Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Health policy 126 (2022) 382–390

Contents lists available at ScienceDirect

Health policy

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

Providing health services effectively during the first wave of COVID-19: A cross-country comparison on planning services, managing cases, and maintaining essential services ☆

Erin Webb[a,b,*], Cristina Hernández-Quevedo[c], Gemma Williams[c], Giada Scarpetti[a,b], Sarah Reed[d], Dimitra Panteli[e]

[a] Department of Health Care Management, Berlin University of Technology, Berlin, Germany
[b] European Observatory on Health Systems and Policies; Department of Health Care Management, Berlin University of Technology, Berlin, Germany
[c] European Observatory on Health Systems and Policies; London School of Economics and Political Science, London, UK
[d] Nuffield Trust, London, UK
[e] European Observatory on Health Systems and Policies, Brussels, Belgium

ARTICLE INFO

Article history:
Received 5 March 2021
Revised 19 April 2021
Accepted 26 April 2021

Keywords:
COVID-19
Essential services
Service delivery
Prioritization of care

ABSTRACT

The COVID-19 pandemic triggered abrupt challenges for health care providers, requiring them to simultaneously plan for and manage a rise of COVID-19 cases while maintaining essential health services. Since March 2020, the COVID-19 Health System Response Monitor, a joint initiative of the European Observatory on Health Systems and Policies, the WHO Regional Office for Europe, and the European Commission, has documented country responses to COVID-19 using a structured template which includes a section on provision of care. Using the information available on the platform, this paper analyzes how countries planned services for potential surge capacity, designed patient flows ensuring separation between COVID-19 and non-COVID-19 patients, and maintained routine services in both hospital and ambulatory settings. Despite very real differences in the organization of health and care services, there were many similarities in country responses. These include transitioning the management of COVID-19 mild cases from hospitals to outpatient settings, increasing the use of remote consultations, and cancelling or postponing non-urgent services during the height of the first wave. In the immediate future, countries will have to continue balancing care for COVID-19 and non-COVID-19 patients to minimize adverse health outcomes, ideally with supporting guidelines and COVID-19-specific care zones. Looking forward, policymakers will have to consider whether strategies adopted during the COVID-19 pandemic will become permanent features of care provision.

© 2021 Elsevier B.V. All rights reserved.

1. Introduction

The COVID-19 pandemic left health systems with the dual challenge of planning for and treating patients with COVID-19, while at the same time maintaining routine services and preventing the virus from spreading further in other care areas. Even the most well-resourced health systems faced pressures from new challenges brought on by COVID-19, and every country had to make difficult choices about how to maintain access to essential care while treating a novel communicable disease.

Even before the pandemic, comparing health services across countries had substantial limitations including but not limited to the lack of standardized definitions of terms (e.g., what is considered an essential service?), the variation in range of services attributed to each type of health care delivery (e.g., what services are provided in outpatient vs. inpatient settings?), and where the services are provided. For example, the number of physician consultations varies widely: in 2016, fewer than 3 consultations per person occurred in Cyprus and Sweden, with over 11 in the Slovak Republic and Hungary [4]. The number of hospital discharges per year also differs, even between closely neighboring countries: the Netherlands had 90 inpatient care discharges per 1000 population in 2018 while Germany had 255 in 2017 [5].

In the context of COVID-19, these variations have come into even starker contrast. Across countries—and over time—the pandemic has seen variation in the case definition [14], treatment

☆ Open Access for this article is made possible by a collaboration between Health Policy and The European Observatory on Health Systems and Policies.

* Corresponding author at: Department of Health Care Management, Berlin University of Technology, H 80 Straße des 17. Juni 135, Berlin 10623, Germany.
E-mail address: e.webb@tu-berlin.de (E. Webb).

https://doi.org/10.1016/j.healthpol.2021.04.016
0168-8510/© 2021 Elsevier B.V. All rights reserved.

for severe patients [1], medications used [13], and the location of COVID-19 treatment [11]. Moreover, the starting point for physical infrastructure and workforce proved crucial in defining the country response to COVID-19 [21].

