Social Science & Medicine 382 (2025) 118322

Contents lists available at ScienceDirect

Social Science & Medicine

journal homepage: www.elsevier.com/locate/socscimed

Policy response matters: A textual analysis highlights indirect Covid-19 impacts in Israel

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ARTICLE INFO

Keywords:
Corona Virus
Resilience
Crisis management
Complex systems
Pandemics
Health policy

ABSTRACT

Covid-19 heralded a prolonged global crisis with wide-ranging impacts still unfolding. Understanding their dynamics is crucial for building societal resilience for future crises. Existing studies focus on pre-determined pandemic impacts, with little comparison of their societal significance. This study bridges these gaps through an exploratory, grounded approach, inducing real-time impacts from diverse published sources using qualitative and quantitative methods.

We assessed a purposefully-random sample of pandemic-related publications by media, government agencies, and civil society organizations in Israel, between January 2020–April 2021. A thematic analysis of 908 publications identified 32 pandemic impacts across four key areas: economic, social, health, and national governance, and 14 additional themes that reflect aspects in which the impacts were referenced.

A content analysis revealed foci dominated by economic and social impacts, particularly on business, employment, the financial market, and the healthcare system. Key featured themes included policy, social distancing, and crisis mishandling. Economic impacts emphasized businesses, social impacts emphasized education, health impacts emphasized the healthcare system (surpassing morbidity and mortality); and governance concerns emphasized the political system. Findings indicate that the effects of responses to Covid-19 were more prominently featured than direct health impacts, signaling their considerable societal significance. In Israel, findings highlight the societal toll of strict infection containment measures.

Our preliminary synthesis supports these findings, revealing an interconnected cascade of accumulating impacts. The key role of policy response measures in mitigating/exacerbating them underscores the need for a whole-systems approach in crisis response and monitoring, with particular attention to indirect, policy-related impacts.

1. Introduction

The Covid-19 pandemic outbreak catalyzed a prolonged global crisis, with wide-ranging impacts continuously evolving (OECD, 2020; UN, 2021). While not yet comparable to other great pandemics of the last two centuries (LePan, 2020; Mack, 2020; Prabhu and Gergen, 2021), it is still ongoing around the world four years after the initial outbreak. Despite widespread administration of vaccines and the mutation of the virus to less lethal variants, the death toll continued to rise: from 6.5K to 894K during the 6 months of initial rapid spreading (March–September 2020), reaching 2.5M five months later (February 2021), and surpassing 7M in October 2024 (WHO, n.d.). Extending far beyond health impacts, Covid-19 has triggered social, economic, humanitarian, and even security-related hardship which has been further propelled by a tightly interconnected, globalized society (UN, 2020).

Along with global challenges affecting human life at every scale and devastating personal consequences to many, Covid-19 is an extraordinary event from a scientific perspective. It has raised awareness for a 'global health' perspective and for the need to close global inequalities related to social determinants of health, e.g., access to clean water (Elliott, 2021). The pandemic is also exceptional to the present generation in that it is a single disrupting phenomenon occurring globally, practically simultaneously. As such, it provides a valuable opportunity to research how societies in different geographies and ecological

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https://doi.org/10.1016/j.socscimed.2025.118322
Received 17 January 2024; Received in revised form 23 May 2025; Accepted 14 June 2025
Available online 19 June 2025

settings, of various characteristics, structures, and mechanisms, and across a range of external conditions, managed themselves and were affected by the same shock. What we learn from their experiences during Covid-19 can inform better coping with future pandemics and other challenges (Folke, 2006; Leitner, 2020).

This understanding motivated this study in the context of a larger research initiative on socio-ecological resilience. Social ecology (SE) is an innovative policy-oriented discipline that transcends traditional disciplinary boundaries and focuses on human-ecosystem relationships (Collins et al., 2011), to offer a more comprehensive and nuanced understanding of complex earth systems (Guerrero et al., 2018). In this context, resilience is the capacity of a SE system to cope with shocks without losing its defining functionality, by absorbing, learning, and adapting (Carpenter et al., 2001). This study is the first and crucial step for understanding relationships between pandemic impacts on the one hand, and characteristics known to contribute to socio-ecological resilience, on the other (e.g., Biggs et al., 2015). Here, we sought to identify the major impacts of Covid-19 on human societies from perspectives reflected in texts produced while the pandemic was unfolding.

We began by reviewing peer-reviewed assessments of pandemic impacts at various levels (national, regional, municipal). However, since this review was conducted during the early stages of the pandemic (May–June 2020), the sources were preliminary, scarce, and characterized by narrow foci on specific types of impacts, populations, and/or locations. For example: life expectancy losses (Aburto et al., 2021); implications on pre-existing medical conditions (Salunke et al., 2020); comparison of national infections/deaths (Jamison et al., 2020) and fatalities correlation to GDP changes (Gordon et al., 2021); effects on mental health (Xiong et al., 2020), health care systems (Paschoalotto et al., 2023), education (Esposito and Principi, 2020), political systems and human rights (Edgell et al., 2021), and other social phenomena like abuse (Tener et al., 2020); and featuring certain populations (Ben-Ari et al., 2020), age-groups (Levkovich et al., 2021) or regions (Gordon et al., 2021).

A few studies offered broader perspectives through meta-analyses. Grasso et al. (2021) reviewed 58 studies of Covid-19 impacts on European societies, referring to social inequalities, education, work, mental health, social solidarity, and cohesion. Another comparative European study included socio-economic impacts of Covid-19, relating national wealth to health, society, and work (Marti and Puertas, 2021). However, in both cases authors explicitly select these aspects based on an a priori assumption of areas most severely affected, offering no further reasoning.

Similarly broad, national and international reviews of pandemic impacts were found in online databases and reports by non-governmental organizations (NGOs) or public administration agencies. While varying widely in data types and indicators, most such resources concentrate on data pertaining to direct health impacts and their effect on local healthcare systems. Oxford University's Our World in Data, for example, details Covid-related cases, tests, hospitalization, vaccinations, mortality risk, excess mortality, and policy responses for 200+ countries (Ritchie et al., 2020). Johns Hopkins researchers created another extensive international dashboard crossing national-level demographics with Covid-related morbidity, symptoms, and various preventative behaviors (Babalola et al., 2021). An independent think tank compiled a "Covid Performance Index" comparing 100+ countries' cases and deaths in proportion to tests (Lemahieu and Leng, 2021). International economic implications were another focal point in online databases and various agencies, comparing, e.g., changes in GDP, mobility, household expenditure, and consumption (ABS, 2021), and other short-term economic impacts (Pitterle and Niermann, 2021).

Few of these reports, however, went beyond health and economics: The World Bank published a report highlighting how inequality manifests in income losses, debt levels, education poverty, commodity pricing, vaccines, healthcare, and recovery-related parameters (Gopalakrishnan et al., 2021). Some resources, like Bloomberg's data visualization platform, combined health with other social and/or economic metrics. 53 nations were ranked based on 12 indicators relating to both health impacts and containment policies, as well as 'quality of life' (e.g., community mobility; GDP forecasts; strength of healthcare system; UNDP Human Development Index) (Hong et al., 2022).

In Israel, similarly, government agencies produced reports according to their specific scope of operation and priorities. However, a couple of more overarching reports suggest the perceived main impacts on Israeli society. The State Comptroller and Ombudsman focused on virus containment, the healthcare system, seniors, employment, and education (State Comptroller, 2020). The Israel Central Bureau of Statistics assessed civic resilience by surveying changes in mental/physical health, employment, and financial hardship, public understanding of and adherence to government guidelines, trust in public agencies, and perception of enforcement measures (CBS Israel, 2020). A report produced for the Special National Committee for handling the Covid-19 crisis provided the broadest study, focusing on social resilience at the personal, community, regional, and national levels (Kutner and Marom, 2020). This report encompassed various elements pertaining to human wellbeing emphasizing organizational capacities and human capital, identity, effective communication, and connection, yet did not explain its choice of surveyed topics.

The examples above cumulatively tell a story about ways in which societies have been affected by Covid-19. However, they pay little attention, if any, to how variables and indicators are determined, and to how the various kinds of impacts may compare in their perceived severity. This research, therefore, offers to deepen our understanding of this story.

We aim to produce a grounded, comprehensive, and empirically based description of impacts endured by societies due to the pandemic outbreak. This will enable the future development of metrics with indicators, informing both local monitoring (temporal studies) and international comparison (spatial studies). Additionally, this research assesses the *extent* to which each impact was discussed in publications by various sources in Israel. Localized studies such as this can unlock opportunities for comparative analyses which will contribute to our understanding of pandemic ramifications.

2. Methods

2.1. Methodological frameworks and research design

Our work draws and adapts elements from two main methods, namely *content analysis* and *applied thematic analysis* (Bengtsson, 2016; Guest et al., 2012), combining both qualitative and quantitative techniques. Each framework encompasses variations, some of consequential differences in their underlying assumptions and practical procedures (Bengtsson, 2016; Braun and Clarke, 2016; Krippendorff, 2004; Roberts, 1997). The differences between content analysis and thematic analysis are not strictly defined, however in *most* cases "content analysis tends to focus at a more micro level, often provides (frequency) counts … allows for quantitative analyses of initially qualitative data" and typically use smaller units of analysis (a word/phrase)", and while thematic analysis tends not to quantify themes, "sometimes they may be" (Braun and Clarke, 2006, p. 98). For clarity and accuracy, we therefore detail our techniques with supporting references rather than fit them to 'defined' methods.

