Physicians spearhead the healthcare system in Israel, from both the care and the managerial perspective. The training of a physician, which takes between 7 and 12 years and includes theoretical studies, practical clinical studies, a residency period, and usually also specialization, requires a significant amount of resources and infrastructure. Due to the long training period, making significant changes in the number of doctors in the short term is difficult.

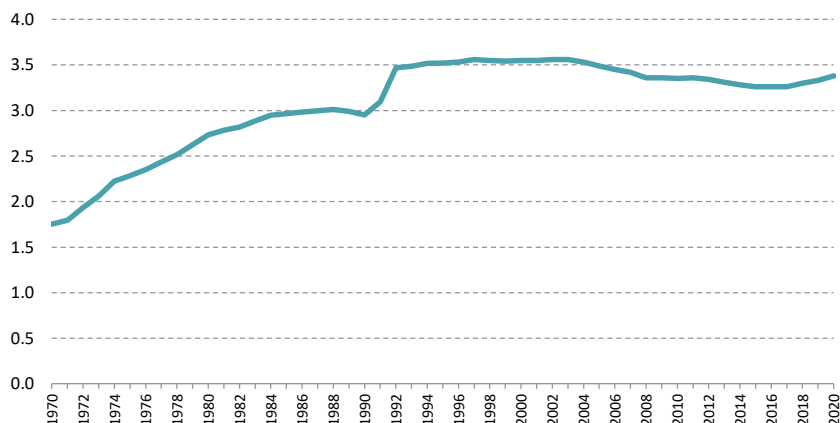
Therefore, it is highly important to plan the health workforce for the system in the long run. The planning process should take into account the predicted number of physicians and the trends in physician retirement, as well as the future and evolving needs of the population (Shapiro et al., 2021).

This chapter will, therefore, discuss one of the most important aspects of the response to the Covid-19 pandemic in Israel, namely the preparedness of its health workforce in the face of the pandemic. The discussion will include a brief description of the quantity of the health workforce in Israel prior to the pandemic's appearance and the difficulties and challenges that faced the medical staff in dealing with the pandemic, as well as recommendations for the future.

### **The quantity of health workforce in Israel prior to the onset and in the course of the Covid-19 pandemic**

At the end of 2020, there were about 31,800 physicians with a medical license under the age of 67 in Israel. Of those, more than 8,300 were medical residents. The number of physicians under age 67 per 1,000 population rose from 3.33 to 3.38 in the previous year. The increase in physicians per capita occurred following a long downward trend that began in the early 2000s. In 2015, the number of physicians per 1,000 population stabilized at 3.26 and since 2017 it has gradually risen (Ministry of Health, 2021a) (Figure 1).

The Israeli healthcare system is still benefiting from the massive influx of immigration from the former Soviet Union during the 1990s when the health workforce grew significantly. However, it appears that this effect is tapering off. As pointed out by Tur-Sinai et al. (2020), studies show that the supply of physicians relative to the size of Israel's population is declining due to the increasing rate of retirement as the population of physicians ages, and there is a clear shortage in certain medical professions, including internal medicine, emergency medicine, intensive care, infectious diseases, and others. A high percentage of physicians report being overloaded, which is manifested in long work hours, large patient lists, and difficulty in allocating sufficient time to each patient. It was also found that a large majority of specialists work in more than one institution and their remuneration in the private sector accounts for a large portion of their income. Thus, for example, it was found that 29% of the average salary of a physician with seniority of at least 10 years who is employed in a government hospital is earned in private medicine (Tur-Sinai et al., 2020).

**Figure 1. Physicians under the age of 67 per 1,000 population**

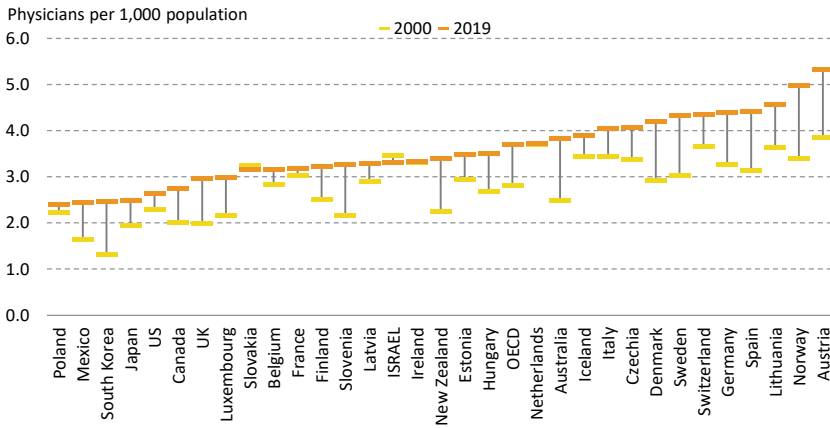
Source: Nadav Davidovitch, Baruch Levi, and Rachel Arazi, Taub Center | Data: Ministry of Health, 2021a

### Trends in the physician population in Israel

During the past decade, there has been a sharp rise in the number of new physicians each year, which has been the result of several factors. The number of medical students who began studying in Israel has doubled during the past decade (representing an annual growth rate of about 8%) following the steps taken by the Ministry of Health and the Ministry of Finance, the Council for Higher Education, and others. These measures included the opening of new faculties of medicine in Safed and Ariel, the modification of hospital departments to serve as teaching departments, and others (Shapiro et al., 2021). However, the graduation rate from medical schools in Israel is still one of the lowest among the developed countries and stands at 7.2 graduates per 100,000 population versus 13.5 in the OECD countries (Ministry of Health, 2021a). Many Israelis are studying abroad. Essentially, Israel is the OECD record holder for the share of foreign-trained medical graduates (OECD, 2021b). The majority of the new medical licenses are given to graduates from abroad, both Israelis and immigrants. Since 2008, the number of foreign graduates has grown at an average annual rate of about 19%, reaching 942 new license recipients in 2020 (approximately six times their number in 2008). Due to this sharp rise, the share of Israeli graduates from abroad out of all newly licensed physicians reached a peak of 51% in 2020, as compared to only 27% in 2008.

(Ministry of Health, 2021a; Shapiro et al., 2021). The number of immigrant physicians has also been characterized by an upward trend in recent years: the average annual increase in their number has been about 7% since 2008. The total number of medical licenses is characterized by an upward trend: 1,835 in 2020 as opposed to only 727 in 2010 (a 2.5-fold increase). Of the licenses issued in 2020, about 36% were to graduates of schools in Israel and the rest to graduates of schools abroad (Ministry of Health, 2021a).

**Figure 2. Number of active physicians per 1,000 population in the OECD, 2000 and 2019 (or the closest year)**



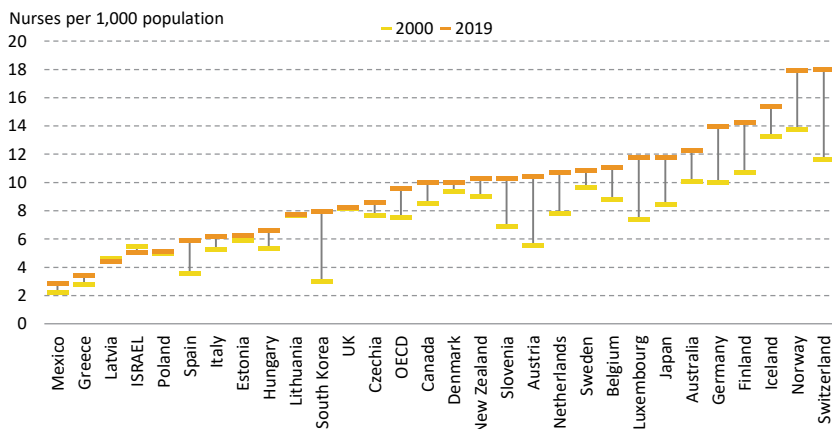
Source: Nadav Davidovitch, Baruch Levi, and Rachel Arazi, Taub Center | Data: OECD, 2021a

Despite the jump in the number of new licenses, Figure 2 shows that not only is Israel below the OECD average, it is the only country in the comparison (except for Slovenia) in which the number of physicians per 1,000 population was lower in 2019 than in 2000. This drop occurred despite an increase of 26% in the number of physicians during that period, and it reflects the rapid growth in Israel's population during those years (Tur-Sinai et al., 2020).

It is worth noting that this situation is not unique to physicians. The number of nurses employed in Israel per 1,000 population is particularly low relative to the OECD countries: 5 nurses per 1,000 population versus an average of

9.5 in the reference countries (Figure 3).<sup>1</sup> Israel is one of the only countries in which the number of nurses relative to the population has declined since 2000 (OECD, 2021b).

**Figure 3. Number of active nurses per 1,000 population in the OECD, 2000 and 2019 (or the closest year)**



Source: Nadav Davidovitch, Baruch Levi and Rachel Arazi, Taub Center | Data: OECD, 2021a

The share of nurses under the age of 67 with a nursing license (in contrast to nurses actually working in the profession) stood at 6.3 per 1,000 population in 2020. This represents a slight increase relative to 2019 (from 6.2 nurses per 1,000 population), which followed a long decline since 2000 (Ministry of Health, 2021a). There are two conflicting trends that can be seen in the nursing profession: the absolute number of registered nurses and their ratio to the population is characterized by an upward trend (about 5.7 registered nurses per 1,000 population in 2020) as compared to a long downward trend

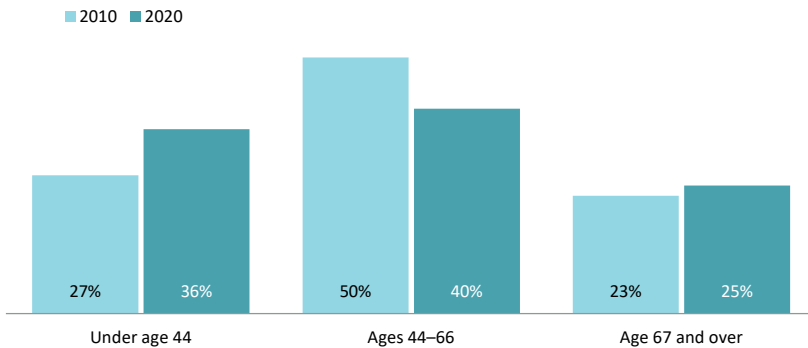
1 The countries in Figure 3 use the same definition of active nurses as Israel, i.e., nurses actually working in the profession of nursing. After weighting all of the OECD countries, the average is 8.8 nurses per 1,000 population; however, this figure includes countries that have different definitions of active nurses, such as definitions that also include nurses working in the healthcare system in managerial or research positions, that include only hospital nurses, or that include all nurses with a nursing license.

among practical nurses, both in their absolute number and in their number relative to the population (about 0.7 practical nurses per 1,000 population in 2020).

The change in the composition of license recipients and at the same time in the characteristics of active physicians naturally raises questions regarding the quality of medical care, particularly in view of claims of gaps in the level of training and expertise between physicians who studied abroad and those who studied in Israel. These gaps are reflected, for example, in the success rate on physician licensing exams. In 2019, the Ministry of Health tightened the criteria for obtaining a license and shortened the list of recognized foreign medical schools whose graduates are qualified to take the licensing exams in Israel. The shortened list includes medical schools in the OECD countries or medical schools that have received accreditation by the World Federation for Medical Education (WFME). Similarly, graduates of foreign schools who received their clinical training in a hospital that has been accredited by a recognized organization can take the exams (Ministry of Health, 2019a).

As shown in Figure 4, the share of physicians aged 67+ has risen somewhat during the past decade, and there has been a larger increase in the share of young physicians (age 44 or younger). In contrast, the share of middle-aged physicians (ages 45–66) has plummeted from 50% in 2010 to 40% in 2020. According to estimates, about one-third of senior physicians are expected to retire in the coming decade.

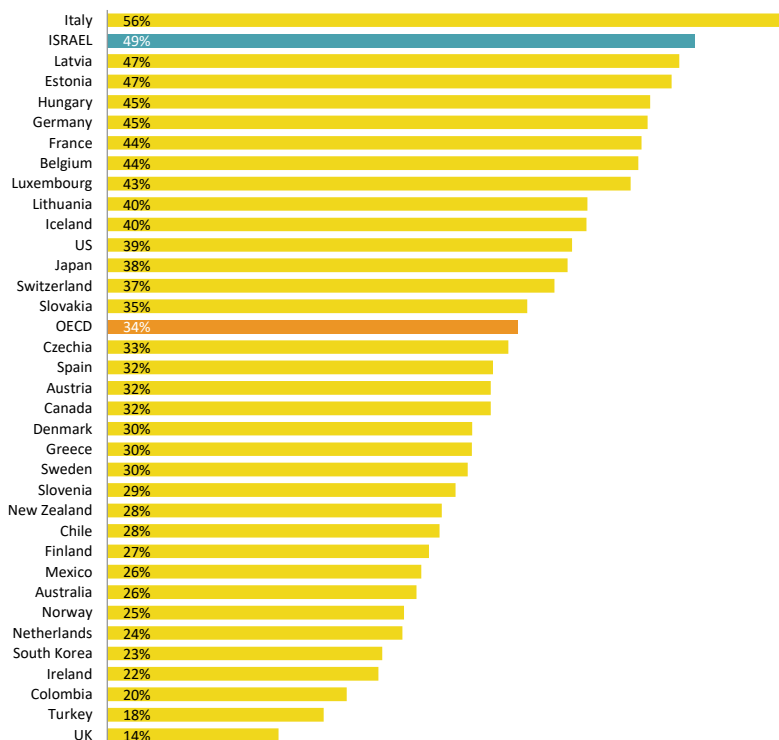
**Figure 4. Age profile of physicians in Israel, 2010 versus 2020**



Source: Nadav Davidovitch, Baruch Levi, and Rachel Arazi, Taub Center | Data: Ministry of Health, 2021a

The share of older physicians in Israel is one of the highest among the developed countries. About one-half are age 55+, which is the highest rate among the OECD countries except for Italy, as shown in Figure 5 (OECD, 2021b).

**Figure 5. Share of physicians age 55+ in the OECD countries, 2019 (or the closest year)**



Source: Nadav Davidovitch, Baruch Levi, and Rachel Arazi, Taub Center | Data: OECD, 2021a

There are also changes in the gender profile in the medical profession: the share of female physicians out of all physicians is rising although the increase has moderated to a great extent during the last decade, from 31% in 1990 to 41% in 2010 and 43% in 2020. The upward trend in the share of female physicians is a welcome phenomenon but it nonetheless requires monitoring and study in view of its potential consequences for the employment of

physicians, from the structure of work hours and the choice of specializations to the expected rise in women's share of managerial positions. For example, according to Ministry of Health data, the average number of weekly work hours for female physicians in the healthcare system is lower than that of male physicians across all age groups (Ministry of Health, 2021a).

## Inequality

Added to the general shortage of manpower are the large disparities in the dispersion of healthcare infrastructure and in the level of health between geographic districts and population groups. In Israel, there are disparities in the amount of healthcare services between the periphery and the center.

Unfortunately, the populations that in general suffer most from inferior health outcomes are also the ones with the least access to healthcare services, including physicians. Alongside the disparities in the number of hospital beds and physicians per capita between the center and the periphery, there are gaps in primary health indices, such as life expectancy, infant mortality, and disease morbidity. For example, the infant mortality rate in the South and North of Israel are higher than in Tel Aviv and the Center. Health disparities also exist across population groups; the life expectancy of Jewish men is higher than that of Arab men and likewise in the case of women (Ministry of Health, 2020).

Data on the socio-health profiles of cities in Israel shows, as expected, an inverse relation between socioeconomic status and mortality. In the majority of cases, the lower the socioeconomic ranking of a city, the higher its mortality rate (Chernichovsky et al., 2017) (Figure 6).<sup>2</sup>

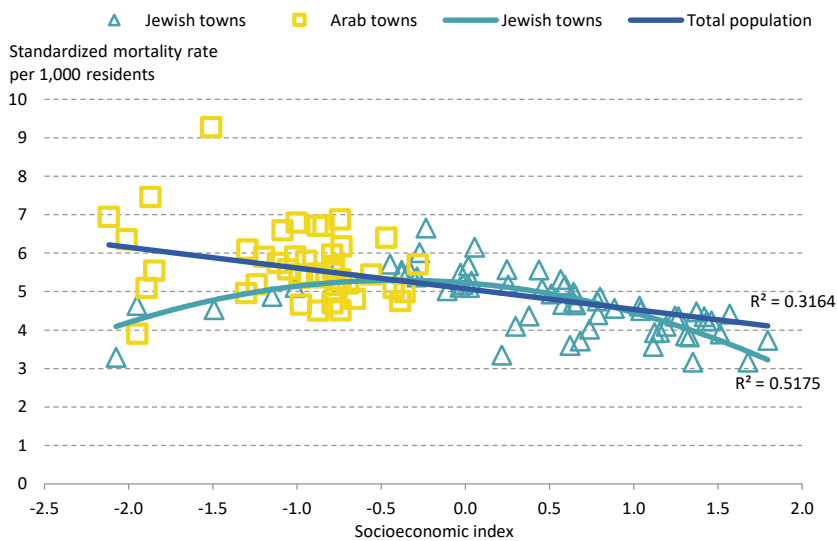
Mortality and infant mortality in Arab towns are in general higher than in Jewish towns with similar socioeconomic ranking. Furthermore, even within geographic locations, the life expectancy of Jews is higher than that of Arabs (Chernichovsky et al., 2017). Thus, in addition to socioeconomic status, it appears that population group is also connected to health outcomes, apparently due to behavioral and cultural phenomena that are characteristic of Arab society more than they are of Jewish society, such as relatively high rates of smoking (primarily among men), high rates of obesity and diabetes, and consanguine marriage.

---

2 This trend applies to most of the cities, apart from a few whose life expectancy is high despite their low socioeconomic level, such as Modi'in Illit, Bnei Brak, Beitar Illit, Beit Shemesh, and Jerusalem. These cities are all characterized by high concentrations of religious-Haredi (ultra-Orthodox Jewish) residents.



**Figure 6. The relationship between socioeconomic ranking of a city and its standardized rate of mortality, for cities of 10,000 residents or more, average for 2012–2016**



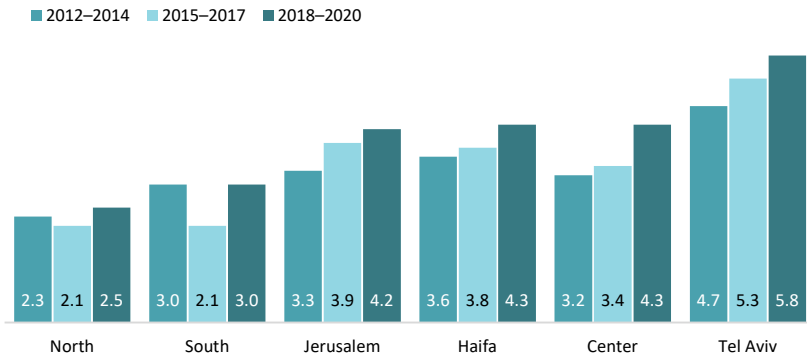
Source: Nadav Davidovitch, Baruch Levi, and Rachel Arazi, Taub Center | Data: CBS, 2019

The number of hospital beds per capita in the South and North are the lowest among all of the districts. In addition to the disparities in number of acute care hospital beds relative to population, there are also disparities in the number of beds for general and geriatric rehabilitation. The periphery also suffers from a gap in infrastructure and health workforce levels, including relatively low rates of physicians, nurses, and auxiliary staff, which are in general lower in the North and South than in the rest of the districts.

Figure 7 shows the distribution of physicians by district. Their ratios per capita in the South and the North are significantly lower than in the rest of the districts (Ministry of Health, 2021b). The ratio per capita of physicians in Tel Aviv is approximately 2.3 times higher than in the North. The data also show that between 2015 and 2017 there was a decline in the South and the North in the number of physicians per capita relative to the average between 2012 and 2014, which served to widen the existing gaps. This situation may be related to the gradual phasing out of periphery grants for physicians, which were meant

to attract health workforce to the South and the North. Most of the grants were budgeted up to 2014, and, since then, they have declined significantly until they were stopped altogether in 2020.<sup>3</sup> It appears that their termination had an effect on the health workforce in the South in particular (DoctorsOnly, 2019). Later on, the ratio of physicians in the North rose to 2.5 per 1,000 population and in the South it rose sharply to 3 per 1,000 population. It may be that the increase in the South is related to the jump in the number of foreign graduates in recent years, which includes many physicians from among the Bedouin population who returned to work in their home districts.

**Figure 7. The distribution of physicians per 1,000 population according to district of employment, three-year average**



Note: The graph is based on the CBS Labor Force Survey rather than administrative data of the Ministry of Health and therefore the data should be treated with caution.

Source: Nadav Davidovitch, Baruch Levi, and Rachel Arazi, Taub Center | Data: Ministry of Health, Manpower in the Healthcare Professions (various years)

Certain medical specialties are not always accessible to patients in the periphery, and, as a result, patients need to travel to distant healthcare centers and to be hospitalized far from home. Nonetheless, from a national perspective, broad dispersal of specialized medical services may not be an ideal solution, both from a medical perspective and an economic one, and may not even be possible. Both from an economic perspective of economies of scale and from a medical perspective, which emphasizes the need for the development of skills and training by means of caring for a large number of

3 See the Israeli Medical Association, [Grants to Bridge the Health Workforce Gaps in the Periphery](#) (in Hebrew).

patients, it appears that investment in a relatively small number of mega-centers that provide tertiary healthcare is preferable to geographic dispersion.<sup>4</sup> Such a policy may be particularly preferable in a small country like Israel, and it would be better to invest in transportation solutions that can bring patients to the mega-centers as needed. In contrast, the allocation of primary medical services in the community to remote areas, and in some cases even secondary medical care, is likely to provide large benefits for public health in exchange for a relatively small investment, primarily by promoting preventive care and advancing healthy living.

### Introduction of physician assistants into the medical system

One of the ways in which to improve the population's access to healthcare services is to create new caregiver roles which are not physicians and to integrate them into the system under the supervision of physicians.<sup>5</sup> The elimination of systemic and organizational barriers and of legal restrictions, which will enable the integration of auxiliary medical professionals into the healthcare system, will likely help improve the quality of care in Israel and increase its efficiency. In recent years, there has been significant progress in this direction with the development of the role of Advanced Practice Nurse (a nurse with special training who is permitted, under certain restrictions, to diagnose illnesses, write prescriptions, and carry out certain medical procedures) and the certification of pharmacists with special training to write prescriptions, which in the past could only be done by physicians (Levi & Zehavi, 2016).

Another new role, which was started in the US and is becoming established in Israel and other countries, is physician assistant (PA). A PA is a health professional certified to practice medicine under the supervision of a physician.

- 
- 4 Primary care is the first point of medical consultation in the community including family medicine, pediatrics, internal medicine, and gynecology. Secondary care is provided by medical specialists and other health professionals often based on referral by the primary care physician. Tertiary care is for patients requiring a higher level of care including specialized equipment and treatments most often in a hospital setting. It is a level of care for patients with complex, serious, or rare medical conditions.
  - 5 In this context, there are discussions in Israel and other countries regarding their integration of alternative medicine caregivers (chiropractors, naturopaths, homeopaths, and others) into the caregiver system through existing or alternative integration models within the community and the hospitals, under the supervision of conventional physicians.

PAs can be involved in preventive medicine, diagnosis, and medical care by means of a broad variety of healthcare services that traditionally have been the domain of physicians. A PA is always under the responsibility of a physician and works under physician supervision. There is a certain amount of flexibility in the responsibilities that can be allocated to the PA by the supervising physician and in their scope. Training programs for PAs in other countries are based on the curricula for physicians (Tur-Kaspa & Klausner, 2021).

The Ministry of Health has in recent years been working to strengthen this role, based on the conclusions of a committee charged with examining this issue (Physician Assistant Committee Report, 2013) and according to the legislative measures and directives that regulate the activity of the PAs in Israel. Following the Committee's recommendation, the "Eligibility to Carry out Exceptional Procedures" regulations were issued in 2014 as part of the Physicians' Act and were intended to allow PA anesthetists and emergency care PAs to carry out medical procedures.<sup>6</sup> A bulletin issued in 2015 by the Director General of the Ministry of Health defined the framework of the PA role in Israel along general lines, including a description of the training required and the PA's professional responsibilities (Ministry of Health, 2015).

The PA role is becoming increasingly common, primarily in emergency medicine. Its continued development, in collaboration with the government, employers, and the Israel Medical Association (IMA), can alleviate the shortage in health workforce to a significant degree, primarily in remote and sparsely populated areas, in which access to medical services is problematic.

## Responding to the Covid-19 pandemic

The Covid-19 pandemic began in late 2019 in the city of Wuhan, China, and quickly reached global proportions. Countries around the world were forced to deal with the pandemic using a variety of emergency methods, including border closings, population lockdowns, quarantine of infected individuals and patients, physical distancing, cancellation of mass events, closing of the education system, restriction of movement, and a reduction in economic activity to a minimum. Apart from the imposition of restrictions on the public and their enforcement, the response to the pandemic required an organized and well-orchestrated multi-system effort between the government, economic players, and civil society organizations.

---

6 [Physicians Regulations \(Eligibility to Carry Out Exceptional Procedures\), 2001.](#)

First and foremost, though, dealing with the pandemic is a test of the healthcare system. As will be discussed, the professional echelons in Israel have for years been warning of a shortage in the health workforce that is liable to endanger lives, and of the system's lack of preparedness to deal with emergency situations.

# SPOTLIGHT

## On the Relationship Between Socioeconomic Status and Covid-19 Vaccination Rates

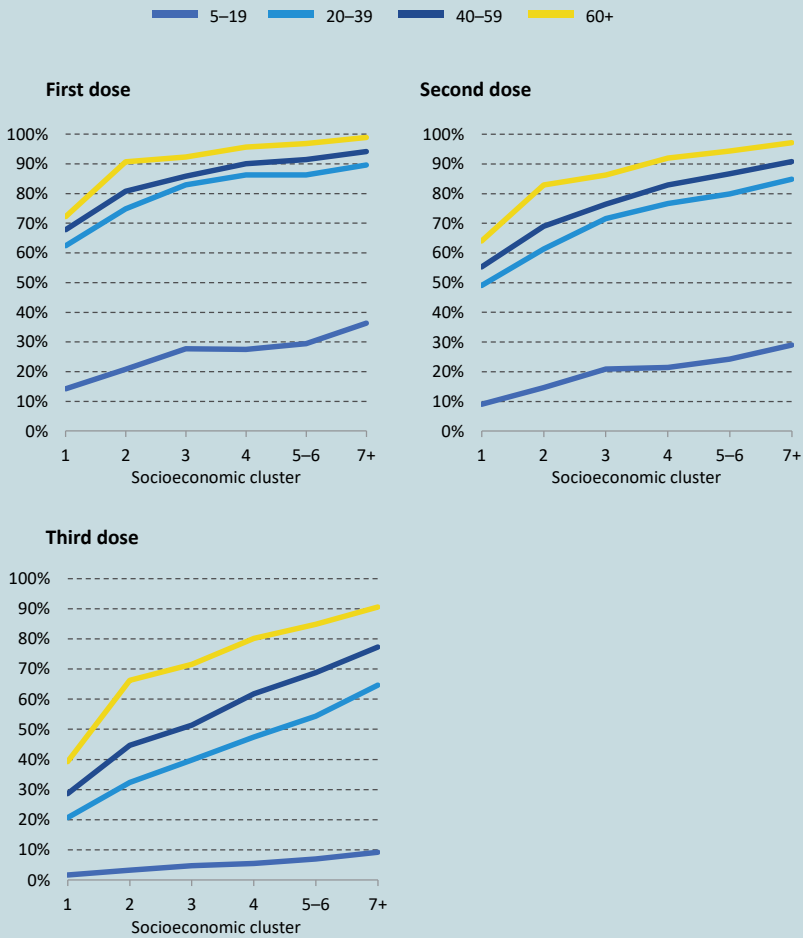
The start of the vaccination campaign constituted a dramatic turning point in Israel's response to the Covid-19 pandemic. Until that point, the tools available to the healthcare systems throughout the world were primarily behavioral: ranging from hygiene measures, wearing of masks, and social distancing, to a general lockdown. These non-pharmaceutical interventions played — and still play — an important role in dealing with the pandemic. Nonetheless, effective vaccinations are far superior to non-pharmaceutical interventions from several perspectives. First, unlike non-pharmaceutical interventions, vaccination does not involve day-to-day compliance and enforcement. Second, the vaccine is intended to provide protection from the disease. And third, beyond the protection on the individual level, the vaccines have an effect on the community and national level, since the vaccination also reduce the risk of infecting others. However, these advantages have not been fully realized in the case of the Covid-19 vaccine. It appears that the vaccine's effectiveness diminishes over time and that a booster is required. This raises the question of the vaccine's effectiveness in preventing infection, particularly in the face of new variants. The reservations, and even vocal opposition to the vaccine that existed from the start have therefore gained in intensity.

---

\* Oren Meron, doctoral student, Department of Health Policy and Management, Ben-Gurion University of the Negev, participated in the preparation of this Spotlight.

Therefore, despite the clear advantages of the vaccines, they have constituted a huge challenge for policy makers in Israel. Some are scientific challenges related to the effectiveness of the vaccine on the individual level and the ability to prevent further infection, as well as on the number and timing of booster vaccinations. Other challenges have been more fundamental: the manner in which the vaccines are approved in an emergency situation; the provision of incentives to vaccinate; and the question of whether to make vaccination compulsory for the entire population or only those in certain professions, such as the healthcare professions. There have also been social challenges, first and foremost an expected challenge of disparities in vaccination rates across socioeconomic levels. These disparities have been documented in studies of other vaccinations in Israel (Amit Aharon et al., 2020; Binyaminy et al., 2016). They found that in the case of routine vaccinations, rates are in general higher among poorer populations. In the vaccine campaign against polio in 2013, after a large amount of the virus was found in the sewage system, it was found that in areas with greater socioeconomic disparities as measured by the Gini coefficient, vaccination rates were lower (Tur-Sinai et al., 2019).

**Figure 8. Vaccination rates for the Covid-19 vaccine according to age group, number of vaccinations, and socioeconomic cluster**



Note: The data are updated to December 6, 2021.

Source: Nadav Davidovitch, Baruch Levi, and Rachel Arazi, Taub Center | Data: Ministry of Health; CBS



As can be seen from the graphs, in contrast to the regular vaccines, the vaccination rates for Covid-19 are positively correlated with socioeconomic status, including for the third booster, with the rate of vaccination in all age groups above 20 rises with socioeconomic status. In addition, the differences are concentrated primarily in the lower socioeconomic clusters. In interpreting the data, it is important to remember that while in the older age groups the vaccination campaign has been ongoing for many months, children ages 5 to 11 began vaccinating only recently and children ages 12 to 15 are only now starting to receive their third vaccination booster.

In conclusion, there are significant disparities in vaccination rates, and it was found that they are lower among the poorer populations in each age group. These data raise concern that this is not simply a matter of the poorer populations choosing to defer the third vaccination, but, rather, it is a decision to avoid it altogether.

Whatever the case, the presentation of the data by socioeconomic status illustrates how disparities are manifested through the effect of the pandemic on Israeli society. In view of the long-run physiological, mental, and socioeconomic effects of the disease, this disparity is expected to have future consequences.

### The challenge of fighting on two fronts simultaneously

Even now, after the vaccination of most of the Israeli population, it appears that the pandemic is far from over and it is doubtful whether it will be completely eradicated in the near future. Therefore, the healthcare system must be prepared to deal with two fronts for the long run: fighting Covid-19 and at the same time treating the public that is in need of services, regardless of the pandemic. The question of the preparedness of manpower in general and the health workforce in particular to deal with the new situation therefore takes on even greater importance. About two years after the onset of the pandemic and more than 18 months since the first case in Israel, questions are emerging with respect to the level of the healthcare system's preparedness to deal with the pandemic and its ability to maintain the level of service and provide optimal care to non-Covid-19 patients at the same time.

According to a special report by the State Comptroller on the medical system in Israel during the Covid-19 pandemic, the hospitalization system suffered from a shortage in manpower and excessively high acute care hospital occupancy rates prior to the pandemic outbreak, which left it without reserves. With the onset of the pandemic, the Ministry of Health instructed hospitals to prepare hospital beds for Covid-19 patients. Hospitals were forced to close or temporarily reduce the size of existing units, most of which were internal medicine units, and also to limit elective procedures in other units, such as various surgical units (State Comptroller, 2021). The State Comptroller also concluded that the main bottleneck in caring for serious Covid-19 patients was a shortage in medical personnel with expertise in intensive care and ventilator systems and in nursing staff trained to deal with seriously ill patients in a complex health situation.

General intensive care beds constitute only 3% of all acute care hospital beds in Israel. This is a low level relative to other countries. The average rate is about 5% in Europe and about 10% in the US. In this context, it is also worth mentioning that the number of acute care hospital beds per 1,000 population in Israel is one of the lowest among the OECD countries (State Comptroller, 2021). Currently, there are 2.2 acute care hospital beds per 1,000 population, in contrast to about 3.6 in the OECD countries. According to the OECD data, only five member countries have a lower number of acute care hospital beds per capita than Israel. According to the OECD definitions, these hospital beds also include psychiatric beds; without psychiatric beds, the number of acute care hospital beds in Israel is only 1.8 per 1,000 population (Ministry of Health,

2021c). Standardizing according to Israel's relatively young age profile leads to a number of about 2.5 beds per 1,000 population; however, this does little to narrow the large gaps between Israel and other developed countries (Chernichovsky & Kfir, 2019).

The general hospital system in Israel is therefore characterized by an extremely high occupancy rate of 91% (second only to Canada) in contrast to an average of 76% in the OECD countries (OECD, 2021b). Furthermore, the bed turnover rate is particularly high in the Israeli healthcare system. As shown by Chernichovsky and Kfir (2019), in 2016, the average number of hospitalizations per bed in Israel was 66, as compared to an average of about 41 for the OECD countries. These data provide evidence of a relatively short duration of hospital stays, with the average hospital stay in Israel being 5.2 days — lower than the average in the OECD countries of 6.7 days. Similarly, waiting time for elective surgeries are long, and according to a survey carried by the IMA, they have reached one and even two years in some hospitals (IMA, 2020).

It is important to understand that the number of hospital beds in Israel is closely connected to the quantity of manpower in the hospitals, including physicians and nurses, as specified in the manpower positions agreements over the years. Apart from the acquisition of the equipment itself, “creating a bed” means allocating manpower positions and filling them. Manpower is the main component in the expenditure on hospital beds and therefore it is not possible to simply “create beds” when there is a shortage without at the same time investing in manpower. This is essentially the difference between “bed allocations”, i.e., the number of beds approved for a hospital according to its manpower, and “actual beds” that the hospital uses in practice.

These data reflect the national expenditure on healthcare services and the resources that were available to the system prior to the crisis. They are at low levels relative to those in other developed countries. With the onset of the crisis, an additional NIS 17 billion was allocated to the healthcare system, although only NIS 4 billion of that was invested directly in the system. The rest was designated for the purchase of ventilators, medicines, and personal protection equipment. It is also important to mention that most of the resources were invested in hospitals and diagnosis centers, while community care, which deals with the majority of patients, was not allocated any significant additional resources (Chernichovsky et al., 2020).

These data are in line with the conclusion of the State Comptroller relating to the heavy load on the healthcare system prior to the outbreak of the

pandemic. In addition to these data, there are the findings of Report No. 8 of the Barometer Group published in October 2020, according to which serious and critical patients in several hospitals were treated by medical staff who were not trained in intensive care treatment and there was a high ratio of patients to each intensive care nurse. According to the report, although there were enough nurses in most places they were not always located within the intensive care units, and, in particular, they did not always have the appropriate training (Magen Israel, 2020). As a side note, it should be mentioned that intensive care is the most common advanced course taken by nurses. There are 6,395 registered nurses (under the age of 67) who are graduates of an advanced intensive care course, which is almost twice the number of graduates of the second most common advanced course (midwifery) (Ministry of Health, 2021a). This might explain why there were enough intensive care nurses when the need for them arose, even though their overall share out of all nurses in Israel is quite low.

This is not the first time that health officials have warned that the overload in normal times will lead to a lack of preparedness in an emergency. A decade ago, at an emergency gathering of the IMA following the Carmel fire disaster in which there were dozens of fatalities, there was a consensus that Israel is not prepared to provide intensive care in emergency situations. According to data presented at that gathering, in January 2011, there were about 800 patients on ventilators in all of the hospitals in Israel, but only 300 of them were in intensive care units. It was also claimed that the insufficient capacity of the intensive care units reduces the chances of successful treatment and may increase mortality among patients. As a result, the IMA called for the number of intensive care beds to be doubled (IMA, 2011a).

Similar conclusions are found in the special report by the State Comptroller on the preparedness of the healthcare system for outbreaks of infectious diseases. According to the report, and following the flu epidemic in 2009, the Epidemic Response Team recommended that online medical systems be created in the communities for diagnosis and treatment, with the goal of reducing the arrival of patients to clinics, lightening the expected burden on the healthcare system, and reducing opportunities for further infection. According to the recommendations, an individual suspected of having been infected by the flu would be asked to contact the health funds, and a nurse would speak to the individual and decide whether they should be examined by a physician, go to the emergency room, or remain at home.

The Ministry of Health believed that in a flu epidemic there would be about 12,000 daily inquiries to the health funds. However, the health funds determined that due to manpower constraints they were not capable of handling that number of inquiries (State Comptroller, 2020, p. 536).

The State Comptroller also concluded that the limited number of physicians and nurses in Israel cannot be increased during an event. On the contrary, that number is expected to decrease due to infection of the medical staff, as indeed occurred during the Covid-19 pandemic. Therefore, the health funds are currently developing an online community medical system that allows for “digital house calls” as a partial solution to the expected demand for healthcare services during an outbreak. However, the State Comptroller found that the Ministry of Health does not have a plan for filling the existing gaps in hospital beds, medical staff, and equipment that are needed to provide appropriate care for the large number of patients expected in a flu epidemic outbreak (State Comptroller, 2020, p. 537).

### **Burnout among the medical staff dealing with the pandemic**

Given this situation, there were multiple reports during the pandemic of worker burnout in the healthcare system. Although the results of a national survey carried out by the Ministry of Health regarding the burden borne by the medical staff have not yet been published, there is evidence of a worrying deterioration in the resilience of the medical staff in dealing with the effects of the pandemic over time. According to the report of the Barometer Group, many workers were absent from work due to quarantine or infection. An increasing level of overwork has been reported among the medical staff, particularly among those who are not being rotated out of the Covid-19 units, in view of the high morbidity and mortality to which they are exposed. In some of the hospitals, there is reluctance among the staff to work in the Covid-19 units (Magen Israel, 2020).

