# COVINFORM

CORONAVIRUS VULNERABILITIES AND INFORMATION DYNAMICS RESEARCH AND MODELLING

# D5.4 Synthesis and lessons learnt on public health responses and impacts

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# Executive Summary

The empirical research conducted in the COVINFORM project is centred around assessing COVID-19 impacts, responses, and lessons learned across diverse local contexts. This includes an exploration of how national and local COVID-19 responses have impacted human behaviour, social dynamics, economic well-being, and physical and mental health outcomes; how local responses to COVID-19 were adapted to and shaped by the local health, socioeconomic, political and community contexts; and which policy failures, unintended consequences, trade-offs and promising practices can be identified in COVID-19 responses. Within this broad scope, part of the empirical research is focused specifically on exploring COVID-19 impact, response and lessons learned from a public health perspective.

This deliverable outlines the findings of the expert interviews conducted with health care workers and public health policy- and decision makers, organised into three thematic chapters. The first topic tackled is the conceptualisation of vulnerability in the context of the COVID-19 pandemic. The interviewees reflected upon the intersectional nature of vulnerability and resilience, noting that it is important to consider not just pre-existing health status, but also the social determinants of health and the unequal impacts of the COVID-19 containment measures. The second theme discussed is the impact of the COVID-19 pandemic on healthcare workers. This chapter highlights how due to their positions at the frontline of the pandemic, healthcare workers have experienced high levels of uncertainty and stress, and how the crisis exposed pre-existing flaws and bottlenecks in health systems. Finally, the last chapter offers a bird's-eye view of key challenges and lessons learned in public health responses. These include the coordination of public health responses at different geographical levels; dilemmas in decision making; the challenges associated with evidence-based action; COVID-19 public health communication; and lessons for the future.

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## Acronyms & Abbreviations

| Term | Description |
|---|---|
| COVID-19 | Coronavirus Disease 2019 |
| WP | Work Package |
| GDPR | General Data Protection Regulation |
| GP | General Practitioner |
| PPE | Personal Protective Equipment |
| HCW | Health Care Worker |

# 1 Introduction

The COVINFORM project examines how vulnerability is defined and addressed in response to the COVID-19 outbreak. Through an intersectional approach, the project analyses the impact that different national, regional, and local responses have had on vulnerable and marginalised groups, exploring the interconnection between different factors and how these may exacerbate vulnerability and marginalisation. COVINFORM will also develop solutions, guidelines and recommendations to ensure that the needs of vulnerable and marginalised groups are appropriately considered in potential further waves of COVID-19 and future pandemics.

The current report is part of Work Package (WP) 5 of the COVINFORM project. WP5 analyses COVID-19 impacts and responses from a public health perspective, with a specific focus on health inequality and vulnerability. Key dimensions of analysis are definitions and operationalisations of health vulnerabilities and inequalities; influences of social and cultural factors, as well as institutional, legal, and data collection factors on public health responses; public health communication impacts; and COVID-19 impacts on health care workers. We aim to answer three overarching research questions in this WP:

1. How have COVID-19 public health responses been received, implemented and adapted across diverse local contexts and groups?
2. How have vulnerabilities and structural health inequalities been addressed and/or exacerbated by COVID-19 public health responses?
3. How has the COVID-19 pandemic impacted health care workers across diverse contexts and care settings?

The current report is the fourth deliverable written within the scope of WP5. The first deliverable, **D5.1**, took a comprehensive desk-based approach in assessing the public health responses to the COVID-19 pandemic across COVINFORM partner countries. Within the broader theme of public health responses, the report tackled a range of subtopics, including an overview of partner countries' health system structures; epidemiological outcomes over the course of the COVID-19 pandemic; governance, decision-making and consultation in the COVID-19 response; legal factors influencing the COVID-19 pandemic; data collection factors influencing the COVID-19 pandemic; public health information and communication strategies; impacts of COVID-19 on health care workers; demographic and social network factors influencing the COVID-19 pandemic; and conceptualizations of vulnerability in the COVID-19 pandemic. D5.1 provided a comprehensive insight in key similarities and divergences in various dimensions of public health responses to the COVID-19 pandemic across COVINFORM partner countries.

**D5.2** outlined the research design of the empirical research activities for WP5. This included the overarching research questions; a description of the research methods used for data collection; the WP5 sampling plan; and guidance on data analysis. The aim of D5.2 was to streamline the empirical research that will take place across study sites and provide a clear set of expectations and guidelines. Based on extensive conversations with COVINFORM partners, the deliverable linked with other deliverables to ensure coordination and consistency across the project's work packages and empirical research sites.

For **D5.3**, various COVINFORM partners wrote thematic chapters based on preliminary findings from the WP5 expert interviews, as well as an additional desk-based review. The four chapters in the report tackled the following four topics:

- Comparative definitions and operationalization of health vulnerabilities
- Institutional, legal, and data collection factors influencing public health responses
- Communication around vaccines and vaccination campaigns
- Impacts of COVID-19 on health care workers: preliminary findings from a qualitative analysis

The current deliverable, **D5.4**, is based on the full transcripts of the WP5 expert interviews with health care workers and public health decision- and policymakers. We synthesise and interpret the findings of the interviews conducted in 10 COVINFORM countries: Austria, Belgium, Spain, Wales, England, Sweden, Greece, Portugal and Germany. Given the huge diversity of these countries' health systems, the evolution of the pandemic, and the specific public health responses, we do not make country-specific comparisons. Instead, we group together common findings and experiences across all countries. The interview findings provide greater understanding of decision-making processes during the COVID-19 pandemic, shed light on the impacts experienced by public health practitioners and policymakers in the 10 partner countries, and elucidate promising practices. The findings can also inform (future) policy makers and health care workers, to better organise health care and reflect upon work cultures in specific professions or sectors and the working conditions of health care workers.

The findings are organised into three chapters in this report. Chapter 3 synthesises insights on conceptualisations of **'vulnerable groups'** and intersectionality across COVINFORM countries. Chapter 4 goes into the specific impact of the COVID-19 pandemic on health care workers, discussing three main topics: 1) uncertainties and changes during the pandemic, 2) professional cultures and organisation of health care systems during crisis and 3) the mental health and work-life balance. Finally, chapter 4 provides a bird's-eye view of a number of **key challenges and lessons learned** in COVID-19 public health responses, by going over a number of themes that were identified as pertinent across countries. These include the coordination of public health responses at different geographical levels; dilemmas in decision making; the challenges associated with evidence-based action; COVID-19 public health communication; and lessons for the future.

# 2 Methods

## 2.1 Study population and sampling strategy

WP5 expert interviews were conducted with Health Care Workers (HCWs) and public health policy- and decision-makers. In each of the 10 research sites, partners aimed to conduct a total of n≥5 qualitative interviews, of which n≥3 HCWs and n≥2 were public health policy- and decision-makers. For the HCWs, partners were encouraged to focus on General Practitioners (GPs) or 'family doctors' (medico di base/famiglia; Hausarzt; clínico geral; médico general; husläkare; huisarts, etc.). For the interviews with public health policy- and decision-makers, partners were encouraged to focus on individuals working at the national public health institute and/or people in a coordination/leadership position for the implementation of vaccination campaigns. The latter category could also be people leading vaccination campaigns at the local level (e.g., at the level of a city or region).

For the WP5-specific qualitative interviews conducted with HCWs and public health policy- and decision-makers, partners used expert purposive sampling. This sampling strategy is widely used in qualitative research to identify and select individuals that are knowledgeable about a specific phenomenon of interest (Palinkas et al., 2015). As participants were recruited based on their profession, in many cases COVINFORM partners departed from publicly available contact details, as well as from potential contacts within their networks. After this first stage of recruitment, snowball sampling was used to contact more participants. All interviews were in line with GDPR guidelines.

## 2.2 Research methods

The WP5 expert interviews were semi-structured interviews, allowing the researchers to explore participants' views and system of meaning in great depth. In line with intersectionality theory, qualitative interviews allow for responses that are not based on uniform answer choices, instead giving participants the opportunity to talk about their lived experiences in relation to several aspects of their identity (Windsong, 2018). Partners were offered guidance on the structure of the interview in the form of topic guides (see appendix 1 D5.2). These topic guides consist of different groups of questions, including 'probes' which encourage participants to elaborate on a point or provide additional information. Different topic guides have been developed for the different populations of interest. The topic guides are relatively structured, so that research results can be compared across the consortium. However, the questions are quite open in nature, to allow participants freedom in their responses and to avoid finding only 'what is expected' (Devers & Frankel, 2000). The topic guides were provided in English, and partners were asked to arrange translation to the required language(s) themselves.

The following set of questions were central in the topic guide for health care workers:

- How has the COVID-19 pandemic impacted HCWs' day-to-day working realities?
- How has the COVID-19 pandemic impacted HCWs' mental health/psychological wellbeing?
- How has the impact of the COVID-19 pandemic differed among different types/groups of HCWs?
- How has COVID-19 affected dynamics and interactions among HCWs?
- How do HCWs perceive vulnerability and vulnerable groups in the context of the COVID-19 pandemic?
- How do HCWs perceive the impact of COVID-19 on patients' access to health services?
- How have HCWs experienced vaccination campaigns and efforts?

The following set of questions were central in the topic guide for public health policy- and decision-makers:

- How have actors at various levels of governance implemented and adapted COVID-19 public health measures in their sub-national context?
- How have top-down COVID-19 public health measures been adapted to meet the needs of specific groups in society?
- How have different actors defined and operationalized conceptualizations of vulnerability in public health responses?
- How have different actors in the governance system (in different sectors, governmental and non-governmental) collaborated in public health responses?
- How has disaggregated data collection (e.g. by age, gender, ethnicity, socioeconomic status) informed COVID-19 public health responses?
- How has community participation been elicited to inform decision-making?

Interviews were recommended to last between one to 1.5 hours. All interviews were audio recorded, pseudonymized and carefully transcribed ad verbatim, to serve as a basis for comparison and analyses.

## 2.3 Data collection and data analysis

The data was collected between October 2021-March 2021, a time during which the health professionals and policy makers were still very busy, given their work during the pandemic. This also complicated data collection, as it was sometimes challenging to find the time to conduct an interview. Many interviews had to be rescheduled due to pandemic-related matters and the ongoing heavy workload of many health professionals. Given the circumstances, we showed considerable flexibility in terms of rescheduling interviews, interview locations and interviews being conducted virtually. All data was transcribed and translated to English, to facilitate systematic thematic analyses (Clarke, Braun & Hayfield, 2015). To ensure systematic analysis, we applied data and researcher triangulation and all interpretations were double-checked with the interviewers and COVINFORM partners. Interview quotes were, after translation to English, sometimes revised to facilitate reading and understanding.

## 2.4 Achieved sample

A total of 44 interviews were conducted across the 10 target countries for the empirical research. The demographic profile of the interviewees is summarised in Table 1. The study population was well-balanced in terms of gender (48% self-identified as women), and most were middle aged, 40-59 years (56%). With regard to educational attainment, 75% of interviewees received a bachelor's or master's degree, with 16% achieving doctoral degrees.