This article reviews key themes in how health systems adapted the provision of health care during the early peaks of the pandemic. We discuss how countries compare in their approaches to planning services, managing cases, and maintaining essential services, highlighting country-specific innovations and preliminary lessons for policymakers.

2. Methods

The evidence presented in this article has been compiled from the methodology used and content reported in the Health System Response Monitor (HSRM), an online platform established in March 2020 in response to the COVID-19 outbreak to collect and organize up-to-date information on how countries in the WHO European region and Canada are responding to the crisis. The HSRM, available at https://www.covid19healthsystem.org/, focuses primarily on the responses of health systems but also captures wider public health initiatives. The HSRM is a joint undertaking of the European Observatory on Health Systems and Policies (Observatory), the WHO Regional Office for Europe, and the European Commission.

The HSRM content is broadly structured around the standard health system functions [16], and collects information about six broad areas of the country response to COVID-19: (1) preventing transmission, (2) ensuring sufficient physical infrastructure and workforce capacity, (3) providing health services effectively, (4) paying for services, (5) governance, and (6) measures in other sectors. The HSRM is authored by country experts, largely from the Health System and Policy Monitor network, and is edited by Observatory staff. The template for the HSRM has been used by the country experts to continuously update their country's response based on the latest measures taken in their countries. By using a structured questionnaire and having a team of Observatory staff editing the responses, information collected in the HSRM enables cross-country comparisons.

This article focuses on one of the six areas: "Providing health services effectively". Within each country response, this section describes approaches for service delivery planning and patient pathways for suspected COVID-19 cases. It also considers efforts by countries to maintain other essential services during periods of excessive demand for health services.

Data collected from the HSRM between March 2020 and October 2020 serves as the primary source for this article, although some content has been supplemented with information from co-authors, Observatory editors, other country materials and documents. The absence of specific countries does not necessarily mean it did not adjust its provision of health services, but rather that limited information was available at the time of data collection. Additionally, the HSRM country pages contain varying levels of information, which means that the summary tables included in this analysis are not meant to be exhaustive.

This article does not aim to answer why some countries have responded better to the pandemic than others, but rather, to draw out interesting patterns, key contrasts, and innovative approaches in policy responses aimed at addressing common challenges across countries. Attributing any causal link between policy response and pandemic outcome presents a multitude of methodological challenges, so the analysis instead intends to describe and assess policy responses and draw out critical lessons. In turn, this can serve as a basis from which to begin discussions that eventually lead to an understanding of what seems to work, what does not work, and why. This analysis also presents some current gaps in policy knowledge that may open up areas for future research or provide a basis for further policy development.

3. Results

The COVID-19 pandemic presented immediate challenges to health care providers, and the countries studied in the HSRM show wide variations in response, but also significant overlap in spite of real differences in the organization of health care services. The continually changing situation created an unprecedented strain on health care providers to respond, with rapidly changing guidance for the COVID-19 case definition, management of COVID-19 contacts, infection prevention and control, occupational health, pregnancy and post-partum care, and more.

Regardless of the specific approaches taken, COVID-19 required health care providers to plan and implement measures to keep essential services running while managing an influx of COVID-19 suspected or confirmed cases. The following sections provide details about how countries planned services for potential surge capacity, designed patient flows ensuring separation between COVID-19 and non-COVID-19 patients, and maintained routine services in both hospital and ambulatory settings.

3.1. Planning services for COVID-19 patients in hospitals

In most countries, the initial pandemic response focused on planning services in hospitals, including ensuring sufficient physical infrastructure and workforce [21], as well as preventing transmission [15]. This article focuses on how hospitals planned services for treating and caring for COVID-19 patients. In some countries, central governments made national determinations for how resources should be allocated, and where and how patients with COVID-19 should flow through the system. Other countries left it up to regional bodies to determine the response. Still others gave guidance about measures to implement but left individual health care providers responsible for implementing the measures. This section describes each of these approaches, with country examples for each.

