

A PICTURE OF THE NATION

Israel's Society and Economy in Figures **2020**

Avi Weiss

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Taub Center for Social Policy Studies in Israel

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The research upon which most of the figures and analyses in this booklet are based can be found in the *State of the Nation Report 2019* and other Taub Center publications

Taub Center for Social Policy Studies in Israel

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Table of Contents

Foreword	9
Abbreviations	11
Health: In the Shadow of the Coronavirus	13
Part 1: Coronavirus: Some Numbers	15
Low mortality rates from coronavirus in Israel relative to other developed countries / 16	
Relatively young population and low confirmed infection rates for elderly have worked in Israel's favor / 18	
Low confirmed infection rates in Arab Israeli towns and high confirmed infection rates in Haredi towns / 20	
Mortality rates from the coronavirus are more evenly distributed between the genders in Israel / 22	
Part 2: The Health System	23
A basic lack of acute care hospital beds poses a serious challenge to the ability to adequately treat coronavirus patients / 24	
Waiting times in emergency rooms growing disproportionately / 26	
State incentives lead to overcrowding in emergency rooms and hospital wards / 28	
Relatively good health of Israelis plays in their favor / 30	

High loss of function from pain and diabetes / 32

Function loss from many illnesses has fallen, but has increased from those ailments affecting older populations / 34

More voluntary health insurance by stronger socioeconomic population groups leads to less equality / 36

Healthcare prices in Israel are the fifth highest in the OECD – higher than in the US / 38

The Economy and Standard of Living

39

A decade of declining growth in GDP and GDP per capita / 41

Productivity in Israel still lags behind that in other developed countries / 42

Capital investments are contributing little to productivity growth in Israel / 43

Private and public capital investments are low relative to those in other developed countries / 44

Half a decade of steady consumer prices closed a gap that opened in the mid-2000s / 46

Increased competition from abroad – decreases in foreign prices quickly translate into falling prices in Israel / 47

An unusual pattern of income growth – the weaker populations have benefited the most / 48

An atypical decade of decreasing income inequality / 50

The growing deficit – reason for concern / 51

Value of limiting coronavirus mortality – almost a quarter of annual GDP / 52

Spotlight: Population Projections

55

Fertility reductions for Arab Israeli women of all ages and among young Jewish women / 56

Significantly different distribution for Jewish and Arab Israeli women of childbearing age and below / 58

Age structures of the population are vastly different for Jews and Arab Israelis / 60

Israel's population is expected to grow from 9 million today to 12.8 million in 2040 / 62

Substantial growth in 70+ population — more for Arab Israelis than for Jews / 63

Ratio of Jewish to Arab Israeli births will fall for a decade and then reverse for the following decade / 64

Substantial increase in working-age individuals / 65

Large increase in projected number of students in higher education / 66

Social Welfare

69

Increasing emphasis on social investment / 71

Social expenditure is increasing in real terms, but as a percentage of GDP is still relatively low / 72

The relative poverty rate in disposable income remains high / 74

Saving for Every Child — social investment with unintended consequences / 76

The Families First program — a look at the Ministry of Labor, Social Affairs and Social Services' flagship program / 78

Demographic distribution among Families First program participants / 79

A significant increase in wages from the Families First program / 80

The use of the financial assistance from Families First program differs across sectors / 81

Labor Markets

83

A steady rise in real wages in recent years / 85

Employment rates and weekly work hours for Israel's sectors and genders / 86

Massive differences in family employment structure across sectors / 88

A Haredi couple works less than one full-time job, while a non-Haredi Jewish couple works almost two jobs / 89

Israeli women tend to continue working after having children, but work fewer hours / 90

Spotlight: Highly Skilled Workers in Israel

91

For high-skilled workers, skill level of non-Haredi Jews are similar to the OECD average; below average for Arab Israelis / 92

Highly skilled Israelis are more likely to be employed in professions that utilize their skills / 93

The "quality" of employment for highly skilled workers in Israel is higher than in other countries / 94

An increase in skills for highly skilled individuals increases wages more than in other countries / 96

Wage gaps relative to the OECD decrease as skill levels increase / 98

The skill level of workers in the lower half of the skill distribution in Israel is below those in most OECD countries / 99

Low-skilled workers in Israel are highly educated / 100

Spotlight: The Future Labor Market

103

The portion of workers at high risk of losing their jobs to automation in Israel is similar to the OECD average / 104

Younger workers and Arab Israeli men have a higher risk of losing jobs to automation / 105

Construction, manufacturing, and transportation jobs are the most likely to be lost to automation / 106

Employment in jobs that require higher education are more secure / 108

Low-risk workers are far more likely to use computers at work / 109

The cost of government subsidized training programs is the main reason that high-risk individuals do not participate / 110

Education

111

An expanding education system / 113

Israel's four education systems: projections vs. reality / 114

More per student expenditure in high schools and an increased gap between Hebrew and Arab schools / 116

Closing the education budgetary gap with the OECD / 117

Large gaps in wage per frontal instruction hour relative to the OECD remain, especially for newer teachers / 118

Increase in the number of per student hours in primary school classrooms / 119

Sharp fall in PISA 2018 scores among Arab Israelis / 120

Falling high school dropout rates; lower for girls and in the Hebrew education system / 122

When controlling for Nurture Index, Arab high schools are more successful at keeping their students in school / 123

Children from birth to age 2 living in families in poverty perform more poorly on future achievement exams / 124



Foreword



It is once again my pleasure to present *A Picture of the Nation 2020*, generously supported by the Koret Foundation.

This year's book is being published in the shadow of COVID-19 (hereinafter, coronavirus) that has affected us all. While we do not yet know the full extent of what we are facing, we do know that the implications will be quite substantial, that they will involve basically all parts of our lives, and that it will take time, possibly a long time, for what was lost to be regained. As a result, this book will have a different feel to it than those of years past. While the book, once again, brings mostly analyses that stemmed from the research carried out by the Taub Center's researchers in the past year, we would be remiss were we not to discuss the effects, those already felt and those that are expected, of coronavirus on the socioeconomic situation in Israel. Thus, the texts will tend to be longer than in previous books, including descriptions of what was (generally presented in the graphs) and what will be.

We naturally begin the presentation with the health situation in Israel, including some initial information on the fight against coronavirus in Israel. We present key information in each of our four other policy areas — macroeconomics, social welfare, labor markets, and education. In addition, we have included three spotlights. In the first, we present a careful study of population size in Israel over the next twenty years, breaking this down by sector. We then consider high-skilled workers in Israel and show why they are so successful when compared with high-skilled workers elsewhere. Finally, we take a fresh look at the future labor market and consider the skill sets required to succeed in this developing reality.

I would like to once again thank the Koret Foundation for helping make this publication possible and freely available to anyone interested in the Israeli economy and society. I pray that the coming months will see us all relieved from the current limitations, and that society will be able to return to its pre-coronavirus state and continue to grow from there.

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Abbreviations

ASFR	Age-specific fertility rates
BOI	Bank of Israel
CBS	Central Bureau of Statistics
CPI	Consumer Price Index
DALYs	Disability-Adjusted Life Years
EU	European Union
GDP	Gross domestic product
ICT	Information and communications technology
IHME	Institute for Health Metrics and Evaluation
IMF	International Monetary Fund
LIS	Luxembourg Income Study
Meitzav	Hebrew acronym for Measurement of School Growth and Efficiency – nationwide exams in schools in Israel
NII	National Insurance Institute
NIS	New Israeli Shekel, represented by the symbol ₪
OECD	Organisation for Economic Co-operation and Development, 36 member countries including Israel
PIAAC	Programme for the International Assessment of Adult Competencies, Survey of Adult Skills
PISA	Programme for International Student Assessment – worldwide exams of the OECD
PPP	Purchasing power parity

RAMA

Israel's National Authority for Measurement and Evaluation in Education

TFP

Total factor productivity

UI

Unemployment Insurance paid by the National Insurance Institute



Health

In the Shadow of the Coronavirus

The struggle to contain the spread of coronavirus and its potential dire consequences affects all aspects of current day life. Health and healthcare are naturally center stage to any discussion and pertinent policy debate. This struggle reveals weaknesses and strengths of the Israeli healthcare system at this time of extreme strain. Consequently, the grim situation actually has a silver lining: it helps pinpoint the areas in which improvements are needed and attainable for ordinary situations as well as for emergencies.

The Israeli healthcare system enters the war against coronavirus under favorable demographic and public health circumstances. At the same time, the system itself is underinvested, underfunded and overstretched, even with the favorable circumstances considered. In addition, the system suffers from several structural weaknesses that aggravate the situation: these concern the private-public mix, the conflict of interests that arises from the state's multiple roles in the system, and the non-regional allocation system (see the Health Section in *A Picture of the Nation 2019*). However, some of the fundamentals in the State of Israel and Israeli society mitigate the situation and provide a sound base for fighting the virus in the present and, partially based on this war, reforming the system for the future.

Prudent policy requires us to look beyond just the virus, even when limiting ourselves to discussing the health implications alone. Part of the challenge is to minimize collateral mortality that is likely to follow from the reluctance to seek treatment for elective cases, the isolation of the sick and frail, and the diversion of medical resources of an already overstretched system from “regular” cases to coronavirus cases. The result of such collateral mortality may be considerable with the system “trading” mortality in a suboptimal fashion.

The presentation below is divided into two parts. In the first, we will present some statistical information regarding coronavirus in Israel, thereby laying the groundwork for understanding what Israel has faced and can be expected to face going forward given the information currently available. The second part returns to our more standard type of analysis, describing the health and healthcare situation in Israel, while at the same time considering how these will be affected by and will affect the pandemic.



Part 1

Coronavirus: Some Numbers

Coronavirus is the most economically disruptive global event to have taken place since WWII. Although we do not yet have enough historical distance (or enough good data) to evaluate its full impact on Israeli society and its economy, there are some early indications that Israel's experience of this pandemic, and pathway through it, is somewhat different from those of most of its developed country peers.

While the full effects of coronavirus on mortality are still quite speculative, estimates are essential for a prudent policy debate. As of the date of this book going to press (May 17, 2020) there are 16,608 confirmed cases in Israel, of which 12,855 have recovered and 268 deceased. Compared with other developed countries, Israel has a relatively young population — only 12% are aged 65 and older — and as will be shown in the next section, the population is relatively healthy, mitigating the mortality risk of the virus. All told, therefore, it seems that the comparative burden is lighter in Israel than in other countries because of Israel's demography and public health situation.

In this short statistical overview, we will focus on some basic comparisons between Israel and some other developed countries in this worldwide epidemic, and present confirmed infection breakdowns within Israel by gender, age, and sector.

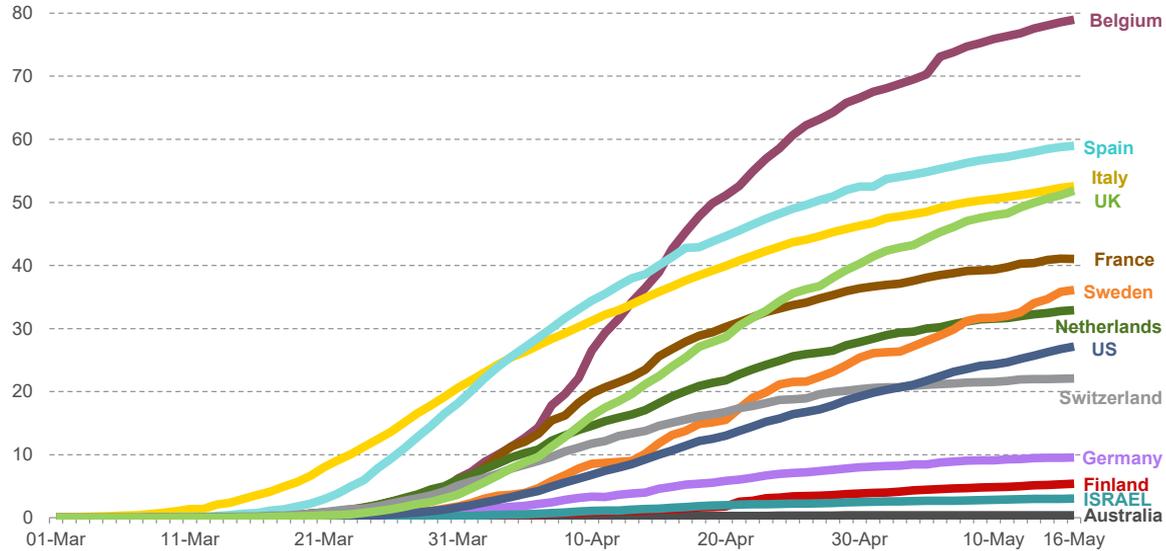
Low mortality rates from coronavirus in Israel relative to other developed countries

Relative to most of its developed country peers, per capita mortality from coronavirus in Israel has been very low. As of May 16, by which time the daily number of deaths was low, as was the number of new cases, Israel's mortality is below that of much-lauded Finland, and stood at 2.9 deaths per 100,000. This was about 1/20th of the level in Belgium and Spain, less than 1/10th of the level in France, the UK, Italy, and the Netherlands, less than 1/5th of the level in the US and Switzerland, and less than half the level in Germany, Canada, and Denmark. Moreover, many of these differences

were growing as Israel's "flattening of the infection curve" occurred at much lower mortality levels. In fact, the only developed countries doing better than Israel were Australia and New Zealand, a handful of smaller European countries mainly in the center and east of the continent, and a number of countries in East Asia. But even here, the differences between Israel and these countries were very small, averaging less than 2 deaths difference per 100,000.

Deaths from coronavirus, March-May, 2020

Number of deaths per 100,000



Source: Alex Weinreb, Taub Center | Data: CSSE, Johns Hopkins University; OECD database

Relatively young population and low confirmed infection rates for elderly have worked in Israel's favor

Coronavirus threatens the elderly much more than the young, and in this way, Israel has been very fortunate: Israel has a much younger population than almost all OECD countries; and the age gradient of confirmed infections in Israel is disproportionately young.

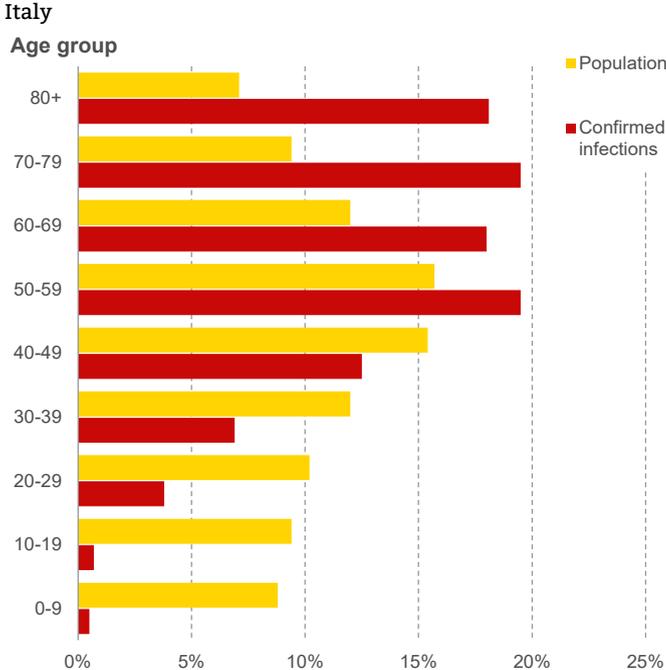
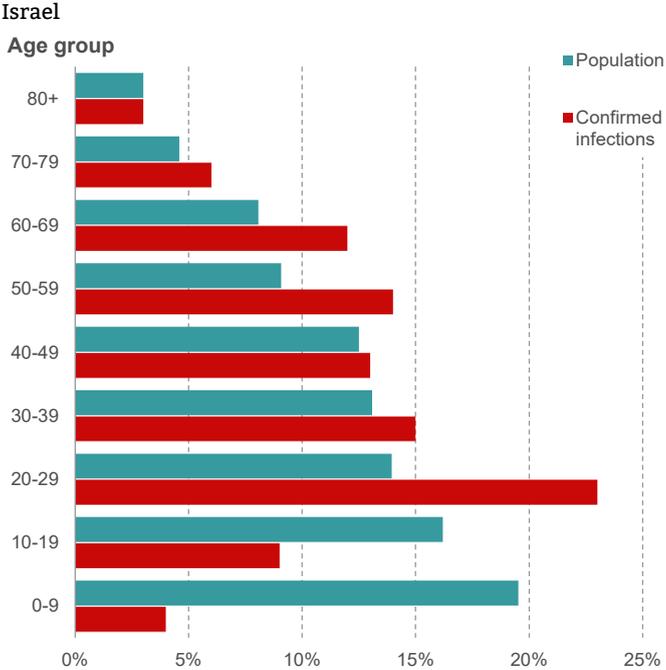
Both these factors come into play when we compare Israel to Italy, for example. With respect to the age distribution (2020 estimates), Israel has a standard pyramid shape. Only 25% of Israel's population is aged 50 years or older, and 35% are under age 20. Italy's distribution is more pear-shaped. Some 44% of the Italian population is at least 50 years of age, and only 18% is below age 20.

If coronavirus confirmed infection rates were to follow the age structure proportionately, Israel would already have an advantage over Italy in terms of likely mortality from coronavirus. Yet that advantage is magnified by the

age profile of confirmed infections in the two countries. It disproportionately targets the young in Israel and the elderly in Italy. In Israel, for example, 36% of confirmed infections are in people under 30, as opposed to a mere 5% of confirmed infections in Italy. This is at least partly the result of the disproportionately high confirmed infection rates in the Haredi population (as shown on the next page) and the remarkably young population among Haredim. Likewise, whereas 21% of coronavirus confirmed infections in Israel are in people over 60, that is the case for 56% of confirmed infections in Italy — almost double the share of the 60+ age group in the Italian population.

These two age structure differences constitute one of the main reasons for Israel's relatively low mortality from coronavirus.

Population and coronavirus distribution, by age



Source: Alex Weinreb, Taub Center | Data: Israel, Ministry of Health; Italy, Istituto Superiore Di Sanità (ISS)

Low confirmed infection rates in Arab Israeli towns and high confirmed infection rates in Haredi towns

Because epidemics move from person to person, they are often associated with “hotspots,” that is, particular groups or areas with high prevalence. Over time, these can shift as people moving from one place to another — “bridgers” in network parlance — carry the virus from a hotspot to virgin territory, where it then spreads anew. One of epidemiologists’ first tasks when confronting a new epidemic is to identify these areas or populations in order to direct focused intervention intended to freeze the spread.

It is not surprising that Israel, with its diverse and highly segregated population, should be experiencing hotspots. To look at how much this is occurring, we categorized all towns and cities based on the dominant local population — including some mixed categories where there were at least two large groups. We then merged this with the Ministry of Health’s data on confirmed infections in those areas.

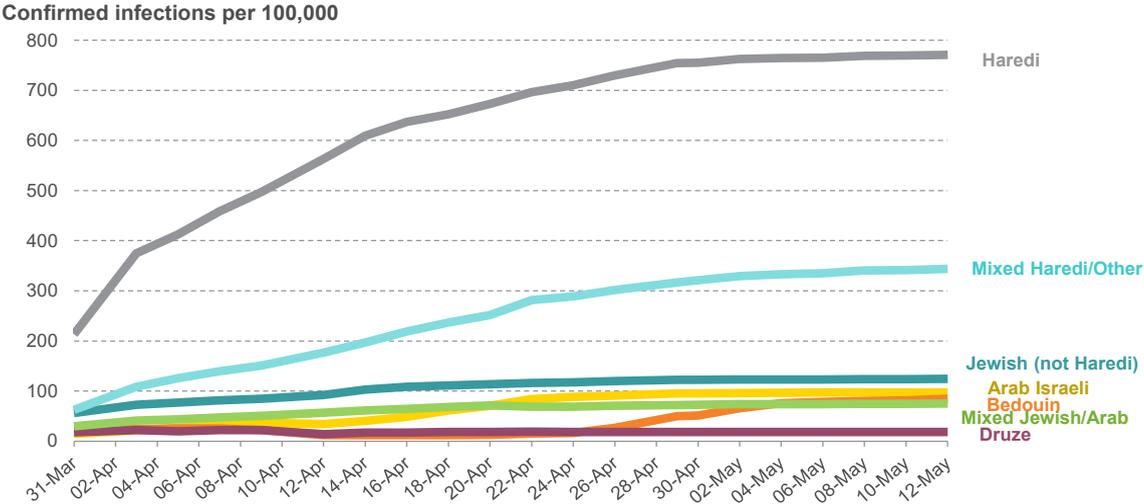
The graph confirms that over the month of April, confirmed infections were higher in Jewish than non-Jewish areas. Note that with only a couple of exceptions, this did not change dramatically as testing efforts in the Arab and Bedouin sectors grew over the middle of the month. Thus, even though the number of confirmed infections rose in

the Arab sector from the middle of the month, and in the Bedouin sector from late April into May, those numbers remained around half of the national average, and well below the average for the non-Haredi Jewish population.

More important, the graph also shows that within the Jewish sector, there were massive differences between wholly Haredi towns (Bnei Brak, El’ad, Modi’in Illit, Beitar Illit, Kiryat Ye’arim, Kfar Habad, Kochav Ya’akov, and Rechasim), mixed Haredi/non-Haredi towns (Jerusalem, Bet Shemesh, Safed), and other places. By May 12, 22% of all confirmed infections in Israel (in towns with 5,000+ residents) were located in Haredi towns — which housed only 5% of the population — and a further 26% were in the three mixed cities with large Haredi populations — almost double the 14% of the national population resident in those areas. In part, these differences reflected the fact that infection rates increased much faster in Haredi areas across this period: 23% of the increase in the national confirmed infection rate from March 31 to May 12 occurred among the 5% in Haredi towns, and another 32% among the 14% of the population that lives in the three mixed cities. Other Jewish cities and towns contributed around 34% to the growth —

though they represent roughly 60% of the population. Growth in Arab Israeli towns accounted for less than 8% of the increase, and in Bedouin towns for about 1% of the increase. Equally notable, virtually none of the increase in the national rate could be ascribed to Druze areas, where infection rates remained around 18 per 100,000, roughly 1/10th of the national average. This is a remarkable accomplishment.

Confirmed infections by town’s dominant population sector



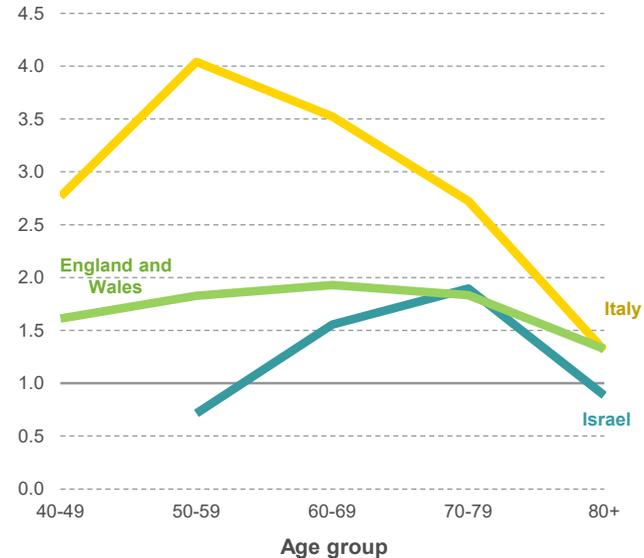
Source: Alex Weinreb, Taub Center |
Data: Ministry of Health

Mortality rates from the coronavirus are more evenly distributed between the genders in Israel

Men are at higher risk for coronavirus mortality. In fact, even though there are many more women in the 70+ age categories that is most susceptible to death from coronavirus, 61% of deaths in England and Wales have been men, and 65% in Italy. Wherever such data are available, they point to similar patterns.

Mortality patterns by gender have been a little different in Israel. Here, as of May 4, the 237 deaths were more evenly divided between men and women: 124 men:113 women. The data point to distinct age patterns in the sex ratio of coronavirus death in these countries. All had strong excess male mortality in the 70-79 age group — of the 43 Israelis who had died in this age group, there were almost twice as many men as women. But the ratio in Israel then flipped among the 107 deaths above age 80: 9 women for every 8 men. And below age 60, there was an even more pronounced female disadvantage, albeit with very few deaths for either men or women. In Italy and England and Wales, in contrast, women retained their lower mortality advantage at all ages.

Ratio of male to female deaths from coronavirus



Source: Alex Weinreb, Taub Center | Data: Israel, Ministry of Health; Italy, Istituto Superiore Di Sanità (ISS); England and Wales, Office of National Statistics (ONS)



Part 2

The Health System

In this section we review the situation in the health system in Israel pre-coronavirus, and discuss the implications for Israel in the new reality.

From a resource perspective, Israel entered this pandemic in a relatively precarious position. In 2018, national expenditure on healthcare was about 7.45% of GDP — lower than the OECD average (8.9%) and lower still than the average of 11% in “similar countries” to Israel (countries with universal coverage overseen by health funds/plans: Belgium, France, Germany, the Netherlands, and Switzerland). Even after adjusting for Israel’s relatively young population, Israel’s share was still low at about 8.4%. In monetary terms, average health expenditure per capita (age-adjusted) in the similar countries was \$5,700, versus \$3,300 in Israel. This suggests that the risk of significant collateral damage from the pandemic, resulting from reallocation of resources to deal with it, could be considerable.

