

## Article

# The Effects of COVID-19 on Wellbeing: Evidence from Israel

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**Abstract:** Many aspects of wellbeing have been studied in the context of the COVID-19 pandemic. However, studies that measure a comprehensive, multi-faceted conceptualization of wellbeing are rare. Using a broad conceptualization of wellbeing, based on the Organisation for Economic Co-operation and Development (OECD) wellbeing indicators and a theoretical model of wellbeing developed previously, this study empirically assesses the wellbeing effects of COVID-19 in Israel. A representative sample of the adult population in Israel was surveyed and structural equation modeling (SEM) was used to analyze the impacts of the pandemic on a number of wellbeing indicators. Relationships among indicators were also analyzed. The study's findings highlight the importance of social interactions, economics, mental health, and leisure on wellbeing. The study can be used by policymakers to fully understand the impact of various COVID-19 response policies on the wellbeing of the population.

**Keywords:** wellbeing; COVID-19; Israel; systems approach; structural equation modeling



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## 1. Introduction

Wellbeing is increasingly used to assess quality of life, both on the individual and the societal levels. However, in contrast to gross domestic product (GDP) per capita, which has also been widely used to assess quality of life in countries [1], there is no agreed-upon definition of wellbeing or single set of indicators to measure it. The Organisation for Economic Co-operation and Development (OECD) adopted a set of indicators for wellbeing, comprised of short-term individual wellbeing indicators (including quality of life and material conditions indicators) and the long-term indicators of different types of capital preservation (including economic, natural, human, and social capital) [2]. On this basis, systems analysis was employed to create a general map of wellbeing indicators and identify the potential wellbeing impacts of the COVID-19 pandemic and response, based on a large body of literature [3]. However, these potential impacts have not been assessed empirically. This research builds upon the theoretical comprehensive mapping of the COVID-19 effects on wellbeing and empirically assesses these impacts in the Israeli context.

In response to the outbreak and rapid spread of COVID-19 in early 2020 many countries implemented wide-ranging restrictions to curb the pandemic. These included restrictions on the domestic and international mobility of people, lockdowns and quarantines, limitations on gatherings and social distancing requisites, as well as temporary closures of schools, businesses, and other establishments. While the timing and exact specification of the measures varied by country, most implemented these measures in some combination.

The implementation of these measures had widespread economic ramifications, but also many non-economic effects on daily life [4–9], all of which have implications on the well-being of the populace. While many aspects of these effects have been studied, there is a lack of comprehensive, integrated, and multi-dimensional analyses of the implications of the pandemic on wellbeing. This can perhaps be explained by the multi-dimensionality, complexity, and elusiveness of wellbeing (for a brief overview of the notions of wellbeing, their development and relationship to other post-GDP indicators see [3]), as identification of the implications of various measures on multiple indicators is difficult to discern.

Existing academic literature on the impact of the COVID-19 pandemic on wellbeing is varied with regards to the definition, conceptualization, and operationalization of wellbeing; the populations studied; and the mechanisms that impact wellbeing. The majority of studies have examined the effects of the COVID-19 crisis on limited components of wellbeing. For instance, many studies define wellbeing as relating to one or two underlying domains, such as mental health, physical health, life satisfaction, economic/financial wellbeing, or social relationships. Of these, studies of mental health and satisfaction (often using the World Health Organization's Well-Being Index [WHO-5] and the Warwick-Edinburgh Mental Well-being Scale [WEMWEBS]) are most common [10–19]. Furthermore, many existing studies target narrow populations, such as university students [14,16,20–22], healthcare providers [23–25], parents and/or children [26–29], or the elderly [30,31].

Finally, many studies refer to the impact of only one or a few mechanisms on wellbeing throughout the COVID-19 pandemic. For instance, Poortinga and colleagues study the impact of access to public and private green space on wellbeing during the pandemic [32] and Campisi and colleagues analyze the effects of the pandemic on use of public transport and travel in Sicily [9,33], while Cowden and colleagues show that physical suffering is associated with worsened pandemic wellbeing [34]. Other studies identify wellbeing trends without identifying the mechanisms responsible for impacting wellbeing or variables that mediate wellbeing effects. For instance, in their study of parents and children, Patrick and colleagues point to decreases in food security, mental health of parents, and the behavioral health of children as three areas particularly impacted by the pandemic [29]. Similarly, in their national study of individuals in the United States, VanderWeele and colleagues identify health, happiness, and financial stability as the areas of wellbeing most negatively impacted by the pandemic [35].

Our study is unique in its scope: wellbeing is conceptualized broadly, the general adult population in Israel is studied, and multiple mechanisms impacting and mediating the effects on wellbeing are analyzed. Using a systems-approach, recent studies have outlined the complex relations between the COVID-19 outbreak and wellbeing indicators [3,36]. We utilize these studies as a basis for empirically analyzing the wellbeing implications of the measures instituted to curb the pandemic's spread, focusing on the first two waves of COVID-19 in Israel.

#### *The COVID-19 Pandemic in Israel, March–October 2020*

Israel was quick to react to the outbreak of COVID-19. On 27 January 2020, COVID-19 was added to the list of infectious diseases. The government then ordered all entrants to remain in home isolation for 14 days and prohibited gatherings. While first only mega-gatherings were forbidden, by mid-March, the edict was extended to gatherings of more than 10 people, thereby closing schools, university campuses, and gyms. The government issued dozens of emergency regulations to contain the spread of the pandemic, including closing borders, isolating infected people, and limiting public transportation.

Israel was under general lockdown for one month (19 March–19 April 2020), in which residents were instructed to stay within 100 m of their homes, except for specified essential activities. By 4 May, the number of new cases of infection fell to only a few per day and many restrictions were gradually eased. However, due to temporary government regulations restricting employment, many employers were forced to fire employees or put them on unpaid leave. As of May 2020, more than a million workers had become

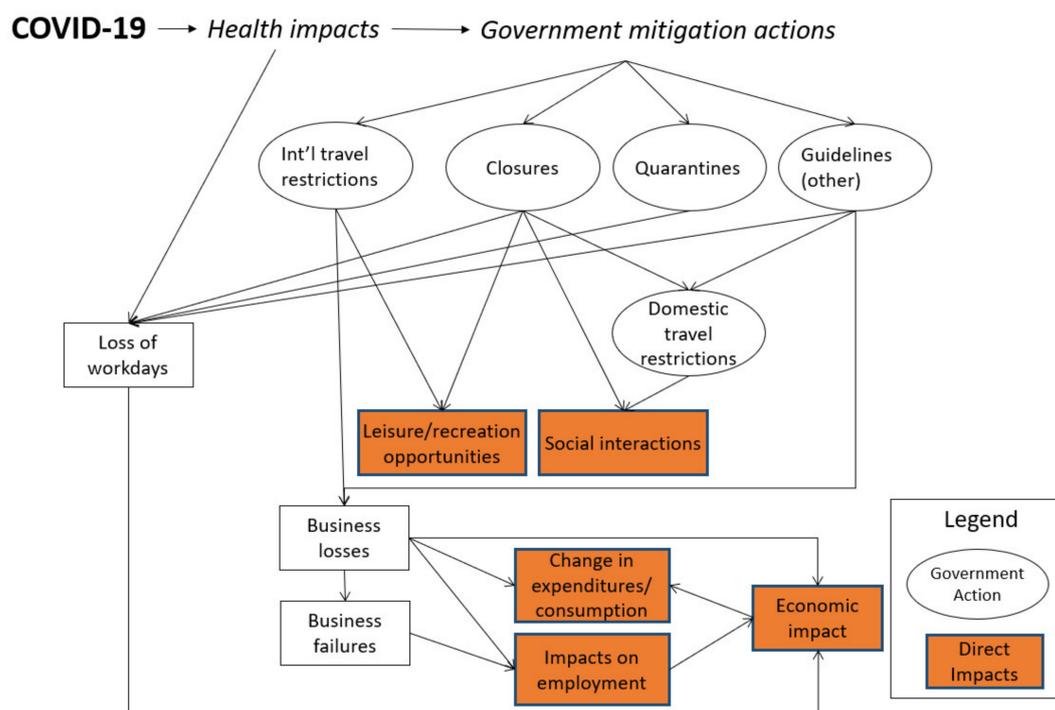
unemployed, putting the unemployment rate at about 25%. Additionally, many others saw a reduction in their hours and/or earnings.