Particularly at the beginning of the pandemic, several countries organized the treatment of COVID-19 patients in designated hospitals, often those that specialized in treatments of infectious diseases or had intensive care capacities. Albania initially designated two hospitals for COVID-19 and transferred the medical services conducted at these hospitals to other public hospitals. Kyrgyzstan designated 24 hospitals for the observation of suspected cases and two hospitals for confirmed COVID-19 cases. On March 4th 2020, the Republic of Moldova designated four hospitals for the treatment of COVID-19 patients, two for severe cases, and two for mild and moderate cases. Greece created 13 COVID-19 reference hospitals across the country, with four hospitals dedicated solely to COVID-19 patients. In February, Serbia designated four hospitals as points of treatment for COVID-19 patients, although with increasing case numbers, five more were designated on March 16th 2020 to exclusively treat COVID-19 patients. The Ministry of Health in Slovakia designated three hospitals to serve uniquely for the treatment of COVID-19 patients, with other hospitals providing separate pavilions.

Other countries designated the hospitals in the largest cities to treat COVID-19 patients, but this quickly adapted as case numbers grew. Belgium designated two hospitals, in Brussels and Antwerp, as referral centers for the treatment of COVID-19 patients, but as the case numbers grew, all hospitals started admitting COVID-19 patients. In January, Cyprus initially designated the biggest hospital in the country as the reference hospital for COVID-19, but later changed this to a smaller hospital and a nursing ward, as well as

an intensive care unit in each of the remaining five public hospitals in the country.

Other countries took a more regional approach. In Austria, each region designated specific hospitals or new hospital units to treat patients with suspected or confirmed COVID-19 cases. On March 27th 2020, the Bulgarian Minister of Health issued an ordinance on determining the hospitals, hospital wards, and number of beds determined for treatment of COVID-19 patients in each district describing that regions with higher infection rates identify designated COVID-19 hospitals. In Poland, each province (*voivodeship*) designated at least one hospital for COVID-19 patients, which serve as reference hospitals to which confirmed cases can be referred and treated. In addition, provinces have also selected hospitals with infectious disease departments that will be the second choice to admit patients at risk; these hospitals are required to be at the highest levels of readiness, with appropriate equipment and personal protective equipment (PPE). Switzerland's Federal Council took some measures in mid-March 2020 to ensure equitable distribution across cantons, such as requiring cantons to report on capacity, however in general cantons were able to organize individual responses to COVID-19.

Several other countries have not designated specific hospitals to exclusively treat COVID-19 patients, and provide national guidance while leaving the specifics to individual hospitals. Hospitals in Denmark designated departments and sections for treatment of COVID-19 patients. In France, initially all COVID-19 cases were referred to hospitals, while national recommendations for managing COVID-19 cases were first published in March 2020 and regularly updated on the Ministry of Health webpage. Ireland and the UK (England) required all hospitals to have a COVID-19 plan in place. The main acute hospital in Malta duplicated its emergency room so that one could treat COVID-19 patients and the other could treat non-COVID-19 patients. The Netherlands used open capacity due to postponements to support COVID-19 patients. In Sweden, hospitals on aggregate have doubled the system's capacity for intensive care, but different regions and hospitals have taken different measures.

Overall, the measures initially taken in hospitals influenced the subsequent response in managing cases and maintaining essential services. Even within one country, the initial approach could vary between regions, with Italy providing a clear example: as of April 8th 2020, the Lombardy region hospitalized 49% of positive cases while the Veneto hospitalized 21%. In contrast, in Germany, as of April 1st 2020, 85% of COVID-19 cases were treated by ambulatory physicians, mainly general practitioners (GPs), despite Germany having one of the largest acute care sectors in Europe. As more became known about COVID-19, countries increasingly transitioned their focus to manage cases outside of the hospital.