This study was designed to correspond with existing information about Covid-19 impacts, yet doing so independently from this knowledge, in a convergent rather than a sequential research design (Creswell, 2014). Thus, the study is characterized by both exploratory (content-driven) and confirmatory (hypothesis-driven) approaches to qualitative analysis (Guest et al., 2012), exercised in non-linear, iterative reflexivity and adaptation (Maxwell, 2005). It is exploratory, in that it employs a bottom-up, inductive approach to identify Covid-19 impacts, using text as a proxy for local experiences, and because publication types

were purposively selected. The process of data collection, however, also exhibits some confirmatory characteristics. We used existing data rather than generating primary data, randomly selected sample units within each publication type, and applied quantitative methods to analyze code frequencies (Braun and Clarke, 2012; Guest et al., 2012).

A broad, functional definition of qualitative research enabled us to reconcile the qualitative nature of this study with its positivist approach. This study is qualitative because the *type of data* it uses is text-based, i.e., of non-ordinal values, despite the use of quantitative analysis tools (Guest et al., 2012). In any case, the quasi-statistical basis of our conclusions should be, and is therefore, made explicit (Maxwell, 2009). Finally, we clarify that this study does not amount to a 'case study' as a methodology (Creswell, 2013), mainly because it does not combine diverse types of evidence (Kohlbacher, 2006) but rather as "a choice of what is to be studied" (Stake, 2005, p. 443).

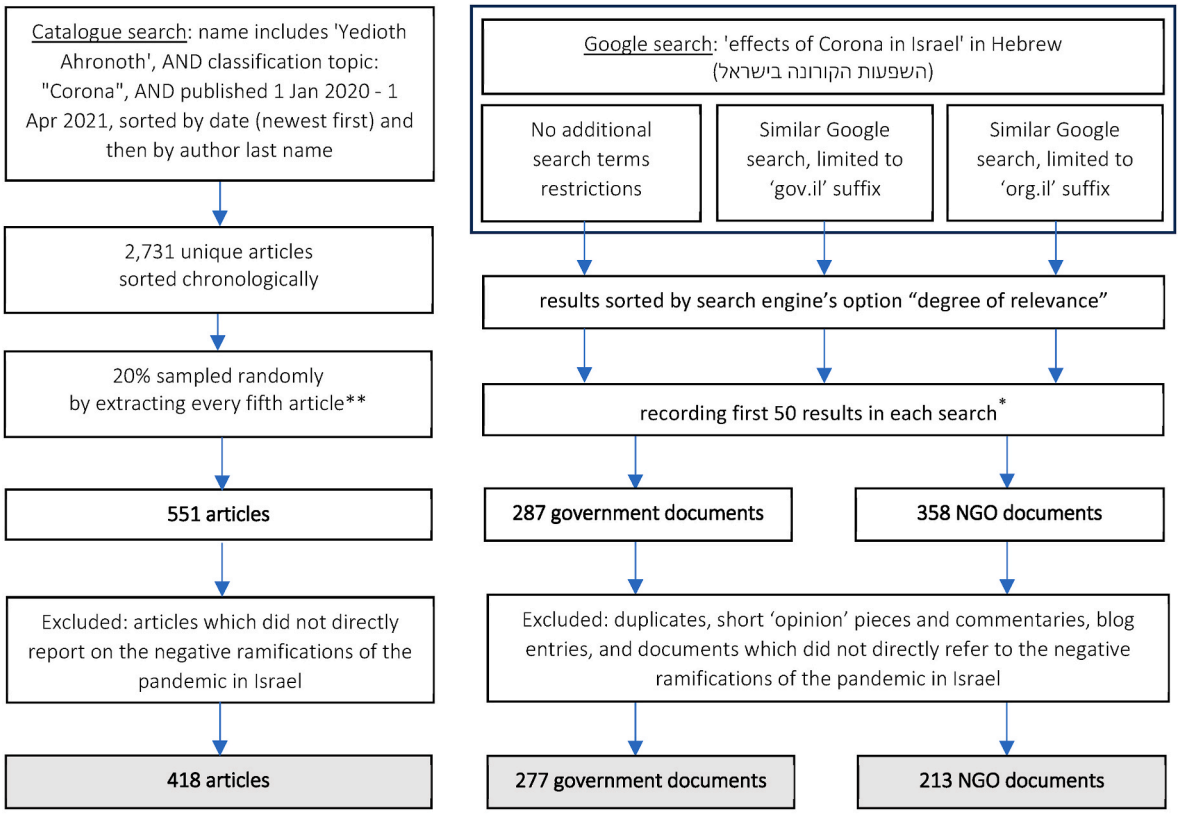
2.2. Data collection

We examined the representation of Covid-19 impacts in three types of sources of gray literature in Israel – news media, government agencies, and civil society NGOs, by querying Covid-related texts they published from the pandemic's onset in Israel (January 2020) to the review's completion (March 2021). The research location was chosen due to Israel's rigorous containment policies and its role as the first to offer vaccinations for all adults (Haklai et al., 2022), as well as for data accessibility (Creswell, 2013). Data selection was designed to find relevant textual units (Krippendorff, 2004) to best address the research question (Creswell, 2014) within our capacity. Source types were pre-determined for information richness (Kuzel, 1992), representing diverse perspectives, while ensuring sources were both credible and mainstream. Data collection details are as follows:

We surveyed the print version of Israel's leading for-pay daily newspaper, 'Yedioth Ahronoth' (Wiener and Altshuler, 2020), which accounts for ~34 % of national newspaper readership (Mann and Azi Lev-On, 2017). Using 'Beit Ariela Daily Press Catalogue' (a bibliographic classifications of select Israeli printed news outlets) we identified a large body of articles relevant for analysis. We then conducted random sampling to reduce the sample size (Creswell, 2013) to fit our limited resources and capacity (see search terms, sample sizes, and selection criteria in Fig. 1).

Using Google search engine as described in Fig. 1, we identified 277 governmental and 213 NGO publications as relevant for analysis. Government publications include policy documents and statements by Israeli government and public agencies. NGO publications originate from prominent civil, non-profit, and non-governmental organizations (e.g., think-tanks, research institutes).

We then assessed the diversity of governmental and NGO sources. We clustered the publications by source, calculated each source's share of publications in its type (government/NGO), and classified their professional focus. We found a diverse sample composition (source



* We selected the first 50 results of each search and recorded all publications relevant to the impact of Covid-19 in Israel. Results beyond 50 were considered repetitive or less relevant, reaching saturation (Creswell, 2014). Where a web-result led to multiple relevant publications (e.g., from the same organizations/agency), we recorded all of them.

** Since the sample unit was purposefully selected (newspaper article from a specific source on a given topic), all publications were considered equally representative. This allowed us to apply random sampling to credibly reduce the large sample size (Creswell, 2013). We selected a starting point using an online random number generator and extracted every 5th article thereafter.

Fig. 1. Sample composition. The process of establishing the sample for news media, government, and NGO publications, and its final composition by source types.

institutions, professional foci, etc.), not dominated by a single topic or area of interest (277 governmental publications from 15 agencies including ministries, legislative bodies, and national research institutions; 213 NGO publications from seven NGOs; see Appendix 2).

2.3. Analysis

This study closely aligns with the quantitative approach to content analysis, aiming to summarize datasets by analyzing category frequency rather than providing detailed descriptions (Bengtsson, 2016). With that, the study extends beyond the traditional focus on counting words/phrases (Berelson, 1952). We conducted a qualitative analysis of the sample publications, to identify references to Covid-19 impacts and additional related themes, and then quantitatively evaluated them, as detailed below. As such we note that while we explore news media, this study does not include a 'news frame' analysis (Odijk et al., 2013).

2.3.1. Categorization

Data interpretation by coding key ideas into categories is fundamental to thematic and content analysis, and we drew upon characteristics from both methodologies to refine our database. Treating each publication as a 'coding unit' (Krippendorff, 2004), we categorized primarily by title and subtitle and examined the full text where necessary. Assuming explicit content reflects genuine meaning (Preiser et al., 2021) we inductively assigned categories (i.e., categories were not pre-defined) (Braun and Clarke, 2012), according to the manifest meaning of the text (Bengtsson, 2016; Braun and Clarke, 2006). Its brief, clear nature did not necessitate uncovering latent meanings (Krippendorff, 2004) and enabled analysis by a single researcher.

We assigned keywords to each publication to reflect both Covid-19 **impacts** described (e.g., *morbidity* and *mortality*, see Table 1) and recurring aspects in which they were discussed (**additional themes**, e.g., *lockdowns*; *critique of public agencies*; see Table 3). These key words were then organized into substantive (descriptive) categories and clustered under broader organizational **topics** (Maxwell, 2009) (e.g., *morbidity* and *mortality* were clustered under HEALTH). A '*general*' category was assigned to publications covering a wide range of impacts within a topic (e.g., *HEALTH-General*). Finally, we assigned topics to impacts which were initially less intuitively clear (e.g., *civil rights*, *education* and *crime* related impacts were clustered under SOCIAL). In such cases, topics were determined based on the affected entities according to the publication, e.g.: erosion of civil rights was clustered under SOCIAL because it focused on impacts to society, while GOVERNANCE-related impacts highlighted the political system or national security directly. Finally, we formalized the categories in code typologies (Tables 1 and 3).