The Barometer Group has concluded that it is important to ensure that intensive care physicians are part of the staff on duty on a day-to-day basis. Similarly, it was concluded that in every shift there should be at least one nurse who is a graduate of an intensive care course and has experience in an intensive care unit for every four patients, so that they can advise and direct the less-experienced medical and nursing staff. It was emphasized that the ratio should not exceed that level. The group also recommended that the hospital’s management should better allocate the experienced staff between

the acute units and the Covid-19 units and should also allocate patients in severe and intermediate condition between hospitals in order to balance the loads. Another recommendation was to introduce programs to reduce burnout and stress among the medical staff in all of the hospitals (Magen Israel, 2020).

A survey of 547 staff members conducted by the Soroka Medical Center at the end of the first wave of the Covid-19 pandemic (March–April, 2020) provided evidence of concern for healthcare workers' families and concern on the national level. Most of them mentioned that they are coping well with the crisis and reported moderate levels of pressure, although the staff members who were caring for Covid-19 patients reported higher levels of overwork than their colleagues. Women in general reported a higher level of stress than men and nurses more than physicians, even after correcting for gender (Bashkin et al., 2021). A similar study carried out in Barzilai Hospital among 263 staff members produced similar results: physicians reported the lowest level of concern, followed by nurses, while the greatest concern by far was expressed by other staff members. In this study as well, staff members expressed a deep concern for the health of their families more than for themselves (Dopelt et al., 2021).

### **The struggle for more manpower positions**

Given the pressure on the system and on the medical staff, the Ministry of Health added 600 positions for physicians, 2,000 positions for nurses, and additional positions for paramedics during the first and second waves. The status of those positions — whether they are to become permanent or not — was the subject of discussions between the Ministry of Health and the Ministry of Finance, but no final decision was made during the hiring process. Although it was agreed that the workers being hired would not be temporary and would be integrated into the medical institutions, there remained disagreement as to the status of the positions themselves, since the Ministry of Finance preferred that the added positions be offset against positions eliminated through retirement.<sup>7</sup>

It was finally decided that the 600 physician positions would be financed only until June 2021 dependent on morbidity rates and the load on the hospitals. In view of the success of the vaccination campaign in Israel and the continuous decline in morbidity and mortality during the first half of 2021, the Ministry

---

7 [Protocol No. 62 from the Special Committee for the Novel Coronavirus and the Examine the State's Preparations for Epidemics and Earthquakes](#), 8 September 2020.

of Finance intended to eliminate the new positions, despite the opposition of the IMA and the hospitals (Yanko, 2021). As a result, the IMA began a 24-hour warning strike with hospitals operating on an emergency format (Efrati, 2021). Following negotiations between the Ministry of Finance and the Ministry of Health and pressure from the medical community, the Ministry of Health announced in July that the Covid-19 positions for physicians, nurses, auxiliary workers, and healthcare professionals would not be eliminated (Eisbruch, 2021).

In any case, making the positions permanent will have a fairly negligible effect on the health workforce in the system. It increases the ratio of active physicians from 3.22 per 1,000 population to approximately 3.28 (Chernichovsky et al., 2020). There are recent claims of shortages in the health workforce, hospital beds, and advanced medical equipment in the intensive care departments, as well as concerns about the professional level of the staff treating Covid-19 patients who are on ventilators, which may be putting patients' lives at risk (Resnick, 2021a; 2021b).

### **The effect of the Covid-19 pandemic on medical residents**

The multiple effects of the Covid-19 pandemic on the healthcare system also include changes in the working conditions of medical residents in the hospitals. During the first wave in March 2020, the hospitals decided to move to 12-hour shifts followed by 24 hours of rest, with the goal of reducing the exposure of the staff to Covid-19 patients in the units (DoctorsOnly, 2020).

At first, the decision led to a fear that salaries would be lowered by the shortening of shifts and the reduction in overtime; however, it was quickly replaced by a call to adopt this new work format and to abandon the long shifts in place prior to the Covid-19 crisis (a resident currently works without a break for 26 hours: 8 hours of "regular" work in the morning and afternoon with another 16-hour shift until the morning of the following day and two hours for the handover between shifts). In public protests that took place, many residents called for the shortening of shifts and viewed the process forced on the system due to the pandemic as a successful "natural experiment," which had demonstrated that the time was ripe for a change in their work hours (Linder, 2020).

The issue of shortening residents' work hours is not new to the healthcare system. It has been on the public agenda for many years and there are voices for and against. Alongside the desire to improve the residents' quality of life, the supporters of shorter shifts cite the possibility of reduced quality of

care and a threat to patient safety as a result of mistakes in judgment and the physician's inability to function due to fatigue and a lack of focus after long hours without a break. The opponents emphasize that the effect on the continuity of care and the "hand over of the baton" from one shift to the next threaten the quality of care and the safety of the patient. They also express the fear of a decline in the quality of education and training due to the fewer hours spent in the hospitals.

As a result of the Covid-19 pandemic and the protest by the residents, the discussion of this issue was reignited and the IMA created a special committee to examine the change in work hours for physicians in the hospitals. Heading the committee was Prof. Ran Tur-Kaspa and Prof. Joseph Klausner. There were 36 members and observers on the committee, which included professional representatives from 11 scientific associations and representatives of the medical residents' forum, the interns' forum, the young specialists' forum, the Scientific Council, the Organization of State Physicians, the Clalit Health Services Physicians Organization, and others. As part of the committee's work, 9 subcommittees were created to examine the work hours of physicians in various types of medical residency (Tur-Kaspa & Klausner, 2021, p. 1).

The committee recommended far-reaching changes and concluded that the traditional and accepted approach of an identical shift length for all types of medical residents is not optimal since each specialty has its own unique characteristics that are likely to dictate different work formats. In view of the position of the scientific associations, and supported by the findings of surveys among the residents, the committee recommended a different work format for each type of residency, and proposed four different models for residents. The models are differentiated primarily by characteristics such as uninterrupted number of work hours, rest hours, number of shifts, etc.:

- *The existing model with a few changes:* In this model, half-shift positions<sup>8</sup> will be added with the exclusive goal of allowing residents to rest; in addition, there will be a shift of administrative staff and PAs. For this model, additional positions and manpower must be added.

---

8 According to the physicians' collective bargaining agreement of 2011, a "half-shift" on a weekday lasts from 16:00 to 23:00 and on Friday from 13:00 to 21:30. See IMA, 2011b.



- *The 16/2 model:* In this model, the shift will be shortened to 16 hours plus 2 hours for the handover, and will last (on a weekday) from 13:00 until 9:00 the next day. The resident does not work the morning of the shift.
- *The 18/30 model:* In this model, the shift continues from 15:00 until 9:00 the next day. The resident will not work in the morning of his shift and between one shift and the next there is a break of 30 hours.
- *The “bridging resident” model:* In this model, the shift continues from 21:00 until 8:00 in the morning, and after completing a night shift, the resident continues to work until 12:00. In order to bridge the gap between the end of the morning shift and the beginning of the night shift, another resident stays after the morning shift and works from 8:00 until 22:00. This resident has a day of rest after the shift.

The committee proposed an additional model for work in emergency rooms (Tur-Kaspa & Klausner, 2021, p. 3).

Finally, the committee recommended that each scientific organization choose the optimal model for each residency type on a differential basis and in cooperation and coordination with the IMA's Scientific Council, and that the model would be chosen jointly by the association and the Scientific Council. At the same time, the association would have the right to retain the current work hour format and is not obligated to choose one of the new models proposed in the report (p. 125).

The implementation of the new models will lead to a reduction in work hours, and, therefore, the committee concluded that the State and the employers would need to deal with the implications for physicians' salaries in all of the medical specialties. The committee also recommended a number of measures to improve residents' working conditions and the working environment in hospitals (p. 3).

Based on the committee's report, the implementation of its recommendations is dependent on many factors, including the addition of hundreds of positions in order to shorten shifts and the allocation of PA positions and administrative manpower. If these positions are indeed added, it will be necessary to find the manpower to fill them in the relevant medical specialties, without exacerbating the inequality that already exists between the large institutions in the center and the smaller ones in the periphery. Finally, consideration must be given to the question of salaries and whether and how the salary structure for physicians will be affected by these changes.

The Covid-19 pandemic was the trigger for a highly important process for the training of health workforce in Israel; at the time of writing, it is unclear how it will turn out.

## Technological solutions to the shortage in the health workforce

Medical services have traditionally been provided in face-to-face encounters between caregivers and patients. However, in recent years, there has been growing use of remote medical services. Remote medical services are defined as any service provided in an encounter between a caregiver and a patient in which the sides are not physically located in the same place and which is not necessarily synchronous (Ministry of Health, 2019b). The connection between the caregiver and the patient can be based on various platforms, like telephone, email, sms, or video chat by means of a designated application, whether that connection is synchronous or asynchronous.

Formally, the provision of remote medical services began in the mid-1980s, with the introduction of telephone consultations between a patient and physician and between physicians (NIHP, 2010). Subsequently this service was provided sporadically according to the internal initiatives of the health funds. Prior to the Covid-19 pandemic, remote medical services were provided in areas such as radiological interpretation, in certain expert systems, for instance, tele-EKG, and also in virtual meetings between a caregiver and a patient by video chat, such as in defined instances of hard-to-heal wounds or certain chronic illnesses like Chronic Obstructive Pulmonary Disease (COPD). According to an OECD study, Israel is one of the world leaders in the penetration of remote medicine into the healthcare system (Oliveira Hashiguchi, 2020).

Due to the need for social distancing and the desire to avoid infection, the Covid-19 pandemic accelerated the development and use of remote medical platforms. In community medicine, this development was reflected in the large number of virtual consultations and “house calls.” In the case of hospitalization, there was a significant increase in home hospitalization as a result of, among other things, the wish to avoid overloading the hospital system, which had to deal with both Covid-19 and “regular” morbidity.

Thus, technological platforms can support the broadening of access to healthcare services, particularly in the periphery where there is less health workforce and patients are often far from clinics and medical centers.

Remote monitoring of patients allows physicians and caregivers in both community medicine and hospitals to observe important health markers and to monitor the progress of high-risk or post-surgery patients who are recovering at home. This can help reduce inequalities in care and to some extent bridge gaps in physical infrastructure, manpower, and medical equipment between geographic regions.

## Measures that can improve public medicine in Israel and can benefit health workforce

- Increasing the number of positions for physicians, including medical residents, in the hospitals and in the community.
- Improving the work format of medical residency based on the recommendations of the Committee for Changing the Work Format of Physicians in the Hospitals: shortening of shifts in medical specialties where this is called for and agreed upon by the medical community, while at the same time adding the necessary positions and manpower.
- Increasing the number of medical students who are trained in Israel: broadening of medical studies in the academic institutions while adding clinical fields in the hospital units, by means of, among other things, training during the afternoon hours, use of simulators, and offering economic incentives that will encourage hospital departments to expand their training of students; and the adoption of the Marom-Halperin Committee recommendations (Shapiro et al., 2021) to increase the number of medical students in Israel, which recommended, among other things, that training programs for students from abroad be designated instead for Israeli students.
- Remote medicine: continuing the development of telemedicine in the health funds in order to provide patients with home care treatment and to facilitate home hospitalization. The development of these platforms was accelerated by the Covid-19 pandemic due to the need for social distancing and to avoid visits to clinics and hospitals by patients. Also in normal periods, remote medicine can improve efficiency in many cases and can increase the accessibility of healthcare for populations living in remote areas.

- Furthering the use of PAs who are health professionals licensed to practice medicine under the supervision of a physician. It is common in many countries that PAs are involved in preventive medicine, in diagnosis, and in medical treatment through the provision of a wide range of medical services that have traditionally been provided by physicians. In recent years, the Ministry of Health has worked to expand the PA role in Israel, and it is becoming common primarily in emergency medicine. Its continued development in additional areas of medicine can increase the efficiency and reduce the workload on physicians and nurses.
- Reducing physician workloads: monitoring and measuring workloads and burnout; providing the possibility for breaks during work hours and greater access to lounges and dining halls; strictly keeping to work hours and rest hours; avoiding as much as possible excessive workloads and monotonous tasks; maintenance of healthy, open, and inclusive communication between workers and managers and among the workers themselves; and, the creation of a pleasant work environment, both physical and mental.

## Conclusion

The Covid-19 pandemic continues to present a challenge to the healthcare system. It is exposing weak points and is highlighting structural and organizational faults that have characterized the system for many years. At the same time, it is accelerating positive processes that had proceeded at a snail's pace prior to the onset of the pandemic, and in particular, the development of remote medical platforms, and the rethinking of physicians' work formats in the hospitals and the improvement of their working environments.

From many perspectives, the pandemic can be viewed as an opportunity for rehabilitation of the system — first and foremost, from the perspective of manpower. Thus, it is an opportunity to strengthen the intensive care system, to increase the number of physician positions in hospitals and in the community, to broaden medical studies in Israel, etc. Alongside the quantitative aspect, manpower quality should not be ignored. The Ministry of Health has tightened the criteria for obtaining a medical license and has shortened the list of foreign medical faculties that are recognized in Israel (the "Yatziv reform"). These steps are evidence that the Ministry is aware that the quality of medical training in foreign schools relative to medical schools in Israel is an issue that requires consideration.

The need to deal with burnout of manpower is also not a new problem in the healthcare system; on the contrary, the exceptional workloads created by the pandemic, the fear of infection, the concern for staff's family, and the difficult daily scenes in the Covid-19 units intensified the existing feeling of stress and overload in the day-to-day work of physicians and other medical staff. Recognizing the problems of the medical staff and adopting solutions can benefit the healthcare system not only during a pandemic but also in normal times. From this perspective, the Covid-19 pandemic may be a welcome turning point from which the healthcare system will set out on a new path.

## References

### English

- Amit Aharon, A., Nehama, H., Rishpon, S., & Baron-Epel, O. (2020). Different reasons for not completing routine vaccinations among Jewish and Arab children in Israel. *Journal of Racial and Ethnic Health Disparities*, 7(2), 298–304.
- Bashkin, O., Davidovitch, N., Asna, N., Schwartz, D., & Dopelt, K. (2021). [The organizational atmosphere in Israeli hospital during COVID-19: Concerns, perceptions, and burnout](#). *International Journal of Environmental Research and Public Health*, 18(11), 5544.
- Binyaminy, B., Bilenko, N., Haas, E. J., Grotto, I., & Gdalevich, M. (2016). Socioeconomic status and vaccine coverage during wild-type poliovirus emergence in Israel. *Epidemiology & Infection*, 144(13), 2840–2847.
- Chernichovsky, D., Bental, B., Arazi, R., & Seela, E. (2020). [The battle against the coronavirus from the perspective of the healthcare system: An overview](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy 2020* (pp. 21–65). Taub Center for Social Policy Studies in Israel.
- Chernichovsky, D., & Kfir, R. (2019). [The acute care hospitalization system in Israel: The current situation](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy 2019* (pp. 387–430). Taub Center for Social Policy Studies in Israel.
- Dopelt, K., Bashkin, O., Davidovitch, N., & Asna, N. (2021). Facing the unknown: Healthcare workers' concerns, experiences, and burnout during the COVID-19 pandemic — a mixed-methods study in an Israeli hospital. *Sustainability*, 13(16), 9021.
- Levi, B., & Zehavi, A. (2016). Delegation of clinical authority, administrative culture and policy adoption: A comparative analysis. *Journal of Comparative Policy Analysis: Research and Practice*, 19, 227–244.
- Ministry of Health (2019a). [Ministry of Health Accreditation of Foreign Study Programs](#).
- OECD (2021a). [OECD health statistics 2021](#).
- OECD (2021b). [Health at a glance 2021: OECD indicators](#). OECD Publishing, Paris, 2021.
- Oliveira Hashiguchi, T. (2020). [Bringing health care to the patient: An overview of the use of telemedicine in OECD countries](#). OECD Health Working Papers, No. 116, OECD Publishing.
- Pan-European Commission (2021). [Pan-European Commission on Health and Sustainable Development](#).
- State Comptroller (2020). [Annual report 70A](#) (Abstracts). State Comptroller.
- State Comptroller (2021). [The State of Israel response to the Covid-19 crisis. Special report](#). State Comptroller.

- Tur-Sinai, A., Gur-Arie, R., Davidovitch, N., Kopel, E., Glazer, Y., Anis, E., & Grotto, I. (2019). [Vaccination uptake and income inequalities within a mass vaccination campaign](#). *Israel Journal of Health Policy Research*, 8(63).
- 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 2020* (pp. 67–95). Taub Center for Social Policy Studies in Israel.

## Hebrew

- CBS (2019). Media Release (4 December 2019). [Health and social profile of the localities in Israel, 2011–2017](#). The Central Bureau of Statistics.
- DoctorsOnly (2019, 4 December). [The head of Soroka warns: The shortage of medical manpower in the South is likely to worsen](#). *DoctorsOnly*.
- DoctorsOnly (2020, 19 March). [The new work plan landed on the doctors – they are afraid that their salaries will be harmed](#). *DoctorsOnly*.
- Efrati, I. (2021, May 9). [The corona epidemic is ending and doctors are fighting for their small gains](#). *Haaretz*.
- Eisbruch, D. (2021, July 16). [Minister of Health: Thousands of “Corona positions” of doctors and healthcare workers will not be terminated](#). *Davar*.
- IMA (2011a). *Following the Carmel disaster: Is Israel ready to give emergency care in an hour of need?* Israeli Medical Association.
- IMA (2011b). [Labor agreement explanatory notes](#). Israeli Medical Association.
- IMA (2020). *Waiting times for planned surgeries at acute care hospitals in Israel*. Israeli Medical Association.
- Linder, R. (2020, 6 May). [12 hours of work instead of 26: Medical residents just want to sleep like in basic training](#). *The Marker*.
- Magen Israel (2020). *Magen Israel Committee – Barometer of doctors in the field. Report no. 8*.
- Ministry of Health (2015). Director General report 7/2015: [Physician assistants in the hospitalization and community system](#).
- Ministry of Health (2019b). Director General report 6/2019. *Criterion for medical services remotely (Telemedicine)*. 6 May 2019.
- Ministry of Health (2020). [Reduction of inequality in health, 2019](#).
- Ministry of Health (2021a). *Healthcare professions manpower, 2020*.
- Ministry of Health (2021b). [Reduction of inequality in health, 2020](#).
- Ministry of Health (2021c). *Hospital beds and licensing positions*, January 2021.
- NIHP (2010). 11<sup>th</sup> Dead Sea Conference, *The Health System in the Digital Age*, 26–27 May 2010. Israel National Institute for Health Policy Research.

- Resnick, R. (2021a, 11 September). [They don't know how to care for intubated patients in the corona units.](#) *Israel Today*.
- Resnick, R. (2021b, 22 September). [The heads of the Corona units on the shortage of ecmo machines and intensive care beds: "We are choosing who lives and who dies."](#) *Israel Today*.
- Shapiro, N., Kayam, A., Kovetz, A., Belinsky, A., & Brenner Shalem, R. (2021). [The number of physicians in Israel: Trends and policy recommendations.](#) Ministry of Health.
- Tur-Kaspa, R., & Klausner, J. (2021). *Recommendations of the High Commission to Examine Doctors Work Conditions and Work Shifts in Hospitals.*
- Yanko, A. (2021, 12 April). [A strike on the way? 600 positions for doctors that were added during corona are likely to disappear.](#) *Ynet*.





# *Executive Summary*

## Variation in Covid Testing, Infections and Hospitalization by Town and Population Sector

**Alex Weinreb**

By the end of September 2021, about 14% of Israel's population — 1.2 million people — had been infected by Covid-19, of whom 7,800 had died.

This study looks at three major metrics of the Covid epidemic in Israel — the testing, infection, and hospitalization rates — across 205 yishuvim (towns/cities), home to about 8 million people, 88% of Israel's population in mid-2020. A multivariate analysis is conducted using the main characteristics of the yishuvim like their socioeconomic status (as classified by the Central Bureau of Statistics), population density, and the percent of residents ages 65 and older.

### **Findings of the study of the Covid-19 epidemic in Israel**

The 205 yishuvim are classified by their dominant residential population into one of seven groups: Jewish non-Haredi; Haredi; Arab; Bedouin; Druze; mixed Jewish and Arab; or mixed Haredi and non-Haredi.

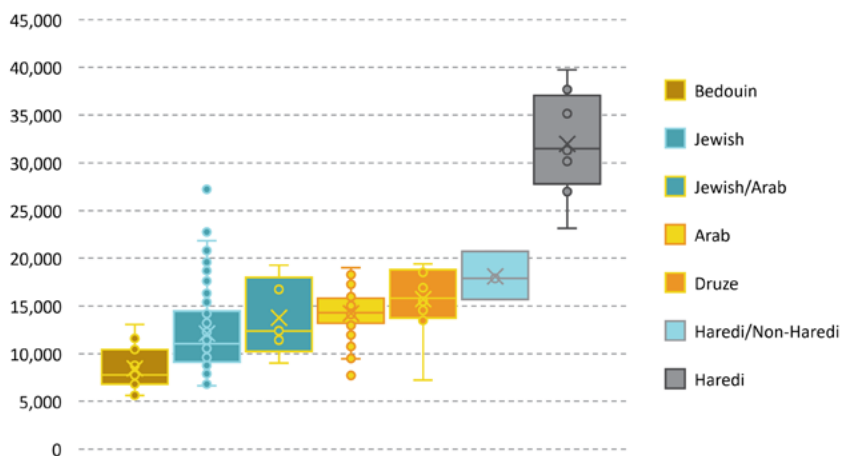
---

\* Prof. Alex Weinreb, Research Director, Taub Center for Social Policy Studies in Israel; Sociology Department, University of Texas at Austin. This study was first published in October 2021.

## Main findings

- The highest testing rates are in Jewish non-Haredi yishuvim.
- The lowest testing rates — less than half the national average — are in Bedouin yishuvim.
- The highest infection rates are in Haredi yishuvim — 31% of the population has had a confirmed infection in Haredi yishuvim.
- A high correlation is found between infection rates and the share of the yishuv population that is Haredi, even in non-Haredi Jewish yishuvim.
- The highest rates of hospitalization are found in Arab yishuvim, due mostly to the higher prevalence of preexisting health conditions — particularly heart disease and diabetes, which are known to increase the risk of serious illness from Covid.
- Higher than expected hospitalization rates in the Bedouin yishuvim (relative to the share of confirmed infections) reflect the high prevalence of preexisting health conditions alongside low testing rates — the latter hide the true infection rate.

### Cumulative infections per 100,000 in 205 yishuvim, by sector



Source: Alex Weinreb, Taub Center | Data: Government portal, [COVID-19 Dataset](#)

### **Multivariate impact: poverty, population density, and the share of the over 65 population**

- Yishuvim from the lowest socioeconomic cluster have both the lowest testing rates and the highest rates of confirmed infections.
- The share of the resident population ages 65 and older had an influence on the testing, infection, and hospitalization rates. In yishuvim with a high share of residents ages 65 and older, low rates of infection and hospitalization are found — this indicates the success of efforts to lower infection rates among this population group. Low rates of testing and hospitalization are also found in yishuvim with a low share of elderly adults — that is with more young people, who, for the most part, even if infected are asymptomatic and do not get tested or need hospitalization.
- Population density within the yishuv does not have a significant influence on rates of testing, infection or hospitalization.

In order to continue the current fight against Covid or to deal with a future epidemic, it is important to consider differences between population sectors. Some of the differences we document here are the results of unequal access to health resources and others are the result of both behavioral differences and insufficient enforcement of restrictions intended to limit the spread of the virus. Both problems need to be addressed.



# *Executive Summary*

## Excess Mortality and Life Expectancy in Israel in 2020

**Alex Weinreb**

Since the outbreak of the Covid-19 pandemic, public discourse has centered around the question of Covid-related excess mortality. It is clear that the Covid pandemic has increased mortality in Israel; the full extent of this, though, needs to be understood in order to evaluate how well the system has handled the epidemic. This study examines excess mortality in Israel over the course of 2020, mortality according to age group, and the effect of excess mortality in Israel in 2020 on life expectancy.

It should be noted that identifying Covid-related mortality is a fairly challenging task, since it is difficult to know whether the virus was the main cause of death, a contributing factor or a background characteristic, and whether the patient was near death or whether he would have lived for many more years if not for Covid. Another challenge is to differentiate between the direct effects of the virus on mortality and its indirect effects, such as the shifting of healthcare system resources to dealing with the pandemic at the expense of treating and preventing other medical situations.

---

\* Prof. Alex Weinreb, Research Director, Taub Center for Social Policy Studies in Israel; Department of Sociology, University of Texas in Austin. This study was first published in March 2021.

## Findings of the research

### Mortality rates in Israel in 2020

- In the initial months of 2020, mortality rates in Israel were lower than they ever were — less than 11 cases of death per 100,000 population per week, a decline of 7% relative to the same period between 2017 and 2019.
- The effect of Covid-19 on mortality rates began to be felt at the end of March 2020 and even more so from early July until late September.
- Between the pandemic waves, mortality rates fell to lower levels than those observed between 2017 and 2019.

### The effects of Covid on excess mortality according to age profile

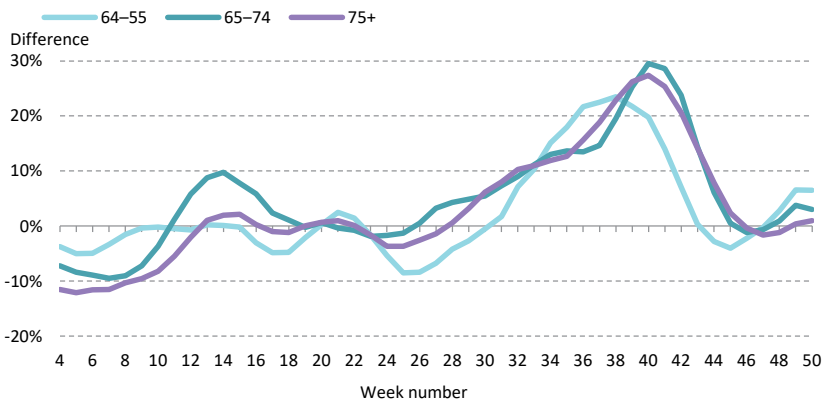
In view of the large variation in the mortality risk across age groups, it is clear that nationwide differences in the effect of Covid on mortality are almost exclusively a function of the ability to maintain a low level of infection, particularly among the elderly.

- Throughout the pandemic (in 2020), confirmed cases in Israel were disproportionately concentrated among the 20–55 age group, with higher representation in particular among individuals in their 20s.
- The pattern of change in mortality rates among the younger age groups supports claims of a continuing downward trend in overall (all-cause) mortality rates in the population as a whole: among the 0–19 age group mortality in 2020 was 23% lower than between 2017 and 2019, and among the 20–29 age group it was lower by about 4%.
- In the first wave of high mortality rates, the rate of confirmed patients among the 80+ age group was about 40% higher than their share of the population. By September, the number of infections in this group dropped to about 60% of its share in the population; in October it again shot up temporarily; and in the final months of the year, there was again a drop. This trend could also be seen in the second highest risk group, i.e., individuals aged 60+.
- These trends point to the partial success of the healthcare system in Israel in protecting the elderly against infection. However, the low rates of mortality are to a large extent also a result of the difference between the age pattern of infection in Israel and the age profile of the population.

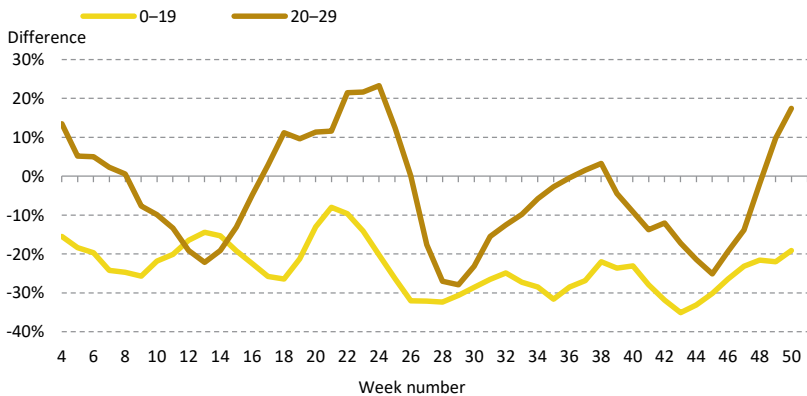
If the rates of infection had been in line with Israel's age profile, then there would have been 31% more deaths. If the infection rates had been in line with the age profile in the OECD countries, the number of deaths would have been double.

### Differences in mortality rates between 2020 and 2017 to 2019, by age group and week

#### a. Ages 55+



#### b. Ages 0-29



Source: Alex Weinreb, Taub Center | Data: CBS



## Effect on life expectancy

- The excess mortality in 2020 led to a drop of 2.2 months in life expectancy at birth and of 2.6–2.9 months in life expectancy at the age of 65.
- Taking into account the rate of population growth in Israel, the wave of mortality during the Covid-19 pandemic increased the number of deaths by about 7%. However, if the expected reduction in mortality in the absence of Covid is also considered, the pandemic increased the death rate by about 10%. This constitutes a significant increase, although it is less than in other countries.
- The data indicate that about one-half of the infections among the 65+ age group up to mid-October 2020 were among the Haredi (ultra-Orthodox Jewish) population. Among this group, Covid-related mortality rates are 4 times greater than this group's share in the overall population. Therefore, the drop in life expectancy in 2020 was concentrated disproportionately in Haredi areas.
- Excess mortality was also higher among the Arab population in Israel, most likely due to high rates of pre-existing conditions, particularly diabetes, which raises the likelihood of death from Covid considerably.

# How Many Deaths Could Be Avoided in Israel? A Comparative Analysis of Cause of Death Across 37 Countries

Alex Weinreb and Elon Seela

## Introduction

Between 1975 and 2018, life expectancy at birth in Israel increased from 72.1 to 82.9 years. That is equivalent to a 3-month gain in life expectancy per calendar year.<sup>1</sup> Since this rate of increase was marginally higher than the average across developed countries (2.8 months per year), Israel steadily moved up the international life expectancy rankings. Across the 38 countries that constitute the OECD today, Israel was in 17<sup>th</sup> place in 1975 (0.29 standard deviations higher than the mean). By 2018 it had reached joint 5<sup>th</sup> place (with Iceland, 0.84 standard deviations higher than the mean).

This long-term increase in life expectancy in Israel, as in other developed countries, is the result of several factors that, together, have virtually eliminated mortality from infectious diseases at younger ages, and also significantly reduced mortality from chronic diseases. Since the 1980s, in particular, there have been especially massive reductions in mortality from various types of heart disease, and significant reductions in deaths from “external” causes — those associated with accidents and violence (Weinreb, forthcoming). The factors responsible for these reductions include advances in medical sciences, in clinical care (e.g., early diagnosis and treatment of serious medical conditions), in public health services and conditions in general (e.g.,

---

\* Prof. Alex Weinreb, Research Director, Taub Center for Social Policy Studies in Israel; Department of Sociology, University of Texas at Austin. Elon Seela, Research Assistant, Taub Center.

1 Life expectancy at birth is the number of years a child born in Israel in a given year can expect to live under age-specific mortality rates of that year. The annual pace of the increase in months is: (130 month gain/516 month period)\*12.

vaccinations, cleaner water and food, less pollution), and, most recently, in health behavior (e.g., diet and exercise).

The central goal of this paper is to identify areas that Israel can focus on in order to continue reducing mortality rates given the current state of these factors, that is, absent any new medical technologies or breakthroughs. To do this, we compare age-specific mortality from 30 discrete causes of death across 37 developed countries. This allows us to identify the particular causes of mortality on which Israel's performance lags that of other high life expectancy countries. We argue that these areas of poor performance relative to other developed countries are likely to be the easiest points of leverage for improving population health.

Note that in focusing on existing medical technologies, we do not intend to understate the importance of paradigm-shifting breakthroughs in medical science or clinical practice for population health in the future. Rather, we simply follow conventional accounts in the history of medicine that point, in the short- and medium-term, to the pivotal role played by investing in and scaling-up access to humdrum existing technologies and best-practice, including those associated with the "social determinants of health" (Braveman et al., 2011; Braveman & Gottlieb, 2014).

Two other benefits should accrue if we can leverage areas of relatively poor performance. First, it should be relatively cost-effective, since it will inevitably employ existing interventions and technologies. That fits another unusual characteristic of Israel's health profile, the fact that its high life expectancy, and ongoing gains in life expectancy, have come while spending a relatively small percentage of GDP on health.<sup>2</sup>

---

2 In 2019, combined public and private health expenditures in Israel were equivalent to 7.5% of GDP, only marginally more than the 6.9% of GDP it spent in 1995. Across that same period, the other nine countries in the world with top-10 life expectancy in 2018 (Japan, South Korea, Norway, Switzerland, Iceland, Australia, Ireland, Sweden, and Italy) increased their health expenditures from 7.15% of GDP to 9.9% (8.0–12.1 range, all above the expenditure in Israel). Note, too, that between 1995 and 2019, Israel's GDP increased by a factor of 3.4, very similar to the growth in the other 9 countries in this top-10 list (3.3), though that was well above the overall OECD average (2.7).

In other words, despite the diversity of its population, Israel's life expectancy gains have been achieved with relatively minor increases in health expenditures, and relatively low health expenditures in general. Note that OECD countries that spent less than the OECD average of 8.8% in 2019 include Turkey, Mexico, and various Eastern European countries, all of which have life expectancy far below Israel's.

The second benefit of this approach is that it can help reduce health inequalities in Israel. Because there are substantial differences across Israel's diverse subpopulations on many causes of death (Chernichovsky et al., 2017; Pinchas-Mizrachi et al., 2020), any intervention would — even if just for efficiency reasons — naturally be aimed at the portion of the population that is more affected by that specific ailment.

The empirical core of the paper compares Israel's mortality by cause-of-death to that of 36 other high life expectancy countries, mostly members of the OECD. We describe our methods for identifying these causes more formally below. For now, it suffices to say that we apply a straightforward set of demographic techniques that disaggregate all age-specific mortality in Israel by cause-of-death, then use information on cause-specific mortality in other developed countries to identify countries that have the *median observed mortality*, the *minimum observed mortality*, and what we call the *minimum feasible mortality* to which Israel could aspire on most causes: 4<sup>th</sup> across these 37 countries (approximately the 10<sup>th</sup> percentile). Substituting each of these for the current Israeli mortality — a type of standardization procedure — allows us to estimate how many deaths could hypothetically be avoided in Israel, if it had one of those other observed mortality patterns.

Herein lies the heuristic strength of this approach: these observed minimum mortality schedules are not theoretical or simulated patterns. They necessarily arise from current medical technology, practice, and policy. Additionally, since the method uses age-specific mortality rates rather than an age-standardized measure, it allows for the direct estimation of how much life expectancy in Israel would be affected by each substitution — we expand on this below.

Four important results emerge from the main cross-national analyses. First, the single most important cause of death on which Israel lags other countries is diabetes, even after the moderate reduction in diabetes mortality over the last 10 years. If Israel, currently ranked 36<sup>th</sup> (out of 37 countries) in terms of men's mortality from diabetes, and 35<sup>th</sup> for women's mortality, had the age-specific diabetes mortality rate of top-ranked Finland (men) and Iceland (women), it would save around 4,741 deaths in 2021 (2,498 women, 2,243 men). That is almost 10% of the total expected number of annual deaths. Even if Israel could only improve its age-specific diabetes mortality to that of the median-ranked countries, it would save around 3,370 deaths in 2021 (1,566 men, 1,804 women). That is similar to the number of deaths from Covid-19 in 2020 (3,338).

Second, even though Israel ranks relatively high on survival from cancers in general, it has much poorer outcomes on particular types of cancer, especially among women. Notably, it ranks 32<sup>nd</sup> on breast cancer and 23<sup>rd</sup> on cancer of the colon and rectum — though on these, too, mortality has been falling in Israel over the last 20 years. If Israel had the same age-specific mortality rate from breast cancer and cancer of the colon and rectum as the top-ranked country, it would save around 880 and 436 women's deaths in 2021, respectively. If it could get to the 10<sup>th</sup> percentile, it would save 663 and 319 women's lives, respectively.

Likewise, 513 men's deaths could be avoided if Israel was in the 10<sup>th</sup> percentile for age-specific mortality rate from colon, prostate, and lung cancer. And more than 1,100 per year would be saved if it equaled the top performers on these causes of death.

Third, significant reductions in mortality could also be achieved by reducing deaths from lesser known causes to those of the minimum feasible mortality schedule (i.e., the 10<sup>th</sup> percentile of countries in our sample). These include: chronic respiratory diseases and infections (1,504 avoidable deaths); digestive diseases (490 avoidable deaths); urinary diseases (594 avoidable deaths); skin and subcutaneous diseases (660 avoidable deaths); endocrine metabolic and immune disorders (593 avoidable deaths); and enteric infections (401 avoidable deaths). Israel does not rank in the top quartile in any of these. In fact, Israel ranks in the bottom three countries in our 37-country sample on the final three causes of mortality on this list.

Finally, gender differences in the number of deaths by cause point to different pathways to improving population health among women as opposed to men. Putting aside breast and prostate cancer, if Israeli men and women experienced the minimum age-specific mortality rates from cardiovascular disease and respiratory infections, 70% of lives saved would be women. The only causes of death where the balance of potential saved lives veers toward men in the same way are self-harm and interpersonal violence, transport injuries, substance use disorders, HIV/AIDS, and neglected tropical diseases. But as a group, these cause far fewer deaths than those in which more women's lives would be saved. They are also much more the result of behavioral factors than disease.

