European Public Health: a single system for healthy populations following COVID-19 pandemic experience

NOVEMBER 2022

BFF INSIGHTS

BFF Banking Group *is the largest independent specialty finance in Italy and a leading name in Europe for the management and non-recourse factoring of trade receivables due from the Public Administrations, for Securities Services, Banking and Corporate Payments.*

Throughout the Group's history, it has always promoted conferences and research to discuss trending topics that could affect the relationship between companies and Public Administrations, to help positive debates and improvements.
In 2022 the Group announced the creation of BFF Insights, with the aim of driving forward and consolidating the commitment to researching and sharing the results of the analyses that have always marked out BFF's relationship with its clients and stakeholders.

This is also the scope of this Report, commissioned to Farmafactoring Foundation, and carried out by Professor Vincenzo Atella and Dr. Joanna Kopinska [1].

The Study analyses and compares 9 healthcare systems in the EU: Italy, Croatia, Czech Republic, France, Greece, Poland, Portugal, Slovakia, and Spain. These healthcare systems are based on different funding principles, as a result of heterogeneous economic conditions and societal views, frequently shaped by different historical and cultural footprints. Thanks to data obtained from official sources and an ad-hoc survey administered to about 30 professionals and experts, the Report offers an overview of these healthcare systems, seeking to highlight common challenges and country specific issues that might be crucial from both practitioners' and policymakers' perspectives.

This Report rests on BFF's intention to promote a broader and constructive discussion on all these issues. Different voices and points of view contribute to share the best practices and seek new solutions in favour of a more efficient and innovative European health care environment.

[1] Biographies at page 137

This edition of the Healthcare Report, which BFF has been commissioning from the Farmafactoring Foundation since 2019, is particularly important for the Foundation and for the Board of Directors that I have chaired since last May.

The publication provides a structured, analytical, international overview of the situation vis-à-vis the Covid-19 crisis and its transformative impacts on the world of healthcare.

We know that the Covid-19 pandemic was the first global crisis with non-financial causes. For the first time, we were all forced to face up to the dramatic, explosive consequences of a failure to monitor the transformations we are living through. The hope is that this experience will mark the start of a journey towards an awareness both of the long-term repercussions and of the crucial role played by government and by welfare systems in the effort to ensure the wellbeing of our economies.

This Healthcare Report, in line with the numerous pieces of research and publications produced over the past twenty years by the Farmafactoring Foundation, can serve as a useful and reliable monitoring tool, allowing us to learn about, explore in depth and understand the variables at play prior to the Covid-19 crisis, during it, and also today, in this post-Covid phase. It enables us to focus on and grasp the opportunities for the overhaul of our societies and our way of managing health, creating healthcare systems that respond more effectively to the needs of all stakeholders and are better-prepared to take on the upcoming global crises.

During the Covid crisis, those countries that spend more on health – to give equal access to care, specifically through close interaction between the hospital and its local area – found themselves at an advantage. The importance of innovation and research, which require long-term investment and planning, became even more evident. We tested out the usefulness of creating synergies and co-operation between the healthcare systems of the various countries; and of ensuring rapid, complete, timely communication between healthcare systems, workforces, patients and families. Retired healthcare workers were brought back due to the lack of human resources, demonstrating the necessity of supporting training and growth. What came across clearly was the importance of compiling, organising, sharing and at the same time defending the data.

In short, there is an overt need to take an approach to health that constructs, around the "Individual", an effective system of welfare – one that today is undergoing profound, essential change.

This is the area on which the Farmafactoring Foundation has decided to focus its efforts over the coming years, recasting its purpose to become an engine for the sustainable transformation of those systems geared towards the protection of the Individual: healthcare, social security and financial inclusion.

Our aim is to work in such a way as to co-generate with our stakeholders – NGOs and other corporate foundations, regulators, businesses, governments, universities and study centres – a tangible, dynamic, project-based approach that makes it possible to experiment with and implement transformative solutions in healthcare management and in welfare systems.

Blazing new trails is not easy: it demands a long-term view and plenty of courage; but we hope to be able to contribute to the creation of new opportunities for our communities, drawing inspiration from what is made very clear in this Healthcare Report.

Livia Piermattei
Chair of the Board of Directors
of Farmafactoring Foundation

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INTRODUCTION

The COVID-19 pandemic has led to a dramatic loss of life worldwide and represents an unprecedented challenge to public health, food systems, and work. As of October 31, 2022, almost three years after the pandemic's start, more than 620 million cases of infection and 6.5 million deaths due to the virus had been reported worldwide. Europe has contributed more than 230 million cases and 1.9 million deaths to this performance. Preliminary estimates also say that all-cause mortality in 2020 and 2021 increased by about 13% compared to the 2015-2019 average. Life expectancy decreased by 1.2 years during the pandemic, from 83.6 years in 2019 to 82.4 years in 2020 (compared to an average reduction of 0.6 years in OECD countries). On October 10, 2022, about 70% of the world population received at least one dose, with at least half of it being fully vaccinated. Latin America has the highest vaccination rate (81% with at least one dose), while Africa lags behind with a meager 29%.

These are some of the main "direct" effects on public health caused by the pandemic. There are other equally important effects that often, for various reasons, risk being overshadowed. The OECD reminds us that the COVID-19 crisis has significantly and negatively impacted mental health. For example, compared to 2019, in Italy, the prevalence of depression tripled to 17.3% at the beginning of 2020. In addition, the pandemic led to delays in treatment, including a 38% drop in breast cancer screening in 2020 compared to 2019. It caused a sharp increase in healthcare spending as a percentage of GDP, from 8.7% in 2019 to 9.7% in 2020 (compared to the average growth of 0.9 percentage points in the OECD area).

Economic and social aspects complement these health aspects. The upheaval caused by the pandemic is devastating: tens of millions of people worldwide have been and are still at risk of falling into extreme poverty, while the number of undernourished people, currently estimated at almost 690 million, is estimated to be increasing by another 132 million by the end of 2022. Nearly half the global workforce of 3.3 billion people risk losing their livelihoods. Workers in the informal economy are particularly vulnerable because the majority lack social protection and access to quality healthcare and have lost access to productive resources. Many cannot feed themselves and their families without the means to earn money during lockdowns. For most of these people, not having income means no food, or at best, less and less nutritious food. While it is true that this effect may be typical of developing countries in the south of the world, it is not entirely foreign to our most affluent societies.

The above events occurred relatively short, and their effects were more disruptive than any other emergency in the last 150 years (except the two world wars). As already highlighted in the previous year's Healthcare Report (Farmafactoring Foundation, 2021), the COVID-19 pandemic is a watershed for modern society, more than the attack on the twin towers in 2001 or the Great Recession crisis in 2008/9. Although many today strive to imagine a return to the pre-COVID-19 state, the world we knew until February 2020 will unlikely return. The pandemic has been impactful not only because it af-

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fected the health of nearly 6 billion people but also because it affected production globally due to shortages of row material and essential goods (e.g., masks, lung ventilators, oxygen, microchips, etc.), evidencing significant limitations of the organizational structures of the supply chains. If these could benefit the overall socio-economic system in regular times, in emergencies, like this one, they can act as a dangerous boomerang. As a result, the economic, health, and social organization of all countries, and the relations between nations, need to be reviewed, rethought, and adapted to the new context.

Now is the time for global solidarity and support, especially with the most vulnerable in our societies, particularly in the emerging and developing world. Loss of the substantial development gains already achieved in the last 20 years will be necessary to overcome health, social and economic problems imposed by the pandemic and to prevent the escalation of a long-running humanitarian and food security catastrophe. We need to recognize a significant opportunity for us to develop long-term sustainable strategies to address the challenges for the health and economic sectors. We must rethink the future of our environment and tackle climate change and environmental degradation with ambition and urgency. Only in this way can we protect all people's health, livelihoods, food security, and nutrition and ensure that our "new normal" is better.

This year's Report aims to explain a complex phenomenon that, also due to not consistently effective communication (institutional and scientific), has left doubts and uncertainties among those who want to understand.

The first part of the Report seeks to fill some of these gaps by providing answers to several questions, including how it was managed, how long we have to live with it, how it affected the economy, who will be hit hardest, how the new world will change us, and how our way of seeing the world will change.

The second part deals with the scars that the COVID pandemic has left on the healthcare systems in the present era. In particular, it discusses distinct issues regarding patient backlogs and the strategies adopted by single countries to recover them. It also discusses staffing and financing issues that permeate the different settings. Finally, it devotes attention to telehealth and how the new digital solutions are expanding in the countries under analysis.

In the third part, the Report revises policies and strategies adopted in the countries studied in terms of crisis management, governance, and economic measures. It provides a focus on the issues of healthcare resilience, procurement, biomedical supply chains, and communication infodemic. Finally, it discusses the integration between hospital and primary care, shedding light on the importance of the transition between the two settings.

Finally, the fourth part of the Report offers a broader perspective on international integration in the general healthcare domain from the point of view of the EU and global cooperation. It discusses the limitations and weaknesses of international cooperation in the case of WHO and analyzes the premises for the enforcement of the European Health Union.

As usual, our Report aims to offer a comprehensive analysis and comparison of 8 healthcare systems in the EU, namely those in Croatia, France, Greece, Italy, Poland, Portugal, Slovakia, and Spain. These healthcare systems are based on different funding principles due to heterogeneous economic conditions and societal views on income redistribution, institutions' presence, and government interference with healthcare provision, frequently shaped by various historical and cultural footprints. Furthermore, they have different characteristics regarding basic founding principles, financing, organization, management, and population size. They also have been hit differently by the pandemic, which led to implementing various policies to respond to the shock. Thanks to data obtained from official sources and an ad-hoc survey administered to about 20 professionals and experts, the Report offers a multilevel overview of these healthcare systems, highlighting common challenges and country-specific issues that might be crucial from both practitioners' and policymakers' perspectives.

BFF INSIGHTS

2

THIRTY MONTHS INTO THE PANDEMIC: THE STATE OF OUR HEALTHCARE SYSTEMS

2.1 EVOLUTION OF CONTAGION

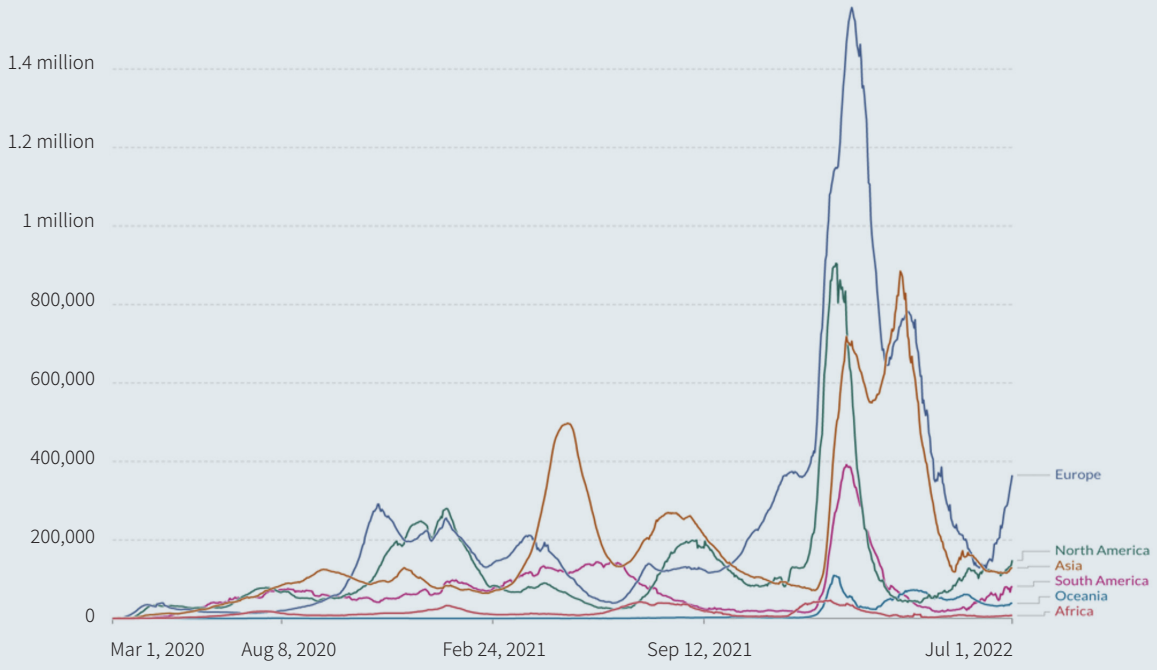
According to *ourworldindata.org,* as of 31 July 2022, there were almost 600 million reported cases worldwide, of which nearly 200 million were in Europe. By the same date in 2020, six months after the pandemic outbreak, those numbers were less than one-sixth, reaching around 84 million infected worldwide, of which about 24 million were in Europe. Figure 2.1 shows how the waves that followed the first one in 2020 were more explosive. Moreover, the spread of infection has not been homogeneous, and the impact on sub-national territories, in reported cases and related deaths, has been very heterogeneous. According to data collected in the first phase of the pandemic by Allain-Dupré et al. (2020), "In China, 83% of confirmed cases were concentrated in Hubei Province. In Italy, the Northern part was the hardest hit, and one of the richest regions of Europe, Lombardy, recorded the highest number of cases (47% in November). In France, the regions of Île-de-France and the Grand Est were the most affected, with 34% and 15% of national cases, respectively. In the United States, New York has the largest share of federal cases (14.6%), followed by Texas (8%). In Canada, the provinces of Quebec and Ontario accounted for 61% and 31% of total cases in November. In Chile, Metropolitan Santiago accounted for 70% of cases in November. In Brazil, Sao Paulo recorded 25% of cases in November. In India, Maharashtra reported 21% of confirmed cases, while in Russia, Moscow accounted for 24% of total cases in November."

FIGURE 2.1 Evolution of new daily COVID-19 cases worldwide.(*)

Source: Worldometer - https://www.ourworldindata.org/.
(*) Moving average of 7 days. The number of confirmed cases is less than the number of actual cases as the number of tests is limited.

Contagion timing was also mixed. As seen in Figure 2.2, the evolution of infections has been very different across continents. With all the measurement limitations, in August 2020, the pick was in South America, in November 2020 in Europe, in January 2020 in North America, in April 2021 again in South America, and during summer 2021 in Asia. With the arrival of new waves driven by new variants, the cycle across continents repeated: the end-of-2021 wave, triggered in part by "Omicron," started in Europe, leading to about 1,000 new daily cases per million inhabitants, followed by a few weeks delay by the other continents.[1] However, these misalignments in the contagion timing can also be found within continents. Figure 2.3 shows the European data, where both the magnitude of the contagion and the timing are very heterogeneous. This depends on several variables, such as new variants, vaccination rates, social behavior, and policy stringency adopted. As of July 2022, according to the World Health Organization, the number of new coronavirus cases is rising again, with more than 4.1 million cases reported globally only in the last week of June 2022. Infections rose by about 32% in Europe and Southeast Asia and 14% in the Americas. However, the number of deaths remained similar to the week before, with some increase only in the Middle East, Southeast Asia, and the Americas. Cases were on the rise in 110 countries, driven mainly by Omicron variants BA.4 and BA.5.

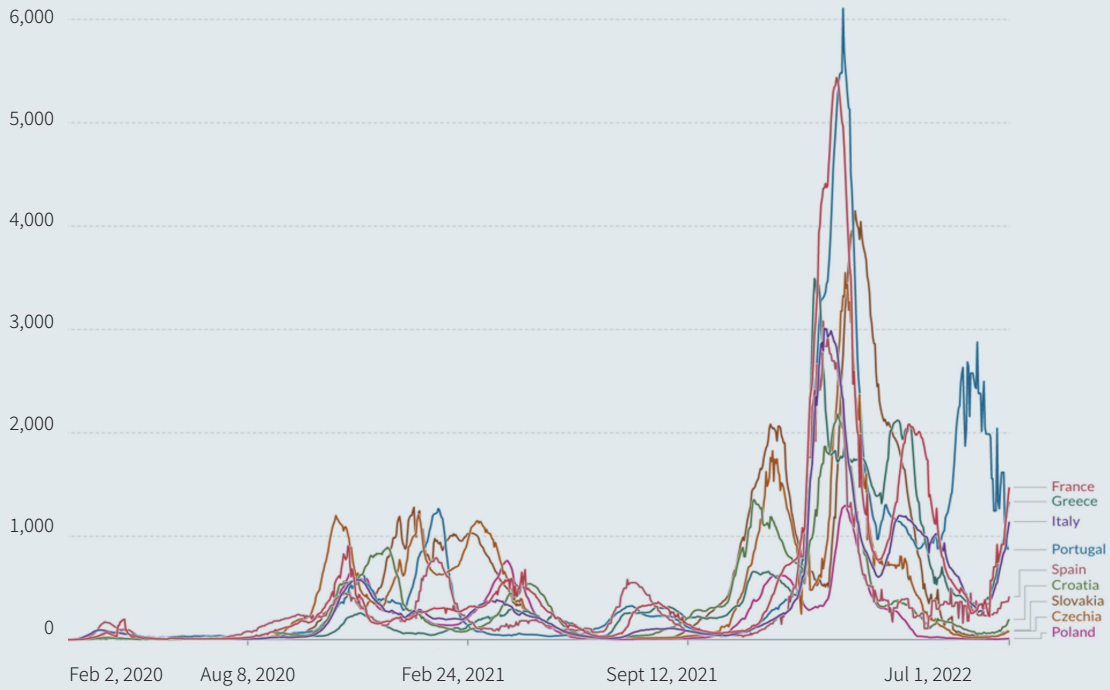
FIGURE 2.2 Evolution of new daily COVID-19 cases by continent (*)



Source: Worldometer - https://www.ourworldindata.org/.
(*) Moving average of 7 days. The number of confirmed cases is less than the number of actual cases as the number of tests is limited.

[1] *At the end of January 2021, the rates of new cases per million inhabitants were higher than previously.*

FIGURE 2.3 Evolution of new daily cases per million inhabitants of COVID-19 in some European countries (*)



Source: Our World in Data - https://www.ourworldindata.org/.
(*) Moving average of 7 days. The number of confirmed cases is less than the number of actual cases as the number of tests is limited.

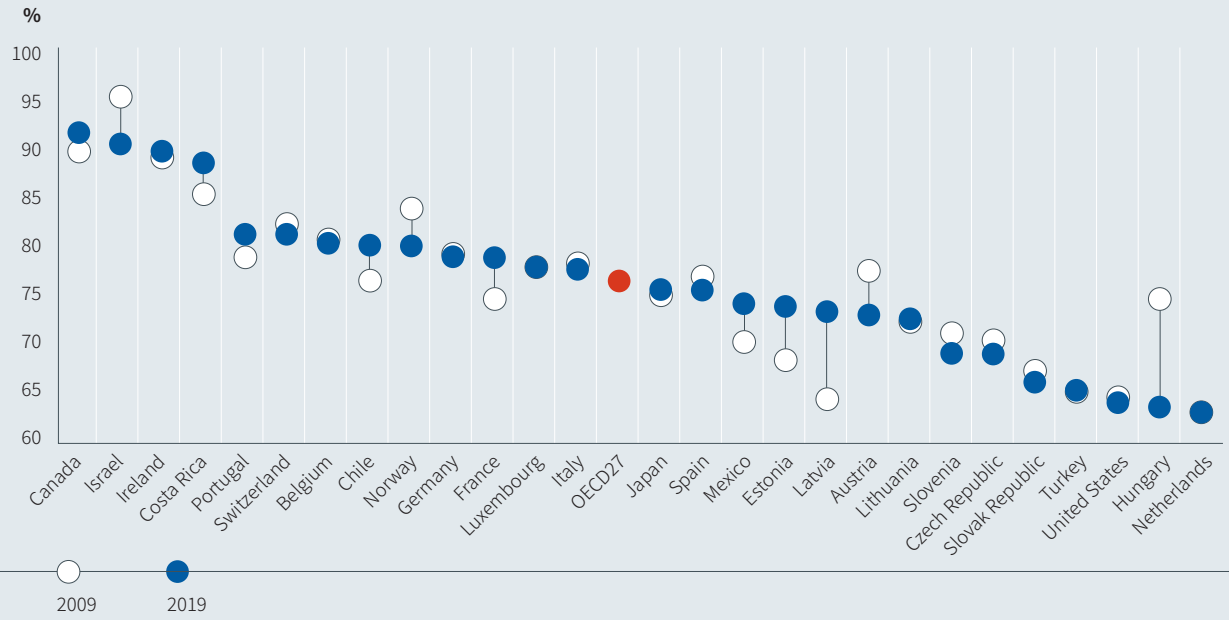
2.2 EVOLUTION OF COVID-19 HOSPITAL ADMISSIONS

The pandemic has highlighted the scarcity of hospital beds due to the immense pressure that COVID-19 exerted on healthcare systems. According to OECD (2021), since 2009, the number of beds per capita has decreased in nearly all OECD countries. Part of the decrease can be attributed to advances in medical technology, allowing a more frequent adoption of day surgery, or to a broader policy strategy to reduce the number of hospital admissions. The occupancy rate of hospital beds offers crucial information to assess hospital capacity. For example, during the early phase of the COVID-19 pandemic, several countries experienced high or full occupancy, which reflected the existence of a health system under pressure.

Occupancy rates within the OECD countries were already problematic before the pandemic. Although there is no consensus about the "optimal" occupancy rate, NICE indicates a threshold of 85% (NICE, 2018). While the scientific literature recommended some spare bed capacity to absorb unexpected surges in patients requiring hospitalization, in 2019, the bed occupancy rate was higher than 85%

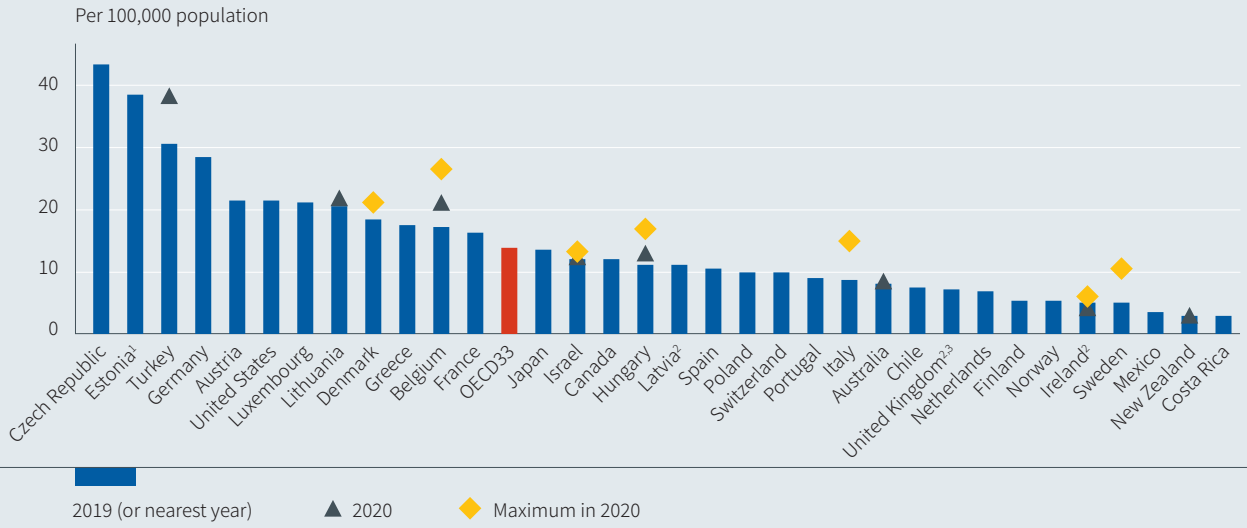
in four OECD countries: Canada, Israel, Ireland, and Costa Rica (see Figure 2.4). On the contrary, occupancy rates were comparatively low in the United States, Hungary, and the Netherlands (less than 65%). In 2019, around half of OECD countries had 70-80% occupancy rates, and the OECD average was 76%. Five of the nine countries analyzed in this report show heterogeneous occupancy rates, ranging from a high 81.4% in Portugal to a low 65.9% in Slovakia, and in any case, below the 85% threshold suggested by NICE.

FIGURE 2.4 Occupancy rate of curative (acute) care beds, 2009 and 2019 (or nearest year)



Source: OECD Health Statistics 2021

FIGURE 2.5 Adult intensive care beds, 2019 (or nearest year) and 2020

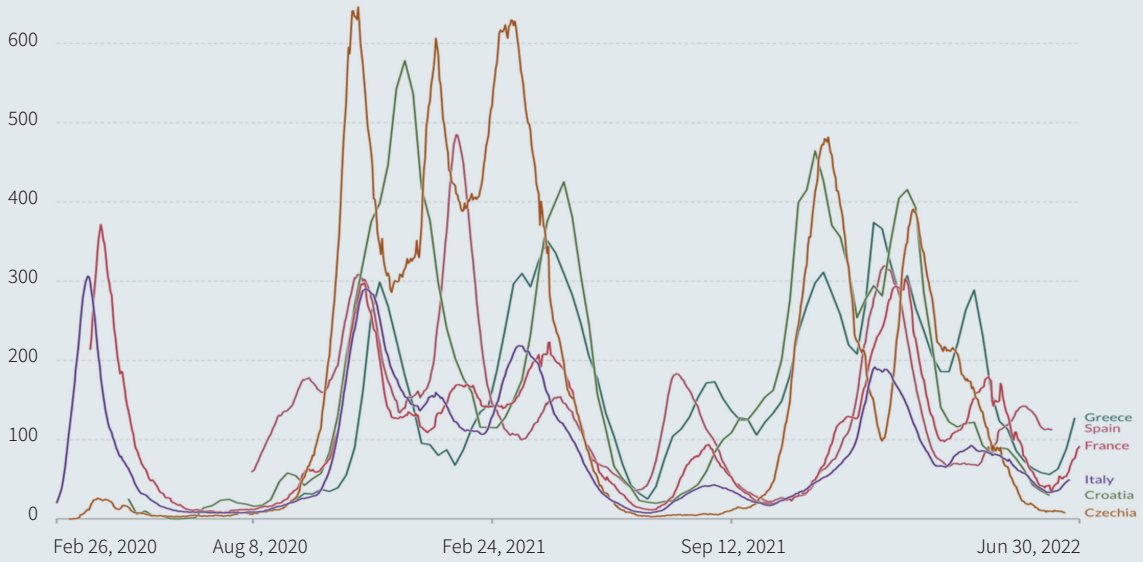


1. Neonatal and pediatric ICU beds included. 2. Data cover critical care beds only. 3. Data refers to England only.
Source: OECD/Eurostat/WHO Regional Office for Europe Joint Questionnaire on Non-Monetary Healthcare Statistics 2021 (unpublished data); Country Health Profiles 2021; Health at a Glance: Latin America and the Caribbean 2020; national sources.

An essential part of the overall number of hospital beds is represented by Intensive Care Unit (ICU) beds. These beds have proven necessary during the COVID acute phases, delivering care for critically ill patients. As we can see from Figure 2.5, and notwithstanding definitional differences across countries, in 2019, the OECD average number of ICU beds was 14.1. As for hospital beds, there exists a vast difference between the Czech Republic (43 beds per 100,000 population) and Costa Rica, with a low of 2,9 beds per 100,000 population. France and Greece were positioned above the OECD average, while all other countries of interest were below. It is worth noting that during the pandemic, countries deployed several policy interventions to boost their capacity. In particular, in 2020, Italy increased its capacity from 8,7 to 14,3 beds per 100,000 population (the most significant increase recorded). Most of this extra bed availability was created by transforming other clinical wards into ICUs, setting up field hospitals with ICU units, and transferring patients to localities with spare ICU capacity (sometimes also in other countries).

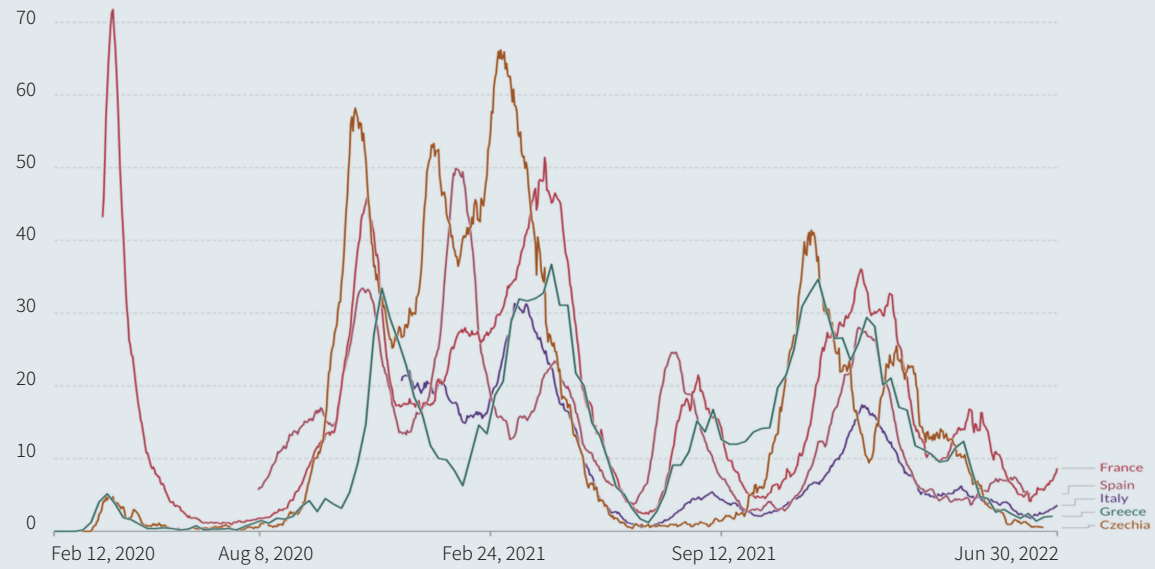
Occupancy rates within the OECD countries were already problematic before the pandemic. Although there is no consensus about the "optimal" occupancy rate, NICE indicates a threshold of 85% (NICE, 2018). While the scientific literature recommended some spare bed capacity to absorb unexpected surges in patients requiring hospitalization, in 2019, the bed occupancy rate was higher than 85% in four OECD countries: Canada, Israel, Ireland, and Costa Rica.

FIGURE 2.6 Evolution of new weekly COVID-19 hospitalizations per million people in some countries (*)



Source: Ourworldindata – https://ourworldindata.org.
(*) Total new entries compared to the previous week.

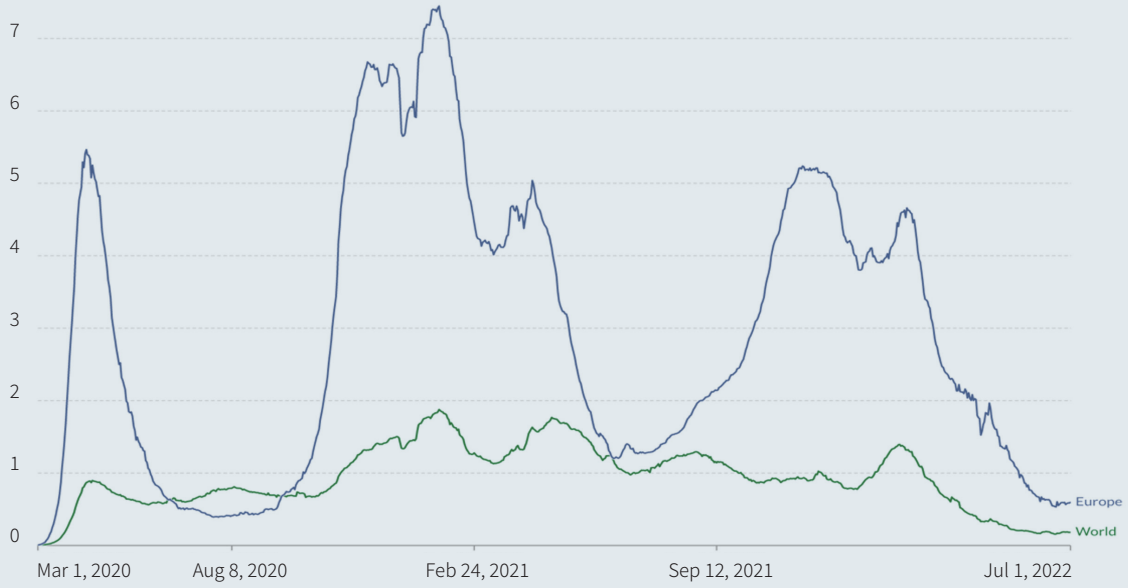
FIGURE 2.7 Evolution of new COVID-19 weekly intensive care (UTI) admissions per million people in some countries (*)



Source: Ourworldindata – https://ourworldindata.org.
(*)For countries where the number of ICU patients is not reported, we display the closest metric (patients ventilated or in critical condition).

In a pandemic context, hospitalizations (including those in intensive care) always correlate with the number of confirmed COVID-19 cases. This relationship has been discontinued only following advances in vaccination coverage, contributing to fewer hospital admissions since 2021, particularly among older people. For example, in the United States, hospitalization rates among people aged 85 and over have dropped markedly with vaccination campaigns. A particular resurgence of hospitalizations after the vaccination campaign started with the arrival of the Delta variant. However, as seen in figures 2.6-2.7, the availability of the vaccine has reduced hospitalizations even in the presence of the new variants that followed one another. Furthermore, the most critical effect was on the most fragile people (> 50 years) and, particularly, on the over-80s.

FIGURE 2.8 Evolution of COVID-19 daily deaths per million people in Europe and worldwide



Source: Ourworldindata – https://ourworldindata.org.
Note: Moving average of 7 days. For some countries the number of confirmed deaths may be lower than the actual number of deaths. This is due to limited testing and challenges in attributing the cause of death.

2.3 EVOLUTION OF COVID-19 MORTALITY

As the pandemic spread globally, people began to get used to the grim mortality records. According to the website 'ourworldindata.org', there have been around 6.5 million COVID-19 deaths worldwide by the end of July 2022 (an estimated 800 deaths per million inhabitants). Europe alone has had over 1.9 million, but the value per million inhabitants was almost three times higher (2,480). The heterogeneous evolution of new infections and COVID-19 deaths across countries reflects differences in demographic factors, containment and mitigation strategies, their implementation timing, and health systems' ability to treat COVID-19 patients and adapt to the current challenges. Indeed, according to the OECD (2021), mortality rates have generally decreased during the pandemic, with the cumulative rate reaching around 1-2% in most OECD countries in early October 2021 OECD (2021).

The explanations are several. On the one hand, there has been an increase in detection over time. In addition, vaccination campaigns, better disease management, and capacity building in the health system have significantly reduced mortality rates. However, factors beyond the immediate control of policymakers, such as geography, demographics, and the prevalence of risk factors such as obesity, have made some countries more susceptible to high infection and mortality.

The evolution of mortality in Europe and worldwide is shown in Figure 2.8. There have been three significant mortality peaks in Europe: the first in the initial months of the pandemic, the second in the winter of 2020/21, and the third in the winter of 2021/22. Europe has been hit more than the rest of the world, with an average of three daily deaths per million people, compared to one daily death per million people worldwide (including Europe).

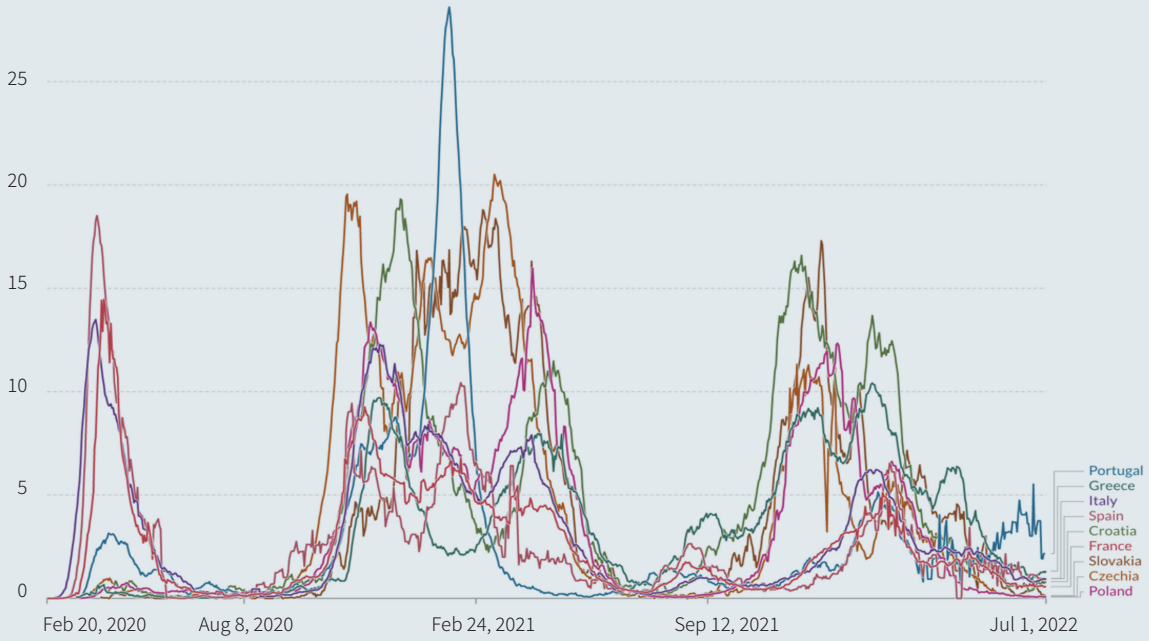
However, the European numbers hide considerable heterogeneity, with some countries recording much higher mortality. Figure 2.9 shows mortality for the group of countries nine countries analyzed in the report. Although we observed similar three waves across countries, the timing and the death rates somehow differed. In the first wave, high mortality was limited to France, Italy, and Spain, with the other countries only mildly affected. In particular, Croatia, Greece, Poland, and Slovakia recorded less than one daily death per million in that period. The situation changed when the two other waves hit Europe in winter: although with some time differences, all countries were affected. In terms of magnitude, all these countries recorded peaks of nearly 20 daily deaths per million people (with Portugal reaching 28.6 in February 2021).