The second wave of COVID-19 began in June 2020, after restrictions from the first wave were eased. The number of new daily infections peaked at over 9000 in September 2020. In July the government issued a small number of restrictions on gatherings and businesses. However, by mid-September, Israel had the world's highest rate of recorded COVID-19 infections per capita. The country again imposed a month-long full lockdown (18 September–18 October), this time limiting residents from traveling beyond 500 m of their home. Subsequently, restrictions were slowly lifted. The education system was opened gradually between 18 October–18 December. By the beginning of October 2020 the unemployment rate stood at 22.7%.

## 2. Materials and Methods

### 2.1. The Model

Previous studies identified the connections between COVID-19, the measures undertaken to limit its impacts, and wellbeing indicators [3,36]. In essence, these studies track the impacts of the pandemic by first identifying the health effects of COVID-19 and the impacts of measures implemented to curb the pandemic's spread. These impacts are then traced to variables that affect wellbeing indicators or the direct impacts on such indicators. Thus, the impact of the pandemic and response on wellbeing is identified by the extent to which they impact wellbeing indicators. This is depicted visually in Figure 1.



**Figure 1.** Direct Impacts: the direct impacts of the COVID-19 pandemic and response measures, as identified in previous studies [3,36].

This study looks at an additional layer, focusing on the implications of the direct impacts on other well-being indicators. These are conceptually depicted in Figure 2. While COVID-19 may well have implications on future wellbeing, this study, as with the previous systems studies, concentrates on *current* wellbeing. Thus, a sub-set of the 25 short-term individual wellbeing indicators that were outlined by the OECD are used [2]. These indicators do not contain some of the environmental wellbeing indicators included in the wellbeing map created by Illmola-Sheppard and colleagues, which served as the basis for the previous systems studies [36,37]. In addition, some modifications were made to fit the

map to the Israeli context. A leisure/recreation indicator was added [36]. Additionally, meaning in life became an indicator, whereas in the previous studies it was an intervening variable. Self-employment and the presence of young children in the household were added as mediating variables. Finally, life expectancy was changed to healthy life expectation, as health prospects are increasingly seen to be central in an epidemic context. In Figure 2 the direct impacts of COVID-19 (from Figure 1) appear with orange fill and the interactions among the wellbeing variables are indicated by arrows. However, the effects on some of the indicators are modified by intervening variables. In particular, type of employment (employee or self-employed) is hypothesized to impact employment and economic aspects of wellbeing, income level is hypothesized to impact leisure/recreational opportunities and household wealth, and the presence of young children in the household is hypothesized to affect job-related stress. Finally, we differentiate between indicators that are affected immediately (marked with blue borders) and those that have long-term implications (marked with red borders). The implications of indicators with immediate impacts can be redressed in the short-term, as the pandemic ebbs or when the more restrictive measures are lifted. Indicators that may have longer term implications, such as life satisfaction, meaning in life, healthy life expectation, and household wealth, may have continued impacts after the pandemic has ebbed and life returns to normal.

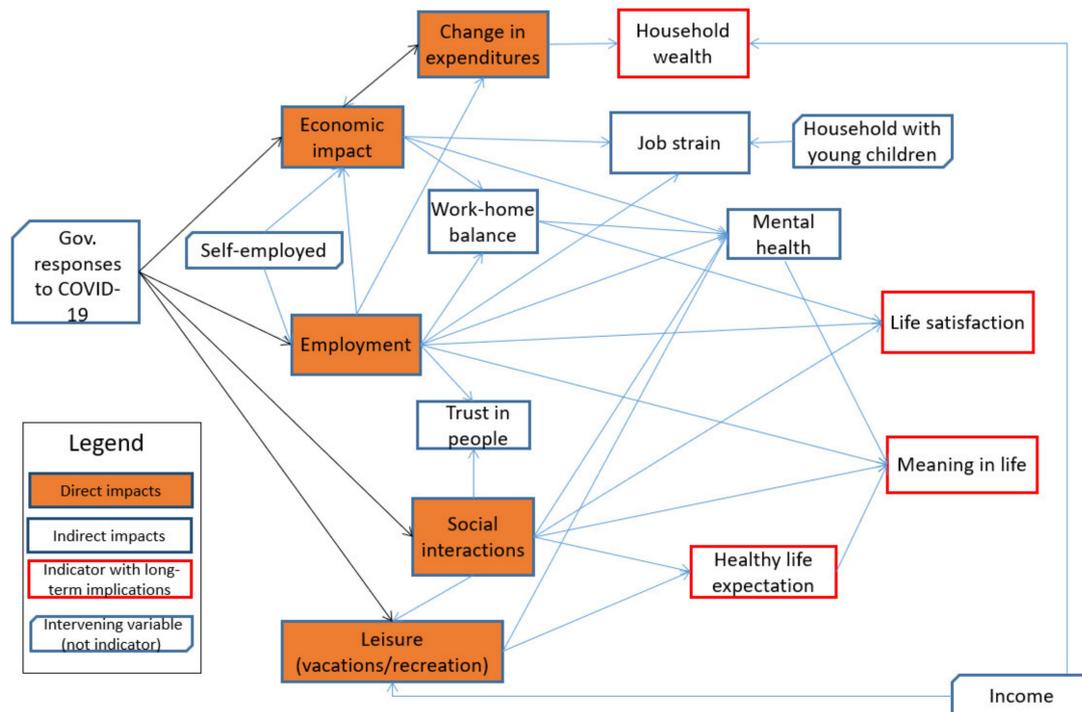


Figure 2. Operational Model.

On the basis of the earlier system analyses [3,36] we hypothesized that the government actions shown in Figure 1 would lead to business closures and losses, thereby adversely impacting employment and the economy. These effects may differ, however, between employees and self-employed earners, as self-employed earners have more discretion and run higher risks by closing their businesses. Economic losses may change expenditure patterns, but this may not suffice to compensate for loss of income. Therefore, households may be forced to either use loans or savings, which have long-term implications on household wealth. The severity of these effects may, however, be moderated by level of income, as households with a higher income are likely able to better preserve wealth. In the short-run, economic and employment loss may lead to job stress, due to loss of job security, the loss of face-to-face interactions with colleagues, and, in some cases, the need to travel on sometimes crowded public transport. This stress may be felt more by households

with small children. The employment and economic effects may, thereby, lead also to the disruption of the home-work balance.

Government imposed restrictions are likely to reduce social interactions, thereby affecting inter-personal trust and expectations for a healthy life. Such loss of human interactions is also hypothesized to affect mental health, life satisfaction, and possibly feelings of meaning in life. These effects may be worsened due to the limitations on leisure activities and recreation.

Since the focus of this research is on the short-term effects of the measures imposed in the first two waves of COVID-19, we did not analyze effects on indicators that take over a year to materialize (the survey was conducted during the second COVID-19 wave, so that respondents, although referring to the pre-pandemic condition and the first wave, were aware that they were experiencing another wave of the pandemic). Hence, in the empirical study we did not analyze the effects on human skills, educational attainment, and housing availability, all of which are OECD indicators. The only other OECD indicator not included in this study is stakeholder involvement in politics. During the initial period of the pandemic, Israel was embroiled in a political crisis, in which national elections were held four times within two years, following repeated failures to secure a majority coalition government. Both the government responses to COVID-19, as well as trust in the government were affected by this crisis [38]. Our survey results showed that political involvement was largely an outcome of the political crisis. Therefore, it is not discussed in this paper.