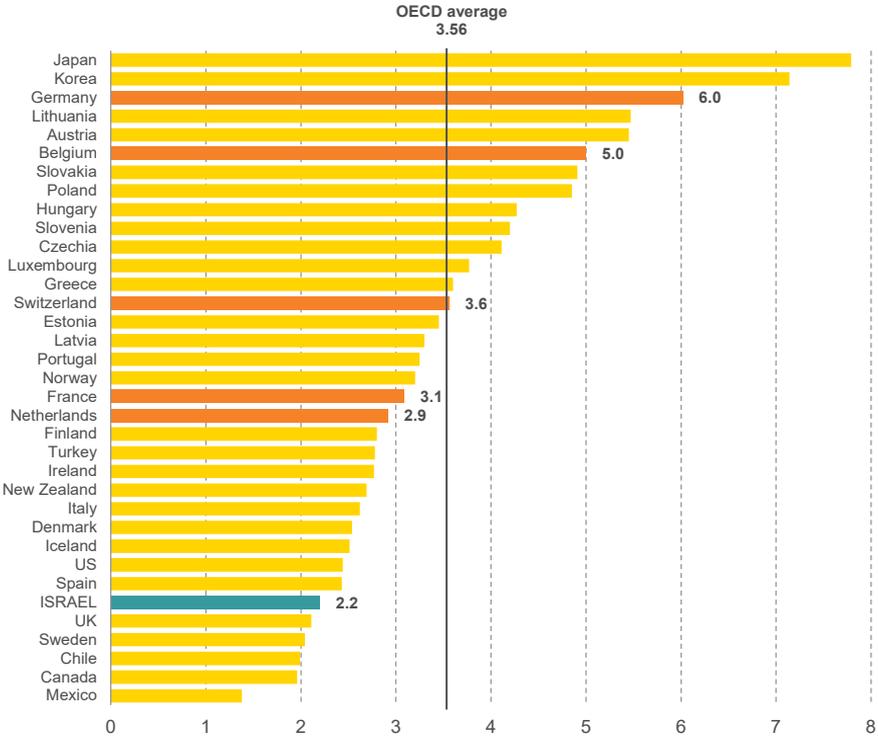
Turning to acute care hospitals, which are on the front line of the battle, the number of hospital beds, the number of nurses and the availability of necessary facilities and equipment required to battle the coronavirus pandemic seemed to be sorely inadequate at the outset. However, steps were taken to overcome the shortcomings and at this stage they seem to have been successful. It remains to be seen whether we will be able to develop the resources necessary to deal with potential future waves of this virus or other healthcare emergencies.

A basic lack of acute care hospital beds poses a serious challenge to the ability to adequately treat coronavirus patients

The acute care hospital system is at the forefront of the war against the virus and it is entering the war against coronavirus underinvested, overstretched and underfunded. There are about 2.2 acute care hospital beds per 1,000 population in Israel as compared to 3.6 in the OECD countries and 4.1 in the similar countries. Even if Israel's younger age distribution is taken into account, the adjusted number of beds is still only approximately 2.5 per 1,000. The bed occupancy rate in the acute care hospital departments stood at 94% , while the average for the OECD and the countries similar to Israel stood at only 75% (see page 83 in *A Picture of the Nation 2019*). The average hospital length of stay in Israel is short relative to both the OECD countries and the similar countries: 5.2 days per patient versus 6.7 and 6.2, respectively. In other words, the bed turnover rate in Israel, which takes into account both the average hospital stay and the bed occupancy rate stood in 2016 at about 66 versus an average of about 41 in the OECD countries and an average of about 44 in the similar countries.

This means that Israel's acute care hospitals already worked at full capacity before the pandemic, with little or no slack for emergencies, including the option to discharge admitted patients without risking their health since they have not been in the hospital for enough time for full recovery. Under the best scenarios, this system will have to admit increasing numbers of coronavirus patients. Thankfully, the original doomsday predictions suggesting the need for 40,000 beds – as opposed to the barely 16,000 available – seem no longer relevant. At the time of writing this report Israel is doing relatively well with regard to the virus (see page 17 for an international comparison). This relative success is partially attributed to “flattening the curve” by social distancing, and to assigning noncritical cases to secondary facilities like re-purposed hotels. These steps freed up critical care beds in hospitals thereby avoiding overwhelming the system. In view of the picture painted above, these were critical measures.

Number of acute care hospital beds per 1,000 population, 2017



Note: Data are current to 2017 except for the US where the data are from 2016. For the following countries 2018 data are used: Belgium, Canada, Denmark, Iceland, Israel, Luxembourg, and New Zealand. Countries in orange are those with a similar healthcare system to Israel: Belgium, France, Germany, the Netherlands, and Switzerland.
 Source: Dov Chernichovsky and Roi Kfir, Taub Center | Data: OECD.Stat

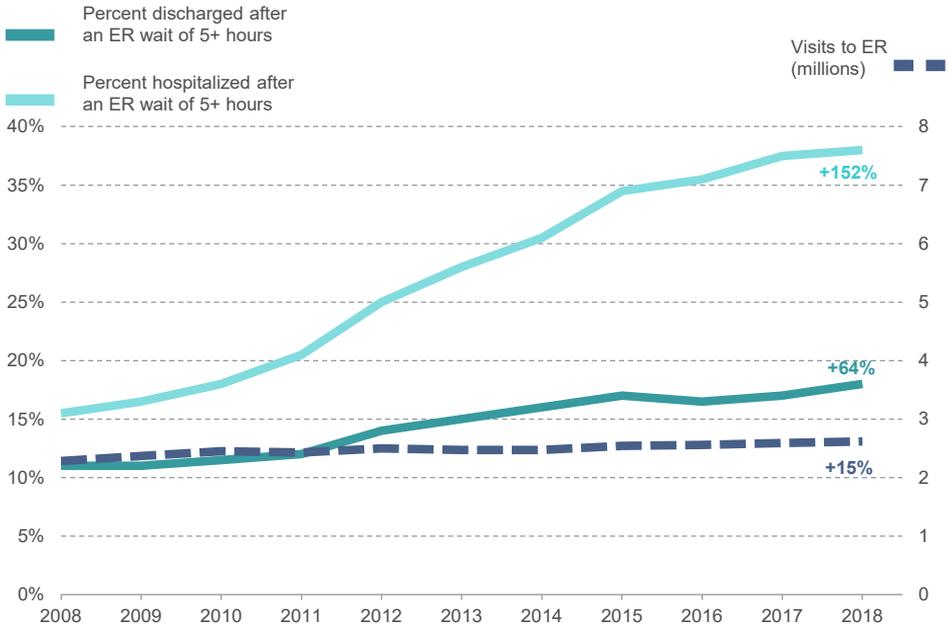
Waiting times in emergency rooms growing disproportionately

The emergency room is the patient's portal when moving from the community to the inpatient hospital department. Waiting times in the emergency rooms result from the inflow from the community and the outflow to the hospital departments. Entry into an emergency room that is not accompanied by a timely exit creates a bottleneck and public frustration from the system at a particularly sensitive point in terms of medical care with resulting emotional pressures for the patients and their families.

There is a high rate of emergency room visits in Israel. Based on the latest available data for the OECD (from 2011 to 2012), the number of visits to emergency rooms per capita in Israel (35.9 per 100 population) is higher than the average in the OECD countries (31.0), and almost twice that in countries with similar health funds (17.7).

The situation is worsening. The number of emergency room visits in Israel increased by 15% between 2008 and 2017 (a 5% drop per capita given the population growth rate). During the same period, the percentage of those released to their home who had to wait at least 5 hours in the emergency room increased by 64%, and the percentage of those admitted to the hospital who spent at least 5 hours in the emergency room increased by 152%. The data indicate three worrisome phenomena: an increase in the severity of cases arriving in the emergency room, a decline in the emergency room's ability to respond, and a decrease in the ability of the hospital departments to receive patients. The last two phenomena are caused by the particularly high bed turnover rate in Israeli acute care hospitals that prevents a smooth transfer of patients from the emergency room to the departments, especially internal care departments, due to the shortage of available beds shown on the previous page and the relatively acute state of those hospitalized due to the short average stays.

Emergency room visits and the number of waits of 5 hours or more out of those who were then discharged or admitted as inpatients



Note: Data do not include women admitted to the maternity ward.
 Source: Dov Chernichovsky and Roi Kfir, Taub Center | Data: Ministry of Health, 2019

State incentives lead to overcrowding in emergency rooms and hospital wards

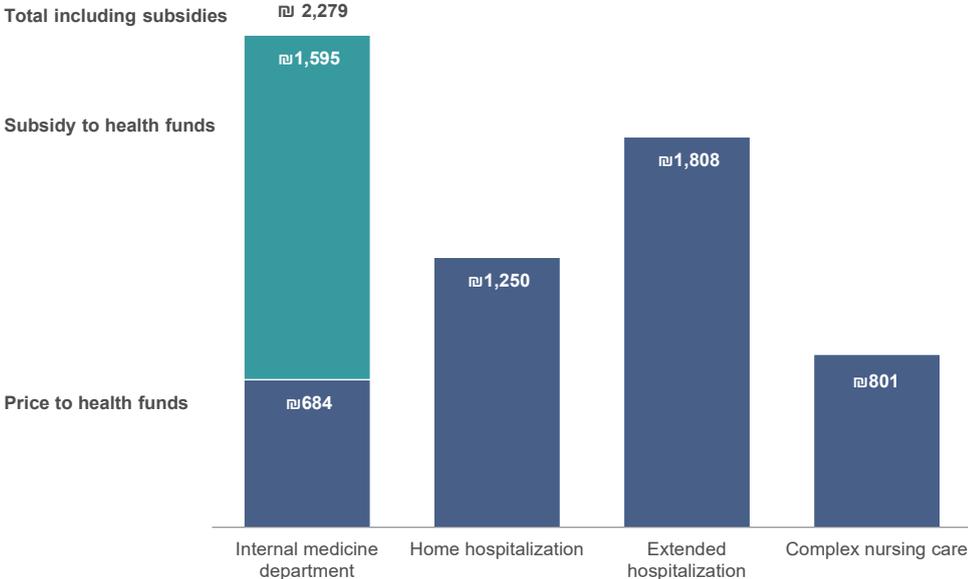
The rather grim state of affairs presented on the previous page follows from a perverse hospitalization incentive system that adversely affects acute care hospital operations as well as care in the community, including nursing homes.

In general, the cost of an inpatient acute care hospital day is higher than the cost of the viable alternative in the community. As a rule, when there is an alternative treatment outside the general hospital, including long-term care institutions, it is usually preferable both medically and financially due to less exposure to infections, lower disconnect from the natural environment, and freeing hospital infrastructure for the treatment of relatively more acute patients.

However, based on the state-determined pricing mechanism (known as the CAP), the price paid for a hospitalization day in the acute care hospital by the health funds (the marginal

price) is between 20% and 40% of the cost, and is lower than the cost of the community alternatives, including home hospitalization. As a result, the health funds, charged with procuring care for their members, choose to hospitalize rather than develop services and treat patients inside their communities. Notably, long-term care institutions refer seniors to hospitalization rather than treating them at the institutions themselves. This has become a dire situation with regard to the high-risk aged population in long-term care institutions that are ill-equipped to deal with relatively minor acute care health situations of their residents. This incentive system overloads emergency rooms and internal care wards in Israel, making response to unexpected emergencies even more difficult to address adequately. At the same time, it contributes to a weakened community care system.

The cost of a hospital day after the state's intervention



Source: Dov Chernichovsky and Roi Kfir, Taub Center | Data: Ministry of Health

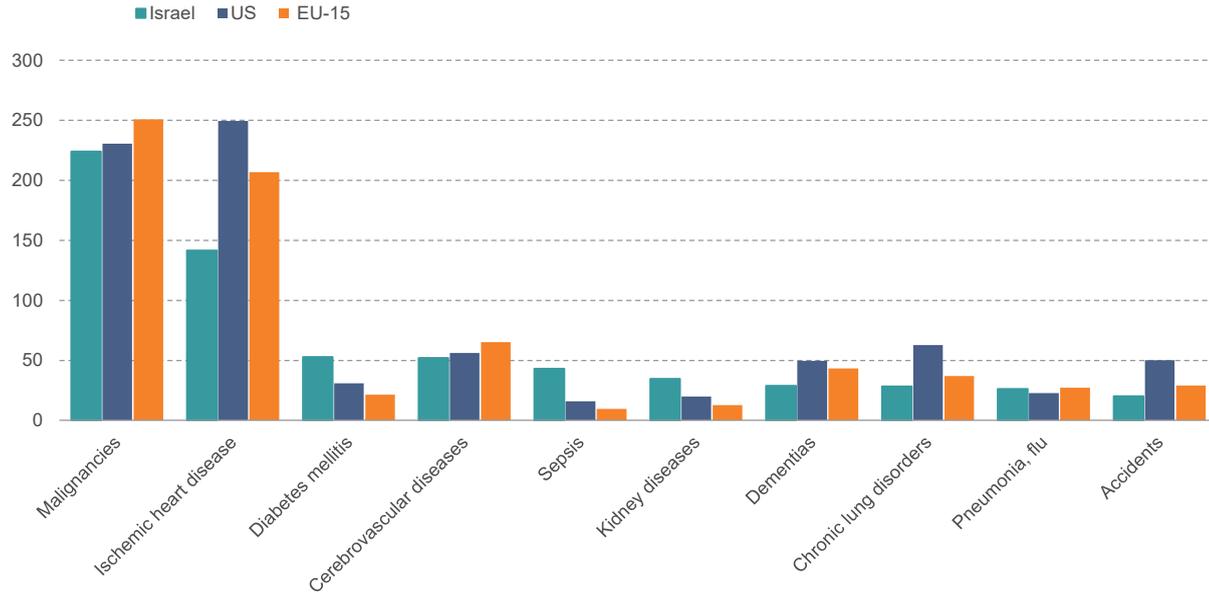
Relatively good health of Israelis plays in their favor

Aside from Israel's young age structure, there are additional factors that are likely to mitigate the cost, in mortality and economic terms, from coronavirus. Relative to the US and the 15 EU countries for which data are available, Israel has low rates of age-adjusted mortality from the two main causes of death — malignancies and cardiovascular disease — that increase the likelihood of death from the virus. This, together with a low rate of infant mortality, which fell from 3.86 in per 1,000 births 2010 to 2.85 in 2020, explains the high life expectancy at birth (83.0 in 2020).

In contrast, the soft underbelly of fighting the virus in Israel is with respect to mortality rates from diabetes, sepsis, and kidney disease. The two highest ranking causes of mortality in Israel are cancer and cardiovascular disease as in Europe and the US; cerebrovascular diseases also rank similarly in Israel (4th), the US (4th), and the EU (3rd). Diabetes, in contrast, is ranked as the 3rd leading cause of death in Israel, with a similar mortality rate as cerebrovascular diseases, while in the US it is ranked in 8th place and in the EU countries in 9th. Overall, Israel is in a good position from a health perspective. This perception is strengthened if we look at the quality of life, as on the next pages.

Leading causes of death, 2015

Rates per 100,000 persons



Source: Dov Chernichovsky, Taub Center | Data: Haklai, Goldberger, and Aburba, 2019

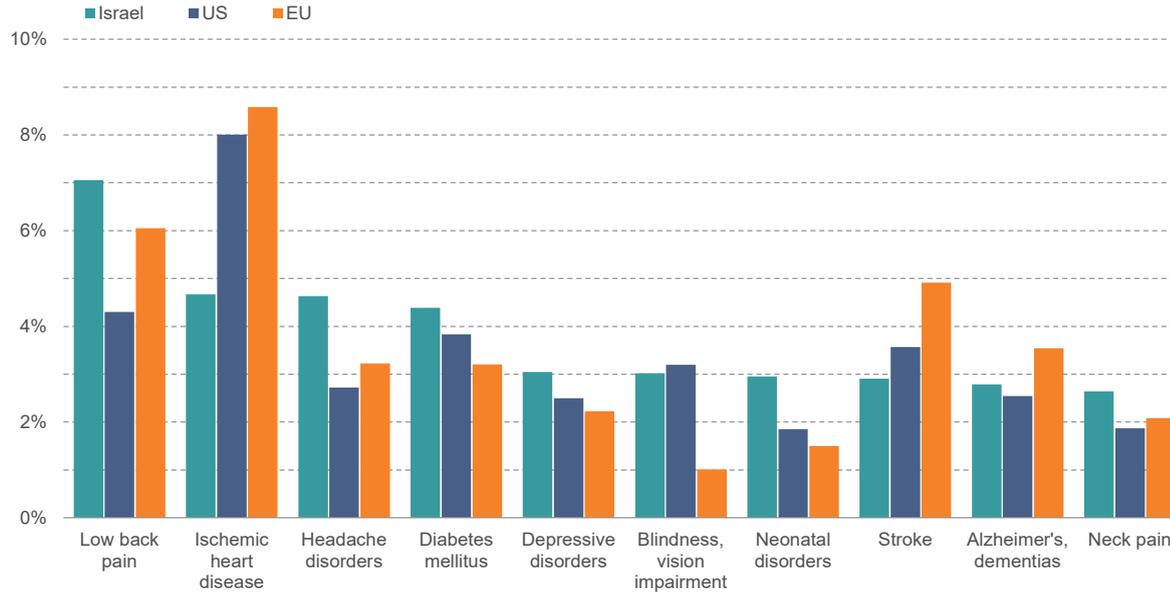
High loss of function from pain and diabetes

Mortality is not the sole measure of health. While traditional indices for examining health levels are based on mortality rates by age group and on life-expectancy based on those rates, they do not always testify to the quality of life or the ability to function. Since the 1990s, indices have been developed that try to evaluate a year of life based on its “quality.” One of these is Disability-Adjusted Life Years (DALYs), which denotes the cumulative numbers of years lost due to premature death and ill health due to disability. The burden of illness is defined as the gap between the current health status of the population and the situation in which the population is living to its full potential. Using this measure, Israel’s situation is good relative to the US and EU with respect to ischemic heart disease, strokes, and even Alzheimer’s and dementia. However, from the perspective of loss of function related to pain, neonatal disorders, depressive disorders, and diabetes, Israel is at a relative disadvantage.

Israel’s comparatively favorable combined demographic and health position works in its favor in its battle against coronavirus also from a DALYs standpoint. It is important to note, however, that this perspective highlights a concern about the Israel’s relatively inferior position with regard to depressive disorders in the scenario in which the epidemic requires a long period of social distancing. As discussed in the coming pages (pages 39-41, 48, 51, 83-84, and 103), a prolonged battle could have serious labor market and macroeconomic consequences, and a sizable loss of income and incipient poverty is likely to heighten depression and its consequences, possibly including suicides.

Leading determinants of loss of function (DALYs), 2017

As a percent of all causes of loss of function



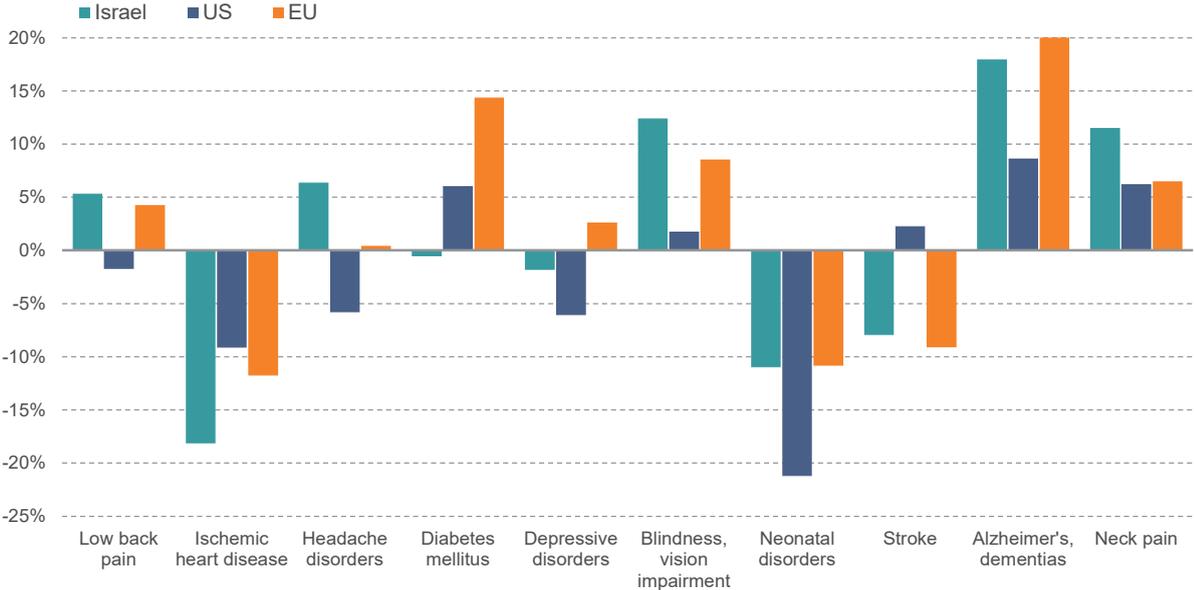
Note: Share of DALYs for a particular cause relative to DALYs for all causes.

Source: Dov Chernichovsky, Taub Center | Data: IHME, 2018

Function loss from many illnesses has fallen, but has increased from those ailments affecting older populations

On a per capita basis, the level of Disability-Adjusted Life Years (DALYs) fell between 2007 and 2017 for some of the main causes of DALYs. This is particularly true for heart diseases, for which the DALYs fell by about 18%, neonatal disorders (12%), and strokes (7%). Even the loss of function from diabetes has fallen slightly. The largest increases have been in Alzheimer's disease (17%) due to the aging of the population, and in pain related loss of DALYs. It is clear that the effects of aging have important policy implications for the future. Compared to the US and the EU, Israel gained ground during this decade in ischemic heart disease and diabetes, but lost ground to one or both in the other top ten DALY illnesses.

Changes in the leading causes of loss of function (DALYs) per capita, 2007-2017



Source: Dov Chernichovsky, Taub Center | Data: IHME, 2018

More voluntary health insurance by stronger socioeconomic population groups leads to less equality

By law, the state must guarantee that every citizen can receive any required medical treatment covered in the health basket in a hospital that is publicly funded. To date, all coronavirus patients have been treated through the public system, and this will continue to be the case. However, due to the burden created by the virus, the ability of the public health system to deal with everyday medical treatments and elective procedures is limited, and so it will likely remain in the near future. Hence, populations that depend exclusively on the public system for such services, in other words those who do not own private insurance, and especially commercial insurance, are likely to be harmed.

Between 2010 and 2018, the total share of private health expenditures has decreased, but the composition has changed towards more voluntary insurance – commercial and supplemental – and less out-of-pocket expenditures. About 75% of the increase in insurance expenditures has been on commercial insurance. The increased share of public health expenditure together with the increase in the share of supplemental insurance could be expected to contribute to greater equality in the system as sought in Israeli National Health Insurance Law. This follows

because the supplemental insurance, held by about 80% of the population, has a cross-subsidy element and does not require underwriting. However, the upward trend in the share of commercial insurance works strongly in the opposite direction. The socioeconomic profile of the insured population supports this assertion; as seen in the figure on the right, commercial insurance is more sensitive to income than supplementary insurance. The share of those insured through supplementary insurance is higher than the share of those insured through commercial insurance and the variance in the share of those with supplementary insurance by income group is lower than that for commercial insurance and for those with both types of insurance. Thus, those who are financially well-off tend to have a greater ability to choose their physician, face shorter waiting times, and receive coverage for the costs of medicines not included in the public healthcare basket. In other words, the health status of those with voluntary insurance, and commercial insurance in particular, is potentially superior – both in theory and in practice – to that of individuals without voluntary insurance, and in particular without commercial insurance.

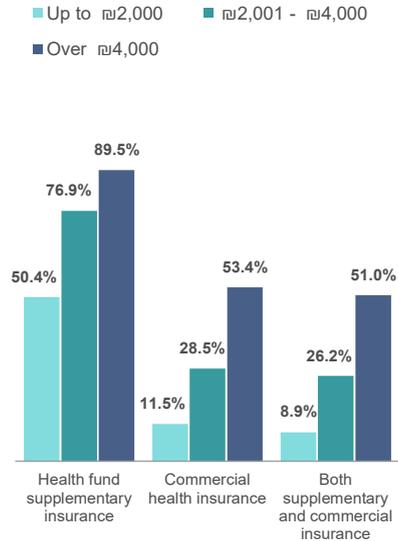
Share of private expenditure out of total healthcare expenditure and the components of private expenditure



Source: Dov Chernichovsky, Taub Center | Data: CBS, 2018; 2019

The percent of those who report carrying voluntary insurance, 2017

By insurance type and monthly income per capita

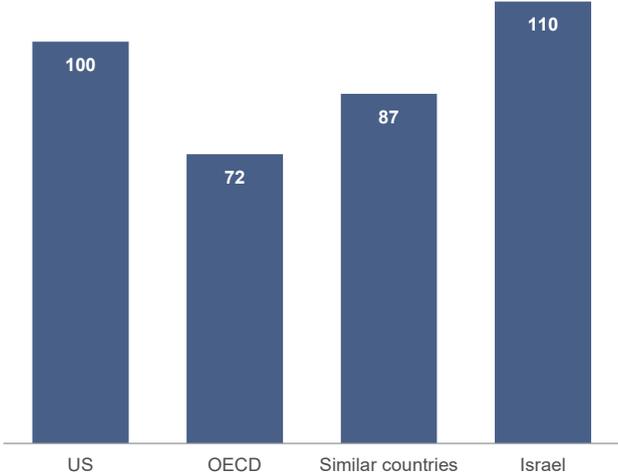


Source: Dov Chernichovsky, Taub Center | Data: CBS, 2019

Healthcare prices in Israel are the fifth highest in the OECD — higher than in the US

It is likely that the rise in commercial insurance presented on the previous page and the public/private mix that has led to skyrocketing physician salaries, as discussed in *A Picture of the Nation 2019*, have led to high healthcare prices in Israel. A recent OECD report considered healthcare prices in its member countries relative to those in the US in 2017. The report identifies Israel as the 5th most expensive OECD country in healthcare, after Switzerland, Iceland, Norway, and Sweden. According to this report, the level of healthcare prices in Israel is 10% higher than that in the US, 53% higher than the average in the OECD countries, and 26% higher than that in the similar countries. An earlier OECD report using data for 2014 shows Israel in a more positive light, but the price of healthcare in Israel was still 4% higher than in the US and the similar countries, and 19% more expensive than the average in the OECD. This surprising finding challenges the view that the price of healthcare in Israel is relatively low.