Each publication could address multiple impacts within the same or different topics, and was categorized based on *presence*, not frequency (i.e., each impact was counted once regardless of prominence). A publication could be assigned both '*general*' and specific categories within the same topic (e.g., a publication regarding various health impacts, but also detailing mortality was categorized as *HEALTH/General* and *HEALTH/Mortality*).

2.3.2. Quantification

Occurrence patterns do not necessarily indicate importance (Preiser et al., 2021), however mass communication research has long linked topic frequency in messages to perceived importance or emphasis (Krippendorff, 2004). Some recommend avoiding or masking code-counts in certain cases (Hannah and Lautsch, 2011), however we found this inapplicable to our study.

Once categorized, we aggregated the number of publications coded with each category (topic, impact, additional theme). This count reflects the *presence* of categories in publications, not their frequency in them.

Then, we calculated each category's percentage of total publications; each *impact* was also calculated within its topic (e.g., the ratio of publications discussing *mortality* among HEALTH-related publications). When aggregating the publications for each *topic*, we counted each publication once if it referred to at least one impact within that topic (e.g., a publication tagged with both *HEALTH/morbidity* and *HEALTH/infection* was counted as *one* HEALTH-impact related publication). After aggregating the codes for the entire sample, we performed similar calculations for additional 'sample units' (Krippendorff, 2004): We imported the data to Atlas.ti and crossed *topics* and *impacts* with publication types (news media, government agencies, NGOs) to compare how they reflect each *topic/impact*.

2.4. Preliminary modeling

In a final stage, we applied a systems-thinking approach to outline relationships between the impacts and additional themes identified in this study. Our goal was to reveal the general structure of these interactions and provide an initial understanding of possible feedbacks and key components. This preliminary model is discussed separately from the quantitative analysis of gray Israeli publications but is based on the same data to form broader theoretical assumptions.

We manually developed the model using our knowledge and insights from the literature review and gray literature analysis. Each connecting link reflects our research notes and analysis, and at least one publication (gray or otherwise). However, this model is not exhaustive, as we did not conduct axial coding of causal connections (a grounded theory method) (Creswell, 2013). Links were based on the literal meaning of the text and are neutral (not positive/negative) and uniform in strength for simplicity.

The model was organized in Atlas.ti software using a hierarchical 'top-down' Network layout. Components were distinguished by shape (impact, additional theme) with impacts color-coded by topic, and themes color-coded to indicate their role as exacerbating/mediating factors. The visual organization allowed for further analysis and discussion.

3. Results

3.1. Topics & impacts

We identified references to 32 different impacts across four topics: ECONOMIC, SOCIAL, HEALTH, and GOVERNANCE. ECONOMIC and SOCIAL impacts were prominent (Fig. 2).

Within each topic (see Table 1), the most referenced impacts were regarding *Businesses* and *employment (*ECONOMIC); *education*, *conflict*, and *welfare* (SOCIAL); the *healthcare system* and *mental-emotional health* (HEALTH); and the *political system* and *national security* (GOVERNANCE). Notably, only 10 % of publications addressed the direct health impacts of the pandemic (*infection*, *morbidity*, and *mortality*).

Comparing impacts (Fig. 3), we found ECONOMIC impacts (*businesses*; *employment*; and the *financial market*) were most discussed, followed by impacts on the *healthcare* system.

Table 1
Categories of Covid-19 impacts identified in the publications, divided by topic with descriptions. The number of publications featuring each impact (N = 908), its ratio within the topic ('% of topic') and its percentage of the total publications ('% of total').

Topic	Impact	Details	No. of publ.	% of topic	% of total publ.
ECONOMIC (393 publications, 43 % of total)	***Business(es)***	Struggling businesses, closures, reduced sales, purchase trends (e.g., real estate, agriculture, culture, tourism).	142	36 %	**16 %**
	Employment	Negative impacts on the job market, including rates and trends of jobs lost, paid leave, termination, average wages.	129	33 %	**14 %**
	The market	Negative impacts on Consumer Price Index, Gross National Product, import-export, national expenses, cost, resources.	91	23 %	10 %
	Foreign trade	Shifts or expected shifts in international commerce and their effect on the local economy.	13	3 %	1 %
	Banking	Negative impact on banking services and funding, e.g., credit, interest.	11	3 %	1 %
	General	Publications that addressed various negative economic implications in general.	370	94 %	41 %
SOCIAL (376 publications, 41 % of total)	***Education***	Declining educational performance, struggles of the education system (e.g., remote learning, loss of school days, effects on student performance, school closures, teachers and students).	68	18 %	**7 %**
	Conflict	Rising tensions among local populations and between the people and the government (e.g., protests, clashes, hostility).	63	17 %	**7 %**
	Welfare	Socio-economic hardship, decline in material standards of living, (e.g., personal struggles related to poverty, lack of food, medicine, housing conditions).	63	17 %	**7 %**
	Disadvantaged	Negative impacts on vulnerable populations (e.g., underrepresented communities, people with disabilities).	50	13 %	6 %
	Gaps	Widening socio-economic and cultural divides, inequality.	40	11 %	4 %
	Distrust	Decreasing trust in public officials and declining confidence in their ability to guide the public through the crisis.	38	10 %	4 %
	Family	Negative implications on family life and wellbeing.	30	8 %	3 %
	Civil rights	Erosion of civil rights and liberties, causes and factors.	27	7 %	3 %
	Violence	Rise violence (e.g., domestic, youth, riots, involving enforcement agents and service providers).	24	6 %	3 %
	Children	Negative impacts on children (e.g., education, mental/physical wellbeing).	22	6 %	2 %
	*Elderly***	Negative impacts on seniors (e.g., access to services, mental/physical wellbeing).	22	6 %	2 %
	Women	Negative impacts on women (e.g., employment, equality safety).	9	2 %	1 %
	General	Publications which addressed negative impacts on the fabric or function of society in general.	211	56 %	23 %
HEALTH (227 publications, 25 % of total)	***Healthcare***	Health and mental-health care system capacity to service patients (Covid-19 and other), impact on staff's physical/mental/emotional wellbeing.	81	36 %	**9 %**
	Mental-emotional	Mental and emotional distress caused by the pandemic (e.g., anxiety, depression, loneliness, fear of infection, financial pressure).	51	22 %	**6 %**
	*Morbidity (illness)**	Number infected or sick, the disease and its short and long-term implications.	35	15 %	4 %
	*Infection**	Disease spread, infection events, mega-spreaders, hot spots.	26	11 %	3 %
	*Mortality**	Number of deaths due to Covid-19, rates, trends.	25	11 %	3 %
	General	Publications that addressed physical health impacts and pandemic spread in general.	138	61 %	15 %
GOVERNANCE (104 publications, 11 % of total)	***Political***	National politics and foreign relations, including elections, reduced public trust in government and public agencies, political debates/conflicts regarding the management of the crisis.	50	48 %	**6 %**
	Security	Threats to national security due to Covid-19 impacts on internal/international conditions.	42	40 %	**5 %**
	Instability	Changes to national/international conditions adversely affecting Israel in various ways, e.g., economic, health.	16	15 %	2 %
	Criminality	Rise in crime.	13	13 %	1 %
	Food security	Negative impacts or threats to national food supply chains.	4	4 %	0 %
	Environment	Environmental implications (positive/negative).	3	3 %	0 %
	General	Includes publications that addressed national governance and/or international affairs related impacts in general.	50	48 %	6 %

* Direct impacts.
** Both direct and indirect impacts (impacts un-noted are indirect impact).

3.2. Comparing publication sources

Publication types showed both similarities and differences in referencing Covid-19 impact topics (Fig. 4). Newspaper articles focused more on HEALTH impacts (31 %) than government (21 %) and NGO (18 %) publications. NGOs emphasized GOVERNANCE impacts (31 %) more than other publication types (each 6 %). Government publications prioritized ECONOMIC impacts (56 %), while NGOs mainly addressed SOCIAL impacts (55 %).

Analyzing individual impacts (Table 2), all publication types highlighted impacts on *employment* and the *healthcare* system. Newspaper articles focused on *businesses* more (18 %) than employment (9 %), while NGOs prioritized *employment* (16.9 %) over *the market* (11 %), and mentioned impacts to *business* in fewer than 5 % of publications. Of the SOCIAL impacts, Newspaper articles emphasized *social conflict* (11 %), while government publications focused on *welfare* (15.5 %). NGOs referred to various social impacts (*disadvantage populations*, *social gaps*, and *civil rights*, all >10 %), and prioritized *national security* (19 %) and

Table 2
Most highlighted impacts by publication type (newspaper, government, NGOs). The numbers and percentages of impacts (noted as 'Topic.Impact'; see Table 1) referenced in >5 % of publications per type, from highest to lowest. 'General' impact categories are excluded. Topics are color-coded consistently with previous tables and figures. Impacts referenced in >10 % of publications per type are highlighted in dark gray. Since publications could refer to multiple impacts/topics, totals exceed 100 %. See Appendix 1 for full table and additional figures.

