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Linking healthcare and societal resilience during the Covid-19 pandemic

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ABSTRACT

Coronavirus disease 2019 (Covid-19) has highlighted the link between public healthcare and the broader context of operational response to complex crises. Data are needed to support the work of the emergency services and enhance governance. This study develops a Europe-wide analysis of perceptions, needs and priorities of the public affected by the Covid-19 emergency. An online multilingual survey was conducted from mid-May until mid-July 2020. The questionnaire investigates perceptions of public healthcare, emergency management and societal resilience. In total, N = 3029 valid answers were collected. They were analysed both as a whole and focusing on the most represented countries (Italy, Romania, Spain and the United Kingdom). Our findings highlight some perceived weaknesses in emergency management that are associated with the underlying vulnerability of the global interconnected society and public healthcare systems. The spreading of the epidemic in Italy represented a ‘tipping point’ for perceiving Covid-19 as an ‘emergency’ in the surveyed countries. The respondents uniformly suggested a preference for gradually restarting activities. We observed a tendency to ignore the cascading effects of Covid-19 and possible concurrence of threats.

Our study highlights the need for practices designed to address the next phases of the Covid-19 crisis and prepare for future systemic shocks. Cascading effects that could compromise operational capacity need to be considered more carefully. We make the case for the reinforcement of cross-border coordination of public health initiatives, for standardization in business continuity management, and for dealing with the recovery at the European level.

1. Introduction

Covid-19 represents a wake-up call for systemic risk: interdependencies between the healthcare sector and other societal functions require the implementation of broader actions to reduce vulnerability beyond that which is directly related to the primary hazard (UNDRR, 2019). Research and development on public health need to integrate holistic strategies into the management of concurrent, interacting, interconnected and cascading events (Osterholm, 2005; Pescaroli and Alexander, 2018; Pescaroli et al., 2018; Salas et al., 2020; Blumenthal et al., 2020).

This process has different operational implications. First, the mitigation of the peaks of the emergency needs to be connected to improvements in the ability to respond to future epidemics and must strengthen the policy, technical and organizational aspects of health care systems (Gates, 2020; Parmet and Sinha, 2020). Secondly, health-care response needs to be integrated with lessons learned on disaster resilience strategies, including risk governance, humanitarian coordination and response by communities (Djalante et al., 2020).

Research on Covid-19 has explored the role of individual and collective risk perception (Dryhurst, 2020; Van Bavel, 2020). The psychological impacts of Coronavirus disease have been subjects of investigation since the early phase of the unfolding in China (Qiu et al., 2020). However, few studies have stressed its role in improving operational crisis management, in both healthcare and other front-line activities. This paper reports a European survey (N = 3029) that is focused on understanding how Covid-19 could be amplified by vulnerability to cascading and interconnected risks (Pescaroli and Alexander, 2018, 2016). Our study explores individual perceptions of essential services, information and gaps in response and recovery in order to support the prioritization of responses during both waves of the pandemic and recovery actions. Our goal is to derive additional evidence and lessons learned, whose value could go beyond Covid-19 and help manage future systemic crises.

2. Methods

2.1. Study design

The survey entitled “Covid-19: Emergency, Recovery and...
Improvement” was jointly developed in Spring 2020 by researchers from University College London’s Institute for Risk and Disaster Reduction and the European Commission’s Joint Research Centre Directorate for Space, Security and Migration. Targeting the general population at a European-wide level (EU countries and UK), the study was meant to improve the framing of similarities in and differences between risk and emergency perceptions across the countries that experienced the first wave of the Covid-19 pandemic.

I contrast to other studies that have focused on the acute phase of the first wave, our data collection was planned for a later stage. This allowed us to gauge perceptions related to recovery aspects and explore options for improvement. The questionnaire (see Appendix I for supplementary data) investigated aspects of general and individual perception of the emergency, crisis communication and management, and possible future developments. We benchmarked the answers to a Likert-Scale based model to identify “performance gaps” or “capacity gaps” that were reflecting undesirable states of resilience (Pescaroli et al., 2020). We emphasized the link between social, psychological and organizational vulnerabilities driving cascading and interconnected risks associated with the pandemic (Pescaroli and Alexander, 2018). In particular, we explored how the progression of the pandemic could be challenged by access to healthcare services and other critical infrastructure, along with reliable information about complex scenarios and associated learning in society.