Index of healthcare basket prices, 2017
PPP, Index: US = 100



Note: Similar countries: Belgium, France, Germany, the Netherlands, and Switzerland.

Source: Dov Chernichovsky, Taub Center | Data: *Health at a Glance, 2019*



The Economy and Standard of Living

The following reflects the state of the Israeli economy on the eve of the coronavirus crisis. Naturally, the crisis implies a deep change that is hard to gauge at this point. However, the information below is required in order to identify which features of the Israeli economy provide strengths and which constitute a burden when considering the economy's ability to cope with the crisis and emerge out of it when it abates.

Prior to the coronavirus epidemic, the Israeli economy was quite strong, but not as strong as might have been expected. GDP had grown nicely, but the growth rate has been falling for a decade, and when taking into account the growth in the population, GDP per capita growth in Israel was lower than the average OECD growth rate. Prices had fallen relative to other countries, but remained high, despite increased competition from abroad. The rise in income lessened inequality, but Israel still had greater income inequality than almost all developed nations. These issues and others presented below need to be taken into account when facing the great challenges of the coronavirus crisis.

The immediate government response to the coronavirus pandemic was to close Israel's borders and restrict economic activity to an ever-increasing extent. As a result, over a million workers were sent on an indefinite unpaid leave of absence or dismissed. The unemployment rate, including those on unpaid leave, reached 25% by mid-April, though there has been the start of a slow return to employment as the market has been opened up. The consequence is that GDP is expected to fall by 5.3% this year. The loss of taxes, increased health-related expenditures, and government support programs for

households and the business sector, amounting to NIS 100 billion (7.6% of GDP), will perforce increase the budget deficit to at least 10%, leading to a sharp increase in the public debt to GDP ratio from under 60% to about 75% of GDP. To mitigate interest rate hikes, the Bank of Israel announced its intention to support the government bond market. In addition, the Bank of Israel is taking measures to facilitate a smooth operation of the financial markets.

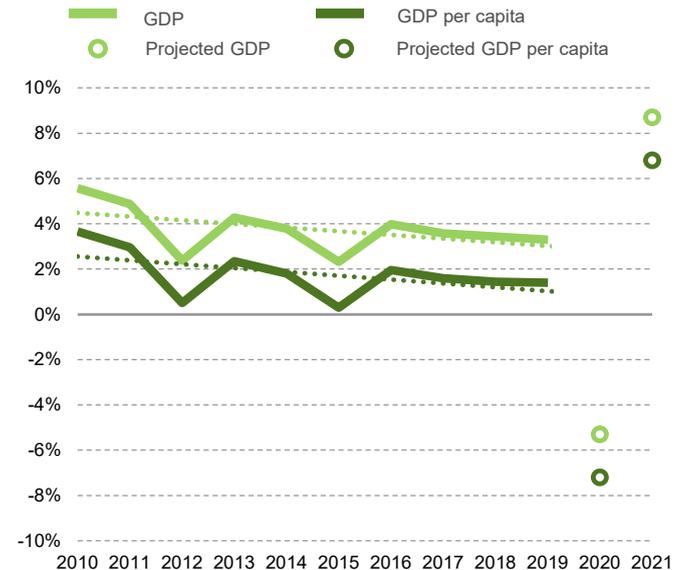
A decade of declining growth in GDP and GDP per capita

The last decade has been characterized by a continuous decline in the GDP growth rate and with this, in the rate of growth in GDP per capita. The apparent decline in Israel's potential growth stems in part from demographic changes (a decrease in the share of the population that is of prime working age), and from a decrease in the contribution of human capital to growth.

In an international comparison, Israel's situation was also unsatisfactory. The average GDP per capita growth in Israel of 1.5% over 2017-2019 is 0.15 percentage points lower than the OECD average despite the fact that average OECD GDP per capita is \$4,500 higher than that of Israel. The Israeli GDP per capita growth rate falls short also of that of Slovenia, the Czech Republic, and Spain, whose GDP per capita is similar to that of Israel. As a result, even under favorable circumstances Israel has had a hard time narrowing gaps in the standard of living relative to other developed OECD countries, as shown in the next figure.

Based on current Bank of Israel projections, Israel's GDP is expected to shrink by 5.3% in 2020 and, in 2021, is expected to increase by 8.7%.

Growth rate of GDP and GDP per capita

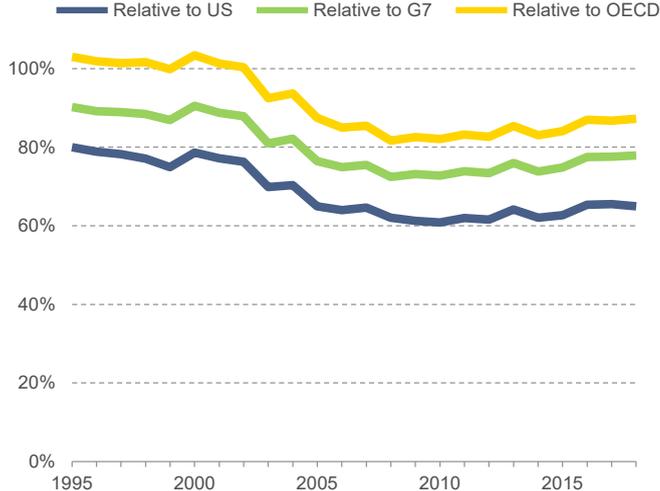


Source: Benjamin Bental, Taub Center | Data: CBS; BOI

Productivity in Israel still lags behind that in other developed countries

Disparities in growth rates of GDP per capita between Israel and other countries reflect the low labor productivity in Israel. While a quarter of a century ago GDP per employed person in Israel was slightly higher than the OECD average, a gap of some 18 percentage points opened up in the middle of the first decade of the 21st century. This was in part due to a rise in the employment rate where many of those joining the labor market had low skill levels. This gap has narrowed some in the past few years to about 13 percentage points. Disparities relative to the wealthiest countries (G7) are greater, and particularly relative to the US. Programs related to coronavirus crisis recovery need to include active labor market measures aimed at improving worker skill levels, especially of those at the low end of the earnings scale.

GDP per person employed in Israel relative to their peers in other country groupings



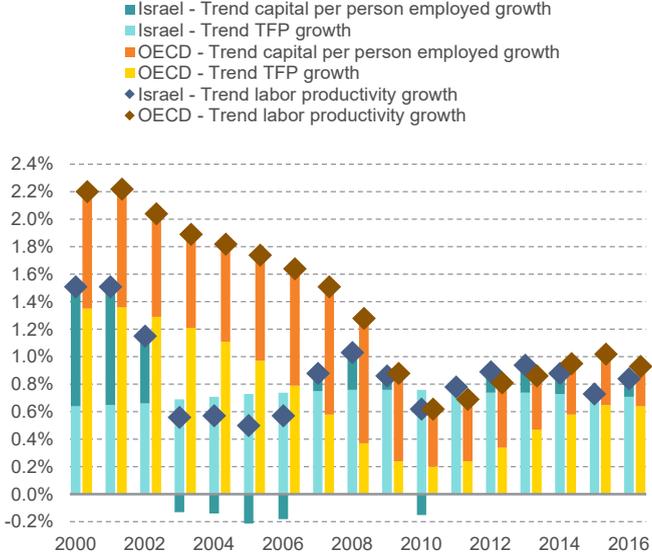
Note: PPP adjusted.
Source: Benjamin Bental and Gilad Brand, Taub Center | Data: OECD.Stat

Capital investments are contributing little to productivity growth in Israel

As in the previous figure, here, too, it can be seen that growth in the first decade of the 21st century has also been considerably slower than in other OECD countries. In the current decade, the gap is not closing.

More than this, changes in the level of productivity as measured by changes in production per worker can be disaggregated into changes in the level of capital available to the average worker and the remainder – total factor productivity (TFP) – that reflects technological and organizational improvements. Comparing Israel to other OECD countries highlights the extent to which increases in capital contribute little to worker productivity (in fact, in some years, it even has a negative effect). In contrast, in the past few years, there has been a relative improvement in the contribution of total factor productivity to worker productivity. A great deal of the explanation for the disappointing growth is due to a lack of private investment in physical capital in the market, as shown on the next page. Dealing with the aftermath of the coronavirus crisis is likely to delay further the required private investments in the Israeli economy.

Rate of annual growth in worker productivity



Note: The OECD refers to a “trend variable” when it considers its value net of business cycle fluctuations (i.e., Hodrick-Prescott detrended).
 Source: Benjamin Bental and Gilad Brand, Taub Center | Data: OECD

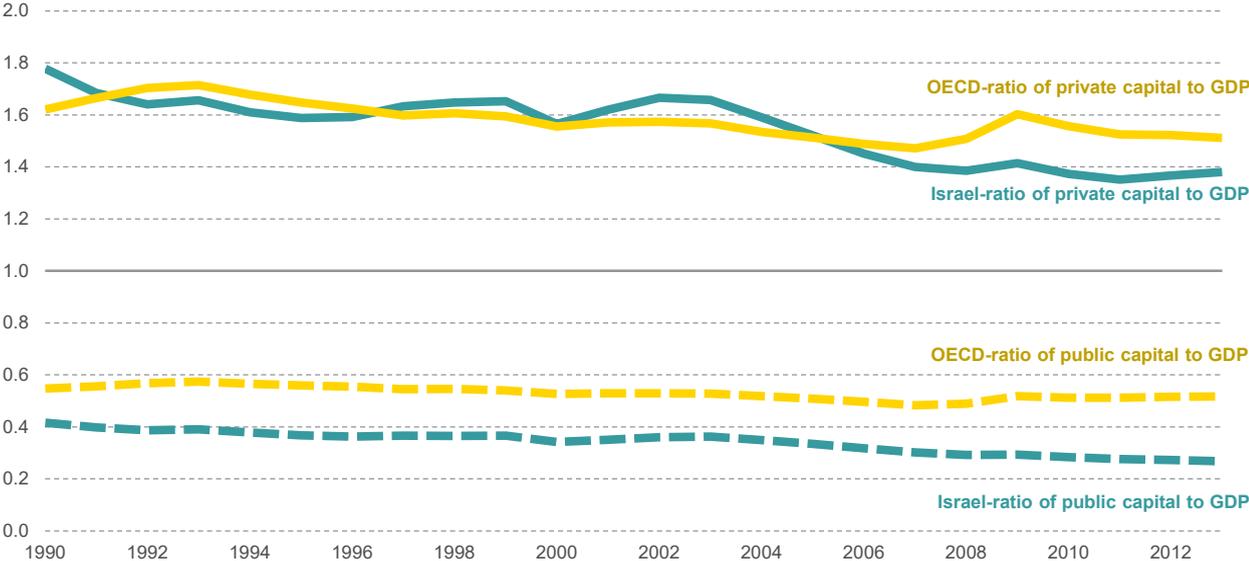
Private and public capital investments are low relative to those in other developed countries

A substantial share of the per-employee GDP gap that developed (currently 13% as shown on page 42) can be explained by processes that characterized factors of production that are complementary to labor — private and public capital. In the middle of the last decade, a substantial gap began to develop in the relation of private capital to the GDP of Israel relative to other OECD countries. Economic models show that increasing the private capital stock to the level in the OECD (an increase of 15% of GDP) would decrease the per-employee GDP gap by about 5 percentage points. Public capital as seen in, among other things, infrastructure, transportation, and communications, decreased over the last quarter of a century to half of average OECD levels relative to GDP.* According to the economic models, doubling the public capital stock could contribute as much as 17 percentage points to GDP per employed person, fully erasing the existing gap.

Paradoxically, the coronavirus crisis may actually help close the gap as it is likely to lead to a massive increase in investment in the health sector. In addition, it seems that investments in the transportation system will be accelerated.

* Recent calculations by the CBS indicate that some of the public investment has not been correctly attributed to the public sector because it was executed through transfers to non-government organizations. Despite this, it seems that, even if this is accounted for, public investment in Israel is still lower than the OECD average.

Ratio of private and public capital to GDP



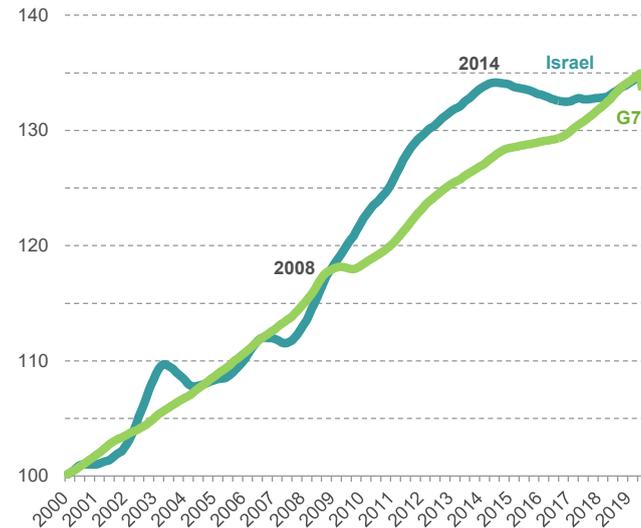
Source: Benjamin Bental and Gilad Brand, Taub Center | Data: IMF

Half a decade of steady consumer prices closed a gap that opened in the mid-2000s

Consumer well-being is affected not only by productivity; it is also affected by price levels. Since the turn of the century, prices in Israel have risen at about the same pace as those in the major industrialized nations but with greatly different paths. While the rate of inflation in the G7 countries rose fairly uniformly, prices in Israel started rising far more sharply in 2008; in the last half decade, though, prices have basically remained steady. The change that started in 2014 resulted from reforms that increased competition both locally (e.g., in telecommunications) and through imports (e.g., the “Cornflakes Law” allowing free imports of dry foods such as pasta), and from a resulting shift in the pass-through rate, as explained on the next page.

Despite these improvements, prices in Israel remain about 12% higher than expected in countries with a similar level of income. The corona crisis will affect supply and demand competition at home and from abroad. The affect on price levels in Israel depends on the intensity of these effects. The effect on the housing market is expected to be relatively mild.

CPI in Israel and G7 countries
Q1-2000 = 100, annual moving average

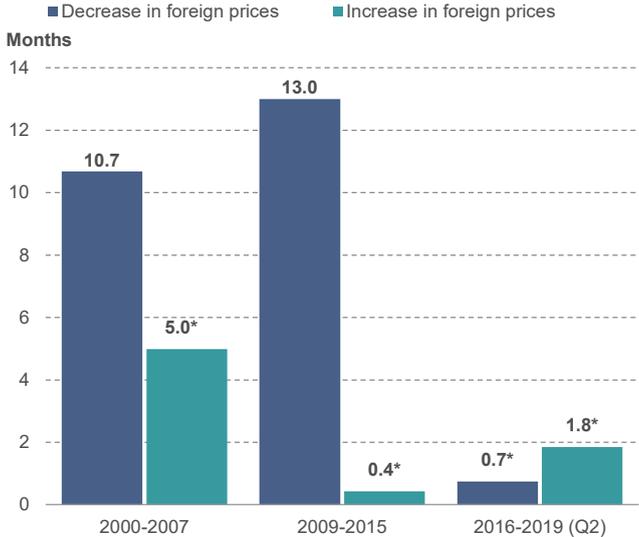


Source: Benjamin Bental and Gilad Brand, Taub Center | Data: OECD.Stat

Increased competition from abroad — decreases in foreign prices quickly translate into falling prices in Israel

This figure shows the length of time (in months) that it takes for local prices to catch up halfway to changes in foreign prices. Until 2015, prices in Israel rose relatively quickly in response to a foreign price rise, while local prices responded slowly and over a longer period of time to a decline in foreign prices. This strong asymmetry is exceptional in international terms. Of late, significant changes can be felt in the pass-through rate from foreign to domestic prices. The asymmetry between the change in local prices in response to a rise or fall in foreign prices that was characteristic of the previous period is diminishing and the response rate is quickening significantly. This is apparently a reflection of recent reforms to remove foreign trade obstacles.

Length of half-life of local price deviation relative to foreign prices



* Significance level of 1%.

Source: Benjamin Bental and Gilad Brand, Taub Center | Data: OECD.Stat

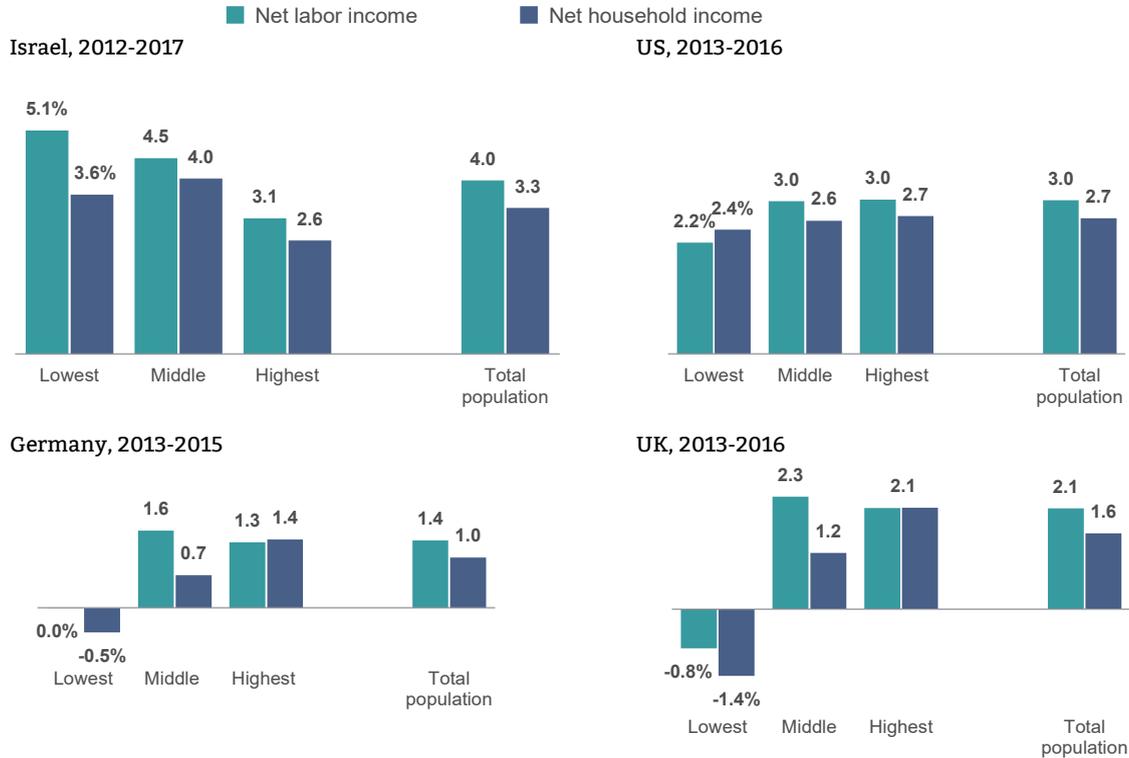
An unusual pattern of income growth — the weaker populations have benefited the most

As a result of the slowdown in consumer price increases, the nominal rise in wages over more than the last half decade was translated almost fully into real wage increases — that is, an increase in worker purchasing power. Despite the fact that worker productivity rose relatively slowly in the past few years, price changes, and in particular the relative cheapening in production costs, led to an improvement in worker wages despite the lack of any substantial rise in worker productivity. Looking ahead, the coronavirus crisis will reverse this trend due to a significant increase in unemployment, which will lead to a reduction in wages. The wage rises seen prior to the onset of the coronavirus crisis were not distributed evenly among population groups; labor income rose more substantially for lower

income households than for those in higher socioeconomic quintiles. This is at least partially the result of a second wage earner joining the labor market, especially among households in the lower wage quintiles, and also a result of real wage increases at the lower end of the income distribution. This phenomenon is substantially different from the experience in other countries, where wages for stronger populations grew faster while those in the lowest quintile rose slightly or even declined in many countries.

As indicated above, the coronavirus crisis will lead to a reduction in wages. It is likely that those who have recently joined the labor market will be hit harder and that many of them will lose their jobs.

Average annual change in real household income

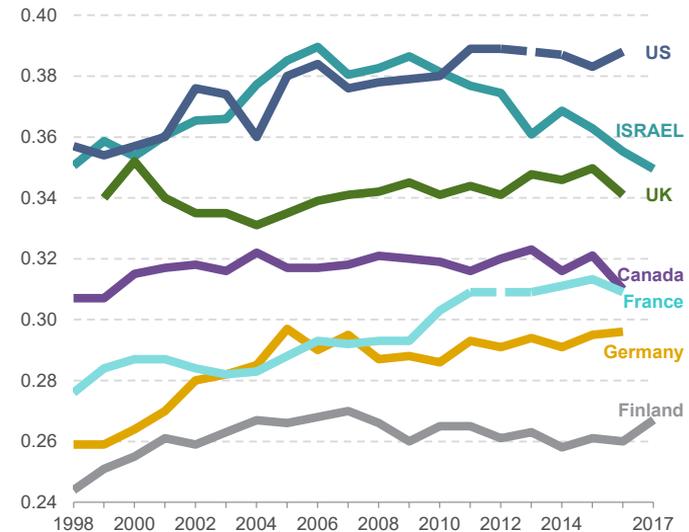


Note: Due to data limitations, comparable years for the selected countries were not available.
 Source: Benjamin Bental and Gilad Brand, Taub Center | Data: LIS; CBS, Household Expenditure Survey

An atypical decade of decreasing income inequality

As a result of the relative increase in income among the weaker socioeconomic populations in Israel (see the previous page), the encouraging trend of the past decade has been a lessening of inequality (as measured by the Gini index). This is especially striking when comparing the trend in Israel to that in other countries, where inequalities have not lessened and in some cases have even increased. The turning point in Israel came with the wave of workers entering the labor market – mainly from the weaker socioeconomic populations. Among other things, this was a response to government reforms in welfare transfers and changes in the labor market at the beginning of this century. Nevertheless, inequality in Israel remains high. It is to be expected that the economic effects of the coronavirus crisis will disproportionately affect the weaker echelons in society, largely because of their labor market characteristics, thereby increasing income inequality in Israel, but this effect will likely be even stronger among countries hit more strongly than Israel by the pandemic, and Israel's relative ranking may actually improve.

Gini index for disposable income



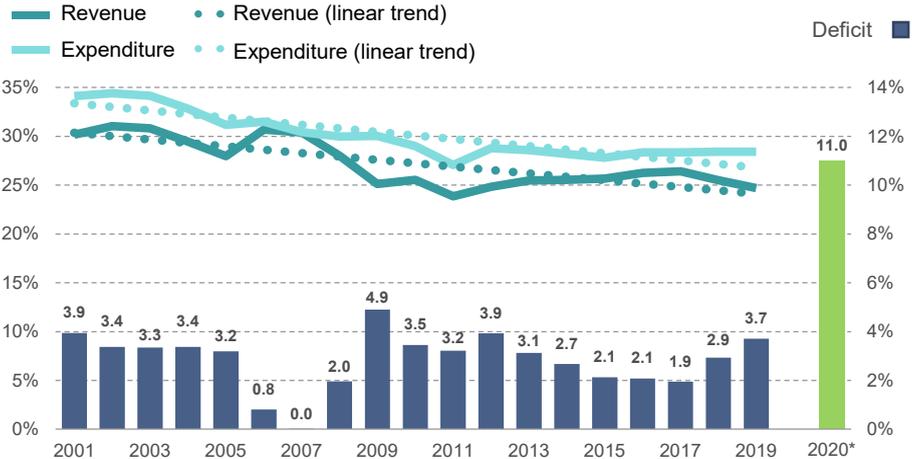
Source: Benjamin Bental and Gilad Brand, Taub Center | Data: OECD.Stat

The growing deficit — reason for concern

The trend in government budget management has changed. Specifically, the deficit of 2.9% of GDP that was set for 2019 was not achieved, and the (pre-crisis) deficit projections for the coming years exceeded 4% of GDP. It is especially striking that in contrast to the stability in the level of expenditure, there has been a notable decline in revenues, especially relative to 2016 and 2017 when there were one-time revenues due to technical changes as well as exceptional business transactions resulting in high tax receipts. The increased deficit significantly worsened Israel's budgetary starting point in dealing with the coronavirus crisis. Clearly the deficit will skyrocket, and is currently projected to be around 11% of GDP in 2020. Nevertheless, the low debt to GDP ratio below 60% (likely to increase to around 75%) enables the country to

use the capital markets as a source for financing the large deficit associated with the decline in tax revenues and the sharp increase in expenditures required to support business and household sectors.

Revenue, expenditure, and deficit relative to GDP



* Current projections for 2020.
Source: Benjamin Bental and Gilad Brand, Taub Center | Data: Ministry of Finance; CBS

Value of limiting coronavirus mortality — almost a quarter of annual GDP

As in the rest of the world, Israel took unprecedented steps to fight the outbreak of the coronavirus. This page and the figure on the next page present a rough estimate of the value of the potential years of life lost as a percent of GDP had these steps not been taken. This estimate is based on the value of a year of life used in the decisions regarding the “basket of medicines” provided under the National Health Insurance Law. This value does not represent the ability or the willingness of the private individual to pay for an additional year of life, or the value in labor productivity terms, or even the average actuarial value of a year of life in Israel; it represents the willingness of the state to pay for a year of life, which is estimated at NIS 340,000. This figure is more than double the GDP per capita in 2019.