Yet, several factors can strongly distort the mortality trends based on COVID-19 deaths.[2] Indeed, official statistics do not always faithfully describe mortality for various reasons. The best way to keep track of this phenomenon is to calculate statistics on excess mortality, which consists of taking the number of people dying from any cause in a given region and period and then comparing it to a historical

[2] *In many countries, official statistics often do not count victims who have not tested positive for coronavirus before death, which can be a significant problem, especially in places where screening activity is low. In addition, the time at which deaths are recorded may vary significantly from the actual time of death. This is because there are often delays in communication between the authorities responsible for establishing death and those collecting the data for statistical purposes. Finally, the pandemic has made it more difficult for doctors to treat other conditions and discouraged people from going to the hospital, which may have indirectly caused an increase in deaths from diseases other than COVID-19. Therefore, the reported data could be underestimated in most cases.*

baseline from recent years. However, this "indirect" approach provides only a rough estimate, as it does not distinguish between direct and indirect COVID-19 deaths, for example, due to shortages in the provision of urgent care.

FIGURE 2.9 Evolution of COVID-19 daily deaths per million people in some EU countries



Source: Ourworldindata – https://ourworldindata.org.
Note: Moving average of 7 days. For some countries the number of confirmed deaths may be lower than the actual number of deaths. This is due to limited testing and challenges in attributing the cause of death.

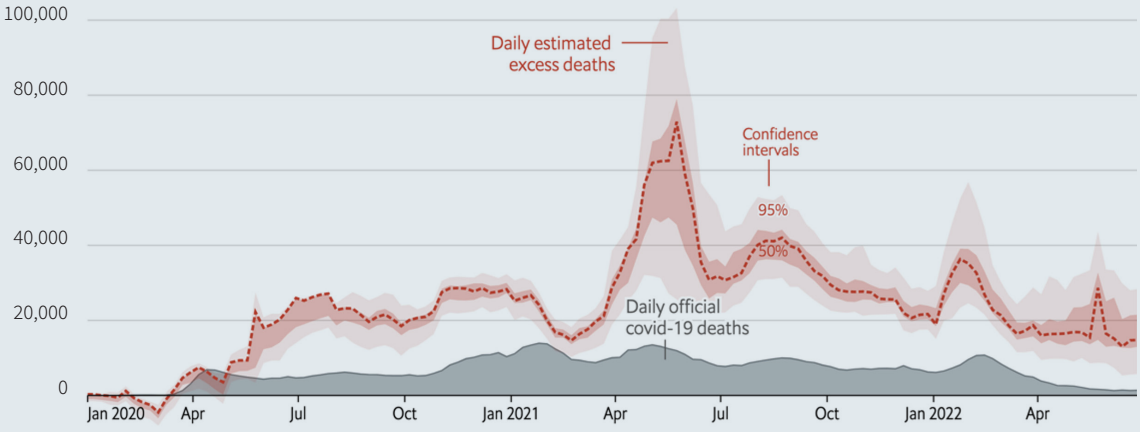
The Economist expert group has applied the excess-death methodology, counting all deaths – rather than distinguishing their causes – and comparing them with those of a reference period defined as "normal." The indicator provides a reasonably accurate picture of the actual number of deaths with respect to how many casualties there would have been had no particular circumstance occurred. Based on this methodology, at the end of July 2022, the Economist estimates an actual death toll of 19 million people (which is 95% likely to be between 11.8 and 22.1 million excess deaths), compared to the official 6.5 million COVID-19 deaths.

Figure 2.10 shows that COVID-19 caused more deaths than the official statistics suggest at any point during the pandemic. The difference between established and estimated data varies by country. If the excess mortality rate is relative to the population, many of the world's worst-affected countries are in Latin America. Also, in Russia, the death toll suggests that the country has been hit fairly hard

by COVID-19, and India's death toll is estimated to be millions rather than hundreds of thousands. On the contrary, a handful of countries have actually had fewer deaths during the pandemic than in previous years (negative excess mortality), which is likely to result from changes in lifestyles that lowered the toll of other causes (such as influenza, accidents, and others).

Another essential feature of the excess mortality indicator is to allow credible comparisons between countries. Table 2.1 shows the official mortality data (total and per 100,000 inhabitants) and the confidence intervals of the estimated excess deaths over the period 27 January 2020 – 31 July 2022 for our sample of countries. Poland, Croatia, and Slovakia are the most affected countries, where the estimated excess mortality is higher than the official COVID mortality statistics by 40% or more. Italy follows with an excess death toll close to 30%, while all other countries have lower estimated excess death rates, with France recording a remarkable -30%.

FIGURE 2.10 Estimated global excess mortality and official deaths from COVID-19 (*)



Source: https://www.economist.com/graphic-detail/coronavirus-excess-deaths-estimates?fsrc=core-app-economist
(*) The model estimation methodology is available at: https://www.economist.com/graphic-detail/2021/05/13/how-we-estimated-the-true-death-toll-of-the-pandemic

Finally, it is useful to emphasize that the national data often masks significant differences at a more local level that can tell very different stories. To this end, the information available on the "Tracking the coronavirus across Europe" website is very useful for understanding the scale of the phenomenon in an international context.[3] In particular, a comparison of eight sub-national regions is made in Figure 2.11, looking at infections and deaths.[4] To facilitate the cross-country reading, the available data is standardized using the seven-day moving average and re-scaled in all series to 100 for the highest infection and death rates in each region. It is, therefore possible to see that Lombardy is by far the

[3] *The link to the website is: https://www.economist.com/graphic-detail/tracking-coronavirus-across-europe.*
[4] *It is worth noticing that the Economist does not report sub-national estimates for Croatia, Greece, and Slovakia.*

European region with the highest death toll per 100,000 inhabitants (350 per 100,000) and that most of those deaths occurred during the first wave. While the second wave was also heavy, since the beginning of 2021, thanks to the introduction of vaccines, the situation has dramatically improved everywhere (see next section). The only exception could be the region of Ile de France, where the increase in cases at the end of 2021 seems to be accompanied by an increase in mortality, the only case among the 8 regions considered. Finally, the timing of deaths varies greatly between regions.

TABLE 2.1 Cumulative excess deaths by country at July 2nd 2022

Countries	Official COVID-19 Deaths	Per 100,000	Estimated Excess Deaths	Per 100,000	Estimate *vs.* Official
Poland	116,417	308.0	3,180k to 190k	480 to 500	60%
Slovakia	20,142	369.6	28k to 30k	520 to 550	40%
France	149,386	221.6	110k to 120k	160 to 180	-30%
Italy	168,102	278.5	210k to 230k	350 to 370	30%
Spain	107,799	230.6	120k to 130k	250 to 270	10%
Portugal	24,013	236.2	27k to 30k	270 to 290	20%
Greece	30,178	291.0	33k to 36k	320 to 340	10%
Croatia	16,050	393.2	22k to 24k	550 to 580	40%

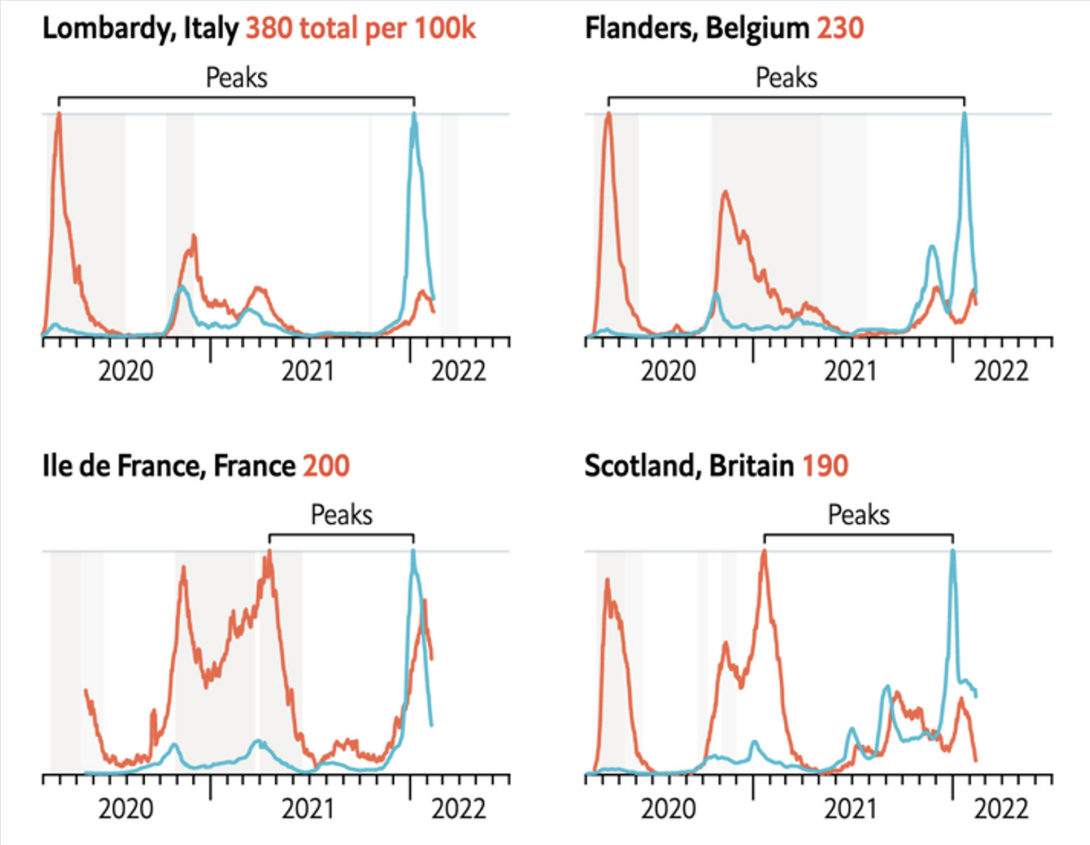
Source: https://www.economist.com/graphic-detail/coronavirus-excess-deaths-estimates?fsrc=core-app-economist
(*) The model estimation methodology is available at: https://www.economist.com/graphic-detail/2021/05/13/how-we-estimated-the-true-death-toll-of-the-pandemic

Figure 2.12 presents trends in excess mortality per age group. Examining excess mortality among age groups is also important in the context of COVID-19. The vast majority of COVID-19 deaths occurred among the elderly (as well as those with chronic conditions, such as cardiovascular disease and diabetes). These are also population groups with the highest risk of underlying mortality. The breakdown of excess mortality by age thus provides information on the extent to which deaths among people of different ages have been higher than in previous years. In all but three of the 26 OECD countries with comparable data by age, the number of deaths in the population aged 65 and over was higher than expected, with 15% more deaths than the average in Belgium, Italy, Poland, Spain and Slovenia.

The data shown in Figure 2.12 come from EuroMOMO, a network of epidemiologists who collect weekly reports on deaths for all causes in 23 European countries. These figures show that, compared to a historical baseline of the previous five years, Europe has suffered from deadly flu seasons since

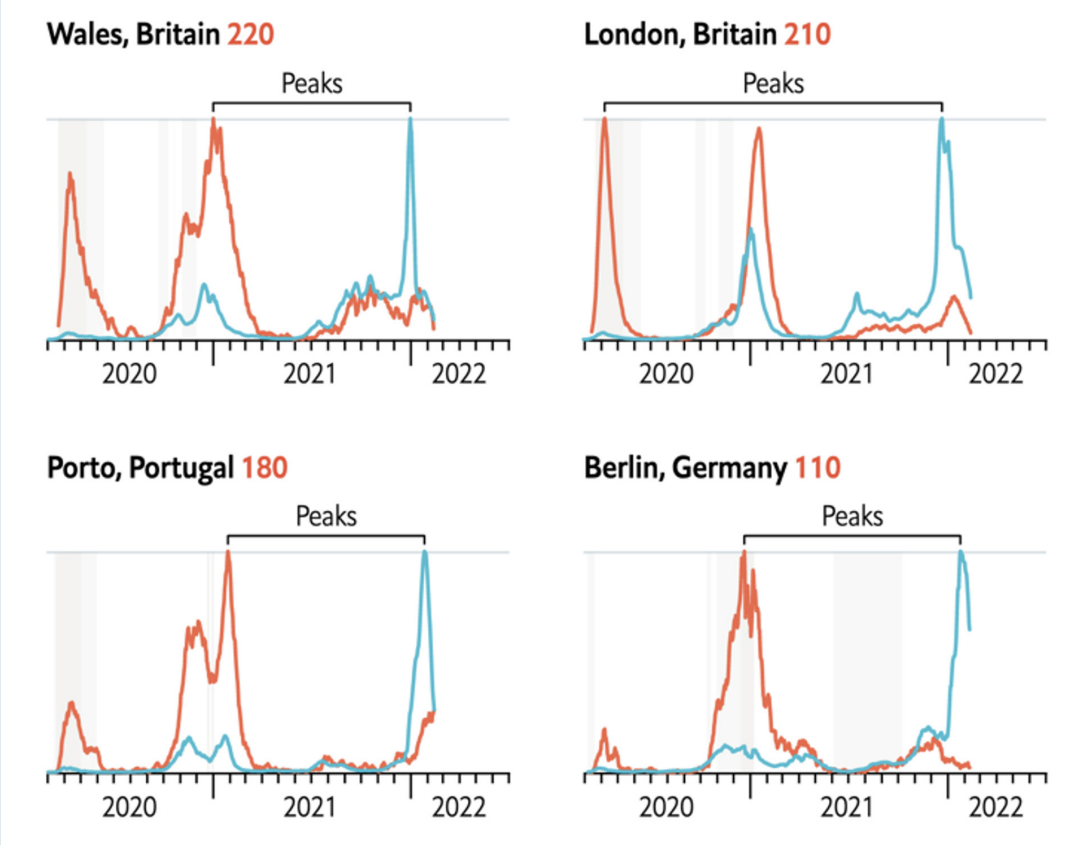
2016, but that the death toll from COVID-19 is far higher and that most of the excess mortality has been concentrated among people aged 65 and above. However, it should not be overlooked that, at the beginning of April 2021, in 23 European countries the number of deaths in populations aged between 45 and 64 was still 40% higher than usual. This needs to be considered very carefully, as we have often heard in recent months that COVID-19 was a problem only for the elderly. Finally, the data also show that since 2021, thanks to vaccination campaigns, the excess mortality has significantly decreased, especially for older age groups.

FIGURE 2.11 Regional COVID-19 cases and deaths per 100,000 people. Peak-scale, seven-day moving average, as of 31 July 2022 (*)



Source: The Economist – https://www.economist.com/graphic-detail/coronavirus-excess-deaths-tracker.

FIGURE 2.11 Regional COVID-19 cases and deaths per 100,000 people. Peak-scale, seven-day moving average, as of 31 July 2022 (*)

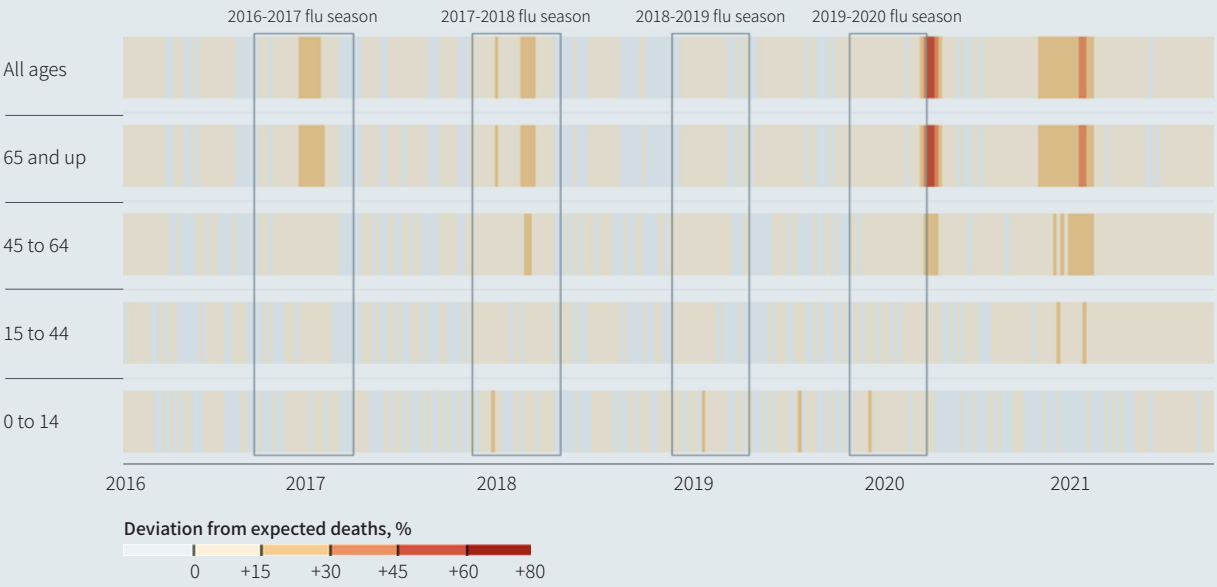


Source: The Economist – https://www.economist.com/graphic-detail/coronavirus-excess-deaths-tracker.

2.4 CHANGES IN LIFE EXPECTANCY

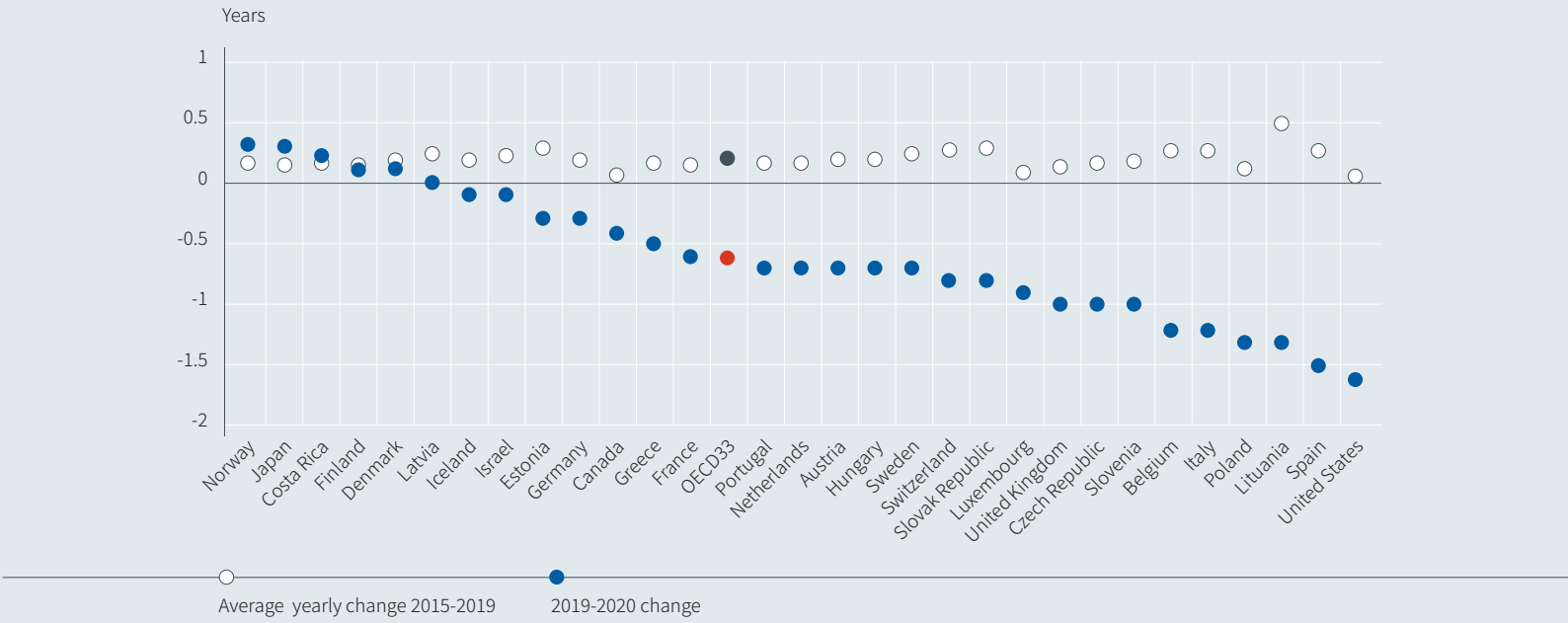
Data on all-ages mortality and excess mortality are considered reliable indicators to understand the impact of the COVID-19 pandemic on health systems and human health because they are less sensitive to coding errors, competing risks, and misclassification, and, as such, allow cross-country comparisons. Yet, what they do not reflect is the number of years lost in a population. To address this alternative metric, indicators of "life expectancy" and/or "lost years of life" are used, which have the major advantage of being able to weigh the demographic composition of the deceased and, therefore, the impact of the pandemic on society as a whole.

FIGURE 2.12 Weekly estimated excess deaths by age group. Total for 23 countries, until the week ending 26 September 2021 (*)



Source: taken from The Economist on EuroMOMO data; European Center for Disease Prevention and Control.
(*) The countries involved in the analysis are: Austria, Belgium, Great Britain, Cyprus, Denmark, Estonia, Finland, France, Germany (Berlin and Hessen), Greece, Hungary, Ireland, Israel, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovenia, Spain, Sweden and Switzerland.

FIGURE 2.13 Reduction of life expectancy during the pandemic



Note: 2020 figures are provisional for some countries.
Source: OECD Health Statistics 2021.

Life expectancy, a widely used mortality metric, indicates how long people can expect to survive on average if that year's age-specific mortality rates remain constant for the rest of their lives. On the contrary, the lost-life-years indicator considers the distribution by the mortality age, giving greater weight to deaths occurring at younger ages. There's an essential difference between life expectancy and years of life lost. While life expectancy is a standardized measure based on a hypothetical life table cohort, the indicator of years of life lost is calculated from the number of deaths observed in real populations. Therefore, if life expectancy depends solely on mortality, the years of life lost depend on mortality and the population's age structure.

According to the latest official OECD data (OECD, 2021), life expectancy has increased in all OECD countries over the past 50 years, although progress has slowed over the past decade. Moreover, in 2020 (the latest available data), the COVID-19 pandemic led to a decline in life expectancy in most OECD countries. While life expectancy at birth averaged 81 years in OECD countries in 2019, more than ten years longer than in 1970, life expectancy decreased at the end of 2020 in all OECD countries for which data were available (see Figure 2.13). These negative results are primarily due to the exceptionally high number of deaths caused by this pandemic (OECD countries have recorded about 2.0 million excess deaths). As we can see from Figure 2.12, in 2020, the annual reduction reached one year or more in nine countries and was particularly large in the United States (-1.6 years) and Spain

(-1.5 years), Poland (-1.3 years), Italy (-1.2 years), and Czech Republic (-1.0 year). The only countries that have recorded an increase in life expectancy are Norway, Japan, Costa Rica, Denmark, Finland, and Latvia.

2.5 CHANGES IN LIFESTYLES AND RISKY BEHAVIORS

An important aspect to consider is that the COVID-19 pandemic has significantly changed many people's lifestyles and risky behaviors. Some of these changes were due to containment measures implemented at different times during the pandemic.

According to the OECD (OECD, 2021), the most significant changes in lifestyles include:

- in four of the five OECD countries with available data, the impact of the pandemic led to an increase in alcohol consumption, in particular among women, parents of young children, people with higher incomes, and those with anxiety and depressive symptoms;
- a reduction, albeit temporary, of physical activity and an increase in sedentary behavior during lockdowns (Stockwell et al., 2021);
- changes in smoking habits, with some individuals increasing daily cigarette consumption and others – particularly older people, such as in France and Japan – reducing consumption, possibly due to the association between smoking and the risk of contracting the virus.

One of the main effects of endangered behavior has been the ability of many, especially women and children, to leave abusive homes, seek help outside, or be proactively helped by others, and appears to have contributed to a significant increase in the frequency and severity of domestic violence against women and children in many countries. According to the United Nations (UN Women, 2020), in France, "official estimates indicate that reports of domestic violence increased by more than 30% in the first ten days of the March 2020 lockdown, while reports from Canada, Germany, Spain, the United Kingdom, and the United States indicated that the need for emergency shelter grew during the pandemic as domestic violence increased. In London, the Metropolitan Police reported that between mid-March and mid-June 2020, domestic abuse increased by 16% among family members and nearly 9% among current partners but decreased by 9% among former partners (Suleman et al., 2021). Although data from a metropolitan region cannot be extrapolated to the country, the trend of increasing domestic abuse by current partners and family members and decreasing abuse by former partners underlines the impact that COVID-19 movement restrictions are likely to have on domestic violence.

Children play a unique role in risk-taking behavior. According to a recent UNICEF report, the impact of COVID-19 on children has been devastating, endangering decades of progress on crucial childhood challenges such as poverty, health, access to education, nutrition, child labor, protection, and mental well-being (UNICEF, 2021). Nearly two years after the pandemic's start, the widespread impact of COVID-19 continues to worsen, increasing poverty, reinforcing inequality, and threatening children's

rights to levels not seen before. As the number of starving, out-of-school, abused, living in poverty, or forced into marriage increases, the number of children with access to healthcare, vaccines, sufficient food, and essential services decreases. The report estimates that an additional 100 million children are living in multidimensional poverty due to the pandemic, an increase of 10% since 2019. In addition, the number of children in financially poor households has increased by about 60 million compared to before the pandemic. Over 23 million children have lost their essential vaccines, which is 4 million more than 2019.

During the pandemic, at its peak, more than 1.6 billion students were not attending school because of nationwide closures. Schools were closed worldwide for almost 80% of in-person education in the first year of the crisis.

Before the pandemic, it was estimated that around 1 billion children worldwide had suffered at least severe deprivation without access to education, health, housing, food, sanitation, or water. This number is increasing as the uneven recovery aggravates the growing divisions between rich and poor children, with the most marginalized and vulnerable suffering the most. But perhaps the most alarming figures are about the school. During the pandemic, at its peak, more than 1.6 billion students were not attending school because of nationwide closures. Schools were closed worldwide for almost 80% of in-person education in the first year of the crisis. As reported in several systematic reviews, studies have reached mixed conclusions regarding the impact of school closure and subsequent reopening on the spread of COVID-19 (National Collaborating Centre for Methods and Tools, 2022; ECDC, 2021; Ziauddeenet al., 2020). This inconsistency of findings may result from the high risk for bias in most studies. For example, in many regions, the initial decision to close schools for in-person instruction occurred concomitantly with the institution of other nonpharmaceutical interventions (such as masking and distancing), stay-at-home strategies, and economic closures, making it challenging to disentangle the individual impact of school closures. Further, many studies examining SARS-CoV-2 transmission in children have been limited to daycare or summer camps and might not be generalizable to other settings. Understanding the impact of school reopening allows for developing additional policies and mitigation strategies to reduce transmission risk (Fitzpatrick et al., 2022).

In addition to schooling problems, the pandemic has often affected mental health. Overall mental health conditions affect more than 13% of adolescents aged 10-19 years worldwide. By October 2020, the pandemic had disrupted critical mental health services in 93% of the world's countries.

Finally, we should not forget the problems associated with early marriages (estimated at more than 10 million marriages in the next ten years) and the number of children involved in child labor which has risen to 160 million worldwide, with an increase of 8.4 million children in the last four years. Another 9 million children are at risk of being pushed into child labor by the end of 2022 due to the increased poverty triggered by the pandemic. In the best-case scenario, it will take seven to eight years to recover and return to pre-COVID levels of child poverty.

2.6 LACK OF CONTINUITY OF HEALTH SERVICES DURING COVID-19

During a pandemic, the maintenance of essential health services is crucial. In the specific case of vulnerable persons, the disruption of services such as services for health promotion, disease prevention, diagnosis, treatment, rehabilitation, and palliative care can cause severe adversities to the population and individual health, sometimes more than the pandemic itself. Unfortunately, as reported by Xiao et al. (2021) and Bodilsen et al. (2021), the restrictive measures imposed during the last two years have caused a decline in access to care, surgery, and other territorial, specialist, and hospital care services.

Moreover, as discussed in Mogharab et al. (2022), the literature finds a reduction in emergency department (ED) visits during the pandemic (Jaehn et al., 2021; Schwarz et al., 2020). Some studies also report delayed emergency medical care in the case of pre-hospital services, like the response to out-of-hospital cardiac arrest (Baldi et al., 2021). Others show that the untimely and improper management of emergency medical needs increased the morbidity and mortality of non-COVID-19 patients during the pandemic (Maringe et al., 2020; Czeisler et al., 2020; Lazzerini et al., 2020; Santi et al., 2021). Additionally, the EDs have also seemingly given less priority to non-COVID-19 patients comparatively (Lazzerini et al., 2020). Diagnostic delays caused by COVID-19 are mentioned to cause a significant rise in the incidence of preventable cancer deaths in England.

Another report approximates that 41% of individuals in the United States have postponed or avoided medical care, including urgent (12%) or non-urgent care (32%) (Czeisler et al., 2020). Healthcare avoidance is a type of patient disengagement that leads them to delay seeking medical care (Byrne, 2008). In some circumstances in the COVID-19 era, people experiencing urgent medical emergencies avoided healthcare services due to the fear of contagion. This reduction in the overall healthcare services utilization might worsen health outcomes for patients with other chronic diseases or acute medical emergencies (Santi et al., 2021). Where data are available, the size of the problem is emerging larger than forecasted, particularly for individuals with long-term health conditions. For them, COVID-19 disrupted their access to routine medical care, with many chronically ill patients experiencing severe discontinuations in in-person care during the pandemic.

To better understand the role that the COVID-19 pandemic had in disruptions to essential health services worldwide, since 2021 the WHO initiated its "Global Pulse Survey", a rapid key informant survey on the continuation of essential health services during the COVID-19 pandemic.[5] The third round of the survey was launched in November – December 2021, involving 223 countries, territories, and areas. The survey provides a rapid and timely assessment of the worldwide pandemic impact over time on "disruptions and rebounds in services and responses, mitigation strategies and bottlenecks to the implementation of essential COVID-19 tools. [...] The survey also captures the challenges health systems are facing to ensure continued access to services and essential COVID-19 tools (including COVID-19 diagnostics, COVID-19 therapeutics, COVID-19 vaccines, and PPE) and how countries are responding

[5] *The pulse survey consisted of multiple-choice and open-ended questions related to current national policies, plans, and structures, disruptions to health services, reasons for disruptions, mitigation approaches, information tracking, and priority needs. It included sections targeting different key informants in the country, including cross-cutting health system functions and services, and focused on disruptions to service-specific areas. Unfortunately, only four of our nine countries have participated in the survey (i.e., Croatia, France, and Poland). This has prevented us from constructing ad hoc summary statistics and focuses limited to our sample of countries.*

to mitigate challenges and recover services. The findings can be used to support evidence-informed planning and implementation of mitigation strategies in countries. The results are also used for monitoring the progress of multiple WHO and other response-related plans" (WHO, 2022).

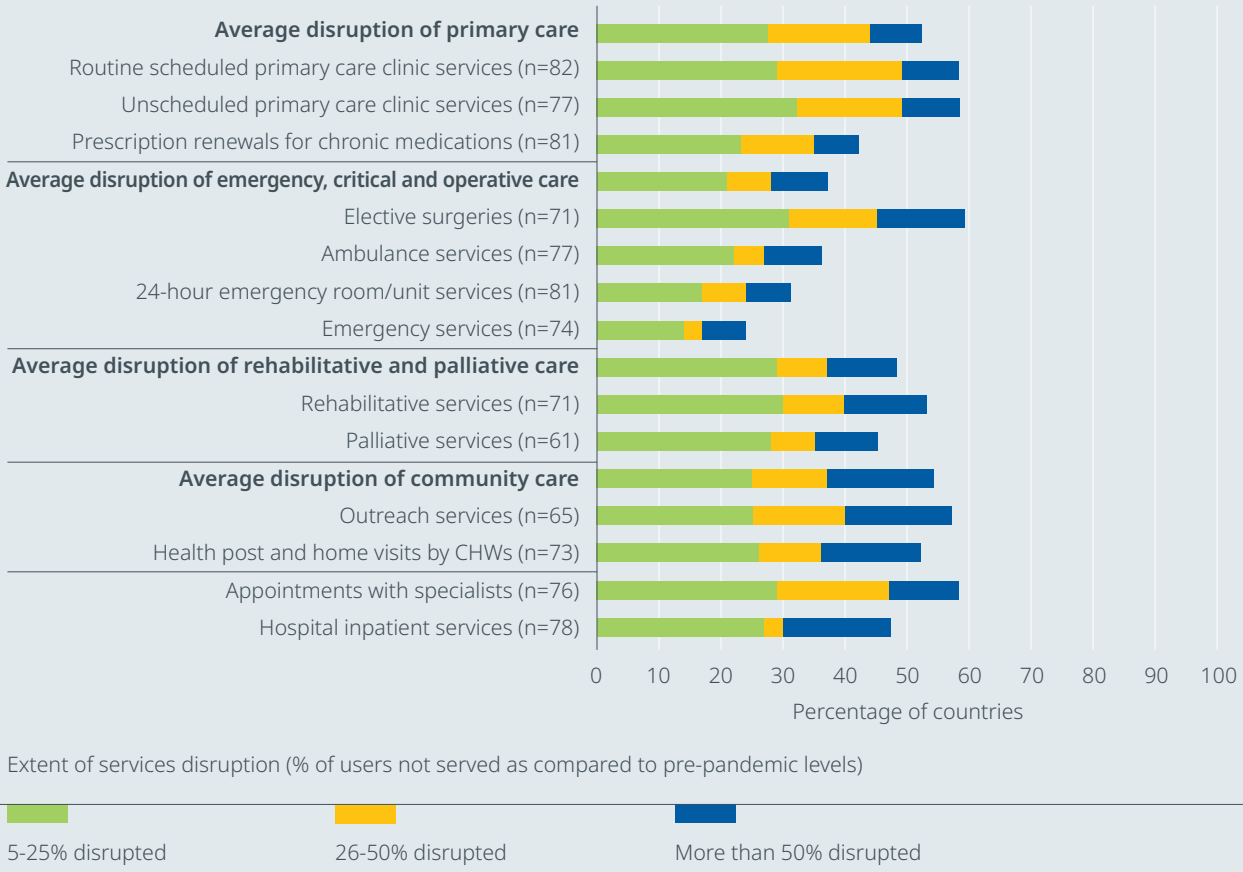
According to the Global Pulse Survey results (WHO, 2022), more than two years into the pandemic, "worldwide health systems are still not recovering or transitioning beyond the acute phase of the pandemic, and COVID-19 continues to disrupt essential health services in almost all countries across the globe. The magnitude and extent of disruptions within countries have not significantly changed since Q1 2021, though all countries have intensified efforts to respond to health systems challenges, bottlenecks and barriers to care brought on by the COVID-19 pandemic. The survey also highlights the impact of pre-existing health systems issues that have been exacerbated by the pandemic."

The Global Pulse Survey (WHO, 2022) represent the most updated and comprehensive set of evidence about the role that the COVID-19 pandemic had on the supply of healthcare services across settings and platforms. The survey assessed a total of 66 services including services for primary care, emergency, critical, and operative care; rehabilitative and palliative care; and community care. Figure 2.14 shows that in 95 countries all service delivery settings and platforms were disrupted, including primary care (53% of 80 countries), emergency and critical care (38% of 76 countries), rehabilitation and palliative care (48% of 66 countries), and community care (54% of 69 countries). The results recorded in the third round of the survey confirm the situation of the previous rounds, with the exception of emergency care, which was more frequently disrupted in round 3.

Going through the single settings and services, Figure 2.14 shows that the primary care services like routinely scheduled visits, unscheduled primary care clinic visits, and prescription renewals for chronic medications were disrupted in more than half of the countries surveyed. Such large disruptions in primary care services should rise several warnings among healthcare managers given the role they have in determining population health. As repeatedly stated by the WHO, primary care "sits at the foundation of achieving universal health coverage (UHC), and any disruptions in this setting can have a major impact across the health system for service delivery and the overall health and well-being of patients". Potentially life-saving emergency, critical, and operative care interventions have also been disrupted and this should rise major concerns among professionals. In particular, the data show that emergency service disruptions increased from 29% of 67 countries in Q1 2021 to 36% of 58 countries in Q4 2021. Similar results have been recorded for the postponement of elective surgeries (59% of 71 countries), for rehabilitative services (52% of 71 countries), and palliative care services (44% of 61 countries). These results are perfectly in line with those obtained in several more detailed and country-specific studies. Below we summarize some of these results grouped by disease.

According to the Global Pulse Survey results (WHO, 2022), more than two years into the pandemic, "worldwide health systems are still not recovering or transitioning beyond the acute phase of the pandemic, and COVID-19 continues to disrupt essential health services in almost all countries across the globe".

FIGURE 2.14 Service disruptions across service delivery settings (n=95)



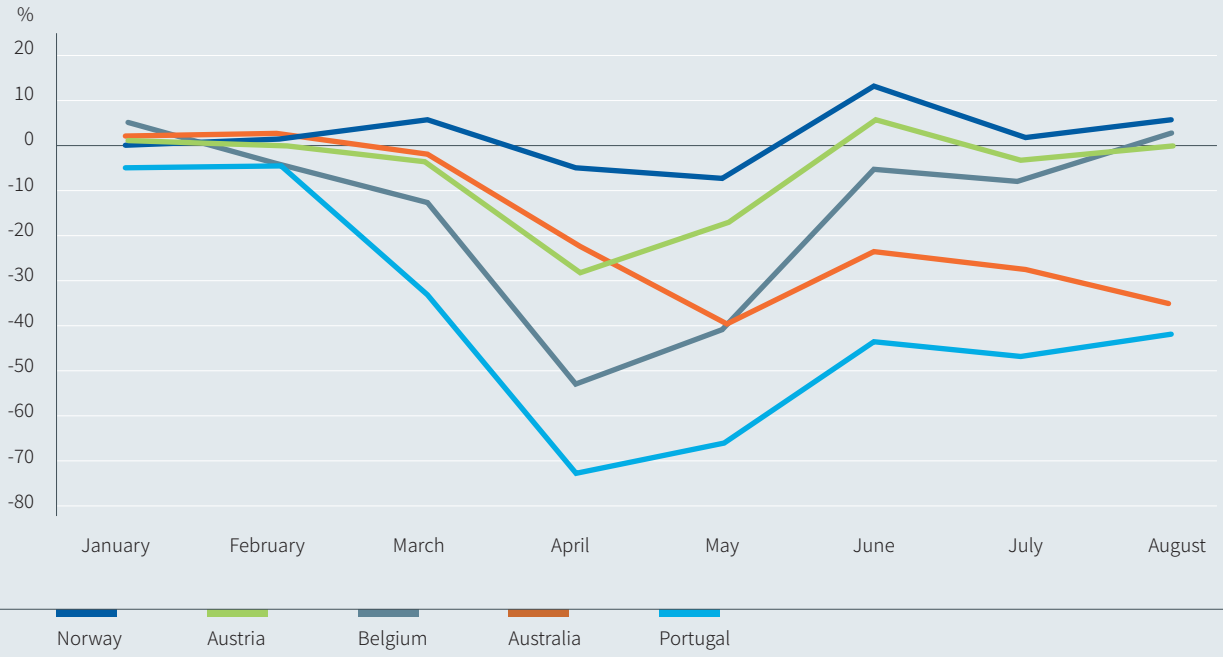
Source: WHO (2022).