**Table 1.** Demographic information of achieved sample

| Country of residence of interviewee | Number of interviewees (%) |
|---|---|
| Austria | 4 (9.1) |
| Belgium | 5 (11.4) |
| Greece | 5 (11.4) |
| Italy | 4 (9.1) |
| Portugal | 5 (11.4) |

| | |
|---|---|
| Spain | 5 (11.4) |
| Sweden | 7 (15.9) |
| Wales | 6 (13.6) |
| Germany | 1 (2.3) |
| England | 2 (4.5) |
| **Age category, at time of interview** | |
| 20-29 (years) | 0 |
| 30-39 (years) | 7 (16) |
| 40-49 (years) | 16 (36) |
| 50-59 (years) | 9 (20) |
| >60 (years) | 10 (23) |
| Unknown | 2 (5) |
| **Gender** | |
| Male | 23 (52) |
| Female | 21 (48) |
| **Has children** | |
| Yes | 23 (52.3) |
| No | 7 (15.9) |
| Unknown | 14 (31.8) |
| **Highest level of education completed** | |
| High school | 0 |
| Post secondary (non-tertiary) | 0 |
| Bachelor's degree or Civil Service exam | 10 (23) |
| Master's degree | 23 (52) |
| Doctoral or equivalent | 7 (16) |
| NA | 4 (9) |
| **COVID-19 vaccination status** | |
| Fully vaccinated | 39 (89) |
| No | 0 |
| NA | 5 (11) |
| **Previous COVID-19 infection** | |
| Yes | 8 (18) |
| No | 23 (52) |
| Unknown | 1. 13 (30) |

# 3 Conceptualisations of 'vulnerable groups' and intersectionality

This section first examines intersectionality theory and its relation to vulnerability. Then the findings of the interviews conducted with health care workers and policy makers will be presented, summarising their conceptualisations of vulnerability. An **intersectional approach** recognizes that social groups are heterogeneous and ever-changing. It is a way of understanding how a web of factors such as gender, race, class, age, disability, migration status, and religion, intersect to shape individual identities and experiences. Intersectional approaches can help to understand the **differentiated nature of vulnerability and resilience**, revealing who benefits and who is left behind in pandemic responses (Lovell et al., 2019). These impacts include the risk of severe disease and mortality, differentiated exposure to COVID-19, and what makes someone vulnerable to the responses to the COVID-19 crisis. Disease outbreaks thrive on, deepen and create new equalities (Goldin & Muggah 2020).

**Participants varied in their definitions of vulnerability**. First of all, it was not always easy for health care workers and policy makers to reflect upon the definitions of vulnerability they used. Some participants, more often health care workers, defined vulnerability solely in terms of **risk of the health impact of COVID-19**. These would either be factors heightening one's risk of severe illness or death, such as age or pre-existing health conditions, or the role of differential exposure to COVID-19 due to one's profession or pre-existing inequalities. Other participants viewed vulnerability **as someone more at risk of negative consequences of pandemic measures**, including economic or mental health consequences. Some of the interviews would highlight all of these factors when talking about vulnerability, as was the case for the following policy maker in Wales:

> Policy maker (Wales): *There's the vulnerability of people as individuals and actually their rights to choose and our role to protect them, but also be mindful that people are experiencing things, they're not experiencing things equally, it's not equitable. So I might have had a great pandemic, but somebody the same age as me, same gender, but with an underlying health condition might have had a completely different experience.*

Our analysis indicates that these varying and overlapping definitions of vulnerability could be a challenge whilst setting up health and social policies, and conceptualisations of vulnerabilities were not made explicit when developing strategies and policies to deal with the COVID-19 pandemic. In the following sections, we will discuss the interpretations of health and other vulnerabilities in more detail.

## 3.1 Vulnerability to the health impact of COVID-19

Interviewees often distinguished between the **risk of falling seriously ill or dying from COVID-19** and the **social or economic determinants of exposure to COVID-19 and disproportionate impact of the COVID-related containment measures** (see next section), which are not equally distributed within and across societies. Some interviewees defined vulnerability solely as **physical or medical vulnerability**. Respondents classified those most vulnerable to the health impact as older or/and having **certain underlying health conditions**. For example, a Swedish policymaker stated that *"This is a disease that initially hit the very, very oldest very hard. Knocked them out."* Many interviewees said that having a pre-existing health condition, such as diabetes, heart disease, cancer, lung or kidney disease, or being

immunosuppressed, increases one's vulnerability to the health impact of COVID-19. In addition, gender was mentioned to matter in terms of health vulnerabilities, suggesting that men are also more at risk of severe illness and death. As stated by a health care worker in Spain, it was also noted that age is often associated with "*more morbidities and pathologies*". This demonstrates how age is automatically assumed to intersect with having health morbidities.

Apart from the health vulnerabilities of the COVID-19 virus itself, **the disruption of other types of health and social care** is discussed by some of interviewees as reinforcing existing health vulnerabilities and causing future vulnerabilities. A doctor in Belgium referred to this as 'collateral damage'. Moreover, the diagnosis and management of chronic diseases such as cancer, cirrhosis, tuberculosis, HIV diabetes, and heart conditions, were discussed as being adversely affected. The impact on pregnant women was also highlighted by a policy maker in England:

> Policy maker (England): *"I think the other thing is the prioritisation of services, particularly in health, has meant that people didn't receive the diagnosis that they might have had, they still were able to get a doctor's appointment. So the deferral of particularly surveillance screening, the deferral of routine immunisation and health checks. The challenges for citizens in accessing particularly health but also social care means they've now presented later with more complex and more costly needs."*

While health vulnerabilities were often central in participants' responses concerning their interpretations of the concept 'vulnerability', they were often mentioned together with other types of vulnerabilities.

## 3.2 Existing vulnerabilities shaping the differential spread of COVID-19 and risk of exposure to COVID-19

Health outcomes are **influenced by non-medical factors**, such as social, economic, and environmental inequalities – the 'social determinants of health' that shape people's ability to prevent sickness, their risk of getting ill, as well as their access to treatment (Dahlgren et al, 1991). **How likely people are to be exposed to the virus** is heavily influenced by **social, economic, and ethnic inequalities**. Structural health inequalities are intrinsically linked to risk factors for severe COVID-19 infections (Bambra et al., 2020). During the interviews, many viewed 'vulnerability' as being at **more risk of catching the virus, due to factors such as their work, housing, and/or reliance on public transport**:

> General practitioner (Portugal): *"Therefore, groups of professionals, of course, health professionals, and firefighters, people who collaborated in the transport of patients, basically I think they were the groups that I consider to be most vulnerable to infection. Then, in social terms, people with an unfavourable socio-economic condition and with a great need to use public transport or in less housing means, which did not allow such intense isolation, had an increased degree of vulnerability."*

Two types of (sometimes overlapping) vulnerabilities in particular were mentioned that seemed to explain or result in an increase in social, economic and ethnic inequalities: 1) economic and work-related vulnerabilities, and 2) housing and living conditions.

## 3.3 Housing and living conditions

Building further on the previous section, interviewees explained that the main cause of vulnerability in contracting the virus and spreading the virus is the circumstances in which one lives. Both work-related and living conditions were often intrinsically related to each other. For example, those of **lower socioeconomic status, living in densely crowded housing, lacked the space to maintain distance** and were, therefore, more vulnerable to catching the disease. A general practitioner in Italy described such circumstances as an 'objective fragility' where people were less able to defend themselves. Specific cases of this are given by doctors in Belgium and Germany:

> General practitioner (Belgium): *"Then in effect... we do have some Afghan families, for example, who are usually very large and live small. And the one during the heatwave, this summer... we had a family with six children who all took turns getting positive every seven days, and so all had to stay indoors. So they spent an entire summer vacation inside a two-room apartment. Yes, I find that vulnerable in a different way. They have not all been super sick, but they have been locked up for a long time."*

General practitioner and psychiatrist (Germany): *"[Densely-populated 'hotspots'] are where severe damage occurred [...] When 3-4 children in a confined space suddenly have to be cared for at home by a single mother, it's a severe disadvantage."*

As illustrated by these quotes, dense housing meant not being able to physically distance when infected. Similar experiences were mentioned across all countries, indicating the importance of housing conditions, which were often difficult to secure for people living in lower socio-economic conditions. Some groups, such as **asylum seekers and refugees**, often **lacked secure accommodation,** increasing their vulnerability**.** This was confirmed by a policy maker in Wales:

> Policy maker (Wales): *"So they were homeless. So you get these multiple layers upon layers of inequity, you know, where somebody is already disadvantaged, because English is not their first language, and they've had trauma in their lives, they've mistrusting authority, they're hesitant about anything health wise; that you will share their records. And they may actually be homeless or sofa surfing or living in church halls or whatever."*

Living conditions are therefore one of many relevant factors making people more prone to catching COVID-19. Another vulnerable group mentioned was the Roma (Greece) and Traveller (Wales) community, for example. Additionally, **people living in institutions such as care homes, detention centres, and prisons** also faced many COVID-19 breakouts. One take-away lesson from the pandemic may have been to reconsider such institutions in the future.

> General practitioner (Greece): *"There are long-term issues with these kinds of facilities nevertheless we've been given an opportunity, during COVID-19, to look at them a little bit more in depth and maybe that should be left as if to say so a "legacy": from the epidemic that we should look at these structures in a different way."*

**Elderly homes** particularly experienced dramatic consequences in the early stages of the pandemic, home to some of the oldest and most physically frail members of society and less able to isolate from one another.

> Health worker (Italy): *"An extremely problematic focal point was that of residences for elderly people, assisted health care residences, and similar facilities. This was a real critical point; the initial impact was really hard because the factors of the clinical susceptibility of the elderly to an unfavourable evolution of the infection were combined with the epidemiological susceptibility of the closed communities, and therefore the sum or product of these two factors meant that there was really an impact in terms of mortality in this type of facility."*

Finally, COVID-19 distribution is not just about the vulnerability of an individual, but it is also correlated with the **vulnerability of the communities** (Fisher et al., 2020; Hatef et al., 2020). As a doctor noted in Belgium, people living in ethnically diverse and lower income neighbourhoods faced a greater spread of COVID-19. This was due to increased housing density, lack of public space, language barriers, and a higher concentration of people working on the frontline:

> General practitioner (Belgium): *"For example, if you think back to the local Antwerp wave in the summer of 2020, those were mainly people who either all lived in a large family in a small apartment, and then it is of course easier to have a cluster. People who lived in social blocks, or people who didn't speak the language and followed foreign-language media. So I think that is already a very good example of why there was an Antwerp wave, especially in 2060 and in 2140 where there are indeed many people of other nationalities and lower incomes."*

Some of the interviewees **criticised the policies made by governments**, for not addressing these inequalities when making policies to counter COVID-19. Criticism also centred on the failure to recognise the difficulties related to the unequal housing conditions. The guidelines were often aimed at more privileged groups. For example, in Belgium, guidelines surrounding the relaxing of lockdown measures frequently mentioned garden centres and barbecues, alienating parts of the population.

> Policy maker (Portugal): *"For example, we have a Graça Freitas who at Christmas says absurd things like 'if you want to spend Christmas with family, but keep the windows open'… It's winter! It happened to be a nice winter, but it's winter. We have 26% of people in Portugal living in energy poverty… 26%. Measures would have to be made."*

This exemplifies a lack of consideration for vulnerabilities and structural inequalities in the development of some COVID-19 measures and policies, enhancing the disadvantage of these groups.

