Promoting societal resilience during the COVID-19 pandemic: a multi-country analysis of public health strategies

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Abstract. *Background and aim:* Enhancing public health communication during a global crisis is crucial to promote resilience. This study examines the influence of health communication in ten countries, analysing its positive and negative impact on society's behavior regarding the origin, symptoms, and prevention of SARS-CoV-2. *Methods:* A comprehensive narrative analysis of available data was conducted to evaluate societal and resilience responses during the COVID-19 pandemic. The study consulted academic and grey literature, from February 1, 2020, to March 1, 2022, focusing on ten countries that exhibited heterogenous responses to pandemic, including EU (Italy, Denmark, Sweden, Spain, Portugal, Romania, France, and Germany) and non-EU (United Kingdom and Israel) countries. *Results:* The stringency of policy responses varied between countries and over time, with some countries implementing strict lockdowns while others only issued recommendations. Vaccination campaign and the spread of less virulent variants of the virus has led most countries to lift most restrictions by April 2022. However, vaccine uptake and refusal remain complex issues influenced by social norms, cultural beliefs, access to information, and trust in government authorities. Social media played a significant role during the pandemic, but healthcare professionals' active participation in addressing misinformation was lacking. *Conclusions:* The COVID-19 pandemic highlighted the importance of Public Health in developing proper strategies and utilizing digitals tools to counteract infodemic and spread relevant information. Healthcare workers should improve their communication skills to face future epidemics and be trusted by the population. Social media and digital platforms should be studied and used effectively in times of emergency. (www.actabiomedica.it)

Key words: Covid-19, resilience, public health, vaccine hesitancy, infodemic

Introduction

Resilience involves restructuring a system, not returning to its original state, but changing crucial aspects of its structure. This is what we can expect to happen to our world in the post COVID-19 pandemic phases. Planning and control, utilizing expertise to make the best use of resources and support, as well as self-efficacy and confidence in the future are pivotal roles in developing strong resilience (1,2).

Therefore, promoting resilience requires enhancing public health communication during a global crisis. One of the most complex challenges for health communicators during the pandemic was the increasing amount of fake news circulating on social media platforms. This misinformation about the origin, symptoms, and prevention of SARS-CoV-2 fueled an *infodemic*, which the WHO defines as the dissemination of a significant amount of false or inaccurate information. Individuals and communities have been

overwhelmed by changing and mixed messages from public health and political leaders, as well as evolving recommendations and state-by-state differences in public health responses. This explains why people may choose not to follow recommended prevention measures. Some believe false information regarding recommended behaviors, while others may lack understanding of the risks and severity of COVID-19 as well as the benefits of infection prevention measures. Unclear, changing, and variable guidelines cause confusion among the public and contribute to the growth of misinformation.

This article analyzes the behavior of ten selected countries during the COVID-19 pandemic and provides a framework of strategies and messages that can be used to promote effective public health communication during a global crisis.

Methods

The available data on societal responses and resilience during the COVID-19 pandemic were analyzed from February 1st, 2020, to March 1st, 2022. Ten countries were selected by the responsible of the H2020 project for inclusion in our review, both within the European Union (Italy, Denmark, Sweden, Israel, Spain, Portugal, Romania, France, and Germany) and outside the EU (United Kingdom and Israel), to provide a wide spectrum of policies and pandemic management strategies for comparison. The following selection criteria were employed:

- Availability of relevant data and resources;
- Inclusion of countries with examples of provident and well-run policies;
- Inclusion of countries with poor policies;
- Availability of notable examples of population responsiveness and resilience;
- Consideration of analogies between neighboring geographic regions;
- Consideration of differences between neighboring geographic regions.

Academic literature was retrieved using PubMed/Medline and Google Scholar. Further information on specific countries was obtained by directly checking each country's COVID-19 website when available. Grey literature was also consulted, including publicly available institutional reports, archival records, policy briefs, books, and news from verified sources. The majority of the data were retrieved from the webpages of the European Centre for Disease Prevention and Control (ECDC) (3), one of the major Public Health authorities in Europe. Additionally, country-specific data and graphs were collected form the website "Our World in Data", which was created by the University of Oxford in collaboration with the non-profit organization "Global Change Data Lab" (4).

Results

1. Public health response to COVID-19

The COVID-19 pandemic, caused by SARS-CoV-2, has had a significant impact on the world since its emergence in late 2019. From March 1st, 2020, to February 28th, 2022, the virus spread across different countries in a highly heterogeneous way. However, the pandemic waves and curve steepness among the analyzed countries were very similar. During the early stages of the pandemic, the most widely used strategy was that of "flattening the curve" (Figure 1) (5,6), which means slowing the spread of the epidemic so that the peak number of people requiring care at any given time was reduced, and the healthcare system would not exceed its capacity. This approach requires the application of mitigation measures such as non-pharmacological interventions (NPIs), including hand and respiratory hygiene, appropriate use of face masks and social distancing (7,8).