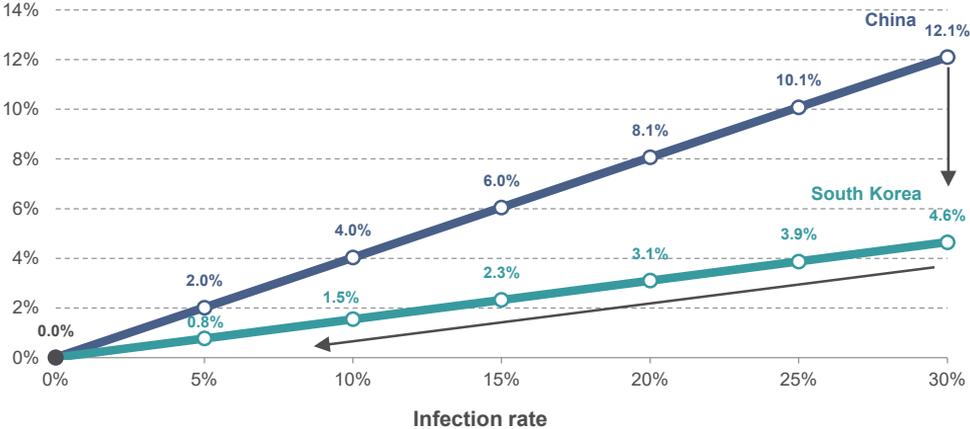
We calculate the monetary equivalent of life-years lost from the coronavirus epidemic using two age-dependent mortality scenarios: that of China (Hubei province) and that of South Korea. The figure on the next page represents the resulting costs expressed as percentages of GDP for population infection rates ranging from 0% to 30%.

On the basis of these assumptions, we can estimate the value accruing to Israeli society from preventing mortality. We assume that alleviating pressure on the healthcare system moves us away from the outcomes in China or even Italy towards those in South Korea. This is represented in the figure by moving from the Chinese curve down to the South Korean one. In addition, we assume that a policy of widespread social distancing keeps the infection rate low. This result is represented in the figure as a move down the South Korean curve (movement to the left along the South Korean curve to lower levels of infection).

Assume that in the absence of any government intervention, the infection rate would have been 15% and mortality rates would have been as they were in China. The life-loss would have been equivalent to 6.0% of GDP as shown in the figure. By intervening, two goals are achieved: life-years are gained through an induced reduction of mortality from the Chinese to the South Korean rate and the infection rate is reduced. Lowering the infection rate through social distancing from 15% to 10% would have lowered the economic loss to only 1.5%, thereby justifying the cost to

the Israeli economy from the strict lockdown, which is estimated at 4.2% of GDP. Even with an intervention-free infection rate of only 10% with Chinese mortality rates the strict lockdown is almost “break even” if it induces a mortality rate drop to where it approximately did in practice — an infection rate of 0.5% with 250 deaths.

Value of potential years of life lost as a percent of GDP



Source: Dov Chernichovsky and Benjamin Bental, Taub Center | Data: CBS, 2018, 2019; CDC, University of Bern



Spotlight

Population Projections

Among developed countries, Israel has a unique demographic profile: very high fertility, very low mortality, and positive in-migration. The result is that the population in Israel has the fastest growth rate in the OECD. In this section we present the results of an exercise that projects Israel's population to 2040 based on current and anticipated fertility, mortality, and migration rates. One of the key results of the exercise is to show how the *current* age structure will work through those rates in driving Israel's demographic future.

We note, too, that even worst-case scenarios involving coronavirus mortality are likely to only affect the pace of aging in the Israeli population. They are unlikely to affect demographic change in general, which is largely driven by events for populations below age 60.

Fertility reductions for Arab Israeli women of all ages and among young Jewish women

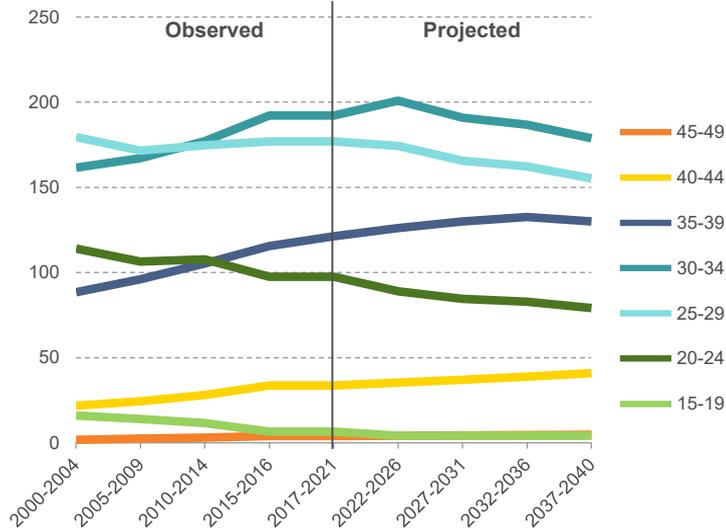
The first step in forecasting population sizes is predicting fertility rates. Since 2000, there have been significant reductions in age-specific fertility rates (ASFR) among Jewish women in the under-25 age range, stability in the 25-29 age range, and substantial increases in ASFR in the 30-44 age range. In our main projection, we assume that these trends will continue, and then start to fall (25-34 age group), or stabilize (40-44 age group). The only exception to this is the 35-39 age group, where we expect a continued slow increase, reflecting increasing delays in childbearing and single parenthood.

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

Observed and projected age-specific fertility rates (ASFR), 2000-2040

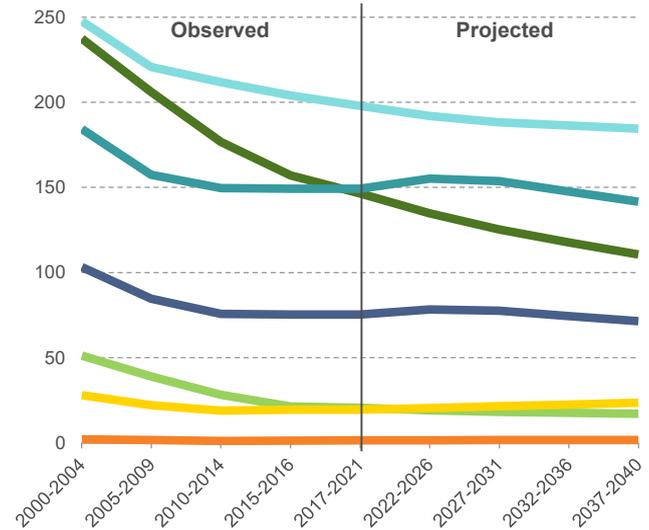
Jews/Others

Births per 1,000 women



Arab Israelis

Births per 1,000 women



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

Significantly different distribution for Jewish and Arab Israeli women of childbearing age and below

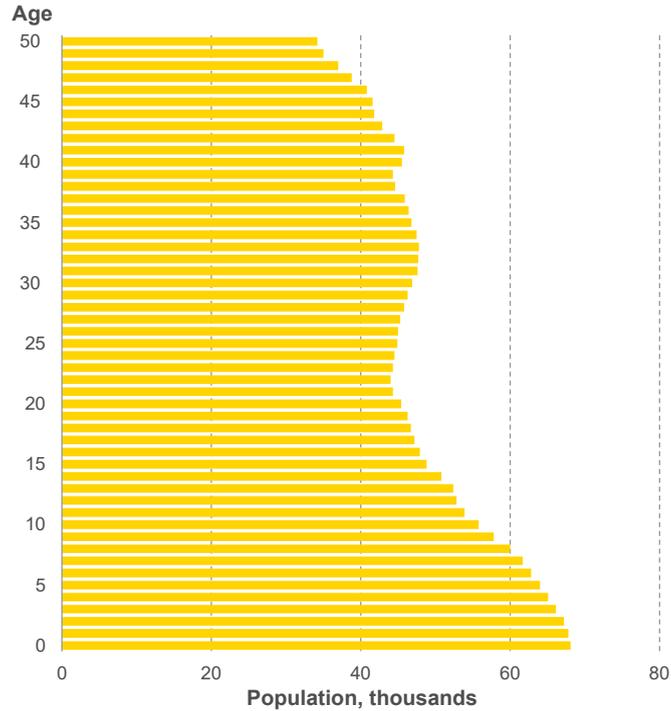
The number of actual births is the sum of age-specific fertility rates (ASFR) multiplied by the number of women in the associated age group. This means that even if the ASFR remains constant over the next 20 years, differences in Jewish and Arab Israeli women's age-structure up to age 50 would themselves lead to fluctuations in the number of births. The figure shows these differences in age structure: it graphs the number of women by single years of age in 2017, from age 0 to 50, for Jews and Arab Israelis.

Comparing the relative size of cohorts, we see that there will be roughly the same number of women aged 20 in the Arab Israeli sector in 2037 as there were in 2017 — the year in which these women were born (shown in the graph as age 0). In the Jewish sector, in contrast, there will be far more women aged 20 in 2037 than there are now. Differences in the number of births will follow from this difference in cohort size.

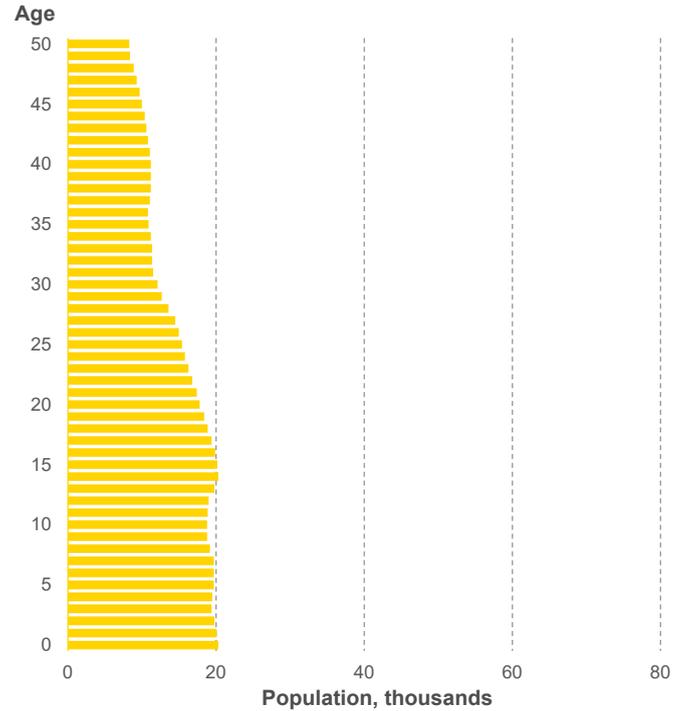
Source: Alex Weinreb, Taub Center | Data: CBS, *Statistical Abstract of Israel 2018*

Number of girls/women aged 0-50, 2017

Jews/Others



Arab Israelis



Age structures of the population are vastly different for Jews and Arab Israelis

There are three notable differences in age structure between the Jewish and Arab Israeli populations.

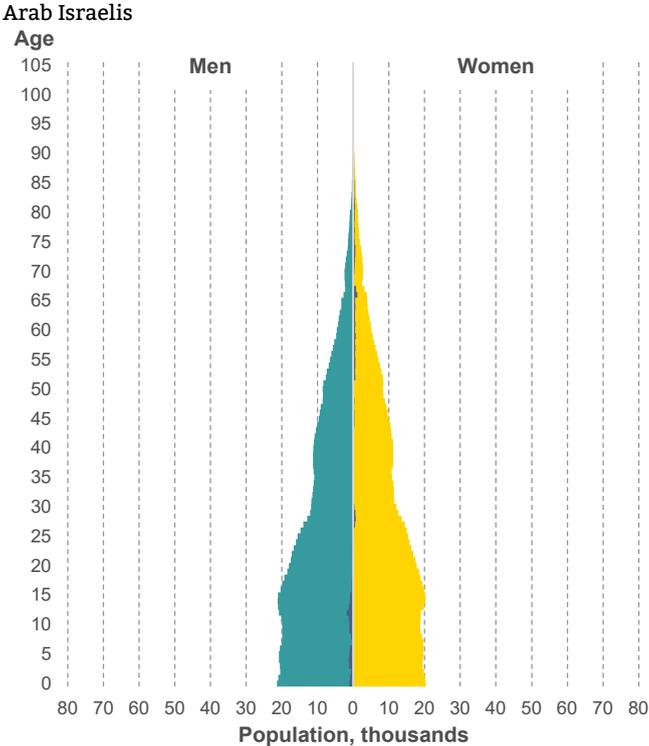
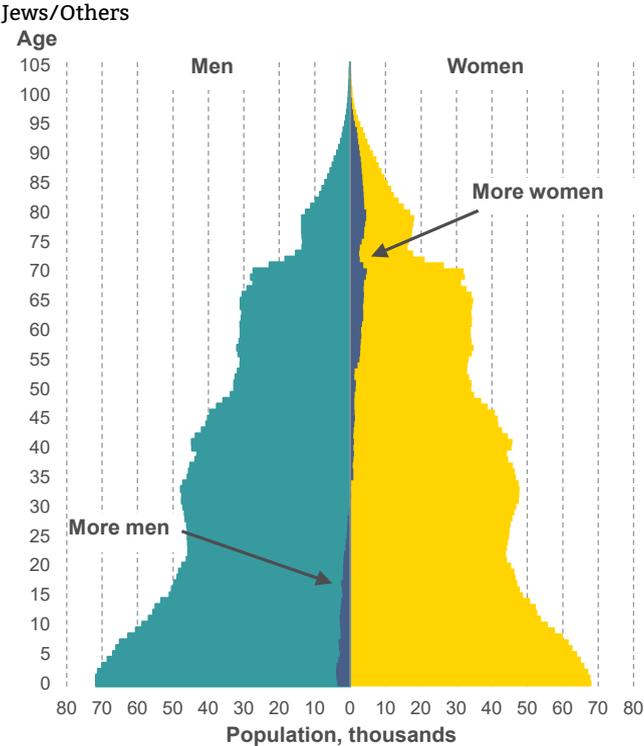
First, whereas the Jewish population has distinct waves, with “echo” effects every 30 years or so, the Arab Israeli age pyramid looks more stable. The large age bulge among 55-70-year-olds in the Jewish population are a product of a post-WWII baby boom, massive in-migration in the early years of statehood, and the large migration of prime-age adults from the Soviet Union in the early 1990s. The first echo of that initial bulge — people aged late 20s to early 40s — are the children of the older bulge, and the more recent echo — extending from age 3 to early teens — are their grandchildren. In contrast, there has been little in-migration into the Arab Israeli population, so its age structure primarily reflects fluctuations in fertility.

Second, over the last 20 years, each successive Jewish birth cohort has been larger than its predecessor. In the Arab Israeli population, there has been a sharp reduction in the number of births, beginning in 2004, which has led to relative stability in the size of birth cohorts over the last 15 years.

The third notable age-structure difference between the Jewish and Arab Israeli populations is the relative impact of aging in these communities. In 2017, 7.7% of Jewish men and 10.1% of Jewish women were at least 70 years of age. The same was true of only 2.6% and 3.3% of Arab Israeli men and women.

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

Age structure of the Israeli population, mid-year 2017



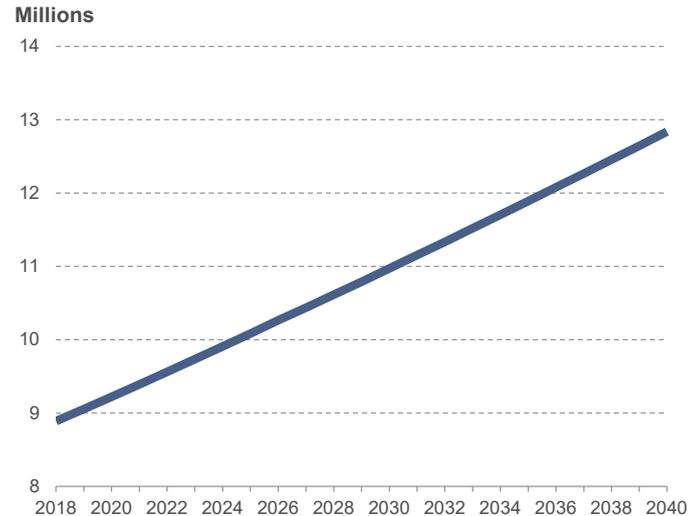
Israel's population is expected to grow from 9 million today to 12.8 million in 2040

The full projection suggest that Israel's population will increase from around 9.05 million in mid-2019 to 12.83 million in 2040, with the annual growth rate falling from 1.87% to 1.52% across that period. The proportion of the population that is Jewish/Other will fall slightly: from 79.0% to 77.7%.

Estimates based on other projection scenarios — allowing for a more modest reduction in mortality, assuming sharper fertility reduction or, unrealistically, setting migration to net zero, and fertility as stable with no reduction at all — change the overall estimated population with projected overall sizes ranging from 12.4 to 12.8 million.

On the pages that follow, we focus on the three main findings discussed on page 60.

Projected population of Israel, 2018-2040



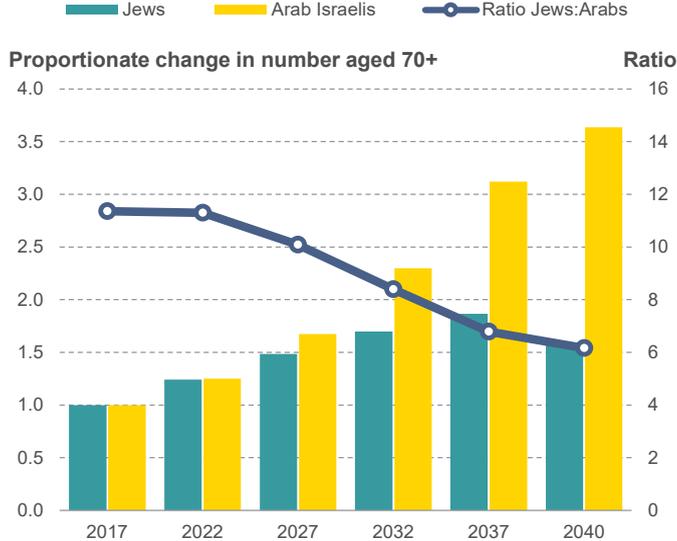
Source: Alex Weinreb, Taub Center | Data: CBS, *Statistical Abstract of Israel 2018*

Substantial growth in 70+ population — more for Arab Israelis than for Jews

Projections are for substantial growth in the over 70 population: from 669,000 in 2017 to 1.411 million in 2040. The pace of aging will be rapid for the next 15 years. It will then slow in the mid-2030s and remain quite slow until the prime-age bulge begins to age into their 70s in the late 2040s. This population of people older than 70 will continue to be disproportionately female.

More notably, the rate of growth will be much higher among Arab Israelis than Jews. Among Jews, the population aged 70 or above will increase by 88%, while among Arab Israelis, it will increase almost four-fold. While in 2017 there were 11.4 Jews aged at least 70 for every Arab Israeli of the same age, by 2040, that ratio will shrink to 6.2:1. This change points to emerging issues regarding elderly work and welfare in the Arab Israeli sector over the next couple of decades.

Index of population aged 70+, 2017-2040



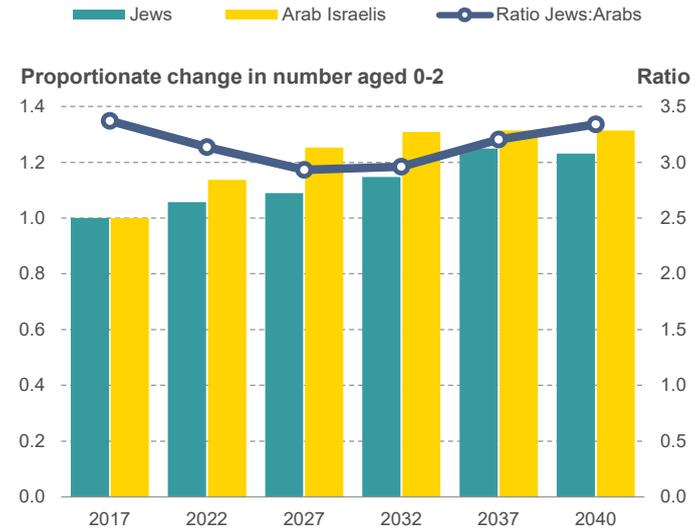
Source: Alex Weinreb, Taub Center | Data: CBS, *Statistical Abstract of Israel 2018*

Ratio of Jewish to Arab Israeli births will fall for a decade and then reverse for the following decade

The forecasts show an initial slowdown in the rate of growth of the number of children born over the next 10 years in the Jewish sector (because of smaller cohorts of Jewish women entering peak reproductive ages). By the early 2030s, this will change. Larger cohorts of Jewish women entering peak reproductive ages will give rise to a more rapid increase in the annual number of births in the Jewish sector.

Trends in the Arab Israeli sector will be almost the inverse. There will be faster initial increases in the number of children born, leading to a sharp reduction in the ratio of Jewish to Arab Israeli children between 2017 and 2027 — from 3.4 to 2.9. This will begin to taper off as the smaller successor cohort of Arab Israeli women — currently aged 0 to early-teens — mature into their mid-20s and 30s amid continued reductions in age-specific fertility rates. Alongside increasing numbers of Jewish births, the ratio of Jewish to Arab Israeli children will rise back up to 3.3 by 2040.

Index of number of children aged 0-2, 2017-2040



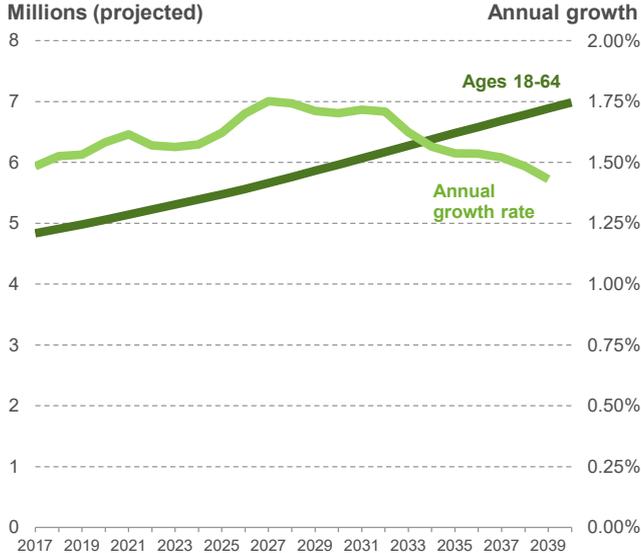
Source: Alex Weinreb, Taub Center | Data: CBS, *Statistical Abstract of Israel 2018*

Substantial increase in working-age individuals

Over the next twenty years, the prime working-age population of 18-64-year-olds will grow from around 4.8 to 7.0 million. In this figure we see that the annualized growth rate underlying this increase in population will peak in the early-to-mid 2020s at around 1.8% per year — relative to around 1.5% today — before dropping in the mid- and late-2030s to around 1.4%.

These are very substantial rates of increase that will pose significant challenges to the Israeli economy in terms of higher education, employment, and housing.

Projected number of 18-64-year-olds, and annual growth rate



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

Large increase in projected number of students in higher education

In international comparisons, rates of enrollment in higher education in Israel are high for non-Haredi Jews, especially women. They are significantly lower among Arab Israelis, and very low among Haredi Jews, especially men. Israel's high rate of population growth means that just to maintain current enrollment rates within each of these groups — Scenario 1 in the figure — there will need to be a 49% increase in enrollment by 2040: from 52,000 first-year students in 2018 to 77,600 in 2040.

Yet that number understates the likely need, since ministers of education and others (e.g., The Council for Higher Education) have repeatedly expressed a desire to increase levels of higher education. Scenarios 2-5 describe four such possibilities in which gradual increases in enrollment for different subpopulations are accounted for along with the effects of population growth within each group.

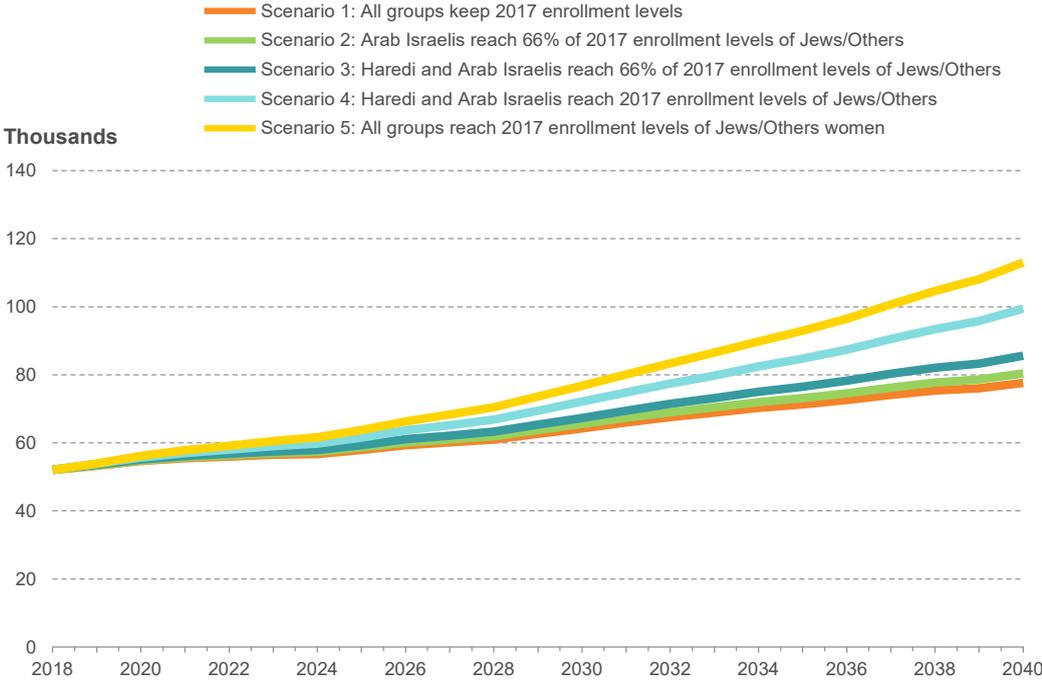
Projections based on these scenarios show that even the most modest aspirations will demand substantial investment. Raising Arab Israelis' higher education levels to just two-thirds of the non-Haredi Jewish rate — Scenario 2 — will require a 55% increase in enrollment capacity in higher education. Raising Haredi higher education levels

alongside those of Arab Israelis to just two-thirds of the non-Haredi Jewish rate — Scenario 3 — will require a 65% increase. Raising levels of Arab Israeli and Haredi higher education to that of non-Haredi Jews — Scenario 4 — will require a 92% increase. And in the least realistic scenario, Scenario 5, increasing all groups' enrollment to that of non-Haredi Jewish women will require 2.2 times as many places in 2040 as in 2018.