## 3.4 Economic and work-related vulnerabilities

Apart from the specific living conditions, type of job impacted vulnerability to infection of COVID-19. Those named as "**essential workers**" were at the frontline of the pandemic and therefore more vulnerable to be infected by COVID-19. Essential workers consist of health care workers, but also people that keep everyday life running, such as shopkeepers and construction workers. These groups were also recognised by the large population and policy makers as more vulnerable. A health care worker in Wales reported the following:

> Health care worker (Wales): *"Obviously, health professionals, because they have direct contact, all professions that have direct contact with a large volume of people, are high-risk groups, counter employees, people who work in shopping centres, shopkeepers, all*

> *these groups are groups of risk, risk of infection, I am a health professional and I work within a hospital, I work within a medical school, which is within a hospital, so yes, I am a group that can be considered vulnerable."*

Many essential workers, where conditions do not allow for adequate physical distancing and cannot be performed at home (e.g., manual work), were part of lower socio-economic classes, as described below:

> Policy maker (Spain): *"The conditions with a lower economic level are the ones that in the end were very quickly affected…. This has happened for example with the second wave that started from the transmission between groups of seasonal workers in various parts of Spain, especially in areas where a lot of fruit was picked."*

Many interviewees were health care workers themselves and considered themselves vulnerable to exposure to the virus. This was evident at the beginning of the pandemic when there was a shortage of personal protective equipment, and without vaccinations. Vulnerability can be a combination of different factors, and not all within the category of healthcare workers were equally vulnerable. In fact, some health care workers, such as a doctor in Belgium, did not consider themselves vulnerable, despite being at the frontline of the pandemic and being in contact with many COVID-19 infected patients. Additionally, a doctor in Spain highlighted that someone who is a health care worker but older and with chronic pathologies is multiply disadvantaged and therefore more vulnerable than a younger colleague.

> General practitioner (Spain): *"Yes, maybe if you are a bit younger... I have very young colleagues who, on the contrary, have experienced it with the excitement of the rush of it being a different thing and an experience and so on, with a certain fear. But those of us who have been caught at an age when we already have some chronic pathology… You always think: if I'm going to get severe COVID, and I'm going to get to the ICU and they're going to intubate me, then I don't know how I'm going to get out of it. Of course, those of us who have been caught at an age, those of us who are over fifty, which is my case, have thought about it."*

These frontline jobs were often lower-paid than those which could be carried out from home. Some workers were therefore vulnerable in multiple ways during the pandemic. With a focus on care home staff, a public health practitioner in Wales illustrated the following:

> Senior public health practitioner (Wales): *"The staff that work with them are some of the lowest paid individuals in society. They have low educational standards, low health literacy, they have poor money, they're often on the poverty line, but also they're vulnerable themselves. So when you think about what I was saying around what people are bringing in, and nobody's equal actually, if you just look at that health and social care workforce. They were still going to work, even though they were susceptible to adverse risks themselves."*

Similarly, a doctor in Germany identified low pay in care sectors as a sectorial vulnerability, and as a symptom of misplaced societal priorities:

> General practitioner and psychiatrist (Germany): *"I don't want to badmouth IT professionals and bank employees or managers here, but it has been shown in the pandemic how little care workers earn and that there are therefore far too few. They're all doing their best, but you can't treat people like that! They need a real income."*

These comments indicate multiple vulnerabilities in society made people more at risk of COVID-19 infection, and with more negative consequences for their health. The socio-economic vulnerability of these essential workers showed clearly **how structural disadvantages in society are exacerbated during the pandemic**.

Apart from the socio-economic vulnerability that in some cases coincided with being an "essential worker", more structural inequalities became visible during the pandemic that related to **economic pressures and the fear of losing a job and/or being unemployed**. More specifically, many people were unable to self-isolate due to loss of salary or the fear of losing their job, particularly when working on precarious (casual, temporary, zero-hours or indirect) contracts. As one policymaker in Portugal states,

> *"some people lost their jobs because of the isolation, because they left, and as the work was precarious, someone took the place… it's a long time, for those who earn a day, and many people in Portugal earn a day, it's a long time, seven days, they can't make ends meet." An Austrian policymaker emphasised that some people refuse to get tests or use forged test certificates, out of fear of testing positive and losing their job.*

Finally, economic pressures cause **unequal access to health care,** as a doctor in Portugal illustrates: "*If we are thinking in terms of access to health, to treat symptoms, there is clearly an even greater gap, because naturally, those who have more financial capacity, can have more access than those who do not have the financial capacity".* For instance, as indicated by a doctor in Germany, workers in the informal economy often suffer severely unequal access – especially workers in (semi-)criminalised sectors such as sex work, who face intersecting barriers such as lack of documentation, social stigmatisation, and the risk of penalisation:

> *"this is extremely difficult. Because they don't have health insurance coverage, because they don't have identification papers, it was difficult to reach them. And the one or two patients from sex work that I vaccinated against Corona, one who had an identity card, or one who had health insurance – they were the exception in sex work. And that's very unfortunate because it really shows now that women in prostitution are the least protected and the least medicated." In addition, some groups are already not being heard in society, and some policy makers highlighted the importance to also consider the voices of specific vulnerable groups. More importantly, as stressed by a policy maker in Wales, "you have to take into account deprivation as an additional factor."*

## 3.5 Impact of the COVID-19 measures on inequalities and vulnerabilities

Many of the interviews would focus on vulnerability through the lens of the impact of measures taken to address COVID-19, or as a general practitioner in Austria said: *"In the social area, it is more difficult. In the social field um, to delineate who is particularly harmed (takes) by the pandemic, I don't think that's the disease itself, but that's the measures."* These measures affect societies in three ways: 1) exposing existing vulnerabilities, 2) reinforcing current inequalities, 3) amplifying social differences in the future because of scarring effects (Haase, 2020). In the following sections, themes are discussed

which emerged from the interviews. Note that this list is non-exhaustive and mainly summarises the main and common topics mentioned: 1) economic outcomes, 2) digitalisation, accessing information and 3) psychological vulnerabilities and mental health outcomes. Additionally, as previously established, living conditions and housing also complicated the effectiveness of containment measures.

## 3.6 Economic and family outcomes

The restrictions caused by COVID-19 have reinforced and increased pre-existing economic inequalities. Economic vulnerability is often mentioned in correlation with other aspects of the person's identity, such as nationality or ethnicity. A policy maker in Austria states that low income usually *"goes in parallel with a low education or people who come from other cultural backgrounds*". Furthermore, it was often those who were already financially struggling who lost their jobs or saw a loss in their wages, as the quote below illustrates.

> Policymaker, (England): *"Then there was a third group who became vulnerable due to the limitations on daily life because of the risk reduction interventions… individuals who were - in England we would say just about coping, so people who prior to the pandemic could just about pay their bills, just about manage. Because of the restrictions, they either lost their jobs or they moved to furlough, so they were getting a lower income. They dipped below and started to crash."*

Increased economic pressures have also increased the risk of domestic abuse. According to a doctor in Belgium, *"isolation does not make it any better, at least".* Another problem mentioned by interviewees has been the impact of COVID-19 on **caring responsibilities.** Although this was already present before COVID, the closure of childcare facilities, teleworking and remote learning have created more challenges for this vulnerable group. This care burden is not evenly distributed. It was gendered and felt particularly among single mothers and women on a lower income. Furthermore, many unpaid carers are they themselves elderly and more vulnerable, as the example below highlights:

> Advanced Nurse Practitioner (Wales): *"I think you can tell a lot more when you're face to face with somebody than when they're on the phone, because people tend to hide a lot. They're hiding carer's strain and things, then it's difficult for us to be able to deal with that from our end. …, when carers are saying that an elderly husband of a patient on the ward is failing to cope with his wife's needs, but may on the phone say he wants her home because he feels terribly guilty. But actually, if you saw him, he may be physically frail himself. And you could be able to pick up on the nuances of them not being able to cope with that situation. So he's under pressure. And he's under strain to care for his wife."*

These interview extracts show how existing structures, caring responsibilities and economic insecurities were sharpened during the pandemic.

## 3.7 Digitalisation, accessing information and digital literacy

Being unable to access information in times of COVID-19 made one more vulnerable to being exposed or infected and/or not following and being able to implement the latest containment measures. This could be due to **language barriers, digital gaps, visual impairments, literacy levels, or following different media channels** than those used by governments to communicate. Being able to access

information and making appointments online for tests or vaccination was often vital to protect oneself against COVID-19.

**Older people**, or as a GP in Spain stated, "*people who don't even have a computer at home because there are families who are very vulnerable, not because they are very old but because they don't have resources*", are more likely to be vulnerable in this regard. Furthermore, **migrant groups** who have difficulties with their host country's language may find it difficult to access information on country-specific containment measures. A policymaker in Belgium, for example, discussed the difficulties in reaching groups such as undocumented migrants, who were often "invisible in the figures" and living without status, without a national registration number, and without a regular GP. Respondents highlighted the initial challenges in reaching the more vulnerable groups.

> Policy maker (Spain): *"To get information out, a lot of the traditional media have been used… […] it is clear that those who absorb this information are perhaps the stronger groups, and this means that the weaker groups - if you look at both socio-economically weaker groups with different languages and so on - they were somehow overshadowed initially."*

However, steps were taken to disseminate information and reach those more vulnerable, such as the use of community 'coaches', 'leaders' or 'champions' in various countries:

> Policy maker (Wales): *"So first example, the community champions from the gypsy and Roma community said to us your information is not getting through to us because in our community people don't own smartphones. So communication is predominantly by text message. So it's great you have a WhatsApp group but it doesn't help us, we can't disseminate your information. Also the understanding of written English is poor, so literacy levels are weak. So they worked with us to take the messaging and adapt it into a format of text messages in very, very simplified English, that they could then transfer and then were disseminated through the communities. So an example about how they came back to us and said what you're doing isn't working and we co-produced with them a solution."*

These findings demonstrate the importance of having access to information and digital literacy in protecting against risk of exposure to COVID-19. It also shows how previously disadvantaged groups became even more 'left behind' due to this, complicating policy making on the COVID-19 pandemic.

Lastly, **digitalisation** has increased as a result of the COVID-19 pandemic and the implementation of lockdowns. It became more necessary to attend doctor's appointments online, work from home, or conduct remote learning. That said, the vulnerability of being excluded digitally became more pronounced. A policymaker in England explained: "*I think the downside is that we knew we had digital exclusion, we knew we had proportions of people that didn't have smartphones and they haven't always had the services they need".* Commenting on who may be more challenges in booking appointments or a test in the digital age, a General Practitioner in Belgium explains:

> General practitioner (Belgium): *"You can also see that everything is very digital. You must have an ItsMe and you must apply for your codes online, and you can make an appointment yourself at the triage centre, but then you must first create a CTCP [corona test prescription code], and then you have to go to that site... So in that respect, there are*

> *also older people who cannot work with a computer, people who are less gifted who do not work with a computer, and people who do not speak Dutch."*

To summarise, official information on the spread of the COVID-19 virus, mutations, containment measures, vaccinations, testing etc., was unequally spread across the population. In addition, there were varying levels of digital literacy which impacted access to information (and the ability to assess the accuracy of information), services and social contact. These factors complicated everyday life during the pandemic, but also affected people differently in making informed decisions and/or receiving reliable information.