2.2. Dissemination, data collection and analysis

The survey was administered online in a multilingual format, with dedicated pages for each EU country and the UK, according to the country of residence indicated by each respondent (Wright, 2005). Participation was voluntary and anonymous and took place between mid-May and mid-July 2020. The questionnaire was disseminated using our institutional social networks (e.g. Twitter, LinkedIn and Facebook), and through news headlines and mailing lists. Additionally, it was supported by partnering organizations such as Europe Direct and the London Climate Change Partnership, and by individuals.

We accumulated N = 3029 valid questionnaires on the basis that 90% of questions had been answered in each case. These were processed statistically both as a whole and with reference to the four countries which supplied the greatest number of questionnaires: Italy (1190), Romania (252), Spain (676) and the United Kingdom (293). In the discussion that follows, percentages are rounded. See Appendix 2A for supplementary data.

3. Results

3.1. Demographics

Almost two-thirds of survey respondents (61.1%, N = 3023) were female, and males constituted 37.6%. Among the different age groups, the largest concentration came from the 45–64 years group (41.3%, N = 3022), followed by 35–44 years (23.3%), 25–34 (19.1%), 18–24 (8.1%) and 65+ (8.3%). In terms of education, the most represented options were master’s degree or equivalent level (38.3%, N = 3025) and bachelors degree or equivalent (26.4%). People whose highest level of education was from secondary school or equivalent accounted for 18.9% and those with a doctorate or equivalent constituted 14.8%. This distribution may depend somewhat on the structure of the dissemination campaign which was performed through our institutional social media and professional networks. The majority of the respondents were employees (60.4%, N = 3024), followed by self-employed (11.4%), retired people (8.8%) and students (8.6%). Unoccupied or unemployed people accounted for 4.2% of the total, while home-makers totalled 1.9%.

3.2. General perception of the emergency

Many respondents (30.1%, N = 3022) began to see Covid-19 as an ‘emergency’ when outbreaks started in other countries in Europe. Some 22.7% reached this point when outbreaks started in their own country and 20% reached this conclusion upon hearing the news of the contagion in China. The moment when the outbreak started in the respondents’ own region was identified as the start of the emergency by only 4%. It is clear that the event in Italy represented a critical ‘tipping point’ which changed the perception of Covid-19 from being a faraway event, to a collective and European ‘emergency’ (see Fig. 1). This is confirmed by the cases of Romania, Spain, and the United Kingdom.

When asked to identify the most important reasons for the spread of the virus, a majority of respondents (61%, N = 3023) indicated international mobility, followed by lockdown measures that were implemented too late or not restrictively enough (43.3%); indifference, carelessness or lack of caution among the population (34%); cuts to health services and research (28.6%); contradictory information (28.4%); lack of personal protective equipment (25.6%); and the deadliness of the virus (19.9%). Only a few answers (6.5%) identified the violation of lockdown measures, while 5.4% reported other factors.

Before the outbreak of the Covid-19 emergency, respondents considered an epidemic in Europe to be rather unlikely (M = 2.29, σ² = 1.24, s = 0.79 on a five-level scale of importance). Others saw their national civil protection services as inadequately prepared for such an event (M = 2.37, σ² = 1.07, s = 0.42 on a five-level scale of importance). Country comparisons reveal some differences in perception of the role of preparedness, but, with the exception of Spain, the general tendency is to indicate lower values (see Fig. 1).

3.3. Individual perception of the emergency

We queried the participants about some typical emergency preparedness measures taken at the individual and household levels. Table 1 (A) shows that the largest proportion of respondents did not take any measures, but there is a significant difference in the minority that did, which is highest for reading official information about the pandemic and organising for working/studying remotely.

We addressed changes that occurred prior to the lockdown and worries (see Table 1 (B)). In terms of mean values, psychological well-being appears to bear the most significant impact. The other factors (workplace, family and economic well-being) are less affected. Compared to the situation before the lockdown, the daily consumption of food, water, electricity and heating appears to have increased and the use of telephone and internet services even more so. Conversely, for most respondents the use of transport significantly decreased, together with the use of health services, hospitals, banking and financial services. The respondents were mostly worried about the direct consequence of the primary emergency, such as the shortage of economic recovery measures and the possible occurrence of a second wave. However, much lower concern was expressed about the disruption of essential services, the concurrence of events such as flooding, and the risk of intentional damage actions such as terrorist acts or riots.