## 2.2. Study Design

To empirically assess the effects of COVID-19 on wellbeing indicators in Israel, a representative, cross-sectional, stratified survey was conducted during September and October 2020, nine months into the crisis, during the height of the second wave of the pandemic in Israel. Survey items and the wellbeing indicators they measure are listed in Table 1. All questions had multiple choice answer options. Questions containing statements about meaning in life, trust in people, work-home balance, healthy life expectations, social interactions, leisure and recreation activities, and mental health impact were measured by level of agreement in a Likert scale of 1–5 to gauge attitudes before the pandemic. Respondents were then asked to assess whether they agreed more or less with the statement during the pandemic, as compared with their level of agreement before the pandemic. Life satisfaction was measured on a scale of 1–11.

The survey was performed through a survey company which holds a representative national panel. It was conducted online via an internet panel. The approval of the Committee for Behavioral Science Research Ethics at the Technion, Israel Institute of Technology was obtained. A consent form was signed by participants stating that the participation is voluntary, anonymity is preserved, and the participants are allowed to withdraw at any time. Participants in this study were awarded for their time with 22 credits for purchase in a “BUYME” gift card platform, which is the equivalent of 2.20 NIS.

For those populations with limited internet access—namely, the elderly and ultra-Orthodox Jewish populations—the online survey was complemented with a telephone survey. In total, there were 1026 participants (51.5% male and 48.5% female). The range of the statistical error is  $\pm 3.05$  with a level of significance of 95%.

Participants in the survey were selected through a cohort design comprised of three dimensions:

1. Household income level: income below average (<20,000 NIS gross); average (approximately 20,000 NIS gross); and above average (>20,000 NIS gross).
2. Age groups: 18–39, 40–46, and 65+.
3. Ethnicity and level of religiosity: Jews (divided into secular, traditional-religious, and ultra-Orthodox Jews) and Arabs.

**Table 1.** Concepts (variables) and the corresponding questions used for measurement in the questionnaire.

Concept (Variable)	Question
Life Satisfaction	How satisfied are you with life? (Before and during the pandemic)
Social Support *	How many people can you turn to for help in a time of need? (Before and during the pandemic) From which organizations do you receive assistance? (Before and during the pandemic)
Meaning in Life	To what extent do you agree with the following statement: I find meaning in my life. (Before and during pandemic)
Trust in People	To what extent do you agree with the following statement: You can generally rely on people. (Before and during the pandemic)
Work-Home Balance	To what extent do you agree with the following statement: I maintain a good work-home balance.
Healthy Life Expectation	How has the pandemic impacted your expectation to live a healthy life?
Social Interactions	How has the pandemic impacted your social interactions?
Leisure (Vacations/Recreation)	How has the pandemic impacted your recreational and leisure time activities? How has the pandemic impacted your vacations?
Mental Health	How has the pandemic impacted your mental and emotional health?
Job Strain	Have you experienced an increase in work-related stress due to the pandemic?
Economic Impact	Did you incur personal economic loss since the beginning of the pandemic? (Same question about spouse)
Employment	Did you lose work due to sickness, quarantine, or other response policies?
Change in (Household) Expenditure	How has your household spending changed since the beginning of the pandemic?
Household Wealth	Have you taken loans or withdrawn savings during the pandemic?

\* Social support is not part of the operational model, but was added to the questionnaire, which included a large number of additional variables. Because we found it to be relevant to this study, it is included in this analysis.

A total sampling of 36 subgroups (quotas) of the various combinations of 3 income levels  $\times$  3 age groups  $\times$  4 religious groups were created, with the aim of gender balance. In the Arab and the ultra-Orthodox populations, it was especially difficult to reach the quotas for the age of 65+. Therefore, the three income levels were created for them with a 40+ age category. We also combined Arab Christians and Muslims into one group due to lack of respondents.

### 2.3. Analysis

In the first stage we analyzed the survey results descriptively, in order to understand trends of the pandemic's impact on wellbeing, behavioral patterns, and attitudes. This included a description of the self-reported evaluation of the impact of COVID-19 on the various aspects of life studied. Crosstabulations were then used to give a preliminary understanding of the relationships among the variables.

This assessment was followed by a rigorous analysis using structural equation modeling (SEM). The SEM analysis provided a fuller understanding of the relationships among variables. The analysis was performed in R version 4.0.3 using the Lavaan package.

The SEM model was created on the basis of the model presented in Figure 2. The direction of the relationships among variables was determined in the theoretical model, through systems analysis. The analysis assesses the extent to which the empirical data fits the theoretical model. All variables in the model are observed; most are represented by a single question in the survey. Based on this model, a series of sub-models were created to test the relationships between different variables within the model. A final model, similar to the theoretical one, was created on the basis of these sub-models. Four fit indices were used to assess all SEM models: chi-squared, root mean square error of approximation (RMSEA), comparative fit index (CFI), and standardized root mean square residual (SRMR).

### 3. Results

The sample included 1026 respondents (51.5% male and 48.5% female). It is divided into three main age groups: 18–39 (41%), 40–64 (33%), and 65+ (26%). Income distribution shows that 39% of all respondents reported earnings below average, 29% reported earnings above average, and 32% reported earning an average income. Regarding ethnicity, 80% of respondents were Jewish, while 20% were Arabs (Christians and Muslims, reflecting the breakdown in Israel’s general population). Within the Jewish population 43% identified as secular, 35% identified as traditional-religious, and 22% identified as ultra-Orthodox.

#### 3.1. Wellbeing during the Pandemic (Descriptive Analysis)

Survey responses of selected variables, as well as selected crosstabulation results, are presented in Tables 2–11 and discussed in the paragraphs below.

##### 3.1.1. Economic and Work Impacts

Of all respondents, about half (49% (in the text, all numbers are rounded to the nearest whole number. Tables contain numbers rounded to the first digit after the decimal point)) reported economic losses as a result of the pandemic and the vast majority (81%) feared that the government response to the second wave of the pandemic would result in personal financial loss. Nearly one third (32%) of respondents reported that they had to draw from savings or take loans during the pandemic, thereby compromising their long-term assets and adversely affecting their wealth. Yet, only 18% of high-income respondents relied on loans or savings during the pandemic, as compared with 36% of respondents with below-average incomes. Furthermore, 43% of respondents who were put on unpaid leave or who reported loss of income due to the pandemic took loans or withdrew savings, while just 12% of other respondents relied on loans and savings.

Many respondents who did not incur economic losses still suffered from job strain. Three quarters (75%) of respondents reported an increase in job-related stress during the pandemic. Respondents who reported unemployment (including unpaid leave), underemployment, or loss of income also reported larger negative impacts on work-home balance than those who did not suffer economic or employment losses (32% versus 20%). However, those put on unpaid leave also reported more positive impacts on work-home balance (14%) than those whose employment didn’t suffer (7%). Additionally, respondents who reported significant increases in job strain also reported a negative impact on work-home balance (39% versus 25% of those with some increase in job strain, and 15% of those with no increase in job strain).

**Table 2.** Economic impacts.

		% Respondents
Did you incur personal economic loss since the beginning of the pandemic?	No loss	51.1
	Lost income or employment uncertainty	26.2
	Dismissal	5.8
	Unpaid leave	17.0
Did you lose work due to sickness, quarantine, or other response policies?	Yes	43.0
	No	41.6
	Not relevant	15.4
Have you experienced an increase in job-related stress due to the pandemic?	Significantly	32.1
	Somewhat	42.4
	Not at all	25.5
Have you taken loans or withdrawn savings during the pandemic?	Yes	31.9
	No	68.1
How has your household spending changed since the beginning of the pandemic?	Significantly decreased	25.2
	Somewhat decreased	39.7
	Significantly increased	9.3
	Somewhat increased	3.2
	No change	22.7
What was your employment status before the pandemic?	Employee	71.4
	Self-employed	8.4
	Own company with 5 or more Employees	0.2
	Unemployed	20.1

In Table 3, the crosstabulation results show that respondents whose household expenditures either significantly decreased or significantly increased (as opposed to slightly decreased or slightly increased) were more likely to take out loans or use savings (53% and 55% versus 26% and 23%). This is likely due to different reasons for expenditure changes. Some families reduced their expenditures because of lost work or income. Theoretically, these households likely relied more on loans or savings. Other households ended up spending more in order to adjust their lives to the pandemic response regulations. These families may have needed to spend more than usual on technology and the like. They may have relied on loans or savings in order to cover these extra costs (Table 4).