There are a few issues that we intentionally sidestep in this paper. *First*, since our focus is on current mortality patterns across developed countries, which necessarily reflect current medical knowledge and practice, we ignore

the scholarly debate about how long into the future life expectancy will continue to rise. Given the slowdown in life expectancy gains over the last couple of decades (Vallin & Mesle, 2009),<sup>3</sup> much of that debate centers on the potential for biological- and paradigm-shifting interventions to significantly increase survival probabilities and maximum healthy human lifespan in the medium to distant future (e.g., Roichman et al., 2021 on manipulation of SIRT6). Those technological shifts are not relevant to our argument here. *Second*, we take no explicit position on a more philosophical question: whether constantly increasing life expectancy is a desirable outcome, where desirability can be framed in ethical, social, or economic terms. Arguably, this means that we are implicitly conforming to the conventional view that increasing life expectancy is a good thing. *Third*, we also sidestep questions about the relationship between length of life, quality of life, and healthy aging. This, too, is a philosophically problematic issue, though at least in this case there is a considerable body of empirical evidence showing that in terms of both population and individual health, healthier people tend to live longer and tend to report a higher quality of life — see prior Taub Center research on healthy years of life for a focus on Israel (Bowers & Chernichovsky, 2017), and Phyo et al. (2020) for a more general and recent meta-analysis. *Finally*, although we touch on variation in mortality across subpopulations in Israel, we do not address those directly in any empirical way. Our mortality data are national, so any reference that we make to within-country variation is anchored in other research (e.g., Chernichovsky et al., 2017; Pinchas-Mizrachi et al., 2020). That said, as mentioned above, interventions directed at those causes of death in which Israel most lags other developed countries would inevitably also reduce inequality within Israel, especially between Jews and Arabs. Diabetes, three times as prevalent in Israel's Arab population as in its Jewish, is the most prominent example. Another is lung cancer, whose incidence is 50% higher

- 
- 3 In the 10 years leading up to 2018, gains to life expectancy were slower across all developed countries, including in Israel, where it increased by only 1.4 years. Israel's increase was still much greater than that of the US, Germany, or the UK — where life expectancy across the decade increased by 0.2, 0.7, and 0.9 years, respectively — but it lagged the 1.8–2.05 years increase of other high performers like Switzerland, Spain, and Italy. There is some debate about the causes of this global slowdown. Much publicized “deaths of despair” have certainly played a role in the US and UK. But the sharp rise in the prevalence of obesity, diabetes, and certain types of cancer also point to a broader set of diseases of prosperity that, in wealthy countries, disproportionately affect the poor, and in poorer countries, the wealthy and middle class.

among Arab Israeli men as Jewish men, but about 150% higher among Jewish women as Arab women (Ministry of Health, 2015). Right now, around 8% of Israel's population aged 70+, where these conditions are most prevalent, is Arab population. By 2040 it will be 14%. By 2060, it will be more than 20%. Any failure to reduce these inequalities will increasingly pull down national indicators of population health.

## Cause of death in Israel in international perspective

We compare cause of death across 37 countries — Singapore, Taiwan, and all members of the OECD except Colombia, Costa Rica, and Mexico — using 2019 data from the Global Burden of Disease (GBD) project at the University of Washington's Institute for Health Metrics and Evaluation (IHME).<sup>4</sup> Data on Israel's population by five-year age groups are the projected mid-2021 population based on Taub Center's projections (Weinreb, 2020).

To estimate where Israel's performance lags that of other high performing countries in terms of mortality, we first rank these 37 countries on 30 causes of death in Israel — most of these contain several clinically distinct conditions.<sup>5</sup> To control for variation in age structure across countries, the ranking uses the age-standardized cause-specific mortality rate (ASCMR). Table 1 shows Israel's ASCMR for each of these 30 causes, its rank among the 37 countries, and the percent of Israel's age-standardized mortality associated with that specific cause. Since mortality differs substantially across sex, the data are presented separately for men and women.

---

4 We do not include data from Colombia, Costa Rica, and Mexico out of concern for quality. In contrast, Taiwan and Singapore have highly regarded health characteristics and high-quality health-related data.

5 One limitation of GBD data, especially for understanding mortality in Israel, is that they do not have a distinct code for sepsis, which has seen substantial increases in crude death rates in Israel over the last 20 years (Weinreb, forthcoming). This is a known limitation of GBD data and reflects the difficulty in identifying sepsis-related deaths by underlying cause — Rudd et al. (2020) review these difficulties and provide global estimates.

**Table 1. Age-standardized death rate per 100,000 people per year and Israel's ranking across 37 developed countries, by cause of death and gender**

Cause of death	Men		Women	
	Israel death rate	Israel rank	Israel death rate	Israel rank
Neoplasms	145.09	5	107.52	19
Tracheal, bronchus, and lung cancer	31.35	10	13.41	13
Colon and rectum cancer	19.27	14	14.34	23
Breast cancer			21.47	32
Prostate cancer	14.20	5		
Cardiovascular diseases	112.70	3	82.36	6
Diabetes and kidney diseases	50.09	36	36.48	35
Neurological disorders	28.72	5	27.45	4
Chronic respiratory diseases	19.85	7	13.19	16
Digestive diseases	18.92	11	14.60	15
Respiratory infections and tuberculosis	15.88	13	11.74	18
Other non-communicable diseases	14.04	34	14.34	34
Urinary diseases and male infertility	5.55	31	5.83	34
Endocrine, metabolic, blood, and immune disorders	5.08	34	5.42	36
Congenital birth defects	2.79	15	2.48	13
Sudden infant death syndrome	0.23	13	0.21	21
Gynecological diseases			0.04	18
Self-harm and interpersonal violence	12.62	7	2.96	4
Unintentional injuries	10.30	2	7.30	10
Transport injuries	9.26	17	3.27	22
Skin and subcutaneous diseases	5.20	37	4.68	37
Enteric infections	3.08	37	2.83	34
Maternal and neonatal disorders	2.66	11	2.35	14
Substance use disorders	2.27	5	0.32	3
Other infectious diseases	1.22	25	0.96	25
Musculoskeletal disorders	0.76	15	1.47	17
HIV/AIDS and sexually transmitted infections	0.55	23	0.25	21
Nutritional deficiencies	0.40	19	0.39	23
Neglected tropical diseases and malaria	0.05	26	0.02	23
Mental disorders	0.00	7	0.00	8

Source: Alex Weinreb and Elon Seela, Taub Center | Data: GBD project, Institute for Health Metrics and Evaluation (IHME), University of Washington



Three notable phenomena can be seen in Table 1. First, almost a third of deaths in Israel are caused by neoplasms — around 20% of these are caused by tracheal, bronchus, and lung cancer (men) and breast cancer (women) — around a quarter of all deaths are caused by heart disease, and around 11% by diabetes (including kidney disease). In other words, these three categories alone account for roughly two-thirds of all deaths in Israel. More generally, the top 10 causes of mortality — at least as structured in these categories — account for around 95% of all deaths in Israel.

Second, in terms of the top-5 causes of mortality among men, Israel's international ranking is relatively high — that is, it experiences low mortality. Israel has between the 3<sup>rd</sup> and 7<sup>th</sup> lowest mortality on these top-5 causes, with the very notable exception of diabetes, where it is ranked 36<sup>th</sup>. Heading down the table the ranking slips. Israel ranks 34<sup>th</sup> on the generic "Other non-communicable diseases" category — this is largely driven by its very low ranking on mortality from "Urinary diseases" and "endocrine, metabolic, blood, and immune disorders," which account for 76% of Israel's deaths in this category. Israel is also absolute bottom of the table in terms of mortality from skin and subcutaneous diseases, and mortality from enteric infections (broadly, bacterial, parasitic, and viral infections of the intestinal tract).

Third, women's mortality ranking follows roughly the same pattern as men's, with two exceptions. The first is that Israeli women are in 19<sup>th</sup> place in terms of cancer — 32<sup>nd</sup> on breast cancer and 23<sup>rd</sup> on colon cancer — and 6<sup>th</sup> place in terms of heart disease, as opposed to 5<sup>th</sup> and 3<sup>rd</sup> place, respectively, among men. This points to the second exceptional pattern: the more general gender difference in Israel. Even though Israeli women have lower mortality than their male counterparts on almost all causes of death, women's mortality ranks 2.1 places lower than men's in an international comparison, or 6.0 places if that average is weighted by the proportion of deaths associated with each cause.

## How many lives could be saved?

In order to identify areas that Israel can focus on in order to continue reducing mortality rates, we estimate how many lives could be saved in 2021 if we were to substitute one of three different age-cause-specific mortality rates:

1. *Minimum observed mortality* — the age-specific mortality rates of the country ranked top (of the 37 countries) in its ASCMR: estimates of potential lives saved are provided for all causes of mortality.
2. *Minimum feasible mortality* — the age-specific mortality rates of the country ranked 4<sup>th</sup> in its ASCMR (approximately the 10<sup>th</sup> percentile): estimates of potential lives saved are limited to causes of mortality on which Israel is ranked 5<sup>th</sup> or lower.
3. *Median observed mortality* — the age-specific mortality rates of the country ranked 19<sup>th</sup> in its ASCMR: estimates are limited to those causes of mortality on which Israel is ranked in the bottom half of countries.

We calculate these lives saved using a multiple decrement life table, treating men and women separately. Specific methods are described in the Appendix. Note these calculations make the conventional assumption of multiple decrement life table methods: that cause-specific mortality rates are functionally independent. We expect this to be a valid assumption for some causes of death. For example, reducing Israel's age-specific mortality rates from heart disease to those of Japan — which has the lowest ASCMR from heart disease — should not affect age-specific mortality rates associated with traffic accidents or suicide.<sup>6</sup> In contrast, where there is some “comorbidity” — people suffering from a related set of chronic health problems, especially common at older ages — we expect this assumption of functional independence to underestimate the effects on mortality as a whole that would result from reducing mortality from a single cause. For example, reducing Israel's age-specific mortality rates from heart disease to those of Japan should, in the real world, also reduce mortality rates from diabetes, and vice-versa.

---

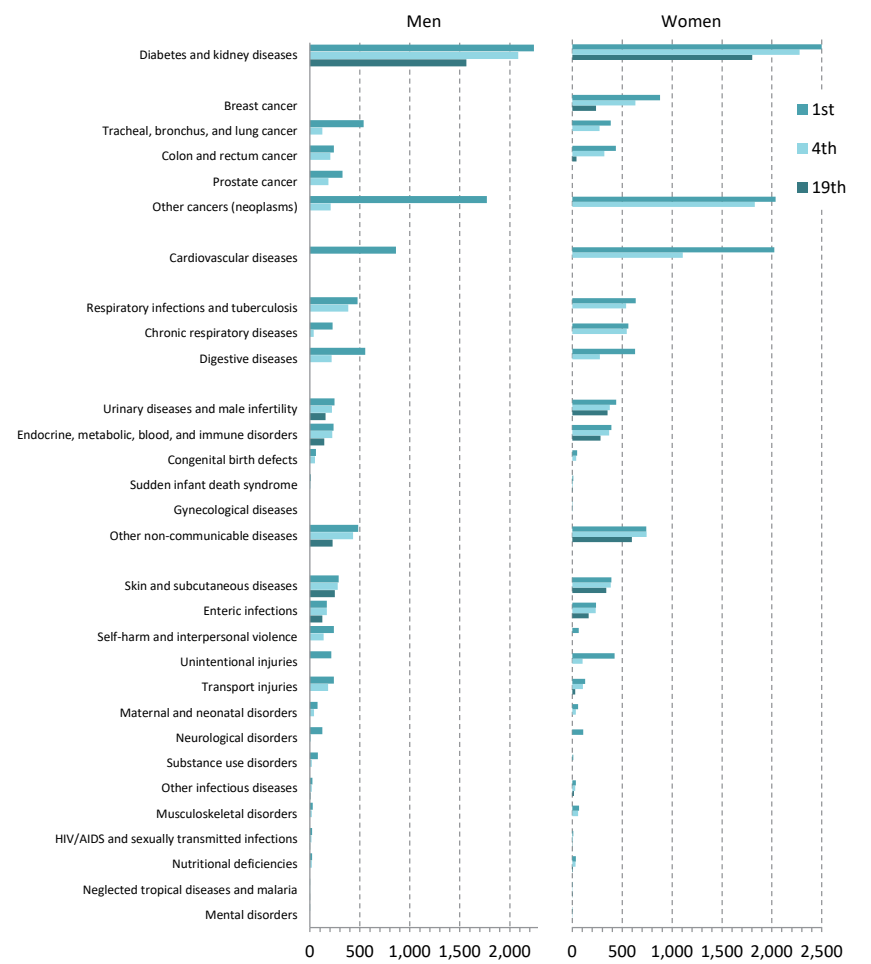
6 Though the *number* of deaths from traffic accidents or suicide will increase a little, since the same rate is being applied to a slightly larger denominator (fewer people died from heart disease).

## Results

The potential number of lives saved are presented in Figure 1, with discrete estimates for men and women. The causes are ordered by total lives saved for both men and women. The expected effects on life expectancy at birth and ages 25, 65, and 80 are shown in Appendix Table 1, with separate estimates for women and men. To ease interpretation, the expected effects on life expectancy use *months* of life gained.

Not surprisingly, given that diabetes is one of the major causes of death in Israel, and that, as shown in Table 1, Israel ranks 36<sup>th</sup> for men and 35<sup>th</sup> for women in terms of ASCMR from this cause, the largest potential gains in terms of survival could be achieved through further reductions in diabetes-related mortality. Figure 1 shows that if Israel's age-specific mortality rates from diabetes among men and women were the same as the minimum rate observed globally — in Finland and Iceland, respectively — there would be approximately 4,741 few deaths in Israel in 2021 (2,243 men and 2,498 women). That is roughly 10% fewer deaths than the expected number of deaths from all causes during the year. As a result, life expectancy at birth for both men and women would increase by about 10.5 months, and life expectancy at age 80 would increase by almost two-thirds of a year. Note, too, that the combination of Israel's low ranking on diabetes mortality and the substantial cross-national variation in mortality from this cause means that Israel could save a substantial number of deaths even if it were to experience a more moderate improvement in its age-specific mortality rates. For example, if Israel had the same diabetes mortality rates as the 10<sup>th</sup> percentile countries — referred to as the minimum feasible mortality above — 4,361 lives would be saved. If it could improve diabetes mortality to the median observed levels of this 37-country group, around 3,370 deaths would be avoided (1,566 men, 1,804 women).

**Figure 1. Number of lives that would be saved if age-cause-specific mortality rates in Israel were the same as those in countries ranked 1<sup>st</sup>, 4<sup>th</sup> or 19<sup>th</sup> place across 37 developed countries, by cause of death and gender**



Source: Alex Weinreb and Elon Seela, Taub Center | Data: GBD project, Institute for Health Metrics and Evaluation (IHME), University of Washington

Significant improvements could also be made on other diseases on which Israel ranks very low by international standards, though here we need to break down the estimates by subtype. For example, more than 1,300 deaths could be saved from a range of “other non-communicable diseases” if Israel, currently ranked 34<sup>th</sup> among both men and women, moved up to levels of mortality observed in South Korea (men) and Japan (women). Note that almost 80% of deaths in this category in Israel — for both men and women — are caused by either urinary diseases or endocrine, metabolic, blood, and immune disorders. Israel ranks in the bottom five countries on both of these groupings. Reducing mortality to its lowest observed levels from these causes would save 686 and 627 lives for men and women, respectively. Reducing them to the median observed mortality levels would save 509 and 425 lives, respectively, which would raise male life expectancy by 2.5 months and female life expectancy by 3.1 months.<sup>7</sup>

Not all potential improvements in mortality are related to causes where Israel is ranked toward the bottom of the distribution across these 37 countries. Significant improvements could also be achieved if Israel were to reduce mortality in areas where it is toward the middle of the distribution. For example, Israel currently ranks 13<sup>th</sup> (men) and 18<sup>th</sup> (women) in mortality from respiratory infections. If it could reduce mortality to the 10<sup>th</sup> percentile, the minimum feasible level, it would reduce the number of deaths by more than 900 — 382 men, and 539 women. A further 583 deaths could be saved — 94% of them women — if Israel reached the 10<sup>th</sup> percentile levels of mortality for chronic respiratory diseases, even though Israel is toward the top of the table on these (7<sup>th</sup>) among men and toward the middle (16<sup>th</sup>) among women.

Israel’s performance in certain types of cancers is similar. Although Israeli men have relatively low mortality from cancer in general — the 5<sup>th</sup> lowest out of these 37 countries — their outcomes lag on particular types of cancer, notably colon and rectum cancer (14<sup>th</sup>) and the more common tracheal, bronchus, and

---

7 Other causes of death in this category, including congenital birth defects, sudden infant death syndrome (SIDS), and gynecological diseases, are relatively rare in developed countries. We mention them here because known resistance to prenatal testing in Haredi populations and consanguineous marriage in the Arab sector should increase congenital mortality — Chernichovsky et al. (2017) confirm much higher mortality from congenital disorders in the Arab sector. Likewise, the relatively high fertility in both subpopulations should be associated with gynecological disease and SIDS. On all of these causes, however, Israel ranked in the second quartile, which together with the relatively low probability of death from these causes means that 127 lives (in 2021) could be saved, and life expectancy increased by a mere 0.05 years.

lung cancer (10<sup>th</sup>). Reducing these to the levels seen in the minimum feasible mortality would save, respectively, 203 and 104 deaths.

For women, the differences across types of cancer are even more pronounced. Israel's overall rank of 19<sup>th</sup> is partly pulled down by its high mortality from breast cancer, where it ranks 32<sup>nd</sup>, and colon and rectum cancer, where it ranks 23<sup>rd</sup>. Reducing these to the minimum feasible level (10<sup>th</sup> percentile) would, respectively, save 633 and 319 lives. Even reducing to the median observed level — a more feasible goal given certain genetic risk factors, reviewed below — would save around 280 lives.<sup>8</sup>

Gender differences in mortality patterns extend beyond these examples, pointing to different pathways to improving population health among women as opposed to men. If Israeli men and women experienced the minimum age-specific mortality rates from cardiovascular disease and respiratory infections observed in other countries, 70% of the lives saved would be those of women. The only causes of death where the balance of lives saved veers toward men in the same 2:1 ratio are self-harm and interpersonal violence, transport injuries, substance use disorders, HIV/AIDS, and neglected tropical diseases. In terms of sheer number of deaths, however, these causes are responsible for far fewer deaths than those in which more women's lives would be saved. And they are also much more the result of risky behavior than disease. In other words, reducing mortality from these causes demands a different type of intervention.

A final point is related to where the gains in life expectancy occur. On almost all these causes of death, the conditional gains to life expectancy at birth and at age 25 are greater than at 65 or 80. In some, the gains are much more weighted toward life expectancy at younger ages, signaling a significant mortality reduction at younger ages (e.g., self-harm and interpersonal injuries, transport injuries, substance use disorders). On other causes of death, the effects are largely flat, or even marginally higher at older ages, implying that the reduction in mortality will be primarily at older ages. Notable examples include deaths from cardiovascular diseases, respiratory infections, urinary diseases, skin and subcutaneous injuries, and enteric infections.

---

8 Another 490 deaths could also be saved by reducing mortality to the 10<sup>th</sup> percentile from a range of “digestive diseases” — on which Israel is solidly in the second quartile. However, we ignore this here since it includes too large an array of health conditions, making it difficult to target any single problem: cirrhosis and other chronic liver diseases; upper digestive system diseases; appendicitis; paralytic ileus and intestinal obstruction; inguinal, femoral, and abdominal hernia; inflammatory bowel disease; vascular intestinal disorders; gallbladder and biliary diseases; pancreatitis; other digestive diseases.

## Discussion

The hypothetical number of lives saved and concomitant gains in life expectancy outlined in Figure 1 and Appendix Table 1 highlight health conditions in which substantial progress could be achieved, not only if Israel to be suddenly blessed with the *minimum* mortality currently observed in one of the reference group countries, but even if it could lower mortality to the *median*. Those conditions include: diabetes (4,741 or 3,370 avoidable deaths with best practice and at the median, respectively); urinary diseases (686 or 509 avoidable deaths); skin and subcutaneous diseases (676 or 588 avoidable deaths); endocrine metabolic and immune disorders (627 or 425 avoidable deaths); enteric infections (407 or 287 avoidable deaths). Israel ranks towards the bottom quartile in most of these, suggesting that it is not employing current best practice in relation to these conditions.

On other conditions, Israel already has lower mortality than the median but could benefit by improving mortality to *minimal feasible level*, around the 10<sup>th</sup> percentile. Doing so could save 1,504 deaths from chronic respiratory diseases and infections, and 490 from digestive diseases.

All of these conditions, we suggest, serve as key points of leverage for further health investments in the near- to medium-term even if a priori we assume that each such intervention demands a different combination of the factors mentioned in the introduction: modifying clinical practice, leveraging public health resources, and encouraging behavioral modification. It is equally clear that not all these interventions are the responsibility of medical professionals. Rather, they demand more general public health campaigns, that may also differ somewhat by gender.

An additional bonus is also worth noting. Improvements in mortality will not be limited to those particular health conditions. Patterns of comorbidity mean that some of these will have added effects on other health conditions. Notably, dietary improvements that reduce risk factors for diabetes should also lower the incidence of heart disease and certain types of diet-related cancers. Reducing the incidence of respiratory infections should marginally reduce congenital heart failure. More frequent or universal screening — including annual “blood work” — will likely catch a range of clinical conditions at earlier and more treatable stages.

Finally, targeting the conditions on which Israel lags other top performers is also a way to reduce inequality in health outcomes across populations. This brings us to the second of the two remarkable things about Israel’s gains in life

expectancy over the last 50 years (the first was its cost effectiveness). Israel's population includes substantial and growing subpopulations that either have more limited access to health services — especially the case in Israel's "periphery" which includes disproportionate numbers of Bedouin and Arab communities — or that engage in culturally-rooted behaviors that are obstacles to health. Examples of these behaviors include, in the Arab sector, rising rates of smoking among men (Baron-Epel et al., 2010), higher obesity and lower levels of exercise (Muhsen et al., 2017), an increasingly unhealthy Western diet (Abu-Saad et al., 2012), and the relatively high (albeit falling) prevalence of consanguineous marriage (Sharkia et al., 2016). The health-related behaviors increase the incidence of a variety of cancers and of obesity and diabetes (Basel-Vanagaite et al., 2007; Glushko et al., 2010) while the last of these raises infant and child mortality (Chernichovsky et al., 2017). Infant mortality in Israel's non-Jewish population is 5.6 per 1,000 births, with congenital problems accounting for 2.1 of these, which is almost as high as the total infant mortality in the Jewish sector — 2.3 deaths per 1,000 births (CBS, 2020, Table 3.13).

Examples of behavioral obstacles to improved health in the Haredi sector are a little different. They include much lower rates of prenatal testing (Ivry, 2015), breast-cancer screening (Freund et al., 2015), lower consumption of fruits and vegetables (Leiter et al., 2020), overeating, and lack of exercise (Rosenberg et al., 2016). Respectively, these patterns are known to increase the prevalence of — and risk of mortality from — congenital health problems, breast cancer, colorectal cancer, diabetes, and obesity (Arbel et al., 2021a, 2021b; Gruber et al., 2015).

Over the next few decades, the proportion of Israel's population that self-identifies as part of the Arab or Haredi subpopulations — or that was at least raised in them — is projected to grow, giving them more weight in the population as a whole, especially at older ages. Population health at the national level will therefore increasingly be affected by the health preferences and practices within those two subpopulations. Since the causes of death on which Israel performs poorly in international comparisons appear to disproportionately affect Israeli Arab and Haredi populations, reducing mortality from those causes should lead to both an increase in life expectancy at the national level, and to a reduction in inequality across groups.



## Conclusions

There are three potential points of weakness in this study. The first is related to data quality. The validity of our claims about Israel's performance on any given cause of death depends on the quality of the GBD mortality data, especially the reliability of coded cause of death. Officially, all deaths across these 37 countries are coded in accordance with ICD-10 guidelines. These are further processed by IMHE staff before release through the GBD project. That said, we have no way to validate the reliability of ICD-10 coding practices across countries. We therefore assume that they are broadly valid and reliable — other than deaths associated with sepsis, a special category (Rudd et al., 2020) — especially as we restrict our attention to members of the OECD, alongside equally developed Singapore and Taiwan. In addition, since our estimation procedure assumes the functional independence of each cause of mortality — even when we know that there is some comorbidity in which risk factors are positively interdependent — our analyses likely underestimate the total reduction in mortality that would arise from reducing rates of mortality from a single cause only. This, at least, is true of estimates reduced to the median observed mortality or minimum feasible mortality.

A second potential weakness in our argument is related to “natural endowments” associated with the country's location or population's biological characteristics, at least given current medical technology. These can both limit a country's ability to climb to the top of the rankings, or stop it from falling to the bottom. Examples abound. Within the constraints of contemporary medical science, mortality from skin cancer in Israel will never reach the global minimum for developed countries — there is simply too much exposure to the sun. Nor can breast and ovarian cancers ever reach the global minimum, since BRCA gene mutations — which substantially raise the risk of these cancers — are much more prevalent among Ashkenazi Jews. In each of these cases, maximizing screening would almost certainly improve mortality outcomes and move Israel up the rankings, but not to the top. On the flipside, Israel's latitude and yearly total sunshine mean that Israel will likely never be at the bottom of the ladder for suicide, and its population will tend to be outdoors more, associated with improved cardiovascular health and higher levels of Vitamin D. Likewise, aggressive screenings for gene mutations like BRCA may pick up on other emerging health problems that, treated earlier, resolve faster and at a lower cost. The bottom line here is that natural endowments are an important constraint at any given point in time, but they are not destiny. They point us

toward behavioral and institutional innovations that may end up offsetting a given disadvantage.

The third and final potential weakness in our argument is related to long-term secular trends that partly drive mortality reduction. We refer especially to the long-term impacts on health of diseases of prosperity associated with overeating, smoking, and less exercise. To the extent that these behaviors are among the key causal factors in the slowing gains to life expectancy over the last few decades (Cardona & Bishai, 2018; Vallin & Mesle, 2009), Israel's high life expectancy today arguably reflects its relative lack of prosperity in the 1940s to 1980s, the key developmental stage of today's middle-aged and elderly. If this is true, it limits how much we can learn from other countries that have lower mortality rate from a given cause. As above, we think this is only a minor weakness, and it is specific to certain causes of death. For example, although there is little that can be done about today's prevalence of lung cancer given smoking rates in past decades, its treatability is, in part, conditional on timing of diagnosis, about which there is much to be done. In addition, many other leading causes of death where we think major gains could be made — diabetes, respiratory infections, digestive diseases — are much less a function of behaviors in the distant past. Interventions today can not only slow, reduce, or even reverse the trajectory of a given condition or disease, they can also prevent their emergence over the next few decades.

Overall, therefore, the general argument seems solid. Israelis enjoy high life expectancy at relatively low cost. To ensure continued improvements in population health, we need not only rely on the development of new medical technologies, or on reinventing the wheel for a given health condition on which Israelis' health outcomes lag those of their counterparts in other developed countries. Instead, we can simply look to the best-performing countries on causes of death on which Israel ranks low and where, as a result, thousands of lives could be saved every year if we adopted, adapted, and implemented other methods of care. This list includes: mortality from diabetes, chronic respiratory disease, digestive diseases, urinary diseases, endocrine and metabolic disorders, skin and subcutaneous diseases, and enteric infections.

As gains to life expectancy slow in Israel and globally, this approach to saving more lives — focusing on the optimal mix of existing technologies and interventions — will become a more important model for improving public health. That approach may be especially apposite to a country like Israel that has both a highly heterogeneous population and relatively low per capita spending on health.

## References

### English

- Abu-Saad, K., Murad, H., Lubin, F., Freedman, L. S., Ziv, A., Alpert, G., Atamna, A., & Kalter-Leibovici, O. (2012). Jews and Arabs in the same region in Israel exhibit major differences in dietary patterns. *The Journal of Nutrition*, 142(12), 2175–2181.
- Arbel, Y., Fialkoff, C., & Kerner, A. (2021a). Are ultra-Orthodox Jews healthier than secular Jews? Gender differences, cohort effect, lifestyle and obesity. *Contemporary Jewry*.
- Arbel, Y., Fialkoff, C., & Kerner, A. (2021b). What is the optimal family size for a minimal likelihood of obesity? *Contemporary Jewry*.
- Baron-Epel, O., Keinan-Boker, L., Weinstein, R., & Shohat, T. (2010). Persistent high rates of smoking among Israeli Arab males with concomitant decrease in rate among Jews. *Israel Medical Association Journal*, 12(12), 732–737.
- Basel-Vanagaite, L., Taub, E., Halpern, G. J., Drasinover, V., Magal, N., Davidov, B., Zlotogora, J., & Shohat, M. (2007). Genetic screening for autosomal recessive nonsyndromic mental retardation in an isolated population in Israel. *European Journal of Human Genetics* 15(2), 250–253.
- Bowers, L., & Chernichovsky, D. (2017). [Revisiting Israel's healthcare priorities](#). Taub Center for Social Policy Studies.
- Braveman, P., Egerter, S., & Williams, D. R. (2011). The social determinants of health: Coming of age. *Annual Review of Public Health*, 32(1), 381–398.
- Braveman, P., & Gottlieb, L. (2014). The social determinants of health: It's time to consider the causes of the causes. *Public Health Reports*, 129, 19–31.
- Cardona, C., & Bishai, D. (2018). The slowing pace of life expectancy gains since 1950. *BMC Public Health*, 18(1), 1–7.
- CBS (2020). [Statistical abstract of Israel 2020, No. 71](#). Central Bureau of Statistics.
- Chernichovsky, D., Bisharat, B., Bowers, L., Brill, A., & Sharony, C. (2017). [The health of the Arab Israeli population](#). In A. Weiss (Ed.), *State of the Nation Report: Society, Economy and Policy 2017* (pp. 325–372). Taub Center for Social Policy Studies in Israel.
- Freund, A., Cohen, M., & Azaiza, F. (2019). Factors associated with routine screening for the early detection of breast cancer in cultural-ethnic and faith-based communities. *Ethnicity & Health*, 24(5), 527–543.
- Glushko, Y., Basher, W., Barchana, M., & Zidan, J. (2010). Differences in clinical and pathological characteristics of colorectal cancer in Arab as compared to Jewish patients in Northern Israel. *Familial Cancer*, 9(3), 327–330.
- Gruber, N., Reichman, B., Lerner-Geva, L., & Pinhas-Hamiel, O. (2015). Increased risk of severe diabetic ketoacidosis among Jewish ultra-Orthodox children. *Acta Diabetologica*, 52(2), 365–371.
- Ivry, T. (2015). The predicaments of koshering prenatal diagnosis and the rise of a new rabbinic leadership. *Ethnologie Francaise*, 45(2), 281–292.

- Leiter, E., Greenberg, K. L., Donchin, M., Keidar, O., Siemiatycki, S., & Zwas, D. R. (2020). Cardiovascular disease risk factors and health behaviors of ultra-Orthodox Jewish women in Israel: A comparison study. *Ethnicity & Health, 0*(0), 1–16.
- Muhsen, K., Green, M. S., Soskolne, V., & Neumark, Y. (2017). Inequalities in non-communicable diseases between the major population groups in Israel: Achievements and challenges. *The Lancet, 389*, 2531–2541.
- Phyo, A. Z. Z., Freak-Poli, R., Craig, H., Gasevic, D., Stocks, N. P., Gonzalez-Chica, D. A., & Ryan, J. (2020). Quality of life and mortality in the general population: A systematic review and meta-analysis. *BMC Public Health, 20*(1), 1596.
- Pinchas-Mizrachi, R., Zalcman, B. G., & Shapiro, E. (2021). Differences in mortality rates between Haredi and non-Haredi Jews in Israel in the context of social characteristics. *Journal for the Scientific Study of Religion, 60*(2), 274–290.
- Roichman, A., Elhanati, S., Aon, M. A., Abramovich, I., Di Francesco, A., Shahar, Y., Avivi, M. Y., Shurgi, M., Rubinstein, A., Wiesner, Y., Shuchami, A., Petrover, Z., Lebenthal-Loinger, I., Yaron, O., Lyashkov, A., Ubaida-Mohien, C., Kanfi, Y., Lerrer, B., Fernández-Marcos, P. J.,... Cohen, H. Y. (2021). Restoration of energy homeostasis by SIRT6 extends healthy lifespan. *Nature Communications, 12*(1), 3208.
- Rosenberg, D. A., Swencionis, C., & Segal-Isaacson, C. J. (2016). Caloric intake on the Sabbath: A pilot study of contributing factors to obesity in the Orthodox Jewish community. *Journal of Religion and Health, 55*(5), 1824–1831.
- Rudd, K. E., Johnson, S. C., Agesa, K., M., Shackelford, K. A., Tsoi, D., Kievlan, D. R., Colombara, D. V., Ikuta, K. S., Kissoon, N., Finfer, S., Fleischmann-Struzek, C., Machado, F. R., Reinhart, K. K., Rowan, K., Seymour, C. W., Watson, R. S., West, T. E., Marinho, F., Hay, S. I.,... Naghavi, M. (2020). Global, regional, and national sepsis incidence and mortality, 1990–2017: Analysis for the Global Burden of Disease Study. *The Lancet, 395*, 200–211.
- Sharkia, R., Mahajnah, M., Athamny, E., Khatib, M., Sheikh-Muhammad, A., & Zalan, A. (2016). Change in marriage patterns among the Arab community in Israel over a 60-year period. *Journal of Biosocial Science, 48*(2), 283–287.
- Vallin, J., & Meslé, F. (2009). The segmented trend line of highest life expectancies. *Population and Development Review, 35*(1), 159–87.
- Weinreb, A. (2020). [Population projections for Israel 2017–2040](#). In A. Weiss (Ed.), *State of the nation report: Society, Economy and Policy 2020* (pp. 129–162). Taub Center for Social Policy Studies in Israel.
- Weinreb, A. (forthcoming). *Causes of death in Israel, 1990–2018: Trends in crude death rates*. Taub Center for Social Policy Studies.

## Hebrew

Ministry of Health (2015). [Data on cancer in Israel](#). Ministry of Health.

## Appendix

For each of the 30 causes of death  $i$ , we distinguish the total age-specific mortality rate observed in Israel  $m_i$ , at a given age  $x$ , into mortality from that cause, and mortality from all other causes combined ( $\sim i$ ). We substitute the age-specific mortality rate of the country that has one of the three alternative mortality schedules from cause  $i$ ,  $m_x^{i(alt)}$ , for Israel's own age-specific mortality rate from that same cause,  $m_x^{i(Isr)}$ , leaving all other cause- and age-specific mortality rates,  $m_x^{\sim i}$ , unchanged. This procedure is run on each of the 30 causes of mortality for men, and then again for women.

To generate an estimate of how many deaths would be saved in Israel in 2021 if its age-specific mortality from a given cause  $i$  was  $m_x^{i(alt)}$  as opposed to the observed  $m_x^{i(Isr)}$ , we calculate the difference between the number of lives lost in Israel across all ages under the observed pattern ( $m_x^{i(Isr)}$ ), and under the hypothetical scenario in which Israel had one of the alternative observed mortality schedules ( $m_x^{i(alt)}$ ). That means we first calculate the total number of deaths at any given age in Israel's population as a whole,  $D_i$ , from cause  $i$  under each of these two scenarios:

$$D_x^{i(z)} = N_x * m_x^{i(z)}$$

Where  $N$  is Israel's total mid-2021 population in given age interval  $x$  (Weinreb 2020),  $z$  refers to either the observed or one of the alternative mortality schedules, and all other terms are as defined above. The difference between the total number of lives saved in Israel across all ages is then simply:

$$S^i = \left( \sum_{a=x}^{\infty} D_x^{i(Isr)} - \sum_{a=x}^{\infty} D_x^{i(alt)} \right)$$

Since total lives saved from a given cause of mortality,  $S$ , does not necessarily point to the largest gains in life expectancy — the former is a simple count, while the latter takes into account age at death — we also calculate the changes in life expectancy associated with substituting the minimum observed mortality  $m_x^{i(min)}$  for  $m_x^{i(Isr)}$  for any given cause of death. To do this, we use standard life table techniques, setting  $m_x$  to the sum of  $m_x^{i(min)} + m_x^{\sim i(Isr)}$ , converting this mortality rate into a probability of death, calculating total person years lived under this new mortality scenario, then converting this into measures of life expectancy at birth, as well as ages 25, 65 and 80.

**Appendix to Table 1. Anticipated changes in life expectancy (in years) at birth, ages 25, 65, and 80, if Israel lowered age-cause-specific mortality to the minimum observed, by cause of death and gender**

	Men				Women			
	Change in life expectancy at age:				Change in life expectancy at age:			
	Birth	25	65	80	Birth	25	65	80
Neoplasms	0.842	0.842	0.479	0.294	0.822	0.823	0.608	0.370
Tracheal, bronchus, and lung cancer	0.273	0.275	0.124	0.031	0.145	0.146	0.127	0.069
Colon and rectum cancer	0.096	0.096	0.076	0.063	0.164	0.164	0.131	0.089
Breast cancer					0.371	0.373	0.239	0.143
Prostate cancer	0.123	0.124	0.121	0.093				
Cardiovascular diseases	0.258	0.266	0.413	0.340	0.633	0.640	0.723	0.633
Diabetes and kidney diseases	0.909	0.918	0.864	0.652	0.859	0.861	0.814	0.631
Neurological disorders	0.067	0.062	0.024	0.004	0.034	0.027	0.007	0.010
Chronic respiratory diseases	0.104	0.102	0.068	0.036	0.183	0.181	0.174	0.136
Digestive diseases	0.227	0.226	0.178	0.143	0.197	0.197	0.191	0.161
Respiratory infections and tuberculosis	0.181	0.174	0.169	0.151	0.192	0.186	0.187	0.174
Other non-communicable diseases	0.222	0.171	0.136	0.111	0.243	0.225	0.215	0.189
Urinary diseases and male infertility	0.086	0.086	0.089	0.086	0.125	0.126	0.129	0.123
Endocrine, metabolic, blood, and immune disorders	0.110	0.094	0.065	0.047	0.137	0.124	0.110	0.087
Congenital birth defects	0.048	0.003	0.000	0.000	0.042	0.003	0.000	0.000
Sudden infant death syndrome	0.009	0.000	0.000	0.000	0.007	0.000	0.000	0.000
Gynecological diseases					0.001	0.001	0.001	0.001

**Appendix to Table 1 (continued). Anticipated changes in life expectancy (in years) at birth, ages 25, 65, and 80, if Israel lowered age-cause-specific mortality to the minimum observed, by cause of death and gender**

	Men				Women			
	Change in life expectancy at age:				Change in life expectancy at age:			
	Birth	25	65	80	Birth	25	65	80
Self-harm and interpersonal violence	0.165	0.125	0.016	0.008	0.040	0.030	0.010	0.005
Unintentional injuries	0.088	0.077	0.059	0.065	0.131	0.123	0.115	0.111
Transport injuries	0.146	0.105	0.038	0.025	0.063	0.049	0.028	0.020
Skin and subcutaneous diseases	0.106	0.107	0.101	0.087	0.114	0.115	0.114	0.103
Enteric infections	0.061	0.059	0.060	0.056	0.070	0.068	0.069	0.063
Maternal and neonatal disorders	0.062	0.000	0.000	0.000	0.052	0.003	0.000	0.000
Substance use disorders	0.049	0.048	0.009	0.004	0.004	0.005	0.002	0.002
Other infectious diseases	0.012	0.008	0.006	0.005	0.015	0.012	0.008	0.005
Musculoskeletal disorders	0.011	0.011	0.008	0.007	0.021	0.022	0.018	0.016
HIV/AIDS and sexually transmitted infections	0.013	0.012	0.001	0.000	0.007	0.006	0.001	0.000
Nutritional deficiencies	0.008	0.007	0.007	0.007	0.009	0.009	0.009	0.009
Neglected tropical diseases and malaria	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000
Mental disorders	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Source: Alex Weinreb and Elon Seela, Taub Center | Data: GBD project, Institute for Health Metrics and Evaluation (IHME), University of Washington

# SOCIAL WELFARE

4





# The Social Welfare System in Transition: An Overview

**John Gal and Shavit Madhala**

## Introduction

The year 2021 was a year of transition in social welfare. This was primarily due to a shift from life under the Covid-19 pandemic to life alongside the pandemic, thanks to the vaccination campaign. This transition has major implications for the social security and social welfare systems in Israel. There was also a transition from a government functioning without an approved budget and under extreme political uncertainty to a new government whose efforts focused on passing a budget and stabilizing the functioning of the economic, healthcare, and social services. The implications of this transition period are still not fully known and it is unclear if indeed long-term stability will be achieved in the areas of public health, the economy, and society.