Among the concerns experienced during the peak period of Covid-19, respondents stressed the impacts of the event on their personal health and that of their families (74.9%, N = 3025). They were also concerned about the impact upon the economy, work and study (57.6%) as well as the shortage of hospital and emergency facilities (53.7%). Less significance was attributed to the risk that information was unreliable (24.4%), to social distancing (18.0%), to the shortage of personal protective equipment (17.6%) and to other citizens’ reactions to the state of emergency (17.1%). Shortages of essential goods and services (9.7%) and sanctions for infringing restrictive measures (3.6%) were at the bottom of the scale.
Considering the evolution of the pandemic, this viewpoint may have changed subsequently.

3.4. Emergency communication and management

The main sources of information during the Covid-19 emergency were the Internet (including on-line journals and news media; 89.1%, N = 3026) and television (61.4%), followed by social media (36.4%), radio (25.3%), printed newspapers (14.5%), word of mouth (4.8%) and other (4.9%). Among the news (real or fake) identified as more worrying, respondents indicated the blockage of imports of protective equipment such as gloves and masks (49.7%, N = 2967), conspiracy theories (e.g. Covid-19 as a biological weapon; 35.9%), priority care being reserved for the younger population (33.3%) and total closure of supermarkets and pharmaceutical services (30.6%).

Table 1(C) reports the answers to questions that investigated emergency communication and emergency support tools. Referring to the adequacy of communication, restriction of free movement and measures to prevent the infection dominate the list. Conversely, recommendations about physical and psychological well-being are at the bottom of the list. Among the emergency support tools, the feedback we received was highly variable. Top scores were attributed to symptom-tracking apps and the free distribution of videos that teach good practice.

3.5. Future developments

Nearly half of the respondents thought that they could sustain restrictive measures for a few months (46.6%, N = 3024) and another third for a few weeks (31.1%). A minority (12.8%) were unable to say or claimed not to be able to sustain such measures (9.5%). There are significant differences between countries (see Fig. 2). Specifically, the responses from the United Kingdom seem more optimistic than elsewhere. Considering the evolution of the pandemic, this viewpoint may have changed subsequently.

There was strong agreement (84.3%, N = 3,020) with the idea that activities could be revived through a combination of measures to promote a progressive restart, rather than no measures or total lockdown strategies. As illustrated in Fig. 2, we also observed homogeneity between countries.

When asked about personal priorities after the lockdown (see Fig. 3), major importance was attributed to a return to regular study or work conditions (50.5%, N = 3019), getting back together with one’s family (49.5%), mobility without geographical restrictions (41.3%) and full access to health services (37.4%). These aspects were followed by the access to social, cultural and recreational facilities (30.3%), access to economic incentives (16.6%), and access to social assistance and childcare services (11.8%). Importantly, priorities vary strongly by country, especially in terms of societal aspects. This may be the result of cultural factors, along with the characteristics of the respondents and differences in the phases of the pandemic as experienced in each country at the time of the survey.

Some 39.5% (N = 3021) of respondents were fully aware of national social and economic measures, while 42.3% claimed to have limited information, 14.2% had no awareness and 4% did not know. At the same time, we received significant feedback on the social and economic priorities that were deemed to be the most important. These were topped by investment in health and research (52.6%, N = 3,021) and financial support for families and vulnerable categories (52.5%), followed by support to businesses (41.8%) and financial support for essential needs (34.4%). In terms of priorities, there are significant differences between countries (see Fig. 4).

Table 1(D) illustrates the linkage between the experience gained during Covid-19 and the improvement of disaster management and societal resilience. In general, there is a tendency towards optimism, in particular regarding emergency support technology and logistics. Finally, with respect to participation in forms of volunteering, 43.1% of the respondents (N = 2,989) said that they were not contributing to the categories mentioned, while 27.4% claimed they were donating money. Home care was indicated in 6.5% of cases, health assistance in 8.0% and blood donation in 10.1%. Delivery of food to the needy (9.7%) was more common than delivering medical supplies (3.4%).