If it truly is a national priority for Israel to maintain a large college-educated population in the future — let alone increase it — the pathway is clear. Planned now and executed gradually over the next 20 years, the expansion of the higher education system will be difficult. But it is certainly more reasonable to build in anticipation of that growth than to try to hurriedly close the gap reactively, after the fact.

If the recent shift to online learning forced upon us by the coronavirus becomes a successful model moving forward and is adopted by the institutions for higher learning, the need for expanded physical infrastructure would lessen under all the scenarios.

Expected number of higher education students, by scenario



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



Social Welfare

The impact of the coronavirus pandemic has been felt in Israel as it has across the world. Apart from its impact on the health of the population and upon the economy, the implications of the pandemic on the employment and the incomes of large segments of the population, and on the well-being of Israel's most vulnerable individuals and families, have been significant. At the time of writing, over a million Israelis are out of work due to layoffs or unpaid leave. In addition, vulnerable populations, particularly the elderly, people with disabilities, and children with special needs are suffering from isolation, a lack of ongoing treatment and, often, an acute lack of resources and support. The longer the crisis continues, the more the number of individuals adversely affected by it can be expected to soar.

Efforts by Israel to address the immediate financial needs of the unemployed took a number of forms. Workers who were laid off or who were sent on unpaid leave have been incorporated into the existing Unemployment Insurance (UI) program. This has led to a dramatic increase in the number of recipients of the benefit from 70,000 in January 2020 to 875,000 applicants in early May 2020 and in expenditure from an average monthly expenditure of NIS 0.3 billion prior to the crisis to an expected NIS 17 billion for the duration of the pandemic. However, there are limitations of the UI program due to its limited coverage — it excludes the self-employed, salaried workers lacking a six-month qualification period, recipients of old-age benefits who had worked and are now unemployed, as well as asylum seekers and others — and the costs that it will entail make it difficult to regard it as an adequate long-term solution to mass unemployment. Some self-employed Israelis, who are now unemployed, are eligible for direct financial support and there are currently 225,000 of them receiving these grants. In addition, small grants have also been made available for unemployed elderly workers not eligible for UI. The crisis has also stretched existing social services and provisions for other vulnerable populations. The response has been to define social workers as essential employees, thereby ensuring the provision of basic social services, and to make efforts to draw upon the efforts of civil society organizations for the provision of basic needs and continued contact with service users, primarily the elderly. Given the dearth of resources prior to the crisis and increased needs due to the lockdown, it is unclear how adequate this response will be.

The length and severity of the coronavirus crisis and its human and economic consequences are impossible to predict. Nevertheless, it is clear that the process of rebuilding society after the crisis subsides will be long, difficult, and costly. Changes in welfare policy will be required. The role of social protection and social services in this project will be crucial. Thus, strengthening the social protection system will be necessary, particularly with regard to UI and income support. Spending on social services will have to be increased and the over-reliance on non-state providers will need to be reconsidered. There will be a need to provide a social safety net that offers adequate protection to all of those in need. As options for labor market integration increase, effective insertion programs (welfare to work programs) will be crucial as will enhanced in-work supports.

As can be seen in the survey of the pre-crisis reality that follows, the coronavirus crisis caught Israel with a high proportion of people living in poverty, a social protection system that offers less than generous cash transfers, great dependence on non-state service providers, and underfunded and understaffed social services. The impact of the crisis will likely be greatest upon the most vulnerable segments of the population, particularly those who were previously dependent on cash transfers and social services and those with low-paid, unskilled jobs that will be difficult, if not impossible, to return to after the crisis. Addressing the social problems created by the severe adverse impact of the crisis will require policy makers to address previously unexpected needs and the consequences of large-scale unemployment in ways that appeared unacceptable until now.

Looking back, welfare efforts in Israel have not borne much fruit in recent years. The poverty rate in disposable income terms remains among the highest among OECD countries and the steps taken to alleviate the problem do not seem to have lowered this significantly. On the other hand, as shown previously on pages 48-50, there has been a larger increase in income for disadvantaged portions of society, and a resulting decrease in income inequality. In this section, we look at welfare policies and their effects, and in particular we consider the “Families First” program that has helped thousands of families in Israel.

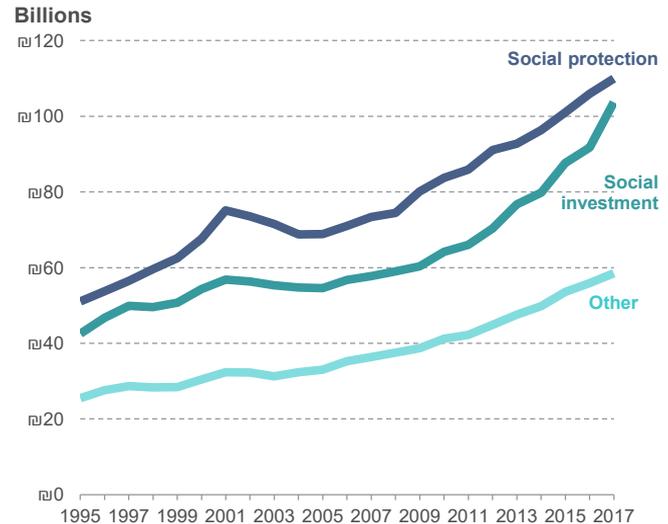
Increasing emphasis on social investment

In place of the standard division of social expenditure into welfare, health, and education (shown on the next page), an alternative is to divide it into social protection, social investment, and expenditures that do not fall into either of these categories (such as health expenditures).

Social protection programs primarily consist of cash transfers for those with low or no earnings. Examples include income support, old-age pensions, and child allowances. Social investment programs seek to strengthen the capacities of individuals. Examples include investment in the education system, programs to support labor force integration, work grants, and negative income tax.

There has been growth in all of the categories over the last two decades, with the gap between expenditure on social protection and social investment narrowing as expenditure on social investment programs has increased more rapidly. This change is primarily the result of an increase in expenditure on daycare and the “Saving for Every Child” program. In other words, there appears to be a government effort to increase spending on enhancing human capital over programs intended to address social distress and deprivation.

Expenditure on social investment, social protection, and other spending, 2017 prices



Source: John Gal and Haim Bleikh, Taub Center | Data: OECD

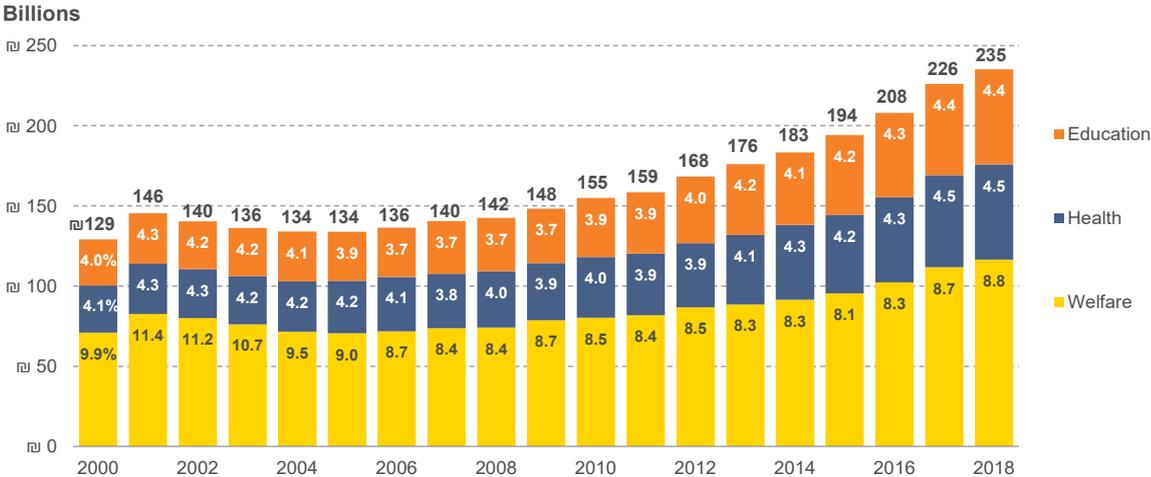
Social expenditure is increasing in real terms, but as a percentage of GDP is still relatively low

Returning to the standard division, the expenditure on welfare, health, and education have all grown significantly in real terms over time, but their shares out of GDP and out of government expenditures have not grown as substantially; over a decade, the share of government expenditures on the three categories together has risen from 53% to 59%, and out of GDP from 16% to 18%.

The share out of GDP is significantly lower than the OECD average; only four OECD countries — Turkey, South Korea, Chile, and Mexico — spend a smaller share of GDP on social expenditure than Israel. What characterizes all of these countries (including Israel) is that the average tax rates are well below the OECD average. Increasing social expenditures would likely require increased taxation.

One of the results of the coronavirus pandemic is a significant increase in social spending. Current estimates are that spending specifically for health and welfare during the pandemic will reach NIS 34.5 billion, with NIS 17 billion being devoted to providing a safety net for the unemployed. Clearly, healthcare spending is also expected to increase significantly due to the crisis and its implications. The level of the increase will be dependent on the duration of the crisis, changes in the economy and labor market in its wake, and the policies adopted by the government during this period.

Real social expenditure by category and as a percent of GDP, 2018 prices



Source: John Gal and Haim Bleikh, Taub Center | Data: Ministry of Finance; NII; CBS

The relative poverty rate in disposable income remains high

The poverty rate in this figure represents the percentage of individuals with income below half the median income in the country (accounting for family size). This can be measured using market income (before taxes and government cash transfers) or disposable income (after taxes and government cash transfers). As such, it is largely a measure of income distribution.

For individuals under the age of 65, the percentage below the poverty line in market income is similar to that in the rest of the OECD, but in disposable income, the poverty rate remains among the highest in the OECD. The steps taken by the government to try to lower this rate have thus far shown limited success. This is likely to continue as long as large parts of the populace remain out of the labor force and social spending remains low.

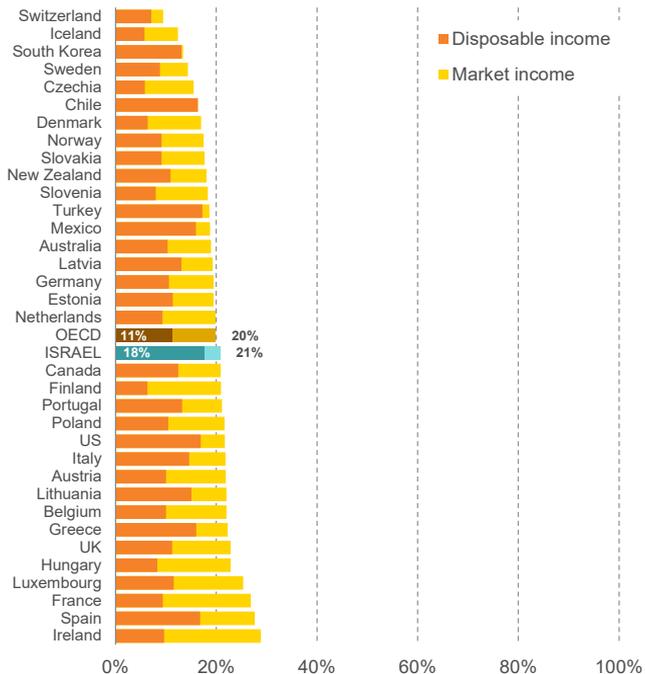
For those over 65, the portion under the poverty line in market income is high in almost all countries because most people are no longer in the work force and relatively generous old-age pensions constitute the main source of income for individuals after retirement. In Israel, this percentage is relatively low because much of the income comes from occupational pensions, which is counted as market income. After government intervention, the poverty rate is brought down to about the same level as for the rest of the population, which is high by international standards. Clearly, the implications of unemployment due to the coronavirus crisis will be greatest for the most vulnerable and low-waged workers. This is likely to have a marked detrimental impact on inequality and possibly the poverty level in the aftermath of the crisis.

Source: John Gal and Haim Bleikh, Taub Center | Data: OECD

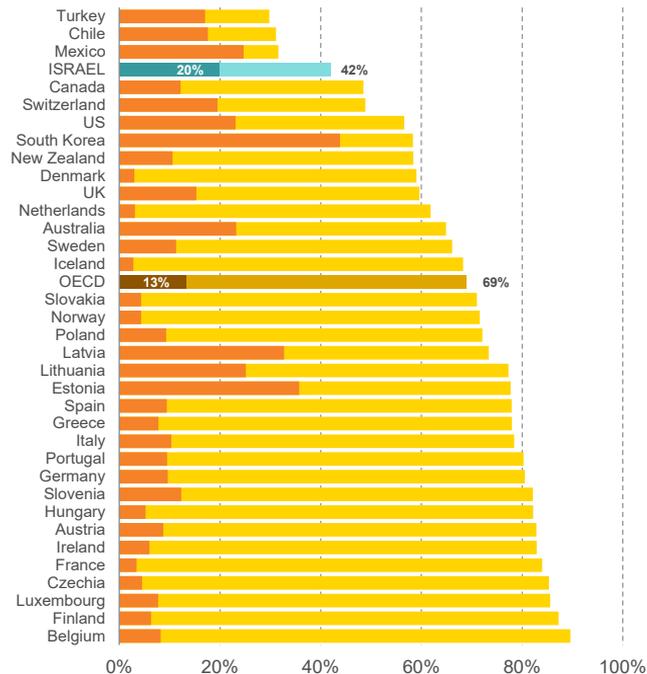
Share of individuals below the poverty line, 2015-2017

By age group

Ages 0-65



Ages 65+

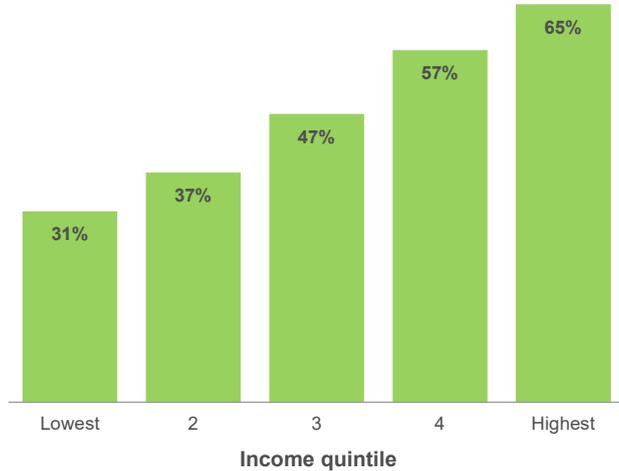


Saving for Every Child — social investment with unintended consequences

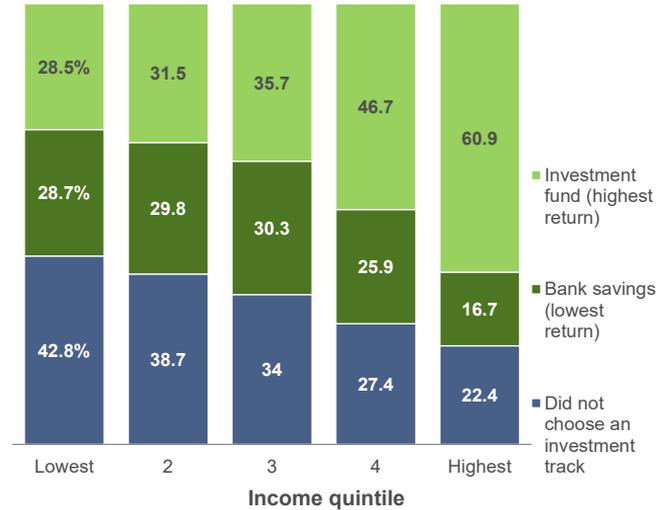
The “Saving for Every Child” program, which began in January 2017, ensures that a lump sum of money will be available to every child in Israel as they embark on their adult life. From birth, an amount of NIS 51 is deposited monthly into the account of every child. Parents have the option to add NIS 51 to this fund from their universal child allowance and may choose between investment channels that vary with respect to risk level and expected return. If the parents do not choose a particular investment channel, the money is placed in a conservative one. The accumulated amount is available at the age of 18 or at the age of 21, with a bonus given to those who wait until age 21 to withdraw the funds.

From the start, concerns were raised that as a result of its universality — which was able to ensure the full use of the program and broad public support — the lack of focus on the poor and on children from large families would weaken the program’s contribution to future social mobility. The concerns, it seems, were justified. The share of parents investing the additional NIS 51 every month and the share choosing a non-default investment channel for their child declines with a decrease in family income. For example, less than one-third of the parents in the lowest income quintile match the government’s deposit for their children, while in the highest quintile the share is 65%. In addition, wealthier parents are more likely to choose to invest in an investment fund with a higher expected return. Thus, the program, as it stands, may fall short in attaining its intended objectives.

Share of families choosing to add NIS 51 to the monthly Saving for Every Child program, 2017



Share of families choosing a specific investment type, Saving for Every Child program, 2017



Source: John Gal and Haim Bleikh, Taub Center, based on Gottlieb, 2018, Figures 4 and 5

The Families First program — a look at the Ministry of Labor, Social Affairs and Social Services' flagship program

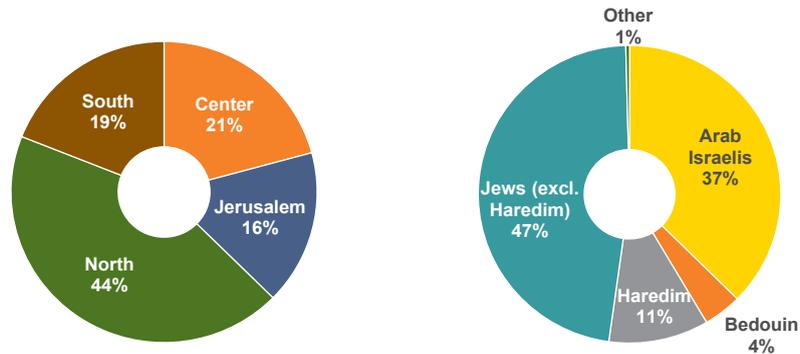
The Families First program of the Ministry of Labor, Social Affairs and Social Services has been operating since April 2015 in 108 cities with the goal of improving the economic situation of families living in poverty and reducing social exclusion due to poverty. The intervention focuses on six areas: full take-up of rights, employment, family economics, basic living conditions, individual and family capabilities, and community resource use.

A flexible relief basket in the amount of NIS 8,000 per year is provided to each family over two years. As of the end of 2018, about 5,700 families have participated in the program, of which about 2,100 are still active while about 3,200 have completed the program.

The distribution of the families across population groups shows that there

was a relatively high representation of the Arab Israeli community, though they constitute only about 21% of the population. In terms of geographic dispersion, a relatively large share of the participating families reside in the North.

Distribution of families in the Families First program by residential district and population group



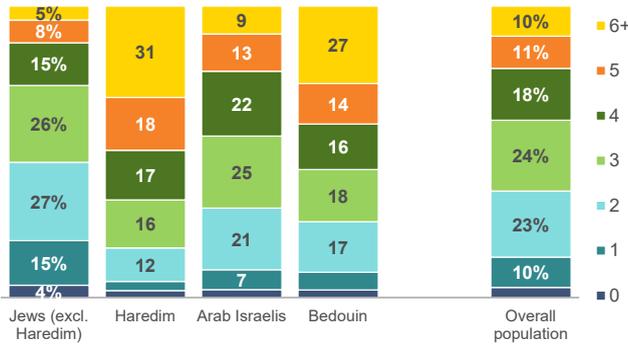
Source: John Gal, Michal Krumer-Nevo, Shavit Madhala, and Guy Yanay, Taub Center |
Data: Families First data set

Demographic distribution among Families First program participants

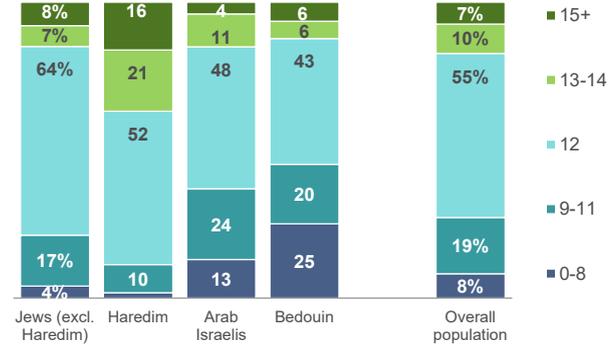
A look at the composition of families in the Families First program shows that a sizable share are large families, with about 40% of them having four or more children. Among Haredi families, this share was about 66% and among Bedouin and Arab Israeli families, it was about 57% and 44%,

respectively. Most of the families in the program have 12 years of schooling. Only about 17% have more than that and about 27% have less. Haredi and non-Haredi Jewish families are characterized by higher levels of education relative to the Arab Israeli and Bedouin families.

Distribution of families in the Families First program by number of children in the family



Distribution of families in the Families First program by parents' years of schooling



Note: Parents' years of schooling for the parent with the highest level of education.

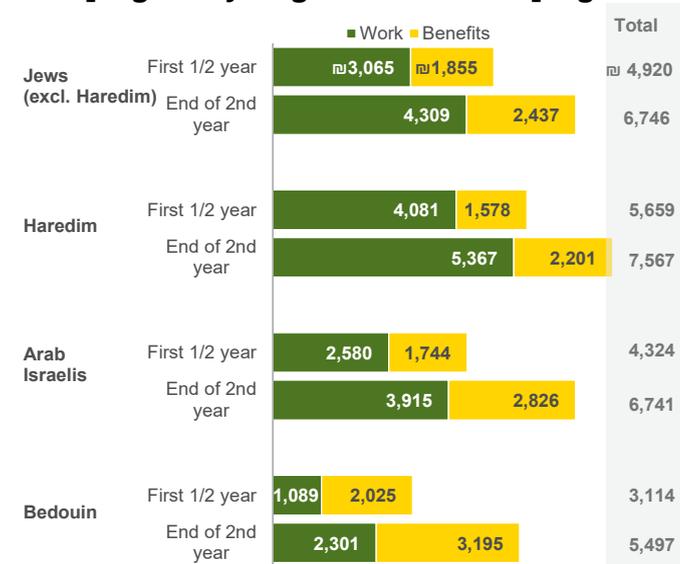
Source: John Gal, Michal Krumer-Nevo, Shavit Madhala, and Guy Yanay, Taub Center | Data: Families First data set

A significant increase in wages from the Families First program

Average family income of families participating in the Families First program is about NIS 2,150 higher at the end of the program than after only 6 months in the program. The largest gaps were found among families in the Bedouin and Arab Israeli communities (a gap of about NIS 2,400). It appears that these differences are the result of both a change in the level of income from labor and in the level of benefits received.

The incomes of Haredi families are the highest among families in the program while those of the Bedouins are the lowest. There is also variation according to the composition of income: among Haredi families, the share of wage income is about 70% of household income and the rest is from welfare transfers, while among Bedouin families, labor income is only about 35-42% of total income and welfare transfers constitute the main component of income.

Income distribution of families in the Families First program by length of time in the program



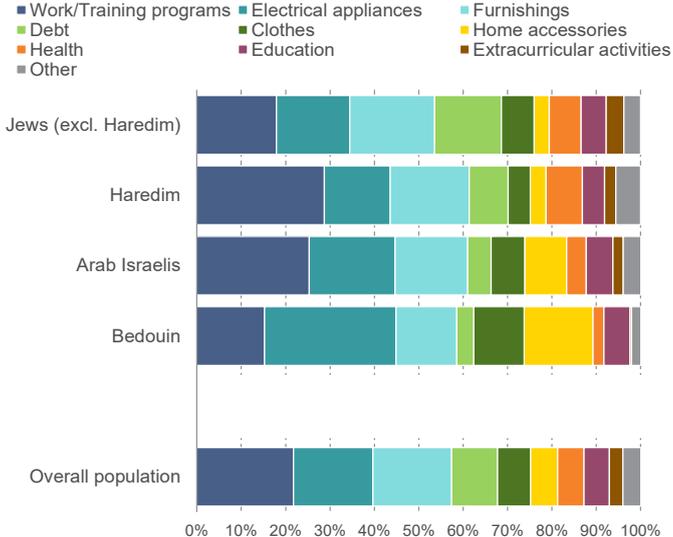
Source: John Gal, Michal Krumer-Nevo, Shavit Madhala, and Guy Yanay |
Data: Families First data set

The use of the financial assistance from Families First program differs across sectors

Among Haredi and Arab Israeli families, a major portion of the Families First assistance basket is used for the advancement of employment. Among Arab Israeli families (especially Bedouin), there is a notably higher use of the basket for the purchase of household appliances and home improvement. There also appears to be a greater tendency among Bedouin to use the basket for clothing and footwear relative to other groups. In contrast, the use of the basket for health uses is greater among Jewish program participants, including both Haredim and non-Haredim. Another notable characteristic of Jewish families is the relatively high use of the basket to repay loans.