Newspaper publications (n=418)		
Covid-19 impacts	No.	% of n
● Economic.Business	76	18.2%
● Social.Conflict	45	10.8%
● Health.Healthcare	39	9.3%
● Economic.Employment	37	8.9%
● Social.Education	36	8.6%
● Health.Mental-Emotional	32	7.7%
● Health.Sickness	30	7.2%

Government publications (n=277)		
Covid-19 impacts	No.	% of n
● Economic.Employment	59	21.3%
● Economic.Business	56	20.2%
● Economic.Market	51	18.4%
● Social.welfare	43	15.5%
● Health.Healthcare	29	10.5%
● Social.Education	26	9.4%
● Social.Disadvantaged	17	6.1%

Civil society NGOs publications (n=213)		
Covid-19 impacts	No.	% of n
● Governance.Security	40	18.8%
● Economic.Employment	36	16.9%
● Governance.Political	36	16.9%
● Social.Disadvantaged	28	13.1%
● Social.Gaps	26	12.2%
● Social.Civil Rights	25	11.7%
● Economic.Market	24	11.3%
● Social.Distrust	21	9.9%
● Governance.Instability	16	7.5%
● Social.Conflict	16	7.5%
● Health.Healthcare	13	6.1%
● Social.welfare	11	5.2%

Table 3
Additional themes identified in the publications with descriptions in order of prominence (see Fig. 5).

Theme	Descriptions
Policy	Public policy aspects, considerations about managing the crisis and its impacts.
Distancing	Social distancing policies restricting people, businesses, schools, and other public services (e.g., lockdowns and stay-at-home orders, quarantine, isolation requirements, masking).
Mishandling	Critique of public bodies and leadership management of the crisis.
International	International changes due to Covid-19 that negatively affect Israel; comparison to Covid-19 impacts and coping mechanisms abroad.
Resilience*	Ways of societal coping with Covid-19 by enduring, adapting, or transforming to meet new conditions.
Enforcement	Enforcement of social distancing and other policies restricting business, public and personal activities.
National aid*	National/local government support mechanisms (e.g., unemployment benefits, grants, tax breaks).
Easing restrictions*	Loosening social distancing policies on business, public and personal activities.
Vaccines*	Obtaining and distributing vaccines, numbers vaccinated and trends, health risks, side effects, effectiveness, vaccination resistance, public opinion and debate.
Culture**	Businesses/professions affected by policy restrictions on cultural events (e.g., performances, theatre, art, leisure activities).
Social support*	Civil Society and grassroots organization's support of affected people/businesses.
Borders	Restrictions limiting entering and leaving the country, or lack thereof.
Tourism**	Tourism businesses/professions affected by policy restrictions (e.g., airlines, hotels, tour guides).
Catering**	Catering businesses/professions affected by policy restriction.

* Positive themes, alleviating adverse effects of Covid-19.
** Specific business-related themes; color-coding consistent with Figure 5.

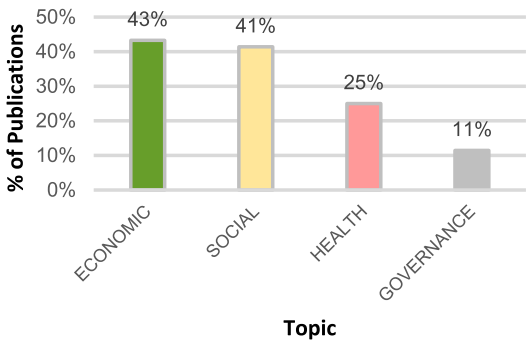


Fig. 2. Percentage of publications referencing each Covid 19 impact topic. Since publications could refer to multiple impacts/topics, totals exceed 100 %. Each publication was counted once per topic (e.g., a publication tagged with both *HEALTH/morbidity* and *HEALTH/general* was counted as one HEALTH-related publication). For topic details see Table 1.

the *political system* (16.9 %).

Additionally, we analyzed the information by topics (see Table 5, Appendix 1). Several impacts were emphasized by more than one publication type: *education* (SOCIAL) by newspaper and government publications, *the market* (ECONOMIC) by NGOs and government), and *politics* (GOVERNANCE) by newspaper and NGOs.

3.3. Additional themes

We identified 14 recurring themes reflecting the issues through which pandemic impacts were discussed (Table 3). These themes deepen our understanding of these impacts (see Discussion). The themes primarily include contributing factors or pathways linking the pandemic to various impacts. Themes indicate action/inaction (e.g., *mishandling*, *social distancing*, *enforcement*, *easing restrictions*, *borders*) and haves/have-nots (e.g., *national aid*, *social support*, *vaccines*), as well as topical categories (e.g., *policy*, *international aspects*, *resilience*, *culture*, *tourism*, *catering*).

Fig. 5 shows that aspects of Covid-19 related *public policy* were most

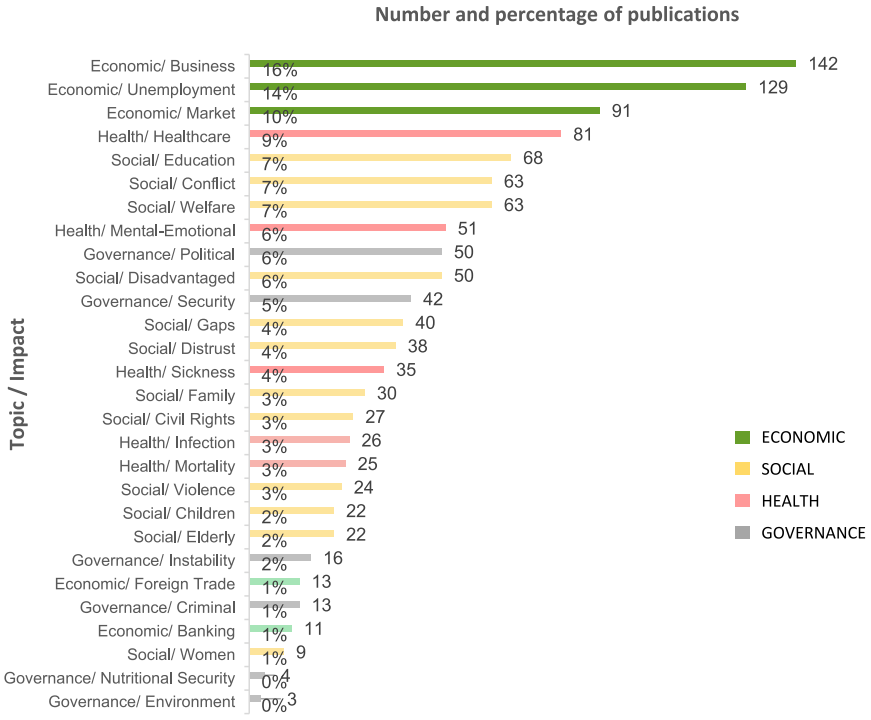


Fig. 3. Number and percentage of publications (N = 908) referencing each Covid-19 impact (noted as 'Topic/Impact'; see Table 1). Impacts are color-coded by topic, consistent with previous tables and figures, and sorted from most to least mentioned, excluding 'general' impact categories. Since publications could refer to multiple impacts/topics, totals exceed 100 %. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

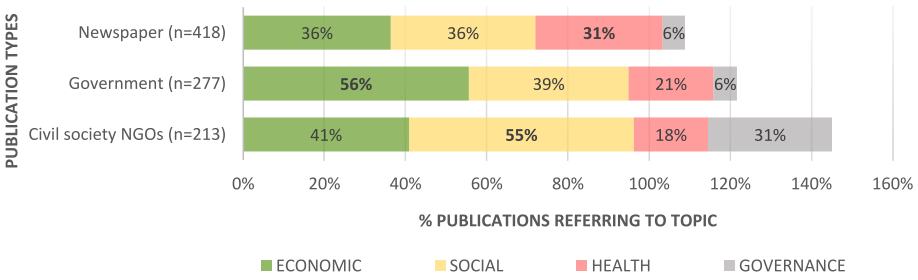


Fig. 4. Percentage of publications referencing each topic by publication type (see Table 1). Each publication was counted once per topic, and since publications could refer to multiple topics, totals exceed 100 %. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

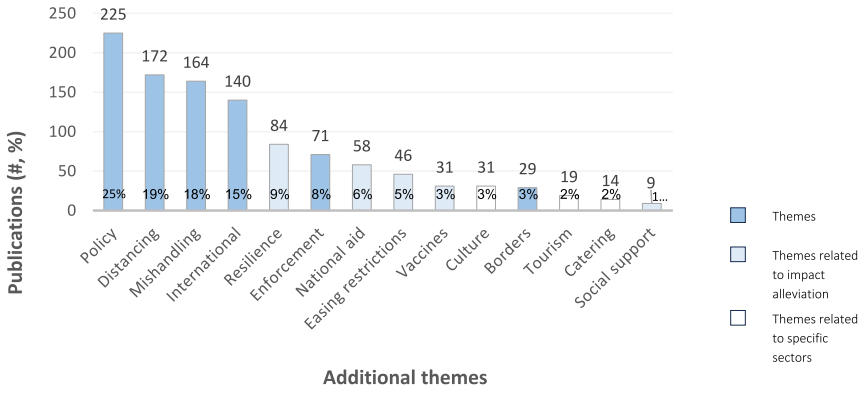


Fig. 5. Number and percentage of publications (N = 908) referencing each additional theme (see Table 3 for theme details). Themes are color-coded consistently with Table 3. Since publications could refer to multiple themes, totals exceed 100 %. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

referenced among the themes (25 %), followed by *social distancing* restrictions (19 %) and crisis *mishandling* by public administration and leadership (18 %).