4. Limitations

Our study has some limitations, and it must be considered indicative rather than representative of general populations in Europe. On the one hand, the decision to disseminate it when most of the lockdown measures were lifted implied that the answers would not be strongly influenced by the status of the emergency. On the other hand, this reduced the breadth of the dataset. A limited number of responses could plausibly have been attributed to ‘questionnaire fatigue’, and changes could have been due to variations in mood (Bailon, 2020). Other limitations can be traced to the limited set of questionnaire translations available, to the unfunded nature of the study, to dissemination by social media and to gathering responses exclusively on line. Finally, given limitations of space, correlations and open responses will be analysed in a subsequent paper.

5. Discussion

Our results provide some new insights for discussing emergency response and recovery to Covid-19, adopting a systemic risk perspective that could be meaningful beyond the pandemic itself.
The data show that Covid-19 was perceived as an ‘emergency’ when it started spreading in Italy, more than through its association with the global or local scales. This ‘tipping point’ seems to stress the importance of reinforcing the supranational governance of a pandemic. It echoes the observation that non-conventional transboundary threats, such as pandemics and cyber-attacks, call for “extreme adaptation and unprecedented cooperation” (Ansell et al., 2010) to overcome limitations of existing country-level protocols and plans (Boin et al., 2020). In this interpretation, the survey results are an important wake-up call for existing country-level protocols and plans (Boin et al., 2020). In this way, the data show that Covid-19 was perceived as an ‘emergency’ when it started spreading in Italy, more than through its association with the global or local scales. This ‘tipping point’ seems to stress the importance of reinforcing the supranational governance of a pandemic. It echoes the observation that non-conventional transboundary threats, such as pandemics and cyber-attacks, call for “extreme adaptation and unprecedented cooperation” (Ansell et al., 2010) to overcome limitations of existing country-level protocols and plans (Boin et al., 2020). In this interpretation, the survey results are an important wake-up call for existing country-level protocols and plans (Boin et al., 2020).

The respondents indicated that the prevailing approach to preparedness and response was inadequate and the possibility of a pandemic was considered unlikely. The root causes for the spread of the disease were attributed to factors that reflected global interdependencies or general mismanagement, rather than to the magnitude of the hazard itself. This points to a substantial shortage of resilience to systemic shocks and interconnected risks. Existing strategies for emergency preparedness and response may need significant revision (Pescaroli and Alexander, 2016; Sachs, 2021).

By promoting cross-cutting capabilities, new actions could integrate the recommendations of the United Nations’ Global Risk Assessment Report (UNDRR, 2019).

Another core insight concerns the interdependencies between the healthcare sector and other critical infrastructure. Our dataset reveals changes in the use of essential services. These were expected but they demand further consideration (Jallow et al., 2020; Galbusera and

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**Table 1**

Selected survey response statistics (N: number of valid answers; M: mean; σ²: variance; s: skewness).

(A) Adoption of emergency preparedness measures at the individual and household levels

| 4. Before the Covid-19 emergency, did you take any of the following actions?                                                                 |
|------------------------------------------------------------------------------------------------|
| Yes | Yes, but limited | No |
| Keeping a supply of medicines | 2,978 | 9.8% | 32.2% | 57.9% |
| Keeping a supply of food | 2,991 | 11.3% | 32.5% | 56.1% |
| Reading official information of what to do in a pandemic | 3,009 | 31.4% | 21.5% | 47.1% |
| Reading official information of what to do in other disasters or crises | 2,962 | 19.9% | 33.0% | 47.2% |
| Organizing yourself for teleworking, working at a different location, remote study | 2,979 | 28.5% | 20.1% | 51.4% |

(B) Individual and household behaviours

| 5. How has your personal situation changed during the lockdown?                                                                                       |
|------------------------------------------------------------------------------------------------|
| N | M | σ² | s |
| Well-being at work | 2,956 | 2.67 | 1.1 | 0.23 |
| Family well-being | 3,018 | 2.88 | 0.94 | 0.14 |
| Psychological well-being | 3,016 | 2.42 | 0.88 | 0.58 |
| Economic well-being | 3,015 | 2.75 | 0.67 | –0.26 |