## 3.8 Psychological vulnerabilities and outcomes

Whilst there has been a clear theme of **physical vulnerability** when it comes to contracting COVID-19, many interviewees also discussed the **mental health vulnerabilities** exacerbated or caused by the measures or the economic consequences of the pandemic. Those living alone during the lockdown, for instance, faced more intense social isolation. Just as potentially damaging on mental health was for those living in cramped housing, or in households with domestic abuse. Further examples given were the psychological impact on health care workers, or those who lost a job or experienced financial difficulties during the pandemic. For young people, for whom the loss of social contact was felt acutely, or for the elderly or more chronically at risk, who were suddenly locked in their homes. For the people who already had a mental health condition. Finally, the process of grieving in lockdown, either with the death of a loved one because of COVID-19 or during the period of COVID-19 with restrictions on funerals and social contact. Some of the respondents questioned whether **the focus on physical health overlooked mental health issues during the pandemic**:

> Midwife manager (Wales): *"So yeah, I think, you know, the government kind of looked at everything, vulnerability, and it was a very physical-based thing, wasn't it. And it was all about different illnesses and diseases and things that people had. I think, emotionally vulnerable people would have been, it would have been a really difficult time for them. And I should imagine just because it's just obvious; you didn't see anybody, I think that would be quite hard."*

> General practitioner and psychiatrist (Germany): *"I would almost like to say that the [government's] approach heavily interfered with the psyche and health and well-being of the elderly and the mentally disabled, those in need of care. Again, visiting people [in care homes] more, after testing, would have been better for them. But we only really know that now, in retrospect, that visiting people in nursing homes is an important, health-promoting measure, and that isolation causes such serious damage. At the beginning, the most severe impacts were expected due to Corona itself, as Italy showed – where at the beginning, more than 70 family doctors, 200 doctors and nursing staff in the clinics, died without being able to help their colleagues. And so this overreaction – to ban everything, no visits – was understandable in this respect."*

One impact of COVID-19 is how it has highlighted **the need to take a more structural approach to promoting mental health**, looking at the underlying societal factors which cause psychological vulnerability:

> Midwife manager (Wales): *"Do feel genuinely that everyone, especially in the health board, and especially our service is just really aware of people's mental health now, and their emotional health and wellbeing but whether we're just doing things to treat the symptoms of that, as opposed to, you know, actually preventing it in the first place really is. We do offer some, you know, we have some mindfulness sessions and some things like that, which are really good. But as I said, that sometimes treats the symptoms instead of what causes it in the first place, isn't it?"*

The lockdown and various other impacts of COVID-19 have **exacerbated the vulnerability of certain groups** in the population with regard to **mental health and loneliness**. Those mentioned in interviews as more vulnerable to this were **those with pre-existing mental health conditions:**

> Policy maker (Portugal): *"Another thing that the vulnerable group, returning to the vulnerable groups and which was not calculated is the accommodation of the group with severe psychiatric illness, , schizophrenia , we know and it is a very scientific literature that social isolation worsens psychosis and promotes the first psychotic conditions in people who already have a borderline personality and so on, or there is a problem with bipolar disorder, and these people were completely unattended, these people stopped having the usual psychiatric consultations for a very long time"*

In addition, interviewees named specific groups who may have been more vulnerable, such as **the elderly, parents, children, young people, as well as for some people living on their own**:

> *"But the loneliness in society is not only COVID of course, we have seen that for years. Even with people who have no family, we also have a lot of Afghan men who are alone here, we also have a lot of them here in practice. And yes, they are alone here, they have no friends, they sometimes have those meetings at a kind of cafe where they get together, and that was all not allowed. So they stay alone."*

Interviewees below highlighted the impact on **elderly people and those living in care homes,** for instance by a GP in Belgium:

> *"Also, for example, there was a little lady who was of Jewish origin, who was incarcerated all the time shouting 'you can't lock me up, I don't want to die'. That it probably had a revival after the war. So yeah, you just can't emotionally do that.". Similar findings recurred across countries and interviews:*

> General Practitioner (Spain): *"A grandfather, an elderly gentleman who came to my office, a gentleman who was perfectly able in his daily activities, who was suddenly confined to his home, and had fallen once, then had another fall at home and his life became much more vulnerable, in pain, unable to leave his home. Well, this patient ended up committing suicide, he threw himself out of the window of his room, I went to see him on several occasions, he commented to me: 'Find me a home', I mean, 'Francisco, I can't find you a home, it's your children', and the children were there, eh? because they took turns to go and live with the grandparents, it's your children who must decide."*

Some interviewees highlighted the **emotional vulnerability of young people**, who, with their often wider social networks, were suddenly forced to reduce their physical contacts and became aware of its importance:

> General Practitioner (Spain): *"We are seeing that young people and adolescents have had a very bad time, and we are seeing the consequences now in mental health illnesses, the risks of suicide have increased: suicides and serious disorders such as eating disorders; in other words, anorexia and bulimia, and I know this because I am in contact with child and adolescent mental health units, and it is something that is also striking because in the lack of communication that there has been in recent months, in this process of isolation that we have all had; I think that the young person who communicates more through social networks, who has not seen these networks cut off, continues to communicate with his peers, but the young person needs more contact with his peers and they are very loving and very physical."*

Furthermore, **children** are also named by many respondents as being more vulnerable through the pandemic. They symbolise the '*scarring effect*', or "*collateral damage*" as some respondents referred to them as. Lockdowns and school closures were viewed by many as a "necessary evil" to control the pandemic, but where social inequalities will be amplified as a result. This was particularly the case for children from a lower socio-economic background:

> Policy maker (Belgium): *"I think children are vulnerable in themselves. I think less thought was given to that in the beginning, what the impact of lockdown was on children. That awareness did come, but too little thought was given to it in the beginning. Let alone about children in precarious situations, because then another dimension is added. What has been done for those children? I don't think anything really, yes they did provide computers. But I think that too is such a complex problem."*

Even two children belonging to the same lower-income bracket may face different levels of vulnerability. The quote below highlights this intersectionality, or "layers of deprivation":

> Policy maker (Wales): *"If you are a child of a substance misuse user, who is homeless, you know, you're in temporary b&b, but your parents have a chaotic lifestyle, and you are not going to get taken to any appointment. And you're, you're barely taken to school. And if you are, it's only sort of so they've got free time. And sometimes you're not picked up, you know, so a child of a substance misuse is in a completely different place, to the loved, cherished child in a housing estate, equally poor, possibly equal means with benefits, but the proportion of those means that you will see as a child of substance misuse is minute compared to the person who would go without to give their child you know, something, a treat, or sight, I do think that is looking on the layers of deprivation."*

## 3.9 Policy making and the intersectionality of vulnerabilities and impacts of the COVID-19 pandemic

All previous sections demonstrate that structural inequalities and health conditions, exposure to the COVID-19 pandemic and containment consequences cannot be seen entirely separately from each other. Physical vulnerabilities and/or the worsening of existing vulnerabilities often coincide with other socio-economic vulnerabilities and disadvantages, and are often related to belonging to a specific

group (e.g., age-related groups, migrant populations, etc.). Those previously more vulnerable are more likely to be impacted by the knock-on effect of COVID-19 on other types of healthcare. The economic impact of the pandemic will further exacerbate structural health inequalities. Respondents discussed how **these different dimensions of vulnerability** can pose a challenge during decision-making.

> Policy maker (Wales): *"But what we were really interested in, kind of our analysis of policy documents, was that decision-making. At least from what we knew, this was based on a kind of combination of two factors. One is about health. And it talks about, you know, where do you draw the line about immunosuppressed people, but also socio-economic factors? You know, in terms of looking at different dimensions of deprivation, which you already mentioned. And we were very curious, I think it's very difficult to question, how to balance these two things, what to give priority to, you know; is it about health, or about provision, or about different kinds of what we call vulnerability? How would you make decisions based on this?"*

Some participants mentioned that an obstacle in understanding the intersectional nature of socio-demographics behind these health vulnerabilities is **rules around data protection.**

> Policy maker (Austria): *"In the pandemic, the EU has, of course, decided that in the weighing of goods the protection of life and the foundations of life is higher than data protection. But that was not accepted, yes. That's why we have a very inadequate data situation in general and not just for vulnerable groups. Because you are not allowed to ask if you are vulnerable."*

This is particularly the case concerning **ethnicity**. Although rates of chronic diseases have also been reported to be higher among ethnic minority groups in several European countries (Modesti et al., 2016), many European countries avoid breaking down data along racial or ethnic lines out of concern over privacy and discrimination. This is unlike in the UK, where COVID-19 death rates have been reported to be highest among Black, Asian and Minority Ethnic (BAME) persons (Otu et al., 2020). However, the benefits of such data collection and protection were discussed in **preventing ethnic profiling** or **stigmatising particular groups** according to a policymaker in Belgium who referred to how data could "*take on a life of their own*", with doubts whether the data would benefit the actual groups:

> Policy maker (Belgium): "*Then you think 'that's an area with 40% immigrants, or 50%, it's going to be them', when you don't actually know that….. They will take on a life of their own, and if you then I think would have more sensitive figures about COVID among vulnerable groups, in vulnerable neighbourhoods, etc. Yes, then you risk even more noise…. On the one hand, it is useful to have that data. But I think you should also be able to keep the necessary distance and take the time to look at that data calmly. "*

As shown also in the accounts of other policy makers, **the risk of stigmatising groups** or contributing to additional stereotyping was regularly mentioned as a concern. Some policy makers would even refrain from referring to the concept 'vulnerability' in specific neighbourhoods or areas which were more ethnically diverse.

> Policy maker (Wales): *"It wouldn't be a word that we've used 'vulnerability' but it's all about the data and where the cases are. So then there might be certain areas at times that would have been more at risk…. So again, it's that language, I think being more at risk*

> *to COVID. That had to have additional measures….So yeah, again, you know, in terms of the concept of vulnerability in a health protection world, it would, it would just be the language would be about risk and high-risk settings."*

Policy makers had to weigh out pros and cons when taking these vulnerabilities into consideration and even more when **communicating about these risks**:

> Policymaker (England) : *"Then there's a group of individuals who were vulnerable due to the risk factors that put them at higher risk of mortality from COVID, the obese men, the elderly, particularly ethnic communities, occupational exposures. That required a lot of work to engage with communities and to think about how to communicate risk and risk narratives without stereotyping or stigmatising."*

The comment shows how policy makers and health care workers recognised the importance of considering how vulnerabilities intersect in order to understand the health impacts of the COVID-19 pandemic and communicate about these risks.

Overall, these analyses show that apart from the difficulties and ambiguous conceptualisation and varied use of the concept 'vulnerability' across policy makers and health care workers, it is also not straightforward to apply insights about specific (intersectional) vulnerabilities in practice. The use of data to monitor overlapping health and other vulnerabilities, as well as making differentiated policies and communicating them, was often considered to be delicate, especially as this could result in (additional) stigmatisation of specific groups. This could also relate to the specific health expertise of many interviewees, who were less familiar with other types of vulnerabilities.

# 4 The impact of the COVID-19 pandemic on health care workers

In the following section, we will go deeper into the specific impact of the COVID-19 pandemic on health care workers. Based on the data analysis, three main topics emerged: 1) uncertainties and changes during the pandemic, 2) professional cultures and organisation of health care systems during crisis and 3) health care workers' mental health and work-life balance.

## 4.1 Uncertainties and changes during the pandemic

Health care workers were the first ones to be aware of the impact of the pandemic and its severity (Shreffler et al., 2020). They were also the first ones that had to immediately take action and change their daily lives in order to respond to the needs of the COVID-19 pandemic. Therefore, in most interviews, participants referred to **a differential impact of the pandemic on their professional (and personal) lives**, depending on the distinct phases of the COVID-19 pandemic. Especially the first wave of the pandemic, in which health care workers had to organise themselves to deal with this "exploding" pandemic, there were still a **lot of medical and scientific uncertainties** concerning the COVID-19 virus as such, as exemplified by this GP in Wales:

> Health care worker (Wales): *"Yeah, absolutely. And there were a lot of, I suppose, not the mistakes, but the miscommunications and maybe as a better term, terminology with regard to infection control as well. So we were getting a lot of mixed messages about infection control. So you know what you should do with a patient once they get COVID. You know, when you should test them, what PPI you should be wearing, or you shouldn't not be wearing, you know, some people were saying the normal material masks, others were saying, you know, you need the full FFP mask. In the first phase, we were told we didn't need to wear masks at all, that transcended them"*

Additionally, there were a lot of **uncertainties** related to the **duration of this pandemic**. A GP in Greece states: "*The key characteristic of the pandemic was perfectly described by the quote ''the next two weeks will be critical''*", suggesting that the idea that 'the pandemic would end soon' was always nearby. Dealing with these uncertainties characterised the first phase of the pandemic and especially the lives of the health care workers, a health care worker in Portugal formulated it: "*Basically, at the beginning it was the confrontation with the unknown*". In addition, this participant described working during the first phase of the pandemic as follows:

> Health care worker (Portugal*): "At the beginning it was quite stressful because we had to confront something that we didn't even know very well. We didn't know what the consequences were, and in the beginning there was a lack of material, there was not enough personal protective equipment."*

As can be seen above, these uncertainties were also accompanied by **a lack of protecting material, protocols and procedures** on how to deal with this pandemic, which recurred across most interviews as well. For instance, like in many other countries, in Greece, a so-called 'mask race' was noted by a Greek GP, referring to how the management of the hospitals and other health care facilities attempted to provide their personnel with the required masks as soon as possible, describing it as a big challenge.