**Table 3.** The relationship between household expenditure changes and use of savings or loans.

		Household Expenditure Changes					Total
		Reduced Expenses Significantly	Reduced Expenses Slightly	Increased Expenses Slightly	Increased Expenses Significantly	No Change	
Use of Savings or Loans	Yes	52.7	25.9	22.8	54.5	8.6	28.1
	No	47.3	74.1	77.2	45.5	91.4	71.9
Total	Count	226	409	101	33	257	1026
	Percentage	22.0	39.8	9.8	3.2	25.0	100

**Table 4.** The relationship between net household income and use of savings or loans.

		Net Household Income				Total (%)
		Above Average (%)	Average (%)	Below Average (%)		
Use of Savings or Loans	Yes	17.5	28.5	35.6	28.1	
	No	82.5	71.5	64.4	71.9	
Total	Count	297	333	396	1026	
	Percentage	28.9	32.5	38.6	100	

### 3.1.2. Mental Health Impacts and Expectation to Live a Healthy Life

Overall, the pandemic had a slightly negative impact on respondents' expectations to live a healthy life. Several specific variables were associated with increased expectation to live a healthy life: respondents who reported increased expectation to live a healthy life also reported a positive impact on vacationing, increased social ties, more meaning in life, and more people they could rely on during the pandemic.

Nearly half of the respondents (46%) reported a negative impact of the pandemic on their mental or emotional health. Respondents who were fired from a job, put on unpaid leave, or incurred financial losses due to the pandemic suffered more negative impacts on mental health than other respondents. While 29% of respondents who experienced no increase in job strain reported a negative mental health impact of the pandemic, 65% of those with significant increases in job strain also reported negative mental health impacts (see Table 5).

Several other variables were also associated with negative mental health impacts. Respondents who reported fewer people on whom they could rely during the pandemic also reported more negative mental health impacts. The vast majority of people who found less meaning in life during the pandemic also reported negative or strongly negative mental health consequences (50% and 31%, respectively), while far fewer people who reported no change or a positive impact to meaning in life reported negative mental health impacts (see Table 6).

**Table 5.** The relationship between job-related stress and mental health impacts.

		Increased Job-Related Stress			
		Significantly	Somewhat	None	Total
Mental Health Impact	Strongly Positive	4.8	3.0	4.3	3.9
	Positive	7.3	9.3	9.2	8.7
	No Effect	22.8	41.9	58.0	41.3
	Negative	41.9	38.9	19.7	34.0
	Strongly Negative	23.2	6.9	8.9	12.1
Total	Count	289	432	305	1026
	Percentage	28.2	42.1	29.7	100

**Table 6.** The relationship between mental health impacts and meaning in life.

		Impact on Meaning in Life			
		No Change	Positive	Negative	Total
Mental Health Impact	Strongly Positive	4.1	5.3	1.9	3.9
	Positive	7.5	21.1	3.8	8.7
	No Effect	49.7	28.6	12.8	41.3
	Negative	31.5	29.3	50.0	34.0
	Strongly Negative	7.3	15.8	31.4	12.1
Total	Count	737	133	156	1026
	Percentage	71.8	13.0	15.2	100

### 3.1.3. Social Interactions and Support

Survey responses indicate a change in social support during the pandemic. There was an increase in the number of people lacking robust social support: while 45% of respondents reported only 0–2 people who could be relied on in times of need before the pandemic, this number grew to 55% during the pandemic. Likewise, there was a decrease in the number of respondents with robust social support: while 56% of respondents indicated that three or more people could be relied on for support before the pandemic, this figure decreased to 45% during the pandemic (See Table 7). Over half of respondents (55%) reported negative impacts on social interactions (See Table 8). This was particularly pronounced among younger respondents. Table 9 shows a clear positive correlation between mental health impacts and impacts on social interactions: respondents who reported negative mental health impacts also reported negative impacts on social interactions and vice versa.

**Table 7.** Selected survey results for social support.

Before the pandemic, how many people could you rely on for assistance during a time of need?	Nobody	14.8
	1–2 people	29.8
	3–5 people	31.4
	6 or more people	24.1
At this point in time, how many people can you rely on for assistance during a time of need?	Nobody	19.0
	1–2 people	36.1
	3–5 people	25.5
	6 or more people	19.4

**Table 8.** Selected survey results for healthy life expectations, social interactions, and leisure.

	How Has the Pandemic Impacted the Follow Areas				
	Very Positive	Somewhat Positive	No Influence	Somewhat Negative	Very Negative
Expectation to live a healthy life	8.7	19.3	37.5	27.3	7.2
Social interactions	5.0	9.0	30.9	42.3	12.8
Recreational and leisure time activities	3.8	7.6	19.0	40.9	28.7
Vacationing	4.4	6.0	15.9	34.0	39.7
Mental health	3.8	9.4	38.2	36.1	12.5

**Table 9.** The relationship between impacts on social interactions and mental health.

		Impact on Social Interactions					Total
		Strongly Positive	Positive	No Impact	Negative	Strongly Negative	
Mental Health Impact	Strongly Positive	39.2	13.3	2.1	0.2	0.0	3.9
	Positive	19.6	32.2	7.9	4.8	2.9	8.7
	No Effect	33.3	34.4	64.6	33.4	17.4	41.3
	Negative	3.9	18.9	20.4	52.0	32.6	34.0
	Strongly Negative	3.9	1.1	4.9	9.5	47.1	12.1
Total	Count	51	90	328	419	138	1026
	Percentage	5.0	8.8	32.0	40.8	13.5	100

### 3.1.4. Life Satisfaction and Meaning in Life

Life satisfaction was negatively impacted by the pandemic. While respondents reported an average life satisfaction score of 8.23 (on a scale of 1–11) before the pandemic, the average decreased to 6.23 during the pandemic. Respondents who were fired reported decreased meaning in life during the pandemic (34% versus 15% overall). Similarly, these respondents reported lower levels of life satisfaction during the pandemic. While ultra-Orthodox Jews reported high levels of meaning in life before the pandemic (57%, compared with 38% of religious-traditional Jewish respondents and 25% of secular Jewish respondents), most of these respondents did not report a change in meaning in life during the pandemic. Additionally, respondents with no more than two people they could rely on during the pandemic also reported lower levels of life satisfaction. Over two thirds of respondents (70%) reported a negative impact on their leisure time and nearly three-quarters (74%) reported a negative impact on their vacations. General results are summarized in Tables 10 and 11.