Immunization services. According to Shet et al. (2022), using data from 170 countries and territories, compared to pre-pandemic, the administration of vaccines for common childhood illnesses declined. This was mainly due to the interruption in the supply and demand flows, and the availability of fewer healthcare professionals to deliver vaccines. People avoided vaccinations because of fears of contracting COVID. Most of the problems were found in lower and middle-income regions, where communicable disease outbreaks could occur very easily and a low vaccination rate fosters the spread of the infection (this is particularly true for future vaccine-preventable disease outbreaks, as we saw during the Ebola epidemic in Africa.

Primary care. According to the OECD (2021), the tightening of restrictions across health and other areas meant that in May 2020, referrals with the GPs decreased significantly, with the number of visits to GPs falling by 66% in Portugal, around 40% in Australia, 18% in Austria and 7% in Norway, com-

pared to the same month in 2019 (see Figure 2.15).[6] Annual data between 2019 and 2020 indicate that the number of medical consultations (both GPs and specialists) per capita was not significantly different in some countries. Decreased care seeking due to community fear, mistrust, financial difficulties during lockdowns or other barriers to care was also commonly reported, most frequently for primary care services (in 36% of countries)" (WHO, 2022).

FIGURE 2.15 Monthly change in the total number of medical examinations (2020 vs. 2019), in some OECD countries



Note: Total number of monthly in-person GPs consultations in 2020 compared to the same month in 2019. The data exclude telemedicine services and refer only to face-to-face consultations and home visits.
Source: Australian Institute of Health and Welfare (2020[127]), 'Impacts of COVID-19 on Medicare Benefits Scheme and Pharmaceutical Benefits Scheme service use', https://www.aihw.gov.au/reports/health-care-quality-performance/covid-impacts-on-mbs-and-pbs/data; Helsedirektoratet (2020[128]), 'Konsultasjoner hos fastleger', https://www.helsedirektoratet.no/statistikk/statistikk-om-allmennlegetjenester/konsultasjoner-hos-fastleger; INAMI (2020[129]), 'Monitoring COVID-19: L'impact de la COVID-19 sur le remboursement des soins de santé', https://www.inami.fgov.be/fr/publications/Pages/rapport-impact-covid19-remboursement-soins-sante.aspx; Leitner (2021[130]), 'Number of e-Card consultations: Analysis of eCard consultations during the pandemic/during the lockdown in 2020', Serviço Nacional de Saúde (2021[131]) 'Consultas Médicas nos Cuidados de Saúde Primários', https://transparencia.sns.gov.pt/explore/dataset/evolucao-das-consultas-medicas-nos-csp/export/?sort=tempo.

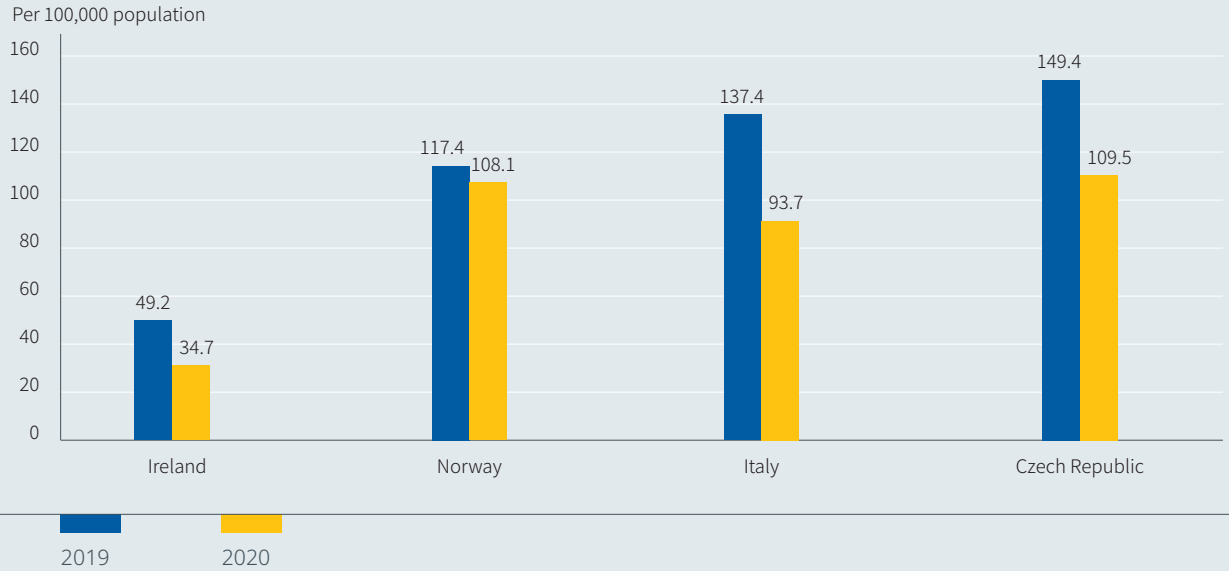
[6] *Data on in-person visits should be interpreted with caution. In many countries, a decline in in-person visits was at least partly compensated by expanding telemedicine services.*

Non-urgent elective surgery. In seven OECD countries with available data, waiting times for three elective surgeries – cataract surgery, hip replacement surgery, and knee replacement surgery – were increased in each country in 2020 compared to 2019. For patients on the waiting list for surgery, the average number of days on the waiting list before undergoing the procedure increased in 2020 by 88 days for knee replacement, 58 days for hip replacement, and 30 days for cataract surgery, compared to 2019.

The number of elective surgeries requiring hospital stays, such as hip or knee implants, declined in many countries in 2020, with a drop of more than 25% in the number of knee implants in the Czech Republic and Italy (Figure 2.17). Similar decreases were also observed for hip replacement and cataract surgery.

While the first months of the pandemic had the greatest impact on increasing waiting times and reducing completed treatment pathways, subsequent COVID-19 hospitalization spikes also interrupted treatment even further, but to a lesser extent. In the UK, for example, treatment activity declined sharply between March and May 2020, before declining again between November 2020 and January 2021, though much less than during the initial decline (The Health Foundation, 2021). In Finland, for example, elective surgery waiting times have increased by one-third since before the pandemic, even though the rate of elective surgeries increased by one-fifth after lockdown restrictions were lifted.

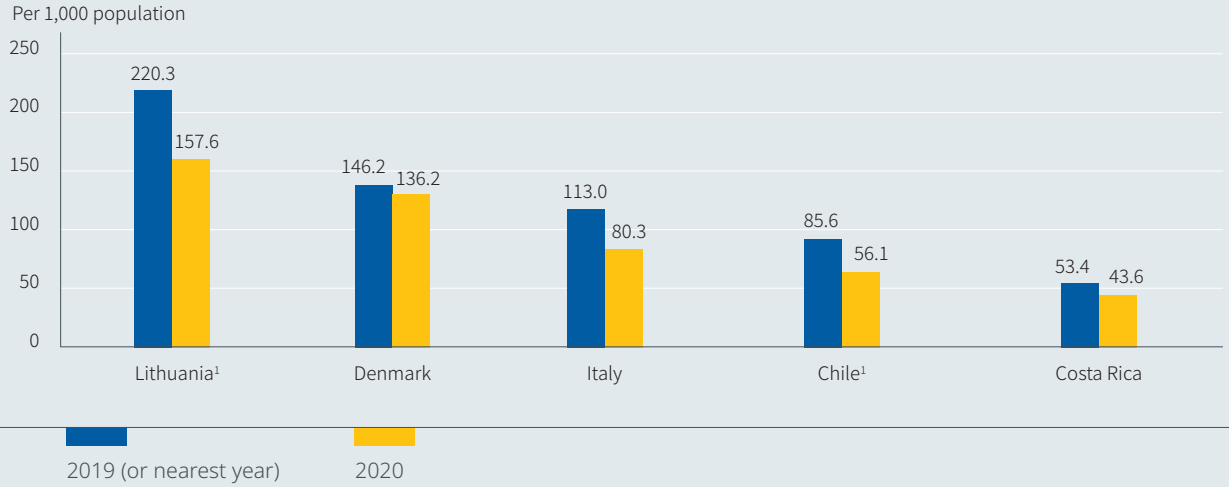
FIGURE 2.17 Knee replacement surgery, selected OECD countries, 2019-20



Source: OECD (2021), OECD Health Statistics, https://doi.org/10.1787/health-data-en

Hospital discharges. In response to COVID-19, many countries increased the number of hospital beds by redesigning hospital discharge policies and postponing scheduled hospitalizations for non-urgent care. As a result, in five OECD countries with available data, overall hospitalizations decreased in all countries between 2019 and 2020, with reductions ranging from about 7% in Denmark to about 30% or more in Lithuania, and Italy (Figure 2.18).

FIGURE 2.18 Hospital discharge rates, 2019 vs. 2020



[1] *Excludes the resignation of healthy children born in hospital (3-10% of all resignations).*
Source: OECD (2021), OECD Health Statistics, https://doi.org/10.1787/health-data-en.

2.7 THE PRESENT STATE OF CARE DELIVERY

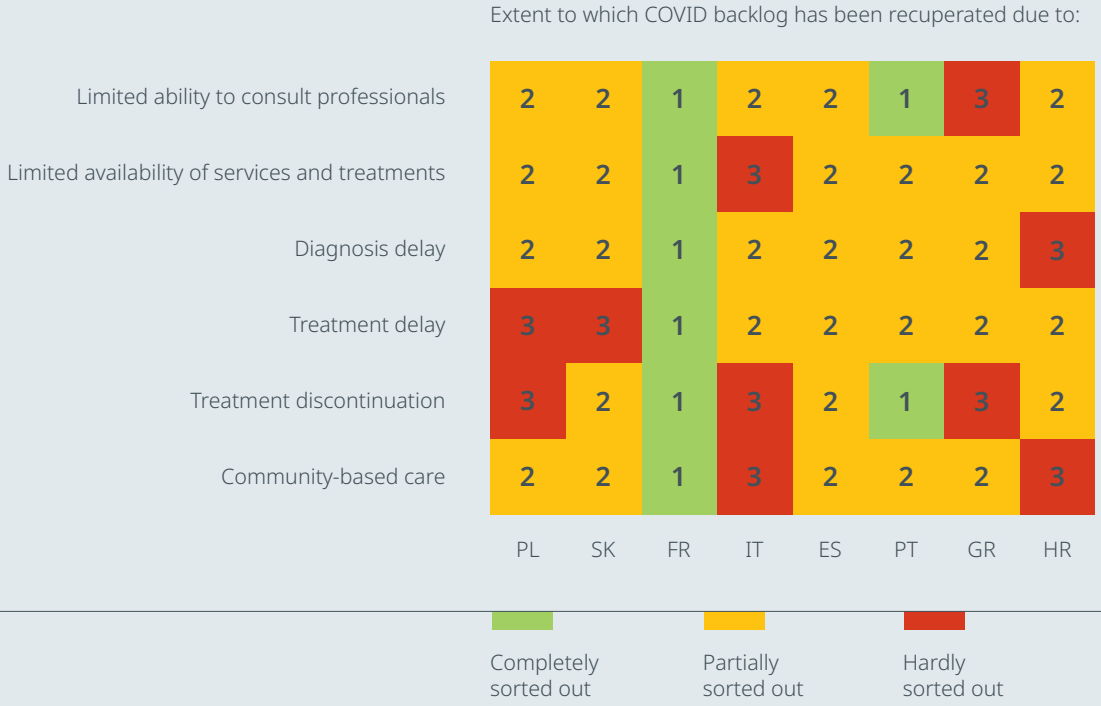
While the existence of forgone care in the international context has been abundantly shown in the literature, much less is known about the present situation of healthcare settings. In particular, if the disruptions in different healthcare settings accumulated over time, to what extent have single countries managed to recuperate the backlog?

For this purpose, focusing on the group of countries key for this report, we discuss the opinions of healthcare professionals and experts on various aspects of healthcare in its present state in Poland, Slovakia, France, Italy, Spain, Portugal, Greece, and Croatia.

When asked about the disruption in healthcare caused by the COVID-19 pandemic, the experts evaluated to what extent the backlog in a selected group of healthcare services has been recovered as of now. Figure 2.19 synthesizes the findings. When evaluating single types of healthcare disruption, the

experts were asked to evaluate if the relative backlog has been completely, partially, or hardly sorted out. From a cross-country perspective, France is the only country to indicate a complete resolution of the backlog. Also for Portugal the expert views suggest that the forgone care due to the limited ability to consult professionals and due to treatment discontinuation has been entirely sorted out. Conversely, for Italy, the forgone care due to a limited availability of services and treatments, as well as due to treatment discontinuation and community-based care is found to be hardly sorted out. In fact, treatment delay, treatment discontinuation and community-based care disruptions are found to be the key areas in which in Poland, Slovakia, and Italy the backlog of care has not been recovered.

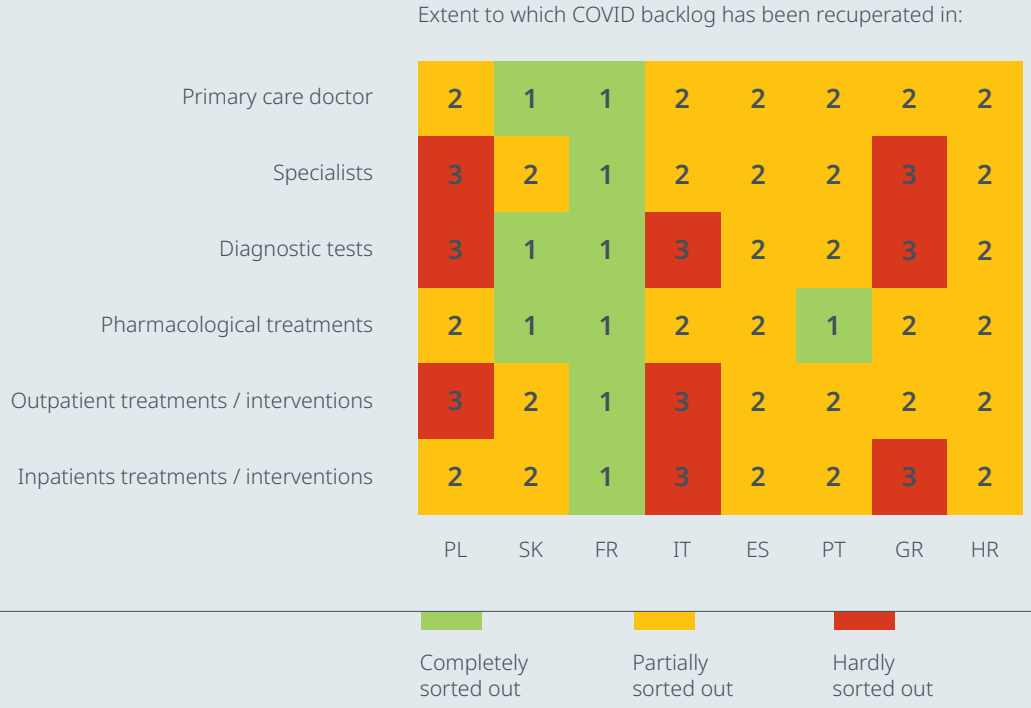
FIGURE 2.19 Evaluation of the extent to which the backlog due to the following disruptions in healthcare caused by the pandemic has been recuperated



Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

When considering the backlog from perspective of distinct healthcare provision types, the experts provide a yet another view in Figure 2.20. Areas which still seem to pose issues for provision management are in particular diagnostic test (in Poland, Italy and Greece), outpatient treatments (in Poland and Italy), and inpatient treatments (in Italy and Greece). In a cross-country perspective, France is the only one that reports to have restored the pre-pandemic state of healthcare provision in all the areas enlisted. It is followed by Slovakia which reports successful patterns in primary care, diagnostic tests, and pharmacological treatments.

FIGURE 2.20 Evaluation of the extent to which the backlog in the following type of healthcare caused by the pandemic has been recuperated



Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

When asked about their views on the most successful strategies adopted in their country to eliminate the backlog, several experts shared a more in-depth view of the issue, as reported in Box 2.1.

BOX 2.1 Views on the most successful strategies adopted in order to recover some of the backlogs

Poland: *The experts indicate that the most important and effective strategies involved reassuming elective admissions to hospitals and removal of dedicated COVID wards, allowing for an increased number of beds in other wards. The experts also highlight the fundamental role of a focus on strengthening and promoting the importance of immunization. Finally, they also stress that instating the possibility of remote consultations in primary care has removed the restrictions on physicians' visits.*

Italy: *The experts highlight the key aspect of general practice, and the success for Italy of the increased time available for medical visits.*

Portugal: *The views draw the attention to the role of delivery of hospital pharmacological treatments through the network of pharmacies, rendering them more accessible locally, and taking away the unnecessary inflow of patients to the hospital infrastructures.*

Notably, the experts have also been asked about the disease group in which they find the backlogs in healthcare in their countries still represent a sizeable burden for the population's health status. Several clear patterns in the responses emerge as pictured in Figure 2.21. First and most salient issue is linked to oncological diseases. In all countries except for Spain, oncology is still affected by the backlogs that, due to COVID, have not been entirely recovered.

This evidence is in line with what is found in the literature in other settings. According to a 2022 Report by Cancer Research UK, cancer care provision declined across all areas. In the first year of the pandemic, one million fewer screening invitations were sent, 380,000 fewer people saw a specialist after an urgent suspected cancer referral, ten times more people waited six weeks or more for cancer tests, and almost 45,000 fewer people started cancer treatment. The same report also shows that by November 2021, cancer waiting time standards in the UK were missed by wider margins than ever before. Riera et al. (2021) find similar results across the world. In particular, regarding the impact of the COVID-19 pandemic on health services for the management of cancer, they find that "the most frequent determinants for disruptions were provider- or system-related, mainly because of the reduction in service availability. The studies identified 38 different categories of delays and disruptions with impact on treatment, diagnosis, or general health service. Delays or disruptions most investigated included a reduction in the routine activity of cancer services and the number of cancer surgeries; delay in radiotherapy; and delay, rescheduling, or cancellation of outpatient visits. Interruptions and disruptions largely affected facilities (up to 77.5%), supply chain (up to 79%), and personnel availability (up to 60%)". The declining number of patients visited is a signal of lack of treatment, not that fewer people had cancer.

In terms of prevention, cancer screening, including mammography and colonoscopy, is an important component of prevention programs, with early detection of cancer strongly associated with higher survival rates. The available data indicate that all screening activities were canceled or significantly delayed. In seven OECD countries with comparable data, the percentage of women screened for breast cancer in the previous two years decreased on average by 5 percentage points in 2020, compared to 2019. The decline was particularly significant in the early part of the pandemic. According to the OECD (2021) in Italy, screening rates for breast (-54%) and cervical (-55%) cancer decreased significantly between January and May 2020 compared to the same period in 2019 and remained at lower levels for the whole year than in 2019 (OECD/European Observatory on Health Systems and Policies, 2021).

It is estimated that delaying the surgical treatment of cancer by four weeks increases the risk of death by about 7%, while a delay in therapies (such as chemotherapy) or radiotherapy by four weeks may increase the risk of death by up to 13% (Hanna et al., 2020).

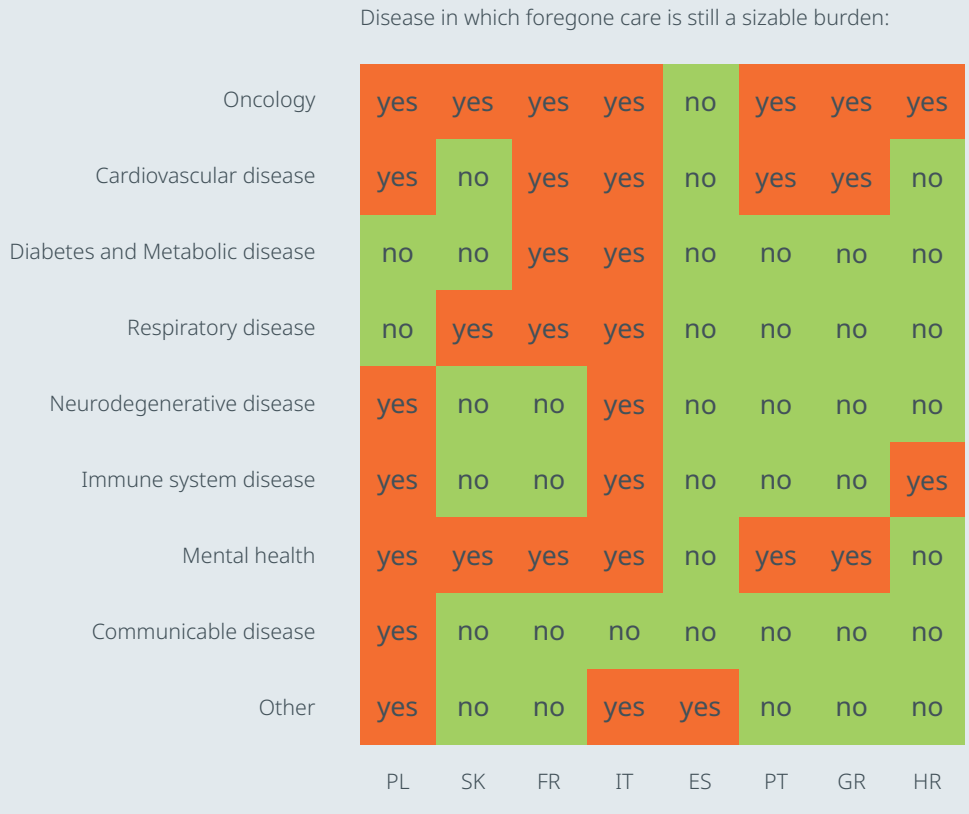
Falling values were recorded in all OECD countries with available data. For example, in France, breast cancer screening decreased significantly in the second quarter of 2020 (-44% compared to the second quarter of 2019). From September onwards, however, screening activity exceeded the levels observed in previous years, with weekly screening in January and May 2021 13% more than the corresponding numbers in 2019 (OECD/European Observatory on Health Systems and Policies, 2021).

These delays and reductions in cancer screening obviously have a negative impact on mortality. In fact, it is estimated that delaying the surgical treatment of cancer by four weeks increases the risk of death by about 7%, while a delay in therapies (such as chemotherapy) or radiotherapy by four weeks may increase the risk of death by up to 13% (Hanna et al., 2020). Delays have been reported in many OECD countries, including Australia, Belgium, Canada (Ontario), Denmark, Finland, France, Ireland, Italy, Korea, the Netherlands, Slovenia, and Sweden. According to the OECD (2021) in Belgium, due to the interruption of cancer treatment during the pandemic, the number of new cancer diagnoses between March and September 2020 was 5,000 less than expected (Belgian cancer registry, 2020). In England, diagnostic delays are expected to increase mortality to five years for four types of cancer from about 5% (lung cancer) to 16% (colorectal cancer) (Maringe et al., 2020).

Another group of disease which is found to represent a current issue is mental health, as evidenced by the experts in Poland, Slovakia, France, Italy, Portugal, and Greece. According to the OECD 2021), the world prevalence of mental health problems was on a stable path until the outbreak of COVID-19 in 2020 when rates of depressive and anxiety disorders increased in several countries. In particular, self-reported prevalence has more than doubled in Belgium, France, Italy, Mexico, New Zealand, the United Kingdom, and the United States in the case of anxiety; and in Australia, Belgium, Canada, France, the Czech Republic, Mexico, Sweden, the United Kingdom, and the United States in the case of depression.

The Global Burden of Disease data shows that the pandemic has led to a 27.6% increase in major depressive disorder (MDD) cases and a 25.6% increase in anxiety disorder (AD) cases worldwide in 2020. Overall, the pandemic is estimated to have caused 137.1 additional disability-adjusted life years (DALYs) per 100,000 population for MDD and 116.1 for AD. The surge in mental health disorders is found to disproportionately affect the young, females, and patients with pre-existing health conditions. In fact, the populations most at risk of COVID-19 and unable to access primary care resources have been severely affected. Social inequalities, accentuated by COVID-19, have played an important role in this regard. Diverting resources and staff from normal to COVID-related activities, such as monitoring and treatment, substantially reduced the supply of care, while fears of exposure to the virus led to a significant drop in patient demand for mental health treatments.

FIGURE 2.21 Disease groups in which the COVID-related forgone care is still representing a sizable burden on the population's health status



Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

A further issue evidenced by the experts is found to be correlated with cardiovascular disease. And this is particularly true for Poland, France, Italy, Portugal, and Greece. Also, according to the meta-analysis of Ramesh et al. (2022) – based on data covering 158 studies in 49 countries – the impact of the pandemic on heart disease and care has been very strong. In particular, they find that across all types of heart disease and all countries studied, there were fewer hospitalizations, treatments, and healthcare appointments than before the pandemic, which implies that people delayed seeking medical attention when suffering from heart conditions. The impact was the most severe in low and middle-income countries, where deaths from heart disease in hospitals increased.

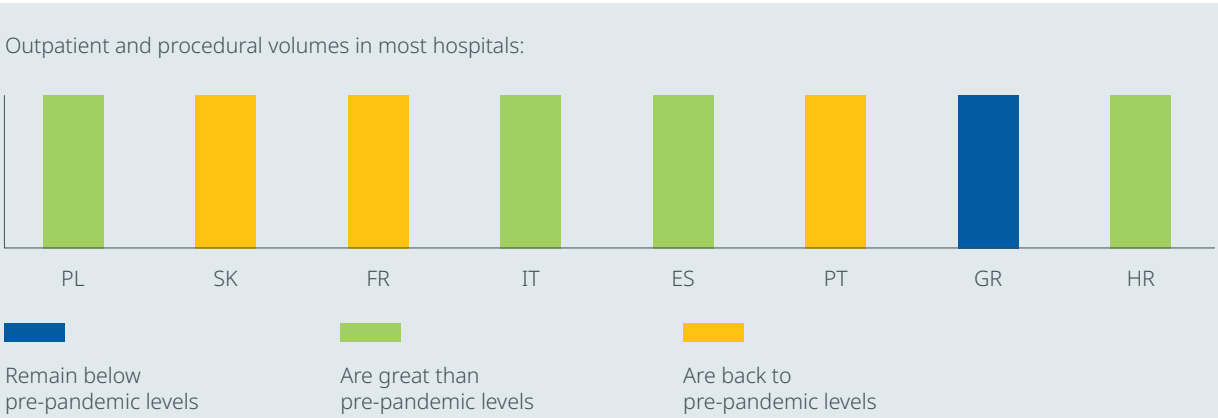
Another important aspect to highlight is the decline in visits for cardiac and cerebrovascular events, which have begun to provide evidence of worse outcomes. Data from the early months of the health crisis indicate that hospitalizations for cardiovascular events, including acute myocardial infarction and strokes, initially declined by 40% or more in many countries, including Austria, Brazil, France, Germany, Greece, Spain, the United Kingdom, and the United States. While hospitalizations for cardiovascular events decreased at the beginning of the pandemic, mortality rates and complications from myocardial infarction appear to have increased dramatically since (De Rosa et al., 2020; Primessing, Pieske and Sherif, 2021). These changes are likely to be associated with a reduced number of hospital visits among patients with mild cardiovascular events. Hospitalized patients were more severe than in the same period in 2019, with a higher risk of complications and worse short-term outcomes and mortality (Primessing, Pieske and Sherif, 2021). These outcomes are likely to be associated with increased ambulance response times and delayed implementation of critical interventions (Scquizzato, 2020).

Experts from France and Italy indicate that he forgone care still not functioning up to the standards represent threats for patients with diabetes and metabolic disease. Valabhji et al. (2022) highlight that diabetes care and services have been disrupted throughout the pandemic, from new diagnoses to critical screening and treatment programs. In particular, in England, death rates (excluding deaths caused by COVID-19) were higher among people with diabetes in 2021 compared with previous years, and this can be attributed to disruptions in routine care caused by the pandemic. Furthermore, also in this case, this effect is unequally distributed across the population, with patients from the most deprived groups featuring poorer outcomes compared to those from more advantaged groups. Some diabetic patients saw their health worsening simply due to lack of access to insulin. Two studies covering 163 and 47 countries respectively, found hypertension and diabetes to be the two most affected conditions by COVID-19 (Chudasama et al., 2020; WHO, 2020). In Portugal, for example, the number of foot tests for diabetes treatment decreased by 24% between 2019 and 2020, while in a nationally representative sample in the United States, two-fifths of adults living with at least one chronic health condition reported delayed or forgotten treatment during the pandemic (Gonzalez et al., 2021; Serviço Nacional de Saúde, 2021).

In this regard, the experts suggest that, as of now, hospital and secondary care backlogs are still interfering with the regular care provision in several settings. Treatment backlogs – of people who should be receiving treatment but haven't yet – existed before the pandemic, but the pandemic made them much worse. To increase the capacity of health systems and address the COVID-19 wave, many

countries have postponed non-urgent elective surgery. As a result, patients' time on waiting lists for many surgeries has increased. In Spain, the experts point out that traumatology, ophthalmology, and general surgery are the specialties with the most extended waiting lists in the country, with over 100,000 patients on the waiting list. In Poland, the results suggest that while elective admissions have been restored, however, the backlog of diagnostics resulting from previous epidemic restrictions is still significant. As seen in Figure 2.22, in Greece, the outpatient procedural volumes in most hospitals remain still below the pre-pandemic level, while only in Slovakia, France, and Portugal the volumes are back to the previous state.

FIGURE 2.22 Evaluation of outpatient and procedural volumes in most hospitals with respect to the pre-pandemic levels



Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

2.8 MITIGATION OF THE BACKLOG IN CARE DELIVERY

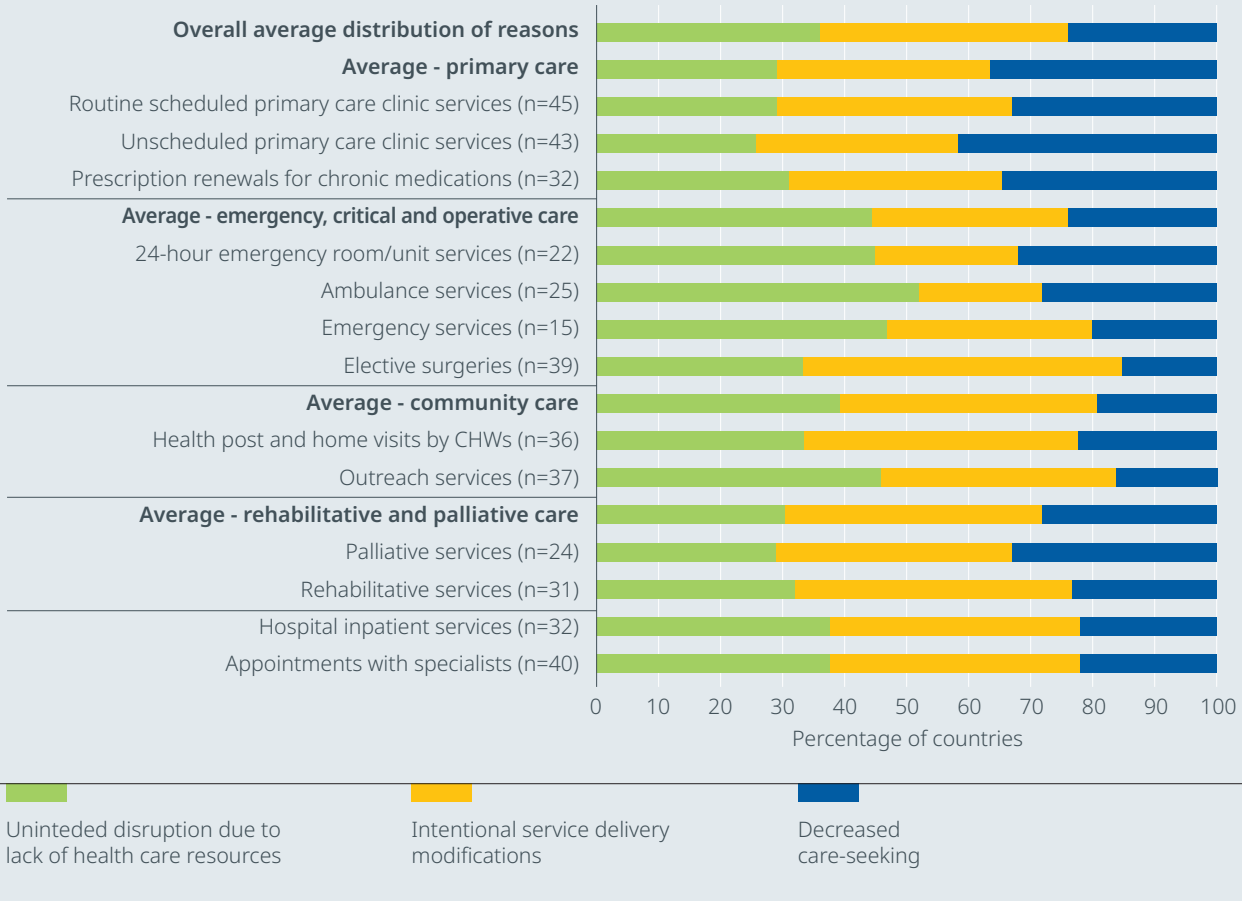
According to the Global Pulse Survey (WHO, 2022), healthcare service disruption has been caused by a mix of demand and supply side factors. Lack of resources, intentional service delivery modifications, and decreased care seeking for major service delivery platforms have been identified as the main reasons for disruption. Figure 2.19 shows that the "predominant reasons for disruptions were intentional service delivery modifications (in 40% of countries) – such as temporary closures or postponement of services – and lack of healthcare resources (in 36% of countries) – such as challenges related to health staff availability and capacities, availability of essential medicines, diagnostics, vaccines or other health products, facility infrastructure, and space capacities.

Functional supply chain systems are critical to ensure that necessary health products are available in the right quantities to deliver essential health services. Disruptions across supply chain systems can limit capacities across the continuum of care and were reported by 46% of countries (38 of 83) (see Figure 2.23 below). Looking at the three regions with sufficient responses, countries in the African

Region and the Americas were most likely to report disruptions to the supply chain system: 59% (20 of 34) and 67% (12 of 33) of countries, respectively. Fewer countries in other regions reported supply chain system disruptions.

There were a variety of factors that led to the healthcare supply chains' slow response to the COVID-19 emergency. Most of them were linked to export bans by countries where protective garments, medical equipment, and pharmaceuticals were manufactured, to port chokepoints and trucking bottlenecks, and reliance on a few manufacturers of essential products. In turn, these events caused other disruptive phenomena, such as not having enough workers to produce and transport products. Finally, organizational failures caused poor alignment and coordination among state, regional, and local agencies and healthcare organizations, leading to a fragmented approach to ordering and fulfillment. These shortcomings impacted clinical care resulting in insufficient testing capability, lack of care coordination, and supply rationing. Also, the World Health Organization released a statement on March 5, 2020, warning that global supply chain disruptions for personal protective equipment (PPE) left health workers dangerously ill-equipped to handle the pandemic.

FIGURE 2.23 Percentage of countries reporting reasons for service disruptions



Source: WHO (2022)

TABLE 2.2 Supply and demand determinants of backlog during and following COVID-19

Supply determinants	Demand determinants
Increases backlog ↑	
• A low number of health workers (doctors, nurses, hospital staff) even pre-COVID • Cost of providing treatment in a safe environment has increased • Staff exhaustion and burnout, anxiety and post-traumatic stress disorders all affect workforce • Payment systems during pandemic have changed, i.e. from activity-based or free-for-service (FFS) to fixed budgets, capitation	• Ageing and rising chronic conditions, and multi-morbidity patients (including long-COVID patients) • Increasing expectations • New technologies and treatments • Higher demand for health care from COVID patients or other unforeseen shocks
Decreases backlog ↓	
• Available workforce and infrastructure key factors for 'bouncing back', affecting the ability to increase supply • Countries with higher financial capacity can fund additional supply and absorb the backlog more quickly • Technologies and digital solutions	• Fear of infection leading to a temporary or permanent reduction in demand but an increase in unmet need

Source: van Ginneken et al. (2022).

Patient backlogs are dynamic and depend jointly on several variables operating via demand and supply channels (van Ginneken et al., 2022). Among the supply-side factors, variables that increase the backlogs are the low number of health workers (even pre-COVID), lower productivity due to staff exhaustion, the extra cost of providing treatment safely, and weakened incentives for some care. On the contrary, variables that decrease the backlog via supply channels include sufficient workforce and infrastructure, extra funding, and more efficient new technologies and digital solutions. On the demand side, new technologies, population aging, and the rise of chronic conditions are all factors that increase backlogs. On the contrary, fear of infection may reduce demand, although this may also increase unmet needs.

To understand how long it will take to absorb this backlog, research by Censuswide surveyed 300 oncologists and 300 surgeons across the United Kingdom, Germany, France, Spain, Italy, and Poland. The aim of the research was to explore the impact of COVID-19 on oncologists and surgeons, how it could be addressed, and their perceptions of how technology can help reduce the current backlog of patients. The results reveal an estimated minimum of three years will be required to clear the current patient backlog across Europe, with 1 in 5 respondents predicting between 4-6 years. Interestingly, 98% of oncologists and surgeons indicated their mental health and well-being were negatively

affected during the pandemic, and 59% of respondents felt very concerned or powerless about the current backlog of patients caused by the pandemic. Finally, 97% of oncologists and surgeons believe that technology can play a vital role to reduce the number of patients waiting to see a physician. This situation may be worsened if we consider that in many contexts there has been a significant dropout in the healthcare workforce during the pandemic (with the loss of one in five healthcare workers at all levels and roles throughout the pandemic), which is making it even more challenging.