The data presented in this chapter enable us to describe the social welfare system during the height of the Covid pandemic and, to a lesser extent, the transition period that followed it. Specifically, the data reflect the central role played by the social security and social welfare systems in dealing with the crisis and its fallout. During the Covid pandemic, these systems served as a critical social safety net and, in particular, an important means of ensuring the standard of living for individuals outside of the labor market. The data, and in particular those related to the second half of 2021, enable us to identify trends in social welfare with a significant degree of clarity. On the one hand, these trends underscore efforts to deal with some of the social problems that were set aside during the Covid pandemic. This is particularly the case with regard to the elderly and groups with disabilities and also with respect to the financial resilience of the National Insurance Institute (NII). On the other hand,

---

\* Prof. John Gal, Principal Researcher and Chair, Taub Center Social Welfare Policy Program; The Paul Baerwald School of Social Work and Social Welfare, The Hebrew University in Jerusalem. Shavit Madhala, Researcher, Taub Center for Social Policy Studies in Israel.

there remains a lack of overall policy in dealing with poverty and inequality and even a step backwards in ensuring the welfare of families with children, something that may lead to a greater incidence of poverty, inequality, and distress among marginalized groups in Israeli society.

## Social expenditure in 2020

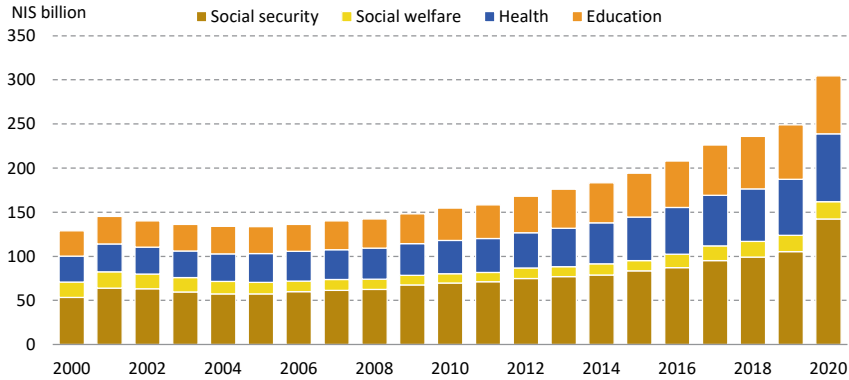
In 2020, social expenditure in Israel reached NIS 304 billion, an increase of NIS 55 billion over the previous year (Figure 1). Social expenditure as a share of GDP in 2020 crossed the 20% threshold for the first time in two decades to reach 22% (Figure 2). About 69% of the growth in social expenditure was a consequence of the increase in welfare expenditure and about 24% was due to expenditure on healthcare. The growth in expenditure on welfare was largely the result of an increase in two main components: unemployment benefits and the payment of almost-universal grants by the NII during the course of the year. These two components alone contributed to an increase of about NIS 30 billion in NII expenditure in 2020 relative to the previous year. In contrast to the growth in social security expenditure, there was no major change in total expenditure on social welfare, i.e., social services (not including healthcare and education services). The expenditure on social welfare grew by about NIS 840 million in 2020, an annual rate of only 4.5%, which was lower than the rate of growth in the previous year.<sup>1</sup>

---

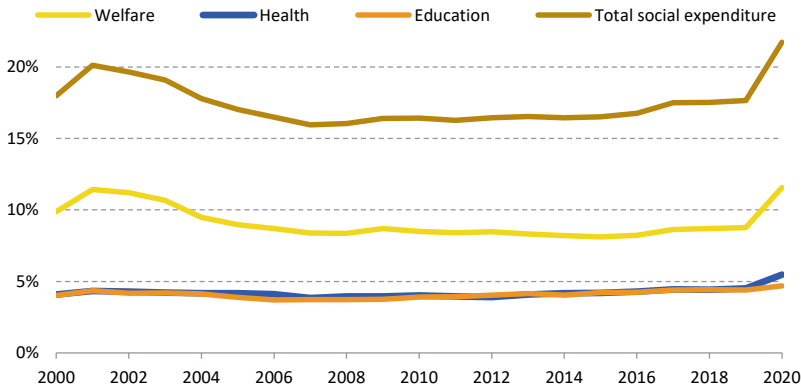
1 The expenditure on social security is measured as total expenditure of the NII, the Holocaust Survivors' Rights Authority, and the Ministry of Defense Bereaved Families and Rehabilitation Department, as well as expenditure on employment grants. The expenditure on social welfare is measured as the total spending of the Ministry of Welfare and Social Affairs, the Labor Division of the Ministry of Economy and Industry, the Ministry of Housing, the Ministry of Aliyah and Integration, and the Ministry of Social Equality.

**Figure 1. Social expenditure by category**

2020 prices

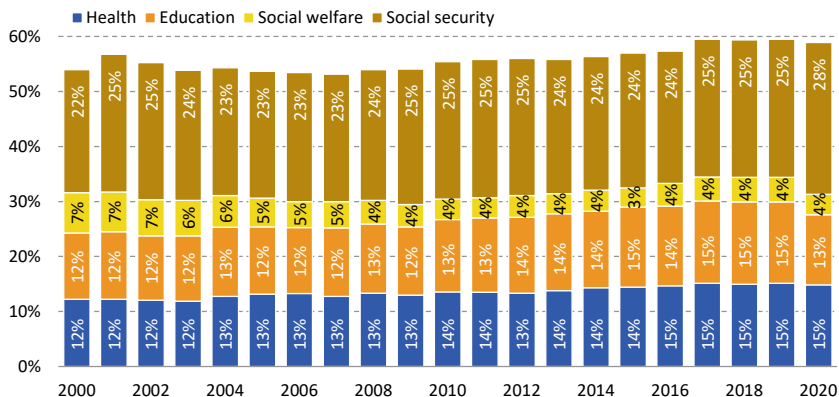


Source: John Gal and Shavit Madhala, Taub Center | Data: Ministry of Finance, State Budget files; NII

**Figure 2. Social expenditure by category, as a percent of GDP**

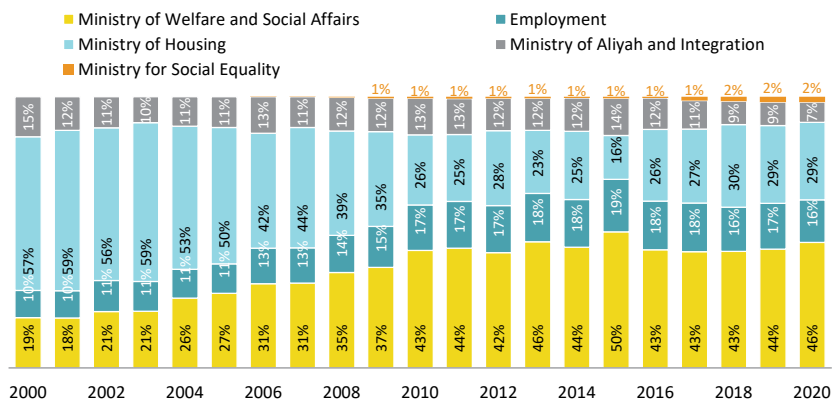
Source: John Gal and Shavit Madhala, Taub Center | Data: Ministry of Finance, State Budget files; NII; CBS

A breakdown of social expenditure (social security, social welfare, healthcare, and education) by percent of government expenditure (Figure 3) shows that it remained similar to previous years, with a small drop in the share of education expenditure and an increase in the share of social security expenditure. The share of expenditure on social welfare contracted somewhat.

**Figure 3. Breakdown of social expenditure, as a percent of government expenditure**

Source: John Gal and Shavit Madhala, Taub Center | Data: Ministry of Finance, State Budget files; NII; CBS

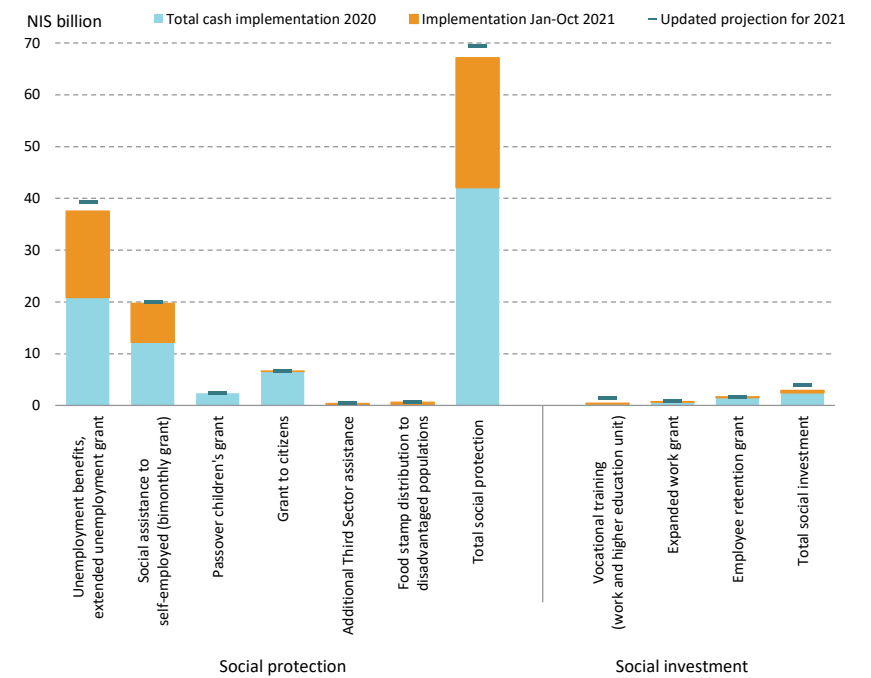
Social welfare expenditure in 2020 was NIS 19.5 billion. A breakdown of this expenditure (Figure 4) shows a slight increase in the share of the Ministry of Welfare and Social Affairs and a decline in the share of the Ministry of Aliyah and Integration, which apparently reflects a sharp drop (of 41%) in the number of immigrants in 2020 relative to 2019 (CBS, 2021).

**Figure 4. Breakdown of social welfare expenditure**

Source: John Gal and Shavit Madhala, Taub Center | Data: Ministry of Finance, State Budget files

The large increase in welfare expenditure in 2020 was primarily due to the increase in resource allocation to deal with the Covid pandemic as part of the government assistance program. As shown in Figure 5, most of the resources were allocated to social protection programs for individuals whose income suffered due to the pandemic and the subsequent labor market contraction, while a very small share was allocated to social investment programs to develop human capital and facilitate workers' transition and integration into the labor market. The trend in welfare expenditure within the assistance program shows that up to October 2021 a large part of the allocated budget was utilized (about 96%).

**Figure 5. Welfare expenditure within the government assistance program to deal with the Covid pandemic**



Source: John Gal and Shavit Madhala, Taub Center | Data: Ministry of Finance

## Social security

The social security systems, which are operated primarily by the NII, played a key role in the State's effort to deal with the Covid pandemic's effect on the lives of Israel's citizens. During the pandemic, there was a dramatic increase in expenditure on social security which reached NIS 142 billion in 2020, of which about NIS 130 billion was allocated to NII benefit payouts. During the first half of 2021, NII expenditure on benefits totaled about NIS 66 billion, which was part of an upward trend relative to the pre-crisis period, during which the expenditure for the entire year stood at about NIS 94 billion.

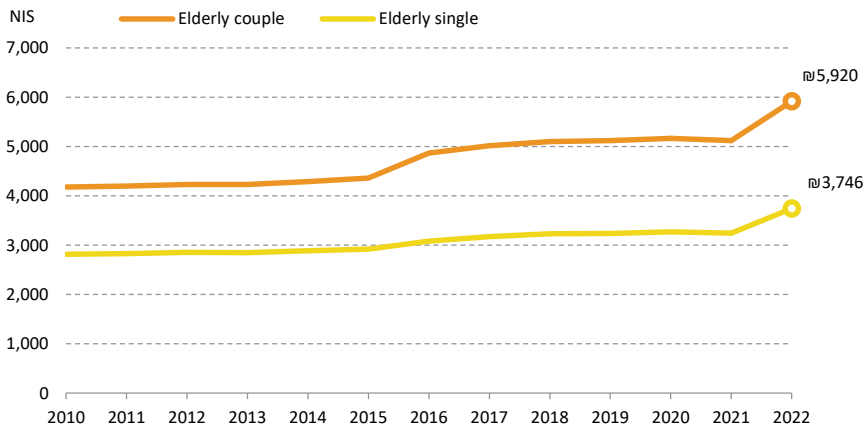
The transition in social security comprises conflicting trends. With respect to the elderly and people with disabilities, the government announced during the crisis year that it intends to complete measures to improve meeting their needs that began prior to the crisis. Completing the measures involves implementing an agreement with organizations representing people with disabilities to increase general disability pensions, in addition to implementing a recommendation by the Committee for the War on Poverty (the Elalouf Committee) to raise income support payments for elderly individuals with no additional sources of income. In parallel, and following a drawn-out public discussion, the measure to raise women's retirement age to 65 (which entails deferring eligibility for an old-age benefit) is likely, in the long term, to improve the financial situation of the NII. It is important, of course, that this measure be accompanied by steps to ease the situation for women living in poverty during this transition period through accompanying policy measures to augment the social safety net, unemployment insurance, and employment grants. In contrast, planned policy change for families with children is liable to worsen their situation and to increase the incidence of poverty among this population, due to the tightening of eligibility requirements for the unemployment insurance program and the lack of steps to deal with limitations of the income support program.

### Income support for the elderly

One of the main recommendations of the Elalouf Committee was to increase the incomes of the elderly living in poverty by raising the level of income support for those whose only or main source of income is the old-age benefit. As can be seen in Figure 6, during the period since 2016, the year in which the gradual implementation of the Committee's recommendations began, there has been an increase in the old-age benefit paid to low-income earners

(the old-age benefit plus income support). However, even after the changes to this cash benefit, the incidence of poverty among the elderly in Israel was between 12.5% to 15.7% (Endeweld et al., 2020). The State budget for 2021–2022 includes a commitment to raise the benefit level and to complete the implementation process. The goal is to extract many of the elderly from poverty, even if the improvement of their economic welfare is not substantial (the addition for a couple is NIS 754 per month and for a single individual is NIS 477 per month relative to 2020).

**Figure 6. The basic old-age benefit supplemented by income support for ages 70–80**



Note: The data for 2021 are based on the total average benefit for the months January–July 2021; data for 2022 are based on a calculation by the Knesset Research and Information Center which was carried out on the basis of the rates in the proposed law (Bar, 2021).

Source: John Gal and Shavit Madhala, Taub Center | Data: NII; Bar, 2021

### Raising the retirement age for women

As in other welfare states, over the past two decades efforts have been made in Israel to change the age of retirement and old-age benefit pension eligibility (Bar, 2021). The expected change, which will raise the age of retirement, reflects both the rise in life expectancy and the effects of the current situation on the financial resilience of the social security systems, since they have significantly increased the period of payment for old-age benefits for a growing part of the

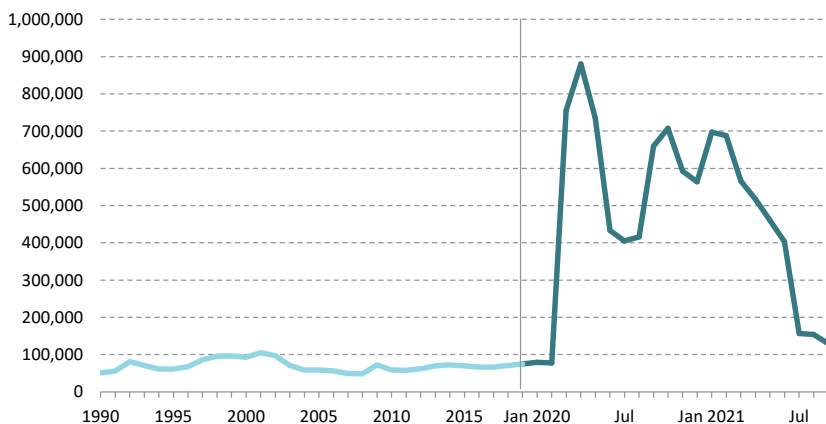


population. Up until now, due to efforts to change the policy in Israel, the age of retirement for receipt of the old-age benefit rose from 65 to 67 for men and from 60 to 62 for women. However, proposals to narrow the gap in retirement age between men and women were not adopted. The Economic Arrangements Law for 2021–2022 includes the plan for a gradual rise in the retirement age for women to 65. Women close to retirement are harmed by this as a result of both the difficulty in integrating into the labor market and the fact that they are not yet eligible for the old-age benefit. In order to mitigate this situation, the plan also includes several supplementary policy measures, including the extension of eligibility for unemployment insurance; an addition to income support and the possibility of receiving the selective old-age benefit at higher income levels; the payment of an acclimatization grant; and an increase in the amount of the employment grants that women aged 60 and over are eligible for.

### Unemployment insurance

The main social security tool employed during the Covid crisis was the unemployment insurance program. Within a short period of time, the number of unemployment insurance recipients jumped from a monthly average of 75,000 during the pre-crisis period to about 880,000 in April 2020 (Figure 7).

**Figure 7. Number of unemployment insurance recipients, monthly average**



Note: The vertical line marks the beginning of the pandemic.

Source: John Gal and Shavit Madhala, Taub Center | Data: NII

During the pandemic, greater use was made of innovative technological tools, such as online applications for unemployment insurance and their approval, which improved the handling of those requests. Furthermore, changes were required in the structure of the program in order to include the many workers who had been laid off or furloughed as a result of the pandemic and who had not been in the labor market long enough to accrue benefits. One of the changes was the inclusion of furloughed individuals and the recipients of other benefits, such as an old-age benefit, within those eligible for assistance. Clearly, the limited supply of labor during the pandemic and the physical and health restrictions that prevented reporting to the Employment Service required modifications to the program structure.

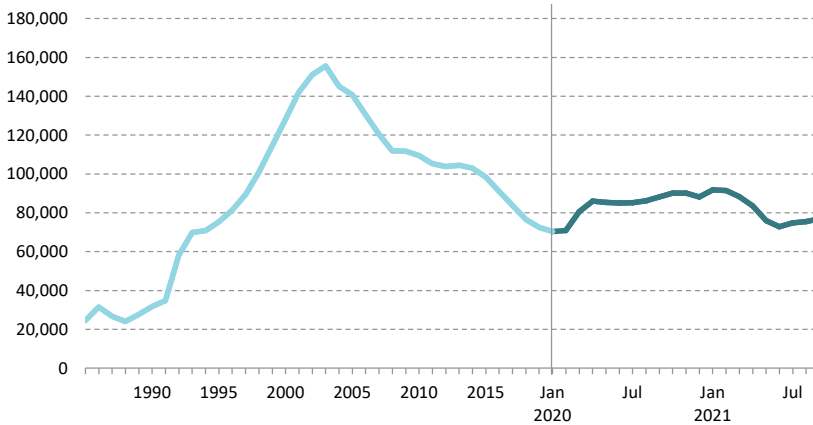
These structural changes were crucial due to the erosion of the generosity and accessibility of the Unemployment Insurance Law over the years. Specifically, prior to the Covid pandemic, unemployment insurance in Israel involved a disproportionate imbalance between ensuring reasonable protection of the standard of living for the jobless seeking to return to suitable employment, on the one hand, and efforts to encourage these individuals to return to the labor market in a timely manner, on the other hand. The emphasis on a rapid return to the labor market, particularly in the case of young workers, led to the adoption of draconian measures to modify the maximum period of eligibility, the level of unemployment benefits, and the qualification period (the seniority accumulated at work in order to be eligible for unemployment benefits). These steps, whether intentional or not, significantly increased the rate of benefit non-take-up (see below).

The return to normal functioning in the labor market during the second half of 2021 obviously required a modification of the unemployment insurance program to fit the new reality and an attempt to find a new balance between protection of the jobless, on the one hand, and the desire to encourage recipients of unemployment benefits to make a reasonable effort to re-enter the labor market, on the other hand. However, the planned changes may again limit the effectiveness of unemployment insurance in dealing with unemployment. Some of the planned changes, such as reducing the level of unemployment insurance for those in vocational training programs, run counter to the efforts to prepare the unemployed for a return to the labor market. The proposed steps (some of which were adopted during the second half of 2021 and some of which are expected to come into effect at the beginning of 2022) include, among other things, a reduction in unemployment insurance benefits

by varying degrees, the return of the qualifying period to what it was prior to the pandemic, cancellation of the extension of eligibility for individuals ages 45 and over, and a reinstatement of the 5-day waiting period after the first four months of receiving benefits. The measures that went into effect in the first half of 2021 had an immediate effect on the number of unemployment insurance recipients and already in July 2021, their numbers fell to about 156,000 (Figure 7).

### Income support

The formal social safety net program in Israel's social security system consists of an income support program that is intended to provide a safety net for individuals with no income or for low-income earners of working age. Eligibility for this program is determined by a means test and an employment test and the benefits levels are low. The expansion of unemployment insurance during the Covid pandemic provided an alternate safety net for most of the individuals affected economically by the crisis. Consequently, the increase in the number of income support recipients during this period was relatively small. As can be seen in Figure 8, the average monthly number of recipients rose from 70,343 in January 2020 to 91,761 in January 2021. This number is dwarfed by the number of unemployment insurance recipients during the same period (about 700,000) and relative to the number of recipients of the income support benefit in the early 2000s, which was more than double. In contrast to unemployment insurance benefits, no major changes were made to the income support program during the Covid pandemic and recipients of income support continued to receive only a small sum. Despite the drop in the number of recipients during the second half of 2021, it can be assumed that the difficulty some groups experience in returning to the labor market, alongside the tightening of eligibility conditions and the shortening of the eligibility period in the unemployment insurance program, will lead to an increase in the number of income support recipients. The first evidence of this can be seen in the increased number of requests for income support submitted in July and August 2021 and the rise in the number of recipients from about 72,800 in June to about 77,000 in September. Furthermore, the particularly low level of the benefit and the scope of non-take-up by those eligible, which is about a third of those eligible (see the discussion on non-take-up of social rights below), are likely to reduce the effectivity of the solution provided by the income support benefit for those in need of a security net.

**Figure 8. Number of income support benefit recipients, monthly average**

Note: The vertical line marks the beginning of the pandemic.

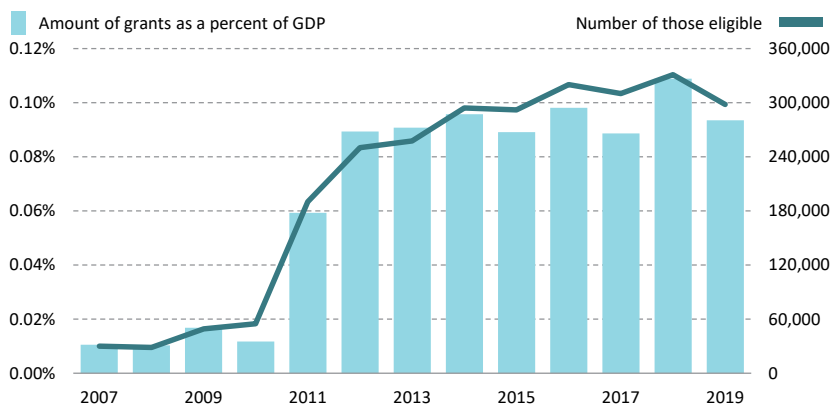
Source: John Gal and Shavit Madhala, Taub Center | Data: NII

### Employment grant

The employment grant is paid to low-earning workers to boost their income. The average size of the grant is NIS 4,000 per year and it is provided to various population groups, on the basis of age, income level, and marital status. Requests are submitted at the post office and the grants are paid in several equal installments following the year for which the request was submitted. Unlike the other programs discussed here, which are operated by the NII, this program is operated by the Tax Authority. Over the years, changes were made that expanded the eligible population and improved accessibility. Nonetheless, the program still suffers from limited generosity, which reduces its effectiveness in dealing with poverty, and the rate of non-take-up is fairly high (about 30%, see below). During the Covid pandemic, a number of steps were taken to make the employment grant more accessible and to transform it into a tool for alleviating the distress of the jobless, such as paying the grant earlier and providing an option of submitting an online request instead of at the post office for those already in the system. As part of the assistance program to deal with the Covid pandemic, about NIS 900 million was allocated to pay the grant of 2021 earlier, and about NIS 650 million of that was actually utilized in 2020.

The data on the number of employment grant recipients and the expenditure on the program (Figure 9) show that in 2019 the expenditure stood at NIS 1.3 billion, which is about 0.1% of GDP. The number of eligible recipients who received the grant in that year was 298,000. The data show a small decline in the number of recipients and in expenditure on the program in 2019, but that may be because the data for that year are not yet final.

**Figure 9. Expenditure on employment grants as a percent of GDP and the number of grant recipients**



Note: The data in the graph are according to the year of work. The data for 2019 are not final since not all of the requests for that year have been processed.

Source: John Gal and Shavit Madhala, Taub Center | Data: Ministry of Finance, Tax Authority 2020

# SPOTLIGHT A

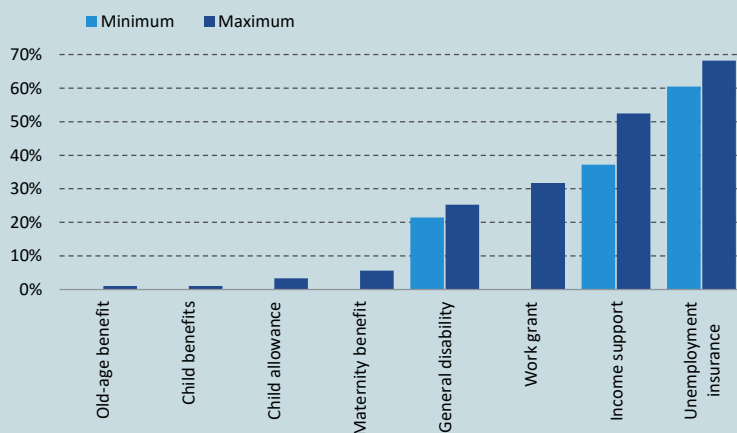
## Non-Take-Up of Social Rights

The Israeli welfare state includes diverse programs intended to protect citizens from social risks, mitigate distress, and reduce inequality and poverty. Yet a report by the State Comptroller (2021) and the findings of recent studies indicate that, in many cases, the program target populations are unable to take-up their rights. This means that social programs do not achieve the goals for which they were created. Despite the increasing interest in the problem of non-take-up in recent years and the growth in government and non-government bodies that are seeking to deal with it, findings indicate that it is still a major problem and that these various agencies are not managing to reduce the distress of those who are the targets of assistance.

While clearly non-take-up of social rights in Israel is present in various segments of the welfare state, including healthcare, education, housing, and welfare services, there is no comprehensive information on the phenomenon. This is due to both the difficulty in gathering data and the lack of willingness of various agencies to examine the non-take-up of their programs. Empirical data exist primarily for the social security programs operated by the National Insurance Institute (NII) and for a few other government ministries. As can be seen in Figure 10, NII studies (Gottlieb, 2021) show that in universal programs — which do not condition eligibility on level of income and where eligibility is relatively simple — the extent of non-take-up is the lowest. Thus, for example, the take-up rate for child allowances and old-age benefits is 99%.

By contrast, when receipt of the allowance is conditional on completion of a complicated bureaucratic process and is intended only for individuals who can prove that their income is particularly low, the take-up rate is low. Existing data (most of which are based on data from the mid-2010s) show, for example, that the non-take-up rate of the general disability pension ranges from 21.5% to 25.3% of all potential recipients; in the case of income support it ranges from 37.2% to 52.5%; in the case of the employment grant, the rate is 31.6%; and in the case of unemployment insurance it ranges from 60.5% to 68.2%.

**Figure 10. Rate of non-take-up of social rights, selected years**



Note: Due to the complexity in measuring non-take-up, in some cases it is presented as a range, and the maximum and minimum levels are based on various basic assumptions. For further details, see Gottlieb, 2021.

Source: John Gal and Shavit Madhala, Taub Center | Data: Gottlieb, 2021; State Comptroller, 2021

The findings imply that members of the weakest and most marginalized populations in Israeli society are most likely to not utilize their rights to a social security benefit pension (and to a lesser extent those eligible for unemployment insurance). Most of them earn very low incomes and it is likely that they are under the poverty line. The high rate of non-take-up for these benefits means that they are not receiving the assistance they are eligible for, a situation that prevents the mitigation of their distress.

Current knowledge on non-take-up of rights indicates that it has a number of causes. In the past, it was assumed that the problem lies with the potential recipient due to a lack of information about the existence of the benefit or about eligibility conditions, and an unwillingness to apply for various reasons (such as, for example, a desire to avoid contact with the bureaucratic system or a feeling of stigmatization). However, it is now clear that there are other factors involved. Some of them are related to the structure of the programs, such as means tests that violate an individual's privacy, complex conditions of eligibility, overly broad discretion in the hands of the bureaucrat, and the low benefit value. Other factors include the way in which the bureaucratic system relates to applicants, such as problems of physical or language accessibility, the complexity of the forms required, the multiplicity of documents to be attached to the request, the lack of technological means to streamline a request, and sometimes even a humiliating attitude toward applicants (Holler, 2021).



A growing awareness of the problem has led civil society organizations, firms, and state agencies to attempt to address the various causes of the phenomenon. Thus, for example, the “Kol Zchut” website provides a popular platform for providing accessible information on social rights. Visitors to the site totaled about 4.5 million in 2020.<sup>2</sup> Moreover, “Manoa Zechuyot,” a new initiative by the government, is meant to improve the accessibility of information on rights. The Ministry of Welfare and Social Affairs has set up a designated department for the take-up of rights, and in many local authorities rights centers have been created and social workers have been given specialized training in rights take-up, with the goal of helping service users fully benefit from their rights (Benish & Weiss-Gal, 2021). This is intended to implement the idea of proactive rights take-up, which is pervasive today in the field of social work (Russo-Carmel et al., 2019).

As a result of the Elalouf Committee recommendations on the non-take-up of rights, the NII has invested a major effort in improving service to citizens. Although not all elements related to non-take-up of rights have been dealt with (State Comptroller, 2021), steps have been taken to make information more accessible, to facilitate the accessibility of programs, and to adopt a policy of proactive contact with potential customers, particularly those in marginalized groups (Tarshish & Gal, 2021). It appears that these efforts, alongside the increased use of technology to deal with requests, also helped the NII deal with the phenomenal growth in requests for unemployment benefits during the Covid period.

- 
- 2 The data were provided by the Kol Zchut site and are based on the Google Analytics monitoring system. According to the data, the number of devices from which the site was visited was 9.4 million. On the basis of various measurements, it is estimated that this involves about 4.5 million individuals.

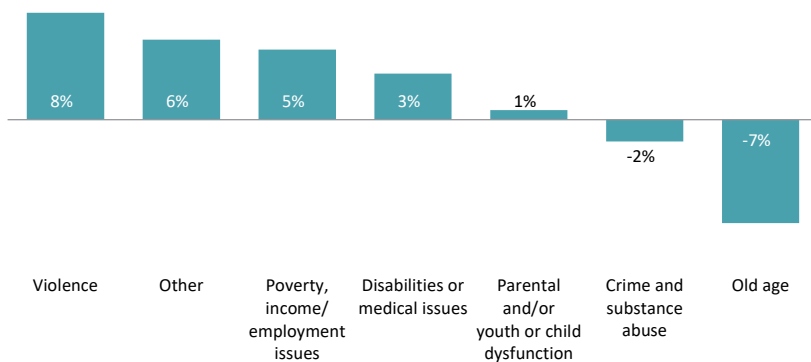
In the absence of long-term data on the non-take-up of rights, it is difficult to assess the contribution of the steps taken so far to increase take-up rates. Apart from limited data on the improvement in take-up among service users in specific Ministry of Social Welfare programs, there are no evaluative studies that look at the effect of the measures adopted. Moreover, in the absence of information on the scope of non-take-up of rights in some of the main segments of the welfare state, and in particular in healthcare and housing, there remains only anecdotal information, which indicates that the problem is still acute in these areas. Furthermore, there is a real concern that the achievements in dealing with the problem will dissipate when changes are made to the social security programs following the economy's return to normality and when the labor market fully recovers from the shock of the Covid pandemic. The most pervasive changes are, as mentioned, expected in the unemployment insurance program, in which — thanks to the major changes made in the structure of the program and the manner in which applicants were handled during the Covid crisis — there has been a significant increase in take-up. The planned return to the less-accessible structure that characterized the program prior to the crisis can be expected to lead to a significant drop in take-up rates.

The message that clearly emerges from the conclusions of the Committee for the War Against Poverty was that the take-up of rights is an essential component in dealing with the phenomena of poverty and distress. However, it appears that this message has only been partially internalized and that in many parts of the Israeli welfare state the problem and its causes are still acute.

## The Ministry of Welfare and Social Affairs

Like other government ministries, the lack of an approved government budget made it difficult for the Ministry of Welfare and Social Affairs to function effectively during the Covid pandemic. The worsened economic distress of people living in poverty and members of marginalized population groups, the health risks and the difficulty in caring for individuals in need of assistance during the lockdowns, and the social distancing rules all created an exceptional burden on social workers in the local authorities, on the Ministry's systems, and on the non-profit organizations and agencies that provide outsourced welfare services. At the end of 2020, the total active files being dealt with by the welfare system numbered more than 450,000 which was similar to the number in the previous year (Ministry of Welfare and Social Affairs, 2021). In contrast, during the year of Covid, there was an increase in requests made to the local authority welfare services and in the number of new files (at an annual rate of 11% according to the Ministry's data). The changes that occurred in the reasons for requests to the welfare services can be seen in the growth of the number of active files due to poverty and economic distress and violence in the family (an increase of 5% and 8%, respectively) and a decline of 7% in the number of files due to old age (Figure 11).

**Figure 11. The rate of change in number of active files dealt with by the welfare services by the main categories of need, November 2019 to November 2020**



Source: John Gal and Shavit Madhala, Taub Center | Data: Ministry of Welfare and Social Affairs, 2021

The establishment of the new government in June 2021 led to changes in the most senior positions in the Ministry of Welfare and Social Affairs and in the Ministry's structure. Alongside the appointment of a new minister and director general, the Labor Division — which was reattached to the Ministry in 2016 — was transferred to the Ministry of the Economy and Industry. The Daycare Center Branch was also transferred to that ministry, although pedagogic responsibility is expected to go to the Ministry of Education. These changes are also reflected in its new name: the Ministry of Welfare and Social Affairs. In addition, there are new initiatives coalescing as part of the Ministry's work plan, and, in particular, efforts to promote far-reaching legislative changes. This primarily involves the Welfare Services Law which will replace the Relief Services Law — the main legal framework for social welfare activity in Israel. It is also the intention of the Ministry to propose a Welfare Services Law for People with Disabilities. In parallel, Minister of Welfare and Social Affairs Meir Cohen has appointed an academic advisory forum that is expected to assist in the formulation of the Ministry's targets and its methods of operation in coming years. Finally, as part of the Ministry's budget for the next two years, an increase is expected in the resources to deal with nutritional security and the implementation of the agreement with the social workers that was signed in the summer of 2020.

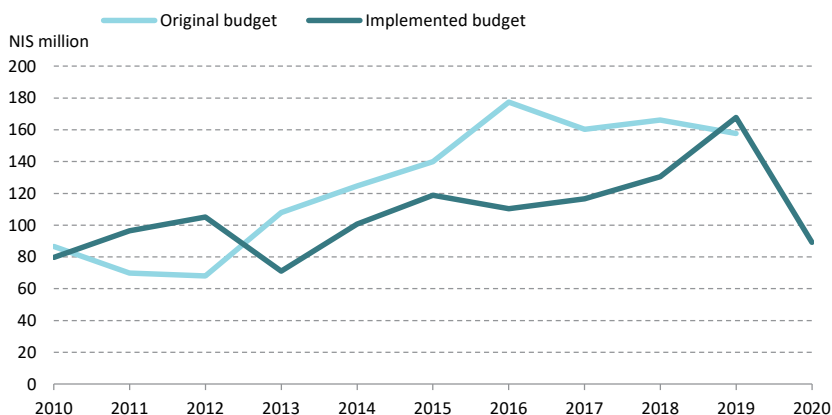
## Employment

As part of the government's efforts to deal with the high unemployment that resulted from the Covid pandemic, steps have been taken to upgrade vocational training programs. These efforts are under the responsibility of the Labor Division, which was transferred from the Ministry of Welfare and Social Affairs to the Ministry of Economy and Industry in the second half of 2021. One of the steps taken by the Labor Division at the beginning of the year was to establish an Employers Administration in partnership with Business Roundtable Israel, part of the Economic Social Forum, in order to develop vocational training and to modify it to meet the actual needs of the labor market. Moreover, and as part of the government program to deal with the Covid crisis, an additional NIS 1.4 billion was allocated to vocational training under the auspices of the Labor Division and for the Council for Higher Education. However, only one-third of the amount allocated has actually been spent in these two areas (NIS 277 million in 2020 and another NIS 171 million up until October 2021) and it appears that only a small share of that was devoted to vocational training under the Labor Division.