It appears that among the Arab Israeli population and particularly among the Bedouin population, the material assistance is used more for basic needs, leaving less for uses such as health, extra-curricular activities, and loan repayment. It is possible that among the Jewish and Haredi populations, there are other (nonprofit and philanthropic) agencies that provide for these needs, thereby reducing the need for assistance from the program for these purposes.

Breakdown of Families First program participants use of financial assistance on goods and services



Source: John Gal, Michal Krumer-Nevo, Shavit Madhala, and Guy Yanay | Data: Families First data set



Labor Markets

The materials in this section reflect, for the most part, the labor market in Israel before the coronavirus crisis. Up to that point, the labor market exhibited great strength, although to different extents among different population groups. More specifically, while labor force participation for non-Haredi Jewish men and women and Haredi women was very high, the same could not be said for Arab Israeli women and Haredi men, or even for Arab Israeli men. In this section, we uncover some of the differences across population groups.

From the outset, the coronavirus has had an unprecedented labor force impact. Uncertainty is high and many businesses were not able or willing to take the risk of continuing to employ their workers, and either fired them or sent them home on unpaid leave with the intention of re-employing some or all of them if and when things return to normal. As a result, over a million people (a quarter of the labor force) found themselves out of a job. These workers were mostly from the economically weaker strata of the labor force, with the average wage of those released being NIS 6,324 while the average wage pre-coronavirus was NIS 10,481. Over 150,000 workers are estimated to have returned to their places of employment in recent weeks, but it is uncertain as of now what percentage will actually be rehired (it is estimated that 20% or more of the newly unemployed will not be able to return to their former place of employment). Those who have not returned are currently drawing unemployment benefits (which have been extended to include those on unpaid leave). In addition, while many small businesses have closed down temporarily, others could go out of business. Some of the effects are likely to be prolonged. If so, it may take a while until the unemployment rate returns to its previous low level.

No less important than the unemployment rate is the labor force participation rate. A quick recovery could leave this almost unaffected, but a prolonged period of low economic activity could leave many former employees, specifically those with lower skills, discouraged about the possibility of finding a job and exiting the labor force once their period of unemployment benefits expires. To help with this, the Israeli Employment Service has begun offering a wide variety of free online courses that could help advance some of the weaker populations, and particularly those in the periphery, towards future employment.

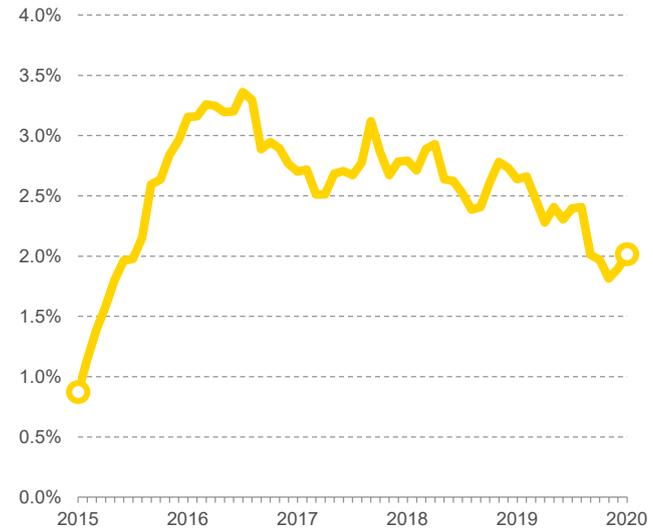
On the other hand, some may benefit from the emerging mode of “working from home.” This could affect populations that live in the periphery provided they have the necessary digital proficiency. In particular, Arab Israelis who live in the Northern villages often do not have good employment opportunities near their residences and must move away for gainful employment. This can affect education decisions early on in life, with many currently turning to community oriented subjects such as education, fields in which they believe they will be able to work near their homes. Improving infrastructures could open opportunities that would lead to more lucrative choices early on.

A steady rise in real wages in recent years

Alongside the stability in the employment and labor force participation rates, the real wage continued to rise through 2019. In 2019, as in 2018, the largest increase in wages occurred in the information and communications industry, which includes computer programming as a sub-industry. The wages in this industry rose by 7% during 2019. The rate of wage increase in this industry was the fastest in the economy since 2014 and the level of wages in this industry was second only to the mining and quarrying industry.

We will have to wait and see the extent to which the current crisis lowers wages in both the private and public sectors in 2020 and beyond.

Rate of change in real wages for employed persons
Relative to the same period in the previous year



Note: Data are seasonally adjusted. Data through August 2019.
Source: Hadas Fuchs and Gil Epstein, Taub Center | Data: BOI

Employment rates and weekly work hours for Israel's sectors and genders

Throughout 2019, the Israeli labor market maintained its relative strength. Employment rates and labor force participation rates remained high and continued to rise while unemployment rates were at all-time lows. Wages continued to rise (as shown on pages 49 and 85). The number of job openings declined although they continued to be high.

For the overall population, average employment rates for men and women in Israel were close to the median for the OECD countries — a little below the mean for men and far above for women. Employment rates for non-Haredi Jewish men and women and for Haredi women were ranked high, despite the particularly high fertility rates in Israel (much higher than in any other OECD country for all population groups — see *A Picture of the Nation 2019*, page 26). At the same time, employment rates for Haredi men and for Arab Israeli men and women were low. Low employment for Arab Israeli men stemmed from the type of work they do which is particularly physically demanding (construction and manufacturing) resulting in their leaving the labor

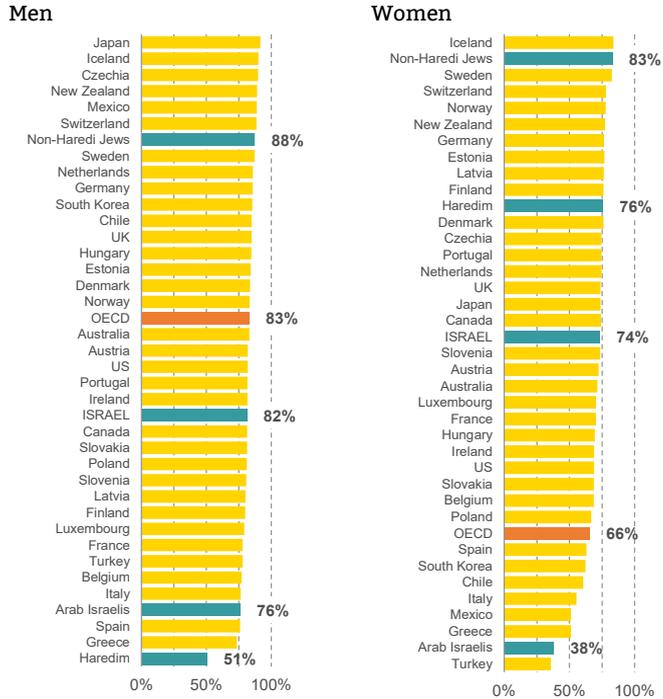
market at relatively young ages. Employment rates for these three groups were lower than the 2020 targets set by the government in 2010, and there was no significant change in these rates in the course of 2019.

Non-Haredi Jewish men and Arab Israeli men also worked long hours on average in an international comparison, and the number of work hours for women was similar to the OECD median. Among Haredi men and Arab Israeli women, in addition to their low employment rates, their average weekly work hours were also quite low. While Haredi women had relatively high employment rates, their average work hours were particularly low and ranked almost at the bottom of the list. The high employment rate and high number of work hours seen among non-Haredi Jewish men makes the work-life balance in Israel difficult relative to the OECD, and, in fact, the OECD has ranked Israel in the 4th lowest place in terms of work-life balance.

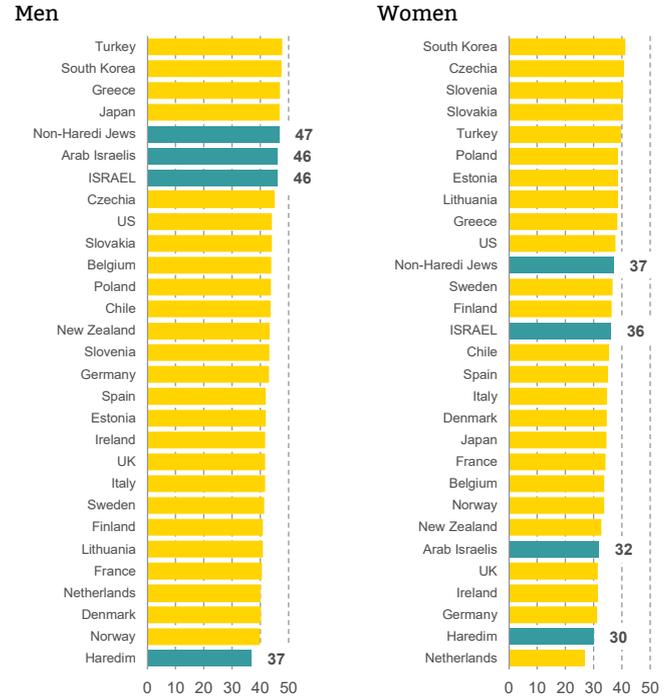
As of this writing, it is still unclear how these figures and international comparisons will change as a result of the effects coronavirus is having internationally.

Source: Hadas Fuchs and Gil Epstein, Taub Center | Data: CBS; OECD; PIAAC

Employment rates among 25-64-year-olds, 2018



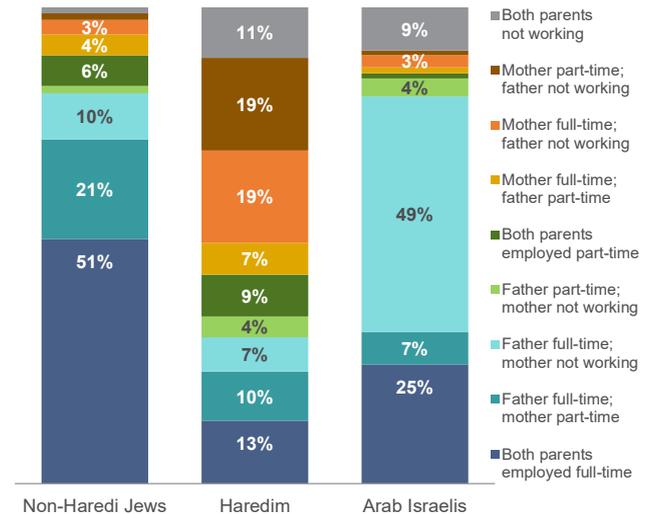
Average weekly work hours, ages 25-64, 2014-2015



Massive differences in family employment structure across sectors

For the most part, the family structure for those aged 25-64 is a coupled relationship. About half of the population in this age range live in a household with children under the age of 18, and about 71% of them are a couple. Among heterosexual, non-Haredi Jewish couples with children, in more than half of these households both members of the couple were employed full-time, and in about 83% of the households both worked. In Haredi households, both members of the couple worked in about 39% of households and among Arab Israelis, the figure is 34%. In about 39% of Haredi households, only the woman worked, and in about 53% of Arab Israeli households, the man was the sole wage earner. In 45% of Haredi households, the mother worked more hours than the father. In 43% of Haredi households, neither member of the couple worked full-time; this contrasts with 11% of non-Haredi Jewish households and 15% of Arab Israeli households.

Household structure for families with at least one child under 18, 2017

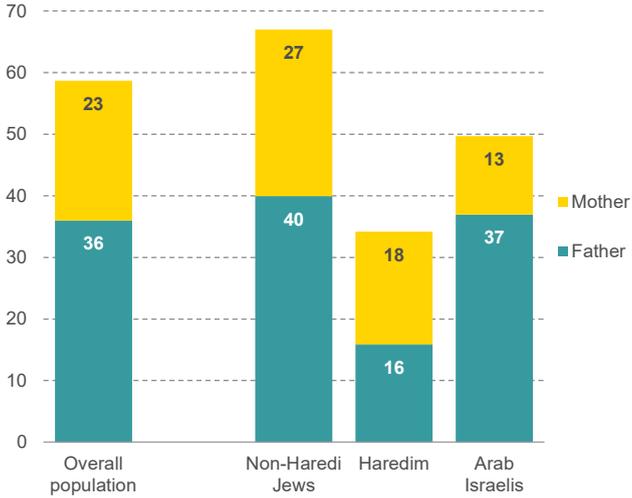


Source: Hadas Fuchs and Gil Epstein, Taub Center | Data: CBS, *Labor Force Survey*

A Haredi couple works less than one full-time job, while a non-Haredi Jewish couple works almost two jobs

The average number of work hours for a coupled household with children was 59 weekly hours. Here, too, there are large differences between sectors: among non-Haredi Jewish households, the average number of work hours was 67 hours, while 40% of those hours were worked by the mother and 60% by the father. Among Arab Israelis, the average number of weekly work hours in a coupled household was 50 — where the mother worked 26% of those hours. Among Haredi households, the combined average work hours was only 34 — less than one full-time employment position — which was divided almost equally between the couple.

Average cumulative weekly work hours of parents with children, 2017

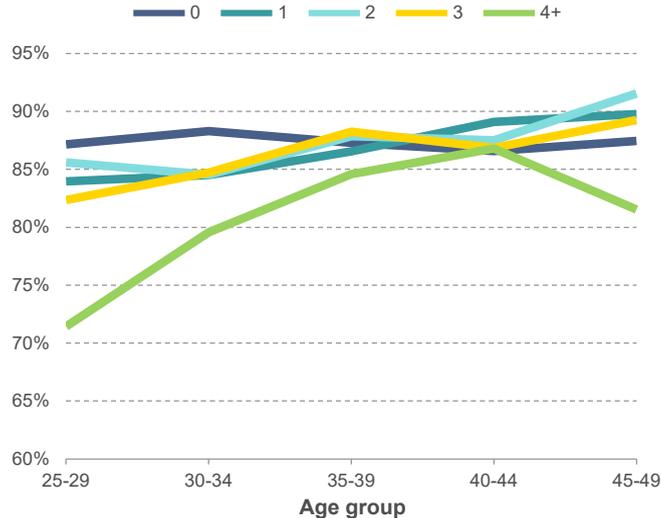


Source: Hadas Fuchs and Gil Epstein, Taub Center | Data: CBS, Labor Force Survey

Israeli women tend to continue working after having children, but work fewer hours

The employment rate for Israeli mothers has risen over the past few years, and, pre-coronavirus, even mothers of young children worked at high rates. The likelihood of employment by number of children was very similar for those women with no children and mothers of 1 to 3 children; in other words, women stayed in the labor force even after they started their families. With that, the average number of weekly work hours decreased as the number of children increased, and especially following the birth of the first child. That is, despite the relatively small changes in the employment rates of young mothers and their tendency to remain in the labor market, mothers still decreased their weekly work hours. The typically long work hours in the Israeli labor market make the work-life balance difficult, and it seems that women continue to be the principal caregivers and are most often the ones who decrease their work hours in order to be available for childcare.

Probability of employment among non-Haredi Jewish women by number of children, 2017



Note: Probability is calculated by a logistic regression analysis, including controls for country of origin, education level, and family status.

Source: Hadas Fuchs and Gil Epstein, Taub Center | Data: CBS, Labor Force Survey



Spotlight

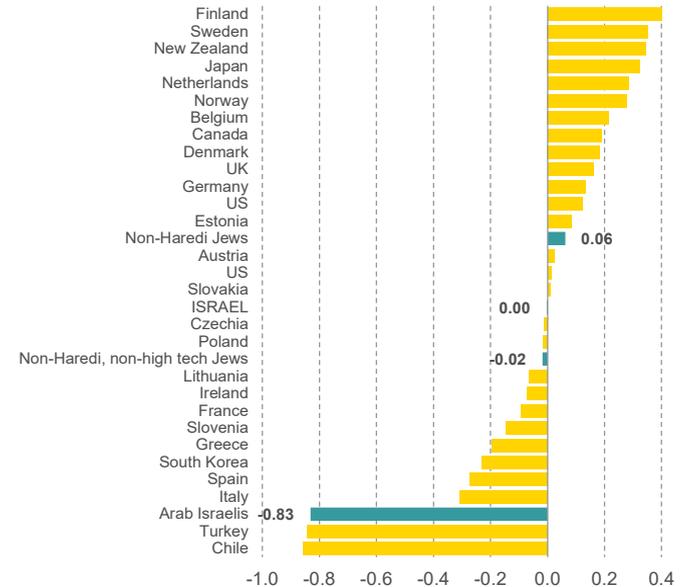
Highly Skilled Workers in Israel

The set of comparisons in this section indicate that human capital potential in Israel is being used more effectively than in other countries and that the wages of highly skilled workers in Israel are relatively close to those paid in other developed countries. Alongside this finding, a large share of the working-age population in Israel have exceptionally low skill levels with concomitant low wages. The analysis emphasizes the need to improve skill levels in the general population, although it appears that increasing accessibility to higher education is not a sufficient answer. Rather, vocational training along with improvements in the education system at younger ages is a key to raising skill levels.

For high-skilled workers, skill level of non-Haredi Jews are similar to the OECD average; below average for Arab Israelis

The Survey of Adult Skills (PIAAC) allows an examination of the characteristics of workers identified as highly skilled — which we define as those in the top 20% of the skills distribution according to the survey. About 60% of those who work in high tech in Israel are in this group. About 95% of this group are non-Haredi Jews, a much higher rate than their share in the population. Their skills are similar to the average of those in the highest skill quintile in all OECD countries on average, but lower when compared only to those in the most highly developed OECD countries. Looking at just the highest achieving 5-10% does not change this picture and does not indicate extraordinary skill levels relative to their peers in other countries. Examining those workers in the top 20% skill level among the Arab Israeli population shows a particularly troubling picture; their level matches the achievement level of the 60th skill percentile in the Jewish population.

Skill level of workers in the highest skill quintile
Relative to the OECD average, in standard deviation units, workers ages 25-64



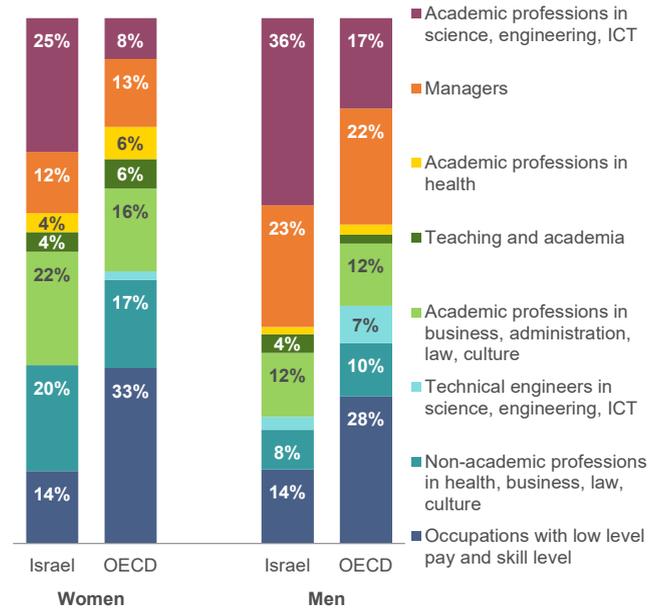
Note: For Israel, the highest skill quintile out of each population group. All economic sectors.

Source: Gilad Brand, Taub Center | Data: OECD, PIAAC

Highly skilled Israelis are more likely to be employed in professions that utilize their skills

A look at the job distribution of the most highly skilled Israeli workers gives an indication of the source of the deep divide between the quality of their work and that of highly skilled employees in other selected OECD countries (see footnote to the figure for a list of the countries selected). Among the population of the highly skilled, and in comparison with the highly skilled in other highly developed countries, a high share of Israelis are employed in engineering, science, and information and communications technology (ICT) industries and a relatively low share of them work in areas that do not require a high skill level and offer low financial remuneration (men and women alike). This, of course, affects the salaries of the highly skilled, as shown on the next page.

Occupational distribution among workers in the highest skill quintile



Note: Selected OECD countries are: Belgium, Denmark, France, Ireland, Japan, the Netherlands, Norway, South Korea, and the UK. Business sector only.
Source: Gilad Brand, Taub Center | Data: OECD, PIAAC

The “quality” of employment for highly skilled workers in Israel is higher than in other countries

Using the adjusted average wage in the OECD countries in various industries and professions (at the 2-digit classification level) as an index to indicate the “quality” of employment, it becomes clear that despite the less than stellar achievements of the highest skilled Israelis relative to their peers in the OECD on the PIAAC skill survey, Israeli workers manage to integrate more successfully than their peers into high-quality jobs as suggested on the previous page. It is possible that the disconnect is due to skills and abilities that are not well tested by such a survey, such as initiative, creativity, and the like, but are well compensated in the labor market.

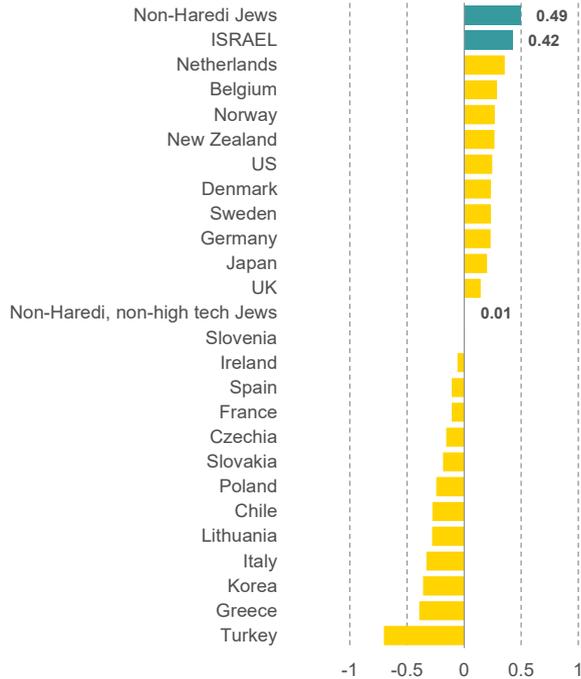
Note: Business sector only.

Source: Gilad Brand, Taub Center | Data: OECD, PIAAC

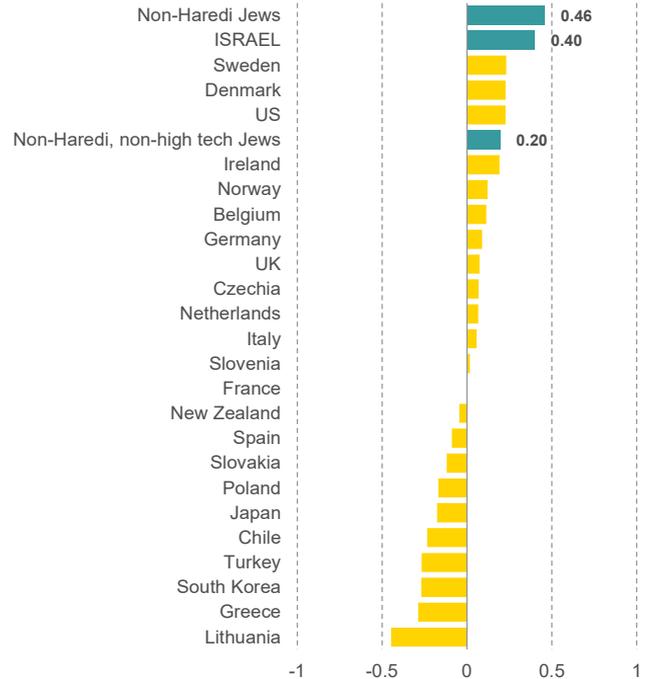
Employment “quality” index

Highest skill quintile, in standard deviation units, relative to the OECD average

Men



Women



An increase in skills for highly skilled individuals increases wages more than in other countries

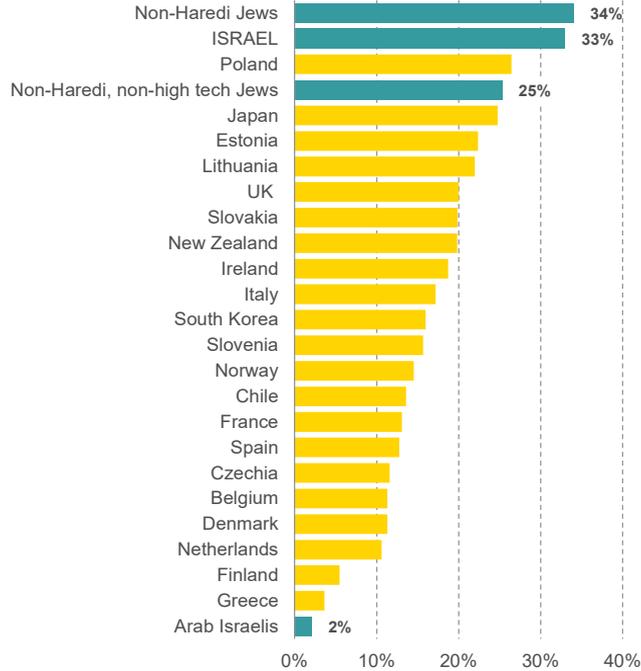
The labor market success of highly skilled workers in Israel is evident in the payoff for particularly high skill levels as well. It appears that in Israel, the return to high skills is unusually high. For instance, a rise in skill level of one standard deviation for an individual at the 80th skill level percentile boosts their skill level to the 99th percentile, which translates into a wage rise of 33% for men and 26% for women. This is a hefty addition in international terms, especially for men.