From a broader perspective, van Ginneken et al. (2022) recommend adopting a strategy based on three (possibly) overlapping pillars:

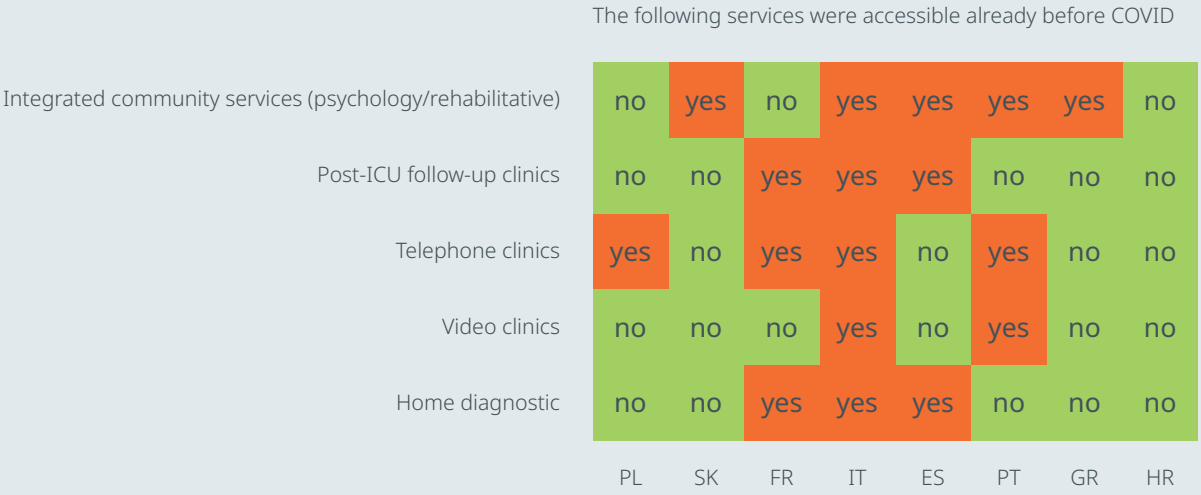
- the first pillar should be directed to increase the workforce. This is a short/medium-term strategy that can be accomplished using a set of overlapping instruments including hiring a new workforce and staffing with new professional roles and competencies via flexible recruitment and training and, improving work conditions and compensation;
- the second pillar should deal with improving productivity, management of capacity and demand, and separating planned and unplanned care. Further, it should introduce tailored financial incentives, the expansion of access to telehealth, careful prioritization, and spreading patients to fit available capacity.
- the third pillar will take care of investing in physical capital, infrastructure, and new models of care (i.e., upgrading health facilities or digital infrastructure, investing in primary and community care, or expanding home care).

To offer a closer look at the issues affecting healthcare provision in the eight countries under consideration, the experts were asked to assess the existence of several types of services, particularly useful in the management of pandemic-related health needs.

Figure 2.24 shows the views of the experts on the services already existing before the pandemic. In particular, integrated community services such as psychological counseling or rehabilitative care are found to have pre-existed in Slovakia, Italy, Spain, Portugal, and Greece. With a similar frequency, the experts indicate that telephone consultations were accessible in the pre-pandemic era in Poland, France, Italy, and Portugal. There is not much evidence of video consultations or structured clinics, with the exception of Italy and Portugal. Finally, home diagnostics is also a relatively rare practice, with only France, Italy, and Spain highlighting its presence already before COVID, typically of long-term care patients managed in home settings.

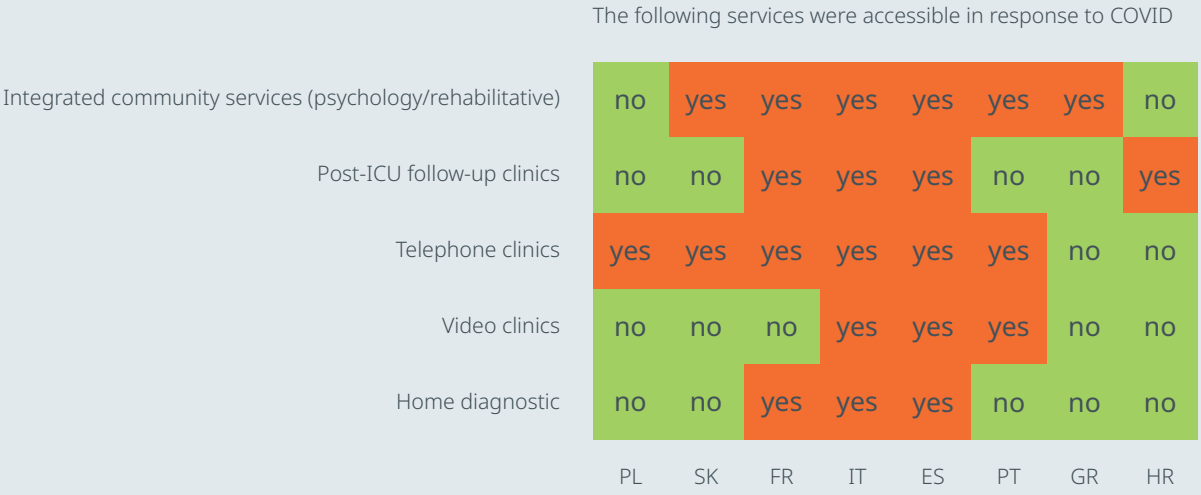
The experts do highlight, however, that in many settings, these services used to be provided in the pre-pandemic era without any regulatory form and relevant control allowing to assess such services. This is particularly true for Slovakia and Italy, where legislatively, the above-mentioned services were not integrated into the healthcare system.

FIGURE 2.24 Healthcare services accessible already before the COVID pandemic



Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

FIGURE 2.25 Healthcare services activated in response to the COVID pandemic

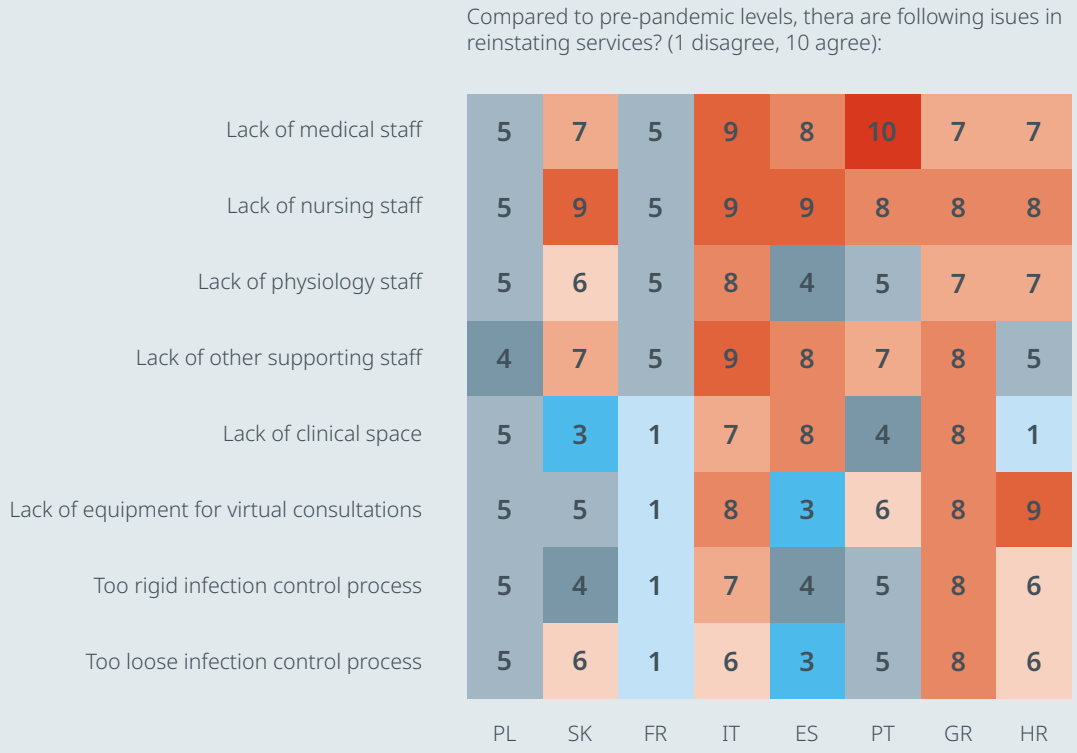


Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

When asked about the existence of such services activated in response to the pandemic, the panorama of the availability is more vivid, as seen in Figure 2.25. In particular, telephone clinics seem to have gained importance following the COVID experience, with the sole exception of Greece and Croatia. Also, community-based services have gained importance concerning the pre-pandemic era in France, while video healthcare became accessible, according to the experts, in Spain.

Overall, the respondents were asked to evaluate the importance of several issues which weigh on the ability of different healthcare settings to reinstate the services at the pre-pandemic level. Figure 2.26 presents the findings, where the experts evaluated how much they agree (1-10) that the specific issues affected the countries' ability to cope with the backlogs. The color gradients range from blue to red and picture the score for each country in each domain. Countries with more blue shades are not affected in the domains; contrarily, the ones with more red cells report significant problems associated with each issue. The most important problems that emerge from the figure are undoubtedly the lack of medical and nursing staff. This is particularly true for Slovakia, Italy, Spain, and Portugal, and to a lesser extent in Greece and Croatia. A correlated issue seems to be also the one of insufficient supporting staff, which in several countries imposes a heavy burden of administrative tasks on medical and nursing staff.

FIGURE 2.26 Evaluation of issues encountered when reinstating services with respect to the pre-COVID era



Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

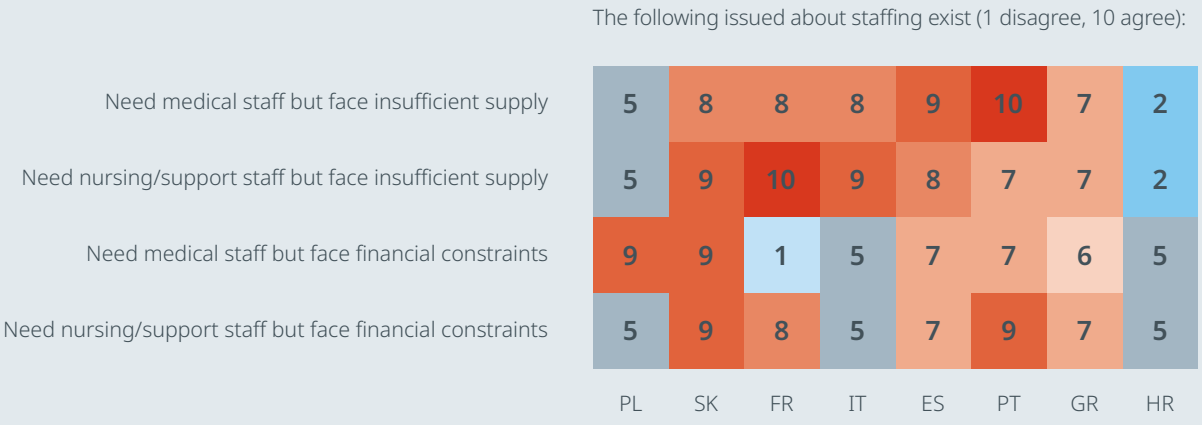
For instance, in Portugal, the experts evidence the insufficient supply of medical staff, where only one private medical school only recently authorized is unable to make up for the limited availability of professionals to hire.

Experts in Spain report that 95% of private hospitals declare shortages of doctors, and 58% of them also declare a lack of nursing staff. A similar issue is raised for Poland, where the experts explain that staffing issues have pervaded the healthcare setting for ten years now and will continue to endanger the continuity in healthcare provision in the near future.

In terms of infrastructural problems, several experts report also the lack of clinical space, as in the case of Italy, Spain, and Greece. Also Italy, Greece and Croatia point to an inadequate preparedness in terms of equipment necessary for video consultations.

Several settings observe also a too rigid infection control process, which might emphasize the supply side bottlenecks in the provision of services, while others find the control process to be at times too lose, putting at risk a number of healthcare settings' professionals.

FIGURE 2.27 Obstacles for optimal levels of medical and nursing/support staff



Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

2.8.1 STAFFING RESOURCES

Looking more in-depth into the staffing issues, Figure 2.27 synthesizes the responses of the experts in terms of the most crucial issues affecting staffing in the healthcare sector. Again, the replies range from blue (disagree) to red (agree).

One of the options the experts were asked to evaluate in terms of its applicability to their healthcare systems was described by a situation where there is a need to hire more medical staff, but the insufficient supply prevents from reaching the optimum employment level. In six out of the eight countries the experts strongly agree with this claim, namely Slovakia, France, Italy, Spain, Portugal, and Greece. A similar pattern in the replies is found for a symmetric question, which asks about the same issue in nursing staff hiring. In particular, Slovakia, France, and Italy seem to be mostly affected by the issue. In Spain, the experts point out that it is estimated that there is a shortage of 120 thousand nurses in the system, a deficit which is unlikely to be covered in the near future.

A specular view on the shortage of staff is also found in Poland and Slovakia, where the inability to attract more medical staff is related to financial constraints. In the first case, the experts suggest that the issue does not only lie in the general unavailability of resources, but is more related to its inefficient redistribution among various settings, where hospitals and other providers are unable to access the resources in a timely manner. Also in Slovakia, the experts suggest that the lack of funds determines the inability of providers to destine more resources to wage compensations.

In greater detail Figure 2.28 analyzes a wider set of possible features which might interfere with hiring. From a very quick overview, it is clear that the aging of medical staff is one of the key factors that the experts raise. These demographic trends indicate impending employment difficulties for the healthcare sector. Healthcare employers must maintain an adequate supply of skilled workers at all levels in order to meet the increased demand for high-quality healthcare services. This is due to a workforce that is already older than that of many other industry sectors, an aging population, and an expanded group of patients due to developing health technology. Employers in the healthcare industry will need to reevaluate their present hiring methods and regulations in order to keep bright older employees on staff while also opening up positions for new trainees of all ages.

Healthcare employers must maintain an adequate supply of skilled workers at all levels in order to meet the increased demand for high-quality healthcare services. This is due to a workforce that is already older than that of many other industry sectors, an aging population, and an expanded group of patients due to developing health technology.

Polish experts indicate that the country has the lowest employment rates of both physicians and nurses per 1,000 inhabitants in the EU, which means that staff shortages (both current and projected) affect the health system more than other countries. According to the experts, the average age of a physician in Poland is almost 50, and that of a physician with a specialization is over 54. The average age of a working nurse is currently around 51. Therefore, a serious systemic problem is the lack of generational replacement in the group of physicians and nurses.

Figure 2.28 also indicates that a too-limited supply of medical and nursing staff is also challenged by a too-heavy administrative burden on the already insufficient staff. There are unnecessary costs to healthcare systems, providers, and patients themselves due to the increasing administrative duties placed on medical and nursing staff, as well as their patients. Additionally, time and attention are taken away from more clinically significant activities, such as delivering patient care and enhancing quality. Excessive administrative work may hinder patients from obtaining timely and appropriate care or treatment.

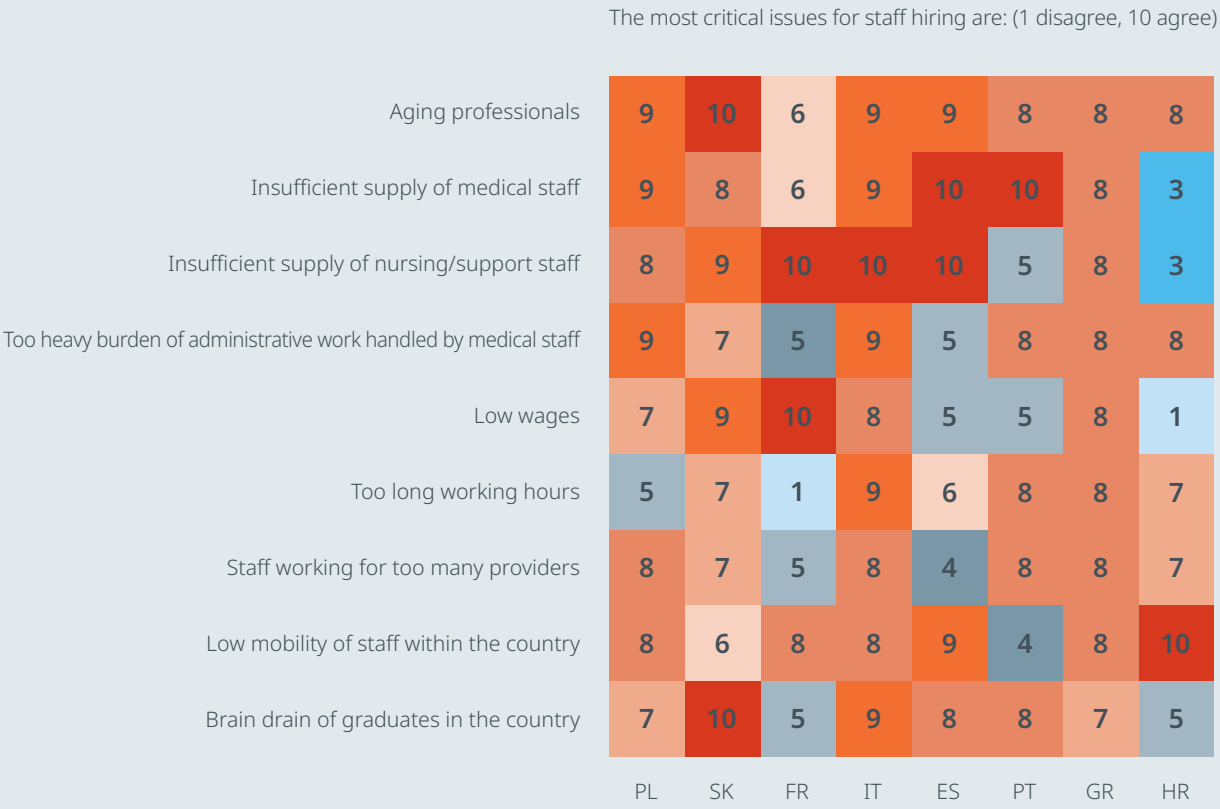
There is also the issue of low wages, which seems particularly relevant for Slovakia and France but also for Poland, Italy, and Greece. Additionally, the low wages are frequently accompanied by overly long working hours, as in the case of Slovakia, France, Italy, Portugal, Greece, and Croatia. For example, as suggested by the experts, in Spain, the low salaries and long-working hours of recent graduates create brain drain pressure.

Another issue raised in Poland, Slovakia, Italy, Portugal, and Greece is that the professionals frequently work for too many providers.

Moreover, the experts also pointed out that low mobility within the country is an important issue for limiting staff availability. This particular feature applies to almost all settings except Portugal. In Spain, the experts suggest that the decentralization of the healthcare competencies to the Spanish regions has made the intra-regional movement of the healthcare staff more difficult.

There are also issues discussed by the experts linked to the educational system. In Slovakia, the respondents evidence an insufficient share of practical classes, which also occurs in poor infrastructural conditions. As a result, instead of practical training, the students are frequently exposed to online teaching in fields that require practice. On top of that, the experts report a lack of a motivational environment in medical facilities, where insufficient wage policy in the country is likely to drive the brain drain for medical and nursing staff.

FIGURE 2.28 The following most critical issues for staffing hiring exist (1 disagree, 10 agree)



Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

2.8.2 FINANCIAL RESOURCES

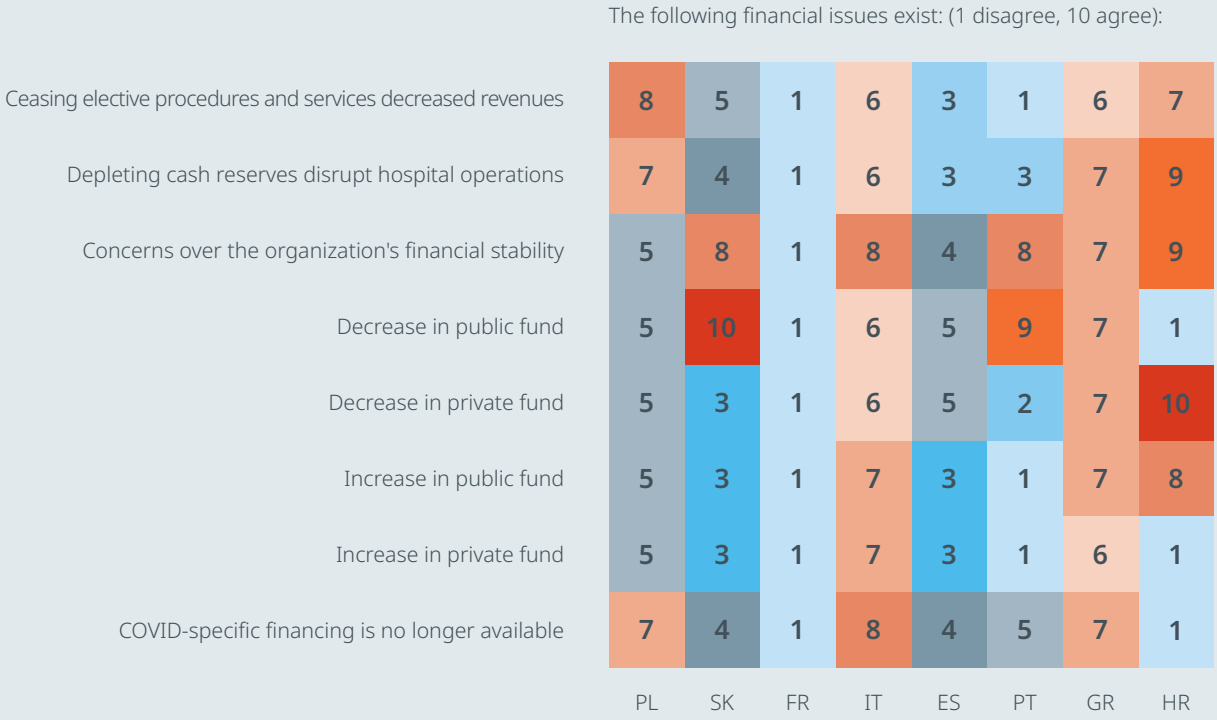
There has been an overall increasing trend in spending across European health systems. This is primarily motivated by and in reaction to expanding demands brought on by age-related and chronic diseases, new technology and innovation, and rising patient expectations.

The hospitals have gotten the lion's share of this extra spending. Some have attempted to control costs by lowering wages at public hospitals, delaying hiring new employees when vacancies occur, and/or postponing investments in hospital infrastructure. Additionally, techniques like price reference, rebates, and more stringent health technology assessment (HTA) criteria have been taken to prevent pharmaceutical expenditure. The majority of countries experience fragmented care, ineffective patient referral and treatment systems, and sluggish decision-making within the health system as a result of siloed funding.

Figure 2.29 describes the views of the experts on the financial issues that pervade their countries' healthcare provision in the post-pandemic era. A first quick examination of the evidence suggests that the financial problems are more decisive for the settings of Poland, Italy, Greece, and Croatia. In particular, the countries report that their healthcare budgets are impacted by contrasting influences. On the one hand, demand has dropped due to service interruptions and patients' (voluntary or involuntary) withdrawal from expected treatments. Additionally, the enormous growth of telemedicine in Europe has contributed to reducing the costs usually associated with in-person consultations. On the other hand, resources are needed for the COVID-19 response, the implementation of vaccination plans, the maintenance of services, the management of the effects of skipped treatment, and crisis planning. Overall the two put the healthcare providers under significant pressure and endanger their financial stability.

Public health spending levels in some nations are insufficient to address population health needs: In 2018, public health spending in EU countries averaged 6% of GDP, and the issue is raised by the experts of Slovakia, Portugal, and Greece, in particular. Numerous countries rely extensively on out-of-pocket payments. Because household expenditure on health is likely to decline as the economy contracts, lowering the financial resources available to the health system, heavy dependence on out-of-pocket payments to finance health care weakens resilience in a downturn. This is pointed out in the case of Greece and Croatia in particular. Worsening socioeconomic disparities in access and financial security, out-of-pocket expenses are likely to raise unmet needs and financial hardship among low-income households, impeding the move toward universal health care. Budgetary pressure is anticipated to increase in the coming years. Unless countries take immediate action to solve fundamental flaws in their health finance policies, they may not be well-equipped to handle economic shocks in the future.

FIGURE 2.29 Evaluation of financial issues affecting healthcare provision



Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

For increased access to services, infrastructure, and labor, the pandemic necessitated a massive increase in financing squarely on hospital financing. In order to manage the unexpected and drastic increase in demand, it was necessary to reorganize care pathways and enhance capacity. Patients with COVID-19 have required particularly resource-intensive care. Extreme pressure has been placed on hospitals as a result of successive waves of demand for ICU beds, protracted hospital stays, more personal protective equipment, and increased remuneration to HCPs for their extended efforts to solve the issue. Spending on other aspects of care has decreased as a result of service disruption, which has occurred concurrently with the acute demands brought on by COVID-19. In response, several countries have put in place procedures to make up for lost revenue. Yet, these ad hoc financial solutions are frequently already withdrawn, while the providers continue to struggle with the mounting deficit. This aspect is raised by experts in Poland, Italy, and Greece, in particular. Short-term budget management emphasized the danger of the approach of "spending a budget" rather than making longer-term, more carefully considered investments. This is sometimes coupled with a time-limited political or administrative mandate, where short-termism neglects the dangerously detrimental effects on debt and forgone care.

Over the medium to long term, it is expected that inevitable consequences of economic contraction would affect the majority of health systems, necessitating an immediate investment of recovery funds to fortify and boost resilience. Many European health systems, especially those that relied significantly on out-of-pocket payments and had relatively low public health spending, were not well-prepared to handle the economic shock of 2008. Responses to the 2008 financial crisis further reduced their capacity to withstand shocks. After the crisis, Europe's health systems had more coverage gaps than before, out-of-pocket expenses grew faster than public health spending, and public health spending in hard-hit countries continued to be below pre-crisis levels even in 2018. Unmet medical needs and catastrophic medical costs have made progress toward universal health care more difficult, which is a stark illustration of the price of austerity.

The speed of the national and international responses to COVID-19 in 2020 implies that the 2008 crisis served as a lesson. Countries quickly raised extra funding for the healthcare system, with a clear emphasis on addressing access-related financial barriers. In Greece, for example, the government promptly delayed the payment of statuary health insurance contributions for enterprises forced to close owing to the lockdown established in March 2020 and paid the contributions on behalf of self-employed people affected by the pandemic. If they had been implemented after the 2008 crisis, these measures would have prevented many people from losing their coverage. Similar to how most nations acted quickly to prevent co-payments from impeding access to COVID-19 therapy, some countries likewise lowered co-payments for non-COVID-19 health services. Again, this is in contrast to the 2008 crisis, when almost half of EU governments raised co-payments. Strong backing from international financial organizations like the European Commission and the European Central Bank helped to strengthen national responses. In reaction to the global financial crisis of 2008, these organizations advocated for austerity, yet, their responses to the epidemic have been significantly different. To lessen the social and economic effects of COVID-19, the EU swiftly relaxed its fiscal regulations and established a generous recovery and resilience facility. Along with the OECD, the EU and IMF have been outspoken supporters of increased public spending on health and social protection, improved taxation, and immediate action to reduce socioeconomic inequities.

Yet, the situation is also dangerously different. COVID-19 health financing policy measures in 2020 were triggered by a health shock, not an economic shock. Countries were willing to raise money and broaden their insurance coverage since they concentrated on containing the outbreak. Finance ministries will, however, object to the public debt level as the pandemic is progressively brought under control and policy attention shifts to the enormous economic crisis.

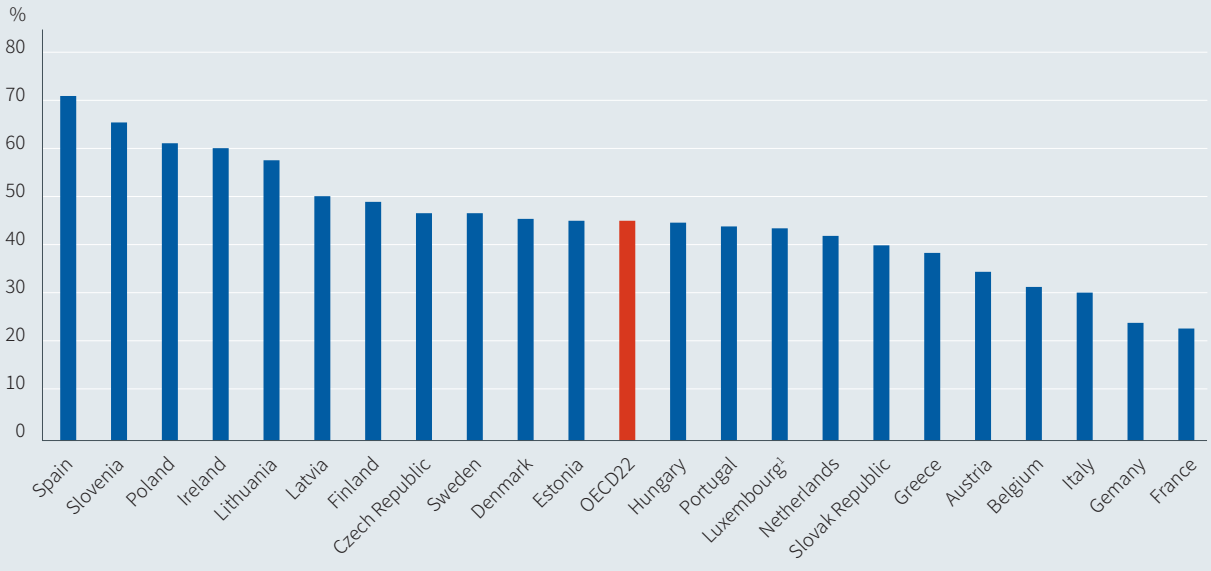
Automatic stabilizers that increase public spending on health as the economy weakens are typically lacking, thus, the public revenue for the health system is not cushioned. They, therefore, depend on arbitrary spending decisions to stabilize revenue. Because the primary source of revenue for health systems funded by statuary health insurance schemes is wages, there is a substantial financial risk associated with this. Any health system can benefit from replacing discretionary responses with automatic stabilizers to lessen the uncertainty, provide short-term buffering, and improve medium- to long-term planning. Additionally, means-tested benefits like co-payment exemptions for low-income households could be funded through automatic stabilizers.

2.8.3 TELEHEALTH

The COVID-19 pandemic has highlighted the importance and usefulness of telemedicine to provide a way to connect patients and healthcare professionals when a consultation in person is not possible. Telemedicine has become a valuable and available tool in many countries to ensure patient care and reduce the risk of exposure to COVID-19 for patients, healthcare professionals, and the public. The authorities greatly expanded telemedicine access during the pandemic to assess suspected COVID-19 cases and to guide the diagnosis and treatment of the patient, minimizing the risk of transmission of the disease. Telemedicine allows many major clinical services to continue operating regularly and without interruption during a public health emergency. There is significant evidence that telemedicine-managed patients express satisfaction with the services they receive, showing that it helps evaluate, diagnose, select, and treat patients, avoiding the potential complications of an emergency room or outpatient visit.

In general, teleconsultation services have expanded in all countries, helping to compensate for the drop in in-person visits. Although the pandemic has pushed the take-up of telemedicine, the use of the services was largely heterogeneous (Figure 2.30). As with the adoption of other digital tools, the use of digital health technologies in medicine has not been evenly distributed also within populations, with some groups – including the elderly, those with lower incomes, and lower levels of education – less likely to seek health information online.

FIGURE 2.30 Percentage of respondents who reported receiving online healthcare (online medical advice or telephone) from a doctor since the beginning of the pandemic



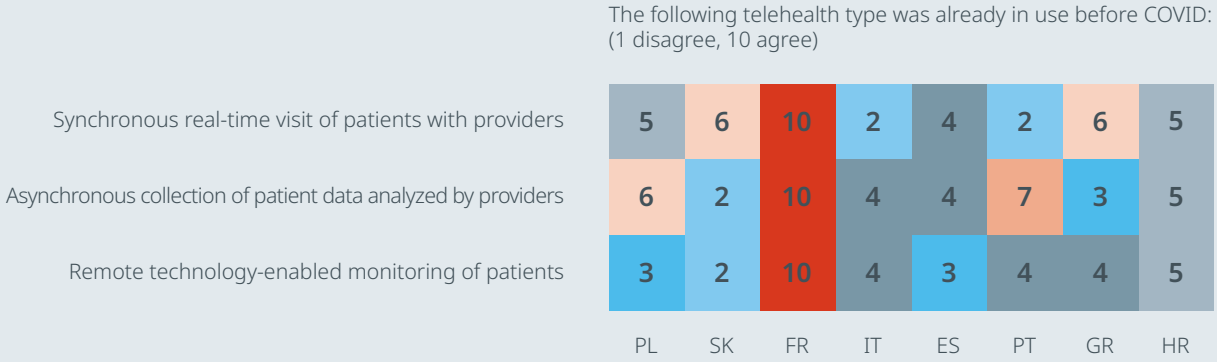
Note: Results based on an online survey may not be representative of the entire population. The data for Luxembourg are of low reliability.
Source: Eurofound (2020[138]), 'Living, working and COVID-19 dataset', https://www.eurofound.europa.eu/fr/data/covid-19/quality-of-public-services

Telemedicine has become a valuable and available tool in many countries to ensure patient care and reduce the risk of exposure to COVID-19 for patients, healthcare professionals, and the public. The authorities greatly expanded telemedicine access during the pandemic to assess suspected COVID-19 cases and to guide the diagnosis and treatment of the patient, minimizing the risk of transmission of the disease.

Figure 2.31 describes the experts' views on the use of telemedicine in the pre-COVID era. The three types of telemedicine distinguish between synchronous interaction (real-time visit between patients and providers), asynchronous consultation (collection of patient data analyzed by the provider at a different time and location), and remote patient monitoring (technology-enabled monitoring of patients outside healthcare settings). The three of them were already in use in France, while other countries indicate they employed one of the solutions to a limited extent before COVID. Synchronous visits were already available in Slovakia, Greece, and Croatia, while asynchronous data collection took place in Poland, Portugal, and Croatia. In Poland, the possibility to apply medical advice via telephone or other remote communication was already introduced in September 2019, but in practice, it started to be applied from March 2020. Before the pandemic, in Poland teleradiology was also adopted, allowing to share statistical as well as dynamic high-resolution images (transmission of the highest quality ultrasound, MRI images), as well as interactive audiovisual files with high accuracy and in real time. For example, thanks to the possibility of ECG tele-transmission, a patient with suspected acute coronary syndrome reached by an ambulance could be diagnosed remotely by a specialist from the cardiology center. Also physicians undertaking cardiac intervention could prepare in advance for an angioplasty procedure.

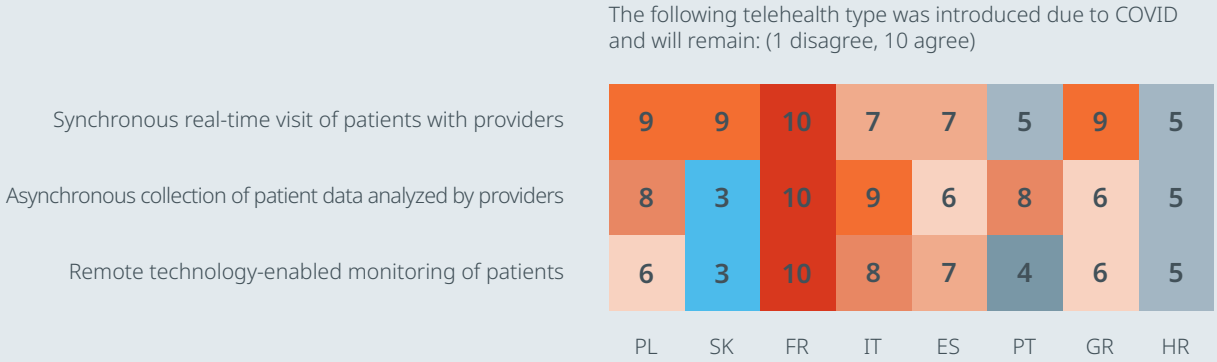
Comparing Figures 2.31 and 2.32 allows us to appreciate the extent to which telemedicine in its various applications has expanded since the COVID arrival. The number of teleconsultations has skyrocketed in France, where the national insurance fund tracked and paid out for more than 10-fold the number of the services with respect to the pre-covid era. Most countries, Poland, Slovakia, and Greece in particular, have introduced synchronous real-time patients-providers interactions. In Slovakia, experts report the existence of partial use of telemedicine technologies for remote patient monitoring in the COVID and emergency. Also asynchronous consultation consisting in the collection of patient data analyzed by the provider at a different time and location have gained in importance in most countries, and in particular in Poland, Italy, and Portugal. In Poland, the experts highlight that telemedicine represents the next stage in the development of medicine and certainly the changes already introduced in this area will not be undone. Telemedicine makes it possible to help implement correct treatment more quickly (teleradiology) but also to relieve the burden on the healthcare system. Finally, remote technology-enabled monitoring of patients outside healthcare settings has been expanded in Italy, and Spain in particular. The capacity to repeat a prescription remotely has made it possible thanks to the availability of digital health data and e-prescriptions in many EU countries to decreasing the need for unnecessary patient-doctor interactions.

FIGURE 2.31 Presence of telehealth in use already before the pandemic, by type of services



Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

FIGURE 2.32 Presence of telehealth introduced during the pandemic by type of services



Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

When asked about the type of healthcare providers that benefitted most from delivering telehealth services, the experts indicate important gains for the private sector and for primary care in Portugal, Spain, Slovakia, Poland, Italy, and France. In Spain, the use of telehealth services in primary care is deemed by the experts to feature very high standards, with 62% of the primary patients to have already used this service before COVID, but with 92% of the current telehealth patients who used the services for the first time in 2020. Polish experts highlight that a great bulk of services carried out with telemedicine was devoted to patients with minor illnesses or needing a prescription for their ongoing medication, without the need for an in-person consultation. This is also true for some specialists especially focused on chronic patients.