Despite the critical importance of vocational training, particularly during a period in which many of the unemployed lack higher education, progress has been slow in this area and in the utilization of resources allocated to it. Apart from the low rate of usage of resources allocated in the Covid program, an examination of the expenditure on vocational training for adults within the current operating budget of the Labor Division shows that following an upward trend in recent years and after reaching NIS 168 million in 2019, expenditure dropped significantly in 2020 to only about NIS 90 million (Figure 12). Similarly, the number of participants in vocational training who are financed or subsidized by the Vocational Training Branch this year was only 7,000, as opposed to about 12,000 in 2019. Undoubtedly, social distancing restrictions and the lockdowns explain at least part of the drop in the scale of vocational training and in its budget this year. Nonetheless, it is clear that during the decade prior to the Covid pandemic and essentially up to 2019, the budget allocated to this area within the framework of the Labor Division was not fully spent in most cases.

**Figure 12. Expenditure on vocational training for adults**

2020 prices



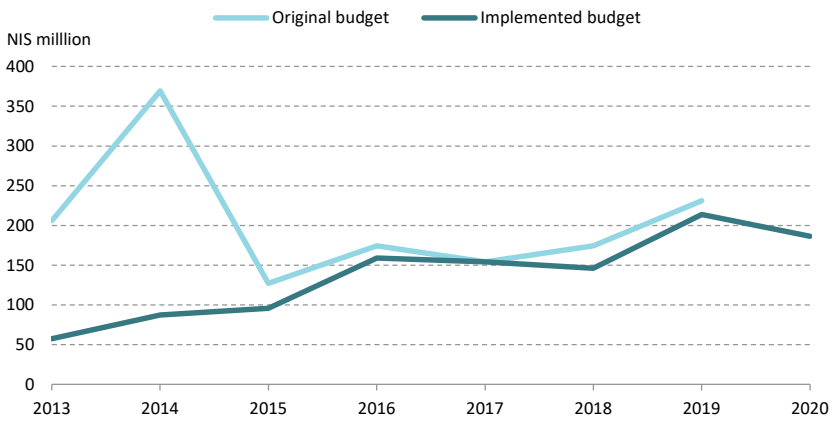
Note: Does not include the training of technicians or training as part of the programs to encourage employment in designated populations.

Source: John Gal and Shavit Madhala, Taub Center | Data: Ministry of Finance, State Budget files

Apart from the vocational training budget, other training courses are provided to encourage employment in designated populations, including Haredim (ultra-Orthodox), single parents, Arabs, and people with disabilities. In 2020, there was a decline in this type of spending (about NIS 186 million), although it was smaller than the decline in general vocational training. As can be seen from Figure 13, during the five years prior to the pandemic, the allocation to these programs was spent almost in its entirety.

**Figure 13. Budget of programs to encourage employment among designated populations**

2020 prices



Source: John Gal and Shavit Madhala, Taub Center | Data: Ministry of Finance, State Budget files

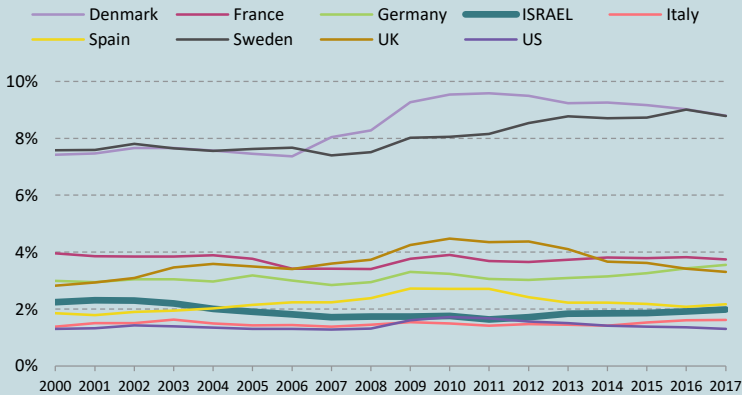
# SPOTLIGHT B

## An International Comparison of Spending on Social Welfare

A comparison of selected welfare states shows that the level of expenditure on social welfare services in Israel is relatively low. This is the case with respect to in-kind services, which include services for the elderly (not including expenditure on long-term care), people with disabilities, and families with children; services in housing and employment; and other assistance that is not included in these categories and is provided in-kind.<sup>3</sup> As can be seen in Figure 14, expenditure on social welfare services in Israel in 2017 totaled 2% of GDP, which was similar to that in Spain and slightly higher than in Italy and the US. There were no dramatic changes in the level of expenditure in these countries over the years. In contrast, in the social democratic welfare states (Sweden and Denmark), there was a relative expansion of social welfare expenditure, primarily towards the end of the 2000s and following the financial crisis of 2008.

- 
- 3 The comparison presents measured spending of *in-kind benefits*, i.e., services and not cash, for social welfare services as they appear in the SOCX survey. In order to allow comparison with other countries, it also includes items that are not usually included within expenditure on social welfare services when considering Israel alone. Therefore, the amount presented in this spotlight is not fully consistent with the amount defined earlier in this chapter as social welfare expenditure. For a description of the items included in the comparison, see the Appendix.

**Figure 14. Expenditure on social welfare services, as a percentage of GDP**



Note: Expenditure on in-kind benefits in welfare fields.

Source: John Gal and Shavit Madhala, Taub Center | Data: OECD

The expenditure on social welfare services can be divided according to the categories used by the OECD. Here we will focus on a comparison of expenditure of four main types: people with disabilities, the elderly, families, and active labor market policy (ALMP) (Figure 15).

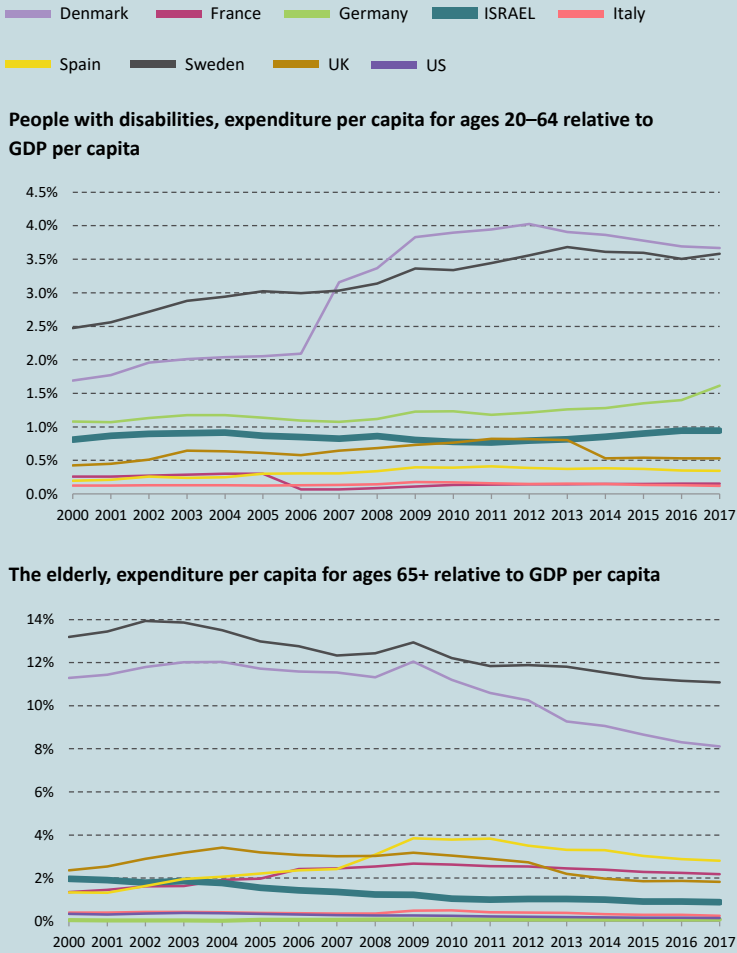
An examination of expenditure on social welfare services aimed at people with disabilities shows that spending per capita for ages 20–64 in Israel has been close to 1% of GDP in recent years. This level is higher than in the Mediterranean welfare states (Italy and Spain), France, and the UK but lower than in Germany, and much lower than in the social democratic welfare states. Israel spends about 0.9% of GDP per capita on social welfare services for the elderly ages 65+ (not including long-term care), and it is almost the lowest ranked country.



Since the early 2000s this expenditure has been shrinking. Although the dependency ratio for the elderly in Israel (the size of the elderly population relative to the working-age population) remains low relative to other countries, over the past two decades there has been an increase in the share of the over 65-year-old age group within the total population while the spending on services for this population has been in decline.

Another major category of expenditure is social welfare services for families. Since the beginning of the decade, there has been an increase in expenditure devoted to this category and it is estimated to have accounted for about 3.4% of GDP per capita in 2017. Notwithstanding this increase, the expenditure per capita in Israel is still relatively low, as in other Mediterranean welfare states in recent years. The final category of expenditure is devoted to ALMP, i.e., programs to support the integration of individuals in the labor market. This expenditure is particularly limited relative to other countries. Moreover, during the period examined, there was a decline in expenditure per capita in the working-age population, and in 2017 it accounted for about 0.3% of GDP per capita, similar to the prevailing level in the liberal welfare states (the US and the UK), which are located at the bottom of the ranking.

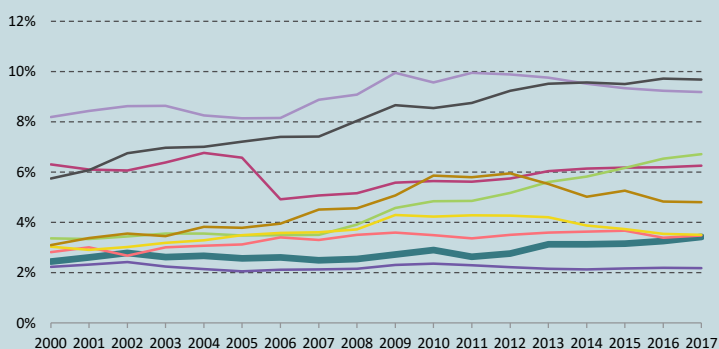
**Figure 15. Expenditure on social welfare services in selected categories in various countries**



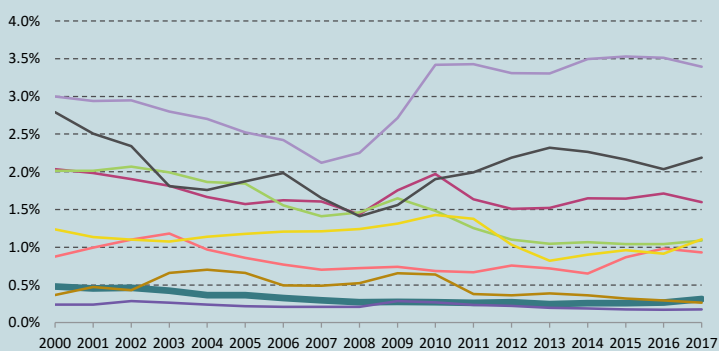
**Figure 15 (continued). Expenditure on social welfare services in selected categories in various countries**

Denmark France Germany ISRAEL Italy  
Spain Sweden UK US

**Welfare services for families, per capita expenditure for ages 0–19 relative to GDP per capita**



**Expenditure on ALMP programs, per capita expenditure for ages 20–64 relative to GDP per capita**



Note: Expenditure on in-kind benefits related to the elderly does not include long-term care.

Source: John Gal and Shavit Madhala, Taub Center | Data: OECD

## Implementation of the Elalouf Committee recommendations

The recommendations of the Elalouf Committee for the War Against Poverty were submitted to the government in 2014 (Elalouf Committee Report, 2014). Since then, the Taub Center has been following their implementation. Figure 16 presents the budget additions since the adoption of the committee recommendations.

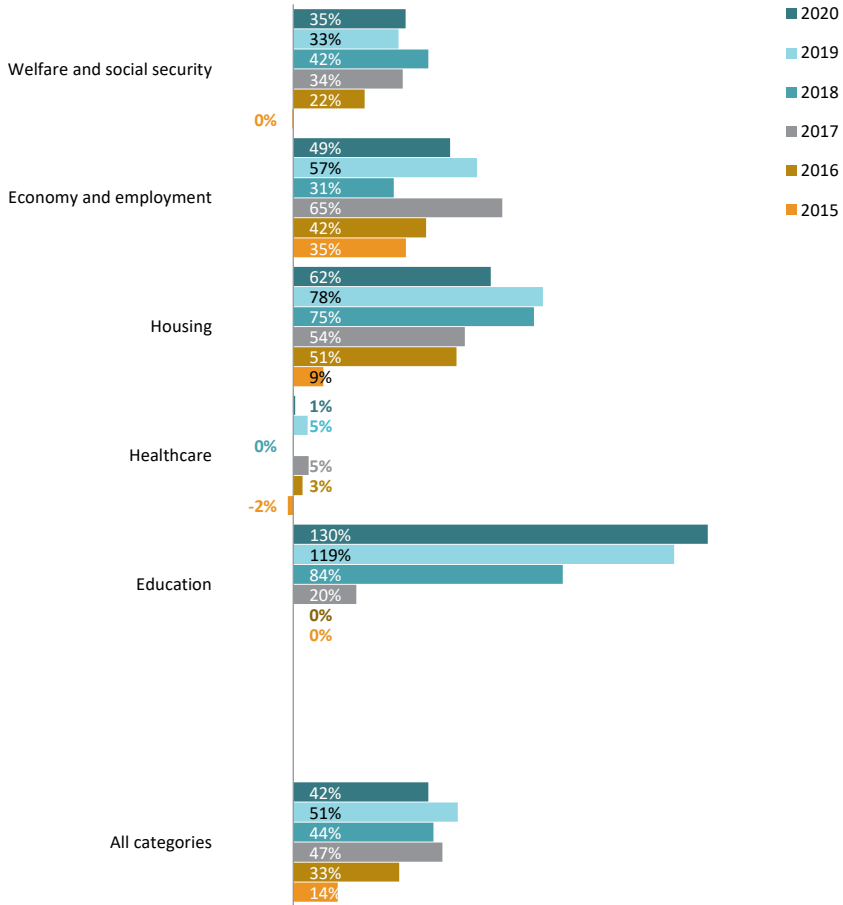
In 2020, there was no significant progress in the implementation of the Committee's recommendations in any area except in education. Moreover, in the areas of housing, the economy and employment, there were cutbacks in budget expenditures. For example, budgets for maintaining public housing and for vocational training and employment programs were reduced. Investment in programs related to welfare and social protection remained stable and account for about a third of the recommended addition. That is, alongside an increase in investment in budget lines related to the responsibility of family social workers and intervention programs there was a decrease in budgets for individual material support. Likewise, the recommendation to increase the income support benefit for working-age individuals living in poverty has yet to be adopted. There has been a positive development, though, with regard to the recommendation to allocate a budget addition to raise income support for elderly citizens. In August 2021, the government decided to increase this support beginning in January 2022.<sup>4</sup> As a result, in the coming year, an increase in the addition for recommendation implementation can be expected in the welfare budget.

---

4 See Government Decision No. 283 from January 8, 2021, [Additional grants for income support to elderly citizens](#).

### Figure 16. Addition to the expenditure for implementation of the Elalouf Committee for the War Against Poverty recommendations

As a percent of the additional funds recommended by the Committee



Source: John Gal and Shavit Madhala, Taub Center | Data: Ministry of Finance, State budget for various years; Ministry of Education; Ministry of Health

## Conclusion

The year 2021 was a year of transition in social welfare: from policies intended to offer social protection for groups detrimentally affected by the Covid pandemic to renewed efforts to deal with fundamental social problems that burden large parts of the population in Israel. After the social security system and the social welfare services provided a comprehensive security net and an immediate response to the needs of the Covid victims, and in particular the jobless, changes are now occurring in social welfare policy. These changes are reflected in the decision to improve the security net for elderly people living in poverty and distress and improving the social security system for people with disabilities. Following a drawn-out public debate, it was also decided to adopt significant steps toward shoring up the financial resilience of the main body providing social security, namely the NII, by raising the age of retirement for women. Finally, government initiatives have been adopted in order to anchor the social rights of the needy to receive the services provided by the Ministry of Welfare and Social Affairs.

Nonetheless, there are indications that the transitional trends in social welfare will not generate sufficient progress in mitigating social distress in Israel. Indeed, if the growth expected after the Covid crisis is not distributed in a more egalitarian way, inequality is expected to worsen. After a significant increase in social welfare expenditure in 2020, it can be expected that social welfare expenditure in Israel will contract in coming years. This will return Israel to the bottom of the ranking among welfare states for a number of reasons: the lack of an overall policy to deal with poverty and inequality; the intention to return the unemployment insurance program to its pre-crisis format; a lack of willingness to deal with the limitations of the income support program; and the lack of real steps to improve the employment support system and to deal with the problem of non-take-up of rights in healthcare and housing. It is doubtful whether a return to the pre-crisis social welfare expenditure patterns will enable Israeli social welfare policy to deal effectively with the social distress it faces.

## References

### English

- Benish, A., & Weiss-Gal, I. (2021). [Social right advocacy by social workers](#). *Social Security*, 113. (English summary)
- Gottlieb, D. (2021). [Take up of social benefits in Israel: research findings](#). *Social Security*, 113. (English summary)
- Report by the Elalouf Committee (2014). [Report by the Israel Committee for the War Against Poverty](#). Ministry of Welfare and Social Affairs.
- Tarshish, N., & Gal, J. (2021). [How does change occur? The emergence of the National Insurance Institute's benefit take-up policy](#). *Social Security*, 113. (English summary)

### Hebrew

- Bar, A. (2021). [Proposal for a law for increasing economic efficiency \(amendments to regulations for achieving budgetary goals for 2021-2022 – increasing income assurance for recipients of old-age benefits\)](#). Knesset, Research and Information Center.
- CBS (2021). [Media Release \(5 September 2021\): Aliyah to Israel 2020](#). Central Bureau of Statistics.
- Endeweld, M., Heller, O., Karadi, L., Kasir (Kaliner), N. (2020). [Standard of living, poverty and inequality – 2018–2019 and estimates for 2020 \(by administrative data\)](#). National Insurance Institute.
- Holler, R., Benish, A., Gal, J., & Tarshish, N. (2021). Take up of rights in Israel: What we know and directions for future research. *Social Security*, 113, 6–16.
- Ministry of Finance (2021). *Supervisory report on the implementation of assistance programs*.
- Ministry of Finance (various years). *State budget files*. Ministry of Finance, Accountant General Division.
- Ministry of Welfare and Social Affairs (2021). [Statistical report for 2019–2020](#). Ministry of Welfare and Social Affairs.
- Russo-Carmel, S., Socolover-Yacobi, I. & Krumer-Nevo, M. (2019). [What is active in active realization of rights? Active realization of rights in MAPA program](#). *Social Security*, 106.
- State Comptroller of Israel. [Annual report 72A, first part. Non-take-up of social rights: Follow-up](#), pp. 865-915.
- Tax Authority, *Report of the Supervisor for Implementation of the Freedom of Information Law 2020*.

## Appendix

### An international comparison of social welfare expenditure

The comparison was carried out using OECD data according to the categories in the SOCX survey. It includes total recorded expenditure on in-kind benefits in the various categories of social welfare, excluding those on healthcare, survivors, and long-term care.

Following are the lines that were included in the comparison:

1. *The elderly* — housing services, home help, and other in-kind benefits provided to this population. Not including long-term care.
2. *People with disabilities* — housing services (day centers and rehabilitation), home help, rehabilitation services, and other in-kind benefits provided to people with disabilities.
3. *Families* — early childhood education and care (including preschool up to age 6), housing services for children, home help, and other in-kind benefits provided to families and children.
4. *ALMP* — employment services, training programs, and incentives.
5. *Housing* — housing assistance, public housing, and other in-kind benefits that are meant to help reduce housing expenditure.
6. *Other services* — social welfare assistance and in-kind benefits that are not included in the other categories, such as assistance to immigrants and food assistance for the needy.

For further details, see the methodology in [OECD, SOCX](#).





## *Executive Summary*

# Enrollment of Arab Children in Supervised Daycare

**Shavit Madhala, Labib Shami, John Gal, and Elon Seela**

Currently, there is broad consensus among researchers and professionals that comprehensive, accessible, high-quality education frameworks for young children (from birth to 3 years) can make a significant contribution to reducing economic inequality and advancing social mobility. Furthermore, research shows that attending a high-quality early education framework contributes to an infant's cognitive, social, and emotional development and the development of their skills and abilities.

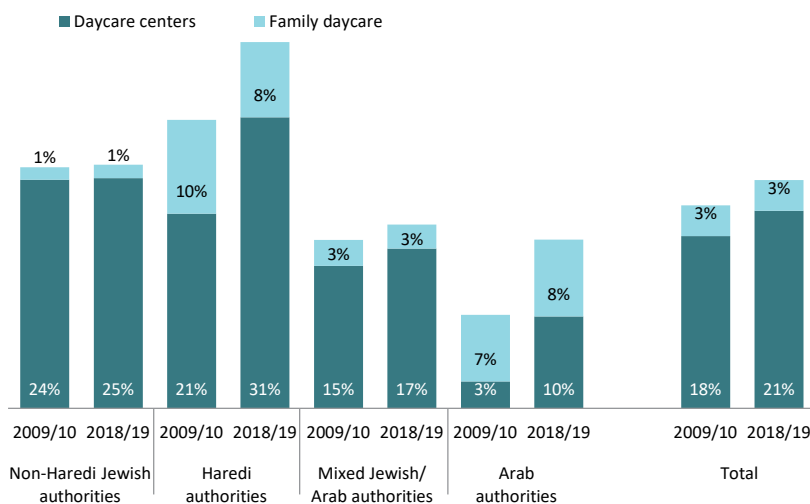
It is reasonable to assume that in frameworks with the daycare badge, which until recently were under the supervision of the Ministry of Welfare and Social Affairs and were subsidized by it, the educational and childcare conditions are superior to those in unsupervised frameworks. This is due to the lack of government supervision and uniform standards with respect to the levels of education and care provided in unsupervised frameworks (the number of staff relative to number of children, the training of the caregivers, safety rules, etc.).

---

\* Shavit Madhala, researcher, Taub Center for Social Policy Studies in Israel. Dr. Labib Shami, Senior Researcher, Taub Center; Economics Department, Western Galilee College; Department of Economics, Haifa University. Prof. John Gal, Principal Researcher and Chair, Taub Center Welfare Policy Program; School of Social Work and Social Welfare, The Hebrew University of Jerusalem. Elon Seela, Research Assistant, Taub Center. The research was carried out as part of the Taub Center Initiative on Early Childhood Development and Inequality, which is generously supported by the Bernard Van Leer Foundation, the Beracha Foundation, and Yad Hanadiv. This study was first published in November 2021.

In the past decade, there has been a 34% increase in the total number of children attending supervised early childhood education and care (ECEC) frameworks. Nevertheless, over the years, large gaps remain between populations in Israel and particularly between children in the Arab sector and children in the rest of the population. Moreover, although 58% of the children in the Arab sector live in poor families, their enrollment rate in supervised and subsidized ECEC frameworks for the birth to 3 years age group is particularly low: 18% in the 2018/2019 school year (in contrast to 39% in the Haredi (ultra-Orthodox) sector and 26% in the non-Haredi Jewish sector). Furthermore, a large share of the children who attend supervised frameworks are there because of the Law for Young Children at Risk (about 41% in Arab local authorities as compared to 11% in Jewish ones and 8% in Haredi ones). Important differences were also observed in the type of supervised framework attended by the children, namely a daycare center or family daycare. About one-half of the children in the Arab sector (46%) attend family daycare as compared to about 6% in the non-Haredi Jewish sector and about 21% in the Haredi sector.

### Share of children from birth to 3 in supervised frameworks, by framework and local authority, 2009/2010 and 2018/2019



Source: Madhala et al., Taub Center | Data: Ministry of Welfare and Social Affairs, files for mapping young children in supervised frameworks; CBS, local authority files; Fichtelberg-Barmatz & Harris-Olshek, 2013

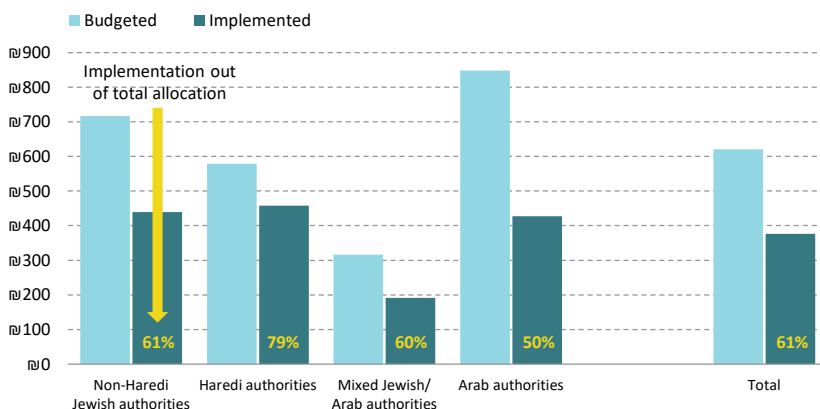
In recent years, efforts have been made by policy makers to expand the use of these frameworks in Arab society — one of the most marginalized sectors in Israel — but without success. Their rate of enrollment in supervised frameworks remains particularly low.

The research mapped the factors determining the low rates of enrollment in these frameworks by children in Arab society utilizing data from the government ministries, an Internet survey carried out by the Taub Center, and telephone interviews conducted by the researchers with relevant professional staff, mothers of infants in Arab society, and operators of private ECEC frameworks. Based on the research findings, a number of policy alternatives to deal effectively with this phenomenon were presented.

## The main barriers to attendance of the frameworks

- *Systemic barriers:* During the 2019/2020 school year, the number of ECEC frameworks for children of working parents in Arab local authorities was lower than in other population groups. Although the Arab localities are given a higher allocation per child for construction of daycare centers, the actual rate of construction is the lowest among the various authorities (50% as opposed to 79% in Haredi local authorities and 61% in Jewish non-Haredi local authorities). It appears that the main reasons for this are the difficulties in obtaining building permits due the lack of zoning plans and the scarcity of appropriate land reserves in the Arab local authorities; the cost of furnishing and equipping the daycare centers after their construction, which is not included in the construction budget and which many Arab local authorities are unable to finance; the difficulty in dealing with the complex bureaucracy in order to obtain government support for the construction of daycare centers; and the lack of professional manpower to initiate and support the planning and construction process.

### Average annual expenditure per child for the building of ECEC daycare settings, by local authority, allocation and implementation, 2014–2020



Source: Madhala et al., Taub Center | Data: Ministry of Welfare and Social Affairs, file for allocation and implementation of building of daycare centers by local authority; CBS, files of local authorities in Israel

- *Barriers to access:* The low rates of employment among Arab women and the linking of daycare subsidies to the mother's employment reduces the chance of Arab children being accepted to supervised frameworks and further reduces the share of families that are eligible for subsidies; the lack of synchronization between the hours of the framework's operation and the part-time jobs in which many Arab women are employed; physical barriers, such as the lack of mobility and the lack of public transport make it difficult for mothers to bring their children to the frameworks; the limited dispersal of supervised ECEC frameworks in Arab local authorities (and in particular day care centers); and bureaucratic and technological barriers that make it difficult to become eligible for subsidies.
- *Financial barriers:* Even after subsidies, the cost of attendance is high relative to the mother's income. The relatively low wages of many mothers in the Arab population mean that they do not reach the lowest tax bracket that qualifies for tax credit points with which to defray the cost of daycare. Thus, almost two-thirds of Arab working women are not eligible for the benefit. Furthermore, many parents in the Arab population prefer registering their children for private frameworks whose cost is lower than

in the Jewish sector, ranging from NIS 1,000–1,700 per month for a full day. This is lower than even the subsidized cost in supervised daycare centers at some of the eligibility levels.

- Although the personal preferences of parents are certainly a factor that affects their willingness to register for supervised frameworks, there are no findings that indicate a particular preference among parents in Arab society that their young children be cared for by their mothers or other female members of the family (the cultural factor).

## Policy alternatives

- In order to overcome the systemic barriers, the researchers recommend modifying the planning rules to better fit the complex reality in the Arab population and local authorities; increasing the resources allocated to Arab local authorities in the planning and approval stages of daycare center construction; and the addition of positions, filling them and training of professionals in the Arab local authorities to develop early education infrastructure.
- In order to overcome barriers to access, consideration should be given to canceling the subsidy linkage based on the employment of the mother, which would begin with a pilot in a number of localities; carrying out a thorough analysis of the registration process for preschool frameworks and the application for subsidies; creating a flexible public transport system; and expanding the dispersal of supervised ECEC frameworks in Arab local authorities.
- In order to overcome the financial barriers, the size of the subsidies for early education frameworks should be increased, such that tuition will not exceed NIS 1,000 per month; the possibility of a short day should be examined as a pilot in a number of localities; the way in which the tax benefit is provided to parents should be changed and the unutilized portion of the tax benefit used to reduce the cost of ECEC frameworks; and tax benefits should be provided to employers who finance childcare services for their employees.



## *Executive Summary*

# The Relationship Between Parental Stress and Young Children's Screen Time During a Covid-19 Driven National Lockdown

**Yael Navon, Liora Bowers, Carmel Blank, Dana Vaknin, and Yossi Shavit**

This study examines screen use by young children during the first Covid-19 lockdown in Israel. Screen use is a matter of importance since there is wide consensus among researchers and professionals that unsupervised screen time has generally negative effects on the cognitive and emotional development of children.

The study found that young children of parents who experienced high levels of stress during the lockdown were exposed to lengthier periods in front of screens. It was also found that the feelings of stress were more common among families from lower socioeconomic backgrounds and among the Arab population, and that screen use was more intensive among children of parents without an academic education.

---

\* Dr. Yael Navon, Senior Researcher, Taub Center. Liora Bowers, Chief Financial and Operating Officer, Taub Center. Dr. Carmel Blank, Senior Researcher, Taub Center; Department of Behavioral Studies, Ruppin Academic Center. Dana Vaknin, Researcher, Taub Center; doctoral student, Department of Sociology and Anthropology, Tel Aviv University. Prof. Yossi Shavit, Principal Researcher and Head, Taub Center Initiative on Early Childhood Development and Inequality and Professor Emeritus of Sociology and Anthropology, Tel Aviv University. The Initiative is generously funded by the Bernard Van Leer Foundation, the Beracha Foundation, and Yad Hanadiv. This study was first published in May 2021.



## Existing research on screen use

There is wide-spread agreement in the research and policy literature that screen use can hinder optimal development, particularly among very young children.

- Unsupervised screen use by children has negative effects related to weight gain, sleep disorders, and behavioral and emotional problems, and may also harm the cognitive development of young children.
- Among preschool-age children, watching screens can harm language and literacy development.
- Young children from low socioeconomic backgrounds tend to spend more time in front of screens than do those from higher socioeconomic backgrounds.
- Existing literature reveals a positive relationship between economic pressures and stress, depression, and anxiety, and parents being less involved with their children.

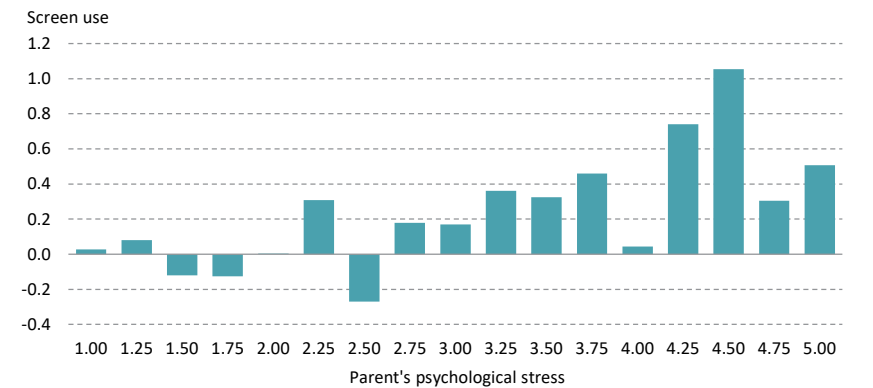
## Survey findings on screen use in Israel

Taub Center researchers conducted a survey during the first COVID-19 lockdown among 1,300 parents, Jews and Arabs, of children between the ages of one and six. The questionnaire dealt with issues related to the daily routine of parents with young children during this period, including screen use and other activities, with additional questions relating to parents' sociodemographic characteristics, their employment status, and their emotional state.

An analysis of the survey results found the following:

- Screen use increased with the age of the child.
- There was a negative correlation between parents' education level and screen use.
- There was a significant and positive correlation between parental stress and screen use. That is, as parents reported higher levels of stress, they also reported that their children spent a greater part of the day using screens.

**Means of child’s screen use by parents’ psychological stress level**  
**Weighted sample**



Source: Navon et al., Taub Center | Data: Parents’ Survey During the First COVID-19 Lockdown,Taub Center

- Parents with income that is lower than average, and in particular, Arab parents, were more likely to suffer from psychological stress during this time than those from stronger socioeconomic groups.
- Controlling for background variables, the likelihood that Arab children ages one to two will watch television is greater than for Jewish children of the same age. In contrast, the likelihood that an Arab child ages three to six watched a great deal of television during the lockdown was actually lower than for a Jewish child of the same age.

The findings suggest that the Covid-19 outbreak and subsequent lockdowns may have exacerbated the negative effects of screen time among young children. This is because the Covid-19 outbreak affected families’ economic stability and stress levels while, at the same time, leaving young children at home when early childhood education frameworks were closed.



# EDUCATION

5



# The Education System: An Overview

Nachum Blass

## Introduction

The Israeli education system never stands still; it is in a constant state of flux. During the last twenty years, teachers in Israel have signed labor agreements that have changed the conditions of their employment to a significant degree; the Compulsory Education Law that was extended for children ages 3 and 4-year-olds has been implemented almost in its entirety; the Special Education Law has been amended; the level of budget per student has grown substantially; and the gaps in academic achievement between the Jewish and Arab sectors have narrowed.<sup>1</sup> During this period, the share of Haredi (ultra-Orthodox Jewish) students in the system increased, enrollment rates rose, and teachers' level of education improved. These are all highly significant trends and they are discussed at length each year in the chapter on the education system in the Taub Center's *State of the Nation Report*. During the past 18 months another difficult and important milestone in the history of the Israeli education system has been experienced, namely the response to the Covid-19 pandemic. This response and its ramifications were described in detail in last year's annual report. In this chapter, we will return to review a number of aspects of the system with a focus on demographic composition issues of the education system, budget allocation, and teachers.

---

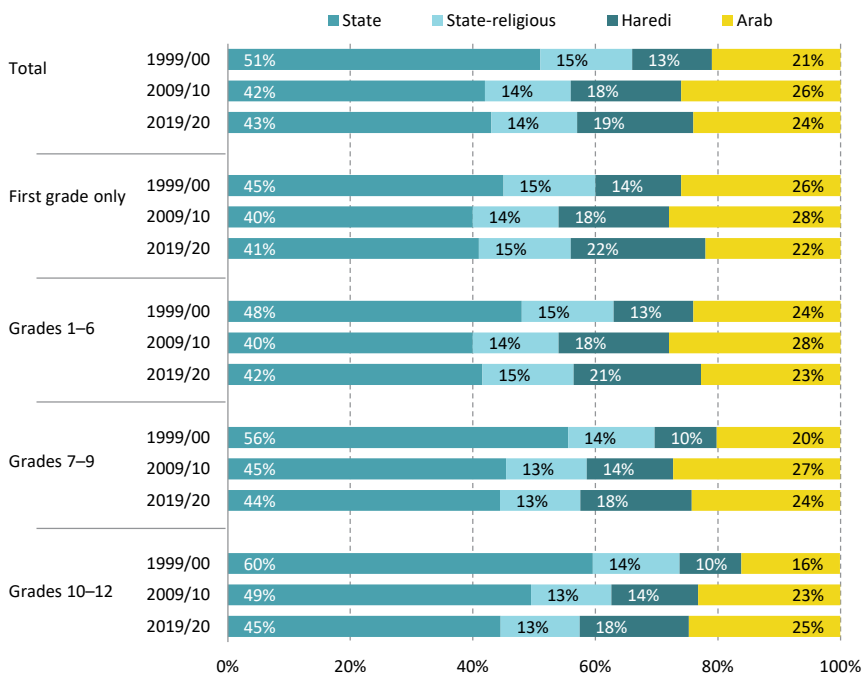
\* Nachum Blass, Principal Researcher and Chair, Education Policy Program, Taub Center for Social Policy Studies in Israel. I wish to thank Prof. Avi Weiss and Prof. Alex Weinreb for their comments on previous versions of the article, Michael Debowy and Yuval Levy for gathering and processing the data and Laura Schreiber for the preparation of the graphs and tables.

1 "Sector" indicates ethnic group. "Type of supervision" is a religious classification in the Jewish sector. All Arabic-speaking students are under State supervision, and they are classified into the following sectors: Arab, Bedouin, Druze, and Circassian.

## The demographic composition of the education system

Over the past 20 years, the education system has undergone a demographic transformation consisting of two stages: during the first decade, there was a massive increase in the population of Haredi students and Arabic-speaking students (Arabs, Druze, Bedouin, and Circassians) and a decline in the share of students in Jewish State education system. During the second decade, in contrast, there was little change in the shares of Jewish State education, Jewish State-religious education, and Haredi education, and a decline in that of Arab education.

**Figure 1. The distribution of students in Israel, by sector and type of supervision, 1999/2000 to 2019/2020**



Source: Nachum Blass, Taub Center | Data: Ministry of Education, A Wide Perspective website

The difference between these two decades with respect to the changing trends in Jewish State education can be seen in all age groups: from a sharp decline in the first decade, to stability and a slight increase in the second decade. It appears that the explanation lies first and foremost in the increase in fertility rates among secular Jewish women.<sup>2</sup> The secularization process, which led to a transfer of students from both State-religious education and Haredi education to State education and the growth in the number of non-Jewish students (Arabs and others) in the Jewish State education system also contributed to this stability and even a slight increase in the weight of Jewish State education. It is not possible to estimate the intensity of each of these trends.

Overall, State-religious education has maintained its relative share within the total student population during the entire period. This is relatively surprising in view of the rise in the fertility rate among the religious Zionist population and the larger share of this sector among immigrant students. The reason for the lack of change is apparently that the secularization process within that population has been particularly robust (Weinreb & Blass, 2018).