The stringency of policy responses adopted to limit the spread of SARS-CoV-2 has been variable through countries and over time, until April 2022 when most countries lifted most restrictions in terms of masks and physical distancing due to the widespread vaccination campaign and the rapid diffusion of more contagious yet less virulent variants of the virus. Even after vaccination, NPIs continue to be the most effective public health measure against COVID-19. However, these have always been very heterogeneous among countries:
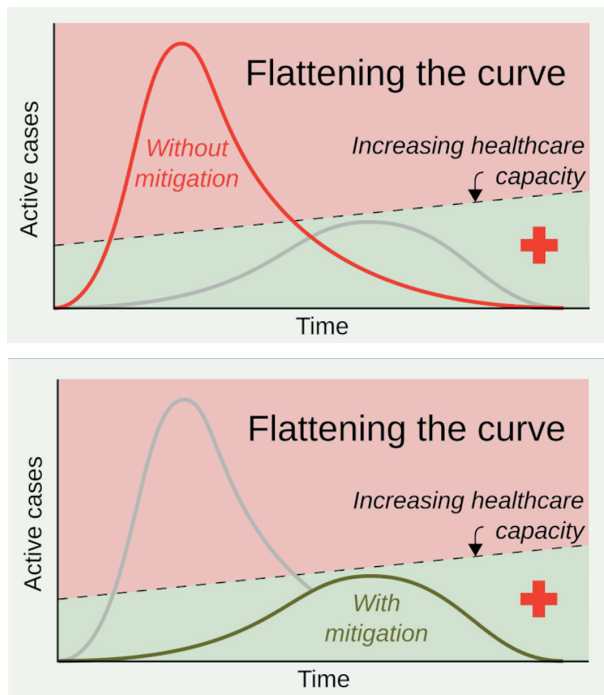
Figure 1. The spread of a communicable disease like SARS-CoV-2 compared to healthcare capacity: on the left, without mitigation strategies; on the right, with mitigation strategies showing a flattened curve. ©RCraig09 taken from Wikipedia (5).

at the beginning of the pandemic, for example, some countries mandated the use of face masks through fines in case of non-compliance, while others only recommended their use. The timing of responses also varied among countries: Italy and Portugal (9), for example, declaring a "state of emergency" early in the pandemic, thus allowing their governments to act more quickly and issue national-level restrictions soon after. This timely response enabled Portugal to combat the spread of SARS-CoV-2 from the outset and prevent the initial overload on the national health system. In contrast, Spain did not initially recognize COVID-19 as a potential internal threat, leading to an alarmingly high number of infections among its population (10). In Italy, the first case of SARS-CoV-2 infection was identified on February 21st, 2020 (11,12). On March 9th, 2020, the Italian Government issued a national lockdown (the 'stay at home' decree) when the country had 12,000 cases of COVID-19 and over 800 deaths (13). Work and leisure activities remained closed until May 18th, 2020, when they started to be reopened under

strict regulations involving a maximum number of people allowed and the requirement of to wear masks at all times (14-16). France developed a similar strategy, based on two pillars: first, to save lives by stopping the spread of the virus 'at all costs', and second, to save the nation's economy (17). The government announced a strict, total lockdown policy that began on March 17th, 2020. Only individuals providing essential services (i.e., health services and food distribution) were allowed to go to work. Similarly, Israel also experienced a lockdown period starting on April 2nd, 2020, despite a rapid response to the pandemic, due to insufficient testing capacity (18-20). In Germany, the success in preventing the spread of COVID-19 was partly due to their rigorous collection and analysis of data to guide their response (21). In contrast, the UK attempted to lift commonly shared restrictions gradually and permanently from March 2021 to March 2022 (22,23). Denmark also implemented a national lockdown in response to the pandemic (24), while Sweden took a different approach by introducing strict restrictions, with no lockdowns (25). In contrast, Romania is an example of a delayed response to the pandemic, with social and cultural characteristics (such as poverty) contributing to confusion and unrest within the country (Table 1).

Travel restrictions were also implemented to varying degrees during different phases of the pandemic, and the severity varied widely among countries (26,27): during the first phase, most countries restricted travels from high-risk areas (that varied weekly depending on the number of cases). In some cases, a valid EU Digital COVID Certificate was required for travel, either based on vaccination status or on a negative COVID-19 test result (28,29). As for domestic travel, each country managed it according to their own epidemiological situation (30).