4. Discussion

In this study, we developed a method to inductively identify crisis impacts as they unfold and applied it in an exemplary case study. Our qualitative and quantitative analysis of sampled popular and gray literature published by Israeli news-media, government agencies, and NGOs during the pandemic yielded insight regarding: (a) *what Covid-19 impacts* were referenced, and (b) the *extent and nature* of these references, compared across publication types.

Regarding the *impacts referenced*: Covid-19 impacted regions differently given global social, economic, and cultural diversity (e.g., population structures, norms, genetics). These variations shaped crisis mitigation measures affecting local experiences. Still, comparative research and international reports indicate similar social, health, economic, and governance impacts, albeit at varying scales and severity (e.g., CCSA, 2021; OECD, 2021, 2020; UN, 2020; WB, 2020; WHO, n.d.; Xiong et al., 2020). The Israeli impacts identified here (through their representation in local publications) offer guidance into key pandemic dynamics and strengthen the foundation for assessing their impacts globally.

Regarding the *extent and nature* of these impacts: In so far that the publication reference to impact could reflect actual impacts endured, these results reflect the unique Israeli experience of Covid-19. These findings hold local relevance, could guide resource allocation (Singh, 2023), and inform policy responses to mitigate future crises.

4.1. Pandemic impacts are both direct and indirect, via policy response

Among the impacts identified, only a few directly result from the disease: *infection*, *morbidity*, and *mortality* (HEALTH, see Table 1). Most other impacts are indirect, stemming from spontaneous and/or policy responses to the disease and its direct impacts. Two SOCIAL impacts, concerning *disadvantaged* and *elderly* populations, due to their health related or social preconditions, experienced both direct (increased vulnerability to infection, morbidity, and mortality) and indirect impacts (e.g., increased risks of mental-emotional health, distrust).

Findings indicate that profound indirect impacts resulted from responses to the primary health threat. Most themes identified (Fig. 5, Table 3) allude to such responses in some form. Response to the primary impacts can be spontaneous such as individual behavior (e.g., stress/depression), social reactions (e.g., solidarity and resilience; national security threats), and market shifts (e.g., financing, rates, wages, jobs), or policy-driven, i.e., government action or lack thereof to mitigate pandemic impacts (e.g., border closures, mask mandate, lockdowns).

Specifically, policy responses emerge as key factors, shaping pandemic impacts, especially on businesses, employment, education, and mental-emotional health. The importance of crisis response is also supported by a recent study on lockdown impacts in Haiti, where pandemic responses and geo-cultural contexts differ significantly from Israel (Bardosh et al., 2023). A study of adults' experience during Covid-19 found similar connections between pandemic impacts and policy response, calling for future mitigation efforts to better "prevent infection while preserving wellbeing" (Lowe et al., 2024, p. 429). The significant role of Covid-19 policy responses has also been acknowledged by a large body of research aiming to monitor, record, and compare its outcomes on national and sub-national levels (Hale et al., 2021; Oxford Supertracker, n.d.).

These findings suggest that responses to major disruptions can have considerable and lasting effects on society and should be carefully considered. As resilience involves responding to crisis through endurance, adaptation, and transformative change, understanding these indirect effects and the role of policy response offers important lessons for managing future crises. Policy makers may consider mitigating indirect impacts through, for example, complementary measures, such as financial aid, subsidized vaccines, and easing restrictions.

The Israeli case exemplifies these lessons. During the pandemic, Israel was mostly successful in containing the virus through strict social-distancing and repeated extensive lockdowns (Schwartz, 2021). Despite debates about the economic and social costs, the government prioritized reducing morbidity (Kershner, 2020). Our findings reflect these tensions: 40 % of publications focused on ECONOMIC impacts on *businesses*, *employment,* and *the market*, while only 10 % addressed all direct health

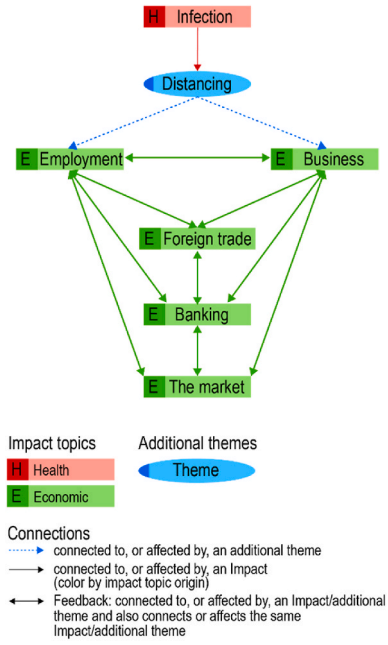


Fig. 6. An example of a conceptual model. This figure exemplifies possible prevailing links between the economic impacts identified in this study.

impacts (*infection*, *morbidity*, *mortality*), a percentage similar to those concerning the *healthcare system* (9 %).

4.2. Indirect pandemic impacts: a cumulative cascade

The literature review on Covid-19 impacts and the gray literature analysis (focusing on Israel), suggest a hierarchy among indirect impacts. Many indirect impacts appear to be underlying drivers of other impacts.

For example, ECONOMIC impacts, as discussed in the publications, align with recent research: *businesses* closures and *unemployment* due to social distancing measures affected *banking* and the *market*, reducing productivity, and increasing debt (Kaplinsky and Tzadik, 2020). *Foreign trade* (international supply chains of goods/services) was similarly disrupted by market uncertainty (IEI, 2020), and border restrictions (WTO, 2020). These impacts often feed back negatively to their causes or with one another, worsening the situation. For example, *market* disruptions increase *unemployment* and hardship in *businesses* (which exacerbate each other) and affect *banking*, feeding *unemployment* directly or through *businesses* or *foreign trade* (financing costs; availability constraints) (Fig. 6).

A closer look at the SOCIAL impacts reveals similar interrelationships. The *education* system was affected by health measures that kept students at home to prevent infection (UNESCO, 2021). School closures then increased the need for home care, disrupting parental employment (Lafferty et al., 2022); with reports on disproportional impacts on women (e.g., Nivakoski and Mascherini, 2021), and worsening socio-economic *welfare* already strained by ECONOMIC impacts. This further exacerbated impacts on businesses, creating a feedback loop that impacted employment, *welfare,* and so on.

This cascade of economic and social pressures deepened *social gaps* (Aviram-Nitzan and Kedar, 2020a), and exacerbated psychological stress caused by fear of the virus and uncertainty about its long-term effects. In conjunction with prolonged indoor confinement, this disrupted *family-life* and increased domestic *violence* (Avgar, 2020; WHO, n. d.), particularly affecting *vulnerable populations* (Aviram-Nitzan and Kedar, 2020b; Shnoor, 2020). The combination of strict distancing measures, vaccine mandating, and lacking transparency, led to abuse of power, weakened governance, and eroded *civil rights* and liberties, resulting in public *distrust*, protests and, in some cases, social *conflict*. These conditions also catalyzed an increase in *criminal activity* (Repucci and Slipowitz, 2020; Shany et al., 2020).

These observed trends can further lead to impact on the local GOVERNANCE system, as observed in Israel. Though less prominent (featured by 11% of surveyed publications), a sound, trusted government is essential for effective crisis management (Mizrahi et al., 2021). *Political* ramifications of the pandemic can cause instability and heighten *national security* risks, ultimately feeding back to enhance other impacts, further destabilizing governing authorities. These results, however, may be influenced by Israel's fragile geopolitical situation and its political turmoil since 2018, including widening political and social divides and four election cycles within two years (IDI, 2021a).

The convergence of these extreme conditions - economic hardship, uncertainty, fear of infection, mobility limits, and social distancing – lead to *mental-emotional distress* (Kimhi et al., 2021; Levkovich and Shinan-Altman, 2020). Studies also highlight the importance of transparent communication by public agencies for building trust, reducing societal anxiety and encouraging cooperation (Shahar et al., 2023; Shorey et al., 2020). Lacking transparency and trust can further exacerbate other impacts such as *violence*, *social conflict*, and reduced capability to *learn* and *work*.

Finally, our analysis of additional themes indicates that *public policy* and governance are similarly interconnected and can have significant societal impacts. As such, it dictates a need for overall institutional capacity and preparedness (e.g., of the healthcare system, which fundamentally influences systemic shock response, Ismail et al., 2022). Its underperformance can spark strong criticism, ultimately fueling public tensions, *conflict*, *instability*, and *political* unrest, further undermining the quality of *policy* making.