The share of the Haredi sector within the student population has also changed over time. The rapid increase in the Haredi student population during the 2000s continued during the 2010s in the higher grades (Grades 7 and above), although it slowed to some extent in the lower grades.

The most significant changes are occurring in the Arab sector. The relative share of students in Grades 1–6 fell from 28% of the student population in 2010 to 22% in 2020. Although the share of students in this sector has increased in the higher grades (Grades 10–12), it appears that this can be attributed to a large extent to the decrease in the number of drop-outs and less to growth in the population. It is also important to mention that the drop in fertility among Arab women is, for the most part, a phenomenon of the past decade, while students in Grades 10–12 are 15-years-old and older.

These changes in the demographic trends may have far-reaching effects. If we focus on, for example, the Haredi and Arab populations — which are characterized by weaker socioeconomic backgrounds — the drop in their share within the student population or even a decline in their rates of increase may have a large effect on both the overall academic and educational achievement levels of the student population and on the gaps in those achievements between population groups.

---

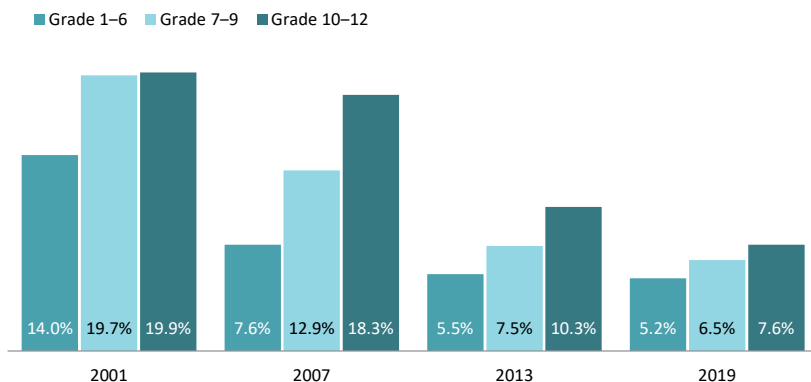
2 It may also be that immigrants from the former Soviet Union have adopted the fertility pattern of the native secular population (Nahmias, 2004).



## Is Israel a country of immigrants?

In the past, Israel was considered to be a prime example of a country of immigrants, and in the education discourse it was common to attribute some of the education system's problems to this fact. However, during the past two decades, only about 20% of the demographic growth in Israel has been the result of immigration. Natural population growth, namely the difference between births and deaths, is the main factor explaining the growth in the population. According to OECD figures, the share of first-generation immigrant students in Israel was about 4% in 2018, among the lowest in the OECD. Moreover, the share of second-generation immigrant students was about 16.4% as opposed to 18% in the OECD (OECD, 2019, Annex B1.9, Table II.B1.9.1). In 2019, for example, only about 6% of Jewish students were not born in Israel and that number continues to decline (among children in Grade 1–6 it is lower than among children in Grade 10–12) (Figure 2).

**Figure 2. Share of Jewish students not born in Israel**



Source: Nachum Blass, Taub Center | Data: Ministry of Education

Figure 3 shows the share of students with two parents who were born in Israel. As seen, in 2019 about 70% of students in Israel had both parents born in Israel. It would seem worthwhile to take these numbers into account when discussing disparities in Israel based on country of birth. Is it relevant to ask whether the grandparents of students were “Sephardi” or “Ashkenazi”? Food for thought.

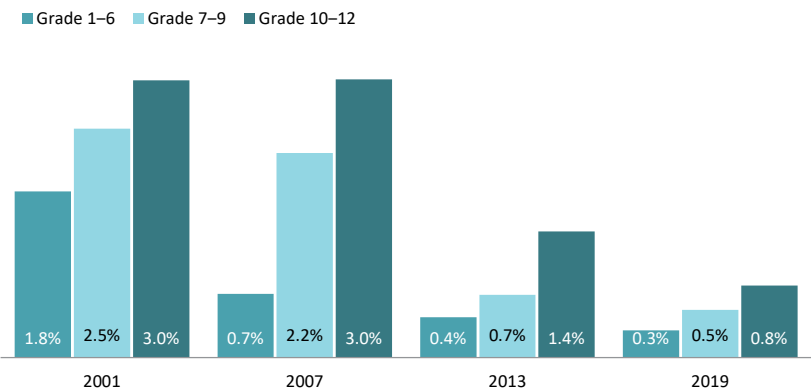
**Figure 3. Share of Jewish students with two parents who were born in Israel**



Source: Nachum Blass, Taub Center | Data: Ministry of Education

Figure 4 shows the share of Arabic-speaking students not born in Israel. This share turns out to be quite small: in 2019, there were only 1,860 Arabic-speaking students not born in Israel, and they accounted for less than 1% of all Arabic-speaking students in that year.

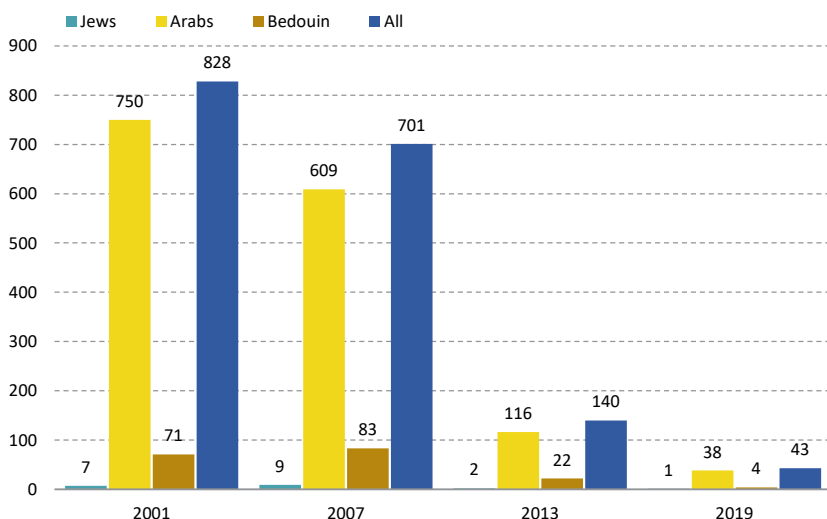
**Figure 4. The share of Arabic-speaking students not born in Israel**



Source: Nachum Blass, Taub Center | Data: Ministry of Education

Moreover, only 43 of those students arrived in Israel as a result of family unification (Figure 5), i.e., following a marriage between an Israeli citizen and a native of Judea/Samaria or the Gaza Strip.<sup>3</sup> The number of students added to the education system in Israel as a result of family unification has declined steeply since 2007, although even at its peak, the effect on the share of Arabs within the student population in Israel, which was always in the hundreds of thousands, was negligible.

**Figure 5. The number of students with one parent who is a native Israeli and the other a Palestinian (not a citizen of Israel), by the education sector they attend**



Source: Nachum Blass, Taub Center | Data: Ministry of Education

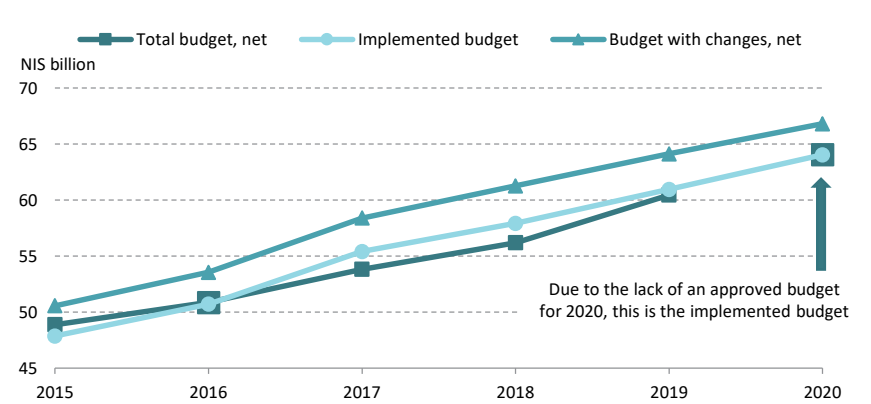
The graphs clearly show that the number of Arabic-speaking students in the Arab education system who can be defined as benefiting from the Law for Family Unification is relatively small and was small even before the law went into effect in 2003. It can also be seen that the phenomenon was significantly reduced after the family unification policy became more stringent.

3 The Citizenship and Entry into Israel Law (Temporary Order) — 2003 applies not only to Arab Palestinians but also to citizens of Syria, Lebanon, Iraq, and Iran.

## The budget

Between 2015 and 2020, the original Ministry of Education budget increased at a rate of between 4% and 8% annually. The actually implemented budget grew by about 5% annually (and somewhat more in the school years 2014/2015 and 2015/2016) and fell behind the total actual budget (during all the years) by about 5%. In 2020, there was no approved budget but the education system continued to operate while dealing with the Covid-19 pandemic. In the 2019/2020 school year, the education system operated under full lockdown from mid-March until the end of April. From then until the end of the school year, it gradually returned to partial or full operation, sequentially according to grade. In August 2020, prior to the opening of the 2020/2021 school year, a special budget of NIS 4.2 billion was approved for the education system. In order to finance the decision, the Ministry of Finance allocated NIS 1.75 billion to the Ministry of Education in 2020 and NIS 2.45 billion in 2021. Overall, the budget available to the Ministry of Education in 2020 was almost NIS 67 billion, of which the Ministry used only NIS 64 billion (according to a report by the Accountant General).<sup>4</sup>

Figure 6. The total budget during the period 2015–2020, in current prices



Source: Nachum Blass, Taub Center | Data: Report of the Accountant General for the relevant years

4 See [The Budget Key](#), The Accountant General’s report.

It is clear from Figure 6 that in spite of the government decision to increase the Ministry of Education's budget to deal with the Covid-19 pandemic, the increase in its 2020 budget was not substantially different from that in the previous two years. Budget utilization (actual expenditure divided by the budget after changes) was also no different than in previous years. From this, one may conclude that the expenses incurred by the Covid-19 pandemic were mainly covered by cuts in other items. Table 1 indicates that there were major differences in the actual expenditures of some line items between 2019 and 2020.

**Table 1. Education budget implementation, 2019 and 2020**

Main activity category	Budget implementation in 2019 (NIS billion)	Budget implementation in 2020 (NIS billion)	2020/2019
Support for Judaism-related activity	1.413	1.401	0.99
Administrative units	1.832	1.647	0.90
Education Workers Administration	2.081	1.706	0.82
Rural settlement education	3.763	3.864	1.03
Tutoring, transportation, and development grants	3.947	4.851	1.23
Supplemental activities for the system advancement	4.988	5.306	1.06
Preschool	7.522	7.682	1.02
Special education	8.255	8.917	1.08
High school	9.937	10.553	1.06
Primary and middle school	17.157	18.103	1.06
Ministry of Education	60.947	64.031	1.05

Source: Nachum Blass, Taub Center | Data: Ministry of Finance, Accountant General Department

If we expect an increase of 5%, then according to the table there were items that grew less than expected and even declined. Particularly notable is the Educational Workers Administration. It is difficult to explain such a large drop in the budget of such an important budget item and the question is beyond the scope of this article. Another area in which the budget declined is the administrative units. In contrast, there was an especially large increase in the budget for tutoring and transportation (which includes the acquisition of computers and splitting classes in the amount of about NIS 770 million) and in the budget for supplementary activities (after school afternoon activities in

the amount of more than NIS 800 million). Another area in which the budget grew more than expected was special education, which can be attributed, at least in part, to the implementation of the 2018 reform.

To summarize, the 1.75 billion shekel increase allocated for 2020 does not seem to have had an effect on the total budget as the growth rate in the budget remained similar to that in earlier years. With this, there were changes in allocations within the budget.

### **How did the Covid-19 pandemic affect the Ministry of Education's budget in 2020?**

As noted, the government decided to allocate a budget of NIS 4.2 billion in response to the Covid-19 pandemic during the 2020/2021 and 2021/2022 school years. This budget has been designated to meet the following needs: reinforcement of the remote learning infrastructure (NIS 1.2 billion); hybrid learning according to educational stage, i.e., primary schools, middle schools, and high schools (NIS 2.6 billion); school protection and hygiene (NIS 300 million); and solutions for special populations (NIS 200 million).

Table 2 describes the expenditure of the Ministry of Education in the 2020/2021 school year (up to December 2020) to deal with the pandemic. It shows that a relatively small sum (about NIS 100 million) was spent in order to add teachers for teaching in capsules and another NIS 300 million was spent on assistant teachers, for *a total of about NIS 400 million for hybrid learning*. If expenditure had continued at the same rate throughout the school year (namely, for an additional 8 months until August 2021) this budget item would have reached an expenditure of no more than NIS 1.2 billion, even though NIS 2.6 billion had been budgeted.<sup>5</sup> In other words, 1.4 billion shekels that were allocated for splitting up classes was not used for that purpose. Instead, most of the budget addition was spent on after-school afternoon activities (about NIS 870 million) and on the acquisition of equipment and training of teachers for after-school afternoon activities (about NIS 280 million). The question is, would it not have been worthwhile to use these monies differently, for

---

5 Nonetheless, it is worth mentioning that for much of the period schools operated normally, and the months of July–August constitute the summer vacation in any case. It is unclear whether the Ministry of Education continued to pay the salaries of those teachers and assistant teachers who were hired in urgency when the lockdowns were lifted. If it continued to do so, then that constitutes a major surplus expenditure and if it didn't then it may be more difficult to recruit manpower again in a future crisis.

instance by splitting up classes, by expanding the move to smaller classes to more grades, or even by extending the period during which the smaller class size were in place?

**Table 2. Expenditure of the Ministry of Education during the 2020/2021 school year (up to December 2020) in response to the Covid-19 pandemic**

	Amount (NIS thousand)	Percent of total
Essential expenditure	2,321	0.1%
Splitting of classes in primary education	79,639	4.7%
Splitting of classes in primary education — Independent and Exempt education institutions	18,037	1.1%
Splitting of classes in primary education — Mayan Hahinuch Hatorani	7,646	0.4%
<b>Total per teaching hour</b>	105,322	6.2%
After-school afternoon activities and supplementary frameworks	870,020	51.2%
Splitting of classes in primary education (teaching support)	296,201	17.4%
Computers, end user equipment, teacher training, and information systems	278,214	16.4%
Protection for preschools and schools	120,118	7.1%
Special solutions for rural/boarding schools	27,270	1.6%
<b>Total</b>	1,699,466	

Source: Nachum Blass, Taub Center | Data: Ministry of Finance, [Accountant General Department](#)

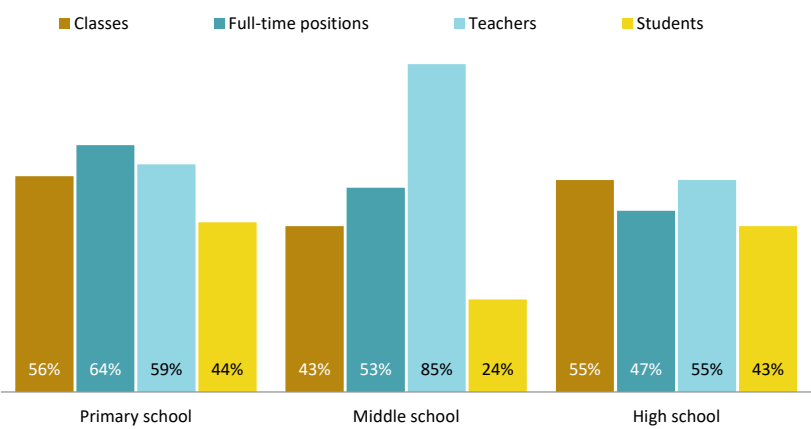
## The change in the fundamental variables of the education system: Teachers and students

### Background

During the past two decades, the education system has undergone two macro-level events. The first is the signing of the Ofek Hadash agreement with the Teachers Union and the Oz LeTemura agreement with the Teachers Organization. The second is the Covid-19 pandemic. Two other important events that also had significant ramifications were the implementation of the Compulsory Education Law for Children Ages 3 and 4 and the expansion of special education frameworks with the passing of Amendment 11 to the Special Education Law in the summer of 2018. Figure 7 shows the implications

of these events on the number of teachers, alongside the changes in the number of students and classes. It is important and also interesting to note that the number of teachers grew much more rapidly than the number of students and somewhat less rapidly than the number of classes.

**Figure 7. Rate of change between the 1999/2000 school year and the 2019/2020 school year in number of classes, teachers, and full-time equivalent positions, by educational stage**



Source: Nachum Blass, Taub Center | Data: CBS, 2021

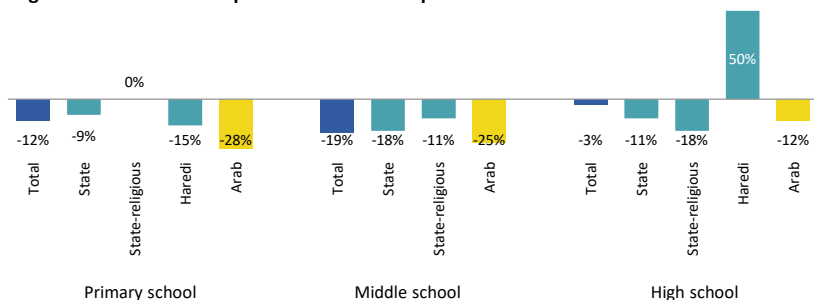
**The change in the number of students per full-time teacher position and average class size**

Figure 8 presents the teacher-student ratio from a slightly different perspective, namely in relation to three important variables for the Ministry of Education: average number of students per full-time teacher position, class size, and the number of teacher work hours per student. The figure presents the rate of change and its direction for each of these variables between the 1999/2000 school year and the 2019/2020 school year.

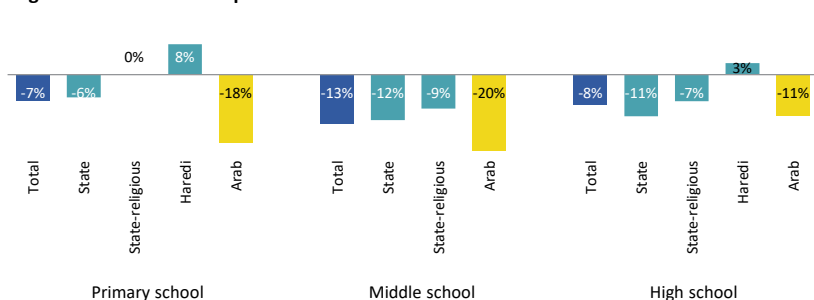


**Figure 8. Rate of change between the 1999/2000 school year and the 2019/2020 school year in average number of students per full-time teacher position, average class size, and average work hours per student, by sector, educational stage, and type of supervision**

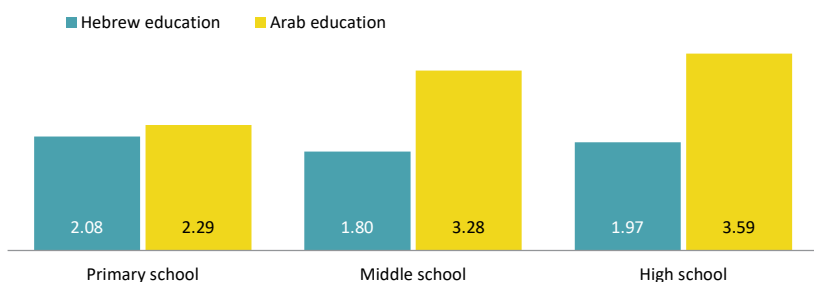
**Average number of students per full-time teacher position**



**Average number of students per class**



**Average number of class hours per student**



Source: Nachum Blass, Taub Center | Data: CBS, 2021

In order to understand the significance of the data, it is worthwhile clarifying some terms.

*Full-time teacher position* — A full-time teacher position in Israel is defined — as in other countries — as the number of required weekly work hours. Up until the Ofek Hadash and Oz LeTemura wage agreements, this referred to the number of frontal teaching hours: 30 hours for Grade 1–6 and 24 hours for Grade 7–12 (or some other framework, as per the principal's decision). Since the signing of the wage agreements, in primary education, a full-time position is defined as 26 frontal teaching hours, 5 tutoring hours, and 5 hours for training, staff meetings, and other tasks ("attendance hours"). In middle and high schools, the corresponding numbers of hours are 24, 6, and 10.

*Average number of students per full-time teacher* — This is the ratio of students in the system to the number of full-time positions in the system, which — in turn — is the number of budgeted teaching hours in the Ministry of Education budget divided by the number of work hours defined as a full-time teacher position. This simplified formula does not take into account the complexity of the calculation due to the rules determining the hours of a full-time position according to the age of the teacher ("age hours"), family status ("mother hours"), and educational stage (primary school, middle school, and high school).

The budget cost of operating an education system is determined by four main variables: teacher salaries, the definition of a teacher position in terms of work hours, class size, and number of teaching hours per class. The total work hours times the wage per work hour essentially reflects the size of the budget allocated for teachers' salaries in the Ministry of Education budget or alternatively the number of full-time positions that are available to the education system. Every country determines the balance between these variables (Blass, 2020). The choice often reflects the country's social-organizational tradition and, in general, is stable over time. Israel has chosen large classes that learn for many hours, low teacher salaries, and a large number of teacher work hours.

In general, the accepted working assumption among educators is that the lower the teacher-student ratio, the smaller the class, the larger the number of teaching hours per class and per student (i.e., the greater the intensity of teaching inputs per student), the higher will be the academic and educational achievements of a student. This is the reason that a reduction in the number

of students per teacher, a reduction in class size, and an increase in labor input per class or per student are considered to be improvements in the education system.<sup>6</sup>

As can clearly be seen in Figure 8, the last 20 years have been characterized by a genuine improvement in each of the variables presented in the graph. Class size in State and State-religious education has declined in all age groups.<sup>7</sup> This is particularly notable among students in the Arab sector and in middle schools. In contrast, there has been an increase in average class size in Haredi education. The changes in the Arab sector reflect a long-term trend of narrowing gaps between the Jewish and the Arab sector (Blass, 2017), a trend that is the result of a combination of Ministry of Education policy, on the one hand, and significant changes in family size, the strengthening of the middle class in Arab society, and the importance attributed by the Arab population to education, on the other hand. The phenomenon in the Haredi sector apparently reflects the quantitative increase of the Haredi population, which in turn creates a reality of larger classes over time.<sup>8</sup>

Was it possible to use the increase in the allocation to the education system following the Ofek Hadash and Oz LeTemura wage agreements and the shock to the education system from the Covid-19 pandemic to generate more radical changes in the balance between these variables, with the goal of improving the performance of the system? This is a question that would have been worth asking at the time these important labor agreements were signed as well as during the Covid-19 pandemic. In my opinion, an important, and, perhaps, one-time opportunity was lost, as there is a strong tendency to return to the status quo, and, therefore, it is difficult to take bold steps that have the potential to change the face of the education system in the long term.

---

6 This statement, of course, relates to a situation in which work hours and teaching hours per class remain unchanged.

7 The increase in the number of hours for middle and high schools is the result of a later implementation of the wage agreements and a delay in an update of wage agreements with teachers in primary schools.

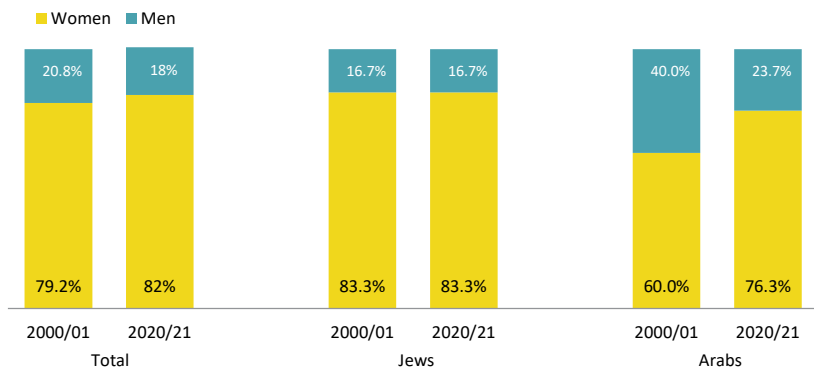
8 The more students there are in a population center, the larger the class size will be. This is the result of the rules regulating traveling distance from the student's place of residence to school and regulations regarding maximum class size.

## Teaching manpower: Characteristics

Teachers are the driving force of the entire education system. Without teachers, there would be no education worthy of its name. Therefore, it is highly important to evaluate the quality and skills of the teachers. The problem is that, to date, no reliable way to do so has been found and evaluations have been carried out on the basis of background data that are not always useful in measuring and evaluating pedagogical skills. There are those who try to evaluate teacher quality and skills by comparing their salaries to those in other occupations, based on the argument that a high salary attracts better candidates to teaching. Others relate to age and experience, on the assumption that teachers reach the peak of their abilities after a few years of work. Others take into consideration formal education levels and there are those who consider the match between the field of a teacher's formal education and the subject they teach. Each of these approaches has its advantages and disadvantages, but none of them provides a full answer.

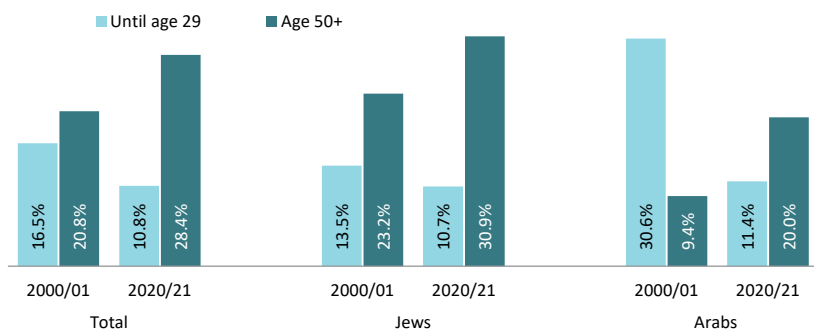
Apart from the inherent difficulty in measuring a teacher's quality and skills, consideration should also be given to the relevant comparisons. It is always possible to make a rough estimate at any given time of quality in isolation from comparisons to other occupations, to other countries, or to other times. However, without such comparisons, the question of whether the current situation is better or worse remains unanswered. Whatever the assessment of the current situation, there will always be those who define it as wonderful and others who view it as a catastrophe. Therefore, the correct approach is to assess a given situation relative to a sufficiently long period in the past (on the condition that there are data for the entire period) and/or in relation to other frameworks of comparison (Israel relative to other countries, Jewish State education versus State-religious education, Jews versus Arabs, etc.).

In the following graphs, the focus is on a number of teacher characteristics in the Jewish and Arab sectors — gender, age, seniority, salary level, and work hours — and on how they have changed over the past twenty years. For each characteristic, Israel is also compared to selected OECD countries. The comparison is based on the Central Bureau of Statistics (CBS) press release regarding teachers in the education system in the 2020/2021 school year (CBS, 2021) and on the OECD, *Education at a Glance* publication (EAG, OECD, 2020).

**Figure 9. Teaching manpower by gender and sector, 2000/2001 and 2020/2021**

Source: Nachum Blass, Taub Center | Data: CBS, 2021

*Gender* — For at least the last twenty years, women have constituted the vast majority of teachers. The share of women among Jewish teachers has not changed while among Arab teachers it has grown from 60% to 75% (Figure 9). In view of what we know about the large advantage of women over men in academic achievement in the Arabic-speaking sectors, it is not unreasonable to assume that the increase in the share of women among teachers in these sectors has had a beneficial impact on the academic achievement of students. The share of women among teachers in Israel is similar to the OECD average (OECD, 2020, Table D5).

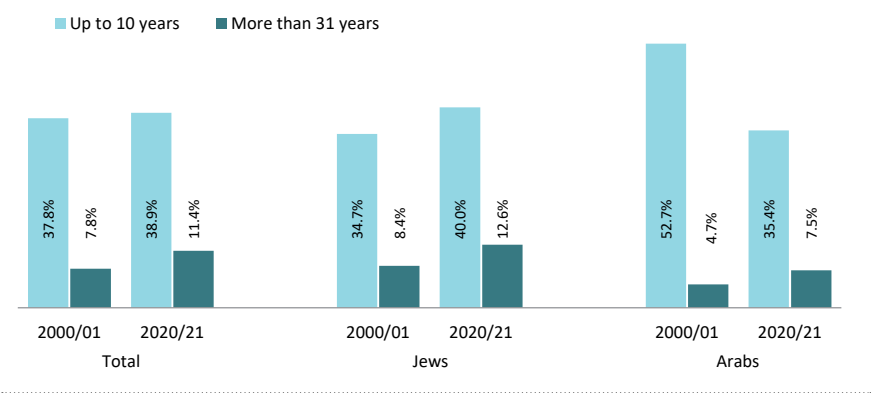
**Figure 10. Teaching manpower by age and sector, 2000/2001 and 2020/2021**

Source: Nachum Blass, Taub Center | Data: CBS, 2021

**Age** — Changes in the age distribution of teachers are often a reflection of demographic changes in the student population or changes in enrollment rates. When the student population is growing rapidly, the age profile of teachers becomes younger, a result of the growing need for new teachers, and vice versa. During the past twenty years, the share of young teachers (up to the age of 29) has dropped from 16.5% to 10.8% while the share of older teachers (over 50) has risen from 20.8% to 28.4% (Figure 10). As can be seen from the graph, in Arab education, the change is especially evident in the young ages, while in the Hebrew education system, change was greater in the older ages. This is an indication that in the period *prior to that surveyed*, the Arab education system grew at a much faster rate than the Hebrew education system, and, therefore, the number of young teachers at the turn of the century was so large.

Relative to the OECD, teachers in Israel are young. In primary education, for example, the share of young teachers (up to the age of 29) in the 2017/2018 school year was 13% as compared to 11% in the OECD, and the share of teachers above the age of 50 was 21% in Israel as compared to 35% in the OECD (OECD, 2020, Table D5.3). There are currently 11 countries in which 40% of teachers are over the age of 50. It is clear that these countries will face a serious manpower crisis in their education systems in the future.

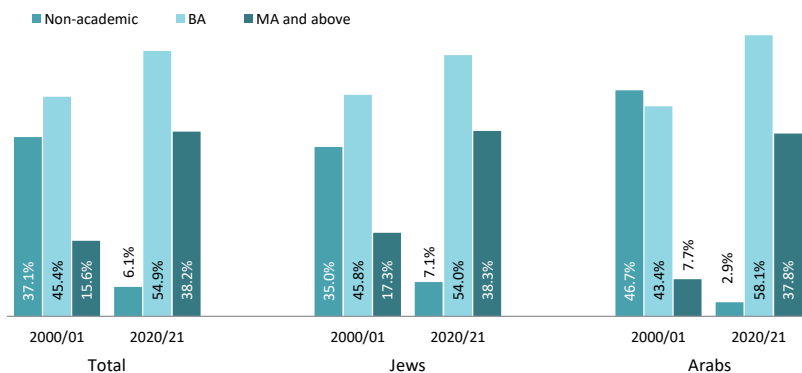
**Figure 11. Teaching manpower by seniority and sector, 2000/2001 and 2020/2021**



Source: Nachum Blass, Taub Center | Data: CBS, 2021

*Seniority* — The seniority variable is, of course, related to the age variable. In this case, the graph shows a slight uptrend in the share of younger and older teachers in the Jewish sector and a steep drop in the share of young teachers in the Arab sector (Figure 11). The latter is the result of a significant decline in the growth rate of Arab students resulting from the declining fertility rate of Arab women.

**Figure 12. Teaching manpower by salary level and sector, 2000/2001 and 2020/2021**



Note: Salary level for teachers is determined by level of formal education.

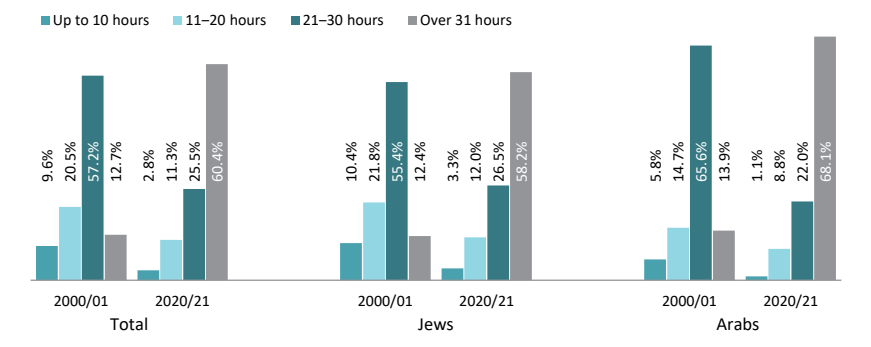
Source: Nachum Blass, Taub Center | Data: CBS, 2021

*Salary level* — One of the most noteworthy changes in teacher characteristics during the past twenty years is the rise in teachers' level of education, and as a result, in their level of pay. In the 1999/2020 school year, 37% of teachers did not have an academic degree, while in the 2019/2020 school year, only 6% lacked a degree (Figure 12). Similarly, only 16% had a master's degree in 1999/2000 while 38% had one by the 2019/2020 school year. This process was even more pronounced in the Arab sector where 47% did not have an academic degree in the 1999/2000 school year, while this figure was only 3% by the 2019/2020 school year (less than in the Jewish sector). Meanwhile, 8% had a master's degree in 1999/2000 as compared to 38% in 2019/2020, which is similar to the rate in the Jewish sector. This is undoubtedly impressive progress.

In this context, it is worth examining the basic level of teachers' cognitive skills, as measured by their psychometric exam scores (see Appendix Figure 1). According to the CBS data, the average score of new teachers is on an upward

trend from 1999/2000 to 2016/2017. This is the case for the system as a whole throughout, apart from State-religious education where it remained more or less stable.

**Figure 13. Distribution of teachers by work hours and sector, 2000/2001 and 2020/2021**



Source: Nachum Blass, Taub Center | Data: CBS, 2021

*Work hours* — The CBS usually measures teachers’ workload using weekly work hours. Figure 13 presents the distribution of teachers according to work hours and sector.

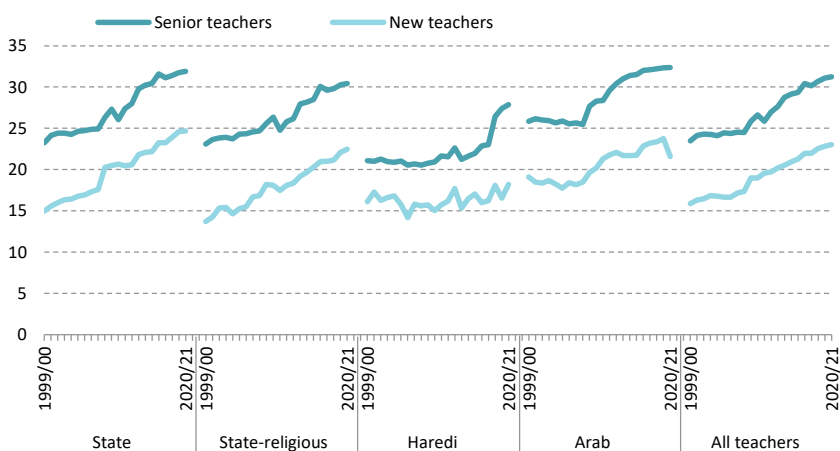
There is a significant uptrend in the average number of work hours in every sector during the period. Although this appears in all of the CBS publications during this period, its relevance should be treated with caution since the labor agreements Ofek Hadash and Oz LeTemura brought about a change in the job requirements. These agreements changed the structure of a teaching position and specified teaching work hours at 36 weekly hours in primary education and 40 weekly hours in secondary education. This change explains both the steep drop in the share of teachers working up to 10 weekly hours and the steep rise in the share of teachers working more than 31 weekly hours.<sup>9</sup>

9 For example, in the case of a teacher who is the mother of young children and is less than 50-years-old, a full-time position in high school was 20 weekly hours prior to 2010 (if she taught students in preparation for the bagrut (matriculation) exams, then her work hours were even lower). Therefore, if her salary slip showed that she worked 10 hours, she was considered to be working half-time. After the Oz LeTemura agreements, if her salary slip said she worked 10 weekly hours then it meant she was working only 25%. Therefore, it appears to be preferable to present the work hours of teachers in terms of full-time equivalence (FTE) rather than actual number of hours. Figures 14 and 15 illustrate the difference between these two methods of representation.



Figure 14 presents the changes over time by the work hours of all teachers. If for a moment we ignore the fact that during this period the system began to implement the new labor agreements, then the graph shows a continuous uptrend in teachers' work hours. However, since the graphs relate to all teachers and since the implementation of the wage agreements was gradual, the uptrend reflects — at least in part — the implementation of the new wage agreements. The new wage agreements went into effect in the 2006/2007 school year for primary school teachers, and in 2011/2012, for secondary teachers. The graph also distinguishes between new teachers in their first year on the job and more senior teachers. It is clear that the new teachers work fewer hours although they also show an uptrend in work hours.

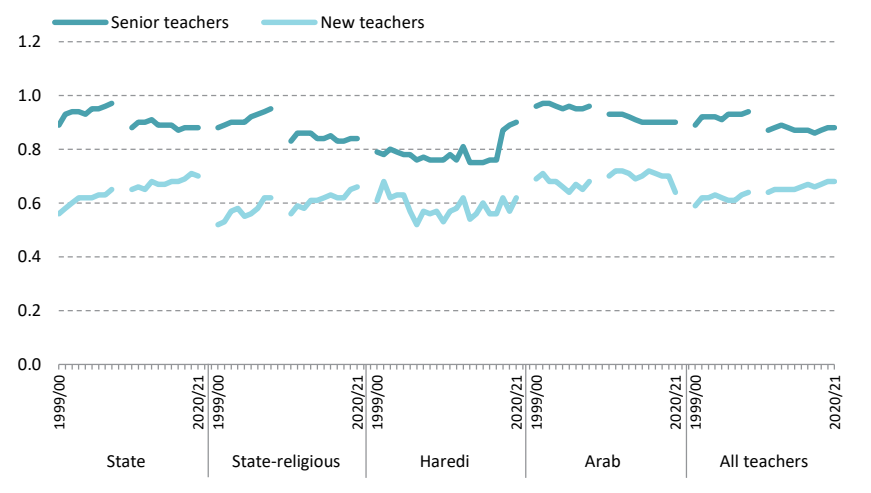
**Figure 14. Change in number of work hours of new and senior teachers, by sector and type of supervision, 1999/2000 to 2020/2021**



Source: Nachum Blass, Taub Center | Data: CBS, calculations for the Taub Center by D. Maagan, unpublished

Figure 15 presents the changes in full-time equivalence (FTE) for all teachers. Here the picture is radically different, with the FTE remaining almost unchanged for more senior teachers and, when it did change, it tended to decline.