Note: For Israel, the highest skill quintile out of each population group.
Business sector only.
Source: Gilad Brand, Taub Center | Data: OECD, PIAAC

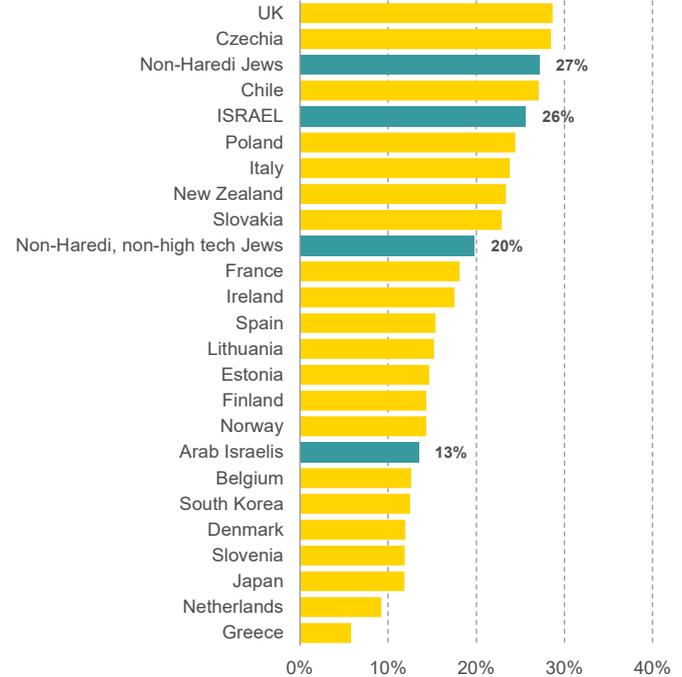
Returns to skills: Addition in percent to hourly wage following an increase of one standard deviation in skill level for workers at the highest skill quintile

Workers in the 80th skill percentile, controlling for formal education and observable characteristics

Men



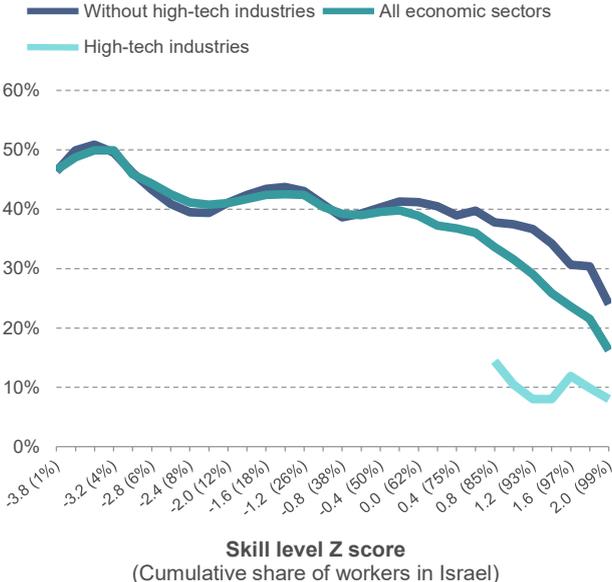
Women



Wage gaps relative to the OECD decrease as skill levels increase

As a result of the success of highly skilled workers in Israel in the labor market, the wage gaps between them and their peers in other countries is relatively small. The comparison in the figure shows the wage gaps between workers in Israel, and foreign workers at various skill levels. At the lower skill levels, wage levels are about 40-50% lower than those of their peers in the OECD. This gap narrows considerably at the higher skill levels, and wages of highly skilled workers in Israel are relatively close to those of higher skilled workers in the OECD. Within the high tech world, wage gaps are small.

Hourly wage gap between Israel and selected OECD countries, by skill level

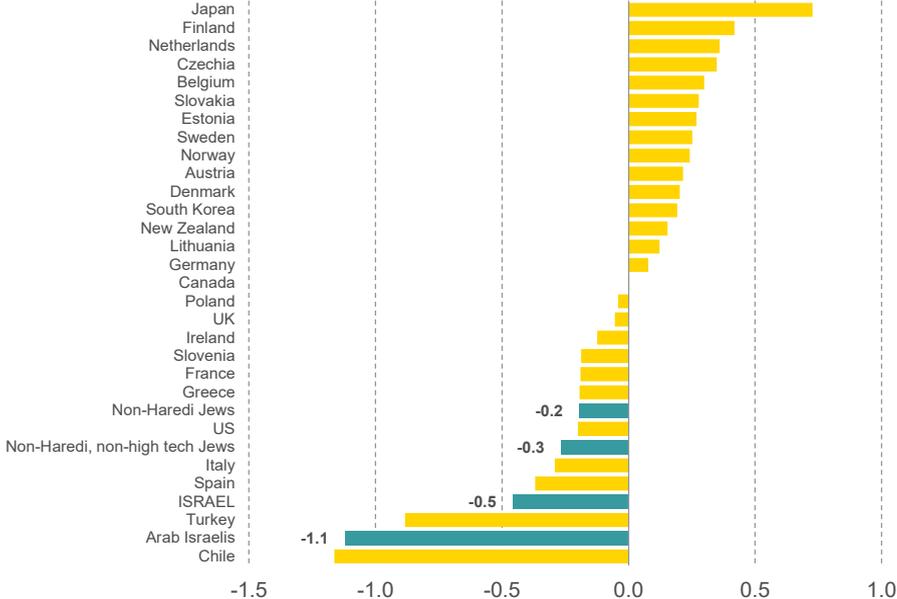


Note: Controlling for gender and age. Selected OECD countries are: Belgium, Denmark, France, Ireland, Japan, the Netherlands, New Zealand, Norway, South Korea, and the UK.
 Source: Gilad Brand, Taub Center | Data: OECD, PIAAC

The skill level of workers in the lower half of the skill distribution in Israel is below those in most OECD countries

A look at workers in the lower half of the PIAAC skill survey, that is the 50% of the population with lower skill levels, gives a less than flattering picture. The skills of those in this group are lower than those of almost all of their peers in the OECD countries that were surveyed. This is despite the fact that their education levels are relatively high, as will be shown on the next page. That is, high education levels do not seem to translate into higher skill levels.

Skill level of workers in the lower half of the skill distribution
Relative to the OECD average, in standard deviation units, workers ages 25-64



Note: For Israel, the lower half of the skill distribution out of each population group. All economic sectors.
Source: Gilad Brand, Taub Center | Data: OECD, PIAAC

Low-skilled workers in Israel are highly educated

As has been noted, the proportion of individuals completing higher education in Israel is high, even for those workers with lower skills. The labor market, though, does not compensate those with high education and relatively low skills well (see *A Picture of the Nation 2019*, pages 42-43). For this half of the non-Haredi Jewish population, returns to academic education are close to zero. This demonstrates the difficulty in narrowing wage gaps through increased accessibility to higher education. A possible explanation for this is that deficiencies in early education cannot be fully compensated for at later stages. In order to ensure high returns for higher education in the future, an improvement in the skill level at young ages is required.

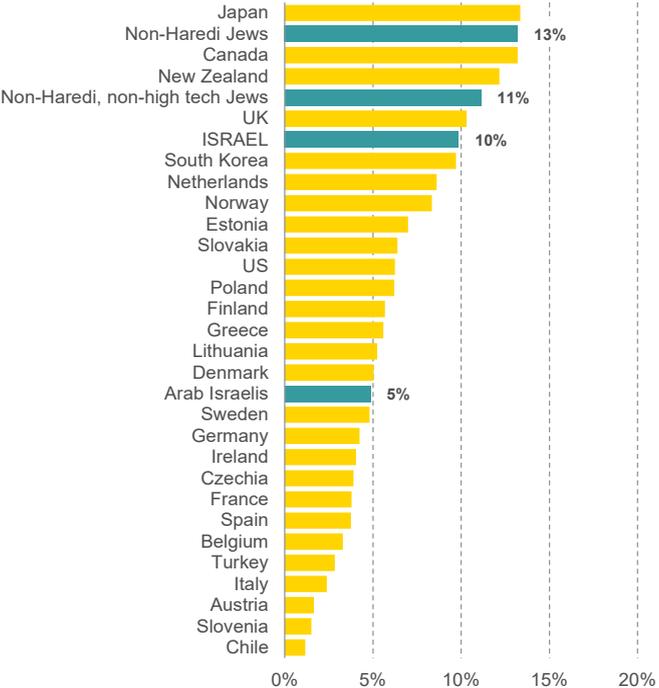
Note: For Israel, the lower half of the skill distribution out of each population group. All economic sectors.

Source: Gilad Brand, Taub Center | Data: OECD, PIAAC

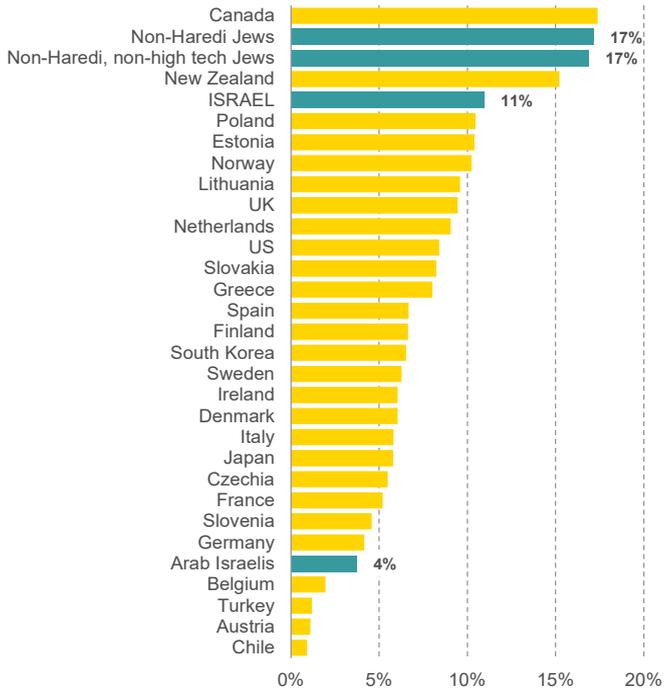
Share of those in the lower half of the skill distribution with higher education

Workers ages 25-64

Men



Women





Spotlight

The Future Labor Market

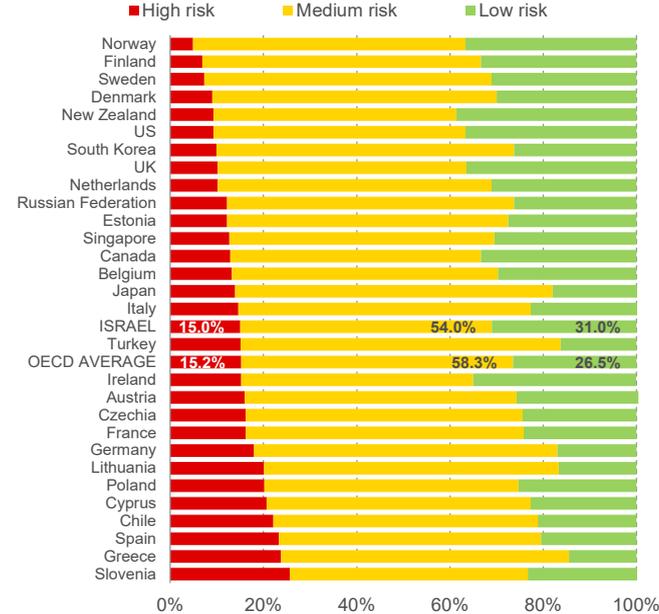
It has long been recognized that as a result of automation the labor market has been changing and will continue to evolve. While fears of widespread unemployment because of a lack of available job positions (once the effects of coronavirus subside) is probably unrealistic, it is clear that some types of jobs requiring certain skills will likely become less in demand, but that others will be increasingly sought after. In this section we analyze the Israeli labor force with respect to the appropriateness of workers' skill sets for this future labor market.

It is possible that as a result of the coronavirus pandemic, the process of automation will be accelerated. An ability to work remotely has already been proven, but only for some types of occupations. This reality increases the need to invest in training programs aimed at enhancing human capital, particularly for those with low skills, by offering programs that help develop skills and abilities aimed at the future labor market.

The portion of workers at high risk of losing their jobs to automation in Israel is similar to the OECD average

The entry of new technologies into the labor market has had the effect of replacing a good number of jobs done by workers with automation. This process emphasizes the importance of skills and abilities that, as yet, have no technological replacement, like functions that require flexibility, creativity, and judgment. An updated mapping of the Israeli labor market, based on the frequency with which workers use those skills considered essential for the future labor market, shows that the share of positions at risk of automation among workers of prime working age stands at about 15% – similar to the OECD average. The share of positions at low risk of automation in Israel is about 31% – higher than the OECD average.

Mapping the labor market by risk of automation
Workers ages 25-65



Source: Shavit Madhala, Taub Center | Data: OECD, PIAAC, 2012; 2015

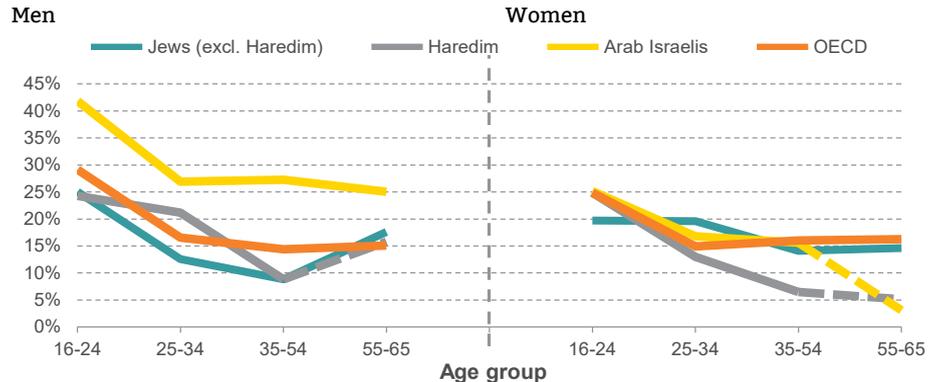
Younger workers and Arab Israeli men have a higher risk of losing jobs to automation

Like the differences in the frequency with which workers use skills that match the future labor market, there are also differences in risk levels among workers according to their age group, level of schooling, gender, and population group. Among most of the population groups, it seems that younger workers – between the ages of 16 and 24 – are those at the highest risk level. This phenomenon is seen not just in Israel, but also in the other OECD countries. Among all groups, the one that stands out the most is Arab Israeli men of all ages. More than half of them work in manufacturing, construction, and machine operation with a high risk of automation (see the next page). This is more than double the share of Jewish men working in these occupations.

In terms of gender, it seems that non-Haredi Jewish women of prime working age work in jobs at higher risk of automation than men; this is true also after controlling for socio-demographic variables. This is in contrast to the Arab Israeli and Haredi populations, where the gender differences work in favor of women.

Share of jobs at high risk of automation

By sector, age, and gender



Note: The data for Haredi men and women and Arab Israeli women ages 55-65 are based on a small number of observations.

Source: Shavit Madhala, Taub Center | Data: OECD, PIAAC, 2012; 2015

Construction, manufacturing, and transportation jobs are the most likely to be lost to automation

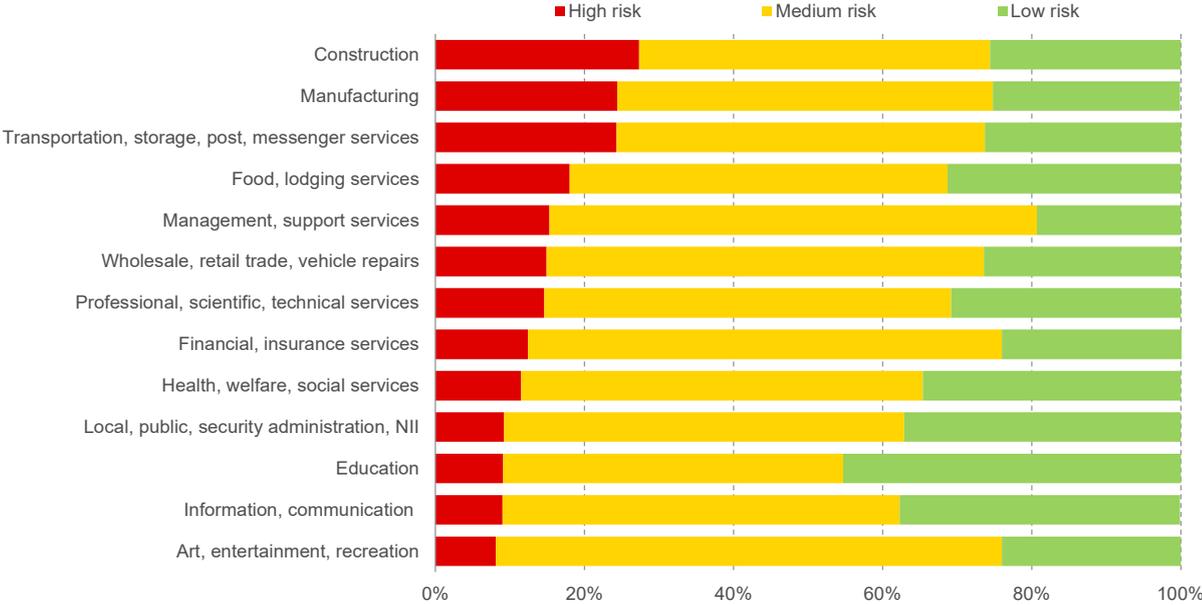
Looking at the various employment sectors and the composition of jobs relative to projected risk of automation levels shows that the construction, manufacturing, transportation and storage, and food and lodging industries have the highest levels of jobs at risk. In contrast, lower risk levels are found in industries that are characterized by skill requirements that include creative thinking, complex problem solving, and social skills such as artistic abilities, entertainment and recreational activities, information and communications, and the field of education.

A closer look at a more detailed list of occupations shows that those jobs requiring an interaction with machines, such as machine operators, and clerical jobs such as registrars are characterized by a high risk of automation. In contrast, occupations requiring higher education, training, and social intelligence, like managers, and academic occupations like teaching and those in the legal professions, are characterized by low levels of risk.

It is important to bear in mind that technological advances aside, the supply and demand for various workers in the market are likely to be influenced by policy as well as external factors. For instance, during the current coronavirus crisis, medical and emergency personnel — positions whose place in the future labor market are assured — have been deemed essential, but so have some workers whose occupations are classified as being at high risk of automation in the future labor market — occupations such as supermarket cashiers and shelf-stockers — and they, too, were instructed to continue working as usual. Had the expected technological developments already existed, fewer employees would have been endangered in the course of their work in these occupations. In the aftermath of the crisis, there could be additional changes in the types of jobs the market requires. For instance, the rise in the number of people who will be seeking new employment may increase the need for employment advisors and employment agencies.

Distribution of jobs in Israel by industry and risk of automation

Workers ages 25-65



Source: Shavit Madhala, Taub Center | Data: OECD, PIAAC, 2015

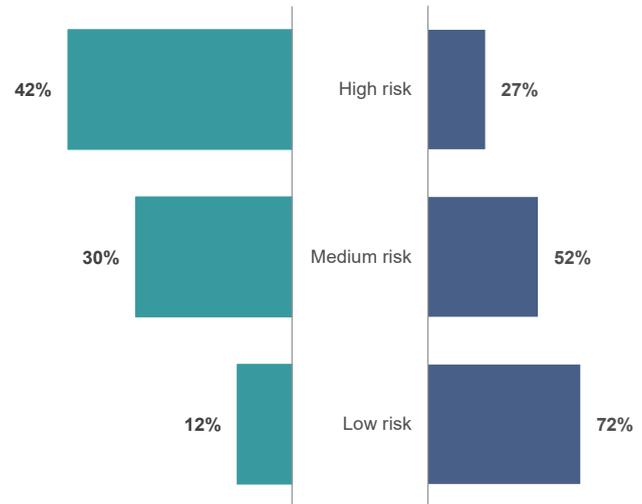
Employment in jobs that require higher education are more secure

There is a negative link between education level and occupational risk level. This figure demonstrates this relationship by showing the educational requirements for jobs with different risk levels. As shown, about 72% of those occupations at low risk require higher education, while for occupations at high risk, only 27% require higher education. Similarly, about 42% of workers in high risk jobs work in jobs that do not require any formal education at all, in contrast with 12% among workers at low risk.

Educational requirement of jobs, by risk level
Workers ages 25-65

Share of workers in jobs that do not require formal education

Share of workers in jobs that require higher education



Source: Shavit Madhala, Taub Center | Data: OECD, PIAAC, 2015

Low-risk workers are far more likely to use computers at work

Important skills for the future labor market involve complex problem solving, the ability to teach others and to plan for them, and the ability to influence and advise others. An additional important skill is the ability to use a computer. This figure shows the link between this skill and the level of risk of automation. Workers in occupations rated at low risk of computerization tend to make greater use of computers in their current work than those at high risk. These sizable gaps are also present across population sectors; Haredim and, in particular, Arab Israelis tend to use computers far less in their work.

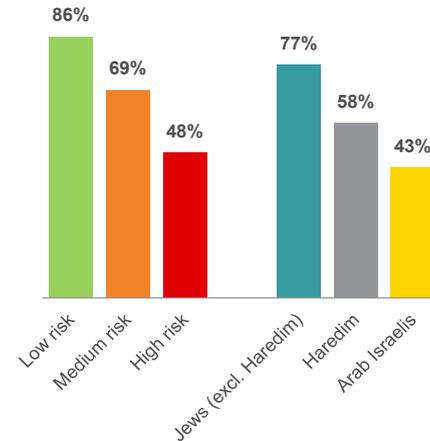
The need for computer literacy has been underlined by the current coronavirus crisis, where the ability of employers to adapt themselves to the current labor market through

virtual employment has been critical. Many workers have been forced to expand their work into a computerized setting and change their accepted way of working, like moving to virtual meetings, online sales, and even online teaching. Many businesses and workers without the arrangements and appropriate skills have been left behind. For example, retail businesses with online sales capabilities continued to function during the crisis and teachers were required to quickly adapt themselves to a labor market requiring them to teach using virtual technology.

It is still too early to estimate the impact of this crisis on various population groups, but it is safe to assume that due to differences in computer literacy, the damage will be extensive for some groups.

Share of workers who use a computer in their work

Workers ages 25-65



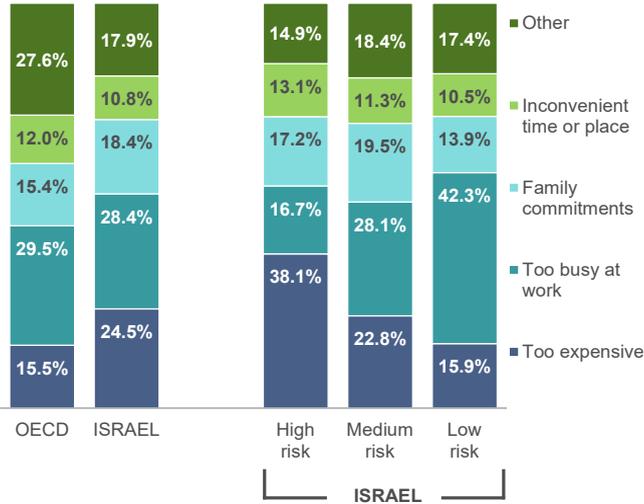
Source: Shavit Madhala, Taub Center |
Data: OECD, PIAAC, 2015

The cost of government subsidized training programs is the main reason that high-risk individuals do not participate

Expected changes require the labor force, and especially certain groups in it, to adapt to future needs. The past few years have seen increased budgetary investment in subsidized training programs run by the state. However, relative to other OECD countries, Israel's expenditure is still quite limited. Not everyone interested in studying or retraining participates in programs, though, for different reasons, as shown in the figure. Relative to the OECD, the rate of non-participation in Israel due to high costs is relatively high (about 25% claimed this was the main reason they did not retrain, versus about 16% on average in the OECD). High cost seems to be the main reason workers in occupations at high risk of automation did not participate in vocational training programs, while workers in occupations at medium or low risk most often cited the lack of time due to work demands as their major reason for not participating. The current crisis presented an opportunity, and the government stepped in and offered online training courses for those confined to their homes. Careful consideration must be given to the method of imparting essential skills as well as the optimal stage at which to do so. It seems advisable to teach these skills sooner rather than later, at early stages in the education system.

The main reason for not participating in studies or vocational training

Workers ages 25-65



Note: For those respondents who were interested in participating in studies or vocational training in the last 12 months but did not do so.

Source: Shavit Madhala, Taub Center | Data: OECD, PIAAC, 2012; 2015



Education

In the wake of the coronavirus, the education system, like other socioeconomic systems, has experienced a deep crisis unlike any it has known in the past. This crisis may instigate real revolution in the education system. It appears that the use of digital technologies for long-distance learning — the computer, tablet, and telephone — will become integral parts of the education system, while the classroom and school playground will be focal centers for social contact. Concurrently, it will become clear that there are different ways to pass on knowledge, and to impart academic skills, but there is no substitute for the school as a place for social interaction, and for the acquisition of those skills that are often considered “informal” and of lesser educational value. This type of revolution will require a redesign of the education profession and a new approach to the training of teachers. Teachers will be more than just a source of knowledge; they also will be the “responsible adult” and the experienced guide for their students. If and when teachers are able to use this opportunity that is before them, they will be able to strengthen their professional status, reinforce their contribution to the education system and the diversity of its programs, and hence to contribute to an unprecedented democratization of the education system, which is currently highly centralized.

This “revolution” entails both possibilities and real dangers. Unless some underlying conditions change, populations from different socioeconomic backgrounds will be unable to benefit equally from this new type of learning situation, because of differential access to things like home computers, the internet with sufficient bandwidth, a home environment that is amenable to study, and parents with the ability and availability to help their children with their studies. The main danger is that at the beginning, at least, more digitalized instruction is likely to increase the educational gaps between students from different economic backgrounds. In addition, school closures may significantly affect children from weaker socioeconomic groups for whom school represented a safe space and sometimes their only source for a hot meal.