Fig. 7 presents a preliminary **mental model** of the components identified in this study (impacts by topic and additional themes) with connecting arrows indicating their relationships and feedback loops. It illustrates the flow of direct and indirect impacts and the role of additional themes in exacerbating or mitigating them. The model also highlights the central role of response policies detailed above, especially social distancing, in shaping Covid-19 impacts. Understanding this dynamic and identifying *key* impacts/themes in it, can guide future policy responses to minimize cascading impacts, and direct research on crisis governance.

This visualization reveals systemic interconnectedness. It also suggests the cumulative magnitude of indirect impacts, enabled by underestimating the significance of policy response (or lack thereof). Most importantly, it points to the need for a holistic systems approach that recognizes and addresses complexity, treating the whole 'patient' rather than focusing on individual issues in isolation, where solving one problem might create another, possibly more significant, one.

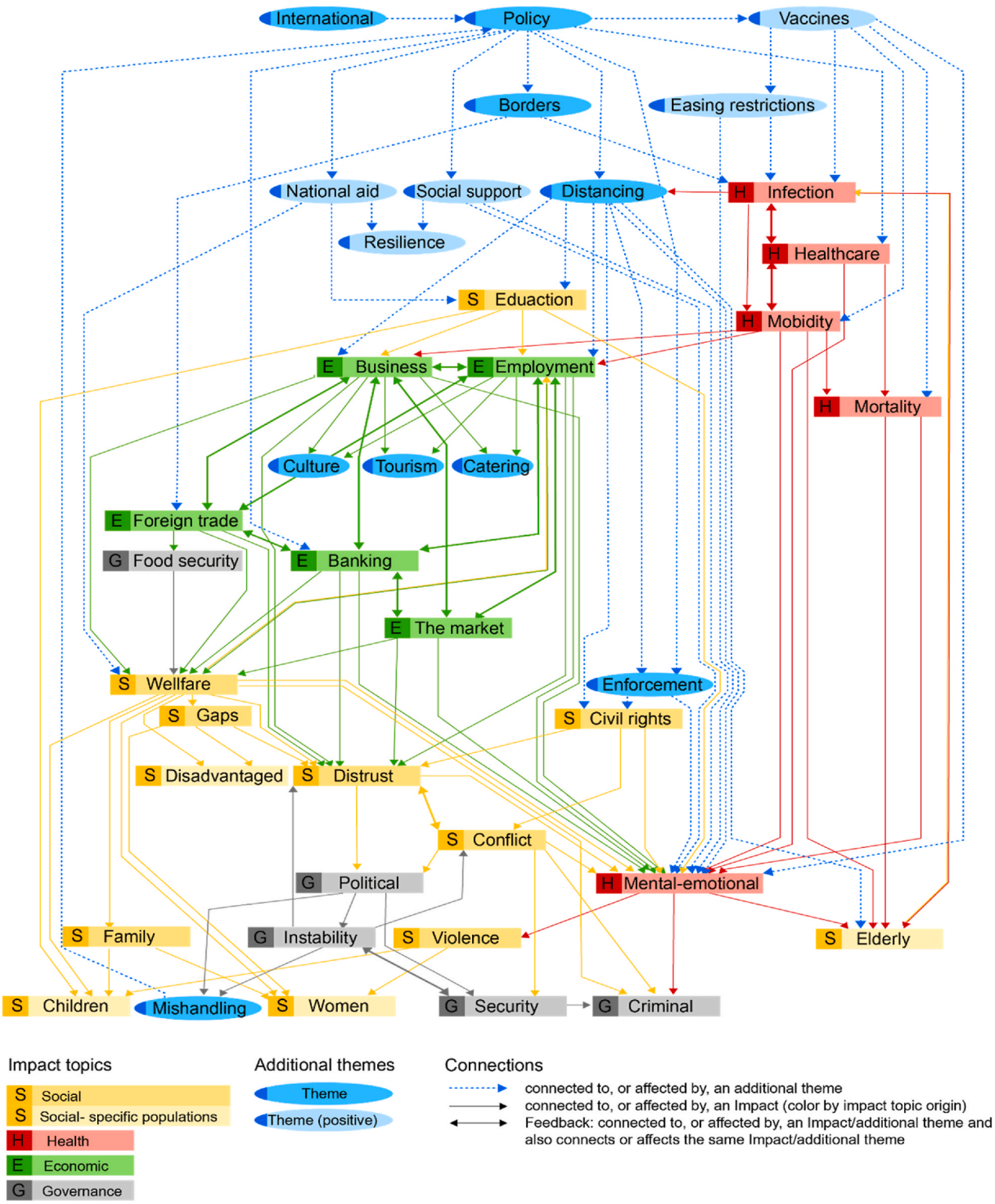


Fig. 7. Preliminary mental model. The impacts and additional themes identified in this study, color-coded consistently with previous figures and tables, excluding *tourism*, *culture*, and *catering* themes for simplicity (these were grouped under business and *unemployment*). Lines indicate relationships (positive/negative) with arrowheads and colors indicating directionality (lines are colored by their source), except feedback loops, marked by both colors or a thicker double-sided arrow. The model was produced using Atlas.ti and edited for clarity using graphic software. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

4.3. Variation in impact representation across sources

This study reviewed publications from three source types: newspaper, government, and NGOs, each serving distinct societal roles. Findings highlight the value of using all three sources to provide diverse perspectives and address potential topic biases. How these sources align or differ in referencing the impacts can deepen our understanding of the debate around them. With that, analyzing the discourse and uncovering latent narratives or 'news frames' ("central organizing ideas" that reflect journalists' subjective perspectives, Odijk et al., 2013) - is beyond the scope of this study. Exploration of Covid-19 communication could better reflect underlying agendas (Krippendorff, 2004) through qualitative instruments like critical discourse/narrative analysis (Preiser et al., 2021).

This study revealed great diversity across source types, while highlighting a narrow consensus on *business*, *unemployment*, and the *healthcare system*. An emphasis on specific impacts may reflect priorities (e.g., government publications emphasizing ECONOMIC impacts while NGOs focus on SOCIAL impacts) or willingness (and lack thereof) to publicly address certain issues (e.g., this may explain NGOs' emphasis on GOVERNANCE impacts, barely discussed in the newspaper/government publications). The newspaper's relative emphasis on HEALTH impacts likely stems from its role in daily reporting virus spread and toll.

4.4. Research limitations

First, the results of this study rest on the assumption that the sample publications analyzed in this study reliably represented the whole body of publications. Although the sampled newspaper is Israel's most widely distributed newspaper and mainstream in its political orientation, a broader sampling of news sources may have affected our results and tempered our conclusions. Additionally, we acknowledge that the *comparative representation* of Covid-19 impacts is limited to Israel, whereas the broader *identification* of impacts may reflect global trends. This study would have benefitted from a wider sample, more publication types, and additional locations.

Second, the representation of impacts in publications may not reflect their magnitude or severity, but rather the volume of public debate or media coverage. For instance, primary health impacts may have been less featured due to their scientific nature. Despite our broad sample, some important issues may have not been covered by the media reviewed. Publications may also strategically communicate content especially in crisis (to avoid causing panic, for example). Although this study does not explore 'news framing', it is important to recognize that journalism can, for various motivations, distort reality (Marais and Linström, 2012). Additionally, this study does not reflect impacts that were successfully mitigated by public policy, societal organization, overall preparedness, etc.

Lastly, comparing different societal impacts (e.g., loss of livelihood, rising crime) poses inherent challenges. Their effects are highly subjective, and their *perceived* severity can vary across cultures, histories, and other socio-ecological characteristics.

5. Conclusion & next steps

Most adverse effects of Covid-19 represented in the analyzed publications were indirect, rather than concerning direct health implication. These findings, along with existing literature, paint a cascade of causal links and feedback loops, emphasizing the central role of crisis response mechanisms. To the extent the publication sample accurately represents the public agenda during the study period, this suggests that public policies can have far-reaching, and enduring societal consequences potentially no less than the health threat itself.

This study moves beyond analyzing Covid-19 impact representation in select local publications, offering insights for future pandemic response and crisis preparedness. Societal resilience is demonstrated by the ability to endure, adapt, and transform during crises. Fragilities identified during such crises, as seen in this study, can inform efforts to reinforce preparedness for future challenges. Therefore, careful attention should be given to designing comprehensive, system-wide crisis responses and monitoring secondary impacts.

Similar surveys in other countries are needed to validate or expand the range of impacts and coping mechanisms identified in this study. Collecting data on these impacts would further clarify their drivers and dynamics. Additionally, the grounded identification of impacts here can inform future research of the relationship between crisis impacts and resilience characteristics in SES. As mentioned in the introduction, the next step of our study, already underway, will operationalize key impacts and examine how characteristics associated with socio-ecological resilience affected societal outcomes during Covid-19.

CRediT authorship contribution statement

Merav Cohen: Writing – original draft, Visualization, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Daniel E. Orenstein:** Writing – review & editing, Supervision, Project administration, Methodology, Funding acquisition, Conceptualization.