**Figure 15. Changes in the FTE of new and senior teachers, by sector and type of supervision, 1999/2000 to 2020/2021**



Note: Breaks in the figure are due to missing data.  
Source: Nachum Blass, Taub Center | Data: CBS, calculations for the Taub Center by D. Maagan, unpublished

There is a major difference between presenting teacher workload in terms of work hours and presenting it in terms of FTE. According to the work hour figures as published in the CBS press release (CBS, 2021), in the 1999/2000 school year, 30% of the teachers worked less than 20 weekly hours (in that year a full-time position was 30 hours in primary education and 24 hours in secondary education). In contrast, in the 2019/2020 school year, 40% of the teachers worked less than 30 weekly hours while a full-time position in primary education was defined as 36 weekly hours and as 40 weekly hours in secondary education. The clear conclusion is that the vast majority of teachers work part-time, at around 75–80% of FTE. However, if one examines the data in terms of FTE, senior teachers worked relatively a lot during those years, 80–90% of FTE, apart from the 2008/2009 school year, which was an outlier for some unclear reason.

It is interesting to note that this process was not what was intended by the Dovrat Committee. The underlying principles of the Ofek Hadash and Oz LeTemura wage agreements appear for the most part in the Committee’s report (Dovrat Committee Report, 2005); however, the authors of the report did not

consider that the implementation of their recommendations would lead to a greater increase in the number of teachers than in the number of students. Essentially, they had the opposite intention. They envisioned that the change in the structure of a teaching position — which would require teachers to work full-time, thereby increasing teaching hours in the classroom — would reduce the number of teachers (though they did not recommend firing teachers and assumed that this would occur “naturally” due to the desire of teachers to continue working full-time) and, therefore, would allow the system to select the best teachers.<sup>10</sup> What actually happened is that teachers in primary schools and high schools continued to work the same percentage of FTE as previously, while teachers in middle schools reduced their percentage of FTE. This is a good example of the difficulty in predicting developments in the education system, especially following changes and reforms.

### Teachers who teach subjects they are not certified to teach

In contrast to the progress in the teachers’ level of education and psychometric scores, there are reports that in many schools teachers are teaching subjects they are not certified to teach, or in other words, “without being fully equipped to teach the subject matter.”<sup>11</sup>

The State Comptroller Report for 2013 stated, “For a significant share (about 60%) of teachers in the primary education system who taught mathematics in the 2012/2013 school year, their training did not match the subject they were teaching. The share of such teachers in Haredi education is particularly high at 83%, and in State-religious education it is about 70%” (State Comptroller, 2014, p. 947).

According to the CBS press release on teachers in the education system in the 2020/2021 school year (CBS, 2021), the share of teachers with the appropriate training to teach mathematics, English (as a second language),

---

10 This is based on my own personal knowledge while serving as a professional secretary of the committee that planned working conditions for teachers and the committee that dealt with the budget for the Dovrat Committee.

11 A teacher is considered certified to teach a subject if their name appears on a list of first degree graduates of an institution of higher education in Israel or abroad (if the foreign degree is recognized) according to the degree’s field of study. In the case of teachers who do not appear on these lists, certification is determined according to the subjects on the teaching license awarded by the Ministry of Education (for those who have received a teaching license). In the case of teacher colleges, the subject of a first degree is defined according to the specialization in teacher training.

or Hebrew is not increasing and in some cases is even declining, where the determining factors are the educational stage, type of supervision, and sector. Another insight derived from the press release is that in all subjects and at all educational stages, the share of teachers who are certified to teach their subject is higher in the Arab sector than in the Jewish sector and sometimes significantly higher. This is particularly the case in the teaching of Hebrew language skills.<sup>12</sup>

A report of the OECD (see Appendix Table 1) also shows that the share of teachers whose principals feel they have the appropriate formal training fell between 2006 and 2018 (OECD, 2019, Table V.B1.4.6). This decline was so large — at least in some of the OECD countries — that it cast doubt on the reliability of the report, which was based on reports by school principals.

The question of whether teachers are certified to teach the subject they actually teach calls for an in-depth examination. It should focus on the current situation relative to the past and relative to other countries and should relate to the various subjects being taught and to all of the educational stages.

## Is there a teacher shortage?

From time to time there are claims that there is a general shortage of teachers, a shortage of teachers in specific subjects, or a shortage of good teachers. These claims are, in general, based on reports by school principals who find it difficult to fill vacant positions. Assessing these claims at any specific point in time is problematic and the severity of the problem is difficult to measure. The findings will be different in July or August (prior to the start of the school year) than in October (after the school year has started) for the simple reason that, in the end, every class will have a teacher. The school administration will always find someone to put in front of the class. The question “Is there a shortage of teachers?” is essentially meaningless. Clearly, one can always claim there is a shortage of good teachers. It is also clear that there will always be a shortage of teachers in certain subjects, in specific cities, or in some schools, and, perhaps, in many schools. The relevant question is whether it is possible to identify an overall or widespread shortage in these subjects or alternatively

---

12 The explanation is perhaps that in order to teach Hebrew in a primary school in the Arab education system, particularly when the teacher is Arab, the teacher must be specifically trained for that purpose. In primary schools in the Hebrew education system, it is sufficient that the teacher's mother tongue is Hebrew.

whether it is possible to identify deeply-rooted processes that will in the near (or not-so-near) future lead to such a shortage. Given this shortage (or the expectation of a shortage), another question is: What means can be employed to overcome the problem in the present or to prevent it from developing in the future?<sup>13</sup> The challenge is to identify the signs of a genuine shortage or the development of a trend toward such a shortage in the future.

Before trying to deal with these questions, we need to look at how the demand and supply of teachers are determined.

*Demand for teachers* — The demand for teachers is determined by many factors, some of which are controlled by those who manage the education system and others that are beyond their control. The main factor that policy makers do not control is, of course, the number of children, which is determined by population growth, internal and external immigration, and the political and organizational arrangements of the education system structure, such as the simultaneous existence of several education systems (State, State-religious, Haredi, and Arab). Factors that can be influenced by policy makers include the number of classroom hours, the number of hours devoted to each subject, teachers' work hours, and the distribution of those hours between actual teaching and hours devoted to other components of a teacher's work.

The CBS prepares an annual forecast of the number of students and their distribution according to educational stage, type of supervision, and sector, and once every few years it also prepares forecasts of the demand for teachers based on those variables and according to subjects taught. These forecasts are made under the assumption that all of the conditions that exist in the present will remain unchanged in the future. However, this is rarely the case. The education system, like any other social system, is in a continual process of flux, which is due, among other things, to changing enrollment rates among different age groups and populations, the curricula, budget fluctuations, and pressures leading to structural reforms to reduce class size.

Total demand can be expressed as the number of teacher work hours needed to operate the education system according to the existing regulations.

---

13 In a discussion of teacher shortages, it is worth distinguishing between static and dynamic situations. For example, the phenomenon of teachers teaching "outside their subject" has always existed and exists in every country. It is a negative phenomenon but apparently unavoidable; in any case it is worthwhile minimizing the phenomenon. The problem is exacerbated, of course, when the phenomenon becomes more prevalent.

However, in order for this number to have operative significance for policy makers, there is a need to break it down into the number of work hours required for each subject taught, age group, geographic region, and education sector.

*The supply of teacher work hours* — The total supply of teacher work hours is primarily determined by the number of active teachers and the average percentage of FTE they are interested in working. In addition, there is the stock of potential teachers which includes individuals with a teaching license and training but who, for various reasons, are not teaching, whether because they have taken early retirement or for any number of other reasons. Other factors, which primarily affect future supply, include individuals in occupations that are close to the subject being taught who can be temporarily or permanently hired and students in teacher education programs. Here again, in order for the data to be useful they have to be broken down by subject, relevant age group, sector, type of supervision, and geographic region.

To properly address the question of whether there is a shortage of teachers without relying on random reports requires an examination of several indicators that are used by those interested in determining the existence of such a shortage and its extent. There are clear signs that indicate a worsening shortage of teachers. In what follows, we will describe each indicator and explain why they point to a shortage or surplus, and we will examine whether they currently exist in Israel's education system.

1. *Growth in the number of uncertified teachers* — An increase in the number of uncertified teachers and a decline in teachers' average level of education are immediate and obvious signs of an existing or future shortage. Such an increase implies a lowering of the threshold to enter teaching, as part of an attempt to deal with a shortage of teachers in general or at least at their existing professional level. Applying this indicator, the share of uncertified teachers has fallen from 16% to 6% since the 2009/2010 school year, and, in contrast, the number of teachers with a master's degree has risen from 24% to 38%. In the Arab sector, the progress has been even more pronounced. Therefore, the conclusion is unambiguous: the thresholds for entering the teaching profession and the level of training have not declined; on the contrary, they have improved.
2. *Changes in the teachers' average percentage of FTE workload* — The average percentage of FTE workload is an indication of, on the one hand,

the employment preferences of teachers, and, on the other hand, the possibilities within the system of accommodating those preferences. An increase in the average percentage of FTE among teachers may be an indication of, among other things, a change in the teachers' preferences (which may be due to a change in labor market conditions) and pressure put on teachers to increase their workload in order to address a shortage of teachers.<sup>14</sup> In contrast, a drop in the average percentage of FTE may be an indication of surplus supply and an attempt by the system to divide a limited supply of work hours among a larger number of teachers.

All told, it is difficult to identify a clear trend in percentage of FTE workload. In some parts of the education system, the average percentage of FTE has increased and in others it has decreased or remained unchanged (see Appendix Table 2), although overall the average percentage of FTE in the system has declined.<sup>15</sup> In general, there has been a slight increase in the percentage of FTE in pre-primary education and a decline in the rest of the educational stages. Between the 2013/2014 school year and the 2018/2019 school year, there was somewhat of an increase in pre-primary and primary education and somewhat of a decrease in middle schools and high schools. There is variation by sector, type of supervision, and educational stage, but overall there has been noticeably little change over time, implying that most teachers work part-time at a rate of between 64% and 84%, with the vast majority working between 70% and 80% of a full-time position (Appendix Table 2).

3. *An increase in class size and/or a decline in teaching hours per class and per student* — There are various reasons for an increase in class size and a decrease in number of teaching hours per class and per student. One of them is that this is the system's response to a shortage of teachers. In Israel, though, the reality in the education system is exactly the opposite: the average class size has been decreasing and the number of work hours per class is increasing.

---

14 It is worth mentioning that the average number of work hours among women in Israel is lower than among men. A report by the Knesset Center for Research and Information states that according to CBS data for 2014 the share of women who worked full-time in that year (67.3%) was lower than that of men (86.7%) (Knesset, 2015).

15 The calculation is made by dividing the number of teachers working full-time by the number of active teachers in the system, as appears in the CBS press release (CBS, 2020b). There may be small differences from Figure 15.

4. *The absence of certain taught subjects* — A situation in which subjects are no longer taught or the number of teaching hours is shrinking may be an indication of a shortage of teachers. However, it may instead be an indication of a lack of interest in that subject among students, which creates a surplus of teachers in that subject. It is possible that the current situation in chemistry has resulted from the first explanation and that the situation in geography stems from the second.

An example of the discrepancy between the feeling that there is a shortage of teachers and the reality on the ground is found in the field of mathematics. For many years, the claim has been made that there is an acute shortage of mathematics teachers. However, in recent years, thanks to a focused effort by the Ministry of Education — led by then Minister of Education Naftali Bennett — the number of students studying math at the highest level (5 study units) has increased. The success of this effort has demonstrated that the problem of the small number of students studying mathematics (and, likely, other subjects) at high levels, and, in particular, at the highest levels, was not a shortage of teachers, but rather the desires of students and their parents, and, of course, also the policies of the Ministry of Education. The fact is that when appropriate steps are taken, namely the provision of incentives, assistance, and guidance for those who need it, the teachers are found.

5. *Trends in the share of graduates of teacher training who become teachers* — The share of graduates of teacher training programs who become teachers is affected by two factors: a surplus or shortage of teachers and the desire of graduates to become teachers (which is determined to a large extent by the general situation in the labor market and the employment opportunities available to them). In more than a few instances, these two factors work in opposite directions. Thus, there may be a major shortage of teachers in a subject for which there is demand outside the education system also; that is, the education system may be competing with other sectors for the same graduates.

Nonetheless, it appears that changes in the rate of integration of teaching program graduates, along with the time between the completion of a teacher training program and entering into teaching, may be an indicator of a shortage or surplus of teachers. To the extent that this rate increases, it may be an indicator of a shortage and vice versa. According to the CBS press releases (CBS, 2019; 2021) and the *Statistical Abstract of Israel 2020*



(CBS, 2020a, Table 4.92), it appears that only about 60% of teacher training graduates between 2000 and 2017 went into teaching. The share that actually go into teaching varies across sectors and according to the year of graduation, as well as other variables. Nonetheless, it is clear that the share who do not teach ranges from 20% to 40% of graduates (depending on the subject, educational stage, sector, and type of supervision). These graduates are without a doubt a potential stock from which to hire teachers in times of crisis.

6. *The gap between those entering teaching and those leaving it* — This difference is not necessarily an indication of a current shortage but it may indicate the possibility of a future shortage. The data in the CBS press release (CBS, 2020b) show that during the past twenty years the share of new teachers has exceeded the share of retiring teachers (Table 3). Since this is a share out of total teachers, every 1% represents thousands of teachers. Since it is also the case that the gap between the share of incoming teachers and the share of outgoing teachers is in general larger than the growth in the number of students in the system, the data on incoming and outgoing teachers do not point to a shortage.

**Table 3. The difference between the share of new teachers coming into the system and the share of teachers leaving it, for selected years**

Percent

Sector and educational stage	1999/2000	2009/2010	2016/2017*
<b>Total</b>	3.4	2.5	5.1
<b>Hebrew education</b>	2.9	2.7	5.7
Pre-primary	2.0	3.9	4.9
Primary	4.4	3.6	7.2
Middle school	3.0	2.4	4.5
High school	0.2	0.5	3.3
<b>Arab education</b>	5.0	1.9	3.2
Pre-primary	0.5	2.5	1.4
Primary	4.9	2.1	4.2
Middle school	6.0	0.6	1.2
High school	5.1	2.7	3.4

\* The figure for new teachers is for the 2019/2020 school year while that for retiring teachers is for the 2016/2017 school year. The reason for this is that the data for retirement are measured only when the teacher does not appear in the Ministry of Education reports for at least three years. Therefore, a teacher who is on maternity leave, for example, and does not teach for a year or two is not counted as having left the profession.

Source: Nachum Blass, Taub Center | Data: CBS, 2020b

All of these indicators — and there are more than a few others — show that from an overall systemic perspective there is no reason to characterize the current situation as a teacher shortage, although in many cases such situations are common, particularly in certain subjects.

### **What can be done to overcome a localized shortage of teachers?**

There always is and always will be localized shortages of teachers in certain subjects. The following are a number of proposals to assist the Ministry of Education, heads of education departments in the local authorities, and school principals.

1. *More generous compensation for overtime* — As mentioned, most teachers work at 70% to 80% of FTE. Currently, teachers do not receive any additional salary for work beyond FTE, unlike the situation in other occupations. The Dovrat Committee considered this issue and suggested that “principals be given room to maneuver to increase a teacher’s teaching hours — with their consent — when necessary” (Dovrat Committee Report, 2004, 3.1.1). However, the Committee limited the additional salary to 3 hours beyond what a teacher has to work in a full-time position and in extreme cases no more than 4 hours. The Committee decided that the additional salary would be 3% for one additional hour, 6% for two, 10% for three and 12% for four hours.

The Dovrat Committee’s proposal seems completely within reason, although the level of incentivization appears to be somewhat low. It is important to emphasize that allowing teachers to work beyond full-time provides the system with hours without any additional salary up to the teacher’s FTE and therefore there is the possibility of more generous incentives for additional hours. Moreover, allowing work beyond full-time does not provide the teacher with any permanent rights and the authorization to work overtime is at the discretion of the school principal.

2. *Compensation for retired teachers without harming their pension* — It may be that certain teachers are prepared to work a small number of hours after their retirement but are concerned that this will harm their pension. Providing these teachers with complete confidence that their pension will not be harmed can increase the stock of teachers available to a principal in a period of distress.

3. *The “teacher registry”* — Just as there is a “contractors registry” so there should be a “teacher registry” including contact details of those with a teaching license (or anyone who has been trained as a teacher but does not have a teaching license), whether they work full-time or part-time, and whether or not they are working as a teacher. Such a list will make it possible for principals who experience a shortage of teachers to directly contact individuals and to propose that they fill in for the missing teachers.

## References

### English

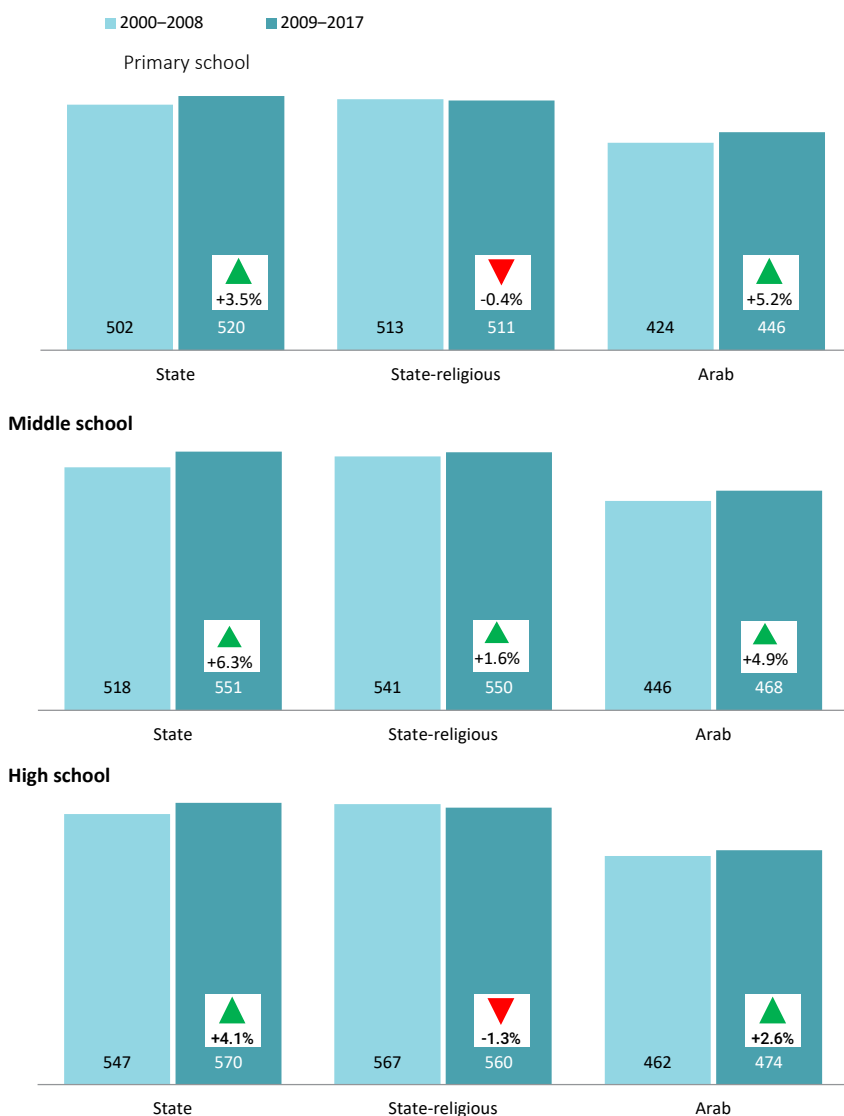
- Blass, N. (2020). [The education system in Israel in the time of the coronavirus: Three alternative frameworks](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2020*, pp. 399–426. Taub Center for Social Policy Studies in Israel.
- Blass, N. (2017). [The academic achievements of Arab Israeli pupils](#). Taub Center for Social Policy Studies in Israel.
- CBS (2020a). [Statistical abstract of Israel 2020](#). Central Bureau of Statistics.
- Nahmias, P. (2004). Fertility behaviour of recent immigrants to Israel: A comparative analysis of immigrants from Ethiopia and the former Soviet Union. *Demographic Research* 10(4), 83–120.
- OECD (2019). [PISA 2018 results \(Volume II\)](#).
- OECD (2020). [Education at a glance 2020](#).
- The National Task Force for the Advancement of Education in Israel (The Dovrat Commission) (2005). *The national plan for education — because every child deserves more*. ([English summary](#))
- Weinreb, A., & Blass, N. (2018). [Trends in religiosity among the Jewish population in Israel](#). Taub Center for Social Policy Studies in Israel.

### Hebrew

- CBS (2017). [Media Release \(15 March 2017\): Teaching staff 2016/17](#). Central Bureau of Statistics.
- CBS (2019). [Media Release \(2 July 2019\): Trends in teacher training, specialization in teaching and entering the field of teaching, 2000–2019](#). Central Bureau of Statistics.
- CBS (2020b). [Media Release \(31 March 2020\): Teaching staff 2019/2020](#). Central Bureau of Statistics.
- CBS (2021). [Media Release \(23 February 2021\): Teaching staff 2020/21](#). Central Bureau of Statistics.
- Knesset, Research and Information Center (2015). *Women in Israel: Main issues*. Presented to the Committee on the Status of Women and Gender Equality, May 2015.
- State Comptroller (2014). *Annual report 2013*. State Comptroller and Ombudsman of Israel.

## Appendix

**Appendix Figure 1. Average psychometric score of new teachers, by sector and educational stage, 1999/2000 to 2016/2017**



Source: Nachum Blass, Taub Center | Data: CBS, 2017

**Appendix Table 1. Share of teachers with appropriate training, by principals' reports**

Percent

	PISA 2006	PISA 2009	PISA 2012	PISA 2015	PISA 2018	Percentage point change between 2006 and 2018	Percentage point change between 2015 and 2018
Colombia	85.3	90.3	10.0	9.8	37.1	-48.2	27.3
ISRAEL	77.0	64.4	71.0	73.6	60.7	-16.3	-12.9
Mexico	56.2	38.0	27.0	35.2	42.5	-13.7	7.3
Poland	96.5	98.8	99.3	95.3	84.5	-12.0	-10.8
Sweden	89.7	88.6	86.4	—	78.6	-11.1	—
Greece	93.8	95.8	79.9	86.9	84.9	-8.9	-2.0
Luxembourg	79.7	72.8	69.4	71.6	72.4	-7.3	0.8
Italy	86.0	84.1	85.2	88.0	78.8	-7.2	-9.2
Iceland	91.4	81.2	96.2	86.4	84.5	-6.8	-1.9
Estonia	87.8	86.7	93.0	89.1	81.1	-6.7	-8.0
New Zealand	88.9	96.0	94.9	90.3	83.7	-5.3	-6.6
Austria	90.2	87.2	86.6	84.0	85.4	-4.8	1.4
South Korea	99.3	97.8	98.7	95.5	94.5	-4.7	-0.9
Australia	98.2	97.3	96.7	95.4	94.2	-4.0	-1.2
OECD	85.6	82.8	83.8	82.5	81.8	-3.8	-1.2
Slovenia	92.3	95.3	93.5	97.1	88.7	-3.6	-8.5
Portugal	85.2	92.6	95.5	91.5	82.5	-2.7	-9.0
US	94.7	93.9	95.5	91.8	92.6	-2.2	0.8
Netherlands	88.6	78.3	75.4	82.6	86.6	-2.0	4.0
Ireland	97.4	94.1	97.7	98.5	95.7	-1.8	-2.8
Japan	97.6	97.9	99.9	97.1	95.9	-1.6	-1.1
Belgium	85.4	89.6	85.2	84.9	84.0	-1.3	-0.8
Germany	86.7	91.5	91.0	88.4	87.8	1.2	-0.6
UK	93.3	95.7	95.0	92.1	95.6	2.3	3.5
Canada	93.2	90.2	95.8	94.7	96.2	3.0	1.5
Czechia	86.6	87.2	90.8	92.6	90.1	3.4	-2.5
Norway	83.3	83.4	88.5	83.9	87.3	4.0	3.4
Finland	84.9	90.5	91.4	92.6	89.4	4.5	-3.2
Switzerland	78.2	79.7	85.1	80.9	83.9	5.7	3.1
Chile	14.7	11.9	19.4	21.0	23.7	8.9	2.7
Lithuania	89.2	91.2	94.4	99.3	98.2	9.1	-1.1
Slovakia	73.7	76.6	94.7	92.1	87.7	14.0	-4.4

Source: Nachum Blass, Taub Center | Data: OECD, 2019, Table V.B1.4.6

**Appendix Table 2. Average share of FTE, by educational stage, type of supervision, and sector**

	1991	2000	2010	2015	2020
<b>Total Hebrew education and Arab education</b>	<b>0.82</b>	<b>0.84</b>	<b>1.01</b>	<b>0.83</b>	<b>0.82</b>
Pre-primary	0.85	0.85	0.76	0.74	0.78
Primary	0.74	0.76	1.00	0.78	0.79
Middle school	0.76	0.81	0.85	0.70	0.69
High school	0.81	0.78	0.81	0.75	0.74
<b>Hebrew education — total</b>	<b>0.83</b>	<b>0.85</b>	<b>0.99</b>	<b>0.81</b>	<b>0.81</b>
<b>Pre-primary education — total</b>	0.85	0.84	0.75	0.72	0.78
State	0.87	0.85	0.75	0.73	0.78
State-religious	0.85	0.83	0.74	0.71	0.76
<b>Primary education — total</b>	0.61	0.74	0.97	0.76	0.77
State	0.73	0.76	1.08	0.79	0.80
State-religious	0.71	0.72	0.98	0.75	0.76
Haredi	0.67	0.67	0.69	0.70	0.71
<b>Middle school — total</b>	0.75	0.81	0.82	0.67	0.64
State	0.75	0.83	0.84	0.69	0.67
State-religious	0.71	0.75	0.75	0.61	0.58
<b>High school — total</b>	0.80	0.76	0.78	0.73	0.70
State	0.82	0.77	0.83	0.77	0.75
State-religious	0.76	0.70	0.71	0.66	0.64
Haredi	0.73	0.81	0.70	0.65	0.66
<b>Arab education — total</b>	<b>0.91</b>	<b>0.91</b>	<b>1.09</b>	<b>0.88</b>	<b>0.87</b>
Pre-primary	0.91	0.95	0.83	0.81	0.82
Primary	0.87	0.84	1.09	0.84	0.84
Middle school	0.81	0.83	0.98	0.83	0.83
High school	0.93	0.93	0.93	0.86	0.86

Source: Nachum Blass, Taub Center | Data: CBS

# *Executive Summary*

## Preschool Attendance to Age 3 and Its Impact on Academic Achievement in Grade 4

**Hai Vaknin and Yossi Shavit**

The environment during a child's first years of life has a major impact on their life outcomes. Therefore, positive experiences in early childhood have a critical effect on development. According to the research, the type of education children receive, the age at which they enter a preschool framework, and the time they spend in the framework are significant factors in determining the opportunities for cognitive, social, and emotional development. The characteristics of the preschool frameworks are also an important factor in child development since they affect the physical and social environment in which children grow up. There is a consensus in the literature regarding the contribution of attendance at a high-quality early childhood education and care (ECEC) framework from birth to age 3 and from ages 3 to 6 to the development of cognitive and non-cognitive abilities. Studies have also shown that attending a high-quality ECEC framework makes an even larger contribution to child development among weaker socioeconomic groups and can help to narrow academic and occupational gaps later in life.

---

\* Hai Vaknin, Master's student, Department of Sociology and Anthropology, Tel Aviv University. At the time of writing, he was a Research Assistant at the Taub Center Initiative on Early Childhood Development and Inequality. Prof. Yossi Shavit, Principal Researcher and Head, Taub Center Initiative on Early Childhood Development and Inequality; Professor Emeritus of Sociology, Tel Aviv University. The initiative is generously supported by the Bernard van Leer Foundation, the Beracha Foundation, and Yad Hanadiv. This study was first published in November 2021.



While studies of the relationship between early childhood education and future achievement focus primarily on ages 3–6, the current study looks at children from birth to age 3 — the years that are most critical to child development. The study looks — for the first time — at the relationship between attendance at an ECEC framework from birth to age 3 and achievement on reading comprehension tests in Grade 4 in Israel.

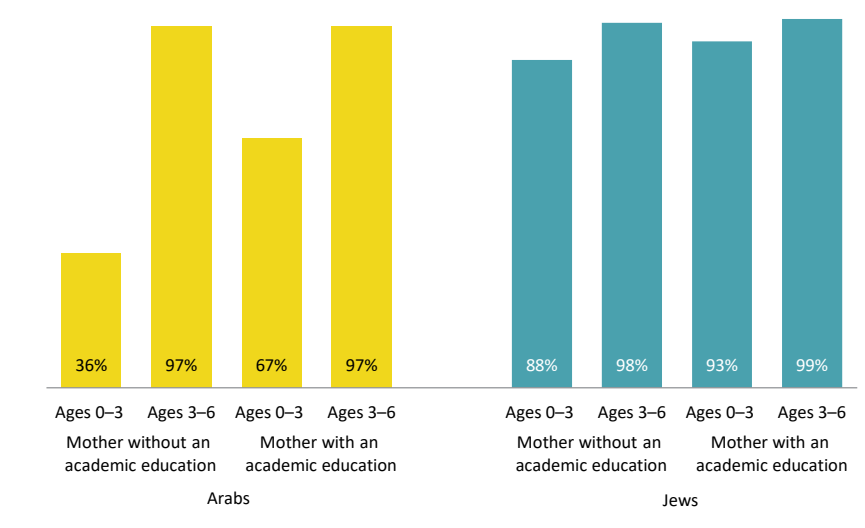
As a result of the high fertility rate in Israel, the percentage of children within the population is one of the highest in the world; attendance rates of young children in preschool frameworks are also among the highest. However, the existing data on ECEC frameworks for young children up to the age of 3 indicate that they are, on average, of poor quality. This study looks at the contribution of attending an ECEC framework from birth to age 3 on academic achievement, despite their low quality on average, and the effect of duration of attendance on cognitive development, as reflected in later academic achievements. Furthermore, the study examines differences between Jews and Arabs and differences that can be attributed to socioeconomic status. The researchers utilized data from the PIRLS test carried out in 2016 (the last one carried out in Israel), which tested the reading comprehension of 3,000 native-born Israeli students.

## Findings of the research

- The research shows that when controlling for family background, the achievements of children who attended an ECEC framework from birth to age 3 are no different than those of children who did not attend; this is in contrast to the positive relationship found in many studies between participation in early childhood education at ages 3–6 and future academic achievement. This is true for both Jews and Arabs and no difference was found based on socioeconomic status. The researchers hypothesize that this finding reflects the prevailing poor quality of early childhood education frameworks for this young age group, which, for the most part, were not under State supervision until recently.
- While the rate of attendance among Jews and Arabs of ECEC frameworks for ages 3–6 are quite similar (98% and 96%), for the younger age group (birth to age 3), the difference is significant: 90% vs 46%, respectively. In other words, the rate of attendance of Jewish children up to age three is almost double that of Arab children of the same age.

- The rate of enrollment in ECEC frameworks for the youngest children increases with socioeconomic status (as measured by the mother’s level of education and the father’s occupation), while in the case of frameworks for ages 3–6 there is no difference according socioeconomic status.

**Rates of preschool attendance according to mother’s education and sector**



Source: Hai Vaknin and Yossi Shavit, Taub Center | Data: PIRLS 2016

- Among Arabs, the share of children of mothers with an academic education who attended frameworks from birth to age 3 was almost double that of children of mothers without an academic education (67% vs 36%), while among Jews, the difference was small (93% vs 88%). For children ages 3–6 attending preschool frameworks, there were no differences according to the mother’s education level.
- The data show a large difference in average scores on the PIRLS test between Jews and Arabs, part of which can apparently be explained by socioeconomic status. The share of mothers with an academic education among Jews is almost double that among Arabs, as is the case for the share of Jewish fathers who are in professional or managerial occupations.



# DEMOGRAPHY

6



# Demographic Trends in Israel: An Overview

**Alex Weinreb**

Demographic change — meaning any shift in the size or composition of a population — is driven by one of three things: a change in mortality; a change in fertility; or a change in migration. These are the core “demographic components.” Covid-19 changed — or was expected to change — each of them. In this chapter we review recent shifts relative to longer-term trends, showing that only some of the anticipated changes actually occurred.

## Mortality

Covid-19 significantly raised levels of mortality in Israel. In earlier research, we estimated there had been about 3,300 “excess deaths” in Israel during 2020, and that this led to a 2.1-month reduction in life expectancy at birth, and a 2.7-month reduction at ages 25 and 65 (Weinreb, 2021). That was a relatively small impact by international standards, especially given the very high infections levels in Israel.

Figure 1 graphs the overall weekly mortality rate for Israel to mid-September, 2021, alongside rates in selected prior years.<sup>1</sup>

Israel began 2021 quite poorly in terms of mortality. As the first vaccination campaign was in full swing, the weekly mortality rate reached the highest seasonal levels in around 17 years. Mortality rates then fell sharply in March and April, bottoming out in late May and into early June at very low levels of mortality, and then climbed again as the Delta variant took hold. This upward trend in mortality in July 2021 tracked the path taken a year earlier. Mortality levels remained at very high levels (relative to average in mid-summer) before

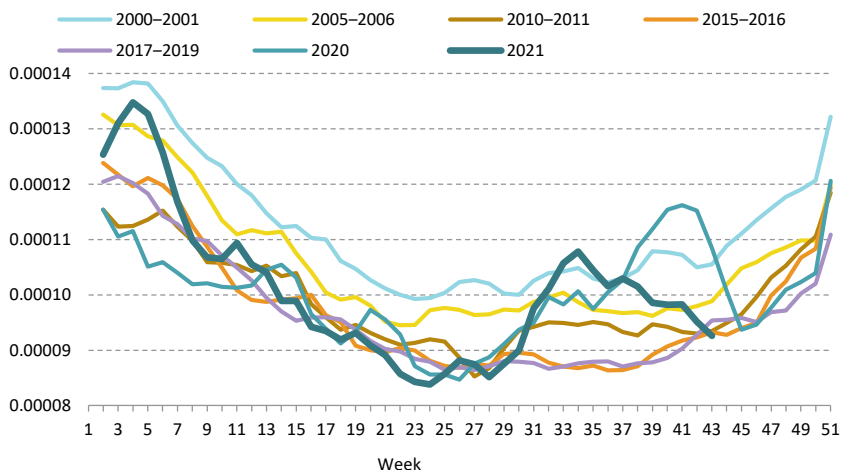
---

\* Prof. Alex Weinreb, Research Director, Taub Center for Social Policy Studies in Israel; Department of Sociology, University of Texas at Austin.

1 This is an age-standardized mortality rate. That is, it the sum of age-specific mortality rates, each multiplied by the proportion of the total population in that age group at the midpoint of that particular year. For more details, refer to Weinreb, 2021.

beginning to fall in mid-September. By the end of October — these are the latest available data — mortality rates had fallen to typical autumn levels.

**Figure 1. Weekly mortality rates (3-week average) in selected years**



Note: 2021 data up to the end of October.

Source: Alex Weinreb, Taub Center | Data: CBS

These mortality rates will generate a further reduction in life expectancy in Israel. It is not just the greater number of Covid deaths in 2021 than in 2020: around 60% of all Covid deaths in Israel so far occurred in 2021. It is also that the variants of Covid-19 that affected Israel in 2021 increased the case-fatality ratio at younger ages; deaths at younger ages pull down estimated life expectancy much more than deaths at older ages.

Table 1 shows this by comparing the ratio of age-specific mortality rates across the first 42 weeks of 2020 and 2021 to rates in the same period in 2017–2019. Mortality across almost every adult age group is higher in 2021 than it was in the 2017–2019 baseline period. That was not the case in 2020.

**Table 1. Ratio of age-specific mortality rates in 2020 and 2021 to mortality rates in 2017–2019**

Age group	2020	2021
0–19	0.77	0.91
20–24	1.02	1.02
25–29	0.92	1.10
30–34	1.04	1.05
35–44	0.95	1.07
45–54	0.98	0.99
55–64	1.03	1.03
65–74	1.05	1.09
75+	1.02	0.99
<b>Weighted average</b>	0.91	0.99

Notes: Estimated for weeks 1–42 only; weighted by proportion of population in age group.

Source: Alex Weinreb, Taub Center | Data: CBS, 2021a

Weighting these age-specific averages by the share of the population in each age group yields a more precise estimate of the total mortality effect across all age groups over these first 42 weeks. That average shows that overall mortality rates in the first 42 weeks of 2020 were 9% less than they had been in 2017–2019, whereas in the first 42 weeks of 2021, they were only 1% less.<sup>2</sup>

Overall, this upward shift in mortality in the first 42 weeks of 2021 means that unless something very unusual happens between now and the end of the year, any return to the pre-Covid mortality trajectory — we were accustomed to seeing overall mortality rates fall year after year — will have to wait until at least 2022. And even that may not occur if vaccination rates globally remain low, allowing more variants to evolve and diffuse in what increasingly is looking like a new globally endemic infectious disease.

2 These reductions in overall mortality were driven by a fall in mortality in the 0–19 age group. Since this group constitutes 36% of Israel’s population, and the mortality reduction in this age group was substantial, it offsets most of the increases in mortality rates at older ages.



## Fertility

### Long-term trends

Israel's fertility profile is very unusual for a developed country. It is not only that Israel's fertility is very high — this is widely known. It is also the fact that it has remained high notwithstanding the low percent of births outside marriage, high levels of women's education, and significant increases in age at first birth. We have documented these patterns elsewhere (Weinreb et al., 2018).