Furthermore, health care workers whose everyday work exposed them to infection sometimes faced the challenge of balancing risks to themselves and their co-workers against the needs of their patients,

without yet having reliable empirical grounds on which to assess either. A GP in Germany indicates that assessing such trade-offs was stressful, especially at the beginning of the pandemic – but also that him and his staff were surprised at how quickly they adapted:

> General practitioner and psychiatrist (Germany): *"At the beginning it was difficult to judge how dangerous the disease was for the patients, my staff, and myself, so we implemented all hygiene rules immediately. After a month already, though, a certain calm had set in."*

Finally, many health care workers were involved and had to participate **in the organisation of dealing with the COVID-19 pandemic**. The impact on their professional lives depended mainly **on the specific tasks and functions the health care workers** already had and took on over the course of the pandemic. For instance, in Belgium, some GPs were on the front line when it came to contact tracing and dealing with the pandemic, but some of them were even more involved as they took up local responsibilities in the organisation of these procedures. Belgian GPs also referred to the COVID-19 testing, which was largely organised at GP level. Others mentioned taking up some local responsibilities in the health care sector (e.g., local GP work teams) that suddenly resulted in a lot more organisation, complicating their everyday work in their offices. Others, as the interview extract of an Austrian infectious disease physician shows, were asked to **participate in advisory boards**:

> Infectious disease physician (Austria): *"This original advisory board was assigned to the Supreme Medical Council, which is now a technical committee. And then suddenly, someone from the Federal Chancellery called me and asked me if I would like to join this new committee, which is called GECKO. I said I'd do it, but only if it's not too much work because I've had enough. Um, he said no, no. Well, of course, he (lied), it's a lot of work, it's more work than the advisory board was at first, because of course um GECKO sees itself as a central instrument, where the other expert staffs, committees, i.e. from the Corona Commission to the crisis team um etc. also report in, and we have to make distillates out of it."*

Many health care workers mentioned they had to **change jobs or specialisation**, due to COVID-19, switching to tasks they are normally unfamiliar with, as this internist in Spain states: "*When it started, I joined one hundred percent, and I joined because I was leading a Covid team, I don't normally have tasks of this type, let's say*". Furthermore, the impact of the COVID-19 pandemic on health care workers **and the type of tasks they had to do**, was very dependent on specific local measures and guidelines on how to implement them. For example, the nature of complaints changed for GPs along the way, ranging from the **nature of complaints they were consulted for** (e.g., psychosomatic complaints, back pain, headaches, etc to Covid-19 related symptoms) **and the nature of their expertise they had to provide** (e.g., writing subscriptions, identification of COVID-19 cases and explaining of COVID-19 measures and consequences for isolation). They also noticed a **changing group of patients**, as many risk patients, such as those living with chronic diseases, **avoided consultations and were replaced by other patients in need for care due to COVID-19 related issues and contaminations**:

> Health worker (Portugal): *"Everyone was very afraid and there was a huge decrease in the number of patients, for example in the emergency room there are normally a lot of patients, I remember seeing 6 patients in 12 hours which is something never seen before. So a decrease in the number of patients, everyone was very afraid, both the patients and the doctors, it was not known what this was [...]. I think whoever walks in the rain gets*

> *wet and when a person decides to go to medicine, he has to be prepared to take some risks in the background, so he has to practise his profession anyway. In terms of consultations, the number of patients also decreased a lot, we started to see only the emergencies, [...] the patients with the severest complaints."*

The pandemic has also made it very difficult for health care workers to conduct their everyday jobs in a **face-to-face manner**, as shown by this GP in Greece:

> General Practitioner (Greece): *"It has become much more demanding than the protection measures in general that we can no longer have the same relationship with patients. Even with colleagues there is a distance to make starting from the mask that anyway in some cases we wore, but now also the distance with the patient which is much more reserved."*

The changing roles and nature of the jobs of many health care workers, being fully taken over by the COVID-19 pandemic also had **life threatening consequences**. For instance, during the first period of the COVID-19 pandemic, some GPs had to work remotely, meaning that they couldn't see their patients and had to handle all interventions via the phone. This was very challenging and led to problems of diagnosing specific diseases, as shown for instance in Italy:

> General Practitioner (Italy): ***"****I know of people who didn't go [to the doctor] when there was chest pain and died, among my patients. So, I personally experienced it. Then the whole world of tumours... I mean, people suffered because of their relationship with the structure, but not with us general practitioners. With us there was no limitation."*

Another GP in Belgium mentioned that conducting doctors' appointments through phone calls made correct diagnosis quite challenging. She feared that she would have overlooked some diseases, which could have been fatal or with large consequences. She mentioned that was relieved to hear that her colleague was able to diagnose someone's heart attack, which could have been dismissed as a COVID-19 infection, by continuously asking questions on the phone. She herself was also able to diagnose a patient with breast cancer, by carrying out a physical examination that the gynaecologist would not do because of the COVID-19 restrictions. Apart from urgent cases, a recurring theme for many health care workers was that the pandemic has resulted in **less preventive health care, yielding long term health effects**. Due to the longevity and severity of the pandemic, they noticed that specific groups of patients did not want to enter hospitals anymore or visit their GPs, resulting in a deterioration of their health. This complicates the work of health care workers as well, as they have to deal with patients with complicated health conditions::

> Health worker (Portugal): *"It had a lot of impact, in clinical terms it had an impact, because as in the hospital my action is within a surgical team, the surgeries all stopped for about a year, bariatric surgery, obesity treatment, [...] So I continued to give consultations of course, to my patients from other areas, depression, anxiety and so on, and there the impact was also noticed by more consultation requests and worsening clinical conditions, which clearly worsened with the pandemic."*

As was also clear in previous interview discussions, many health care workers explained that the pandemic brought along some **digital transformations**, which also applied to their patients and daily work issues. One recurring change was the possibility to conduct consultations by phone or the use of digital registration systems and applications. Despite a lot of limitations and challenges related to this

transformation, health care workers found it useful to reflect upon the ways this could serve and be applied in certain circumstances in the future as well:

> Health worker (Spain): *"In the working reality, the main one that was not very well known was resolving things by telephone... we realised that there are many things that can be resolved in this way, for example a patient who requires a control analysis because of his hypercholesterolemia or is diabetic and often he must have an analysis. The patient has his analysis done and for the results it is not necessary to lose a morning or a couple of hours of his life by going to the health centre. He must make a request by telephone but not to go to the health centre, wait to be seen and be seen in person by a doctor when there is no examination at that moment necessary, but simply to see the results of an analysis. These procedures will remain, in many things they will remain and that is good."*

Nonetheless, they also noted that the elderly and specific groups, such as migrants without residence permits, were not fully following this **digital transition**, and therefore could not always access tools, or transmit their data.

In addition, health care workers are at the frontline and see patients, how they live and how the COVID-19 pandemic impacted their lives. This contrasts with health policy makers and/or virologists, who apply more a top-down perspective. Because of this, HCWs seem to better be able to consider **the social dimensions to the implementation of the COVID-19 measures**, such as housing, family situations, etc. These dimensions became visible through their health outcomes:

> Health care worker (Italy): *"I'm a general practitioner plus I'm a specialist in Gastroenterology and Endocrinology. I'm actually an internist on the ground, so I cover the whole pathology area. I have been completely taken in by this Covid thing, also because I really feel a social need in the sense that... This is not only a health problem, but also a social problem that has caused so many destabilisation. This is the problem, understood? Many, many, many types, and so I fully accepted this challenge, this involvement, in fact, this is the right term."*

Furthermore, as most of the attention was on the availability of beds in hospital wards and reducing the pressure in hospitals, some first line practitioners often felt ignored and indicated that they also were confronted with a lot of patients. Moreover, they often had to **communicate the COVID-19 measures**, including isolation, which was not always easy. While most health care workers felt valued, they also were confronted with the anger of patients, who were fed up with the pandemic and had a hard time putting COVID-19 measures into practice. Given their first-line position, one GP in Belgium indicated that, despite wanting to maintain good relations with their patients, she felt like a police officer, telling people what to do and not do.

In summary, being **put on the frontline, changing roles, positions and responsibilities, as well as being part of the organisation of the unexpected and unforeseen COVID-19 pandemic, combined with a lot of uncertainties** caused considerable stress for many health care workers. As expected in crisis situations, the COVID-19 pandemic lays bare the strengths and difficulties that were already prevalent in these existing professional organisations and sectors.

## 4.2 Professional cultures and organisation of health care systems during crisis

The increased and changing roles and tasks many health care workers were confronted with since the start of the COVID-19 pandemic highlighted the nature of their sectors, local organisations and fundings schemes, and characteristics of working in health care. The COVID-19 pandemic added even more stress and tasks on top of their existing duties. This professional group already **had a heavy workload and a high sense of urgency** before the pandemic. As mentioned by a GP in Belgium, this seems to be also part of the **professional culture of health care workers**, that is guided by phrases such as "*You keep on going, you just do that, it characterises our profession. Patients are counting on us, so we have to continue*" or as mentioned by this internist in Spain:

> Internist (Spain): *"Well, I think that on the one hand there is a certain, you can see a lot of wear and tear feelings. The professional wear and tear are perhaps the most important impact, it happens of course**, because many professionals feel that when they were necessary in the front line, they have been used to the full, they have given their best at the moment.** However, when the situation improved a little and they saw that they were no longer needed, many contracts were cut, and others were not renewed. Many feel they have been used."*

The pandemic stressed and highlighted some of **the weaknesses of the organisation of their profession**, such as the lack of staff, funding issues also causing some issues when dealing with the COVID-19 pandemic. As this prior interview extract shows, the financial repercussions and people being fired after the first wave of COVID-19 shows the vulnerabilities of this professional group and the insecure funding of the health care sector in Spain.

Nonetheless, the pandemic further stressed this professional culture, resulting in an **increased and very high sense of urgency** that made many health care workers feel like "*they did not have any other option*" (as a GP in Belgium stated) to work around the clock and make the organisational changes needed to cope with the pandemic. Moreover, they did so as they thought it was "the moment" to do it, and this would eventually end. However, over time, health care workers became more aware of the continuous nature of the pandemic, and the **sequence of 'hectic times',** making them live from one hectic period to another one as this GP in Belgium stresses:

> GP Belgium: *"And then the second wave came in October, and from December on, we received the news that the vaccines were available, and I am also a coordinating and counselling GP in residential care centres, so, then from January onwards, we had to vaccinate people in our care centre, so, this made that you were lived, going from one moment to the other."*

This sequence of intensive periods with a high workload were mentioned to also impact people's **effectiveness and success** at work, as indicated by a lung doctor in Greece:

> Lung doctor (Greece): *"When you get tired, you have much less patience, much less mood. And just because the measures are time consuming and you need to be much more precise on the gloves, washing your hands etc. which we had to do anyway, but now they are much more intense. All this fatigue, all this over effort combined with all the deaths we had with insecurity and everything that we had to face of course impacted our work and services."*

Given the long timespan of the pandemic, many health care workers mentioned feeling better prepared and more informed about the nature and the variations of the COVID-19 virus over time. Nearly all health care workers felt such differences due to progressive insights in the nature of the COVID-19 virus and its mutations, and a better organisation of the COVID-19 at various levels of governance.