Ethics approval

This study did not require ethics approval.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

M. Cohen acknowledges the financial support of The Center for Integration in Science of the Ministry of Aliyah and Integration, State of Israel. Both authors thank Dr. Ronit Cohen for her advice and assistance on data analysis and visualization, and the members of the Technion combined ecology lab for their ongoing support and thoughtful feedback throughout the process of this work.

Appendices.

Appendix 1

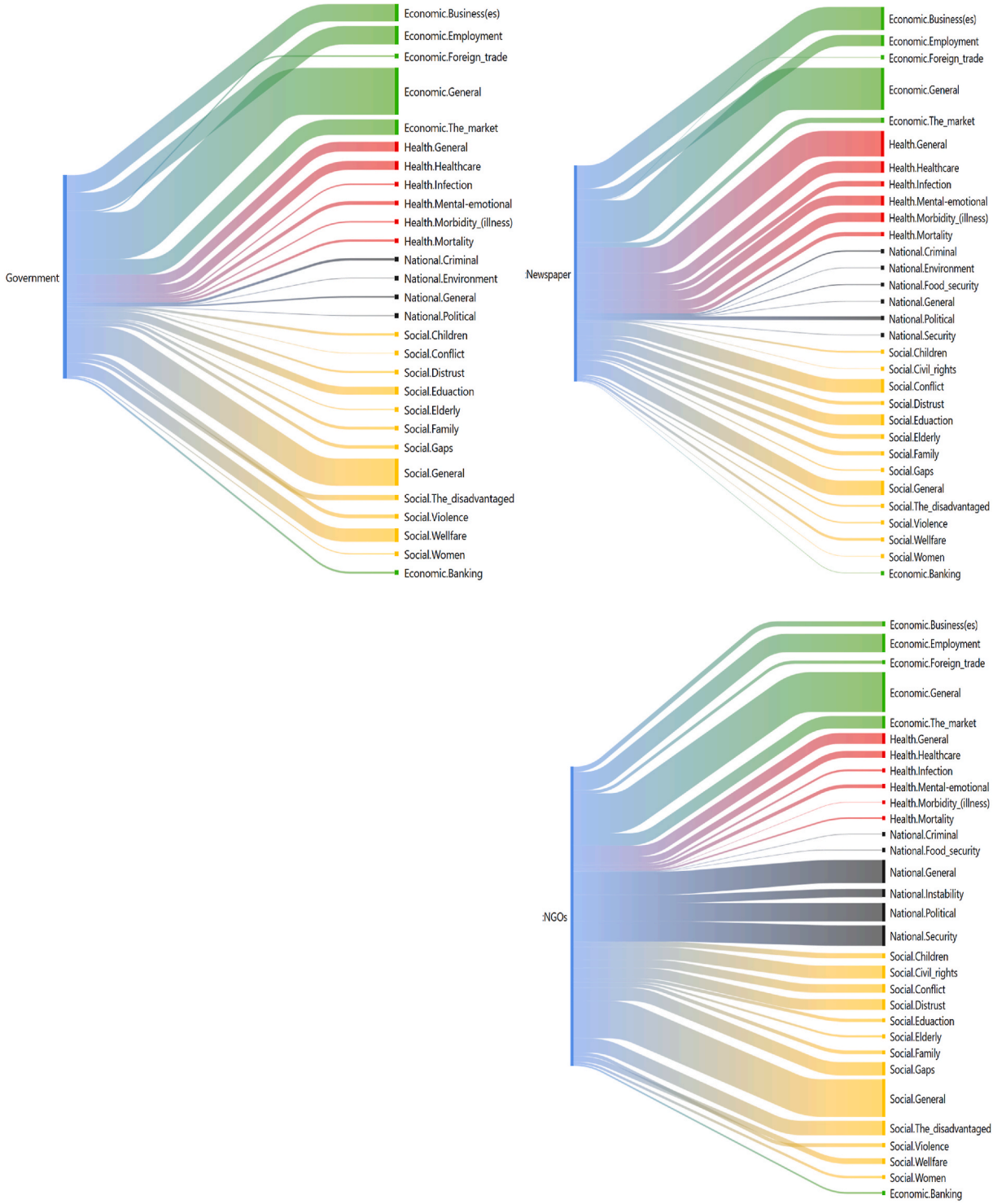


Fig. 8. Impacts by publication type. A visualization of the data detailed in Table 4 below, depicting the relative number of publications, among each of the three publication types (government, newspaper, and NGOs), that discussed each of the impacts (colors by topic consistent with previous tables and figures: HEALTH-red, ECONOMIC-green, SOCIAL-yellow, GOVERNANCE-gray). In contrast to Table 4, this figure includes the 'general' impact categorizations for each topic. Note that each publication could refer to more than one impact. For impact details see Table 1.

Table 4

Impacts by publication type. Number and percentage of publications that refer to each impact by publication type (newspaper, government, and NGO publications). This table exhibits detailed data supporting Table 2. Impacts are noted with their respective topics as 'topic.impact' (colors by topic consistent with previous tables and figures), sorted from most to least widely mentioned. This table excludes the 'general' impact categorizations for each topic. Impacts which were referred to in >5 % and >10 % of publications in each publication type are highlighted in light and dark gray, respectively. Note: Individual publications could refer to more than one impact/topic, therefore the numbers in this table do not accumulatively amount to the total number of publications surveyed (N = 908) and percentages sum is >100 %. For topic/impact details see Table 1.

Newspaper publications (n=418)		
Covid-19 impacts	No.	% of n
Economic.Business	76	18.2%
Social.Conflict	45	10.8%
Health.Healthcare	39	9.3%
Economic.Employment	37	8.9%
Social.Education	36	8.6%
Health.Mental-Emotional	32	7.7%
Health.Sickness	30	7.2%
Health.Infection	18	4.3%
Economic.Market	16	3.8%
Social.Elderly	15	3.6%
Health.Mortality	14	3.3%
Social.Family	14	3.3%
Governance.Political	12	2.9%
Social.Distrust	11	2.6%
Social.welfare	9	2.2%
Social.Children	5	1.2%
Social.Disadvantaged	5	1.2%
Governance.Criminal	4	1.0%
Social.Gaps	4	1.0%
Social.Violence	4	1.0%
Governance.Food Security	3	0.7%
Economic.Banking	2	0.5%
Economic.Foreign Trade	2	0.5%
Governance.Security	2	0.5%
Social.Civil Rights	2	0.5%
Governance.Environment	1	0.2%
Social.Women	1	0.2%
Governance.Instability	0	0.0%

Government publications (n=277)		
Covid-19 impacts	No.	% of n
Economic.Employment	59	21.3%
Economic.Business	56	20.2%
Economic.Market	51	18.4%
Social.welfare	43	15.5%
Health.Healthcare	29	10.5%
Social.Education	26	9.4%
Social.Disadvantaged	17	6.1%
Social.Violence	13	4.7%
Health.Mental-Emotional	12	4.3%
Social.Gaps	10	3.6%
Social.Family	9	3.2%
Governance.Criminal	8	2.9%
Health.Mortality	8	2.9%
Social.Children	7	2.5%
Economic.Banking	6	2.2%
Social.Distrust	6	2.2%
Economic.Foreign Trade	5	1.8%
Health.Sickness	5	1.8%
Health.Infection	4	1.4%
Social.Elderly	3	1.1%
Social.Women	3	1.1%
Governance.Environment	2	0.7%
Governance.Political	2	0.7%
Social.Conflict	2	0.7%
Governance.Food Security	0	0.0%
Governance.Instability	0	0.0%
Governance.Security	0	0.0%
Social.Civil Rights	0	0.0%

Civil society NGOs publications (n=213)		
Covid-19 impacts	No.	% of n
Governance.Security	40	18.8%
Economic.Employment	36	16.9%
Governance.Political	36	16.9%
Social.Disadvantaged	28	13.1%
Social.Gaps	26	12.2%
Social.Civil Rights	25	11.7%
Economic.Market	24	11.3%
Social.Distrust	21	9.9%
Governance.Instability	16	7.5%
Social.Conflict	16	7.5%
Health.Healthcare	13	6.1%
Social.welfare	11	5.2%
Economic.Business	10	4.7%
Social.Children	10	4.7%
Health.Mental-Emotional	7	3.3%
Social.Family	7	3.3%
Social.Violence	7	3.3%
Economic.Foreign Trade	6	2.8%
Social.Education	6	2.8%
Social.Women	5	2.3%
Health.Infection	4	1.9%
Social.Elderly	4	1.9%
Economic.Banking	3	1.4%
Health.Mortality	3	1.4%
Governance.Criminal	1	0.5%
Governance.Food Security	1	0.5%
Health.Sickness	1	0.5%
Governance.Environment	0	0.0%

Table 5

Impacts by publication type and by topic. This table is identical to Table 4, only sorted differently: first by topic, then from most to least widely mentioned. When displayed in this way, it is easier to identify impacts emphasized by each publication type (newspaper, government, NGOs) under each topic (ECONOMIC, GOVERNANCE, HEALTH, SOCIAL, colors by topic consistent with previous tables and figures). This table excludes the 'general' impact categorizations for each topic. Impacts referred to in >5 % and >10 % of publications in each publication type are highlighted in light and dark gray, respectively. Note: Individual publications could refer to more than one impact/topic, therefore the numbers in this table do not accumulatively amount to the total number of publications surveyed (N = 908) and percentages sum is >100 %. For topic/impact details see Table 1.