Prior to the coronavirus crisis, there were substantial augmentations throughout the education system, including increases in expenditures, teachers, and classrooms. Students benefited, teachers benefited, and it is highly likely that the Israeli economy will ultimately benefit. There were also numerous signs that educational (and employment) gaps had been closing. However, these signs were not universal, and some serious concerns existed, particularly when comparing performance in the Hebrew and the Arab education system schools.

The figures that follow present a picture of changes in the education system before the coronavirus crisis.

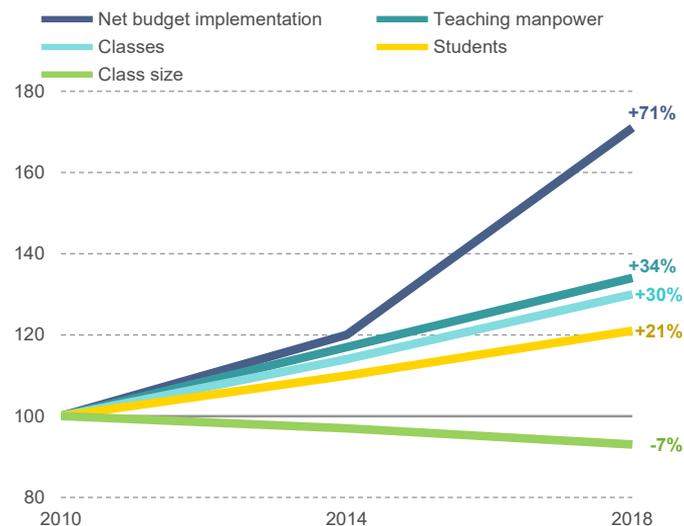
An expanding education system

Since 2010, the education budget has grown faster than the number of teachers (as a result of some recent agreements with the teachers' unions, implementation of compulsory education for 3-4-year-olds, and other changes), the number of teachers has grown faster than the number of classes, and the number of classes has grown faster than the number of students (although not precisely as expected, as presented on the next page). These processes made it possible to decrease class size and increase the per class and per student allocation. During this period, there was also an improvement in student achievements, and a narrowing of gaps in the system on the Meitzav and bagrut (matriculation) exams. Despite this, the latest PISA exams show a decline in the performance of Arab Israeli students, a result that requires further examination since this decline is in the opposite direction of other, positive developments, as discussed on page 120-121.

All of these positive developments are likely to stop or, at the very least, slow their pace over the coming years due to anticipated budget cuts in public services that will be required to overcome the serious damage to the economy due to the coronavirus.

Budget, teachers, classes, and students

Index year: 2010 = 100



Note: Students are from preschool through high school.

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

Israel's four education systems: projections vs. reality

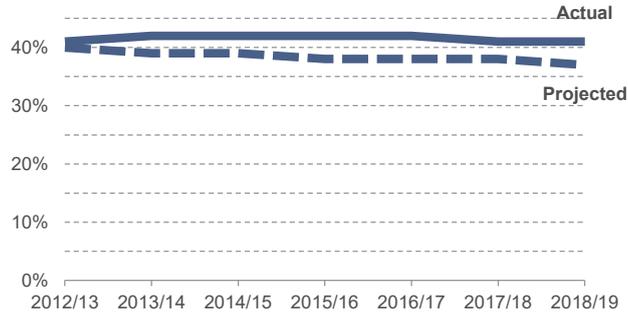
The demographic composition of the education system, and, in particular, the growth in the share of Arab Israeli and Haredi students, has received a great deal of public attention. These figures illustrate the difficulties in making accurate forecasts. In 2013, the Central Bureau of Statistics projected that the share of 1st grade students would decline continually in the Hebrew State education system, would increase in the Hebrew State-religious system and Haredi system, and would not change in the Arab education system.

In actuality, the share of students in the State education system remained stable, in the State-religious and Haredi systems it rose by 1% (less than projected), and the share in the Arab education system fell by 2%. The discrepancies have largely resulted from movement between education systems, and, in particular, net movement into less religious schools, as well as changes in fertility in the Arab Israeli and secular Jewish populations.

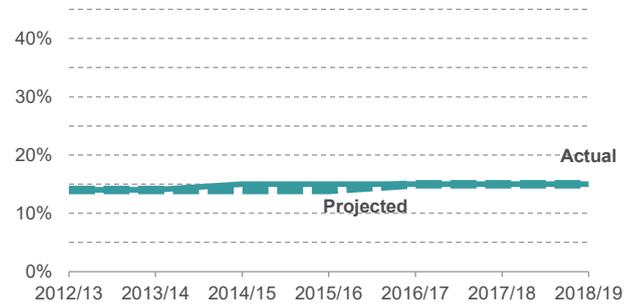
Source: Nachum Blass, Taub Center | Data: CBS

Share of 1st grade students in each supervisory authority out of all 1st grade students

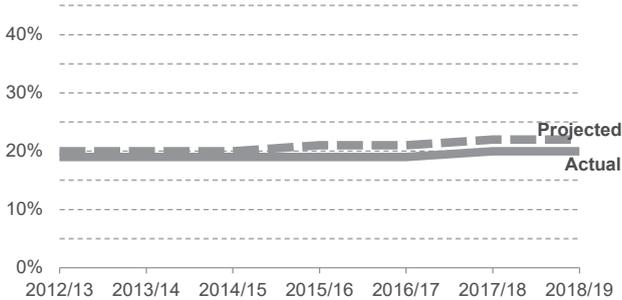
Hebrew State schools



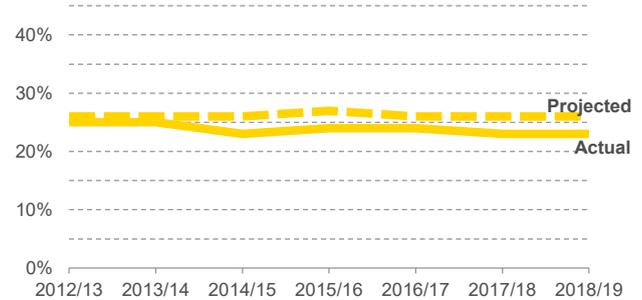
Hebrew State-religious schools



Haredi schools



Arab schools

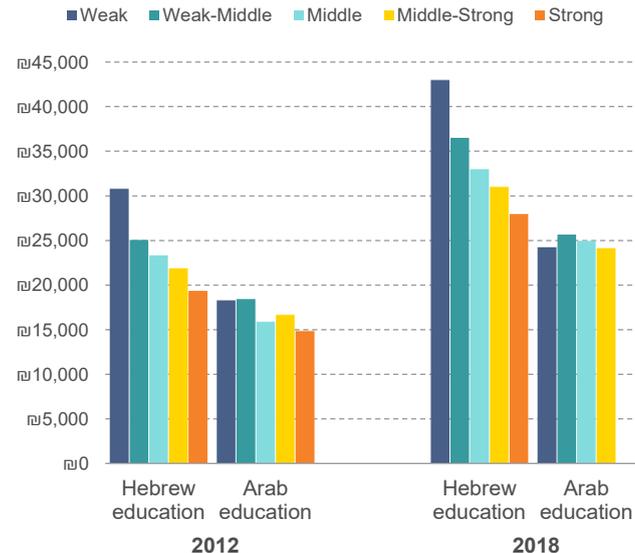


More per student expenditure in high schools and an increased gap between Hebrew and Arab schools

From 2012 to 2018, the budget per student in high schools grew substantially. During this period, the budget per student in high schools increased in the Hebrew education system by about 42%, and in the Arab system by about 38%. In the Hebrew system, budgets increased by about the same rates across all schools, while in the Arab system, budgets increased more in those schools with relatively stronger socioeconomic populations. The gap between the average budget in Hebrew education and in Arab education was about 26% with more budget for Hebrew education in 2012; by 2018, this gap grew to 29% more in Hebrew education.

It is interesting to note that in the Hebrew education system, school budgets increase as the socioeconomic level of the school declines (as the Nurture Index rises), while this is not the case in the Arab education system. The main reason for the difference is the relatively small differences in Nurture Index variables in schools within the Arab sector. Most Arab schools have very high Nurture Indices and the few with a lower Nurture Index tend to focus on lower-cost academic subjects.

Budget per student in high school by Nurture Index quintile and education sector



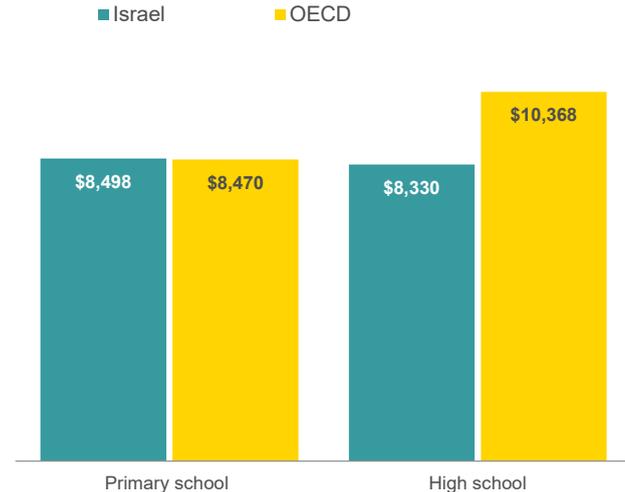
Source: Nachum Blass, Taub Center | Data: Ministry of Education

Closing the education budgetary gap with the OECD

The public discourse on education expenditures in Israel usually focuses on comparisons to other countries, such as the US, Finland, and Japan. However, due to the large differences between Israel and these countries in size, children as a share of the total population, and ability to allocate resources to education, as well as different outlooks on education, and the state's role in it, such comparisons are problematic. In view of the difficulty in finding one or more countries with whom a meaningful comparison can be made, comparisons in per student expenditure in Israel are made to the OECD average.

As shown, the recent teachers' agreements, the decrease in class size, and differential budgeting have led to a situation in which the expenditure per student in terms of purchasing power parity (PPP) in the primary schools reached the OECD average. However, the gap remains large in high schools, although it is expected to narrow with the full implementation of this sector's new wage agreements.

Per student expenditure, 2016
PPP dollars



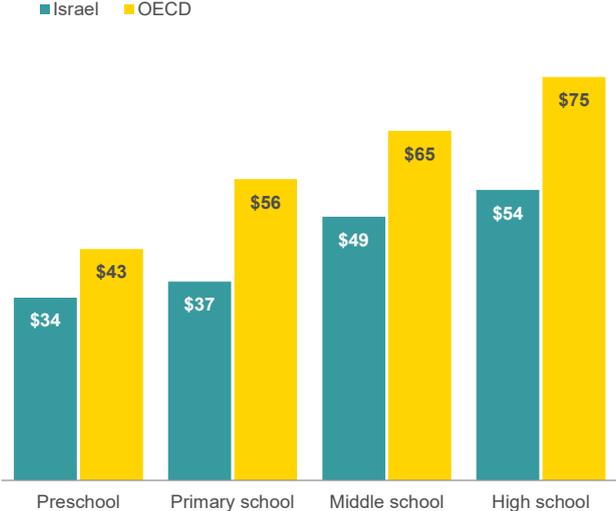
Source: Nachum Blass, Taub Center | Data: *Education at a Glance 2019*, Table C.1.1.

Large gaps in wage per frontal instruction hour relative to the OECD remain, especially for newer teachers

Controlling for the number of frontal instruction hours, there is a significant gap in the hourly wage rate between Israel and the average in other OECD countries. This is shown in this figure for teachers with 15 years of experience. As seen, the rate is significantly lower in Israel at all education levels, particularly at the high school level.

Teachers' wages are higher in the OECD in PPP terms than in Israel with a particularly large gap for beginning teachers in primary schools. Thus, for example, while the annual salary of a beginning primary school teacher in Israel is \$21,276 in PPP dollars, the comparable wage in the OECD is \$32,058. That gap nearly closes for a teacher with maximum seniority (\$53,639 in Israel vs. \$55,364 in the OECD). For high school teachers, the corresponding figures are \$22,629 vs. \$35,859, and \$54,969 vs. \$60,677. It is important to note, however, that full seniority in Israel is reached only after 32 years in the system, far longer than in most developed countries.

Net wage per instruction hour, 2018
Teachers with 15 years of experience, PPP dollars



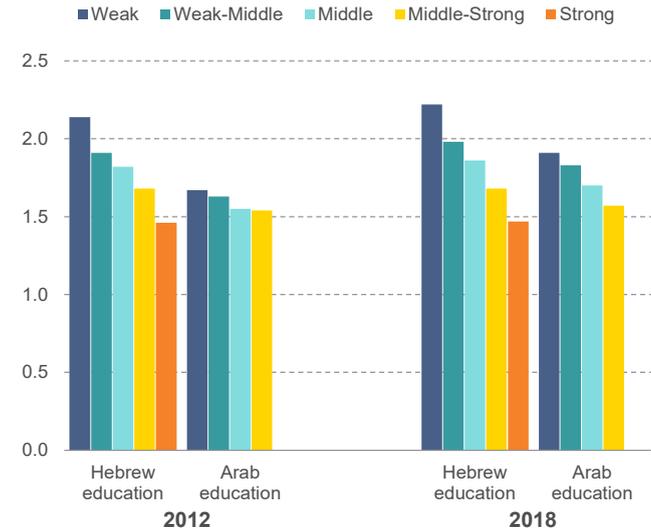
Source: Nachum Blass, Taub Center | Data: *Education at a Glance 2019*, Table D.3.3.a.

Increase in the number of per student hours in primary school classrooms

Between 2012 and 2018, the average number of hours per student in the classroom in Official primary Hebrew education (not including special education) grew only slightly (by about 2%) with the greatest increase in schools serving weaker population groups. In Arab Official primary education as well, the increase in the number of classroom hours (about 13%) was centered more on schools serving weaker population groups.

These data do not reflect the situation in Recognized education where budgets grew a great deal more. While the distinction between Official and Recognized education is mostly a legal one, it also reflects to a great degree the differences between public and private education — where Official education is public and Recognized education is, for the most part, private education.

Average hours per student in Official regular primary education



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

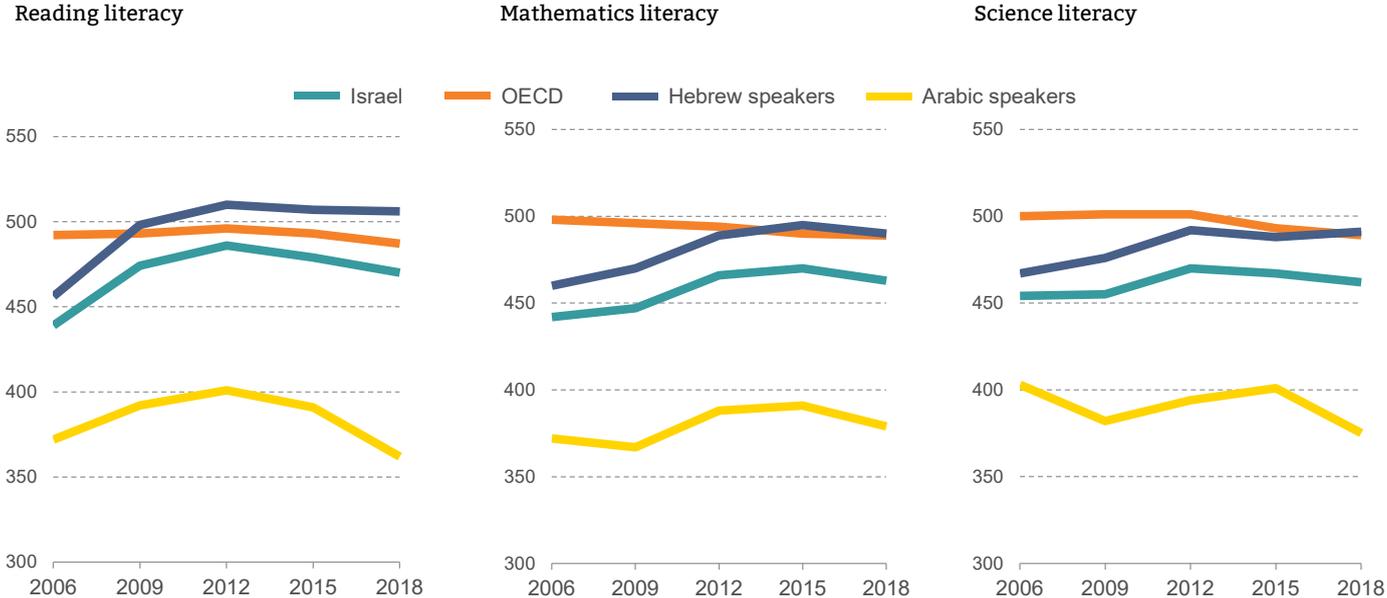
Sharp fall in PISA 2018 scores among Arab Israelis

A comparison of Israeli student scores on the PISA exams in mathematics, reading, and science to their OECD peers shows a number of things. First, on average, the OECD average scores remained stable with a slight decline since 2006, while for the overall Israeli student population there was a rise in scores from 2006 to 2012, with a slight decline since 2012. When Israeli students are divided by sector, we note first the large gap between the Hebrew-speaking students and the Arabic-speaking students; while the grades of the Hebrew-speaking students are slightly higher than the OECD average, those of the Arabic-speaking students are well below the OECD average.

In addition, the trends are different. While for students in Hebrew education, scores rose between 2006 and 2012 and were stable between 2012 and 2018, for students in Arab education, there was a tendency for scores to increase between 2009 and 2015, and there was a sharp decline between 2015 and 2018.

These data showing an increasing gap between Hebrew-speaking students and Arabic-speaking students stand in sharp contrast to other data that indicate a closing of gaps in budgeting, a marked decrease in dropout rates in the Arab education system (see the next page) and significant improvement in standardized Meitzav exam and bagrut (matriculation) exam scores (particularly for girls). This contradiction requires further exploration and follow-up.

Scores on international PISA exams



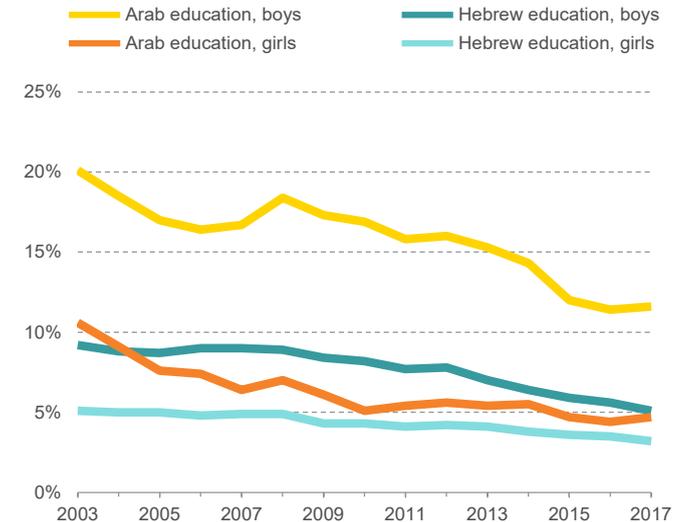
Source: Nachum Blass, Taub Center | Data: RAMA, 2019

Falling high school dropout rates; lower for girls and in the Hebrew education system

Excluding Haredim, for whom data are unreliable, the dropout rate from 10th to 12th grades in Israel fell from 8.7% in 2003 to 5.4% in 2017. As the rate of high school enrollment has approached 100%, each percentage point of reduction in the dropout rate becomes even more significant. Nonetheless, a dropout rate of 5.4% is still quite high, and it is important to take steps to lower it.

Dropout rates differ substantially by gender. Similar to gaps in other education indicators, gaps in dropout rates favor girls; that is, the dropout rate among girls is lower than among boys in both sectors. In addition, dropout rates in the Hebrew education sector are lower than in the Arab education sector for both genders, but with a smaller gap among girls (see the next figure). The difference between the genders exists across the various groups in Arab education — Arabs, Druze, and Bedouin. Over the years, the differences in dropout rates between the genders has narrowed in both the Hebrew and Arab education systems.

Dropout rates by gender and education sector
Excluding Haredi education



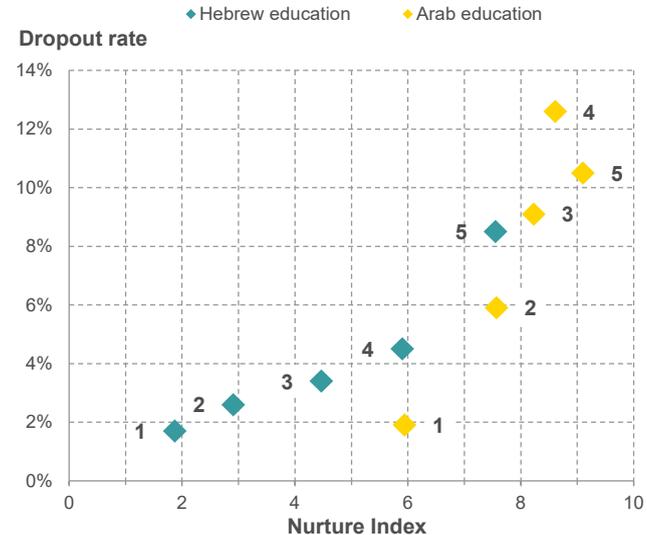
Source: Guy Yanay, Hadas Fuchs, and Nachum Blass, Taub Center |
Data: Ministry of Education

When controlling for Nurture Index, Arab high schools are more successful at keeping their students in school

For the most part, the dropout rate in high schools rises with a school's Nurture Index, signifying a lower socioeconomic level of its student body. The fact that most Arab schools serve populations with low socioeconomic statuses explains the finding on the previous page — that dropout rates are higher in Arab schools than in Hebrew schools. What is surprising is that when controlling for the Nurture Index this is reversed, with students in Arab schools dropping out less than those in Jewish schools with the same Nurture Index. Thus, for instance, the quintile with the lowest Nurture Index among Arab schools (i.e., the strongest Arab schools) has a dropout rate of only 1.9%, while the dropout rate in Hebrew schools with approximately the same Nurture Index (the 4th quintile in the Hebrew schools) was 4.5%. This finding indicates that Arab high schools are better at keeping their students in school than are Hebrew high schools.

Note: Nurture Index: 10 is the lowest socioeconomic group and 1 is the highest.
Source: Guy Yanay, Hadas Fuchs, and Nachum Blass, Taub Center |
Data: Ministry of Education

Dropout rates by education sector and school Nurture Index quintile, 2017 cohort
Excluding Haredi education



Children from birth to age 2 living in families in poverty perform more poorly on future achievement exams

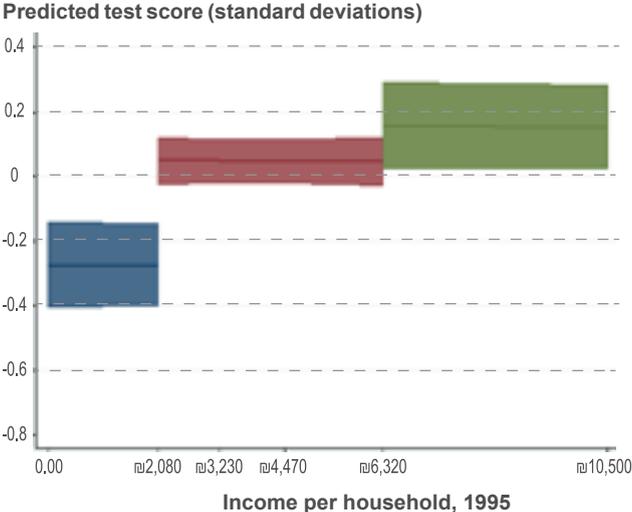
It has been shown conclusively that investments in children during early childhood are among the most productive investments available. Giving children a supportive environment and intellectual stimulation affects their success throughout life. Phenomena such as deep poverty and stress can damage a child's likelihood of succeeding later in life.

In this figure, we show the success in the standardized Meitzav exam in mathematics in 5th grade as a function of household income level during early childhood, controlling for other factors such as the income level at a later period.

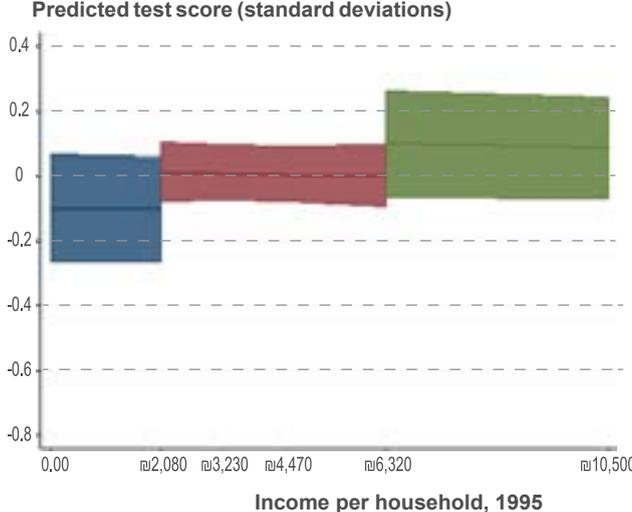
The result of the analysis demonstrates that those living in families with low incomes during their infancy (from birth to age 2) score significantly worse on these exams than other children. When, however, the period of low family income occurs when the child is between the ages of 3 and 5, the effect is weaker and not statistically significant. The same quantitative results are found for language skills in 5th grade, for the Meitzav exams in 8th grade (mathematics, language, and science), and for success on the bagrut (matriculation) exams.

Predicted score on the Meitzav exam in mathematics, 5th grade

Children, birth to age 2



Children, ages 3 to 5



Source: Dana Vaknin, Yossi Shavit, and Isaac Sasson, Taub Center | Data: CBS

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