(C) Emergency communication and management

| 10. Has the following information on Covid-19 been adequately communicated?                                                                            |
|------------------------------------------------------------------------------------------------|
| N | M | σ² | s |
| Data on contagion, number of victims, and their geographical location | 3,021 | 3.22 | 1.45 | –0.16 |
| Restrictions on free movement and social events | 3,014 | 3.64 | 1.06 | –0.43 |
| Identification of the essential commercial and productive activities | 3,001 | 3.25 | 0.96 | –0.03 |
| Status of essential and basic services | 2,998 | 3.27 | 0.99 | –0.10 |
| Measures to prevent infection (e.g. social distancing, use of gloves and masks) | 3,013 | 3.72 | 1.20 | –0.58 |
| Economic support measures (e.g. tax measures) | 3,008 | 2.78 | 1.13 | 0.19 |
| Recommendations on physical and psychological well-being | 3,008 | 2.67 | 1.19 | 0.28 |
| Recommendations on the protection of children and vulnerable categories | 3,011 | 3.05 | 1.38 | 0.03 |

(D) Future developments

| 18. Can the experience gained during the Covid-19 emergency help to improve any of the following?                                                   |
|------------------------------------------------------------------------------------------------|
| N | M | σ² | s |
| Safety practices, including for other events (e.g. a flood or a blackout) | 3,018 | 3.18 | 1.18 | –0.04 |
| International emergency management cooperation | 3,004 | 3.37 | 1.31 | –0.25 |
| Emergency support technologies | 3,011 | 3.54 | 1.02 | –0.35 |
| Emergency support logistics | 2,995 | 3.58 | 1.02 | –0.38 |
The emergency triggered some behavioural changes that may affect the healthcare system in the long term, for example regarding reticence in accessing healthcare structures or the rise of internet-based services (Barr and Podolsky, 2020; Mehrotra et al., 2021). Moreover, the wider networked system of which the healthcare infrastructure is part must also be considered, in terms of both functional dependencies and their implications for society (Galbusera et al., 2020; Little, 2002). Increasing resilience for complex scenarios may require better use of stress testing (Galbusera et al., 2014; Galbusera and Giannopoulos, 2019; Pescaroli and Alexander, 2018), more awareness of supply chain vulnerabilities (Galbusera et al., 2021; Kovács and Falagar Sigala, 2021) and enhancement of public–private partnerships (World Economic Forum, 2021).

There is a need to identify means of raising public awareness of scenarios involving concurrent events. In our data, public concerns were mostly centred on the primary impacts of Covid-19, such as those on health and the economy or on the possible occurrence of further waves. Other elements that could escalate the pressure on healthcare and
response services, such as the concurrency of natural hazards or societal unrest, were not perceived as primary concerns, and low priority was attributed to the issue of fake information. In general, our responses confirmed the presence of discrepancies in communication across the countries, in particular that destined for vulnerable groups (Tagliacozzo et al., 2021). This recalls how “various aspects of social and cultural contexts influence the extent and speed of behaviour change” (Van Bavel, 2020). This should be considered in developing communication strategies (Wood and Schulman, 2021).

New actions are needed to facilitate recovery and long-term resilience. Our data suggested that, before the pandemic, household preparedness for multiple risks was limited. This is complementary with the evidence provided in a recent Japanese study, where it has been found that past disaster experiences did not ensure a better preparedness for other crises happening during Covid-19 (Suppasri et al., 2021). In the long run, it could be worth promoting information initiatives on the tools and skills needed in order to acquire better societal resilience against complex events. A preference for phased recovery was suggested by the respondents and that may be a very valid approach, especially when combined with improved psychosocial capacity building for a sustainable recovery process.

In conclusion, our data on Covid-19 present evidence of a shift towards a new approach to emergency management and improved societal resilience. This includes context-driven and context-dependent integration between public healthcare and other emergency services, which should better exploit the interconnectivity of our technologies, infrastructures and societies. It could be argued that limits to this data collection should be the starting point for a targeted use of research, where the assessment is adapted to the needs of local authorities and used to support a decision-making process that is more inclusive of the bottom-up perspective.

### Acknowledgements

We gratefully acknowledge all those who supported the development and dissemination of our questionnaire. It’s a long list, that includes lots of colleagues and citizens that gave us their spontaneous support. In particular, we wish to express our gratitude: Serena Tagliacozzo (CNR), Michal Nones (Polish Academy of Science), Kristen Guida (London Climate Change Partnership), Rainer Jungwirth (JRC), Marina Alonso Villota (JRC), Georg Peter (JRC). Moreover, we were supported by the JRC & UCL Press Office, the Europe Direct network, and the JRC’s Disaster Risk Management Knowledge Centre.

### Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ssci.2021.105291.

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