A good indicator of the strictness of policies and recommendations that were implemented during the pandemic is the Stringency Index (31), a composite measure that ranges from 0 to 100 that was created by University of Oxford to track and compare policy responses to COVID-19 around the world. This index is based on the evaluation of 9 metrics: school closure, workplace closure, cancelation of public events, gatherings restrictions, international and domestic travel restrictions and controls, stay at home restrictions,

public information campaigns (32). It's important to note that, although a higher score indicates a stricter response (i.e., 100 = strictest), it simply records the strictness of government policies and does not measure the appropriateness or effectiveness of such response. Figure 2 depicts the trend of this index from January 22nd, 2020, to the February 28th, 2022, in the analyses countries.

2. The COVID-19 vaccination campaign

The European Medicines Agency (EMA) authorized 5 different COVID-19 vaccines between December 2020 and February 2022, namely Comirnaty (Pfizer BionTech), Vaxzevria (AstraZeneca), Spikevax (Moderna), Janssen (Johnson&Johnson) and

Table 1. Time periods of strict lockdowns for each of the considered countries.

| Country	First lockdown		Second lockdown		Third lockdown	
	Start date	End date	Start date	End date	Start date	End date
Denmark	March 12, 2020	April 13, 2020	December 25, 2020	March 1, 2021	-	-
France	March 17, 2020	May 11, 2020	October 30, 2020	December 14, 2020	April 4, 2021	May 3, 2021
Germany	March 23, 2020	May 10, 2020	November 2, 2020	November 30, 2020	-	-
Italy	March 9, 2020	May 18, 2020	-	-	-	-
Portugal	March 19, 2020	April 2, 2020	-	-	-	-
Romania	March 25, 2020	May 12, 2020	-	-	-	-
United Kingdom	March 23, 2020	July 13, 2020	October 16, 2020	December 2, 2020	January 5, 2021	March 28, 2021
Israel	April 2, 2020	April 16, 2020	-	-	-	-
Spain	March 14, 2020	May 9, 2020	-	-	-	-
Sweden	-	-	-	-	-	-
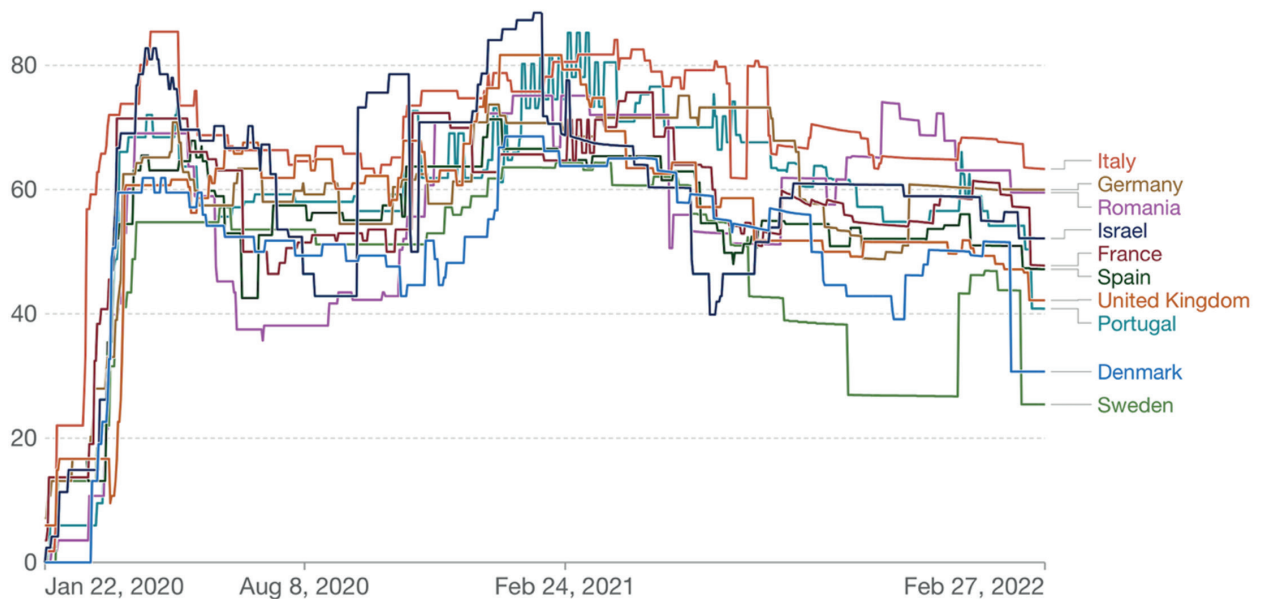
Figure 2. Stringency Index of the 10 selected countries. Data elaborated by the authors from "Our World in Data" (32).