**Table 10.** Selected survey results for trust, meaning, and work-home balance.

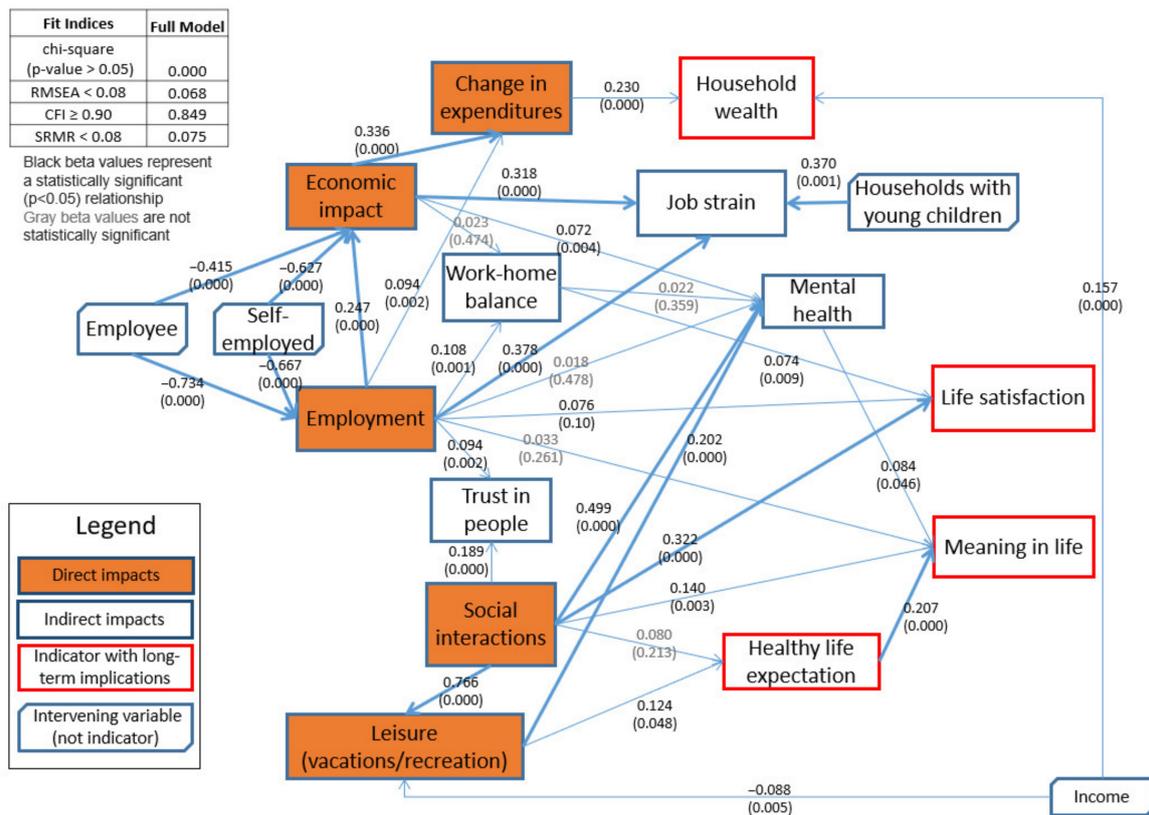
	Before Pandemic				Since Beginning of Pandemic		
	Strongly Agree	Agree	Disagree	Strongly Disagree	No Change	Agree More	Disagree More
You can generally rely on people.	11.5	50.4	30.8	7.4	66.1	12.0	21.9
I find meaning in my life.	32.2	56.1	8.8	2.9	70.3	13.9	15.7
I maintain a good work-home balance.	18.6	60.3	15.4	5.7	61.6	12.0	26.4

**Table 11.** Selected survey results for life satisfaction.

How Satisfied Are You with Life?		
	Before Pandemic	After Pandemic
1—Not satisfied	0.6	4.1
2	0.9	4.7
3	1.0	5.7
4	2.1	10.0
5	4.3	12.5
6	6.1	13.3
7	11.9	19.0
8	25.7	12.7
9	23.1	8.6
10	13.0	5.2
11—Extremely satisfied	11.3	4.2

3.2. Structural Equation Model (SEM) Analysis

The results of the full SEM model are presented in Figure 3. In this figure, indicators with long-term implications are marked with a red border and indicators with impacts felt in the short-term are marked with a blue border. Intervening variables (which are not indicators of well-being) are marked with cut corners. Black beta values represent a statistically significant ( $p < 0.05$ ) relationship, while grey beta values are not statistically significant.



**Figure 3.** Full structural equation model (SEM) results.

The fit indices for the full model indicate an adequate fit overall, albeit that the CFI value, which compares the target model to the fit of a null model, is lower than the ideal 0.9 cut-off. However, the chi-squared value is low (though is it also sensitive to sample size) and the RMSEA and SRMR are both below the acceptable cut-off of 0.08. Given these indices, alongside the size of the overall model, the model was determined to be adequate.

Some of the strongest associations in the model are: the positive impact of social interactions on both mental health and life satisfaction, the negative influence of being self-employed on economic impact, the influence of employment on changes in household expenditures, the influence of economic loss on expenditures, and the influences of having children and incurring economic loss on increases in work-related stress.

The economic and employment effects somewhat differed between employees and self-employed respondents. While salaried employees suffered greater employment losses, self-employed earners suffered more income losses. Income losses led to changes in expenditures, which had impacts on household wealth. These effects were larger for low-income households, over a third of which reported negative wealth impacts. Income loss and employment loss increased job strain, which had adverse effects on mental health. Almost 88% of those suffering economic loss also reported increased job strain. Such stress also adversely affected work-home balance. The stress was greater for families with young children, as they were kept at home when educational facilities closed.

Thus, households that were affected economically suffered wider wellbeing implications than those that were not affected. As the economic impacts tended to disproportionately affect low-income and female-led households, these groups suffered wider wellbeing losses on average. Yet, it is important to note that there were also mid- and high-income households that were adversely impacted and suffered wide-ranging effects, thereby justifying the stratification of wellbeing impacts by economic effects suggested by Strelkovskii and colleagues [3].

In the analysis, social interactions and leisure stand out as two critical aspects of wellbeing with far-reaching implications. The loss of social interaction has implications for mental health, trust in others, recreational activities, life satisfaction, and meaning in life. The adverse effects on recreation, which were more pronounced for high-income households, had adverse implications for mental health and the expectation to live a healthy life. These effects, however, were mediated by religiosity and family ties.

Several partial models demonstrate the relationships between specific variables of interest. Models 1–4 are presented in Figures 4–7. Model 1 (Figure 4) shows employment effects and economic loss (comparing employees to self-employed respondents) and connects these to effects on spending habits. In it, we see that while salaried employees suffered slightly higher employment losses, self-employed earners incurred greater economic loss. Furthermore, economic loss affected expenditures. This can be explained by less complicated procedures for obtaining government benefits following loss of employment for salaried employees, as compared with the difficult process faced by self-employed earners. Thus, self-employed earners continue working despite suffering higher economic losses. Model 2 (Figure 5) examines the effects on life satisfaction. It finds that reduced social interactions had a larger influence on life satisfaction than employment and worsening work-home balance. Model 3 (Figure 6) shows that meaning in life is influenced by mental health, social ties, vacationing (indirectly), employment, and expectations to live a healthy life. It is interesting to note that in both Models 2 and 3, mental health and social indicators have a greater effect than do economic or employment indicators.