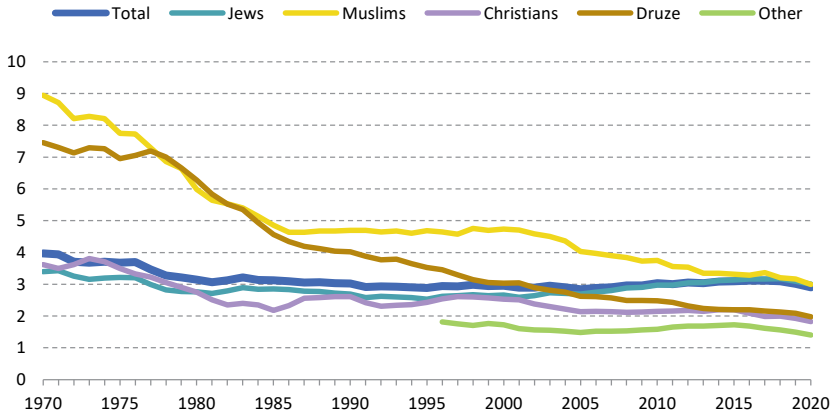
Recent trends point to some changes in that fertility profile. Between 2018 and 2020, Israel experienced the sharpest 2-year reduction in its Total Fertility Rate (TFR) since the 1979–1981 period: the TFR fell by around 0.20 children.<sup>3</sup> This reduction occurred in every ethnoreligious sector, even though most had quite stable TFRs for much of the 2012–2018 period. Note, too, that this reduction in fertility cannot be ascribed to Covid because virtually all 2020 births in Israel were conceived before the epidemic hit Israel. We return to Covid effects shortly.

These long-term fertility trends, including the 2018–2020 reductions, can be seen in Figure 2, which graphs trends in the TFR across the 1970–2020 period by ethnoreligious group. From the 1970s into the 1980s, there were two major groupings in Israel in terms of fertility levels. Jews and Christians were in one group in terms of both fertility level and trajectory, with both on a slow downward track from around 3.5 children per woman in 1970 to around 2.8 (Jews) and 2.3 (Christians) in the early 1980s. Muslims and Druze were in the other group. Their fertility was on a sharper downward track from more than 7 children per woman for most of the 1970s to less than 5 by the mid-1980s.

The TFRs of Jews and Christians continued along similar paths until around 2001. Their TFRs then diverged. The TFR of Jewish women climbed steadily from 2.6, a low-point reached in the mid-1990s, stabilizing in the 3.13–3.17 range during the 2015–2018 period. By 2020 it had fallen back down to 3.0 children, a drop of almost 0.2 children. The TFR of Christian women fell earlier. From 2005 to 2015, it lay between 2.1–2.2. In 2018 it was 2.00. By 2020, it had fallen to 1.83. This, too, is a drop of almost 0.2 children.

---

3 TFR is the most commonly used robust measure of fertility. Formally, it is defined as the average number of births a woman would have if she were to bear children at each age at the observed age-specific fertility rate.

**Figure 2. Total fertility rate (TFR) by mother's religion**

Source: Alex Weinreb, Taub Center | Data: CBS

TFRs in the Muslim and Druze sectors diverged earlier, beginning in the 1980s. Druze women's TFR fell steadily from the 1970s until 2013, when it stabilized at around 2.2 children per woman until 2018. Between then and 2020, Druze women's fertility fell to 1.94. This is the first time that Druze women's TFR has fallen below 2.0 children.

Trends in Muslim women's TFR were initially quite different. Between 1986 and 2002, it remained stable in the 4.6–4.7 range. It then began a steady descent, reaching 2.99 in 2020. That is a 0.2 child reduction since 2018, a 0.8 child reduction since 2010, and a 1.8 child reduction since 2000.

Finally, even among women classified as "other" — these are primarily women who are not halachically Jewish — whose TFR since 2000 has never exceeded 1.75, there has been a sharp reduction recently. Between 2018 and 2020, TFRs in this sector fell from around 1.54 to 1.35. Women in this category are Israel's first to come close to being a "lowest-low" fertility population (Kohler et al., 2002). It is unusual for populations whose TFR falls below 1.4 to raise fertility to replacement level (the average number of children per woman necessary to replace the population — around 2.05 in developed countries).

## Covid effect: Baby boom or bust?

How did Covid affect fertility? Has it magnified the forces that led to those reductions, speeding them up? Or did it provide more breathing room for people to try to achieve their desired fertility levels, which are typically higher than their actual fertility levels?

Research in other countries largely points to Covid reducing fertility. Recent estimates of fertility in a sample of developed countries using birth data for late 2020 and early 2021 — when the initial signs of Covid-era conceptions would first be seen at the population level — confirm that there have been sharp reductions in fertility in North America, Taiwan, and South Korea, and most European countries. The notable exceptions are the Netherlands and most of the Nordic countries (Sobotka et al., 2021). This largely matches data on fertility intentions collected early in the Covid era (March–April 2020), which pointed to a reduction in planned fertility in Italy, Germany, and the UK (Luppi et al., 2020).

The emerging consensus among demographers appears to be that the Covid pandemic has accelerated pre-Covid fertility trends. Countries on a downward track before Covid are expected to fall even further in 2021 to historically low levels (e.g., below 1.6 in the US and UK) or to globally unprecedented levels (e.g., notably, a shocking TFR of 0.7 in South Korea). In contrast, countries with relatively stable fertility levels will experience much smaller effects, if any.

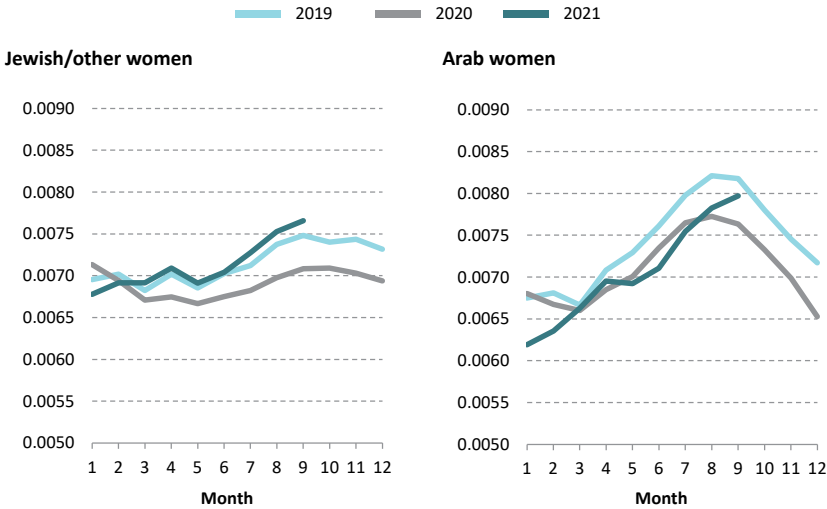
Where does Israel fall in this? TFR estimates covering 2021 are not yet available. But by combining monthly data on number of births with the number of women of reproductive age, we provide an initial answer using the General Fertility Rate for the first 8 months of 2021,<sup>4</sup> alongside parallel estimates for 2019 and 2020. We also estimate discrete measures for Jewish/other and Arab women separately.

The results are graphed in Figure 3. The y-axis in each graph can be interpreted as the proportion of women aged 15–49 in that population that had a live birth in a given month (x-axis).

---

4 The General Fertility Rate (GFR) is the total number of births in the population in a given period divided by the number of women aged 15–49 in that period. By restricting the denominator to women of reproductive age, it is a superior measure of fertility levels than the Crude Birth Rate (CBR), widely used outside demography. It is not as good as the TFR, however, which is basically the sum of age-specific fertility rates, where each of the latter is: the number of births to women aged  $x$  divided by the number of women aged  $x$ . That provides a much better tool for comparison across time and across populations.

**Figure 3. General Fertility rate (GFR) for women ages 15–49**



Source: Alex Weinreb, Taub Center | Data: CBS

Overall, the results point to divergent fertility response to the Covid era between Jews/others and Arabs. The GFRs of Jewish/other women show moderate signs of a Covid-related fertility boost: closer to a boom than a bust. Throughout 2020, with all births up to December conceived prior to Covid, the GFR was lower than in 2019. In fact, the total number of births to Jewish women fell from 138,399 in 2019 to 134,874 in 2020, while the number of Jewish/other women aged 15–49 grew by 1.2%. This is consistent with the overall fertility trends noted in Figure 2.

In January 2021, the GFR remained low. In February, it was almost identical to the level in February 2020. By March 2021, exactly when we would expect to see any signs of a Covid-related bump, the GFR had climbed above levels seen in March 2019. The monthly GFR in 2021 remained just above the 2019 levels from then until June, then exceeded them by a greater degree from July to September. On average, these July–September births are the result of conceptions in the October–December 2020 period. That period came on the heels of the second wave of Covid infections and deaths, which was much more serious than the first major wave in April.

The pattern in the Arab population looks different. From February 2020 until February 2021, the GFR was lower than in the preceding year. This is consistent with the long-term secular downward trend in fertility in the Israeli Arab population. In March–April, 2021 — births conceived on average in the June–July 2020 period — the GFR recovered to its 2020 level, though this was a smaller boost than seen in the Jewish population, where GFR rose to levels higher than in 2019. Until August, GFR in the Arab population largely tracked the 2020 levels, rising above it in September.

Overall, therefore, in the Jewish/other population Covid appears to have given a small boost to fertility levels, pushing them above their 2019 levels for at least a few months, and far above their 2020 levels. In the Arab population, the boost appears to have been more modest — until September it did not exceed the 2020 levels.

To look at the magnitude of these effects more directly, we estimate the difference in number of births in 2019 and 2020 in each of these populations had there been the same number of women aged 15–49 as in 2021.<sup>5</sup> The results are shown in Table 2. In the seven-month period March to September 2021, higher GFRs among Jewish/other women resulted in 4,697 more births than the same number of women would have borne in the same period in 2020. That is a 6.0% increase in the number of births. Relative to 2019, the increase is much more moderate: only 1.8%.

In the Arab population, after much lower fertility in the first two months of 2021 and a small additional drop in June — respectively, these reflected lower conceptions during the first and second big waves of Covid — fertility levels in the remaining months of 2021 were very close to their 2020 levels. As a result, over the seven-month period (March to September) in 2021, Arab women gave birth to almost exactly the same number of children as they had during the same period in 2020. That is a very significant drop in relation to 2019: 1,119 fewer births, an 4.3% decrease overall. However, it is also possible that Covid prevented a further reduction in fertility rates among these Arab women; that were it not for Covid, the fertility rates of Arab women would have fallen even further.

---

5 To do this, we multiply the observed GFR for those years by the number of women aged 15–49 in 2021. Since we are now standardizing the number of women, any difference between the estimated number of births can only be the result of different fertility rates.

**Table 2. Number of births in March to September, 2021, relative to the same months in 2019 and 2020, standardizing for the number of women ages 15–49**

Month	Jews/other		Arabs	
	2021 vs. 2019	2021 vs. 2020	2021 vs. 2019	2021 vs. 2020
March	425	763	35	86
April	118	473	-16	98
May	-181	476	-221	-29
June	343	275	-329	-199
July	-100	675	-221	-140
August	510	1,287	-109	181
September	338	748	-258	113
<b>Total</b>	1,453	4,697	-1,119	109
<b>Percent change</b>	1.81%	6.03%	-4.29%	0.43%

Note: Number of births in 2021 minus the estimated number of births in 2019 or 2020, standardized for the number of women ages 15–49.

Source: Alex Weinreb, Taub Center | Data: CBS, [Live Births Data](#)

As fertility data are updated we will see how long these effects lasted, if at all, into later waves of the epidemic. We will also eventually be able to disaggregate the fertility patterns within these two population blocs — the Jewish/other and Arab population — by religion, religiosity, and region of residence.

More long term, even if there was a boost in births for a period of time, there is a possibility that this merely reflects a *change in timing* rather than *quantity* — known as *tempo* and *quantum*, respectively, in demography. That is, parents may be choosing to have children now that they had planned to have 6 months or a year later, rather than having an additional child they had never intended. A true baby boom is more of a quantum phenomenon; more births occur in total over some extended timespan (Ryder, 1980). That being said, tempo also matters, both because it affects the size of a given birth cohort — which has implications for simple organizational aspects associated with the education system, labor market, and so on — but also because it influences completed cohort TFR. This refers to the number of children women will have borne by the end of their reproductive lifespans. Delayed fertility, especially in populations with relatively high ages at first birth, the case in all contemporary developed societies, reduces completed fertility by pushing more women who may have planned to have a child in their early- to mid-30s to delay doing so.

Those who subsequently try to conceive will do so at older ages, when their fecundability is lower. In countries that have experienced a Covid-related baby bust, this is almost certainly going to be one of the long-term impacts of Covid. The completed fertility of women currently in their early- to mid-30s will be lower. Signs thus far point to Israel largely maintaining its fertility exceptionalism in this respect, too.

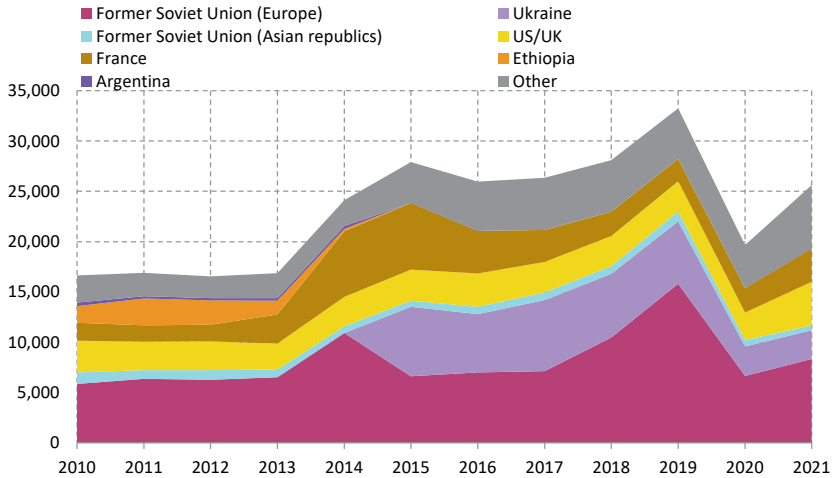
## Migration

Over the last 15 years, net migration to Israel has been steadily growing. By net migration we mean the number of people moving to Israel (either as immigrants or as returning citizens) less the number who left. This trend has been caused by both a reduction in the number of citizens leaving Israel, and a rise in the number of immigrants. The result: between 2005 and 2009, Israel's net migration averaged 7,592 people per year. In the 2010–2014 period, it rose to 11,587 per year. By 2015–2019, it had increased to 21,500 people per year.<sup>6</sup>

As seen in Figure 4, the number of immigrants was stable in the 2010–2013 period — between 16,600–16,900 in all four years. The sharp rise began in 2014, driven primarily by an increasing number of immigrants arriving from the Ukraine (related to the February 2014 “revolution” and subsequent Russian takeover of areas in the East and South) and France (driven by growing fears of antisemitism amid an increase in attacks). These increases more than compensated for the reduction in migration from Ethiopia. By 2018, as the number of French immigrants tapered back to its pre-2014 levels, the number arriving from Russia rose — it more than doubled between 2017 and 2019, reaching 15,800 in 2019. In contrast, over this 10-year period, the number of immigrants from the US and UK, and from former Soviet Union Asian republics, remained quite stable. The former was always in the 2,500–3,300 range, the latter in the 600–1,200 range.

---

6 Data on the number of Israelis leaving and returning are not yet available for 2020, so the latest year with net migration estimates is 2019.

**Figure 4. Total immigrants, by country of origin**

Source: Alex Weinreb, Taub Center | Data: CBS

Not surprisingly, the Covid pandemic led to a sharp reduction in the number of immigrants in 2020. Their number, which fluctuated between 26,000–33,000 per year in the 2015 to 2019 period, fell to 19,700, though that was still considerably higher than the 2010–2013 levels. There were also some moderate changes in the national composition of these immigrants. The reduction was almost wholly driven by a fall in immigration from Russia and the Ukraine. The number of immigrants arriving from US/UK and France remained stable.

During 2021, immigration did largely recover. By December of 2021, almost 26,000 immigrants had moved to Israel, including the largest number of Americans since 1973. But more surprising is what did *not* happen in 2021. Over the spring and summer of 2020, government officials declared that immigration to Israel would soon surpass earlier levels. As reported in media accounts, official expectations ranged from a 20% increase over normal levels during 2021 (Klein, 2020a) to “100,000 will arrive in the next year,” including some tens of thousands of Israelis choosing to return (Klein, 2020b). These expectations appear to have been based on the increasing number of Aliya files being opened, backed up by increasing interest in Israeli real estate from overseas buyers (Morgenshtern, 2020). Two main forces were seen to drive

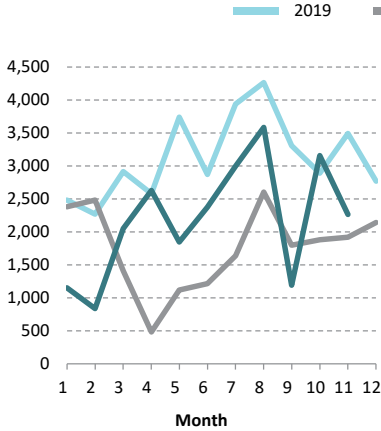


this anticipated wave: “coronavirus Zionism” (Israel being seen to be doing much better than most countries with large Jewish communities in keeping deaths down); and increasing financial hardship in countries of origin (Klein, 2020a).

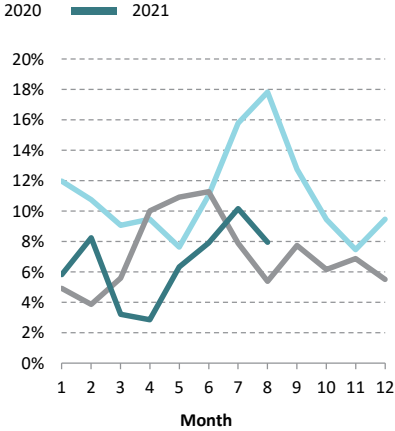
The left-hand panel of Figure 5 graphs monthly numbers of immigrants in 2019–2021. It shows no sign of this anticipated wave in 2021 thus far, including July and August, which are usually the peak migration months. More specifically, although monthly immigration levels to Israel have been considerably higher in 2021 since March than they were during the equivalent months in 2020 — they remained very low during high-infection months of January and February 2021 — they have not yet reached the 2019 levels, let alone surpassed them. Of course, 2021 levels could still pick up, but thus far there is no sign of a massive wave of Covid-related immigration to Israel. There does not even seem to be a small compensatory wave, that is, higher migration due to people who had planned to come in 2020 and were then forced to delay to 2021.

We cannot directly measure whether or not there has been a large wave of returning Israelis since, as mentioned in footnote 6, those data are not even available for 2020, let alone 2021. However, the right hand panel in Figure 5 (b) provides an indirect estimate: the percent of all immigrants that are “returning citizens.” This CBS category refers specifically to citizens born overseas to Israeli parents. To the extent that the anticipated wave of returning Israelis would also include children born overseas, we would expect this percent to increase. It did not, not in 2021 or even in 2020. There is therefore no sign yet of a large wave of returning Israelis.

**Figure 5a. Total number of immigrants, including returning citizens**



**Figure 5b. Percent of immigrants that are returning citizens**



Note: As defined in the CBS tables, a “returning citizen” is a citizen born outside Israel to Israeli parents. It is not the same as a “returning resident.”

Source: Alex Weinreb, Taub Center | Data: CBS

## Conclusion

The Covid epidemic has had moderate effects on Israel’s demography thus far. Life expectancy will be marginally lower in 2021, likely falling to levels last seen in 2016–2017. Jewish-Arab differences in life expectancy will also likely increase given the higher Covid-related mortality in the Arab sector. Fertility trends also appear to have diverged in response to Covid: Jewish women’s fertility increased substantially over 2020 levels, whereas among Arab women, fertility remained at the historic lows seen in 2020. Finally, throughout 2021 migration climbed back toward its “normal” levels for the last few pre-Covid years, though that was far below the levels anticipated during the height of Israel’s triumphant mitigation of Covid’s first wave.

These shifts in demographic behavior will have little effect on Israel’s overall demographic structure in the longer term: not in terms of population size nor in terms of population composition. One big reason is simply our good fortune to be living in a period where scientists are able to develop treatments for a

new infectious disease so rapidly. Scaling up production and broadening the global supply of these treatments will turn Covid into another endemic disease to be sidestepped without disruptive upheavals to everyday life.

Yet in this regard it is particularly important that we do not ignore the more substantial demographic challenges to the state and to the welfare of its citizens. Here we simply point to three. In a society with high fertility and high levels of demographic growth, it is important to anticipate and plan an effective care regime for Israel's fast growing aged population; it is important to continue to improve public health across all sectors; and it is important to meet the challenges posed by ongoing climate change.

## References

### English

- Kohler, H. P., Billari, F. C., & Ortega, J. A. (2002). [The emergence of lowest-low fertility in Europe during the 1990s](#). *Population and Development Review*, 28(4), 641–680.
- Luppi, F., Arpino, B., & Rosina, A. (2020). The impact of COVID-19 on fertility plans in Italy, Germany, France, Spain, and the United Kingdom. *Demographic Research*, 43, 1399–1412.
- Ryder, N. B. (1980). Components of temporal variations in American fertility. In R.W. Hiorns (Ed.), *Demographic patterns in developed societies*, pp. 15–54. Taylor & Francis
- Sobotka, T., Jasilioniene, A., Galarza, A. A., Zeman, K., Nemeth, L., & Jdanov, D. (2021). [Baby bust in the wake of the COVID-19 pandemic? First results from the new STFF data series](#). *SocArXiv*.
- Weinreb, A. (2020). [Population projections for Israel, 2017–2040](#). In A. Weiss (Ed.), *State of the nation report: Society, economy and policy in Israel 2020* (pp. 129–162). Taub Center for Social Policy Studies in Israel.
- Weinreb, A. (2021). [Excess mortality and life expectancy in Israel in 2020](#). 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). Taub Center for Social Policy Studies in Israel.

### Hebrew

- Klein, Z. (2020a, 24 April). [Corona Zionism: 100,000 new immigrants are expected in the coming year](#). *Makor Rishon*.
- Klein, Z. (2020b, 3 May). [Corona Zionism: The aliyah and integration agencies are getting ready for the big wave](#). *Makor Rishon*.
- Morgenshtern, R. (2020, 7 September). [Corona Zionism: The epidemic is bringing a rise in interest in Aliyah to Israel](#). *N12*.



# *Executive Summary*

## A Sociodemographic Profile of the South

**Alex Weinreb**

This study focuses on changes in the sociodemographic and economic profile of Israel's Southern District, which broadly includes the Negev. An initial chapter of the report clarifies some introductory themes related to the delineation of these geographic areas, the region's subpopulations at the time of the study, and it also briefly summarizes some of the major public investments in the South over the last 20 years.

The study is intended to bring a greater understanding of the long-term developments in the southern region of Israel. It employs a combination of aggregate data and household-based survey data from the Central Bureau of Statistics (CBS) to paint a comprehensive picture of several important sociodemographic and economic trends and characteristics. The study's chapters deal with three main issues: demographic growth; household composition, migration patterns to and from the South, and real estate trends; and changes in education as well as selected characteristics of the labor market, particularly the level of labor market participation and relatively high-paying occupations.

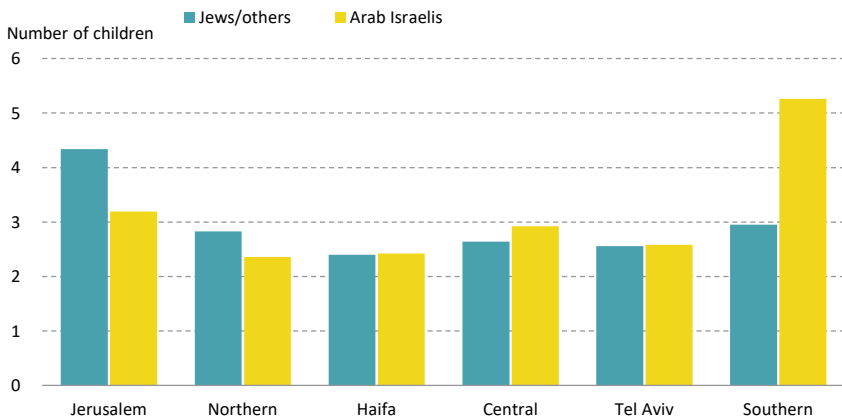
---

\* Prof. Alex Weinreb, Research Director, Taub Center for Social Policy Studies in Israel; Sociology Department, University of Texas at Austin. This research was generously supported by the Mack Ness Fund and was first published in June 2021.

## Demographic growth and residential patterns

- The South has experienced substantial growth over the last 20 years, though this has largely been driven by growth in the Arab sector, and especially among people currently in their teens and 20s.
- After many years of net negative migration out of the South, migration has become positive over the last few years.
- The South is populated not only by Jews and Muslims, but also by a substantial minority of “others” who do not fall neatly into one of the two major religious groupings. In fact, there is a higher percentage of “others” in the Southern District than in any other district in the country.
- Arab fertility levels in the South have fallen sharply over the last 20 years — from over 9 children per woman to around 5 today — but that is still much higher than that of Jews and others (around 3.1 children per woman).

### Total Fertility Rate (TFR) by sector and district, 2019



Source: Alex Weinreb, Taub Center | Data: CBS

- The South has a much higher percentage of people living outside urban areas (using the CBS definition of 2,000 residents), and that percentage has increased over the last 20 years, which means that rural populations have grown even faster than their urban counterparts. That is unusual in a contemporary developed country.

Together, these factors mean that the South is poised for rapid growth, driven disproportionately by its young Arab population. The issue is: to ride this demographic wave productively, it will help to have, retain, or attract a relatively skilled and educated population.

### **Household composition, migration to and from the South, and real estate trends**

- Alongside the 20% increase in the number of households in the South between 2009 and 2019, there has been a slight reduction in the share of households that include co-resident adult children, and a slight increase in the number of childless households in general — these latter now account for about 40% of all households.
- Migrants to and from the South have a similar profile to those in other districts in terms of age, ethnicity, and education: they tend to be under 40, not Arab, and more educated. However, migrants to and from the South differ from the national norm in terms of parents' education. After adjusting for a person's own education, the study shows that a person aged 20–39 whose parents belong to the highest education category — either both have a BA or at least one has an MA — had only a 13% chance of moving out of the South, which is about half the national average. This implies that the South is relatively “sticky” — it is better at retaining its highly skilled people than are other districts.
- Likewise, after adjusting for a person's own education, we show that the probability of in-migration to the South from elsewhere in Israel is higher for people with less educated parents. In other words, the South attracts a disproportionate number of first-generation higher-education graduates.
- People in the South have higher levels of economic satisfaction than people in any other district — with the sole exception of the Jewish residents of Judea/Samaria. People in the South also outscore residents of Haifa, Central, Jerusalem and Tel Aviv Districts on life-satisfaction in general, an index that includes measures of satisfaction with neighbors and family.
- Where the South scores low relative to other districts is on a composite measure of satisfaction with living conditions, including one's own apartment, the local area, parks, cleanliness, and safety. Only residents of Jerusalem and Tel Aviv do worse on this measure.



- In 2000, the average residence of Jews and others in the South had 3.7 rooms. By 2017, it had increased to 4.2 rooms, on par with residence size in the North, around 0.2 rooms more than in Jerusalem and Haifa Districts, and 0.5 rooms more than in Tel Aviv. Only the Central District has larger houses on average.
- The real estate market in the South has looked more resilient during the Covid-19 epidemic in terms of number of sales than that of all other districts. The South was the only district in the country in which combined sales in the second and third quarter of 2020 exceeded those of the same quarters in 2017 or 2018. This is a testament to strong ongoing demand. That demand is largely for 4.5–5 room apartments, appropriate for families.

Overall, these results point to a significant increase in quality of life in the South over the last couple of decades — from increasingly less cramped households to higher-than-average levels of economic and general satisfaction — that is reflected in both the relatively low outmigration of highly skilled individuals, and the greater readiness to buy into the region, even during the difficult and restrictive period of the Covid-19 epidemic. On the flip side, the higher rates of in-migration among people with less educated parents — including first generation higher-education graduates — suggests that the South is more of a destination of choice for people whose intergenerational stores of wealth are more limited.

## Education and employment

### Education

- There have been substantial increases in higher education in the South. Among Jews aged 30–44 in the Southern District in 2000, around 23% had an academic degree. By 2017, this was true of around 40% of Jews in the same age group.
- There have also been substantial increases in university education among the South's Muslim population. Among 25–34 year olds, Muslims have 1.5 years less schooling than Jews versus a gap of 5.5 years among those ages 45–54, and 8 years among those ages 55–64.

- On the other hand, even with these increases in education, the share of people aged 30–44 in the South with a university degree remains the lowest in any district in the country.

### Overall labor force participation

- Though the number of hours worked has climbed in Israel in general over the last decade, that increase has been a little sharper on average in the South, though it still somewhat lags behind Central, Tel Aviv and the Northern Districts.
- Within the South, adults classified as “others” work more hours at all ages up to 60 than either Jews or Muslims. This is true for both men and women. After adjusting for educational attainment, men aged 25–54 who are members of an “others”-headed household work between 4–10 hours more per week than their counterparts in Jewish-headed households and between 13–19 hours more per week than their counterparts in Muslim-headed household.
- Among Jews in the South, religiosity is also inversely associated with number of hours worked at almost all ages, with secular Jews working the most, Haredim the least, and the traditional and Orthodox in between. Again, this ranking is the same for both men and women at almost all ages.
- Assuming that current age-specific hours worked by members of each subpopulation would remain unchanged, a secular Jewish or “other” man will work more hours across his lifetime than either a Haredi couple or an Arab couple.

### High-paying employment

- Although the South has relatively few high-paying tech jobs, it has the highest percentage of employees in well-paid manufacturing positions (computers, electronics, optical, pharmaceuticals, petroleum products), and in upper-level managerial or public administration positions. This suggests that there may be a regional concentration of the types of skill sets required for these occupations.
- There are differences in representation within these occupations across different subpopulations. In the high-end manufacturing sector, there is an over-representation of secular and traditional Jewish men and women, and

“other” men and women. Jewish men — especially traditional and religious — dominate the upper-level managerial and public administration sector. Arabs and Haredim, both men and women, are under-represented in all these higher-paying occupations.

Overall, therefore, notwithstanding a prior OECD publication that warned about the “low-skill trap” in the South, we have found evidence of significant improvements in human capital, very significant differences in labor force participation across subpopulations, and substantial remunerative employment outside high tech. Alongside that, the South continues to lag all other districts in terms of share of the young adult population with a university degree. Even if it takes a little more time for the fruits of recent and ongoing expansion in its higher education systems, alongside other investments, to ripen, there is no doubt that the efforts are worth it. As it says in Psalms: “Those who sow in tears, shall reap in joy.”

הַזֹּרְעִים בְּדִמְעָה בָּרֶנָּה יִקְצְרוּ

# *Executive Summary*

## Youth Bulge, Violent Crime, and Shortages in the Israeli Arab Marriage Market

**Alex Weinreb**

There is broad consensus in the literature regarding the positive correlation between, on the one hand, a large cohort of socially disengaged youth, as reflected in high rates of unemployment, underemployment, and non-participation in higher education and other institutions (e.g., the army, national service), and on the other hand, high rates of crime and other socially deviant behavior. This study examines this situation in Israeli society. The study points to a relationship between the youth bulge — as these large cohorts are sometimes called — and increasing rates of crime in Arab society, and also to how gender differences in educational attainment among young Arabs will modify gender relations and the structure of marriage and family in Arab society over the coming years.

Part of the motivation for conducting this study is to explain the sharp rise in the number of murders in the Arab sector. It has doubled since 2015, as murders in the Jewish sector have fallen. As a result, 80% of all murders in Israel between 2020 and 2021 were in the Arab sector, up from 40% in 2011.

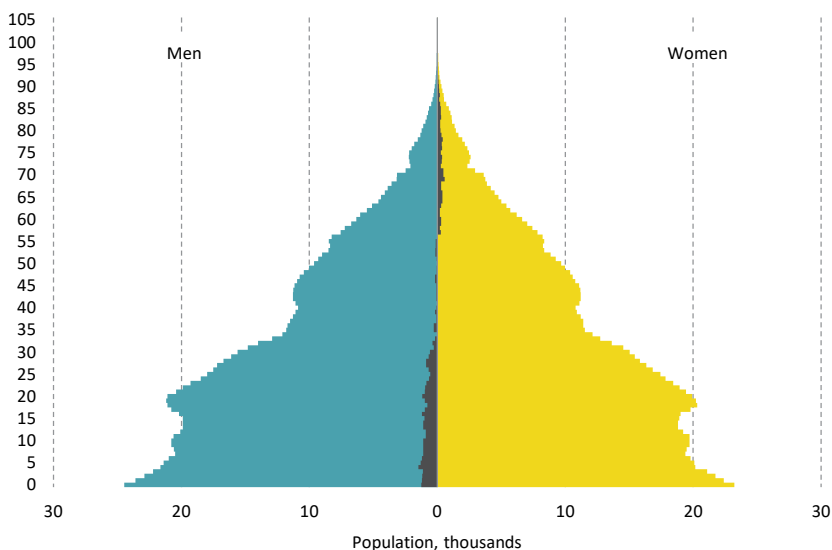
---

\* Prof. Alex Weinreb, Research Director, Taub Center for Social Policy Studies in Israel; Department of Sociology, University of Texas at Austin. This study was first published in December 2021.

## The youth bulge and the increase in the murder rate

The Arab population in Israel has a relatively young age profile. There are more individuals aged 0–10 than those aged 20–30 and many more individuals aged 20–30 than those aged 40–50. Nonetheless, a closer examination of the age profile shows a bulge between the late teens and the mid-20s. In fact, Arab men and women account for a higher percentage of 18–22 year olds than of any other age group: 29%, as compared to 8% in the 70+ age group, 23% in the under-5 age group, and 21% overall.

### Israeli Arab population by sex and single years of age, 2021



Note: Projections are based on CBS, 2019; Weinreb, 2020.

Source: Alex Weinreb, Taub Center

A look at the relationship between the rate of growth in the number of Arab men aged 18–22 and both the murder rate and self-reported feelings of a lack of security shows a positive and statistically significant correlation.

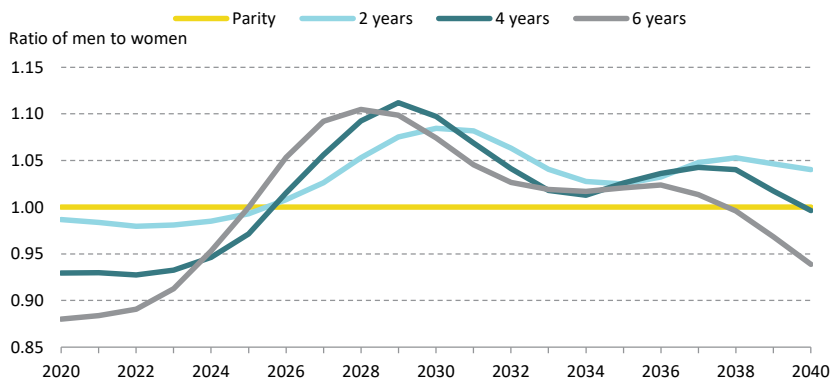
As the number of young Arab men reaching labor market age has grown, their employment rates have fallen: there was a 7 percentage point drop in the rate of employment among Arab men aged 15–24 and 25–34 during the two years prior to the Covid-19 pandemic, due the mismatch between their skills and the needs of the labor market. From the viewpoint of education and the chances of success in the labor market, the share of Arab men in their 30s with an academic degree has increased during the past 20 years and today stands at 18%. This is higher than the share among Haredi (ultra-Orthodox Jewish) men (11%), although it is still substantially lower than the share among non-Haredi Jewish men (47%) and is only about one-half of the rate among young Arab women (35%). The near future does not look much brighter in terms of education and labor market prospects given the low scores of young Arab men on the PISA test and the bagrut (matriculation) exams: they are significantly lower than those of Jews, and now also lower than those of Arab women.

The low average levels of education among young Arab men, together with their sheer numbers, is one of the factors driving the rise in crime in contemporary Arab society in Israel.

### Changing gender attitudes

Another factor which will likely contribute to the high rate of crime among young men in Arab society over the coming years involves the emerging trends in the Arab marriage market. The average age difference between a bride and groom in Israeli Arab society is six years. Since cohorts below age 18 are smaller than those aged 18–22, this means that starting from around 2026 the number of men at the normative age for marriage will be about 5–10% greater than the number of Arab women at the normative age for marriage. This ratio does not even take into account the phenomenon of polygyny in Arab society, found primarily among the Bedouin population, which itself reduces the number of women available for marriage to never-married men.

### Ratio of Arab men at median age of marriage (25–28) to Arab women, two, four, or six years younger than them



Source: Alex Weinreb, Taub Center | Data: Weinreb, 2020

At the same time, changes in education are increasingly favoring women in Arab society. On the assumption that the increase in levels of education will encourage Arab women to enter the labor market, it can be expected that they will become more independent financially and will have greater freedom in their choice of whether and when to marry and how to live their lives in general. The first signs of these changes can already be seen: in the rising age of marriage, the growing number of young Arab couples living in newly mixed-cities, such as Nof HaGalil, Carmiel, Arad, and Be'er Sheva, and even in the increasing rates of divorce. Between 2004 and 2019, the divorce rate per 1,000 population grew by more than 50% among Muslims and Druze and even more among Christians. Another outcome of change — though still marginal — can be seen in the number of Arab women, most of whom are educated Christians, who choose to marry non-Arab Israelis.

Overall, this combination of a demographic imbalance in the size of cohorts and the increasing educational advantage of women will contribute to growing rates of singlehood. A substantial number of young Arab men who want to marry will not be able to find a wife, which will likely further deepen levels of social disengagement.

During the next 10 to 15 years, the age groups reaching adulthood in the Arab population will be smaller — in absolute numbers — than the current group of young adults. During this time period, efforts should be made to improve educational achievements and skills, particularly among young Arab men, and to ensure their social and economic engagement, including through some type of post high-school framework such as national service. Similarly, a window of opportunity will exist for political leaders — and, first and foremost, local leaders in the Arab communities — in which to prepare young men for a less patriarchal society, in which an increasing share of women are educated, participate in the labor market, and are more independent than previous generations.





THE TAUB CENTER WAS ESTABLISHED IN 1982 UNDER THE LEADERSHIP AND VISION OF HERBERT M. SINGER, HENRY TAUB, AND THE AMERICAN JEWISH JOINT DISTRIBUTION COMMITTEE. THE CENTER IS FUNDED BY A PERMANENT ENDOWMENT CREATED BY THE HENRY AND MARILYN TAUB FOUNDATION, THE HERBERT M. AND NELL SINGER FOUNDATION, JANE AND JOHN COLMAN, THE KOLKER-SAXON-HALLOCK FAMILY FOUNDATION, THE MILTON A. AND ROSLYN Z. WOLF FAMILY FOUNDATION, AND THE AMERICAN JEWISH JOINT DISTRIBUTION COMMITTEE.