Newspaper publications (n=418)				Government publications (n=277)				Civil society NGOs publications (n=213)			
Covid-19 impacts	No.	% of n		Covid-19 impacts	No.	% of n		Covid-19 impacts	No.	% of n	
● Economic.Business	76	18.2%		● Economic.Employment	59	21.3%		● Economic.Employment	36	16.9%	
● Economic.Employment	37	8.9%		● Economic.Business	56	20.2%		● Economic.Market	24	11.3%	
● Economic.Market	16	3.8%	32%	● Economic.Market	51	18.4%	64%	● Economic.Business	10	4.7%	37%
● Economic.Banking	2	0.5%		● Economic.Banking	6	2.2%		● Economic.Foreign Trade	6	2.8%	
● Economic.Foreign Trade	2	0.5%		● Economic.Foreign Trade	5	1.8%		● Economic.Banking	3	1.4%	
● Governance.Political	12	2.9%		● Governance.Criminal	8	2.9%		● Governance.Security	40	18.8%	
● Governance.Criminal	4	1.0%		● Governance.Environment	2	0.7%		● Governance.Political	36	16.9%	
● Governance.Food Security	3	0.7%	5%	● Governance.Political	2	0.7%	4%	● Governance.Instability	16	7.5%	44%
● Governance.Security	2	0.5%		● Governance.Food Security	0	0.0%		● Governance.Criminal	1	0.5%	
● Governance.Environment	1	0.2%		● Governance.Instability	0	0.0%		● Governance.Food Security	1	0.5%	
● Governance.Instability	0	0.0%		● Governance.Security	0	0.0%		● Governance.Environment	0	0.0%	
● Health.Healthcare	39	9.3%		● Health.Healthcare	29	10.5%		● Health.Healthcare	13	6.1%	
● Health.Mental-Emotional	32	7.7%		● Health.Mental-Emotional	12	4.3%		● Health.Mental-Emotional	7	3.3%	
● Health.Sickness	30	7.2%	32%	● Health.Mortality	8	2.9%	21%	● Health.Infection	4	1.9%	13%
● Health.Infection	18	4.3%		● Health.Sickness	5	1.8%		● Health.Mortality	3	1.4%	
● Health.Mortality	14	3.3%		● Health.Infection	4	1.4%		● Health.Sickness	1	0.5%	
● Social.Conflict	45	10.8%		● Social.welfare	43	15.5%		● Social.Disadvantaged	28	13.1%	
● Social.Education	36	8.6%		● Social.Education	26	9.4%		● Social.Gaps	26	12.2%	
● Social.Elderly	15	3.6%		● Social.Disadvantaged	17	6.1%		● Social.Civil Rights	25	11.7%	
● Social.Family	14	3.3%		● Social.Violence	13	4.7%		● Social.Distrust	21	9.9%	
● Social.Distrust	11	2.6%		● Social.Gaps	10	3.6%		● Social.Conflict	16	7.5%	
● Social.welfare	9	2.2%	36%	● Social.Family	9	3.2%	50%	● Social.welfare	11	5.2%	78%
● Social.Children	5	1.2%		● Social.Children	7	2.5%		● Social.Children	10	4.7%	
● Social.Disadvantaged	5	1.2%		● Social.Distrust	6	2.2%		● Social.Family	7	3.3%	
● Social.Gaps	4	1.0%		● Social.Elderly	3	1.1%		● Social.Violence	7	3.3%	
● Social.Violence	4	1.0%		● Social.Women	3	1.1%		● Social.Education	6	2.8%	
● Social.Civil Rights	2	0.5%		● Social.Conflict	2	0.7%		● Social.Women	5	2.3%	
● Social.Women	1	0.2%		● Social.Civil Rights	0	0.0%		● Social.Elderly	4	1.9%	

Appendix 2

As described in the methods section, following the sample collection, we assessed the diversity of sources for governmental and NGO publications. Below are the results of this validation process.

Government publications

Table 6 below demonstrates that the 277 government publications (which include research reports, policy documents, press releases and other statements, guides, overviews, public addresses, and articles) were produced by 15 different Israeli government and other public agencies, and that 96 % of these publications were produced by only six institutions (#1 through 6). The largest share of the government publications (40 %) was produced by the Knesset Research and Information Center, a research division specifically serving the legislative branch of the Israeli Parliament. The second highest number of publications (26 %) was produced by the Israel Central Bureau of Statistics. Neither authority specializes in a particular aspect of civil life, rather they investigate a broad variety of topics. This characteristic of a government agency is unlike, for example, the Bank of Israel, which is specifically focused on finance and economics. Authorities # 3–5, as well as 7–8 and 10–15 in Table 6, all focus on specific (yet different) aspects of the Covid-19 crisis pertaining to their sphere of responsibilities.

Table 6
Government publications by source. The number and percentage of publications by government agencies concerning the impact of the Covid-19 pandemic represented by publishing agency.

No.	Administrative authority	No. publications	% of government publications	
1	The Knesset** Research and Information Center	111	40 %	**96 % of government publications**
2	Israel Central Bureau of Statistics	73	26 %	
3	Israel Ministry of Public Security*	40	14 %	
4	National Insurance Institute of Israel*	20	7 %	
5	Bank of Israel*	13	5 %	
6	The State Comptroller and Ombudsman of Israel	9	3 %	
7	Israel Ministry of Finance*	2	1 %	
8	Israel Ministry of Health*	2	1 %	
9	The Knesset**	1	0 %	
10	Israel Consumer Council*	1	0 %	
11	IIA Israel - Institute of Internal Auditors*	1	0 %	
12	Israel Ministry of Energy*	1	0 %	
13	Israel Ministry of Construction and Housing*	1	0 %	
14	Israel Ministry of Agriculture and Rural Development*	1	0 %	
15	Israel Ministry of Justice*	1	0 %	
	Total	**277**	**100 %**	

* Authorities that focus on specific aspects of civil life, and therefore on specific aspects of the Covid-19 crisis pertaining to their sphere of responsibilities.
** The Knesset is the legislative branch of the Israeli Parliament.

Civil society NGOs publications

The 213 publications by NGOs (which include research reports, press releases, surveys, books, articles, and other publications) were produced by seven different think tanks, and research institutes (Table 7). When organized by decreasing volume of publications, we find that 80 % of the publications were produced by the first two institutions, while 97 % of the publications were published by the top four institutions.

The largest share of NGO publications was produced by The Institute for National Security Studies (INSS). According to its mission statement, INSS researchers are "engaged in exploring the most pressing issues of Israel's national security" to provide "policy analysis and recommendations to decision makers, public leaders, and the strategic community, both in Israel and abroad" ("Mission," 2021).

The other three main sources of NGO publications (# 2–4) have broader, more general objectives. The Israel Democracy Institute (IDI, responsible for 38 % of publications), aims to "bolster the values and institutions of Israel as a Jewish and democratic state" and to "improve the functioning of the government and its institutions, confront security threats while preserving civil liberties, and foster solidarity within Israeli society" (IDI, 2021b). Myers-JDC-Brookdale Institute (11 % of surveyed publications) is an independent Israeli center for applied social research. Its mission is to identify and examine key social challenges in order "to strengthen Israeli society and the wellbeing of all its members" (JDC, 2021). The Taub Center for Social Policy Studies in Israel is an independent Israeli research institute that focuses on producing "impartial research on socioeconomic conditions in Israel", to "develop innovative, equitable and practical options for macro public policies that advance the well-being of Israelis" ("Mission, Vision and History," 2021).

The final three institutions producing Covid-19 related publications vary between specific and general agendas: The Haredi Institute for Public Affairs serves as a "knowledge resource on the Haredi community", i.e. the strictly religious branch of Jewish orthodoxy, aiming to advance "issues of mutual concern for Israel's Haredi population and society at-large" (Haredi Institute, 2021). The Institute for Policy and Strategy (IPS) conducts policy analyses and produces recommendations on Israel's national security to support decision-making and inform public discourse (IPS, 2021). Lastly, The American Jewish Joint Distribution Committee is the largest Jewish humanitarian organization in the world. Its work on research and development in Israel aims to "shape the socioeconomic future of Israel" in collaboration with partners from non-profit, business and government (The Joint, 2021).

Table 7
Civil society NGOs publications by source. The number of publications by NGOs concerning the impact of the Covid-19 pandemic represented by publishing agency.

	Civil Society NGO	No. publications	% publications	
1	INSS - The Institute for National Security Studies	89	42 %	**97 % of civil society NGO publications**
2	The Israel Democracy Institute (IDI)	82	38 %	
3	Myers-JDC-Brookdale Institute	24	11 %	
4	The Taub Center for Social Policy Studies in Israel	11	5 %	
5	The Haredi Institute for Public Affairs	5	2 %	
6	The Institute for Policy and Strategy (IPS) at IDC Herzliya	1	0 %	
7	The Joint	1	0 %	
	Total	**213**	**100 %**	

Data availability

Data will be made available on request.

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