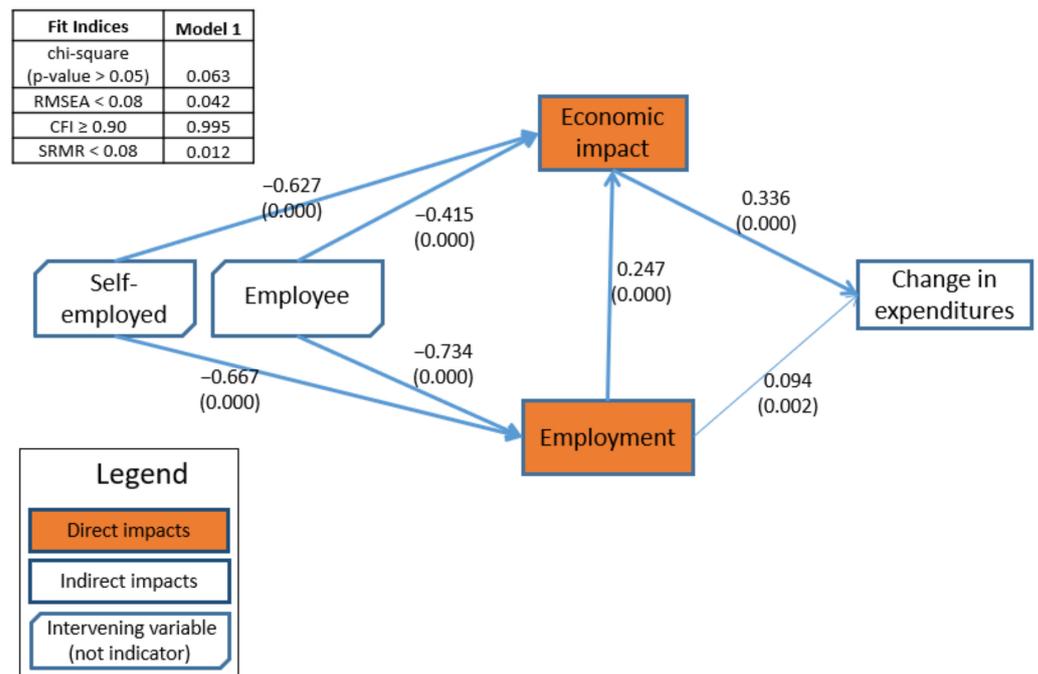


Figure 4. Partial Model 1: Economic variables.

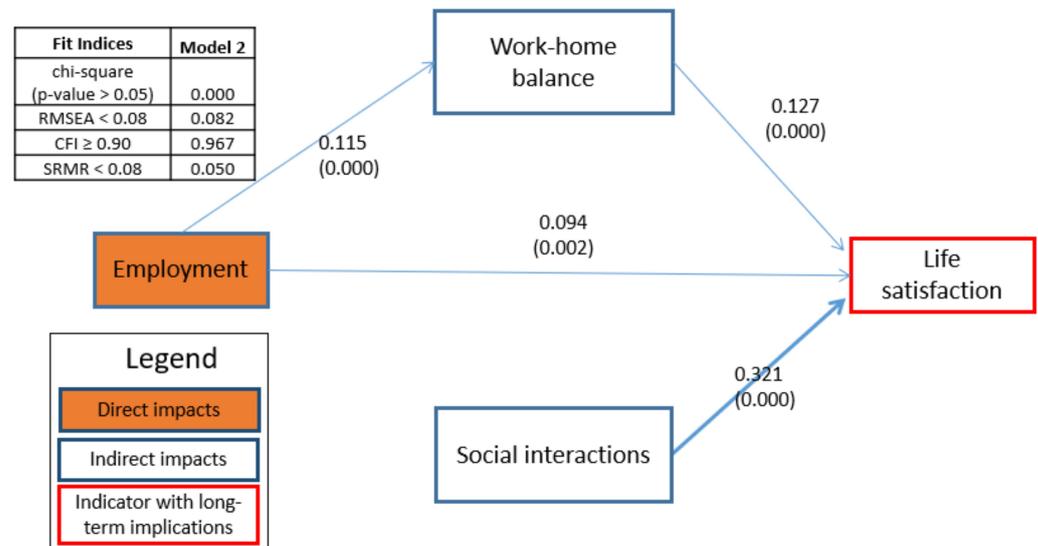


Figure 5. Partial Model 2: Influences on life satisfaction.

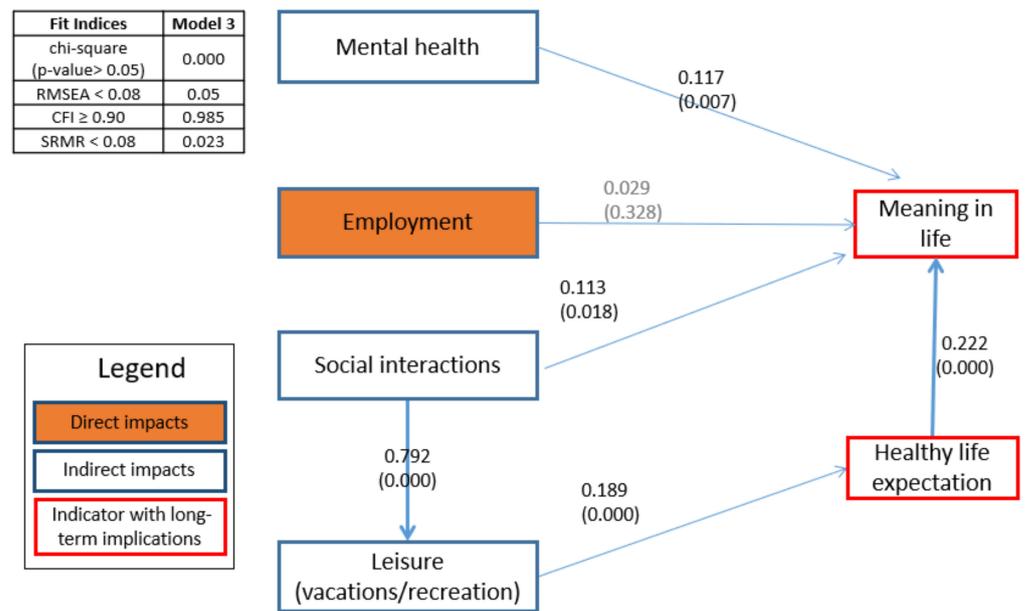


Figure 6. Partial Model 3: Influences on meaning in life.

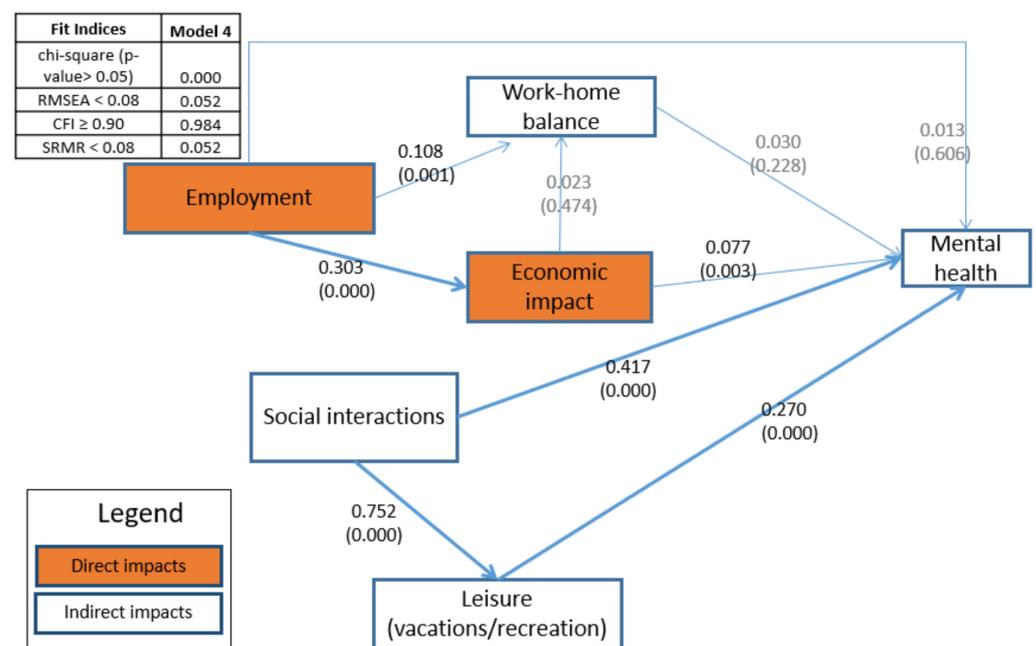


Figure 7. Partial Model 4: Influences on mental health.

In Model 4 (Figure 7) several variables influencing mental health are examined. While the economic variables either lack statistical significance or have a very small effect on mental health, recreation has a larger effect, and social ties have the largest impact.