In general, the experts suggest that telemedicine should be used by healthcare providers whose patients do not always require an in-person visit and physical examination (primary care, follow-up, chronic patients management). Also, in the case of teleradiology, the use of this technology by hospitals often allows for faster test results and reduces operating costs for the facility. Yet, the experts highlight that the adoption of telemedicine should be scrutinized with attention, where any doubt in the assessment via remote consultation should automatically lead to an in-person consultation. In particular, the experts suggest that remote consultations should be used to a limited extent by providers whose patients require physical examinations and procedures or for whom the absence of an in-person examination could delay a correct diagnosis, like in the case of first consultations (with GPs or specialists), specialized outpatient care, inpatient care, mental health, or pediatric visits.

In several settings, telehealth is now offering healthcare services not directly substitutable with conventional in-person visits. As suggested by the experts in Portugal, many remote locations have now gained access to more options in terms of multidisciplinary approaches offered frequently by major central research providers. Also, in Spain, experts report that 85% of patients see convenience as the main reason for using telemedicine tools. The savings materialize not only in travel to distant health centers but also in waiting times and speed of response. Finally, personalized attention and a comprehensive medical list are the reasons for which 55% of patients praise digital health. In the era of medical staff shortages, telehealth holds the promise to guarantee continuity of care. In Slovakia, the experts highlight that telehealth solutions also enable self-monitoring during chronic illness and reduce inappropriate pharmacotherapy. We are witnessing the emergence of ever-sophisticated wearable technologies that can track both physical health indicators like blood sugar and heart rate as well as markers of mental health problems. A fascinating new aspect of the digitalization of health systems is the design of many gadgets to convey such information directly to medical practitioners.

However, some obstacles are also identified: liability, reimbursement, and cyber-security concerns must be addressed by policymakers. The question of who controls and owns personal health data - the patient, the healthcare provider, the government, or the businesses that collect it - is being fueled by the transfer of that data. Sharing sensitive information calls into doubt people's right to privacy. Moreover, since the beginning of the pandemic, there has been an increase in cybersecurity incidents. More than ever, ransomware and sophisticated phishing assaults are being used by criminal actors to target the healthcare industry. The emphasis on the safe and appropriate use of health

data, improving healthcare results and guarantee that each patient's rights are respected and protected, ties all of these developments together.

Regarding responsibility for malfunctioning digital systems, there are still numerous unanswered problems. Numerous of these issues still need to be considered, for example, in the context of new or revised legislation recommendations on product liability. In some countries, the arrival of COVID has motivated the legislator to introduce legal basis and define procedural standards in this area, unifying the rules and introducing a marked level of quality among healthcare providers.

Sharing sensitive information calls into doubt people's right to privacy. Moreover, since the beginning of the pandemic, there has been an increase in cybersecurity incidents. More than ever, ransomware and sophisticated phishing assaults are being used by criminal actors to target the healthcare industry.

Moreover, there are particular implications for the vulnerable population, namely people living with disabilities, migrants, and the homeless, as evidenced by experts in Portugal, Italy, Poland, and Slovakia. These groups of people are probably already living in poor conditions, aggravated by the pandemic, and may not necessarily have access to telemedicine. Proactive vulnerability-based strategies need to be developed to address their specific needs. In essence, while telemedicine can help overcome some barriers to entry, such as for people living in remote communities, the adoption of digital services during the pandemic may also exacerbate some of the inequalities that preceded the pandemic.

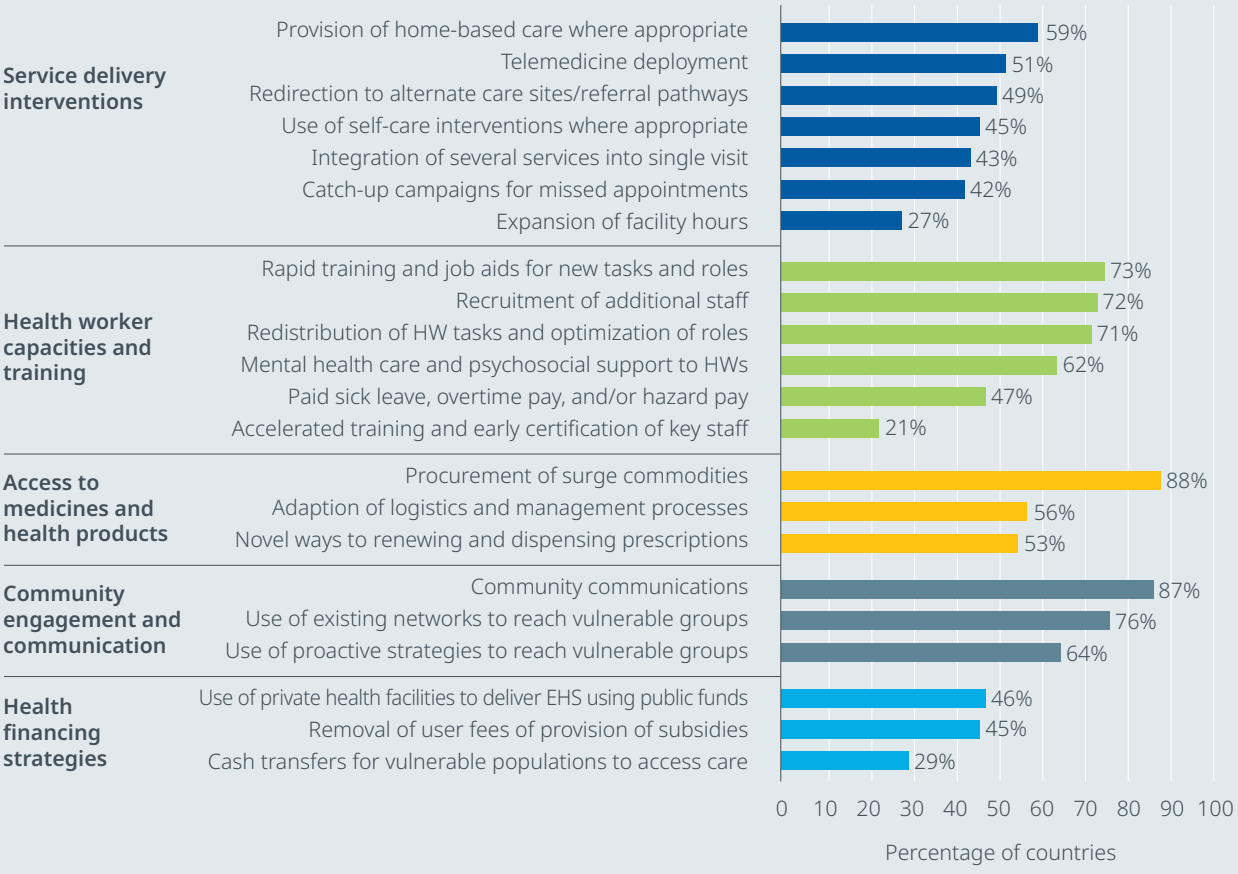
BFF INSIGHTS

3

STRATEGIES, POLICIES, AND PLANS

During the pandemic, governments have used several strategies to deal with the short-term consequences imposed by COVID-19. In many cases, they have been quick reactions to country-specific situations to overcome short-term service disruptions and recover services over the long term. The best recollection of all these actions has been provided by the Global Pulse Survey (WHO, 2022). According to the survey, the countries involved have used (and are still using) "varied strategies and innovations, including service delivery modifications (such as shifting to community-based care or telehealth consultations), health worker capacities and training, improving access to essential medicines and health products, community engagement and health financing strategies." (WHO, 2022). Figure 3.1 reports the results by type of intervention and action taken. As we can see, the wider use of interventions has been to facilitate access to medicines and health products and toward community engagement and management. In particular, almost 90% of countries reported the use of surge procurement of commodities (84 of 95 countries) and communication with communities (83 of 95 countries) as the top strategies. Health workforce mitigation measures are also among the top strategies with more than 70% of countries (at least 67 of 95) applying some of these measures. About two-thirds of countries (61–72 of 95 countries) are implementing targeted approaches to ensure access to care for vulnerable groups.

FIGURE 3.1 Approaches for overcoming service disruptions



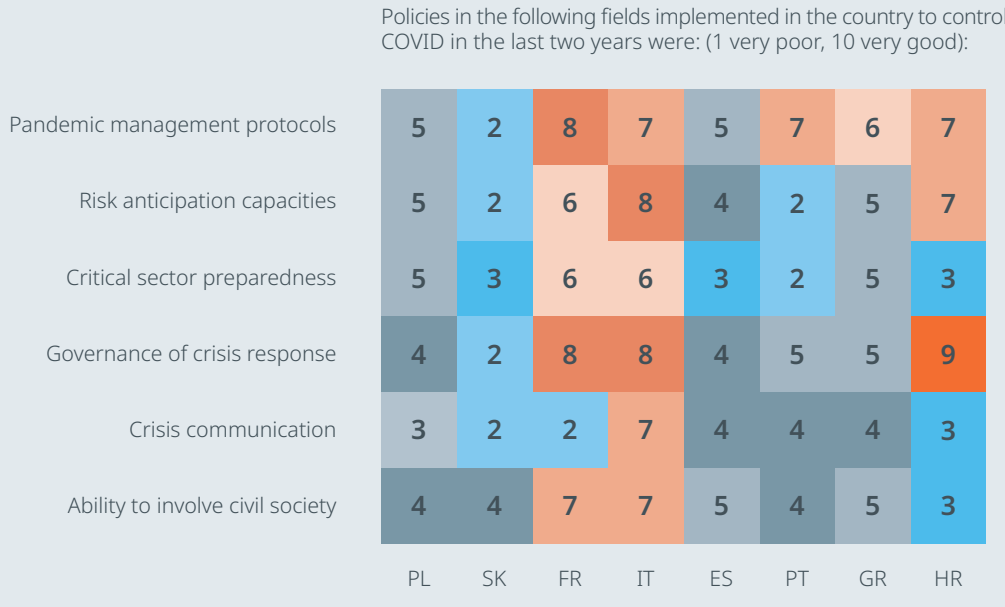
Source: WHO (2022)

3.1 POLICIES TO FOSTER HEALTHCARE RESILIENCE

In order to evaluate the policy efforts that the countries analyzed have undertaken as a response to COVID, the experts were asked to evaluate how they rated the response adopted by their governments to control the spread of the virus over the last two years in your country, ranking a very poor performance as one (in blue), and a very good one as ten (in red). The results are described in Figure 3.2. The respondents had to evaluate the domains that ranged between pandemic management protocols, risk anticipation capacities, critical sector preparedness, governance of crisis response, crisis communications, to the ability to involve civil society. Overall the votes assigned to the countries are relatively low in Poland, Slovakia, Spain, Portugal, Greece, and Croatia. On the contrary, the ratings are rather positive in France, and Italy.

When looking at single domains, the most favorable policy family pertains to the pandemic management protocols adopted, with the highest scores for France, Italy, Portugal, and Croatia. Also, governance of crisis response is found to be relatively positive in France, and Italy, and in particular, in Croatia.

FIGURE 3.2 Evaluation of the policies adopted in the countries to control the spread of the virus over the last two years of the pandemic

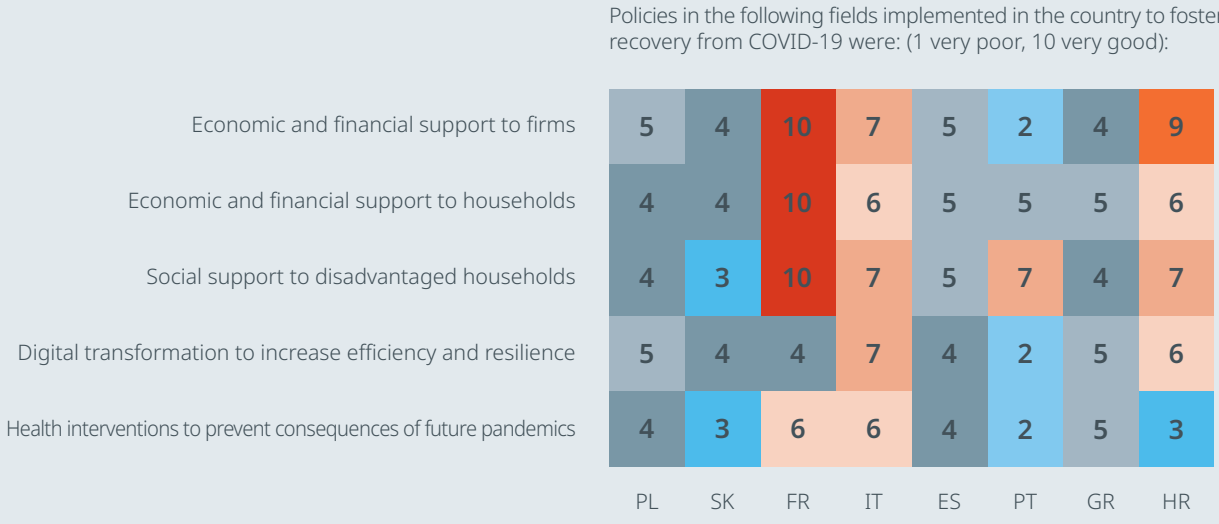


Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

Overall, a low evaluation is evidenced for crisis communication, with Poland, Slovakia, France, and Croatia scoring the lowest. The inability to properly communicate in an effective and timely manner was particularly poor in the early phases of the pandemic, but also when new waves and new variants hit the population. The issue was frequently exacerbated by the exploitation of the information in the political debate, often polarizing opinions on opposing ideological sides correlating with myopic objectives of the local and central administrators.

In terms of the policies aimed at fostering the recovery from the pandemic, the situation is even more heterogeneous. The results are described in Figure 3.3. In France and Croatia, economic and financial support to firms is rated at a very satisfactory level. The same is true for France concerning economic and financial support to households, and social support to disadvantaged and vulnerable families. From the healthcare perspective, this represents an important advantage, as healthcare demand was frequently driven by economic conditions of individuals, with economic inequality representing a significant setback for universal access to care. Relatively low scores are registered for digital transformation success, and health interventions that prevent consequences of future pandemics. The lowest scores are registered for Slovakia, Spain, Portugal and France.

FIGURE 3.3 Evaluation of the policies implemented to foster the recovery from COVID-19



Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

The Covid-19 epidemic made it evident that the EU lacks a coherent health data infrastructure in terms of health data availability and comparability. Data may be required in the modern world in order to prevent, perceive, identify, alert, respond to, and recover from any large, potentially hybrid, cross-border dangers.

The experts were also asked to evaluate the most relevant issues that the national healthcare systems should focus on at present. The synthesis of their views is presented in Figure 3.4.

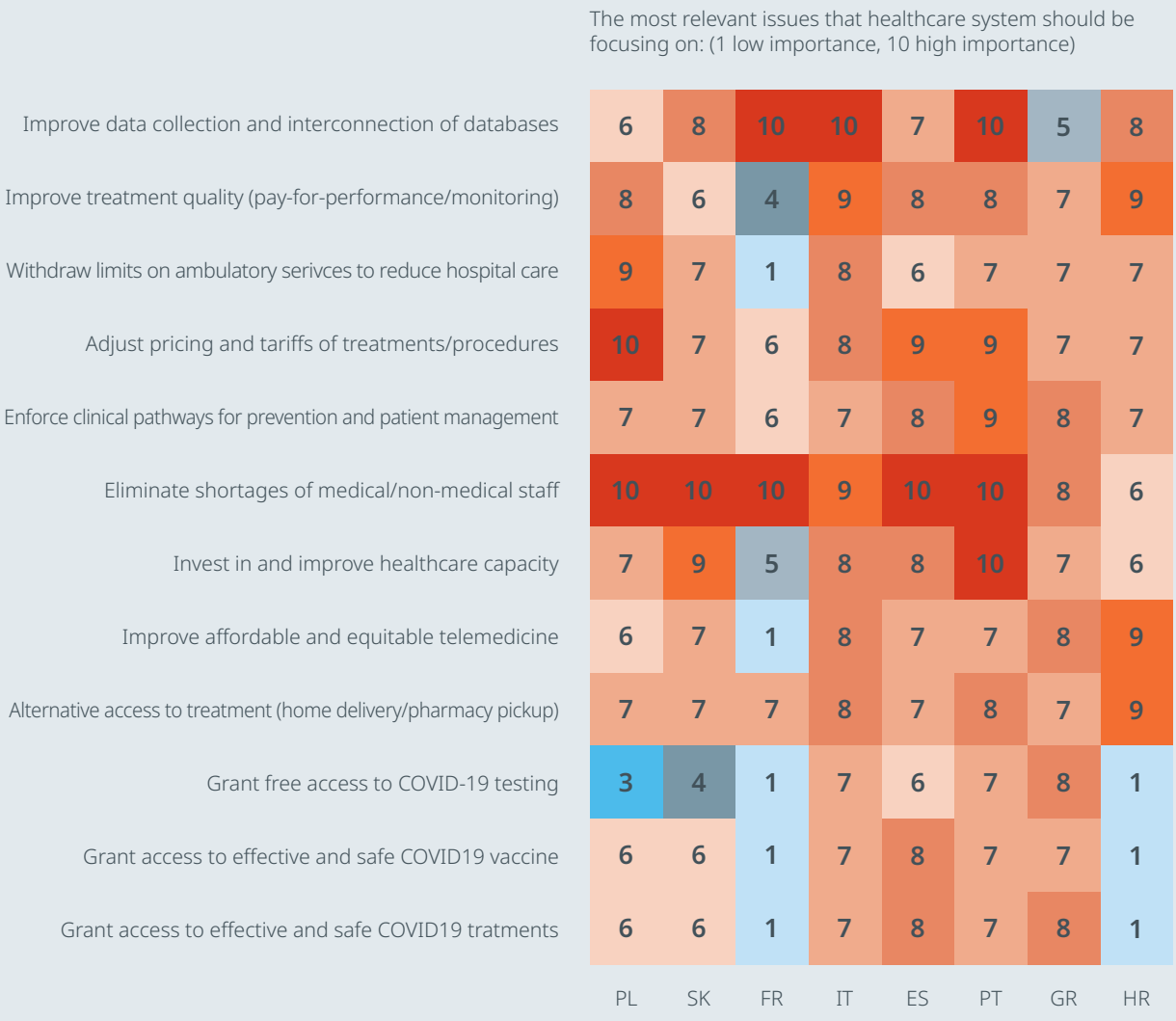
As already evidenced in the previous parts of the questionnaire, the most important issue that the experts highlight is the shortage of medical and non-medical staff. This aspect is particularly relevant in Poland, Slovakia, France, Italy, Spain, and Portugal, but also in Greece, and Portugal. According to WHO (2022), the health and care workforce is currently facing significant challenges in all 53 Member States of the WHO European Region. The largest of these is an aging workforce. According to the analysis, 40% of the medical doctors in the workforce in 13 of the 44 nations that provided data on this subject are already 55 years or older.

Additionally, the report's other main finding is that the workforce in the Region has low mental health. Long workdays, poor professional assistance, severe staff shortages, and high COVID-19 infection and mortality rates among frontline workers, particularly in the early stages of the pandemic, have all left their mark. During the first wave of the pandemic in March 2020, health professional absenteeism in the region soared by 62%, and mental health difficulties were documented in almost all of the member states. Over 80% of nurses in some nations reported experiencing psychological anguish as a result of the pandemic. According to accounts WHO received, up to 9 out of 10 nurses had indicated they intended to resign.

WHO urges all Member States to act rapidly by implementing the following 10 measures to improve the health and care workforce, even in settings that already have a workforce that is above average:

1) synchronize education with population needs and requirements for health services
2) bolster professional development to give the workforce new skills and knowledge
3) increase the usage of workforce-supporting digital tools
4) create plans to keep health professionals in rural and distant places.
5) design work environments that support work-life balance
6) protect the workforce's physical and mental wellbeing
7) increase potential for leadership in workforce governance and planning
8) improve data collecting and processing, as well as health information systems.
9) boost government spending on the workforce education and growth
10) maximize the allocation of resources for creative workforce policies

FIGURE 3.4 **Evaluation of the most relevant issues that the national healthcare systems should focus on at present**



Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

Another issue raised by the experts is data collection and interconnection of databases. The Covid-19 epidemic made it evident that the EU lacks a coherent health data infrastructure in terms of health data availability and comparability. The experts suggest that the lack of harmonization in these practices and the absence of data analysis at the EU level is necessary to promote a better response to public health emergencies. Data may be required in the modern world in order to prevent, perceive, identify, alert, respond to, and recover from any large, potentially hybrid, cross-border dangers. A major actual governance deficit would be filled by a central organization of health data at the EU level, including public health data interpreted in the broadest sense and with a permanent rather than transient nature. However, for such a structure to truly have an influence on populational health improvement and public health preparedness in the EU, it should address many forms of health data and assist numerous EU-level actors/agencies.

In order to provide timely and seamless portability of information and improve the health of people and populations around the world, various information systems, devices, and applications (systems) must be able to access, exchange, integrate, and cooperatively use data in a coordinated manner, both within and across organizational, regional, and national boundaries. Data need to be accessed and shared correctly and securely across the full spectrum of care, within all applicable contexts, and with relevant stakeholders, including the individual, thanks to health data exchange frameworks, application interfaces, and standards.

Recently, the European Commission has put emphasis on empowering people through the Digital Transformation of health and care. It identifies three top priorities:

- citizens' secure access to their health data, including across borders, enabling citizens to access their health data across the EU;
- personalized medicine through shared European data infrastructure, allowing researchers and other professionals to pool resources (data, expertise, computing processing and storage capacities) across the EU; citizen empowerment with digital tools for user feedback and person-centered care using digital tools to empower people to look after their health, stimulate prevention and enable feedback and interaction between users and healthcare providers.

Another imperative issue is related to prices and tariffs that do not reflect actual costs for the providers. In Poland, the DRG-system (JGP) introduced in 2008, is supposed to fully cover all hospital expenses, with exception of major investment costs and expensive medicines. It has not undergone a thorough update since then, and as a result, it does not support current, efficient treatment approaches. The disparity is exacerbated by the fact that tariff valuations lag behind real cost rises. On top of that, the hospital infrastructure in Poland is dated, with aging equipment and an urgent need for renovation. Many public hospitals have been unable to adequately invest in infrastructure due to debt-related issues. Highly specialized clinics are reimbursed at the same rate as nearby general hospitals since the DRG system does not consider reference levels. Additionally, it does not permit enough reimbursement for complete care for patients with multimorbidity, hence it is more profitable for a hospital to discharge the patient and repeat the hospitalization. The DRG system similarly discourages the performance of procedures in outpatient or day-patient settings.

The lack of funding and indebtedness is also evidenced in Spain. Despite the expenditure as a share of GDP falls way below the average of developed countries, the healthcare system continues to be among the best health systems in terms of breadth of coverage, benefits, and quality of care. The experts however highlight that the system is characterized by bureaucratic and centralized structures. As a result, flexible management of healthcare demand by the health centers is limited due to the lack of scientific, professional, or remunerative incentives for staff, with rapid responses and with the desired quality. Hospitals also feature long waiting lists, especially for disadvantaged social groups. The experts highlight that the shift of several procedures to the ambulatory setting should be promoted.

Free access to COVID-19 tests, vaccines, and treatments are not among the top priorities as assessed by the experts, especially in France and Croatia. The reading of Figure 3.5 suggests that France and Croatia offer free COVID-related diagnostics, prevention, and treatment. Also in Poland the COVID vaccination system rated to work very well, allowing a quick opportunity for those willing to be vaccinated.

Access to care is rated very well in France and Spain, but also in Italy and Croatia. In Spain, the experts point out that universal coverage is also complemented by exceptionally well managed access to organ transplants, based on a large network of solidarity in organ donation. In this perspective, the data on Spanish transplants reveal that Spain makes 20% of all organ donations in the European Union and 6% of those registered worldwide. Likewise the Spanish health system is a leader in services such as assisted reproduction or the childhood vaccination schedule.

When it comes to data collection, Poland is the one with the highest experts' score. A successful solution in the country has been the introduction of electronic referrals and, in particular, electronic prescriptions, which limit the need to visit the medical facilities in person.

The quality of healthcare professionals is rated very high in Spain. According to the experts, the majority of people who access a health career do so by vocation, and the quality of health training in the country is very good, demonstrated by a high EU demand for professionals trained in Spain.

FIGURE 3.5 Evaluation of the extent to which the country offers best practice solutions

Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

3.2 IMPROVING COORDINATION IN BIOMEDICAL SUPPLY CHAINS

Supply chain disruptions can occur for many reasons, including natural disasters, acts of war or terrorism, supplier bankruptcy, labor disputes, cyberattacks, and data breaches. COVID-19 pandemic has added further dimensions to the disruption: *i)* it affected not only the supply but also the demand for products and services, *ii)* it presented a high level of uncertainty on the size and length of the disruption, and *iii)* it had a simultaneous impact on various geographic areas.

For these reasons, the COVID-19 pandemic shone a bright light on the weaknesses in the healthcare supply chains. Over the years, the complexity and opacity levels of all supply chains worldwide increased, including those for critical medicines and medical equipment, posing major vulnerabilities to all countries during pandemics. In recent decades, the problem has been exacerbated, with supply chains becoming more complex and reliant on offshore manufacturing, often spanning multiple countries and just-in-time modes of production that prioritize quick turnarounds on orders and warehousing as few goods as possible. Often the complexity becomes opacity generating dangerous situations of upstream monopoly.[7] One of the main causes of this behavior is the continuous attempt to reduce supply costs, which has pushed many medical manufacturers offshore to take advantage of low-cost labor as well as tax incentives. Over time, this has led all Western countries being overly dependent on offshore manufacturing for many essential healthcare items.

From a pure market perspective, the globalized economic geography has guaranteed significant savings and other benefits to producers and consumers at the cost of decreased national autonomy and greater vulnerability to exogenous and geopolitical shocks, with a single broken link capable of interrupting the entire chain. In the end, the pandemic has dramatically shown that all countries lack adequate mechanisms to coordinate their domestic and international activities on supply chains, vaccine development, and disease surveillance. In this way, they are exposed to the risks of depending on fragile, overextended global supply chains for essential medicines and critical supplies. This implies that they cannot afford to develop and implement domestic preparedness policies and initiatives in isolation, without considering international factors that help determine their success. A good example is the shutdowns that occurred in China in January and February 2020. These economic decisions at the national level quickly reverberated across global markets in a context where some productions are highly concentrated within a particular country. In a few weeks, decreased production in China and increased worldwide demand for medicines, PPE, and other critical supplies led to shortages in the United States, European Union, and elsewhere, reducing pertinent countries' capacity to respond to the spread of the disease within their borders while heightening geopolitical tensions and undermining international coordination.[8] Given the limited knowledge of the structure of these supply chains, like in a domino effect situation, policymakers often reacted badly increasing the disruption of supply chains. Given the constraints on domestic production, they were faced with significant limitations in their ability to ensure adequate supplies of goods in times of crisis. In this way, COVID-19 has

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[7] This is the case of the COVID-19 swab industry. In the early months of the infection, the world realized that only two companies in the world produced COVID-19 swabs. That was the result of supplier consolidation, a phenomenon unknown in the downstream part of that industry.
[8] For example, before the start of the pandemic about 80% of all US face masks were manufactured in China. This dependency created major consequences as the pandemic spread. In particular, the U.S. struggled to procure enough face shields and masks when countries producing the bulk of these items shut down manufacturing and enforced export bans.

underscored how both crises and political responses to them can disrupt supply chains and exacerbate shortages of crucial goods. Furthermore, it has proved that relying on purely national efforts to develop disease countermeasures, without a multilateral mechanism to ensure their global manufacturing and equitable distribution is useless.

Unfortunately, the international system lacks a widely supported multilateral mechanism to encourage the joint development of an equitable public health–driven distribution of lifesaving vaccines, treatments, and devices. Absent a commitment to such a global plan, governments will continue to prioritize early doses to members of their populations - even to low-risk individuals - over international initiatives to end the crisis sooner.[10] Even within those countries, the distribution of treatments could be inequitable.

Despite all these problems and following the initial shock, firms and healthcare organizations have learned about strategies to mitigate supply chain disruptions during major emergencies without incurring exorbitant costs. Regarding firms, they have run risk assessments and implemented business continuity plans. In this way they have critically reviewed the structure of their supply chain, trying to understand the main bottlenecks and weaknesses. Further, many have diversified their product portfolio to respond to changing demands, making new products based on their existing resources. For example, some apparel manufacturers began producing PPE, and some distillers started making hand sanitizer. Finally, several have emphasized the need to bring production facilities back onshore or engage in nearshoring. Healthcare organizations had to assess which strategies can help them mitigate supply chain disruptions during major emergencies without incurring exorbitant costs. For example, while holding extensive amounts of safety stocks for a wide variety of healthcare items and/or reshoring production of a wide array of items would improve resiliency, they would be extremely costly strategies, and therefore not practical. Given that emergency preparedness is a public health imperative, solutions cannot just come from the private sector. In this case federal, state, and local governments need to assess what policy prescriptions they should enact in the wake of this experience as well.

Following Mahmoodi et al. (2021), a series of strategies to increase supply chain resiliency and mitigate supply chain interruptions can be suggested:

- **Build redundancy in the supply chain and change compensation programs accordingly.** One way to increase supply chain resilience is adding redundancy, such as carrying an extra inventory of essential healthcare items, holding excess manufacturing capacity for producing critical items, or contracting with backup suppliers. At the same time, compensation programs for managers should be introduced as redundancy is against cost-effectiveness.
- **Utilize technology solutions.** Employing a range of digital and analytical solutions can improve supply chain resilience at a reasonable cost. For example, the use of cloud-based supply platforms and real-time network visibility solutions (such as 5G technology and blockchain) can help integrate suppliers and data across the entire supply chain.
- **Gain greater upstream visibility by mapping and monitoring the supply network.** While mapping out the supply network for essential medical products can be time-consuming, it does

[10] An interesting example is a dispute between the WHO and some Western economies about deploying the vaccine "booster" dose. According to the WHO, these doses could be more effective in providing a first vaccine dose to low-income countries.

help organizations better anticipate how disruptive events will impact their supply chains. It is important to continually monitor the current status of the supply chain by having close communications with suppliers. Finally, ensure that your first-tier suppliers have comprehensive risk management programs of their own (for example, that they are mapping and monitoring their own suppliers and have alternative sources for their own highest risk suppliers).

- **Diversify the supply base.** Some have called for the healthcare industry to "re-shore" production from Asia (in particular, China). But this approach is no panacea, given the industry's desire to serve the huge Chinese market. Furthermore, since China is a sole source for thousands of items, reducing dependence on it will take substantial time and investment. For example, for certain drugs 80–90% of active pharmaceutical ingredients are produced in China or India. Healthcare organizations, however, can improve supply chain resilience by dual sourcing raw materials, if possible, and onshoring more of the manufacture of critical medical products such as face masks and shields, respirators, isolation gowns, commonly used medications, and gloves. It is important to realize that diversifying the supply chain is challenging and time-consuming, and requires significant investments. In addition, healthcare providers on fixed reimbursement incomes (as opposed to those being paid on a "fee for service" model) may have difficulty absorbing price increases for products that are no longer made in the low-cost regions.
- **Improve visibility/transparency of the Strategic National Stockpile (SNS).** Make sure that all stakeholders in the system have a clear understanding of the national repository of antibiotics, vaccines, chemical antidotes, and antitoxins as well as other critical medical supplies. This was not the case when the pandemic started and gave rise to autonomous ineffective behavior by local health authorities. Healthcare systems and manufacturers should also "open their books" and make their inventory lists available to one another so that backorders are prevented and contingency plans are employed.

3.3 HEALTH PROCUREMENT: THE CASE OF VACCINES

The development of safe and effective vaccines against diseases that cause substantial morbidity and mortality has been one of the major scientific advances of the 21st century. Vaccination, along with sanitation and clean water, are public health interventions that are undeniably responsible for improving health outcomes globally. Vaccines are estimated to have prevented 6 million deaths from vaccine-preventable diseases each year. In general, the availability and administration of a vaccine allows people to resume economic activities that were limited or impossible to carry out: the return to work, the resumption of recreational activities, the flourishing of social life. In addition, people may return to dining indoors at restaurants, traveling, and staying in hotels. All students would be able to return to school in person and hospitals could resume more elective procedures linked to prevention and intervention activities to ensure greater levels of health.

The arrival of vaccines has changed the scenario of the COVID pandemic. At the end of 2020, scientists were testing potential vaccine candidates in human clinical trials, and were at least in preclinical development, including animal and laboratory testing. At the time when this report is written, FDA and EMA

Most of the money spent on immunization goes toward buying vaccines, and the prices paid by countries vary a lot. This means that improving how vaccines are bought may make big gains. Changes to how health services, like the delivery of vaccines, are bought can also improve the quality and reach of those services by making the incentives more balanced.

have approved the vaccines of Pfizer, AstraZeneca, Moderna and Johnson & Johnson. The race for the vaccine to protect against the SARS-CoV-2 virus started in January 2020, after the genetic code of the virus was cracked in China and immediately made available to the scientific community. In just months, researchers were able to develop vaccines that seem very effective, at an unprecedented pace, given that in the past, the average time for developing a vaccine was about 10 years. Thanks to these record times, the first vaccines began to be administered in the UK and the US in mid-December. In the European Union, December 27 has been defined as the first vaccination day. As of February 2021, the most advanced countries could use three or more COVID vaccines.

Having vaccines available, on the other hand, is only the first step in getting people vaccinated. Buying things is one of the most important steps in this process. Countries can do more with their limited immunization resources if they use their money more wisely. Most of the money spent on immunization goes toward buying vaccines, and the prices paid by countries vary a lot. This means that improving how vaccines are bought may make big gains. Changes to how health services, like the delivery of vaccines, are bought can also improve the quality and reach of those services by making the incentives more balanced.

Getting vaccines for national immunization programs should follow the same openness, fairness, and honesty rules that apply to all public sector purchases. But vaccines are very different from other health supplies. First, the safety and quality of the product must be a very high priority. Second, most vaccines are supplied by a small number of producers, which gives suppliers a lot of power. Third, lead times are usually long, between 8 and 24 months, so decisions about purchasing must be made in advance to avoid running out of stock. Expertise is also needed to evaluate vaccine products. Not many governments have the means to check if suppliers in other countries meet the right standards, hence the WHO system of vaccine prequalification meets an important need.

Vaccines for large-scale immunization programs are bought using different models, which are set by the European legal framework for procurement. These range from price-based models that discriminate on prices, to value-based models that focus on how much clinicians, patients, and healthcare systems think a drug is worth. In many countries, price-based models are favored as they save money in the short term, but economics research shows that in the long term they can compromise the effectiveness and sustainability of many vaccination programs, and could put public health at risk.

In particular, procurement activities that use a "winner-takes-all" approach usually lead to big short-term drops in the price of vaccines. When Germany started buying flu vaccines based on price for the first time in 2011, prices dropped by about 30% the first year and by about 56% the next year. Prices for vaccines that were not bought based on the lowest cost model, like hexavalent and measles,

mumps, and rubella (MMR), stayed the same over the same time period. Even though price-based models can save money in the short term, they may lead to fewer people getting vaccinated (VCRs). Since 2010, the number of people getting their first dose of a vaccine that protects against measles has gone down in 12 EU states. At the same time, the number of people getting measles has gone up. After a national framework agreement was put in place in Spain in 2011, recent efforts to lower vaccine prices in all regions have led to a drop in the number of influenza VCRs (see Figure 3.6). This led to a 37% price drop, but there were also signs that VCR sales were down by 14%. In the same way, an analysis of trends in the Puglia region of Italy and in Romania found that the number of VCRs went down at the same time that the prices of vaccines went down. Overall, there is evidence that lower prices have not kept or grown VCR in different countries.

FIGURE 3.6 Influenza vaccine price and vaccine coverage rate in Spain (2005–2017)

Source: Ministry of Health, Social Services and Equality (2022)

It has also been found that price-based models make supply problems worse. For example, since Spain started buying vaccines based on price, it has been hard for the country to find suppliers, especially for diphtheria, MMR, tetanus, pertussis, pneumococcus, typhoid fever, rabies, and yellow fever vaccines, because the terms are not as good for business. In response, government officials raised the price of the MMR vaccine in 2014 to encourage manufacturers to keep making and selling it in Spain. When manufacturers find a market less appealing and decide not to join it, this can promote supply problems and limit competition. Long-term, the effect on market competition and manufactur-

ers' willingness to invest in research and development (R&D) could slow down innovation and leave some needs unmet.

As European governments become more aware of the potential long-term risks of price-based models, many are thinking about new ways of acquisition. Some options allow for more than one supplier, shorter contracts, and delivery times that take into account long and complicated production times. Some countries are also switching to buying systems that give value-added services more weight in order to increase or keep VCRs. The Spanish and Italian governments are becoming more aware that anti-vaccination campaigns and people who do not understand the health benefits of vaccines have a big effect on VCRs. This suggests that contracts for buying vaccines include value-based services that give clinicians and patients more ways to learn.

Based on these analyses, there is strong evidence that purchasing strategies based only on price can threaten the future of global vaccination programs. These strategies make supply shortages more likely and make it harder for people to understand how vaccines help their health. Also, value-added services like training programs for healthcare workers, public awareness campaigns, better patient monitoring, and vaccine registries can help get better results and make sure the programs last in the long run.

Recent recommendations from the EU Council call for countries to work together across borders in the fight against communicable diseases. These recommendations encourage the EU member states and the European Commission (EC) to work together to develop optimal vaccination policies. Manufacturers and buyers should develop consistent communication to agree on solutions that improve the health and quality of life for many people around the world in the years to come.

3.4 COMMUNICATION AND INFODEMIC DURING EMERGENCY

If clear and effective communication is generally challenging to achieve, communicating in a crisis is exceptionally difficult. Communication problems and infodemic have pervaded the pandemic since the beginning, continuing through different waves, across various topics, in different fashions, and with multiple tools. According to Wirz et al. (2022), leading a communication campaign during the COVID-19 outbreak was, at times, overwhelming, challenging, and frustrating. The reasons can be evenly split among the weight of uncertainty, the ever-changing information, and the gravity of the situation. Factors that made it a daunting task with significant consequences. Those who have worked in this field have often struggled to obtain good results.