Many health care workers mentioned that, within professional settings, stressful working environments and ongoing dynamics increasing stress, were heightened during the pandemic. Additional pressure was caused by being on the frontline and more vulnerable to being infected, as well as more dependent on their colleagues. The nature of the COVID-19 pandemic resulted in some specific consequences, e.g., **the suspicion of people being infected with COVID-19, thereby** complicating team work:

> Health worker (Greece): *"We all became suspicious, suddenly, which is the simplest, say someone coughs we get a distance. Somebody has a tissue, say on their hand, and they got their nose we were not going close to him. Let's just say, suddenly, we're acting as if we've become more distant. I want to believe that solidarity, understanding, was not lost, but it came to me in a distance. Starting with the mask, by hiding the mouth, the smiles, to touch, to handshake, even with patients we would never touch them without gloves."*

Also lacking was face-to-face contact with professional peers and was often mentioned as a reason for increased distance between colleagues, making it harder to deal with stress and other issues:

Health worker (Portugal): "*Somehow we reduced the peer contact, we lost a little contact between us because we started having meetings all via zoom, in small groups and that somehow led to some degree of distance between people*."

The more distanced contact between colleagues and the lack of face-to-face contact sometimes was compensated by **solidarity and increased feelings of "we are in this together**", creating some kind of family of people working in health care and being in a similar position, as outlined by the following GP in Portugal:

> General Practitioner (Portugal): *"The interactions with other colleagues, we can say that we managed to assemble a family where we always felt pleasure when we met every day at 8 am in the shift delivery, in the middle of the night in the shift delivery. Our relationship with family members by telephone in which we informed them of the state of their most loved ones, we managed to establish a bond that remains until today and that we owe to COVID. COVID has not only brought negative things like the death of people, but it has also caused a collective that until that moment was not known and formed part of a new project in which we are all involved."*

This professional culture that characterises many health care institutions which is often rooted in a lot of health care work, also partially stems from the high level of **immediate relevance of their profession and the priority health has for many people's lives**. Hence, it is understandable that despite this intense period of time, most health care workers mentioned to have many **peaks of higher workloads that were** accompanied **with a high level of job satisfaction and the feeling to conduct relevant work**, but could also weigh on people's resistance after some time, as shown by this public health care policy maker and GP in Greece:

> General Practitioner (Greece): *"My daily life changed very much due to the nature of my profession. I am involved daily in pandemic management, communication and decision making, the work that we do is really motivating. The contribution to society is what keeps me and my colleagues going. It is a newly found experience that has influenced my professional and personal life and I will remember this for my whole life. It really is a life experience that in contrast to what we see we experience in theory."*

These feelings of conducting significant work and "making a difference" also changed over the course of the pandemic, as shown by this quote of a GP in Belgium:

> General Practitioner (Belgium): *"At this moment, the impact of the diseases is far lower. The disease is more widespread, and there are a lot of people infected, but this brain killing work is not really satisfactory anymore. It sounds a bit stupid, but when the infections took on serious forms, you had the impression you meant something. Then you called with pleasure patients with diabetes and heart issues on a daily basis to ask how they were doing and whether they could still walk on the stairs and whether someone had to drop by. Now, the only thing related to COVID-19 people call me for is "My boss doesn't accept the positive PCR test from the lab, you have to make a note saying that I can't work for 7 days and that I can't go outside. And then I sign it (sighs). That is not such an interesting job, I didn't study for nine years to do that kind of job".*

The above excerpt demonstrates the change in how health care workers felt over time. Many of them also felt that public support and appreciation could mainly be felt during the first period of the pandemic. As indicated by a nurse in Spain: "*Well at the beginning we were like Gods, weren't we? People applauded us and so on, and now I think we are on a very low scale of values, very low*". Similar experiences were found elsewhere, such as a health worker in Italy explaining: **"***Yes, yes, I had a lot of appreciation from the people. A lot and it was really very nice. A lot, a lot of appreciation*." Or in Greece: "*At first I didn't have the time to pay attention to public opinion. After a few months the public appreciated my work, my attempts to keep patients alive and of course gratitude every time an ICU patient would come out alive*." Changes over time were noted, for instance by a health worker in Portugal:

> Health worker (Portugal): "*Initially, yes, I think it's also a little bit of manipulation by the media, in fact, in my opinion, it's even a little exaggerated [...]. It seems that the population somehow was in solidarity with the health professionals in the initial phase, but in the long term I don't know if public opinion has changed that much. [...] I think that public opinion at an early stage may have improved but then I think that overall it hasn't changed very much, honestly."*

In summary, the COVID-19 pandemic put a lot of existing vulnerabilities and inequalities under pressure. The appreciation of health care and existing professional cultures were challenged and questioned. This was especially visible when looking at the mental health consequences that were brought along by the COVID-19 pandemic.

## 4.3 The mental health and work-life balance

The high level of responsibility, uncertainty, and difficulty in maintaining a work-life balance during the pandemic caused a large amount of **stress**, resulting in some health care workers 'dropping out' (e.g.,

due to burn-out). This was also clearly felt in the decreasing resilience of many health care workers, which was already stretched but became even more limited due to the COVID-19 pandemic. The previously outlined professional culture in which people just 'keep on going' makes people more susceptible to **mental health complaints and burn-outs**. According to a health care worker in Spain, *"sick leave" is "the only (help) channel that exists"*. It was mentioned by a general practitioner in Portugal that there also existed some "*degree of prejudice in relation to mental health*" amongst health care workers, where they did not *"like to admit to their peers that they may have levels of burnout or anxiety."*

This pressure was even more prevalent during the pandemic. According to a lung doctor in Greece: "*At first, the workload in ICU was so intense that it didn't allow you to think about your personal mental health. We've had a lot of hard times, with fatigue, personal difficulties and family tragedies. Over time all things improved*." This pre-existing professional culture was put under the spotlight given the urgency and nature of the pandemic, in which health care workers were even more confronted with death:

> Policy maker (Spain): *"Many people died who didn't have to die, people who didn't die before, so it was terrible. I had the feeling that I was not in control. You were seeing how younger or people with less pathology were dying and that is obviously terrible."*

On top of the large changes and increased tasks many health care workers were confronted with, facing the consequences of the pandemic first hand also impacted the mental health of many health care workers. This resulted in, for example, a health care worker in Spain stating: "*For the last year I have had to sleep with an oxidant, for example, I think that I smoke more, and maybe sometimes I drink more too."* Or as put by a health care worker in Portugal: "*I am not usually an anxious person and I think that at a certain stage I had levels of anxiety and stress well above what is usual, that is, I had a peak."* In nearly all aspects of the pandemic, health care workers were expected to be very resilient in dealing with the COVID-19 pandemic.

In stressing the sense of urgency, these professional cultures seem to have neglected the wellbeing of health care workers and the impact their work had on their personal lives, as stated by this health worker in Greece: "*My life changed dramatically due to working excessive hours and having minimum contact with my family*", further explaining:

> Health worker (Greece): *"My unit ICU had 6 beds prior to COVID-19. In 2 days we had 14 patients intubated, so we built new walls and equipped the ICU with oxygen (invasive ventilation), monitors and aspiration machines. At first, the doctors were only three, we had an excessive workload and non-standard working hours, we were fatigued and stressed. In the first 6 months, I would go home just to have a bath, change my clothes and rest for only four hours. I tried to avoid my family completely as my mother had cancer, my father is of old age and my child is nine years old."*

The personal lives of many health care workers **interfered with their professional lives**. For instance, those with children also seemed to encounter more difficulties and stress in coping with the pandemic, compared to those without. Some of them mention that they hardly saw their own children, or were very careful in following the rules at home to avoid inconsistencies in their work. The confrontations between professional and personal lives often caused **some feelings of frustrations for health care workers**. This was often related to very difficult professional lives, struggles to combine work and

family life, and then noticing that other people did not comply with the COVID-19 measures, which eventually affected their work lives as well.

Family demands, e.g., to stop working or make tough decisions, were frequently mentioned:

> Health worker (Italy): *"No, for example my daughter...I also work in other places, for example in the Caritas clinic in Via Marsala, where there is a bustle of people of all colours. My daughter wanted me not to go there anymore. She wanted me to stop going there [laughter]. She was afraid that I would go. And that was a difficult moment when you know you have to but the other person says no. That was the only critical moment for me, to tell the truth. Just in the early days when we went with the mask, the plastic visor, the troubles. There were those of us who left... for the domiciliary care, we arrived at the patient's home in the car with the coat, you got out of the car, you got dressed, you went there, you undressed before entering the car, that was one of the moments a bit more...."*

In some cases, due to the gendered status of care work in general, female HCWs were identified as more likely to experience simultaneous professional and domestic demands:

> General practitioner and psychiatrist (Germany): *"So I see that especially for the women [in the health sector], when the schools, the kindergartens were closed, the women had to do the main part of the [domestic/care] work [...] That's where I noticed differences, that after all, women bear the main burden in the Corona pandemic, in the housework and in the care of the children, and that men tend to rather escape into their professions and into the work and not to be present at home: 'I have to earn the money,' is a common excuse."*

Other health care workers mentioned that, whilst everyone faced a high workload, people taking time off due to family responsibilities caused additional strain at work, especially for those with no children to take care of:

> Health worker (Greece): *"In cooperation with specialties I don't think it has played a role simply because let's say someone for example a parent was having his child positive and had no place to leave it thus was getting special purpose leave. In comparison to other social group that didn't have a child, it seemed, let's say somehow like what I can't rest some days without it meaning someone was to blame for but it was a bit controversial especially when staff started to ''burn out'' from workload the ones that never had a day off."*

To conclude, these analyses indicate how the lives of health care workers were heavily impacted at both the professional and personal level by the COVID-19 pandemic. The challenges they were confronted with, related to the professional cultures as well as the organisations and structures of the health care systems in which they work.

# 5 Looking back on two years of COVID-19 public health responses: key challenges and lessons learned

The COVID-19 pandemic has required the implementation of public health responses at an unprecedented scale. Such responses have ranged from personal protective measures – e.g. physical distancing, hand hygiene and mask wearing – to preventive measures implemented by health authorities such as testing, contact tracing, and vaccination programmes. The public health policy- and decision-makers and HCWs interviewed for WP5 have been positioned at the frontlines of these public health responses, and have witnessed the key evolutions over time as the pandemic turned from weeks, into months, and then into years. The interviews conducted by COVINFORM partners are testament to the steep learning curve that these professionals and their organisations have undergone, and document important lessons about what constitutes effective public health responses. This chapter provides a bird's-eye view of a number of key challenges and lessons learned, by going over a number of themes that were identified as pertinent across countries. These include the coordination of public health responses at different geographical levels; dilemmas in decision making; the challenges associated with evidence-based action; COVID-19 public health communication; and lessons for the future.

## 5.1 Coordination of public health responses at different geographical levels

In most countries, emergency responses included an alteration of the distribution of power, with national governments gaining more far-reaching control (Diaz Crego & Kotanidis, 2020). Indeed, central governments and national-level public health institutions have often been ultimately responsible for designing and implementing the main COVID-19 public health responses. However, regional and local public health and government stakeholders typically have had some power to adapt or implement tailored responses at their respective geographical levels. In some countries, this regional and/or local autonomy has been more significant than in others.