#### 4. Discussion

The results of the SEM largely bear out the hypotheses derived from the previous systems analyses, which was, in turn, based on a large literature review of studies focusing on specific effects [3]. Still, some of the hypothesized relations were found to be statistically insignificant. These pertain primarily to the effects of employment loss, which seemingly had no or little effect on mental health and life satisfaction, and meaning of life. Furthermore, work-home balance was not disrupted in a major way, and thereby had little effect

on mental health or life satisfaction. However, loss of income was shown to impact job strain and, subsequently, mental health, work-home balance, and healthy life expectations. In contrast, the impacts of loss of social interactions and loss of leisure opportunities have strong impacts on several variables (with the exception of healthy life expectancy). These results can perhaps be explained by government actions to mitigate the effects of employment loss by providing wide-ranging unemployment benefits and economic assistance. No similar efforts were put in place to address the loss of social interactions and recreation (recreation options were broadened in the second and subsequent waves). Furthermore, the effects of closures, lockdowns, and quarantines on social interactions may pertain to a wider strata of society than the economic effects, as they adversely affect households not impacted economically. The analysis, thus, highlights the importance of the severance of social interactions to many aspects of wellbeing, including life satisfaction and finding meaning in life.

The wide-ranging government unemployment benefits and economic assistance may well render the pandemic's economic and employment impacts to be largely short-term. Thus, as the pandemic wanes and the economy revives, their effects will most likely be minimal. In contrast, the loss of social interactions may have longer term effects as they affect mental health, life satisfaction, and life meaning, all of which may not recede as fast, if ever, after the pandemic wanes.

Furthermore, of particular interest are the effects of pandemic response measures on recreational opportunities, as these have implications for mental health, expectancy for a healthy life, and finding meaning in life. These findings suggest that recreation should be added to discussions of wellbeing in general and to analyses of the effects of pandemics specifically.

## 5. Conclusions

COVID-19 has wide ranging implications for wellbeing. Identifying the breadth and extent of these implications requires the combination of systems analysis (to outline the potential effects) with empirical analysis (to uncover the extent that such effects do indeed materialize). To this end, generic systems analyses had to be modified and contextualized to the Israeli case at hand.

The centrality of the adverse effects on social interactions in the Israeli case raises the question of whether the importance of social ties to wellbeing is specific to the cultural or societal characteristics of Israel, or whether this finding is applicable generally to all countries. To address this question, comparative studies with other settings are necessary.

While the strength of this study lies in its multi-faceted assessment of wellbeing, a weakness is the fact that each dimension of wellbeing was measured narrowly, often with just one item. Further research is needed to explore various relationships between wellbeing dimensions in greater depth. Additionally, while the study was able to confirm the validity of a rigorously developed theoretical model, the model itself contained little flexibility. Finally, even within the Israeli context it is difficult to survey some of the minority populations (particularly parts of the ultra-Orthodox Jewish and Arab communities). The descriptive statistics suggest that some of the effects differ across such communities. Targeted analyses of minority groups are necessary to fully understand these differences.

COVID-19 affected many aspects of wellbeing, due to the multi-dimensionality of the concept and the pervasiveness of the pandemic and response. Mitigating adverse effects will have to be multi-faceted. However, the first step in mitigating adverse effects is identifying the implications of pandemics and specific response policies for various aspects of wellbeing, as was done in this research. In particular, in the Israeli case, the government took measures to mitigate the economic and employment impacts, but did little to mitigate the implications of loss of social ties, leaving local initiatives to find grassroots solutions for coping with these losses. This study shows that the impacts on social ties are no less important and should be addressed no less than the economic and employment implications. Therefore, it is advisable to create policy packages in which measures to curb

a pandemic are accompanied by measures intended to mitigate the full range of adverse effects on wellbeing.

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**Data Availability Statement:** All data are in Hebrew and are available upon request from the corresponding author.

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## References

1. Lepenies, P. *The Power of a Single Number*; Columbia University Press: New York, NY, USA, 2016; ISBN 978-3-319-93193-7.
2. OECD. *How's Life? 2017: Measuring Well-Being*; OECD Publishing: Paris, France, 2017; ISBN 9789264265578.
3. Strelkovskii, N.; Rovenskaya, E.; Iilmola-Sheppard, L.; Bartmann, R.; Rein-Sapir, Y.; Feitelson, E. Implications of COVID-19 Mitigation Policies for National Well-Being: A Systems Perspective. *Sustainability* **2022**, *14*, 433. [\[CrossRef\]](#)
4. Prime, H.; Wade, M.; Browne, D.T. Risk and Resilience in Family Well-Being during the COVID-19 Pandemic. *Am. Psychol.* **2020**, *75*, 631–643. [\[CrossRef\]](#) [\[PubMed\]](#)
5. Rajkumar, R.P. COVID-19 and Mental Health: A Review of the Existing Literature. *Asian J. Psychiatry* **2020**, *52*, 102066. [\[CrossRef\]](#) [\[PubMed\]](#)
6. Shigemura, J.; Ursano, R.J.; Morganstein, J.C.; Kurosawa, M.; Benedek, D.M. Public Responses to the Novel 2019 Coronavirus 2019-nCoV in Japan: Mental Health Consequences and Target Populations. *Psychiatry Clin. Neurosci.* **2020**, *74*, 281–282. [\[CrossRef\]](#)
7. Morrison, P.S.; Rossouw, S.; Greyling, T. The Impact of Exogenous Shocks on National Wellbeing. New Zealanders' Reaction to COVID-19. *Appl. Res. Qual. Life* **2021**. [\[CrossRef\]](#)
8. Greyling, T.; Rossouw, S.; Adhikari, T. A Tale of Three Countries: What Is the Relationship between COVID-19, Lockdown and Happiness? *S. Afr. J. Econ.* **2021**, *89*, 25–43. [\[CrossRef\]](#)
9. Campisi, T.; Tesoriere, G.; Trouva, M.; Papas, T.; Basbas, S. Impact of Teleworking on Travel Behaviour During the COVID-19 Era: The Case Of Sicily, Italy. *Trans. Res. Proc.* **2022**, *60*, 251–258. [\[CrossRef\]](#)
10. Mead, J.P.; Fisher, Z.; Tree, J.J.; Wong, P.T.; Kemp, A.H. Protectors of Wellbeing During the COVID-19 Pandemic: Key Roles for Gratitude and Tragic Optimism in a UK-Based Cohort. *Front. Psychol.* **2021**, *12*, 647951. [\[CrossRef\]](#)
11. Özmen, S.; Özkan, O.; Özer, Ö.; Yanardağ, M.Z. Investigation of COVID-19 fear, well-being and life satisfaction in Turkish society. *Soc. Work Public Health* **2021**, *36*, 164–177. [\[CrossRef\]](#)
12. Büssing, A.; Recchia, D.R.; Hein, R.; Dienberg, T. Perceived changes of specific attitudes, perceptions and behaviors during the Corona pandemic and their relation to wellbeing. *Health Qual. Life Out.* **2021**, *18*, 1–17. [\[CrossRef\]](#)
13. Dawel, A.; Shou, Y.; Smithson, M.; Cherbuin, N.; Banfield, M.; Calexar, A.L.; Farrer, L.M.; Gray, D.; Gulliver, A.; Housen, T.; et al. The effect of COVID-19 on mental health and wellbeing in a representative sample of Australian adults. *Front. Psychiatry* **2020**, *11*, 1026. [\[CrossRef\]](#) [\[PubMed\]](#)
14. Liu, C.; McCabe, M.; Dawson, A.; Cyrzon, C.; Shankar, S.; Gerges, N.; Gerges, N.; Kellet-Renzella, S.; Chye, Y.; Cornish, K. Identifying Predictors of University Students' Wellbeing during the COVID-19 Pandemic—A Data-Driven Approach. *Int. J. Environ. Res. Public Health* **2021**, *18*, 6730. [\[CrossRef\]](#) [\[PubMed\]](#)
15. Every-Palmer, S.; Jenkins, M.; Gendall, P.; Hoek, J.; Beaglehole, B.; Bell, C.; Williman, J.; Rapsey, C.; Stanley, J. Psychological distress, anxiety, family violence, suicidality, and wellbeing in New Zealand during the COVID-19 lockdown: A cross-sectional study. *PLoS ONE* **2020**, *15*, e0241658. [\[CrossRef\]](#)
16. Evans, S.; Alkan, E.; Bhangoo, J.K.; Tenenbaum, H.; Ng-Knight, T. Effects of the COVID-19 lockdown on mental health, wellbeing, sleep, and alcohol use in a UK student sample. *Psychiatry Res.* **2021**, *298*, 113819. [\[CrossRef\]](#) [\[PubMed\]](#)
17. Newson, M.; El Zein, M.; Sulik, J.; Zhao, Y.; Dezecache, G.; Deroy, O.; Tuncgenc, B. Digital Contact Does Not Promote Wellbeing, but Face-to-Face Does: A Cross-National Survey During the Covid-19 Pandemic. *New Media Soc.* **2021**. [\[CrossRef\]](#)