Conveying the correct message during a pandemic crisis is difficult because individuals are often exposed to several stress factors. An epidemic like COVID-19 places a heavy toll on the public. First, it is necessary to accept the crisis and understand how difficult and uncertain it can be. However, the toll is not only related to the impact of the disease. For example, it extends to the social, mental, and financial implications of the non-pharmaceutical interventions used to control the disease. Because non-pharmaceutical interventions are costly, health authorities must engage in communication that

increases public understanding and acceptance of the interventions. This is important for securing the interventions' legitimacy, which is normatively critical in democratic societies and a prerequisite for effectiveness. In fact, many non-pharmaceutical interventions rely partly on people's voluntary compliance. Furthermore, in a prolonged crisis like COVID-19, the costs of interventions accumulate over time, creating feelings of fatigue. The communication task for authorities is further challenged by the fact that interventions need to be re-implemented as new waves of infections build up; for example, those related to seasonal changes for viruses with the season-dependent transmission or the emergence of new variants of the virus that escape prior immunity.

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All these difficulties require that health and non-health authorities know how to communicate perfectly to generate the necessary intervention understanding and acceptance. In this respect, effective and timely communication and leadership are crucial to managing any pandemic successfully. Unfortunately, in the early phases of the pandemic, this did not happen, nor improve when new waves and new variants hit the population and vaccines came into the market. Clear signals of such disruption were already available in Italy during the first few weeks. To first publicly recognize and talk about the problem was the New York Times in an article published at the end of March 2020 in its European edition. In that article, the authors criticized the Government's communication campaign stating that "if the Italian experience has anything to teach it is that the measures to isolate the affected areas and to limit the movement of the population must be adopted immediately, implemented with absolute clarity and strictly enforced" and later sentencing that "the Italian government has failed to communicate the magnitude of the threat with sufficient force to persuade Italians to abide by the rules, formulated in such a way as to leave much room for misunderstanding."[11]

However, it must be noted that during the first phase of the emergency, some of the institutional communication problems were induced by WHO gross communication errors, which often disseminated contradictory messages that fostered confusion and fears. Apart from the ambiguous relationship with China between December 2019 and January 2020, on several occasions, the WHO reversed its decisions by contradicting previous communications. This occurred when, for example, he had to give an opinion on the role of tests and masks. It started on March 15, 2020, when the WHO denied itself to stop testing the whole population, thereby retracting the initial advice to test only the symptomatic. In addition, at the very beginning, the WHO was skeptical about the mask's usefulness (previously recommended as necessary only for medical staff) and then changed its opinion. In addition, on June 6, another denial arrived, recognizing the usefulness of masks, even outdoors. Finally, the communication masterpiece was accomplished within 24 hours when, on June 9, the WHO first declared that "it is rare for asymptomatic patients to get infected", and a few days later organized a press conference and apologized for the inaccuracy of the initial message.

[11] *The full text of the article is available at the following web address: https://www.nytimes.com/it/2020/03/22/world/europe/litalia-pandemia.html*

The institutional communication has faltered significantly, also driven by a hypertrophic activity of the media. In this context, institutional communication has not been able to ensure the coherence of the messages. Instead of speaking with one voice, institutions preferred to speak in chorus, often recording tongue-in-cheek voices. In the first few weeks, all the communication channels were filled with information about COVID-19. Unfortunately, that was also the moment when those who could "occupy" the seats in talk shows became regular guests, independently of whether their role was that of an expert, a politician, or a commentator.

A large part of the responsibility for the information schizophrenic drift should be attributed to the inability of institutional communication to occupy the center of the stage, offering consistent and reliable messages and preventing policy communication from spreading conflicting messages when the epidemic curve began to spike. In this environment, local political leaders (mayors, governors, and party leaders) began to use information instrumentally. The political exploitation of uncertain information was used in political debate, often polarizing opinions on opposing sides governed by ideologies and not by rationality.

The lack of trust between the Government and the citizens became a serious problem. The relationship of trust is fundamental because it enables understanding, first and foremost, why a decision is taken and the importance of the behaviors to follow to help respect the bans and comply with the indications to protect ourselves. This is the only way to avoid underestimating the risk.

These problems occurred worldwide at different stages of the pandemic. In the US, on May 20, 2021, the National Academies of Sciences, Engineering, and Medicine held a virtual convening of public health and communications practitioners to examine the challenges, opportunities, and lessons they saw while executing effective communications and community engagement in response to the COVID-19 pandemic (Overtorne et al., 2021). Participants distinguished between misinformation resulting from genuine misunderstanding and disinformation intentionally spread by individuals and organizations. "(...), during the COVID-19 pandemic, complex information about the rapidly expanding, escalating, and evolving public health crisis was disseminated with insufficient attention to explaining why something was happening or needed to be done, or with little effort to help demystify key concepts and processes required for people to make decisions around their health. Participants noted how confusing and sometimes contradictory the messaging had been about mask wearing and the unsuccessful response to widespread concerns about the speed with which vaccines had been developed, tested, and approved. In both cases, the public health response was inadequate, providing fertile ground for misinformation and disinformation, complicating communications practitioners' efforts and undoubtedly increasing vaccine hesitancy" (Overtorne et al., 2021).

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The same problems multiplied with the public concerns about the sped-up vaccines and their side effects. According to Georges C. Benjamin, executive director of the American Public Health Association, public institutions have not done "a really good job saying, 'Here's what happens if you get this vaccination and here's what happens if you don't. [..] We've not married those two stories in a compelling way for a lot of people who are fundamentally hesitant." According to Lazarus et al. (2022), "misperceptions of COVID-19 vaccine safety, efficacy, risks, and mistrust in institutions responsible for vaccination campaigns have been reported as factors contributing to vaccine hesitancy". In particular, in a survey run across twenty-three countries in June 2021 using nationally representative samples of 1,000 individuals, COVID-19 vaccine hesitancy was found in one-quarter of the respondents. Across all countries, vaccine hesitancy was associated with a lack of trust in COVID-19 vaccine safety and science, and skepticism about its efficacy. Among the countries examined in the report, France, Italy, Poland and Spain have been surveyed. Poland presented the lowest level of acceptance (59.3%), while Spain had the highest one (86,3%).

A list of recommendations for clear institutional communication has been offered by the National Academies of Sciences, Engineering, and Medicine (Overtorne et al., 2021), and can be distilled into four main points:

- Public health sector should build its capacity to respond in a timely manner to credibly rebut misinformation, by monitoring and evaluating messaging and its delivery;
- Voices from a group of organizations and media should unite to consistently address misinformation and disinformation in a coordinated manner;
- Public health officials and entities (and academic institutions) should educate and communicate consistently and authentically with the public in ways that build public trust before a crisis occurs;
- Public health practitioners should adopt tools like polling to understand how people with varying beliefs are interpreting information and to provide the insights needed to develop shared language that will resonate with audiences.

Given that we expect complex public emergencies to be more frequent in the future due to wars, climate change, infectious disease, and other causes, institutions of higher education should be prepared. This includes clear communication crisis management plans in place before they are needed, and emergency research funds budgeted that can quickly and easily be leveraged to conduct crucial, time-sensitive research in applied communication related to the crisis at play. Task forces should work closely with public health officials to optimize the accuracy and effectiveness of messaging and to coordinate terminology and timing of messages.

3.5 THE HOSPITAL – PRIMARY CARE INTEGRATION: THE MISSING LINK IN THE CHAIN

The health systems of all western rich countries have been structured to respond primarily to needs related to patients suffering from "non-communicable diseases". To date, significant experiences in communicable diseases were mainly those related to common seasonal influenza, for which the availability of vaccines before the epidemic emergency could quickly solve the problem.

It has thus been challenging to develop internal mechanisms of automatic responses by health professionals and patients. And despite the many rules that may have been written and codified in advance in all pandemic plans, the arrival of a pandemic can still create several problems. From this perspective, health systems are structurally unprepared and must, therefore, be rethought and reinforced. The difficulties that emerged between February and April 2020 testify to this basic unpreparedness: the lack of separate paths between infected and non-infected patients, the lack of protection tools, and the lack of integration between the hospital and the community are just some of the most macroscopic pitfalls revealed by the COVID-19 experience.

While the experience of COVID-19 has shown the total unpreparedness of all healthcare systems worldwide, it has also highlighted the importance of hospital and community medicine and their integration. On these fronts, it is necessary to work and invest in infrastructure and vocational training at all levels (doctors, nurses, administrative and technical staff). Hospitals should be designed and refurbished in a way that allows the identification of facilities to manage infected patients. The solutions include different paths to different patients to avoid infections, insulating the various areas of the hospital with separate air handling units and filtration systems, and avoiding long queues and crowded waiting rooms. Patients' hospital stays should also be reduced to the minimum for effective diagnostic practices and medical care. In this sense, hospitals will have to be rethought to operate more through telemedicine whenever physical presence is unnecessary. This is also an opportunity to improve services for patients thanks to the development of apps to communicate with hospital staff and accurately book the time and the types of services sought. It will also be necessary to build resilient hospitals able to adapt to the contingencies, preventing the lack of spare capacity in the middle of the epidemic to expand the provision of intensive care beds for treating infectious diseases.

However, such hospital re-organization requires an overall reform of the healthcare system. The lengthening of the average life span and the increasing costs of therapies determine growing healthcare financial needs. In particular, the increase in population life expectancy, which is essentially the result of the increased effectiveness of medical care and prevention, is accompanied by a progressive increase in the demographic weight of the elderly and their related chronic diseases. These phenomena, consistent with the epidemiological transition phenomenon, have recently been complicated by infectious disease outbreaks (SARS, MERS, and COVID-19), which mainly affect the elderly part of the population with several comorbidities. From a supply-side perspective, this evolution implies a radical change in the traditional healthcare organization, challenged by more patients requiring continuous attention while remaining mostly outside hospital facilities. It involves introducing sustainability mechanisms linked to supply and demand and creating markets capable of offering these links.

From the healthcare access point of view, the impossibility of providing continuous care and assistance in hospital facilities should let traditional healthcare services evolve towards a model of treatment in situ (i.e., the patient residence). Thus, the new organizational model must combine medical, paramedical, and care personnel with greater attention to prevention measures and pathological states, particularly those linked to elderly chronic diseases that often worsen the clinical, psychic, and social picture. Patient participation in the management of services is necessary as an integral part of

this model for three fundamental reasons: i) to improve collaboration between healthcare professionals and patients, ii) to ensure quality and transparency of the services rendered, and iii) to pursue a realistic degree of financial sustainability.

From the demand-side perspective, chronic patients, primarily the elderly, to a great extent need to participate in decisions regarding their state of health. This depends on the effectiveness of joint management of their daily lives with the medical, paramedical, and caregiver staff who provide the necessary care and assistance. The traditional separation between medical care and assistance is also less defined for the elderly, who, due to the intrinsic difficulties of old age as a condition of idiosyncratic and cultural distress, are increasingly exposed to the risk of new forms of discrimination and social exclusion. Therefore, in addition to controlling and managing the quality of services, participation in the healthcare system becomes an opportunity for active citizenship for the elderly.

The lengthening of the average life span and the increasing costs of therapies determine growing healthcare financial needs. In particular, the increase in population life expectancy, which is essentially the result of the increased effectiveness of medical care and prevention, is accompanied by a progressive increase in the demographic weight of the elderly and their related chronic diseases.

However, to bring the operation of these services back to the market, it is necessary to reorganize their supply in a way compatible with the market laws while simultaneously maintaining their nature of pure public services. Given these premises, a feasible reorganization of the healthcare sector will necessarily imply i) a territorial articulation of the decision-making process and ii) a set of new decision-making rules designed to protect freedom of choice (compatible with previously indicated attributes) on the consumption side and competition on the supply side. Based on these rules, the users of healthcare services, assisted according to the methods mentioned above, must have the freedom to choose among alternative offerings of services by accredited providers in competition with each other. Health reforms aimed at recovering market automatisms have so far been little tested, except in the USA, although they have been adopted, at least partially, by many other countries. These reforms, which, from a theoretical point of view, are justified by the conviction that competition on the production side always contributes to improved quality and lower prices of services, can, however, benefit at present mainly from the support of hospital activities (Gaynor, 2006). In addition, the functioning of the decentralized reorganization of the public health area implies adopting new procedures for forming national quantitative and qualitative parameters and their articulation at the local level. It also requires the adoption of new approaches to monitoring the behavior of public operators involved in the production of health services.

The articulation at the local level of the production function of health services should be no longer carried out according to extra-economic criteria but based on a "first market automatism" (the visible hand of the quasi-market in which the State and its territorial articulations operate), expressing the standards of quantity and quality of health services produced and offered at the local level. And the choice of local producers can take place, for example, through a procedure of regulation based on a

public auction to select among the local producers who practice the best conditions. On the demand side, a second "market automatism" (the invisible hand of the competition market) can be activated by non-profit institutions in the form of co-managed cooperatives (Abildgaard and Vad, 2003). These cooperatives, which may include the families of current and potential consumers, as well as patient associations, playing the role and function of the institutional entrepreneur, would buy on the market the "packages" of health services, evaluated quantitatively and qualitatively more convenient at their acquisition cost. On the one hand, the cost would be determined by the interaction between the local public sector and producers of services and, on the other, by the "pressure" exerted on producers by cooperatives and other intermediate consumers.

In the new system, new forms of assistance will also emerge. On the one hand, a “patient-centered model”, already in use in advanced hospital facilities, will become more and more generalized, with medical personnel of different skills and specializations rotating around patients with different origins and needs to ensure the best “just in time” mix of health services. On the other hand, even though medicine will retain and even increase personalized attention to the individual patient, virtual interactions between patients, doctors, and the general public will become the norm, with online transactions and operations from home. After dealing with minor injury management and routine illnesses without going to their family doctor or visiting the emergency room or local clinic, patients and doctors might consider virtual consultations a preferred choice. Virtual visits, often in the past looked at with distrust for possible confidentiality and security issues, have become the focus of the action plans of family doctors all over the world. As reported by an English doctor in an interview with the New York Times, "we're seeing ten years of change in a week. In the past, 95% of contacts with patients were face-to-face: go to your doctor, as it has been for decades, centuries. But that has changed completely[12]."

[12] *The full text of the interview is available at the following web address: https://www.nytimes.com/20*

BFF INSIGHTS

4

IN SEARCH OF A MORE COMPREHENSIVE AND INCLUSIVE EU COOPERATION

One of the shortcomings of the past two years is that instead of a coordinated response to a single, global threat, there was a patchwork of occasionally incongruent strategies, which frequently caused confusion and divisiveness. We have all now come to understand the importance of a comprehensive "one health" strategy built on multilateral leadership, collaboration, and the dissemination of research and technology.

The majority of European Union member states have taken slow, sporadic, and erratic action, like blocking internal borders and restricting the free flow of protective gear and medical technologies. The EU, a project that took decades to construct, is suddenly in danger of failing, and trust between nations is eroding. The fear of the unknown is causing people to seek the solidarity of their neighbors and lose interest in what happens across national boundaries.

The EU governance structure is still being developed despite having a legally binding document (the EU Decision on Serious Cross-border Threats to Health) and a specialized organization (the ECDC). Cross-border health concerns are a crucial example of when harmonization and coordinated response should take precedence over national boundaries. The EU framework is still severely constrained by the requirement to respect the competencies of EU member states, and there are still large gaps in the implementation of the EU Decision on Serious Cross-border Threats to Health.

A number of issues will need more focus if the EU wishes to increase its readiness and reactivity in the face of upcoming pandemics. In this regard, the experts were asked to evaluate the extent to which selected interventions and policies require an EU integrated approach. Figure 4.1 synthesizes their views.

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FIGURE 4.1 Evaluate the importance of interventions/policies that require the promotion of an EU integrated approach

Source: Own elaboration of the results of the survey "European public health: a single system for healthy populations following COVID-19 pandemic experience" conducted among health professionals in Poland, Slovakia, France, Italy, Spain, Portugal, Greece and Croatia.

One of the most crucial issues to handle in an integrated manner is disease prevention and health promotion, as well as surveillance, immunization, prevention and detection of diseases. Most countries considered in the study agree on the fact that cross-sectoral partnerships within an integrated strategy must be emphasized in prevention initiatives. Although the current EU strategy, led by the ECDC, is motivated by such an integrated One Health strategy, restricted information exchange and a lack of resources make it difficult to provide early warnings of diseases and timely preventive actions. While the ECDC has provided advice throughout the current outbreak on contact tracing, social distancing, and the standards for COVID-19 patient discharge. and the European Commission released testing strategy guidelines, these recommendations are not legally enforceable on EU member states. There is a need for coordinating measures to contain or mitigate the spread of communicable diseases, even though it is obvious that the adoption of severe measures like quarantines, school closings, and suspension of economic activities need to be adapted at national or even regional and local levels. Localized restrictive actions can have significant implications on other states, where contrasting measures might cause significant cross-border flows of individuals, making an already challenging situation worse. At the same time, further emphasis should be placed on health promotion and the implementation of mechanisms for more effective detection of diseases, in particular cancers, which are still the most common causes of death among EU citizens.

The experts also highlight the importance of an integrated approach in the matter of health data collection, interconnection and exchange. In the long term, the experts suggest that is should be possible to exchange full medical records between all EU countries, which would increase the chances of correct diagnosis and treatment. It is also essential to share data in order to comprehend a development of an epidemic outbreak and adjust response strategies as necessary. The lack of uniformity among data is a significant barrier that the ECDC faced during the COVID-19, even though the ECDC has the ability to gather and disseminate data. Despite the fact that EU member states share data, there are frequently considerable differences in the quality and level of detail. The ability of EU institutions to learn in real time from data at the EU level has so far been limited, which constrains the EU ability to respond to cross-border health issues. Next Generation EU is is a significant step forward regarding the coordination among EU countries of best practices in digitalization and the transition to a more sustainable economy, among others.

What emerges the experts views is that from a policy standpoint, it makes little sense to construct healthcare facilities at the national level. It is less effective to overstock medications at the national versus the European level, and joint efforts in the provision of vaccinations and treatments is likely improve the ability of each single country to fight any health threat.

Several domains of a EU integrated approach raised by the experts refer to the broad concept of health as a global public good, which especially in a construct such as the EU, promoting free movement and labor mobility across borders of single member states, need to be addressed. In the following paragraphs, the report discusses in more detail the most salient issues in this regard.

4.1 HEALTH AS A GLOBAL PUBLIC GOOD

As with all pure public goods, the consumption of health services, alongside a merit character, includes a socially compulsory element. This is especially true for vaccines, but should be extended to all prevention practices, including hygiene, life styles and nutrition. However, despite its merit nature, the fact that health is a global public good cannot completely obliterate people's autonomy of judgement with regard to the quantity and quality of services consumed. To this end, it is necessary that health protection services are produced and distributed within a quasi-market. This should be characterized by the regulatory presence of the public sector, including the State and the multilateral organizations, with prospering industry and thriving innovation, but quantity and quality of the services also guaranteed for all.

Within the quasi-market, it is necessary that the services offered and consumed are of high quality, produced in an efficient way, delivered with effectiveness, responding to consumers' expectations, fiscally justifiable and distributed in a fair manner. Quality concerns the way in which the consumer is treated in terms of courtesy, care, speed and the competence with which the services are offered. Efficiency, given the level of resources used, means that this level is the best possible in terms of quantity and quality. The response to the expectations of consumers of services is aimed at ensuring respect for the dignity of the patient, in view of the fact that, for each person, the consumption of a particular health service must be compatible with the principle of the autonomous individual formulation of her will.

Individual autonomy, which the organization of the health area must respect, must be ensured through the fulfilment of the conditions necessary for its full satisfaction. The tax justification dictates that compliance with the public rules is counterbalanced by the acceptance of a sustainable and fair tax burden on the part of the international community as well as of the tax payers. In this respect, it appears desirable that specific international tax proceeds be earmarked to the provision of international health services, as it may occur with the provision of vaccines and the global corporate tax. The fair distribution of services implies further that they should be evenly distributed from the territorial point of view or from the point of view of access to their use, so as to mitigate inequalities and eliminate any social discrimination caused by differential access to health services.

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In sum, the experience of the provision of health services under COVID-19 has been dismal, taxing and yet and extensive in both its social consequences and its learning aspects. Public health institutions at country level, including Ministries of Health and regional and state government agencies have re-claimed a leading role during their fight against COVID-19 against the bustling private health sector. In spite of the stress on national health systems, in developed countries this has given new legitimacy to government actions and public goods' provision, while in developing countries the performance has been mixed, because of lack of resources and governance

problems. As seen above, at the international level, after a phase of intense critique and pressure on WHO, multilateral organizations appear to have gained new grounds for legitimacy and positive expectations on the part of the international community. Consensus and positive expectations appear to have risen, in spite of current funding difficulties, also for NGOs and civil society initiatives.

More generally, the pandemic has exposed key elements of vulnerability of the present health systems, in as much they rely on a demand driven paradigm with patients passively consuming pharmaceutical products and medical services. COVID-19 has shown that these systems were unprepared to the pandemic, lacked emergency plans, and where neither robust nor resilient with respect to the stress caused by patients' crowding in frequently desperate conditions. While the science community and the pharmaceutical industry joint reaction was timely and powerful in discovering and producing new effective vaccines, the industry was unprepared and the reaction inadequate especially in the growing vaccinal divide and the ever more dramatic increase in health inequality between the developed and the developing world.

Several market and government failures appear to be at the root of these systemic underperformances. On the one hand, the health industry is torn between the search for profit and the difficulty to maintain a feasible business model in the face of the long term payoffs and the high risks of pharmaceutical and biomedical research. On the other hand, the very success of biomedical practices in keeping patients alive for longer and longer lifespans increases the percentage of older people with disabilities or chronic diseases. This fact has been a key ingredient of COVID-19 high infection and mortality rates, since the virus was especially infectious and lethal for older people with health fragilities. The fact that most patients have chronic diseases also imply that willingness and capacity to pay are concentrated in older consumers and richer countries and that vaccines and other preventive medicines are undervalued and underfinanced.

This raises the problem of medicine as yet another case of public investment under-provision. As a global public good, health services are under the direct responsibility of the state and of intergovernmental bodies, with NGOs and civil society assisting on the sidelines. However, while health products and medical services are easy to identify, health infrastructure is much more difficult to plan, administer and assign. Aside from public hospitals and public campaigns for specific diseases, public investment in the health sector has been confined to some financing of selective medical schools and high level research facilities. Both the overall size, but also the scale and the scope of public health investment worldwide has been lacking. Public investment has been falling in spite of the fact that health expenditure in all countries was large, with the USA reported by WHO to be at the top of the list of developed countries with over 18% of GDP, with 46% coming from the government. In contrast, 11 OECD countries spent less than 12% of GDP, but their government contributed to more than 80% of total health spending. For example, a whole series of actions that became a priority during COVID-19 had no precedent support by the public sector. Thus, in most countries there was virtually no public investment in information sharing, public health prevention measures, protection of health workers, promotion of healthier behavior, ensuring continuity of essential health services, and establishing reliable supply chains. Public health labs were successfully established during the pandemic,

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but they were often improvised and could not count on accumulated knowledge, information, and a reliable supply of chemicals and biomedical equipment.

Lacking public investment in health has been caused by a mix of circumstances that include peculiar forms of market and government failures. On one hand, there is a robust association between the demand for health and incomes, and consumers increasingly invest in the quality of life, of which health appears to be a key ingredient. However, lack of foresight and excessive discounting affect private investment in health as a form of human capital in ways similar to private underinvestment in retirement and perceived under-remuneration of pension plans. As a consequence, consumers spend too little on health when they are young and healthy, and their later, and increasing, health expenditure is typical of remedial nature, because it acts as a late substitute to investment in preventive medicine. Government failure depends on the fact that public investment tends to second private behavior by accepting earlier patterns of under-saving in human capital and by concentrating on the provision of medical services needed by older consumers with pathological conditions. These tendencies are accompanied by private and public over-investing in health services for chronic diseases at the expense of medical and research services for other illnesses, including vaccines and preventive and curative anti-infectious medicine. Paradoxically, and contrary to the panicky experience caused by the pandemic, a notion of precision medicine seemed to make roads, whereby health was increasingly under control by the medical community and patients could count on individual and increasingly effective medical attention.

While it is difficult to predict its impact on consumers' behavior and the attitude of the medical community, COVID-19 may have changed dramatically the perception of infections as minor troubles in a world increasingly controlled by precision medicine. The very notion of the priority of increasing life spans and chronic conditions for private and public medicine has been challenged. The pandemic has pushed forward a new paradigm, with collective health rather than individual cure being the primary target of medical services, with prevention and governance as the main instruments of effective public policies.

Under these conditions, vaccination does not appear to be a simple option, but a solution embedding a whole series of enduring characteristics. These include far-reaching research capabilities at both national and international levels, potential, and permanent production capacity on a global scale, a continuous program with universal access, and zero social or country discrimination to increasingly effective immunization biomedical technologies. Again, the global tax that the G7 has just agreed to raise, and whose income could range in the hundreds of billions of euros would seem to be an adequate base for the huge public investment needed to implement this new paradigm.

4.2 MORE COOPERATION IS BETTER

In a recent Editorial, Julienne and Figueras stated that "the COVID-19 pandemic has unleashed unprecedented disruption to our lives and health systems. In this context, European countries have responded with ingenuity and resourcefulness to these challenges. Importantly, we have seen that we can learn from and support each other through this crisis and beyond by working together, across Europe and globally, to help build more resilient health systems." (Julienne and Figueras, 2022). If any, the COVID-19 pandemic has shown that multilateral cooperation is imperative for better preparedness and response, regardless of whether they come from a high-income or a low-income economy. When the crisis started, the prevailing reality involved an insane amount of nationalism, which led to inadequate supply chains for personal protective equipment such as masks, rubber gloves, oxygen, ventilators, and other crucial clinical equipment.

The EU was not an exception, with the Member States reacting in isolation. It took some time before the evolution and cross-border impact of the contagion led the EU to assume a more cooperative behavior to coordinate the efforts. The cooperation was then reinforced with the successive waves of the pandemic, and standard solutions were developed to respond to their healthcare structures' new organizational and financial challenges. Most importantly, the cooperation showed that stockpiling essential goods to meet unexpected emergencies or the reasonable provision of manufacturing capacities for medicines or vaccines depends on trustful regional collaboration.

Then the question is why in the early pandemic phases, cooperation was dismissed by all States worldwide. International organizations are known to be established at the behest of a superpower - usually the strongest form controlling the major political developments in the world - which seeks to control the global system's management. Historically, most of today's universal international organizations, including the UN, the World Bank, the International Monetary Fund (IMF), the World Trade Organization (WTO), and the WHO, were established directly or indirectly by the United States. Many international organizations (NATO and the OECD) were also set up at the US initiative (or at least not against the will). Over the years, these organizations have often served as agents of protection for the liberal global order led by the United States.

Once established, international organizations function well only if states agree on their importance and allow them to work to resolve problems that would otherwise remain unsolved because they are not restricted to individual countries. For this to happen without frictions and full effectiveness, in principle, four basic conditions should be met: i) there must be an effective international legal system with checks and balances and fully implemented treaties, conventions, and agreements; ii) there must be "perfect information" between the various members, which implies that there is complete transparency of information between countries; iii) there must be no transaction costs, i.e., the exchange of information must not be subject to a price, be it financial or linked to power; and iv) there must be trust between the various members. In this context, the organization's objective is to take joint action with a sense of co-ownership and shared responsibility. Collective decisions create a virtuous circle that generates more trust between states and more productive cooperation for the benefit of

the entire international community. Of course, just as an international organization that respects the above conditions can be the solution to many problems, one in which these principles are lacking could become the cause of further difficulties, especially in cases where limits are placed rather than solutions, as has recently happened in Europe.

The few principles outlined are the basis for the success of the many international organizations created after World War II, which have often managed to resolve significant crises and ensure global stability. The collective response was to unite in hardship. This created the League of Nations after World War I, the UN after World War II, and the OECD from the Marshall Plan to promote cooperation between countries and reconstruct Europe. The results of these initiatives were broadly positive, especially in the health field. Smallpox eradication, HIV control, and containment of SARS, MERS, and Ebola infections are examples of international collaboration being the main driver for achieving unprecedented success.

The climate of international cooperation described continued to persist at least until the terrorist attacks of 11 September 2001. Since then, the relationship between the United States and three major international institutions has been deteriorating. The first relationship to worsen was that with the UN, in which the US could not persuade other Member States to fight against countries that allegedly sponsored terrorism, such as Afghanistan, and could not even convince NATO to punish the producers of weapons of mass destruction, namely Iraq. On that occasion, countries like China and Russia blocked the UN Security Council from passing any resolution supporting US policies. Moreover, many US allies in NATO have not endorsed its foreign policy in Iraq. From then on, the multilateral institutions created to maintain a status quo in line with the American strategic vision began to fail to respond to the task for which they were born. These conflicts have subsequently expanded from security to economic policies, opening up to the influence of other global powers. According to (Allen & West, 2020), one of the most critical changes in world foreign policy coincided with the time when the most important "rising" power, China, challenged the US for leadership in international institutions, a field in which the US had long dominated.

These problems were further exacerbated by the appointment of U.S. President Donald Trump, who began to pursue both a more nationalist security policy and a more protectionist economic policy. Trump's slogans of "America first" or "America Only" required a unilateral and nationalist foreign policy orientation, ruining relations with potential adversaries or neutral states and most allies. Thus, populism has risen and seriously undermined the spirit of international cooperation and the functioning of multilateral institutions. In addition, the United States withdrew from some important global multilateral platforms putting an end to political and financial support. Due to the actions of the US government led by the Trump administration, international organizations have lost their effectiveness and responsibility. With a domino effect, this has also led other countries to question the role of such organizations.

The coronavirus pandemic has only brought out in all its drama a phenomenon that has been going on for almost 20 years and exploded on this particular occasion, further increasing suspicion towards international organizations. The WHO, responsible for the promotion of healthcare for all peoples and their protection from public health emergencies, has been heavily criticized for its inaction toward China over the failure to provide accurate and timely information on the progress of the epidemic, thus becoming the main culprit in the poor management of the global spread of the virus. Obviously, this situation has generated heterogeneous responses according to the particular pre-existing ideological positions of individual countries. The need to maintain strong international cooperation remains valid for those countries that were and remain convinced that they are in an increasingly globalized world. In the case of health, this can only be done through strengthening the WHO. On the contrary, for those countries that consider China's growing influence in international affairs to be the main problem to be tackled, this episode is proof of Beijing's influence and China's ability to manipulate international institutions. Finally, for those who tend to mistrust globalization, the spread of COVID-19 is a "textbook case" for initiating the process of reversing globalization and thus gradually weakening international organizations.

However, as UN Secretary-General António Guterres pointed out: "The COVID-19 pandemic is a tragic reminder of how deeply connected we are. The virus knows no borders and is a global challenge par excellence. To combat it, it is necessary to work together as one big family." Viruses know no boundaries, spread everywhere in the same way, and affect everyone equally: from this point of view, they are very democratic! But if this seems to be an obvious statement, it remains challenging to understand why it should not seem so apparent that a pandemic is a global problem requiring a global response. And global responses (both short-term and long-term strategic) must be coordinated among states. Unfortunately, the real problem is that, often, international organizations become ideal scapegoats, used by national and local governments as the perfect outlet for their constituents' discontent.

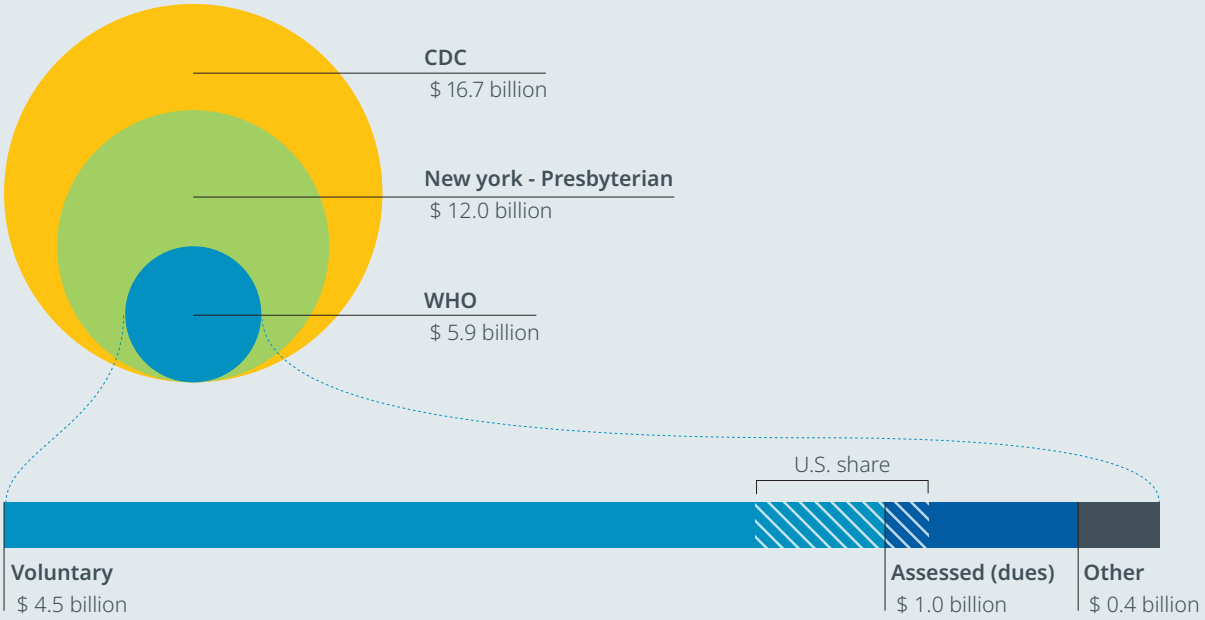
For all these reasons, strengthening international cooperation standards would be valuable and necessary. It is worth recalling that the WHO has played a vital operational role in responding to the pandemic in recent months. This has been particularly true of those countries, which are the vast majority, that do not have an equivalent center for disease control and prevention as in the USA (CDC) or Europe (ECDC) and rely on the World Health Organization for information and analysis on the disease itself. Virtually everything that International Governmental Organizations (IGOs) like the UN, the International Monetary Fund, or the WHO can do is nothing but the result of what governments (especially those of the most powerful states) want collectively. When governments disagree, IGOs cannot act. It is easier to blame an IGO for its inefficiency than individual States, just as at the national level, can blame Parliament as an institution for lack of action rather than individual members making up the legislative body.

4.3 LIMITATIONS AND WEAKNESSES OF INTERNATIONAL COOPERATION: THE CASE OF WHO

To understand how limited the activity of International Governmental Organizations (IGOs) can be today, it is helpful to analyze some mechanisms which regulate the scope of WHO action and the level of funding it receives in the context of the current COVID-19 pandemic. According to Mathews et al. (2020), everything the WHO can do is defined under the International Health Regulation (IHR), which defines its duties and responsibilities and has very sharp boundaries about what it can do. In particular, the rules laid down in the IHR do not allow the WHO to have sufficient investigative authorities and resources to guide and coordinate adequate international responses to pandemics, mainly because the Member States are reluctant to expand those authorities and their funding. These limits reduce the capacity of the WHO to promote pandemic prevention, detection and response. Furthermore, they do not allow the WHO to enable the complete adherence of individual Member States' responses to the IHR rules. The WHO plays a coordinating role but cannot operate in countries without permission from national governments. Furthermore, the WHO does not have an independent capacity to collect intelligence information and cannot apply the IHR requirements on information sharing and transparency. Although binding on the Member States, the IHR does not give the WHO the authority to impose sanctions against countries for non-compliance; at most, it can publicly recall recalcitrant governments.

The last point worth highlighting is the very limited WHO annual budget. In the face of a large mandate, the WHO had a budget of only USD 5.9 billion for 2018-19. This budget is far lower than, for example, some of the leading US hospitals and the CDC (see Figure 3.1). For the two years 2018-19, the WHO devoted $554 million, less than $300 million annually, to implement its core activities in health emergency management. According to Mathews et al. 2020, in addition to the COVID-19 pandemic, the WHO emergency program is currently managing the international response to the Ebola outbreak in the Democratic Republic of Congo, health emergencies in Syria and Yemen, and the Rohingya crisis in Bangladesh. The program also responds to hundreds of "acute" global health events. More recently, they have been monitoring the Monkeypox outbreaks. The WHO emergency program has insufficient resources and lacks a large-scale emergency response capacity. All this occurs even though the WHO is the only global authority devoted to global health.

FIGURE 4.1 WHO budget compared with NewYork-Presbyterian Hospital and the CDC (2018–19)



WHO is highly dependent on voluntary contributions, including from the U.S., its largest funder.
In 2018-19, the U.S. contributed $ 0.9B, 15% of the total budget.

Note: New York-Presbyterian data is the operating revenue in 2017 and 2018. CDC data is the agency budget authority in 2018 and 2019. All data are expressed in billion in current price.
Sources: World Health Organization; ProPublica; U.S. Department of Health and Human Services.

As mentioned before, an international organization can only exercise its authority competently if there is the strongest possible commitment of its Member States, which requires both money and interest. If the Member States do not invest in it, no international organization can afford to manage such complex problems. Member States must rethink the financial burden-sharing arrangement for WHO. Only 16% of the WHO budget derives from the assessed contributions of its members, and the remaining 84% depends solely on donations, which cannot be guaranteed forever and require much effort to be collected and managed. At the same time, Member States must be willing to play a vital and strategic role in the governing bodies of the organization. Without such a strong commitment, the WHO will lose its leadership when it comes to global health. At that point, any other actors that could fill the gap will not be able to be as representative and inclusive as the WHO, and this cannot be in the interest of most governments. Furthermore, with issues related to life, death, well-being, and social cohesion, inclusiveness and transparency are crucial. This is true at any level of geographical aggregation: It could be the regions within a State or the States within regional areas such as the EU.