Across countries, the degree of **centralisation** has changed over the course of the pandemic. During the early stages of the pandemic central governments gained far-reaching additional powers to respond to the crisis through the declaration of states of emergency and/or reliance on special pandemic legislations. Public health actors operating at sub-national level therefore often had limited **autonomy** in deciding on what strategies to pursue, as highlighted by a public health official working in Antwerp, Belgium:

> Policy maker (Belgium): *"Certainly in the beginning, there was very little freedom. In the difficult moments, I sometimes compared it to a kind of Soviet system – everything was centrally controlled and regulated. You had to do what they [central government] said, that is how you were going to work and there was no other way. There may have been good reasons for that, but with the skills and competences we had in Antwerp, we could have moved much faster, and set things up better."*

As noted by the respondent in Belgium, the initial rigidity of top-down public health responses sometimes caused frustration at the subnational level, as local know-how was not always taken advantage of. An Austrian public health official similarly noted that stakeholders at the levels of the federal government and the federal states frequently had "*somewhat different plans*", leading to

"*areas of friction where errors can creep in*". Indeed, as the pandemic stretched on and public health responses became increasingly decentralised, **coordination** between different geographical levels became a key challenge. A Belgian public health actor working at the federal level highlighted that "*it is really not easy to have national directives implemented in a uniform manner*", because "*any approach – whether it is vaccination, testing and tracing or any other aspect – is interpreted and implemented differently in different regions*". A Spanish Ministry of Health representative working at the regional level described the relations between different geographical levels as rather tense at times. He felt that the national government was very concerned with its image and that depending on the current state of the pandemic, responsibilities were shifted: "*when things were going badly, the Autonomous Communities had to take measures, and when things were going well they [the national government] took some credit for it*".

Despite these challenges, respondents also highlighted the **added value** of close collaboration between national and local-level actors and the importance of decentralisation. It was noted by a Belgian policy maker that a decentralised approach was "*absolutely necessary*" to match with the heterogeneous nature of society, and in order to reach more vulnerable groups. In England, a key lesson learnt was the understanding that *"the population is too large and too complex*" to try to manage the pandemic from a national level. A public health official from Wales lauded the fruitful collaboration with local public health teams, consultancies, and stakeholder groups:

> Public health official (Wales): *"What they bring to our public health system is eyes and ears, and that community-level knowledge. […] If we're vaccinating Gypsy Travellers, or if there's been an outbreak in a Travelling community […]. That's where that national-local level partnership really comes in."*

A public health director working at the city-level in England noted that collaborations between partners at different geographical levels have consolidated over the course of the pandemic, and there has been a "*maturing of relationships between sector partners*". As such, the pandemic not only shed light on the existing weaknesses and strengths of policy structures, but also had some **positive impact** on new collaboration processes.

## 5.2 Dilemmas in decision making

Another theme that emerged across the interviews related to the dilemmas that have arisen in pandemic decision making. Many interviewees highlighted how a key challenge in designing and implementing COVID-19 public health responses was having to weigh various **conflicting interests**, and the need to choose 'the lesser evil'. Indeed, pandemic control measures have had wide-ranging negative consequences, including increased loneliness and social isolation; reduced physical activity with detrimental effects on both physical and mental health; as well as reduced access to care leading to untimely diagnosis of new conditions and exacerbation of existing health issues (Beridze et al., 2022).

Many of the respondents expressed how difficult it was to strike a **delicate balance** between countering COVID-19 transmission and minimising negative 'side effects'. A GP in Belgium noted that "*the fact that a lot of people have become very lonely has been somewhat overlooked*" due to the heavy focus on medical vulnerability. A decision-maker in Wales, for example, highlighted how stay-at-home and physical distancing orders conflicted with what she knew to be important for overall health and wellbeing:

> Decision maker (Wales): *"Especially with a background in health improvement and wellbeing… you know, it's a massive impact, being isolated. Sometimes health protection and the precautionary principle didn't quite marry up with what I felt like, the kind of human side of the pandemic, which got lost a little bit sometimes."*

Policy- and decision-makers also faced dilemmas with regards to decisions on where to concentrate limited **resources and capacity**, as illustrated in the following quote by a respondent in Wales:

> Decision maker (Wales): *"It's a fine balance of adding up what resource you've got with the capacity, and making a decision that's right at this point in time. Where are our biggest risks, where are numbers rising faster? What is the best use of our resources?"*

A public health official in Belgium similarly noted that when public health services such as contact tracing were under intense pressure, it was necessary to change their approach and try to maintain services for as many people as possible with the limited resources available. He noted that although his team would ideally use contact tracing field officers when people could not be reached by phone, "*at a certain point you get saturated, and you end up with numbers of people where this is impossible*". When targeted approaches using field officers were no longer visible, contact tracing services had to rely solely on phone calls and SMS. He pointed out that although this meant the quality of the services unavoidably went down, it was still the best solution. "*Yes, quantity becomes a bit more important than quality, because otherwise 95% of the people would be missed. So that is a very difficult thing, a dilemma, but that is how it is*" (Policy maker, Belgium).

Other respondents also noted that these types of dilemmas were particularly challenging when extra resources were needed to develop adapted or **targeted approaches** for specific populations or groups. In the context of the COVID-19 vaccination campaign, a Swedish infectious disease control official commented:

> Disease control officer (Sweden): *"There is no doubt that certain socio-economic groups have been much more difficult to reach, and we can see this not least in the vaccination efforts […] It's difficult to invest everything in these groups because then you miss out on the general public, so you have to be able to manage both parts somehow".*

## 5.3 Evidence-based action: managing uncertainty and constant change

A key challenge in designing and implementing COVID-19 public health responses has also been to pursue evidence-based action even when the aetiology and management of COVID-19 was "associated with unbridled **uncertainty**" (Koffman et al., 2020). The collection of data has been a central component of public health responses in the COVID-19 pandemic across partner countries. Nonetheless, decision-making has often had to be based on flawed, incomplete or inaccurate information (Rutter et al., 2020).

Many interview respondents emphasised the **key role of data** in decision making. For example, an Austrian public health official said: "*data is the basis […] because only then can I actually make targeted decisions"*, and a public health actor in Spain described data as key for "*an information framework for further decision making*". Similarly, a public health director in England explained that "*capturing a lot of data on cases*" has allowed his team "*to profile them against what we know about local populations, and that's informed our communications and our health promotion strategies*". Yet respondents also highlighted the challenges associated with **uncertainties and gaps in data** – another Austrian public

health expert pointed out that the prognosis models used were "*very, very complex*", and that the predictions they make are not always accurate: "*the prognosis calculators, they groan terribly, because of course they always have to work with assumptions as they don't get certain data in time*". Similarly, a public health actor working at the level of the City of Antwerp (Belgium) emphasised that they "*were repeatedly faced with the problem that we were not getting data*" in the context of the vaccination campaign, which meant they were not well-aware of which population groups were 'behind' in terms of vaccination coverage: "*we didn't know that, so we had to rely on assumptions and even prejudices*".

On the other hand, public health actors also pointed out that throughout the crisis, they experienced a certain degree of **pressure** to produce and be transparent about the data used to inform decision making. A Spanish public health official working at the national level noted that as the collection of surveillance data became crucial for technical COVID-19 policy recommendations, his team was burdened with considerable additional workload and psychological pressure:

> Public health official (Spain): *"Obviously, it has also represented an increase in responsibility, an increase in the pressure on the unit, and an increase in the pressure on the quality of the information. The data has had to be of much higher quality in a much shorter period of time, with much more volatile, changing data. This has generated, in addition to the enormous amount of hours and pressure we have had in terms of work, an added psychological pressure on everyone."*

A Belgian respondent working at the federal level echoed these experiences. He also remarked that he felt a problematic aspect of the pressure for publicly available data has been that data are not always correctly **interpreted**:

> Policy maker (Belgium): *"There is a lot of pressure to release those numbers. And I think that has been the case since the start of the crisis – there is a lot of pressure for data, and we are sometimes afraid that the data will not always be interpreted correctly."*

Public health actors from other countries expressed similar concerns about how public health data can start leading their own lives and have frequently been used as **political tools**. Indeed, an Austrian respondent warned that "*you have to be extremely careful*", because "*if you forecast something that fits into someone's political calculus, then he will take it, and if it doesn't fit, he won't take it*".

As public health experts often played a key role in providing the scientific evidence to inform political decision making, in some instances **the line between science and politics** became somewhat blurry. A Portuguese public health expert lamented how, although the Portuguese public health division (Directorate-General of Health) is an independent public agency, "*it is very difficult at this moment for the general public to perceive the degree of independence of the Directorate-General of Health from the Ministry of Health*". He considers this problematic:

> Public health expert (Portugal): *"The independence of the Directorate-General of Health as a technical body has been lost, in my perspective […]. It seems like the Directorate-General of Health is following what the Ministry of Health wants to be done, and it should not be like that. It is very important to be careful not to confuse the technical independence with the political agenda, yet that was a little compromised."*

As evidence related to the COVID-19 pandemic changed rapidly over time, public health guidelines and interventions have also been **in constant flux**. As noted by a Swedish public health decision maker, a

key challenge in developing evidence-based responses to the COVID-19 pandemic has been "*that we have been working against an enemy that we don't know enough about, an enemy that has surprised us so many times*". Both public health actors and health care workers described in the interviews how this led to never-ending changes in guidance, protocols and measures, causing significant levels of uncertainty and **confusion**. For example, an Italian GP said:

> *"Do you remember how many times protocols, things, dates, times have changed? Everything was ultra-fluid and we were not always warned by the local health authority when there was a change."*

Knowledge about issues like aerosol-based transmission and asymptomatic transmission developed rapidly across the course of the pandemic. As noted by a public health actor in England, "*the narrative on things like masks and face coverings has changed through the duration of the pandemic*". As a result, public health efforts had to focus not just on behaviour change, but also "*on behaviour change in the context of a shifting evidence base for risk reduction*". A Welsh HCW who manages a team of community health visitors described how the constant changes to rules and restrictions **complicated the day-to-day working reality**:

> Health worker (Wales): *"We received lots of directions from above and questions from below […]. A lot changed almost on a daily basis really, and the only way to kind of cascade that information was again to email [to the team of health visitors]. I know people were getting so tired and unsure of things, we would get phone calls all the time. 'What do we do now? What do we have to wear? Do we have to go just to garden visits? Or do we ask people to wear masks when they're in the house?' […] And I think that was really difficult to deal with, because you couldn't even get your head around one thing before it changed to something else."*

Public health policy makers, even those that were directly involved in the formulation of new guidance in their professional capacity, also echoed **the sense of confusion** that was brought about by the constant changes. A Welsh public health actor described how the latest measures "*were sometimes very tricky to keep tabs on because the guidance was changing hourly*". A Portuguese policy maker expressed a similar sentiment, saying:

> Policy maker (Portugal): *"It was often a little messy, the pace was very fast, there were always decisions to make and many times we had to act reactively, not proactively. But somehow, we did manage to improve that [over time]."*

As indicated by the Portuguese respondent, the frenzied nature of constantly changing public health measures and recommendations did ease somewhat as the pandemic stretched on. Yet uncertainties and inconsistencies continued to characterise many public health responses, even in later phases of the crisis. A Swedish public health official involved in the Swedish COVID-19 vaccination campaign recalls that the roll-out of the campaign was chaotic, and the plans changed frequently:

> Public health official (Sweden): *"It just poured in with decisions and counter-decisions, vaccines and no vaccines. […] Our plan, we changed it by the hour I would say, looking back. We opened time slot bookings and had to close the time slot bookings, since the vaccines didn't arrive."*

Various respondents also reflected on how these frequent changes impacted the **credibility and efficacy** of the public health measures in place. An Austrian public health actor working for the City of Vienna commented that he felt the uncertainty and rapid changes negatively impacted **trust and compliance**: "*People have said 'I cannot take them seriously – first they announce this and say that, and two days later it's completely different again*'".