18. Brown, A.; Flint, S.W.; Kalea, A.Z.; O’Kane, M.; Williams, S.; Batterham, R.L. Negative impact of the first COVID-19 lockdown upon health-related behaviours and psychological wellbeing in people living with severe and complex obesity in the UK. *EClinicalMedicine* **2021**, *34*, 100796. [[CrossRef](#)]
19. Dawson, D.L.; Golijani-Moghaddam, N. COVID-19: Psychological flexibility, coping, mental health, and wellbeing in the UK during the pandemic. *J. Contextual Behav. Sci.* **2020**, *17*, 126–134. [[CrossRef](#)]
20. Nurunnabi, M.; Almusharraf, N.; Aldeghaither, D. Mental health and well-being during the COVID-19 pandemic in higher education: Evidence from G20 countries. *J. Public Health Res.* **2020**, *9*, s1. [[CrossRef](#)]
21. Van Zyl, L.E. Social study resources and social wellbeing before and during the intelligent COVID-19 lockdown in The Netherlands. *Soc. Indic. Res.* **2021**, *157*, 393–415. [[CrossRef](#)]
22. Habe, K.; Biasutti, M.; Kajtna, T. Wellbeing and flow in sports and music students during the COVID-19 pandemic. *Think. Skills Creat.* **2021**, *39*, 100798. [[CrossRef](#)]
23. Lewis, L.M.; Carpenter, C.R.; Jotte, R.; Schwarz, E. Healthcare Provider Wellness in the Time of COVID and Beyond. *Mo Med.* **2021**, *118*, 13–17. [[PubMed](#)]
24. Jefferson, L.; Golder, S.; Heathcote, C.; Avila, A.C.; Dale, V.; Essex, H.; van der Feltz Cornelis, C.; McHugh, E.; Moe-Bryne, T.; Bloor, K. General practitioner wellbeing during the COVID-19 pandemic. A systematic review. *Br. J. Gen. Pract.* **2022**. [[CrossRef](#)]
25. O’Brien, N.; Flott, K.; Bray, O.; Shaw, A.; Durkin, M. Implementation of initiatives designed to improve healthcare worker health and wellbeing during the COVID-19 pandemic: Comparative case studies from 13 healthcare provider organisations globally. *Glob. Health* **2022**, *18*, 1–13. [[CrossRef](#)] [[PubMed](#)]
26. Martiny, S.E.; Thorsteinsen, K.; Parks-Stamm, E.J.; Olsen, M.; Kvalø, M. Children’s Well-being during the COVID-19 pandemic: Relationships with attitudes, family structure, and mothers’ Well-being. *Eur. J. Dev. Psychol.* **2021**. [[CrossRef](#)]
27. Westrupp, E.M.; Stokes, M.A.; Fuller-Tyszkiewicz, M.; Berkowitz, T.S.; Capic, T.; Khor, S.; Greenwood, C.J.; Mikocka-Walus, A.; Sciberras, E.; Youssef, G.J.; et al. Subjective wellbeing in parents during the COVID-19 pandemic in Australia. *J. Psychosom. Res.* **2021**, *145*, 110482. [[CrossRef](#)]
28. Vallejo-Slocker, L.; Fresneda, J.; Vallejo, M.A. Psychological wellbeing of vulnerable children during the COVID-19 pandemic. *Psicothema* **2020**, *32*, 501–507.
29. Patrick, S.W.; Henkhaus, L.E.; Zickafoose, J.S.; Lovell, K.; Halvorson, A.; Loch, S.; Letterie, B.A.; Davis, M.M. Well-being of parents and children during the COVID-19 pandemic: A national survey. *Pediatrics* **2020**, *146*, e2020016824. [[CrossRef](#)]
30. Bidzan-Bluma, I.; Bidzan, M.; Jurek, P.; Bidzan, L.; Knietzsch, J.; Stueck, M.; Bidzan, M. A Polish and German population study of quality of life, well-being, and life satisfaction in older adults during the COVID-19 pandemic. *Front. Psychiatry* **2020**, 1188. [[CrossRef](#)]
31. Siette, J.; Seaman, K.; Dodds, L.; Ludlow, K.; Johnco, C.; Wuthrich, V.; Earl, J.K.; Piers, D.; Struss, P.; Westbrook, J.I. A national survey on COVID-19 second-wave lockdowns on older adults’ mental wellbeing, health-seeking behaviours and social outcomes across Australia. *BMC Geriatr.* **2021**, *21*, 1–16. [[CrossRef](#)]
32. Poortinga, W.; Bird, N.; Hallingberg, B.; Phillips, R.; Williams, D. The role of perceived public and private green space in subjective health and wellbeing during and after the first peak of the COVID-19 outbreak. *Landsc. Urban Plan.* **2021**, *211*, 104092. [[CrossRef](#)]
33. Campisi, T.; Basbas, S.; Tanbay, N.A.; Georgiadis, G. Some considerations on the key factors determining the reduction of public transport demand in Sicily during COVID-19 pandemic. *Int. J. Transp. Dev. Integr.* **2022**, *6*, 81–94. [[CrossRef](#)]
34. Cowden, R.G.; Davis, E.B.; Counted, V.; Chen, Y.; Rueger, S.Y.; VanderWeele, T.J.; Lemke, A.W.; Glowiak, K.J.; Worthington, E.L., Jr. Suffering, Mental Health, and Psychological Well-being During the COVID-19 Pandemic: A Longitudinal Study of US Adults with Chronic Health Conditions. *Wellbeing Space Soc.* **2021**, *2*, 100048. [[CrossRef](#)] [[PubMed](#)]
35. VanderWeele, T.J.; Fulks, J.; Plake, J.F.; Lee, M.T. National well-being measures before and during the COVID-19 pandemic in online samples. *J. Gen. Intern. Med.* **2021**, *36*, 248–250. [[CrossRef](#)] [[PubMed](#)]
36. Feitelson, E.; Ilmola-Sheppard, L.; Rovenskaya, E.; Strelkovskii, N.; Rein-Sapir, Y. *The Impact of COVID-19 on Well-Being: A Systems Approach, WP-20-019*; IIASA: Laxenburg, Austria, 2020.
37. Ilmola-Sheppard, L.; Strelkovskii, N.; Rovenskaya, E.; Abramzon, S.; Bar, R. *A Systems Description of the National Well-Being System, Version 1.0*; IIASA: Laxenburg, Austria, 2020.
38. Maor, M.; Sulitzeanu-Kenan, R.; Chinitz, D. When COVID-19 constitutional crisis and political deadlock meet: The Israeli case from a disproportionate policy perspective. *Policy Soc.* **2020**, *39*, 442–457. [[CrossRef](#)]