These arguments have pushed several experts to consider the necessity of a "new era of health diplomacy". According to Auer (2021), issues related to global health need better governance when it comes to multilateral cooperation. COVID-19 has revamped the discussion for a new and better organization of pandemic emergencies. "All the ideas being floated about a new legally binding Pandemic Treaty, whether to set the Emergency Councils at the level of Head of States and Governments and so on, should not undermine certain key principles: Fragmentation of responsibility for global health must be avoided, and all initiatives must be anchored within the WHO or under its umbrella." (Auer, 2021). Recently, these concepts have also been discussed in the final report by the "Monti-Commission," the Pan European Commission on Health and Sustainable Development appointed by the Regional Director of WHO EURO (Pan European Commission, 2021). In the Report, the authors discuss several reasons why future crisis management requires investment in health and sustainable development.

The take-home message from these examples is simple: though we hope to go "back to normal" in our daily lives, this cannot be our goal for health policy. "There is no way we can go back to the old normal in international or multilateral health policies predominantly characterized by neglect or the defensive mode of protecting one's cherry garden of competences. The cultural, social, and economic shocks this COVID-19 crisis created should be the trigger to leverage better preparedness and response in the future. Everything will depend on the willingness and readiness of governments to move and enact change. If inertia prevails, the usual legalistic and casuistic debates will start all over again, nothing will be achieved. And the next crisis of this magnitude will occur. There is no doubt about that" (Auer, 2021).

4.4 VACCINE NATIONALISM

COVID-19 vaccine development and production represent an excellent example of the role of international collaboration and international organizations. Since February 2020, enormous efforts have been made to speed up vaccine discovery, its subsequent production, and deployment. The challenges and the efforts needed were enormous and required a great deal of collaboration among all countries.

Unfortunately, this collaboration was lacking in the early months of the pandemic. The absence of a collective response to develop and distribute worldwide a coronavirus vaccine raised many concerns, where the rich countries implemented vaccine procurement strategies with individual contracts to meet the therapeutic needs of their citizens. According to Oxfam, a group of rich countries, representing 13% of the world's population, had reserved about half of the first batch of vaccines expected to be available in the first year of production. The United States, the United Kingdom, the European Union, Australia, Hong Kong and Macau, Japan, Switzerland, and Israel have signed agreements with manufacturers for 51% of doses. It is widely accepted that this trend of "vaccine nationalism," which is countries' desire to develop their vaccine, cannot end the crisis but perpetuate it. It will lead to the same problems experienced initially when several countries rushed to procure personal protective equipment such as masks, gowns, and disinfectants.

Early vaccine nationalism caused pointless accumulation in some countries, price spikes, and potentially lethal deficiencies in others. This state is in no one's interest and, represents a short-sighted strategic choice: In an interconnected world, no country is safe until every country is safe. Moreover, vaccine nationalism would condemn many countries to prolonged suffering, which means slower economic recovery worldwide. Global coordination of vaccines distribution is therefore essential. Furthermore, cooperation is important from the production side as it minimizes the risks of failure in domestic production, ensuring that each country has access to a solution. A cooperative approach is morally right, intelligent, efficient, and can speed up the recovery.

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However, this type of cooperation cannot stem from individual country initiatives. To ensure a collaborative approach, international institutions are needed. In February 2020, the WHO brought together 400 leading vaccine researchers to identify research priorities. Then, to help find effective treatment quickly, it launched a "Solidarity Trial", an international clinical trial involving 90 countries. In addition, the WHO developed research protocols in more than 40 countries in a coordinated way, and around 130 scientists, funders, and producers worldwide have signed a declaration committing to work with the WHO to accelerate the development of a COVID-19 vaccine.

This massive effort of the WHO also led to the launch of the COVAX Global Vaccines Facility initiative, whose aim was to coordinate access to a large portfolio of COVID-19 vaccines under development and to make vaccine doses available to both rich and poor countries. Moreover, the initiative pooled the financial efforts of rich countries, ensuring greater efficiency. In return, rich countries would be guaranteed supplies of vaccines to cover between 10 and 50% of their population, while poor countries will be guaranteed a share of vaccines that can protect up to 20% of the population.[13] The initiative is co-led by two non-profit groups, GAVI and the Coalition for Epidemic Preparedness Innovations, together with WHO. Nine vaccines were present in the COVAX portfolio as of October 2020; two were in the final test phase and production. Other potential vaccines were added, giving the world the best chance to find more effective vaccines.[14] The winning principle of the COVAX initiative was to provide a form of "insurance" to individual countries because of its extensive portfolio of vaccines and the resulting high likelihood of having at least one successful product. It also meant that all countries can plan the timing and size of the vaccine distribution for optimal global recovery. Moreover, having more than 170 countries ensures a large-scale supply and the best collective price possible, which could be only one-tenth of what countries that have embraced the "nationalist vaccine" strategy may have to pay.

Originally the program aimed to deliver at least 2 billion doses by the end of 2021. While this was not enough for everyone, it was meant to be adequate to end the acute phase of the crisis and put the world on the road to recovery. However, some wealthy nations moved to secure their supplies rather

[13] With this agreement the WHO guarantees manufacturers a large market for vaccines and, at the same time, can negotiate a fair price.
[14] According to a document compiled by the WHO, on 19 October 2020, there were 44 vaccines in the clinical evaluation phase and 154 vaccines in the pre-clinical evaluation. The document is available at: https://www.who.int/docs/default-source/coronaviruse/novel-coronavirus-landscape-covid-19cc0232c16129498983a6e30ca94000.pdf?sfvrsn=87aa8dc9_1&download=true .

than joining a common strategy. The United States signed a $1.5 billion deal with the biotechnology company Moderna to buy 100 million doses of its COVID-19 vaccine. It also invested billions of dollars in developing its vaccine, distributing it among eight potential candidates, including AstraZeneca, Moderna, and Pfizer. AstraZeneca had agreements with France, Germany, Italy, and the Netherlands. The UK government secured 60 million doses from GlaxoSmithKline and Sanofi and millions of doses of vaccines developed by Pfizer and BioNTech.

About two years since the approval of the first COVID-19 vaccine, the global situation is worse than what was imagined when the COVAX initiative was started. COVID-19 has exacerbated world inequality in many ways, including the exposure of existing fragilities in income distribution and patterns and the enforcement of egotistic and rival behavior in consumption habits, irrational fears, and willingness to cooperate. Lack of coordination has been a major problem at the national and international levels. According to the UN, the 10 richest countries in the world have de facto monopolized vaccine consumption and supply. However, the apparent end of their acute pandemic crisis, achieved through a relatively successful mass vaccination, may represent a temporary illusion since the pandemic has spread without bounds in the rest of the world, where lack of financial resources and international coordination render vaccine supply short, ill distributed, and insecure. This condition is yet another manifestation of the unsustainable nature of the present development pattern. In this case, unsustainability depends not only on the opening of yet another dimension of inequality and global misery but also on the fact that the pandemic cannot be arrested unless a sufficient amount of immunization is realized at the global level, and this is done in record short times, because of the proven capacity of the virus to mutate into increasingly infectious variants.

Against this background of unsustainable social consequences and urgency of international actions, the decision by the G7 to endorse a minimum global corporate tax of 15% on the profits of multinational enterprises is good news. The OECD estimated that as much as $81bn in additional tax revenues each year could be raised under the reform. While the tax has been hailed as an assist to the coffers of the rich countries strained by the economic crisis, in the short run, its main use would have to be the international financing of mass vaccination for developing countries, and this aim should be pursued over and above any other debt cancellation or crisis relief target.

A moral order requires that the state of need of the entire international community is perceived and satisfied with the common help of all subjects involved, in conditions of reciprocity, where each subject feels his or her need with the states of the need of the others. The interdependence of the states of the need of all the components of the community gives rise to a communion of states of need, which finds its foundation in direct relations of reciprocity across all consumers.

Would this be enough to reverse the present pattern of unsustainable drift of the pandemic in the poorest part of the world? If the tax is raised timely and effectively, it would. The International Monetary Fund estimates that the overall cost of a far-reaching campaign aiming at vaccinating 60% of the world population within 2022 would be 50 billion $, which is an amount that even a lower-bound application of the tax would be able to collect in one year. Against this little cost,

IMF estimates the cumulative benefits, including vaccinations, diagnostics, and therapeutics, would be around 9 trillion dollars by 2025, with over 40 percent of this gain going to advanced economies. The benefits would be pervasive and could reverse some of the unsustainable aspects of the present pattern of the spread of the economic and social consequences of the virus. It would include stronger recoveries in the rest of the world with increased demand, stronger confidence effects at home, and a durable conclusion to the pandemic with a cumulative gain of 1 trillion dollars in additional tax revenue for advanced economies. This means that the combination of the corporate tax and the IMF funding proposal may pay for itself and possibly be the highest-return public investment ever.

However, these interventions meet short-term demands and do not address the structural issues that underlie the biomedical divide between rich and poor countries. This divide is another manifestation of worldwide inequality and unsustainable social inequities. To a large extent, its existence, and the dramatization created by the pandemic, points to a key structural problem in the provision of health as a global public good. The nature of global public goods of health services, in fact derives from the unique circumstance that their supply and demand depend on the existence of direct relationships among consumers, communities, and ultimately, countries.

In this regard, the pandemic has demonstrated that, unlike ordinary consumption, inequality in primary health services is intolerable. While ordinarily, a given person may consume for the satisfaction of uneven states of need compatible with those of other subjects, in fact, in the case of health, consumption gives rise to the direct and reciprocal perception of an indivisible state of need, common to the world community of all subjects affected. A moral order requires that the state of need of the entire international community is perceived and satisfied with the common help of all subjects involved, in conditions of reciprocity, where each subject feels his or her need with the states of the need of the others. The interdependence of the states of the need of all the components of the community gives rise to a communion of states of need, which finds its foundation in direct relations of reciprocity across all consumers.

After wealthier countries were well supplied, global cooperation increased: at a virtual summit on the sidelines of the 2021 UN General Assembly, Joe Biden announced an ambitious goal to vaccinate 70 % of the world population by late 2022 with the help of vaccine donations and funding from wealthy nations. Additionally, dozens of countries at the World Trade Organization have backed a patent waiver for COVID-19 vaccines to scale up global production, though some countries oppose the idea, and negotiations are likely to be slow. Russia's invasion of Ukraine has thrown another wrench into vaccination efforts, with Western sanctions hindering the use in other countries of Sputnik V, a vaccine developed by the Gamaleya Research Institute of Epidemiology and Microbiology. Meanwhile, new strains of the coronavirus, including the omicron variant and its subvariants, have raised concerns among scientists and health officials about increased transmission, waning immunity in people previously infected with COVID-19, and reduced effectiveness of available vaccines. In response, countries, including the United States, are encouraging most individuals to receive booster shots, though WHO and other health officials maintain that initial doses for unvaccinated people should be prioritized over booster shots.

Overall, the COVAX initiative has produced significant effects. Using publicly available data on the numbers of COVAX vaccine doses allocated and distributed to 88 countries and territories qualifying for COVAX-sponsored vaccine doses and 60 countries self-financing their vaccine doses facilitated by COVAX, Yoo et al. (2022) have shown that the initiative has produced positive effects. By 23 January 2022, the COVAX had allocated a total of about 1.7 billion COVID-19 vaccine doses, of which 61% doses were distributed to 148 countries and territories. Taking account of COVAX subsidies, they found that countries and territories with low per capita GDP benefited more than higher-income countries in the number of vaccines. The benefits increased further when the analysis was adjusted by population age group (65 years and older). This partly proves that the COVAX Facility has helped to balance global inequities in allocating and distributing COVID-19 vaccines. However, COVAX alone has not been enough to reverse the overall COVID-19 vaccine distribution inequality.

4.5 THE EU PANDEMIC RESPONSE

Following the initial nationalistic reaction, the EU response has shifted toward a more cooperative behavior implementing several measures and programs which have greatly helped EU citizens to cope with the negative effects of the pandemic. It took some time to activate its RescEU civil protection mechanism, which aims to strengthen cooperation between the EU countries and 6 participating states on civil protection to improve prevention, preparedness, and response to disasters. The initiative's funding was expanded, with the budget that leaped from €766.5 million (for 2014–2020) to €772.7 million (for 2021 alone). Part of the funding allocated to this program served to secure PPE stockpiling. In March 2021, the Member States agreed on a far larger budget for health: the restoration of the Health Programme as EU4Health, with a budget that grew from around €46 million a year to €5.1 billion. It also allowed to expand the remit and funding of ECDC, to agree on a "Vaccines Strategy" for procurement of COVID-19 vaccines, a Pharmaceutical Strategy to ensure a supply of relevant medicines in the future, and a new pandemic preparedness and response organization to be called HERA. These decisions represented a significant improvement in how EU policy had been changed a few years before. In particular, the decision to procure vaccines collectively through the Vaccines Strategy was perhaps the most important, given that single governments accepted to pool their resources on the single most important issue they faced.

Another important pillar over which the EU cooperation has been remarkable is its fiscal governance. By the time the COVID-19 crisis hit, the existing system of fiscal governance was mainly focused on austerity. However, in the face of the pandemic, the Commission invoked the "general escape clause" which suspended the application of the fiscal governance process and launched the Recovery and Resilience Facility (RRF), which directs funds to the Member States for general budgetary support.[15] The RFF is an action line within the NGEU program. The device is a temporary recovery tool. It enables the Commission to raise funds to help Member States implement reforms and investments that align with EU priorities and address the challenges identified in the country-specific recommendations

[15] The RFF is an action line within the NGEU program. The device is a temporary recovery tool. It enables the Commission to raise funds to help Member States implement reforms and investments that are in line with EU priorities and that address the challenges identified in the country-specific recommendations under the European Semester for economic and social policy coordination. Over a total of € 806.9 billion (at current prices) allocated to the NGEU, the RFF consists of € 723.8 billion in loans (€ 385.8 billion) and grants (€ 338 billion). This amount should be summed to the € 1,120.9 billion allocated for the 2021-2027 period by the Multiannual Financial Framework (MFF)

under the European Semester for economic and social policy coordination. As detailed in Table 4.1, over a total of € 806.9 billion (at current prices) allocated to the NGEU, the RFF consists of € 723.8 billion in loans (€ 385.8 billion) and grants (€ 338 billion). This amount should be summed to the € 1,120.9 billion allocated for the 2021-2027 by the Multiannual Financial Framework (MFF).

The RRF represents a highly innovative tool within the EU fiscal policy history. First of all, contrary to the past when only specific projects or goals such as agricultural policy were funded, the new model is aimed at general budgetary support. Second, it comes with conditionality, which means that Member States must specify the use they will make of it. Finally, these interventions are important as they set a radical change in the commitment to budgetary austerity adopted in the aftermath of the 2008 financial crisis (See Figure 4.1). The future politics of fiscal governance in the EU are likely to be quite different. Along these lines the EU is an exception as its leaders have been able to change quite rapidly the scale and scope of its work in health policy, civil protection, and fiscal governance, expanding older systems such as RescEU and the ECDC and expanding with new forms such as the Vaccines Strategy (Deruelle, 2022). "The question now is whether, over the next five years, this newly ambitious and protective EU health policy will convince the Member States and others of its utility and value." (Greer et al., 2022).

By the time the COVID-19 crisis hit, the existing system of fiscal governance was mainly focused on austerity. However, in the face of the pandemic, the Commission invoked the "general escape clause" which suspended the application of the fiscal governance process and launched the Recovery and Resilience Facility (RRF), which directs funds to the Member States for general budgetary support.

TABLE 4.1 Overview of MFF and NGEU allocations (current prices)

MFF 2021-2027 and NGEU total allocations

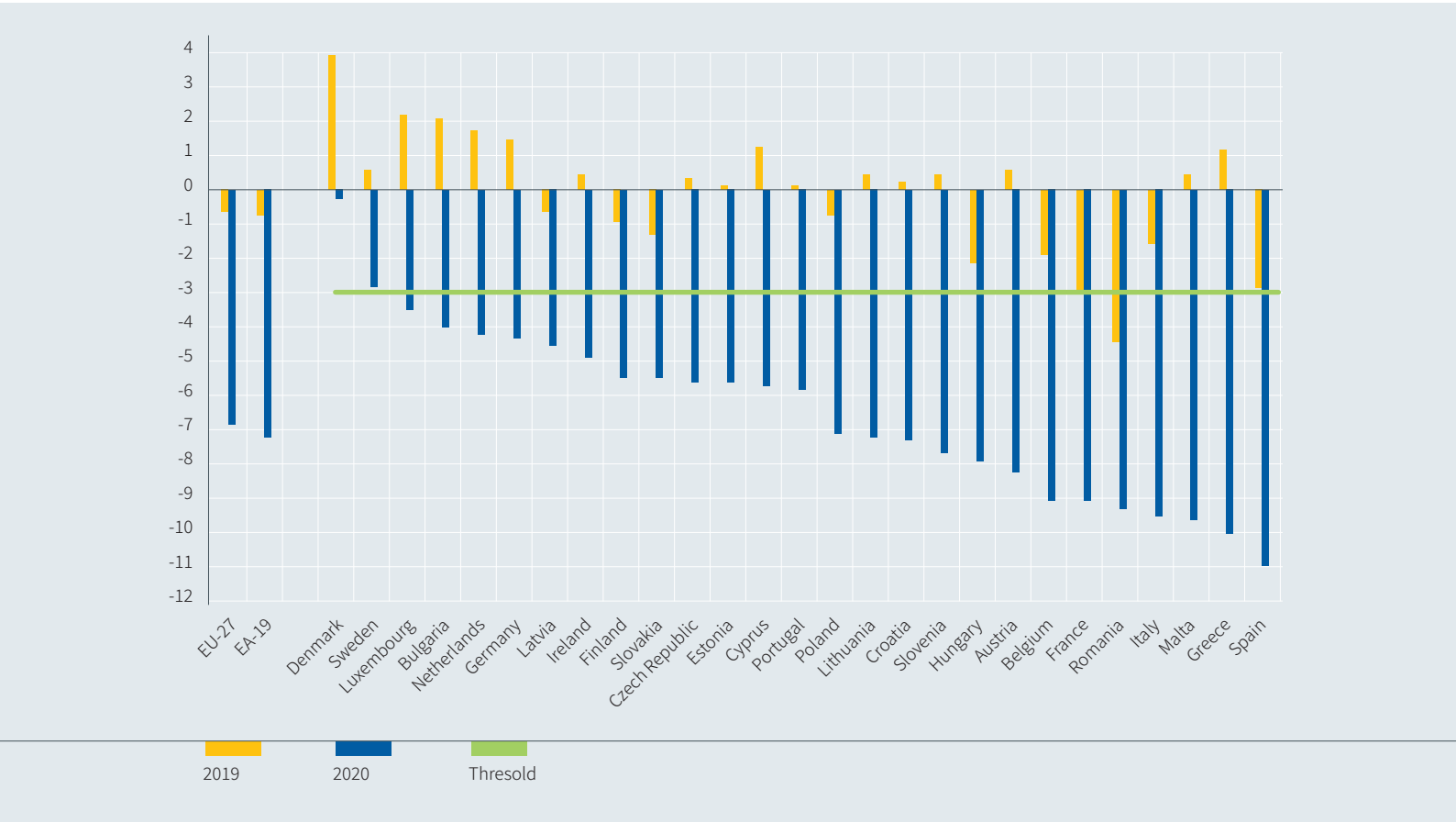
	MFF	NGEU
1. Single market, innovation and digital	€ 149.5 b	€ 11.5 b
2. Cohesion, resilience and values	€ 426.7 b	€ 776.5 b
3. Natural resources and environment	€ 401.0 b	€ 18.9 b
4. Migration and border management	€ 25.7 b	-
5. Security and defence	€ 14.9 b	-
6. Neighbourhood and the world	€ 110.6 b	-
7. European public administration	€ 82.5 b	-
Total	**€ 1,210.9 b**	**€ 806.9 b**

NGEU breakdown

RRF	€ 723.8 b
Of which, loans	€ 385.8 b
Of which, grants	€ 338 b
ReactEU	€ 50.6 b
Horizon Europe	€ 5.4 b
InvestEU	€ 6.1 b
Rural Development	€ 8.1 b
Just Transition Funds	€ 10.9 b
RescEU	€ 2 b
Total	**€ 806.9 b**

Source: https://op.europa.eu/en/publication-detail/-/publication/d3e77637-a963-11eb-9585-01aa75ed71a1/language-en

FIGURE 4.1 Public balance, 2019 and 2020



Source: Eurostat, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Government_finance_statistics

4.6 EUROPEAN HEALTH UNION: WHERE DO WE STAND AND WHAT SHOULD BE DONE?

On 30 March 2021, the WHO released a statement signed by several top government officials and by the President of the European Council and the Director-General of the WHO, recognizing how COVID-19 had shown that united action is needed for a more robust international health architecture. In particular, in the statement, they claim that *"today, we hold the same hope that as we fight to overcome the COVID-19 pandemic together, we can build a more robust international health architecture that will protect future generations. There will be other pandemics and other major health emergencies. No single government or multilateral agency can address this threat alone. The question is not if, but when. Together, we must be better prepared to predict, prevent, detect, assess and effectively respond to pandemics in a highly coordinated fashion. The COVID-19 pandemic has been a stark and painful reminder that nobody*

is safe until everyone is safe. We are, therefore, committed to ensuring universal and equitable access to safe, efficacious and affordable vaccines, medicines and diagnostics for this and future pandemics. Immunization is a global public good and we will need to be able to develop, manufacture and deploy vaccines as quickly as possible."[16]

A high level of health protection must be guaranteed by European policy, according to the Single European Act of 1986. The Act established the framework for a European public health strategy, which was later developed by the Maastricht Treaty in 1992 (Article 129), the Amsterdam Treaty in 1997 (Article 152), and, eventually, the Lisbon Treaty in 2007 (Article 168).

But what are the premises of a potential common health policy in the European Union? The European Economic Community's forefathers did not include health as a foundational element. Yet, with the evolution of the EU, there has been several occasions in which health-specific laws and legislations occurred necessary. For instance, the European Coal and Steel Community established guidelines for workplace health and safety. The European Economic Community enacted its first medicine-related legislation in 1965 to synchronize research, production standards, and licensing procedures. Diploma harmonization began in the 1970s, with the health industry leading the way. Through a sizable corpus of case law, the EU Court of Justice (CJEU) also acknowledges health rights and obligations.

With the creation of the single market, the political acknowledgement of health as one of the goals of European integration began. The single market project's increased level of integration sparked new discussions on social Europe and environmental protection that are related to the four freedoms of free movement of goods, capital, services, and people. A high level of health protection must be guaranteed by European policy, according to the Single European Act of 1986. The Act established the framework for a European public health strategy, which was later developed by the Maastricht Treaty in 1992 (Article 129), the Amsterdam Treaty in 1997 (Article 152), and, eventually, the Lisbon Treaty in 2007 (Article 168). In particular, the Lisbon Treaty stated the "health in all policies" (HiaP) principle, which defines a broad range of public health policy, including prevention of physical and mental illness and diseases, fighting major health scourges, with a specific reference to combating serious cross-border health threats, and combating illicit drugs. It also defines health as a co-equal component of economic, social, and cultural well-being and allows for the harmonization of safety standards in fields, such as blood, tissue, and organs of human origin, medication, medical devices, and in the phytosanitary and veterinary fields. It serves as a reminder that health systems and the provision of healthcare remain a matter of national competence.

The coordination of social security systems, which went into effect in 1971, has organized cross-border access to healthcare services and the continuity of health coverage across borders. With the 2004 reform that brought in European Health Insurance Cards, the rights which were previously restricted to workers were expanded to include all EU citizens. The 2011 directive on patients' rights in cross-border healthcare (2011/24/EU), which grants EU residents access to healthcare in other member states, was codified in parallel on the basis of the treaties. This led to a convoluted network

[16] *The statement can be found at the following web page address: https://www.who.int/news-room/commentaries/detail/op-ed---covid-19-shows-why-united-action-is-needed-for-more-robust-international-health-architecture*

of pathways for cross-border healthcare access. However, the most significant lesson is that in the EU, rights to healthcare have resulted from the freedom of movement of people.

As outlined by Bucher (2022), there are five domains for European action:

1) The "health in all policies" principle (HiaP) has placed a strong emphasis on health. Laws governing workplace health and safety, food safety, chemical legislation, environmental laws, specifically the air quality, noise, and water directives, and measures relating to road safety are among them.
2) Communicable illnesses framework is the most comprehensive in terms of disease prevention and health promotion. It has gradually grown over the years in order to address international health threats, coordinate joint public medical supply procurements, and implement EU-level surveillance by the European Center for Disease Prevention and Control (ECDC; Regulation (EC) No 851/2004). Also the Health Response Emergency Authority (HERA) is a significant step forward in promoting research, development, and manufacturing of treatments, vaccines, and medical supplies for health crises.
3) Non-communicable diseases EU health initiatives mostly rely on soft coordination, with funding from the EU4Health Programme. Interventions are less cohesive and more disjointed. One of the areas in which EU nations have expressed the most interest in collaboration is rare diseases and cancer. Europe's Beating Cancer Plan presently gives cancer top priority. Also common risk factors are tackled but, there is far less justification for EU-wide collaboration to address the social determinants of health (alcohol, tobacco, physical activity, and food). The single market regulation for tobacco goods is the only exception, and it has established a strict framework with significant public health effects.
4) Research is directly promoted by the research framework programs, which represent sizeable investments, particularly in the sectors of cancer, rare illnesses, social determinants of health, and infectious diseases. Since 2014, over €1 billion has been spent annually on health through Horizon 2020 and this contribution is to rise with the upcoming Horizon Europe. If life-science research and environmental research are taken into account, the impact is considerably greater, and the outputs of these initiatives feed into the HiaP principle.
5) Health systems and services remain a matter of national responsibility as emphasized in Article 168, yet European policies have an actual impact on health systems through a number of direct and indirect pathways. The freedom of access to healthcare services has been steadily established through the coordination of social security and the directive on patients' rights in cross-border healthcare. Nevertheless, the EU's actions are not promoting convergence, and national health systems' cross-border access to healthcare is still only marginal in reality. The only instance of actual cooperation between national healthcare systems occurs in the field of rare diseases, where member states perceive benefits in working together at the EU level and have established European Research Networks that cover both diagnosis and therapy.

According to Bucher (2022), another means by which the EU influences health systems is pharmaceutical legislation. A central market authorization system has been established thanks to EU regulation of pharmaceutical markets, which accounts for over 20% of all health spending in the EU. The pharmaceutical strategy of the European Commission is an EU-wide reaction to pressure from both

domestic market difficulties and international competition in the industry. It will make a significant contribution to the Health Union and is a component of the new EU industrial policy.
There is also an important dose of emphasis on health in the Next Generation EU initiative, in terms of both health-sector reforms as part of structural reform and the European Pillar of Social Rights, which has two principles linked to access to healthcare and long-term care. In the April 2021 Eurobarometer (European Commission, 2021b), 38% of Europeans thought the EU institutions' top priority should be healthcare, ranking it above tasks including promoting economic growth, combating climate change, and lowering unemployment.

However, rather than an integration paradigm, member states favor cooperation. Health systems are unlikely to converge under an international integration paradigm because the costs to national budgets would be too high. Already before the COVID crisis, it was clear that there should be room for healthcare collaboration. Topics that have always been important are numerous. For example, it may take more action against anti-microbial resistance or set minimum standards for the robustness of health systems. The EU should utilize the economies of scale of research and knowledge for non-communicable diseases and implement mechanisms for disease surveillance and the consolidation of scientific knowledge. This could be accomplished by expanding the scope of the European Centre for Disease Prevention and Control to include non-communicable diseases. In order to ensure the success of the European Health Data Space initiative, which will serve as a vital foundation for future health research, legislation, and policymaking, the EU should also promote the digital transformation of health systems and set ambitious goals for it. The EU should develop a shared understanding of the performance of health systems and how to define and measure it, warranting consistency and non-overlapping between different disjoint small projects and programs, with a special focus on measuring disparities in access to healthcare.

In fact, if anything, the crisis has taught us that multilateralism and collaboration are the right way to go, despite all that we have done over the last 20 years. The lesson has been learned also in Europe, where, in November 2020, the European Commission produced a set of proposals released under the heading of “European Health Union” (EHU), limited to preparedness and resilience. It is the first time that such an agreement is signed and, hopefully, could be considered the first step toward a potentially more harmonized European healthcare system. The proposal aims to ensure health security and care safety and to develop a stronger and more equitable European Health Union with harmonized collaboration between Member States and stronger institutions. More importantly, the proposal entails a strong global responsibility where multilateralism is crucial. However, in its present shape it represents only a set of proposals.

Health systems are unlikely to converge under an international integration paradigm because the costs to national budgets would be too high. Already before the COVID crisis, it was clear that there should be room for healthcare collaboration.

The proposal addresses several important short and long-term topics. Among the first group, there are those related to the pandemic. All of them are approached in a way to enhance collaboration and integration. Among them, there is a

set of regulatory proposals to expand the mandate of the European Medicines Agency and the European Centre for Disease Control; the proposal to adopt a new regulation to allow the EU to respond to and coordinate serious disease outbreaks. Further proposals concern the definition of the new Pharmaceuticals Strategy, the institution of HERA (Health Emergency Response Authority), the Europe Beating Cancer plan, and a regulation on cross-border health threats which gives the Commission a broader right to declare a public health emergency, and formalizes the Health Security Committee's role. A last important change deals with the joint procurement of medical goods, where the Commission proposes to exclude the possibility for Member States to hold parallel negotiations with (vaccine) manufacturers as long as they want to join the Commission efforts.

In the long-term, the EHU will address challenges related to antimicrobial resistance, the health impacts of climate change, ageing population, and evolving disease patterns. As such, it incorporates elements of the EU4Health program and its related initiatives. In specific areas of concern – namely the development and procurement of medical countermeasures (vaccines) and wider pharmaceutical supply chains – additional initiatives have been launched. The Vaccines Strategy aims to accelerate development, manufacture and distribution of COVID-19 vaccines, whilst the Pharmaceutical Strategy seeks to address structural issues within the pharmaceutical sector, primarily by revising the regulatory framework.

However, creating more union in public health policy and transforming these proposals in efficient and effective institutions and processes will not be easy. First, the EU has only a supplementary and coordinating competence in public health policy. Second, the European Commission has shaped the single market with a common commercial framework for healthcare products, covering intellectual property, R&D and open markets (via the EMA). It can intervene in emergency situations to combat major cross-border health threats and stimulate cross-border cooperation (on the basis of Article 168(5) of the TFEU). Yet it made joint advance purchases of COVID-19 vaccines on an emergency support mechanism designed for humanitarian assistance in the event of natural disasters (Art. 122 of the TFEU). Third, there is still a high sensitivity about health privacy and the General Data Protection Regulation (GDPR) at both EU and the national level. Several problems encountered by the ECDC in gathering accurate and updated data on disease contagion will remain even after the EU has proposed to upgrade and enlarge its competencies. The same problems will be faced by European Health Emergency Preparedness and Response Authority (HERA). This requires the definition of a set of comparable EU-wide data that should be collected and shared in a timely manner by the member states. The same applies to the EMA, where the lack of a single capital market and delays to a single patent law or a single EU legal framework are major obstacles, even if the biomedical industry is core to Europe's economy.

In conclusion, though the EHU is a big leap forward in terms of healthcare and safety for EU citizens, it still consists of a wish list of proposals. As noted by Nabbe and Brand (2021), advances in EU health competence have been developed after crises, with cross-border threats and crisis management representing the core topics. However, given that the EHU main goal is to be concerned about health for all, the range of the initiatives can go far beyond that. How this evolves will strongly depend on

what the EU wants, how the competences will be shared among the member states, and how it will improve all the deficiencies revealed during this crisis. More important, a key issue is represented by data needed to formulate a better view on where the EU stands in public health policy and in health research and this depends on sensitive issue of personal health data. "In the coming years, a treaty change does not seem realistic but the development of a EHU is possible inside the current treaties, depending heavily on political choices and climate. The main issue is to find common ground on what is wanted regarding health at the EU level. In this sense, debates on the topic and exchange on the willingness of stakeholders, EU institutions, Member States, and European citizens for the future should be encouraged to move forward on the EU health competence" Nabbe and Brand (2021).

Finally, as Andriukaitis (2021) suggest, there are at least three scenarios to promote the health and wellbeing of Europeans, 1) doing business-as-usual (using existing legal, financial and managerial instruments, strengthening institutions and improving the implementation of new and existing policies), 2) supplementing existing instruments by means of secondary legislation and the creation of new institutions, 3) an amendment of the Treaty on European Union (TEU) to provide the EU with the explicit legal competence in health policy to construct a real European Health Union, while preserving subsidiarity where functional. This last scenario could be considered the best for Europeans, as it will allow citizens to enjoy the many benefits stemming from deeper cooperation in health. However, the discussions by the Council of Health Ministers during the spring 2021, and the more recent discussions seem to support more an EHU based largely on the first scenario and with elements of the second.

BFF INSIGHTS

5

CONCLUSIONS

Almost three years after the pandemic started, the virus still threatens the world. At the end of November 2022, about 2 million people died of COVID-19 in Europe. Regarding excess mortality, the elderly (aged>65) accounted for 91% of all excess deaths in 2020 and 84% in 2021. Long-term care patients accounted for 40% of COVID-19 deaths and remain particularly vulnerable today.

These numbers are also the result of an epical failure: our healthcare systems were (and still are) unprepared to deal with the double burden of communicable and non-communicable diseases. On the one hand, they had to rapidly reorganize by providing more hospital beds and equipment, hiring new health workers, and often offering extra salaries to compensate for the heavy work burden during the pandemic. On the other hand, financial constraints were binding, so the solution often involved reviewing capital expenditure projects and/or stopping or delaying non-critical projects and purchase orders for non-critical items. These changes have put all levels of care delivery at risk. The rising healthcare expenditure is not sustainable, and governments will need to cut their deficits to manageable levels once the pandemic is over. If they do not, they will not be able to face the usual challenges like the aging population and rising social welfare costs (in primis, pensions, and health care). Even in the most favorable scenario, the countries will have to face significant debt, whose repayment will pose important issues, especially regarding fairness across generations.

Given the common threats, several common strategies at the EU level seem highly desirable. Sustained efforts must be made to improve systems for monitoring and collecting forward-looking and disaggregated data that help identify emerging health needs and gaps. Inter-disciplinary health research is crucial to address the impact of aging on overall demand and access to health in Europe and the fast-growing number of people with mental health conditions. Member states should put much effort into building health partnerships that are open to everyone. All the EU countries together must focus on rebuilding trust in scientific research and public health policy through inclusive and adaptable health communication policies. Free access to information and pluralistic discussion is vital to allay public concerns. Outreach and persuasion have shown to be more successful in obtaining higher vaccination rates than vaccine mandates. Last but not least, leaving no one behind should not end at the borders of the Council of Europe countries. A single response to a common global threat and increased support for COVAX and other efforts towards global health risk-sharing mechanisms should distinguish Europe's commitment to universal solidarity and a recognition that testing, treatment, and vaccines must be available everywhere for everyone to be safe.

The economic slump and inflationary pressure will likely worsen the financing issues regarding public and out-of-pocket spending. This implies that the EU should allocate a higher financial volume to promote the health of disadvantaged and vulnerable individuals and create interventional health-social support teams at the local or central level to fight inequalities. As international competition makes health inequalities and risks worse, the Europe Member states should focus on building health partnerships that are open to everyone.

The recent war crisis has utterly challenged the inequality issues both within and across Member states. Refugees have added further stress to European healthcare, and integration is often ineffec-

tive, especially for underfunded health systems. A clear example is Poland, hosting more Ukraine refugees than any other EU country, meaning that the financial burden on its already underfinanced healthcare system will inevitably increase. Should the emergency continue in the coming years, this will require systemic measures by the EU, particularly in financing and relocation of patients.

The recent events are an inevitable reminder that we live in an interconnected world. As a global community, we have all learned that we need a "One Health" approach based on multilateral leadership, cooperation, and the sharing of science and technology. One Health is still in its infancy in operational terms. Now more than ever, we need to acknowledge that health is a common public good, and if we lack a holistic approach, we pay a much higher price economically and socially.

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APPENDIX - COUNTRY COMPARISON TABLES

A1. COUNTRY PROFILES

This section presents the main features characterizing the healthcare systems in each country in order to contextualize the considerations presented in this report. All information presented has been gathered from the OECD 2020 Health at a Glance database and Eurostat.

Europeans are living longer lives and the age profile of society is shifting towards an ageing pattern. The proportion of working-age population will continue to downsize up to 2040-2050 when the baby-boomer generation will have entirely retired. This continuous shift towards longer lives and increasing age-dependency ratio will set an unprecedented challenge on health and social care systems, labor markets, public finances and pension systems. According to Eurostat data and projections, in 2020, more than one fifth (20.6 %) of the EU population was aged 65 and over and the share of people aged 80 years or above in the EU's population is projected to have a two-and-a-half-fold increase between 2020 and 2100, from 5.9 % to 14.6 %.

Across the EU Member States, for the countries here considered, the highest share of the young in the overall population in 2020 was detected in France (17.9 %), while the lowest was observed for Italy (13 %) and Portugal (13.6 %). Italy is also leading in terms of the prevalence of the 65 or older age group (23.2 %), and is followed by Greece and Portugal (22.1 %). In 2020, 50% of the overall EU population was older than almost 44, while this age was the highest in Italy (47.2 years). According to Eurostat, the last decade (2010-2020) saw an increase in the median age of the EU member states' populations by 2.6 years, while among the populations of Spain, Portugal, Greece and Slovakia it rose by more than 4 years. Naturally, these trends exert and will exert an ever increasing pressure on healthcare expenditure. Public health expenditure in the countries, considered as a share of GDP, was highest in 2020 in France (11%) and lowest in Slovakia (7%), with Croatia and Poland being very close to that threshold.

We should expect that not only aging but also non-demographic drivers of healthcare expenditure will put an increasing burden on public finances, in the long-run. In terms of the composition of this expenditure, due to market failures in healthcare markets, public financing will inevitably remain a large share of healthcare provision. Private spending may play a more important role but will remain of a complementary nature in many Member States, closing gaps in public financing and enabling treatment in areas not considered as lifesaving.