Nuvaxovid (Novavax) (33). As of February 2022, 75% of the population within the EU/EEA had received at least one dose of the vaccine since the vaccination campaigns began in December 2020 (34). COVID-19 vaccination success varied by factors such as healthcare capacity, government support, vaccine hesitancy, and supply chain issues. Countries like Israel and UK (35, 36) had efficient vaccine rollout, with low hesitancy especially in the first phase (4). However, in Israel, the curve started to flatten due to vaccine rejection, mostly due to religious reasons, and younger populations refusing the vaccine (37). Portugal and Spain achieved high vaccination rates (38,39) thanks to their robust public health systems and high vaccine uptake. In contrast, France and Italy faced significant challenges with vaccine hesitancy, greatly complicating their vaccination campaigns (40-42). Romania initially implemented a COVID-19 vaccination campaign more efficiently than its neighboring countries but experienced challenges, particularly in rural areas where misinformation and fake news had a more significant negative impact due to poor education, low social and economic status, and poverty (43). Germany implemented a comprehensive vaccination strategy prioritizing high-risk groups and made significant progress in vaccinating the population despite initial supply challenges (44). Denmark and Sweden successfully developed a targeted vaccine strategy by prioritizing vulnerable groups (45), thanks to both the high degree of centralization and digitization in the call system of both countries and low levels of vaccine hesitancy (46-49). Table 2 shows the vaccination rates of people older than 12 years in the ten selected countries until February 28th, 2022.

Vaccine hesitancy and refusal are complex issues that are influenced by a range of factors such as social norms, cultural beliefs, access to information, and trust in government and health authorities (50,51). Different strategies have been effective in different countries, depending on social and cultural characteristics. For example, Sweden used fact sheets, movies, and collaboration with faith communities, while Spain used social institutions to increase uptake (52-54).

Table 2. Share of COVID-19 vaccinated people older than 12 years in 10 selected countries until February 28th, 2022 (40).

Country	Number of people vaccinated until 28th February 2022	Percentage of people vaccinated until 28th February 2022
Denmark	4,722,569	80,28%
France	52,584,906	77,54%
Germany	62,688,649	75,19%
Italy	47,460,297	80,39%
Portugal	8,768,198	85,37%
Romania	8,060,825	41,00%
United Kingdom	49,014,524	72,60%
Israel	6,132,399	64,90%
Spain	39,039,472	82,09%
Sweden	7,498,966	71,08%

3. The role of social media during COVID-19

The use of social media increased during the pandemic (55), and higher stringency index scores were associated with increased use of the internet and social media. Vaccine hesitancy is strongly related to using social media as a source of information and is highly influenced by political and non-medical Twitter users, with a lack of active participation from healthcare professionals in addressing COVID-19 misinformation (56). However, some types of digital media use, such as one-to-one communication and accurate information dissemination by medical professionals on social media platforms, can be helpful in increasing resilience and promoting vaccine uptake (57).

Conclusions

This report discusses the different approaches that countries took in response to the COVID-19 pandemic, emphasizing the importance of analyzing these policies to improve responses for any future epidemics. It is important to acknowledge that different strategies may be effective in different contexts, and interventions must be tailored to specific cultural and social contexts.

Restriction policies such as lockdowns, social distancing measures, and mask mandates have contributed to the reduction of virus transmission therefore preventing healthcare systems from being overwhelmed over their capacity and have been overall successful in saving lives. However, these restrictions can also have negative consequences, both on the economy of the country and on the mental health of individuals. For these reasons, the cost-effectiveness of these measures should always be considered when making Public Health decisions.

In addition, the population's response to government restriction policies during the COVID-19 pandemic was not always positive, with many perceiving them as too restrictive. The overload of information and lack of clear medical guidance led to an "infodemic", making it difficult for people to discern accurate information. This sense of dissatisfaction continued during the vaccination campaign, with conflicting opinions leading to vaccine hesitancy.

The real effect of restriction policies ultimately depends on a complex interplay of factors, and individual compliance plays a major role in determining their outcome. Therefore, effective communication strategies are crucial during a public health crisis and should include targeted communication, outreach initiatives, intersectoral partnerships, social media campaigns, working with community or faith leaders and community participation. Given the constant exposure to information from various sources in today's society, it is essential to prevent unqualified sources from spreading misinformation on such important and delicate issues. Healthcare workers and public health experts should become advocates for proper policies and should use their communication skills and opportunities to earn the trust of the public, thereby becoming the main source of information during future epidemics.

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Ethic Committee: not applicable

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