## 5.4 COVID-19 public health communication

Across partner countries, a range of different communication and information strategies have been employed to inform the public about COVID-19 and the risks and benefits of specific actions, policies and measures. Although the use of multiple communication channels increased coverage, it arguably also led to fragmentation and inconsistency of messaging (Weitzel & Middleton, 2020). As many countries did not have an official national communication strategy with a coordinated messaging plan for all involved public actors at the onset of the pandemic, it was not uncommon for **discrepancies** to exist between information distributed by different actors at local and national government levels, as well as between different communication platforms. The following quote from a Belgian GP illustrates this point:

> General Practitioner (Belgium): *"The COVID info is really very fragmented at every level, you don't know what to find where. I need a test, where do I start looking? I might want to be vaccinated, where do I start looking? I need information on the measures, where do I start looking? One website is continuously updated yet another is not, and that makes it very difficult for people to be informed."*

Another frequently mentioned challenge relates to the sheer **quantity** of constantly changing evidence, which led to an **information overload** that was hard for people to deal with. A Swedish policymaker notes that "*there was far too much information, and it was difficult to sift through it*". Over time, this also caused a sense of information **fatigue**, where many people became increasingly exhausted and indifferent to COVID-19 updates. A Greek public health policy maker notes that it has been difficult to find a balance in providing the right amount of information:

> Public health maker (Greece): *"Over a long period of time, such as we're going through with the pandemic, there is on the one hand a need for constant information and on the other hand, the constant flow of information eventually can get tiring. So we have to find balance between these two, which is not easy."*

Interviewees also often mentioned that a key dilemma was finding a balance between clear messaging and being transparent about **the level of uncertainty** inherent in the crisis. A Swedish public health actor describes how he struggled with trying to meet the public's need for certainty and longer-term promises:

> Public health actor (Sweden): *"It's very difficult, because everybody really wants you to communicate with certainty. […] A lot of journalists ask 'Oh, what's Christmas going to be like? How can we celebrate Christmas?' – and it's an impossible question to answer. And then at the same time you want to offer hope and you want to offer seriousness, so this is incredibly difficult communicatively."*

Various respondents also indicated they felt communication about public health measures was complicated by the inconsistent nature of some of the measures that were implemented, which sometimes even **conflicted** with scientific insights. A Portuguese policymaker takes the rules to enter nursing homes as an example, which he considers illogical:

> Policy maker (Portugal): *"Some measures are completely incongruous. To say that anyone who is vaccinated can enter a nursing home without taking a test, is to forget all the science that says that the vaccine does not protect transmission […] Then whoever starts to look at this critically, starts to discredit and devalue."*

On a related note, a Belgian GP expressed her frustration with how the vaccination campaign was presented by politicians as a solution that would end the pandemic, despite warnings from virologists and other experts that this might not be the case. When COVID-19 restrictions turned out to be necessary even after the vaccination campaign, she noted that she felt it was logical people became disillusioned, "*like 'but I got vaccinated and now it's still not over!'*".

Many professionals in the health sector also expressed that communication was something they struggled with because it had not been part of their **training**. A Belgian GP explained that she felt GPs are not always well-equipped to communicate about COVID-19 measures, such as self-isolation procedures: "*I think it's partly also something we miss in our medical training, that we haven't been taught the motivational skills to convince people why it's important to go into isolation*". A public health director in England noted that effective communication about COVID-19 requires experience with working with citizens in both group and individual contexts, as well as medical training. "*Not every director of public health has that mix of skills, so there are also implications for the training of the future cohorts of public health directors*".

## 5.5 Looking towards the future

More than two years into the pandemic, many **lessons** about effective responses have been drawn. Interview respondents shared various reflections about key insights that should be considered in the future, both in COVID-19 responses going forward and in responses to potential future crises. A recurring observation in the interviews was that although the COVID-19 pandemic has certainly taught us new things, many of the main challenges and problems that surfaced during the pandemic were **already in place before**. A decisionmaker in Wales explains:

> Decision maker (Wales): *"I think the thing about COVID is that it brought out and revealed problems that were already there and that we knew about, but it amplified them. So now it's really important that we learn the lessons and adopt some of the good practices that we had to adopt in wartime, if you like, and carry them over into the non-crisis situation."*

Respondents emphasised that maintaining good practices in the long run will not happen automatically – it will require determination and effort not to return to pre-pandemic normality. A Greek public health actor expressed worries that the response mechanisms built up during the COVID-19 crisis will not last: "*I think the biggest fear is that what we've built over time will fall apart, […] that what we've built will not be a legacy for the next crisis in the long run*".

An Austrian policymaker pointed out that long-term preparedness and response structures need long-term financial investment, and that this is a key challenge. Whereas the need for investment in curative

health services is easy to justify, it is harder to ensure steady funding for pandemic management structures:

> Policy maker (Austria): *"There will always be heart attack patients, so what you invest there is never wasted. But to put money into a pandemic management, where we have no idea when this will be the case again, is more problematic."*

Another key challenge discussed by interviewees is that it is difficult to prepare for the unexpected. A Swedish public health official explains that a future pandemic might be of a very different nature:

> Public health official (Sweden): *"You don't know what kind of disease we will be facing. Because it could be a disease that hits mainly children […], then it would have become something completely different. I mean, take the Spanish flu for example – it hit people in their twenties and thirties – they were the ones who fell ill and died, while the elderly survived. So you never really know what kind of enemy you will have."*

Nonetheless, respondents agreed that the development of a long-term vision and preparedness plan is crucially important to strengthen good practices and have more effective public health responses in the future. Although it is hard to know what the future holds, key lessons and "*broad outlines of what works and what doesn't*" (policy maker, Belgium) can be extrapolated and incorporated in future pandemic responses.

# 6 Conclusions

## 6.1 Vulnerability in the COVID-19 pandemic

In terms of perspectives on vulnerability in the COVID-19 context, for analytic clarity it is useful to distinguish between the following themes of vulnerability which run throughout the responses of health care workers and public health experts/decision makers. The first theme of vulnerability discussed was people's pre-existing health status which influences how sick they are likely to get when they get COVID-19, and how likely they are to die. Those older and with more pre-existing health conditions were more at risk in this sense. Some respondents also highlighted how people's health status is shaped by the social determinants of health, and therefore layers of deprivation or one's ethnicity could increase one's vulnerability in this regard. Second, some respondents discussed the vulnerability of exposure to COVID-19. This, too, was considered heavily linked to pre-existing social and economic inequalities, such as housing, employment and financial precarity.

Finally, another dimension of vulnerability highlighted was how heavily people are impacted by COVID-19 containment measures. This is about how the responses to the crisis have unequal impacts on different groups of people. These impacts include economic consequences, increased digitalisation and the psychological impacts of repeated lockdowns. Particularly mentioned groups were children, the elderly, young people, those financially insecure, and some people living alone. Many of the interviewees also captured the intersectional nature of vulnerability and resilience in their responses, highlighting how intertwined these categories are with one another. Conceptualisations of vulnerability are multi-faceted, with those at a pillar of various pre-existing inequalities more vulnerable than others.

## 6.2 Impacts on healthcare workers

When looking at the public health responses and measures, the impact of the COVID-19 pandemic on health care workers was very important to study, as many of them have dealt with the pandemic, experienced the pandemic on the frontline, and therefore also had increased health vulnerabilities for them and their families. The interviews highlighted that the participants themselves often experienced an increased level of uncertainty throughout the pandemic, and this level of uncertainty changed constantly over the course of the pandemic. This related to both medical and scientific uncertainties on the COVID-19 virus, the best ways to manage, prevent and treat this virus and the length of the pandemic itself. Especially since the start of the pandemic, these uncertainties were even more felt given the lack of protecting material, protocols and procedures. Furthermore, these uncertainties and progressive insights on the pandemic also caused them to constantly adapt their professional lives, tasks and functions, which often impacted their regular tasks and activities to a high extent. These feelings were even more strengthened - especially at the beginning of the pandemic - by the lack of easily accessible and/or available COVID-19 tests, that caused some kind of suspicion of who is infected by the COVID-19 virus, and increased levels of distrust amongst colleagues and even outside their work spheres.

The careers of many health care workers were already characterised by heavy workloads and high sense of urgency prior to the COVID-19 pandemic, which intensified to unprecedented levels when the crisis broke out. Although many health care workers and health policy makers were already aware of many flaws of the structures and the organisations of their health care systems, the pandemic highlighted them even more, urging the management and policy makers to make some changes or

restructuring. These intense periods that quickly followed up on each other impacted the quality of care, but also stimulated some kind of solidarity between colleagues, all fighting against the COVID-19 virus. This feeling of utility and levels of job satisfaction also resulted in positive feelings towards one's profession. Nonetheless, many health care workers mentioned that the public appreciation was felt to gradually diminish along the course of the COVID-19 pandemic. As a consequence of this high pressure on health care workers over the last two years, the high workload, levels of uncertainties and lack of support, and difficulties to obtain a satisfying work-life balance, many health care workers mentioned high stress levels, frustrations, burn-outs and other mental complaints. These effects are expected to be felt over the coming years as well.

## 6.3 A bird's-eye view of key challenges and lessons learned in public health responses

The interviews also provided valuable insights into what health care workers and public health decision- and policymakers considered to be key challenges and lessons learned in the COVID-19 crisis. Firstly, a theme that emerged across countries was that the degree of centralisation in public health responses had significant implications. On the one hand, in many countries public health responses were characterised by intense centralisation as national-level actors and agencies gained far-reaching powers, particularly in the early phases of the pandemic. On the other hand, the crisis highlighted the value of local-level know-how and expertise. Especially as the pandemic stretched on, there was a growing awareness of the importance of adapting and targeting approaches to complex local realities. Another common theme across interviews was how COVID-19 public health responses have been characterised by various types of dilemmas, in which a delicate balance between different interests and perspectives had to be sought. Respondents highlighted the wide-ranging negative consequences of pandemic control measures, and how it was sometimes hard to determine the proportionality of those measures. In times of crisis and resource scarcity, the quality of services sometimes had to be compromised, and respondents were aware that this often disadvantaged those who were already 'left behind' in various ways.

The challenges associated with pursuing evidence-based action in times of great uncertainty were another common theme. Public health policy-and decision makers underlined the importance of data to make informed and targeted decisions, yet also showed critical awareness of the implications of relying on volatile and incomplete data. Respondents expressed their frustration that data sometimes started leading their own life, and were frequently 'hijacked' for political purposes. Constant changes in public health guidance, protocols and measures caused significant confusion and complicated day-to-day working realities. This constant flux also undermined the credibility of the public health measures in place, and complicated the effectiveness of public health information campaigns. The sheer quantity of constantly changing evidence led to information overload and information fatigue, and public health decision makers struggled to meet the public's need for certainty and a long-term vision. A shared sentiment among public health actors was that they felt insufficiently equipped to deal with the communication challenges posed by the COVID-19 crisis, and that communication skills should be prioritised more in future cohorts of public health leaders and healthcare workers. Looking ahead, respondents highlighted how the COVID-19 pandemic has provided many valuable lessons, but these insights will not automatically lead to improved responses in future crises. Future preparedness will require political will and stable funding, as well as considerable flexibility to extrapolate lessons learned to crises of different natures.

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