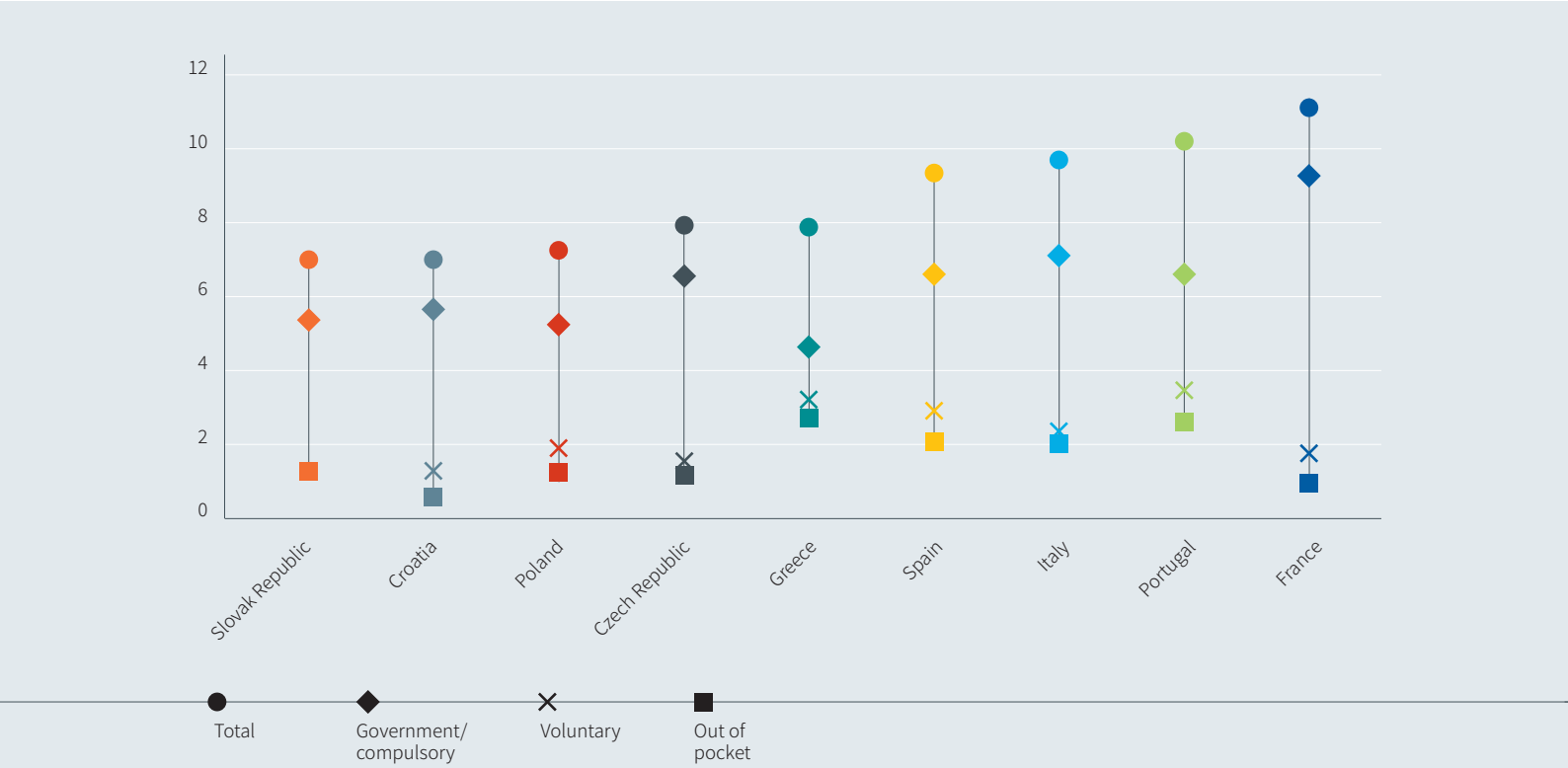
In terms of population size, among the biggest countries here discussed is France, with its 67 million resident population, which is directly followed by Italy with around 60 million resident population and Spain with 47 million. A middle sized country is Poland with a population of 38 million. Portugal and Greece have a smaller population of around 10 million each, while Slovakia and Croatia are much smaller countries, with populations of 5.5 and 4 million, respectively.

Among the countries, as of 2020, the highest GDP per capita terms is found in France (38 thousand dollars) and Italy (32 thousand dollars). The two are followed by Spain (27 thousand), and Portugal (22 thousand).

When seen as a percentage share, the most pronounced proportion of GDP dedicated to healthcare is found in France, followed by Portugal, Italy and Spain. The Slovak Republic, Croatia and Poland are the least spending countries in the group. When we examine government expenditure alone, the lowest GDP shares are found for Greece and Poland. The government spending type is inherent in the type of healthcare system adopted by the countries, which present various forms. In Poland, the Social Health Insurance provides access to a broad scope of benefits. The Ministry of Health coordinates the provision of healthcare which is very fragmented, with an important focus on hospital care. Healthcare in France has a good quality overall, but widely spread issues such as population ageing and deepening of socio-economic inequalities are also spreading. In Italy, the universal healthcare provision contributes indirectly to rising out-of-pocket expenditure. The universalistic provision is also a feature of the Portuguese tax-funded National Health Service, which similar to other southern European neighbors, has to face the sustainability threats due to its ageing population, devoting less funding to its healthcare provision and making a sizable use of cost-sharing. The Greek healthcare system has gone through several reorganizations, moving from a decade of efforts in curbing costs to an effort in reinforcing health outcomes, currently trying to solve the bottlenecks relative to its insufficient provision of primary care services and prevention programs. Last but not least, Croatia features a mandatory health insurance system, with cost sharing schemes.

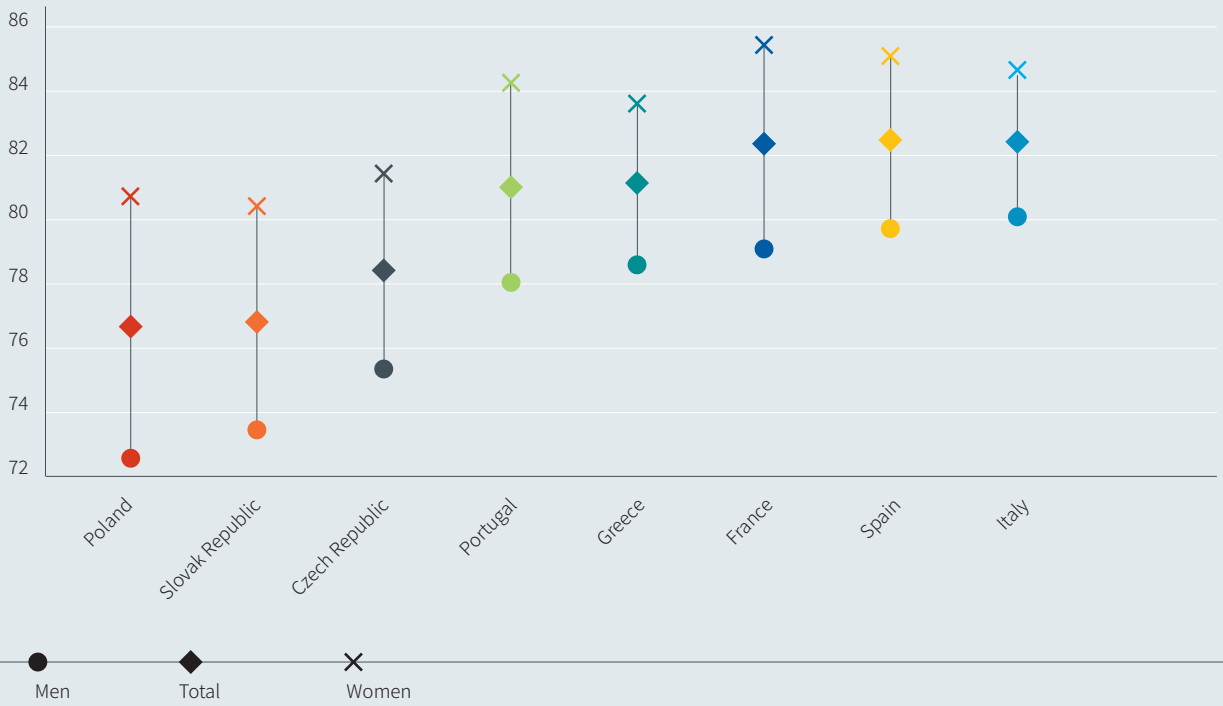
Poland, Slovakia and Croatia have the lowest life expectancies among the group of countries selected, where several threats, related to risk factors, chronic diseases, organizational issues and important socio-economic inequalities in health, set important challenges on the healthcare provision in the future. Among the countries discussed, in 2020 those with the highest life expectancy are France, Spain and Italy. Yet, at the same time, this virtue represents a threat, as aging, chronic disease and long-term care delivery will attract more attention of health policy makers.

FIGURE A.1 Health expenditure as a share of GDP (%) – 2020 or latest



Source: OECD Health indicators, 2020

FIGURE A.2 Life expectancy at birth, 2020



Source: OECD Health indicators, 2020

A2. ECONOMIC INDICATORS*

TABLE A.1 Adjusted net national income (annual % growth)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019	2020
Croatia	..	2.015	-2.2403	1.92168	-0.2377	5.1484	1.61032	5.4855	3.5476	4.173	-6.069
France	2.514773	2.16291	-0.6181	0.89777	1.17177	2.5462	1.12187	2.0082	1.2546	1.958	-10.26
Greece	..	..	-3.9588	-2.8368	2.73583	0.864	0.12691	1.0721	1.1711	2.305	-9.52
Italy	2.465497	1.86119	-4.2629	-1.1225	0.83921	0.4702	4.01084	1.7805	1.3415	0.773	-9.981
Poland	..	2.92219	1.7492	1.63074	3.93907	5.7107	2.80758	5.1181	4.7935	5.744	-1.194
Portugal	7.259359	-0.108	-4.9753	1.57306	0.19087	2.6271	2.77342	3.3576	1.9775	3.051	-9.219
Slovak Republic	..	2.42728	2.99807	0.97172	2.38675	3.9325	1.0441	3.4177	4.0792	1.737	-4.714
Spain	4.950337	3.86668	-2.526	-0.1106	0.48026	4.7039	4.69837	2.1201	2.3086	2.568	-12.29

TABLE A.2 Adjusted net national income per capita (constant 2015 US$)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019	2020
Croatia	..	6774.63	9187.24	9389.9	9405.82	9971.9	10203.5	10893	11381	11922	11247
France	24089.79	28602.2	29897.3	30010.9	30219	30878	31142.6	31676	31985	32541	29144
Greece	..	..	14587.4	14276.7	14765.3	14991	15073	15265	15475	15848	14368
Italy	23648.37	27465.5	24905.4	24342	24322.1	24460	25484.3	25977	26376	26888	24318
Poland	..	6070.75	9503.88	9664.69	10052.9	10634	10937.4	11496	12047	12742	12612
Portugal	11602.83	14951.4	14541.2	14851.3	14960.1	15417	15894.4	16468	16821	17330	15716
Slovak Republic	..	6866.53	12265.9	12371.8	12654.8	13140	13260	13692	14231	14458	13765
Spain	15943.09	20233.9	20385.6	20429.9	20589.5	21575	22569.4	22994	23422	23852	20820

TABLE A.3 GDP per capita, PPP (constant 2017 international $)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Croatia	..	18362.1	24078.3	24057.8	24072.4	24885	25944.3	27154	28192	29336	27077	31047
France	33732.01	39732.3	42790.6	42816.3	43021.4	43346	43705.1	44577	45284	46018	42321	45187
Greece	24262.95	29134	28322.6	27810.9	28130	28260	28239.9	28605	29141	29698	27073	29428
Italy	36585.68	43053.9	41501.7	40268.1	39898.5	40248	40837.7	41581	42046	42746	39071	41937
Poland	11314.96	16257.6	25457.2	25759.3	26649.6	27797	28682.7	30065	31674	33185	32399	34363
Portugal	23556.86	30383.1	30156.7	30042.9	30444.6	31119	31847.5	33045	34041	34946	31962	33514
Slovak Republic	..	15666.5	26478.6	26623.4	27322.1	28720	29236.9	30062	31159	31928	30510	31498
Spain	27543.92	34757.6	35769.5	35371.7	35968.6	37377	38477.6	39529	40257	40802	36211	38098

** Source: World Bank Data (https://data.worldbank.org)*

TABLE A.4 Inflation, consumer prices (annual %)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Croatia	500.00	4.61	3.41	2.22	-0.22	-0.46	-1.13	1.13	1.50	0.77	0.15	2.55
France	3.19	1.68	1.95	0.86	0.51	0.04	0.18	1.03	1.85	1.11	0.48	1.64
Greece	20.43	3.15	1.50	-0.92	-1.31	-1.74	-0.83	1.12	0.63	0.25	-1.25	1.22
Italy	6.46	2.54	3.04	1.22	0.24	0.04	-0.09	1.23	1.14	0.61	-0.14	1.87
Poland	567.88	9.90	3.56	0.99	0.05	-0.87	-0.66	2.08	1.81	2.23	3.37	5.06
Portugal	13.63	2.85	2.77	0.27	-0.28	0.49	0.61	1.37	0.99	0.34	-0.01	1.27
Slovak Republic	..	12.04	3.61	1.40	-0.08	-0.33	-0.52	1.31	2.51	2.66	1.94	3.15
Spain	6.72	3.43	2.45	1.41	-0.15	-0.50	-0.20	1.96	1.67	0.70	-0.32	3.09

TABLE A.5 Unemployment, total (% of total labor force) (national estimate)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Croatia	..	16.06	15.93	17.25	17.29	16.18	13.1	11.21	8.43	6.62	7.51	7.61
France	9.36	10.22	9.4	9.92	10.29	10.35	10.05	9.41	9.02	8.41	8.01	7.86
Greece	7.02	11.24	24.44	27.47	26.49	24.9	23.54	21.49	19.29	17.31	16.31	14.71
Italy	9.78	10.83	10.65	12.15	12.68	11.9	11.69	11.21	10.61	9.95	9.16	9.5
Poland	..	16.31	10.09	10.33	8.99	7.5	6.16	4.89	3.85	3.28	3.16	3.36
Portugal	4.64	3.81	15.53	16.19	13.9	12.45	11.07	8.87	6.99	6.46	6.8	6.58
Slovak Republic	..	19.06	13.96	14.22	13.18	11.48	9.67	8.13	6.54	5.75	6.69	6.83
Spain	16.27	13.79	24.79	26.09	24.44	22.06	19.64	17.22	15.25	14.1	15.53	14.78

A3. DEMOGRAPHIC INDICATORS*

TABLE A.6 Population, total (millions)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Croatia	4.78	4.47	4.27	4.26	4.24	4.20	4.17	4.12	4.09	4.07	4.05	3.90
France	58.24	60.91	65.66	66.00	66.31	66.55	66.72	66.92	67.10	67.25	67.38	67.50
Greece	10.20	10.81	11.05	10.97	10.89	10.82	10.78	10.75	10.73	10.72	10.70	10.66
Italy	56.72	56.94	59.54	60.23	60.79	60.73	60.63	60.54	60.42	59.73	59.45	59.07
Poland	38.11	38.26	38.06	38.04	38.01	37.99	37.97	37.97	37.97	37.97	37.90	37.78
Portugal	9.98	10.29	10.51	10.46	10.40	10.36	10.33	10.30	10.28	10.29	10.30	10.30
Slovak Republic	5.30	5.39	5.41	5.41	5.42	5.42	5.43	5.44	5.45	5.45	5.46	5.45
Spain	38.87	40.57	46.77	46.62	46.48	46.44	46.48	46.59	46.80	47.13	47.36	47.33

TABLE A.7 Population growth (annual %)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Croatia	0.21	-0.99	-0.31	-0.28	-0.41	-0.82	-0.70	-1.20	-0.89	-0.55	-0.43	-3.74
France	0.51	0.68	0.48	0.51	0.47	0.36	0.26	0.29	0.27	0.22	0.19	0.18
Greece	1.06	0.41	-0.54	-0.73	-0.67	-0.66	-0.42	-0.20	-0.20	-0.11	-0.20	-0.34
Italy	0.08	0.05	0.27	1.16	0.92	-0.10	-0.17	-0.15	-0.19	-1.15	-0.47	-0.65
Poland	0.39	-1.04	0.00	-0.06	-0.07	-0.07	-0.04	0.01	0.00	-0.02	-0.18	-0.31
Portugal	-0.22	0.70	-0.41	-0.55	-0.54	-0.41	-0.32	-0.24	-0.16	0.02	0.11	0.02
Slovak Republic	0.44	-0.14	0.17	0.11	0.10	0.10	0.13	0.16	0.14	0.14	0.09	-0.21
Spain	0.10	0.45	0.06	-0.33	-0.30	-0.08	0.08	0.23	0.44	0.72	0.48	-0.08

TABLE A.8 Age dependency ratio, old (% of working-age population)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Croatia	16.87	23.19	27.34	27.91	28.47	29.07	29.74	30.55	31.43	32.30	33.10	33.92
France	21.30	24.69	27.37	28.27	29.20	30.08	30.87	31.61	32.31	32.99	33.69	34.33
Greece	20.31	24.03	30.20	30.89	31.58	32.22	32.75	33.23	33.69	34.20	34.79	35.41
Italy	21.66	27.13	32.24	32.89	33.53	34.12	34.66	35.14	35.59	36.06	36.57	37.12
Poland	15.32	17.57	20.04	20.84	21.72	22.66	23.72	24.83	25.98	27.16	28.37	29.63
Portugal	20.78	24.03	29.50	30.27	31.07	31.87	32.58	33.28	33.99	34.72	35.49	36.18
Slovak Republic	15.90	16.37	18.10	18.60	19.18	19.87	20.73	21.67	22.68	23.68	24.65	25.64
Spain	20.10	24.30	26.18	26.80	27.43	28.06	28.51	28.94	29.38	29.87	30.44	31.04

** Source: World Bank Data (https://data.worldbank.org)*

TABLE A.9 Birth rate, crude (per 1,000 people)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019	2020
Croatia	11.6	9.8	9.8	9.4	9.3	8.9	9	8.9	9	8.9	8.9
France	13.4	13.3	12.6	12.4	12.4	12	11.8	11.5	11.3	11.2	10.9
Greece	10	9.6	9.1	8.6	8.5	8.5	8.6	8.2	8.1	7.8	7.9
Italy	10	9.5	9	8.5	8.3	8	7.8	7.6	7.3	7	6.8
Poland	14.4	9.9	10.1	9.7	9.9	9.7	10.1	10.6	10.2	9.9	9.4
Portugal	11.7	11.7	8.5	7.9	7.9	8.3	8.4	8.4	8.5	8.4	8.2
Slovak Republic	15.1	10.2	10.3	10.1	10.2	10.3	10.6	10.7	10.6	10.5	10.4
Spain	10.3	9.8	9.7	9.1	9.2	9	8.8	8.4	7.9	7.6	7.1

TABLE A.10 Death rate, crude (per 1,000 people)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019	2020
Croatia	10.9	11.2	12.1	11.8	12	12.9	12.3	13	12.9	12.7	14.1
France	9.3	8.9	8.7	8.7	8.4	8.9	8.9	9.1	9.1	9.1	9.9
Greece	9.2	9.7	10.6	10.2	10.4	11.2	11	11.6	11.2	11.7	12.2
Italy	9.6	9.8	10.3	10	9.8	10.7	10.1	10.7	10.5	10.6	12.6
Poland	10.2	9.6	10.1	10.2	9.9	10.4	10.2	10.6	10.9	10.8	12.6
Portugal	10.3	10.2	10.2	10.2	10.1	10.5	10.7	10.7	11	10.9	12
Slovak Republic	10.3	9.8	9.7	9.6	9.5	9.9	9.6	9.9	10	9.8	10.8
Spain	8.6	8.9	8.6	8.3	8.5	9.1	8.8	9.1	9.1	8.8	10.4

TABLE A.11 Fertility rate, total (births per woman)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019	2020
Croatia	1.63	1.39	1.52	1.46	1.46	1.41	1.43	1.42	1.47	1.47	1.48
France	1.77	1.89	2.01	1.99	2	1.96	1.92	1.89	1.87	1.86	1.83
Greece	1.39	1.25	1.34	1.29	1.3	1.33	1.38	1.35	1.35	1.34	1.34
Italy	1.33	1.26	1.43	1.39	1.37	1.35	1.34	1.32	1.29	1.27	1.24
Poland	2.06	1.37	1.33	1.29	1.32	1.32	1.39	1.48	1.46	1.44	1.38
Portugal	1.56	1.55	1.28	1.21	1.23	1.31	1.36	1.38	1.42	1.43	1.4
Slovak Republic	2.09	1.3	1.34	1.34	1.37	1.4	1.48	1.52	1.54	1.57	1.57
Spain	1.36	1.22	1.32	1.27	1.32	1.33	1.34	1.31	1.26	1.23	1.23

TABLE A.12 International migrant stock (% of population)

Country	1990	2000	2012	2013	2014	2015
Croatia	9.95	13.22	..	..	..	13.60
France	10.36	10.57	..	..	..	12.09
Greece	6.10	10.15	..	..	..	11.34
Italy	2.51	3.71	..	..	..	9.68
Poland	2.95	2.14	..	..	..	1.60
Portugal	4.41	6.34	..	..	..	8.09
Slovak Republic	0.78	2.16	..	..	..	3.27
Spain	2.10	4.07	..	..	..	12.69

TABLE A.13 Life expectancy at birth, total (years)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019	2020
Croatia	72.17049	72.8078	76.9244	77.1268	77.478	77.276	78.022	77.827	78.071	78.42	77.72
France	76.6	79.0561	81.9683	82.2195	82.7195	82.322	82.5732	82.576	82.676	82.83	82.18
Greece	76.93902	77.8878	80.6341	81.2854	81.3854	81.037	81.3878	81.288	81.788	81.64	81.09
Italy	76.97073	79.778	82.239	82.6902	83.0902	82.544	83.2439	82.946	83.346	83.5	82.34
Poland	70.89024	73.7488	76.7463	77	77.6024	77.451	77.8512	77.754	77.602	77.9	76.6
Portugal	73.96585	76.3146	80.3732	80.722	81.122	81.124	81.1244	81.424	81.324	81.68	80.98
Slovak Republic	70.93268	73.0512	76.1098	76.4122	76.8122	76.563	77.1659	77.166	77.266	77.67	76.87
Spain	76.83756	78.9659	82.4268	83.078	83.2293	82.832	83.3293	83.283	83.432	83.83	82.33

TABLE A.14 Mortality rate, neonatal (per 1,000 live births)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019	2020
Croatia	8.2	5.5	3.3	3.2	3.1	3.1	3	3	3	3	3
France	3.6	2.8	2.3	2.3	2.4	2.4	2.5	2.6	2.6	2.6	2.6
Greece	6.4	3.9	2.3	2.4	2.6	2.6	2.6	2.6	2.5	2.5	2.4
Italy	6.5	3.5	2.3	2.2	2.2	2.1	2.1	2	1.9	1.8	1.7
Poland	11.1	5.8	3.2	3.1	3	2.9	2.9	2.8	2.8	2.7	2.7
Portugal	7.3	3.4	2.1	2.1	2.1	2.1	2.1	2	2	1.9	1.8
Slovak Republic	8.6	5	3.3	3.2	3.1	3.1	3	3	3	3	3
Spain	4.9	2.8	2.1	2	2	1.9	1.9	1.9	1.8	1.8	1.7

TABLE A.15 Adolescent fertility rate (births per 1,000 women ages 15-19)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019	2020
Croatia	26.37	16.77	11.17	10.67	10.18	9.68	9.18	8.68	8.27	7.85	7.43
France	8.76	7.64	6.65	6.26	5.88	5.50	5.11	4.73	4.74	4.75	4.75
Greece	22.08	11.03	8.54	8.28	8.01	7.75	7.49	7.22	6.94	6.65	6.37
Italy	8.63	6.82	5.89	5.76	5.63	5.50	5.37	5.24	5.11	4.98	4.85
Poland	30.60	16.91	14.33	13.57	12.82	12.06	11.30	10.54	10.17	9.80	9.43
Portugal	24.30	20.29	11.41	10.81	10.20	9.59	8.99	8.38	8.00	7.62	7.24
Slovak Republic	47.62	23.29	22.46	23.11	23.75	24.40	25.04	25.68	25.94	26.19	26.44
Spain	11.85	9.32	8.97	8.72	8.47	8.22	7.97	7.73	7.49	7.26	7.02

A4. HEALTH INDICATORS*

TABLE A.16 Current health expenditure (% of GDP)

Country	2000	2012	2013	2014	2015	2016	2017	2018	2019
Croatia	7.71	7.78	6.52	6.70	6.79	6.83	6.76	6.78	6.98
France	9.58	11.30	11.42	11.54	11.45	11.47	11.33	11.19	11.06
Greece	7.24	8.92	8.37	7.91	8.07	8.32	8.10	7.96	7.84
Italy	7.57	8.78	8.78	8.87	8.86	8.73	8.68	8.68	8.67
Poland	5.29	6.22	6.41	6.39	6.39	6.53	6.56	6.33	6.45
Portugal	8.60	9.65	9.40	9.34	9.32	9.39	9.31	9.41	9.53
Slovak Republic	5.30	7.54	7.50	6.89	6.79	7.11	6.77	6.71	6.96
Spain	6.80	9.16	9.07	9.09	9.13	8.95	8.96	8.99	9.13

TABLE A.17 Current health expenditure per capita (current US$)

Country	2000	2012	2013	2014	2015	2016	2017	2018	2019
Croatia	371.062	1029.97	889.945	909.372	795.52	840.905	902.63	1014.2	1040
France	2161.85	4644.6	4893.48	4982.99	4201.6	4257.15	4402.1	4657.8	4492
Greece	885.41	1948.25	1813.88	1705.11	1452.1	1488.2	1505.9	1572.7	1501
Italy	1524.24	3086.3	3149.24	3154.28	2675.7	2699.73	2809.7	3000.7	2906
Poland	238.004	815.142	878.089	911.298	803.96	813.473	909.58	978.74	1014
Portugal	995.342	1980.02	2030.63	2059.93	1790.5	1875.24	1998.1	2216.3	2221
Slovak Republic	203.506	1319.44	1370.47	1289.35	1108.9	1175.6	1189.1	1299.9	1342
Spain	1005.28	2591.02	2629.61	2679.63	2349.1	2376.72	2526.7	2740.3	2711

TABLE A.18 Domestic general government health expenditure (% of GDP)

Country	2000	2012	2013	2014	2015	2016	2017	2018	2019
Croatia	6.56	6.43	5.54	5.63	5.64	5.65	5.60	5.65	5.69
France	6.97	7.94	8.04	8.14	8.28	8.62	8.60	8.49	8.33
Greece	4.46	5.68	5.11	4.51	4.59	4.34	4.22	4.11	3.77
Italy	5.50	6.66	6.65	6.69	6.59	6.49	6.40	6.41	6.41
Poland	3.61	4.35	4.51	4.47	4.43	4.50	4.51	4.50	4.60
Portugal	6.00	5.92	5.86	5.77	5.75	5.78	5.69	5.76	5.81
Slovak Republic	4.64	5.37	5.50	5.47	5.35	5.69	5.35	5.31	5.48
Spain	4.92	6.60	6.44	6.39	6.51	6.41	6.32	6.32	6.45

** Source: World Bank Data (https://data.worldbank.org)*

TABLE A.19 Domestic general government health expenditure (% of general government expenditure)

Country	2000	2012	2013	2014	2015	2016	2017	2018	2019
Croatia	13.80	13.17	11.35	11.44	11.55	11.91	12.36	12.25	12.07
France	13.50	13.91	14.05	14.22	14.59	15.20	15.21	15.27	15.06
Greece	9.61	10.02	8.14	8.90	8.51	8.72	8.73	8.48	7.88
Italy	11.81	13.17	13.05	13.15	13.10	13.23	13.12	13.24	13.18
Poland	8.38	10.07	10.49	10.48	10.64	10.94	10.94	10.83	11.02
Portugal	14.06	12.10	11.73	11.15	11.91	12.90	12.54	13.31	13.65
Slovak Republic	8.79	13.04	12.94	12.63	11.69	13.33	12.94	12.73	12.85
Spain	12.58	13.57	14.05	14.16	14.83	15.09	15.33	15.17	15.34

TABLE A.20 Domestic general government health expenditure per capita (current US$)

Country	2000	2012	2013	2014	2015	2016	2017	2018	2019
Croatia	315.5	851.3	756.9	764.2	661.0	696.0	747.8	843.9	848.1
France	1572.3	3264.7	3446.8	3512.9	3040.6	3198.4	3339.2	3536.8	3382.8
Greece	545.6	1239.2	1107.0	971.6	825.7	775.7	784.7	812.5	722.2
Italy	1107.2	2341.8	2385.8	2379.1	1991.6	2008.6	2071.8	2215.8	2147.7
Poland	162.3	569.2	617.3	637.3	557.4	559.7	626.0	695.7	723.9
Portugal	694.1	1213.3	1264.9	1271.8	1104.2	1154.7	1221.6	1355.5	1353.0
Slovak Republic	178.0	938.4	1004.7	1022.9	873.1	940.0	939.9	1029.7	1057.8
Spain	727.3	1868.4	1867.2	1882.8	1675.2	1700.6	1782.1	1925.7	1914.6

TABLE A.21 Domestic private health expenditure (% of current health expenditure)

Country	2000	2012	2013	2014	2015	2016	2017	2018	2019
Croatia	14.97	17.35	14.94	15.96	16.90	17.23	17.15	16.79	18.45
France	27.27	29.71	29.56	29.50	27.63	24.87	24.14	24.07	24.69
Greece	38.37	36.25	38.14	41.71	41.49	47.62	47.71	48.20	51.74
Italy	27.36	24.12	24.24	24.58	25.56	25.60	26.26	26.16	26.08
Poland	31.79	30.17	29.57	30.03	30.63	31.17	31.15	28.86	28.56
Portugal	30.22	38.66	37.65	38.20	38.27	38.34	38.77	38.77	39.02
Slovak Republic	12.52	28.88	26.69	20.67	21.26	20.04	20.96	20.79	21.18
Spain	28.36	27.89	28.99	29.74	28.68	28.45	29.47	29.73	29.38

TABLE A.22 Government expenditure on education, total (% of GDP)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018
Croatia	..	..	..	4.50	..	..	..	3.85	3.91
France	4.51	..	..	..	..	..	..	5.45	5.41
Greece	2.05	3.23	..	..	..	3.66	..	3.48	3.60
Italy	..	4.29	4.06	4.14	4.06	4.07	3.82	4.04	4.26
Poland	..	4.98	4.83	4.97	4.94	4.81	4.63	4.56	4.62
Portugal	3.57	5.16	4.95	5.27	5.12	4.89	..	5.02	4.68
Slovak Republic	..	3.86	3.87	4.08	4.23	4.59	3.91	3.94	3.97
Spain	3.63	4.17	4.47	4.35	4.30	4.29	4.23	4.21	4.18

TABLE A.23 Out-of-pocket expenditure (% of current health expenditure)

Country	2000	2012	2013	2014	2015	2016	2017	2018	2019
Croatia	13.86	11.47	8.83	11.28	10.94	10.97	10.97	10.48	11.46
France	7.27	10.12	9.95	9.87	9.72	9.58	9.59	9.32	9.26
Greece	36.27	30.45	34.08	37.10	36.76	34.89	35.08	36.78	35.18
Italy	26.46	22.08	22.23	22.54	23.47	23.32	23.81	23.57	23.31
Poland	31.33	24.27	23.80	23.01	23.31	23.08	23.06	20.79	20.44
Portugal	25.71	29.58	28.79	29.33	29.53	29.43	29.69	29.92	30.45
Slovak Republic	10.84	23.23	23.32	18.01	18.44	17.89	18.71	18.91	19.16
Spain	24.32	21.81	22.77	23.14	22.30	21.96	22.23	22.25	21.81

TABLE A.24 Hospital beds (per 1,000 people)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018
Croatia	7.4	6.2	5.9	5.9	5.9	5.6	5.5	5.5	..
France	9.7	8.0	6.3	6.3	6.2	6.1	6.1	6.0	5.9
Greece	5.1	4.8	4.5	4.2	4.2	4.3	4.2	4.2	4.2
Italy	7.2	4.7	3.4	3.3	3.2	3.2	3.2	3.2	3.1
Poland	5.7	4.9	6.6	6.6	6.6	6.6	6.6	6.6	6.5
Portugal	4.1	3.7	3.4	3.4	3.3	3.4	3.4	3.4	3.5
Slovak Republic	7.4	7.9	5.9	5.8	5.8	5.8	5.8	5.8	5.7
Spain	4.6	3.7	3.0	3.0	3.0	3.0	3.0	3.0	3.0

TABLE A.25 Physicians (per 1,000 people)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019
Croatia	3.0	2.4	3.0	3.0	3.1	3.2	3.0	..	..	..
France	3.1	6.5	6.3	6.4	6.4	6.4	6.5	6.5	6.5	..
Greece	3.4	4.3	5.9	5.9	6.0	6.0	6.2	6.2	6.2	..
Italy	4.7	6.9	7.7	7.8	7.8	7.7	7.9	8.0	7.9	8.0
Poland	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.4	..	..
Portugal	2.8	3.2	4.2	4.4	4.6	4.7	4.9	5.1	5.3	..
Slovak Republic	..	3.2	3.4	3.4	3.4	3.4	3.5	3.4	3.5	..
Spain	2.0	3.1	3.8	3.8	3.8	3.8	3.8	3.9	4.0	..

TABLE A.26 Specialist surgical workforce (per 100,000 population)

Country	2013	2014	2015	2016	2017	2018
Croatia	84.3	..	81.2	..	..	..
France	54.7	63.1	58.6	..	..	..
Greece	145.0	166.8	163.5	..	..	..
Italy	121.5	114.0	..	..	142.4	..
Poland	..	67.7	67.9	..	..	..
Portugal	87.8	84.0	86.1	..	..	..
Slovak Republic	..	57.2	..	..	..	53.9
Spain	..	79.9	..	..	..	..

TABLE A.27 Nurses and midwives (per 1,000 people)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019
Croatia	5.1	5.0	6.0	6.2	6.1	6.2	..	..	..	..
France	..	7.1	9.7	10.0	10.3	10.6	10.9	11.2	11.5	..
Greece	..	4.3	5.2	5.1	5.0	4.9	3.6	3.6	3.7	..
Italy	..	5.8	5.4	5.3	5.6	5.7	5.8	6.1	6.0	5.9
Poland	6.1	5.5	..	5.9	5.8	5.8	5.8	5.7	6.9	..
Portugal	..	..	6.2	6.3	6.4	6.5	..	7.0	6.9	..
Slovak Republic	..	7.4	6.1	6.1	6.1	6.0	6.1	6.0	6.0	..
Spain	2.7	3.7	5.4	5.1	5.1	5.4	5.7	5.9	6.1	..

TABLE A.28 Low-birthweight babies (% of births)

Country	2000	2012	2013	2014	2015
Croatia	5.45	4.85	4.90	4.98	5.10
France	7.53	7.45	7.44	7.44	7.44
Greece	9.04	8.74	8.75	8.75	8.75
Italy	7.09	6.98	6.98	6.97	6.96
Poland	5.69	5.68	5.72	5.80	5.94
Portugal	7.41	8.50	8.64	8.78	8.90
Slovak Republic	6.85	8.01	7.95	7.82	7.60
Spain	7.00	8.18	8.22	8.25	8.27

TABLE A.29 Immunization, measles (% of children ages 12-23 months)

Country	1990	2000	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Croatia	..	93	95	94	94	93	90	-89	93	93	91	89
France	71	84	91	90	91	91	90	90	90	92	92	92
Greece	76	89	99	99	97	97	97	97	97	97	97	97
Italy	43	74	90	90	87	85	87	92	93	94	92	92
Poland	95	97	98	98	97	96	96	94	93	93	80	80
Portugal	85	87	97	98	98	98	98	98	99	99	99	98
Slovak Republic	..	98	99	98	97	95	95	96	96	96	96	95
Spain	99	94	97	95	96	96	97	98	98	98	96	95

A5. SOCIO-ECONOMIC INDICATORS*

TABLE A.30 Multidimensional poverty headcount ratio (% of total population)

Country	2012	2013	2014	2015	2016	2017	2018	2019	2020
Croatia	32.6	29.9	29.3	29.1	27.9	26.4	24.8	23.3	23.2
France	19.1	18.1	18.5	17.7	18.2	17	17.4	17.9	18.2
Greece	34.6	35.7	36	35.7	35.6	34.8	31.8	30	28.9
Italy	29.9	28.5	28.3	28.7	30	28.9	27.3	25.6	..
Poland	26.7	25.8	24.7	23.4	21.9	19.5	18.9	18.2	17.3
Portugal	..	..	..	..	..	..	..	..	..
Slovak Republic	20.5	19.8	18.4	18.4	18.1	16.3	16.3	16.4	14.8
Spain	27.2	27.3	29.2	28.6	27.9	26.6	26.1	25.3	26.4

TABLE A.31 Total alcohol consumption per capita (liters of pure alcohol, projected estimates, 15+ years of age)

Country	2000	2015	2018
Croatia	12.45	9.07	9.23
France	14.08	12.64	12.33
Greece	10.18	10.49	10.18
Italy	10.37	7.59	7.84
Poland	9.17	11.63	11.71
Portugal	14.08	11.88	12.03
Slovak Republic	12.47	11.53	11.14
Spain	12.43	11.32	12.72

TABLE A.32 Prevalence of current tobacco use (% of adults)

Country	2000	2015	2018	2019	2020
Croatia	34.4	36.1	36.7	36.7	36.9
France	34.2	33.7	33.6	33.6	33.4
Greece	54.9	37.9	34.5	34.5	33.5
Italy	26.2	23.8	23.3	23.3	23.1
Poland	39.6	27.2	24.7	24.7	24
Portugal	25.7	25.2	25.3	25.3	25.4
Slovak Republic	32	31.5	31.5	31.5	31.5
Spain	36.8	29.7	28.1	28.1	27.7

** Source: World Bank Data (https://data.worldbank.org)*

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