3.2. Managing COVID-19 cases–patient pathway and the role of ambulatory care

After a positive diagnosis of COVID-19, the patient pathway varied substantially across countries and sometimes even within countries. At the beginning of the pandemic, some countries hospitalized all patients with COVID-19. As more became known about the disease and to help manage capacity levels in hospitals, most countries advised mild cases of COVID-19 to self-isolate at home while only hospitalizing more severe cases. One example is provided in Fig. 1, which compares the patient pathway recommended by the Robert Koch Institute (RKI) in Germany in February and March 2020. The guidance changed from hospitalizing all patients with COVID-19 to hospitalizing only those where treatment at home was not possible, with this change in the pathway indicated in yellow in the figure.

In addition to the adapting process for managing cases changed over time, even within one country, the case definition could vary. In Israel, hospitals did not have a standard definition of "severely" ill COVID-19 patients, which not only caused confusion in reporting to the Ministry of Health, but also at times variations in treatment. On July 12th, 2020, the Ministry of Health issued a circular with a clear guidance in order to harmonize the definition and set standard paths of care and treatment guidelines.

As a result of the increased focus on treating mild COVID-19 patients outside of hospitals, primary care providers took on expanded responsibilities. In many countries, they served as the first point of contact for a suspected case, referred patients for testing, and diagnosed patients with COVID-19. Additionally, they supported surveillance teams in case detection and even in a few cases conducted contact tracing themselves, as described in more depth elsewhere (Rajan, 2020). Furthermore, they provided support and monitored conditions of those isolating at home to make sure they followed medical advice, initiated transfers to more intensive care if needed, and determined when the quarantine period can end.

Some countries, including Armenia, Belgium, France, and Germany, requested GPs to conduct home visits to perform tests or monitor COVID-19 patients. In the Czech Republic, GPs were advised to only conduct home visits with appropriate PPEs, and since many GPs did not have this in the beginning, some GPs were unwilling to see their patients in the first weeks of the outbreak. France advised GPs to group their consultations so that suspected cases of COVID-19 were seen in the same time period. However, more often countries discourage patients experiencing symptoms from visiting primary care providers or hospitals directly until after a phone consultation.

Some countries set up new models of care, such as 'fever clinics' in Georgia or 'community assessment hubs' in Ireland, which aimed at redirecting potential COVID-19 patients from other health care providers and preventing transmission to non-infected patients. During the last week of March 2020, Oslo, which had the highest infection rate in Norway, opened seven 'fever clinics' to receive patients referred by the GPs or the emergency out-of-hours clinics. Luxembourg similarly designated the 'Maisons médicales' (GP out-of-hour offices) as advanced care centers in order to contain the spread of the virus and concentrate these patients outside of emergency departments and general practices. The advanced care centers were supplied with testing materials for diagnosis of infections and appropriate protective equipment for staff. To manage the discharge process for COVID-19 patients, Belgium set up transition centers for patients who do not require hospitalization but are not yet able to return home.

In other countries, especially those with relatively newer primary care structures, it was possible to implement a broader redesign of primary health care operations in reaction to the pandemic. For example, Greece restructured its primary health centers along two main objectives. First, certain health centers operated on a 24-hour basis exclusively for the screening and management of mild COVID-19 cases. As of April 10th 2020, five centers were prepared to support the network of COVID-19 reference hospitals. Second, other health centers were transformed for care for non-COVID-19 patients with chronic diseases, emergency cases, and communication with patients in home isolation.

Other providers, including ambulance, home care, and long-term care providers, have taken various roles in managing cases. Several countries used ambulance providers to transport severe cases to the hospitals, including Belgium, Cyprus, Italy, Kazakstan, and the Republic of Moldova. In Hungary, the National Emergency Ambulance Service tested patients at home and delivered the test results to the lab. Care provided at home also faced changes as a result of COVID-19, particularly because health care providers may not have been equipped with the necessary PPE. A number of countries mobilized volunteers or organizations such as the Red Cross to provide services or deliver medications to vul-

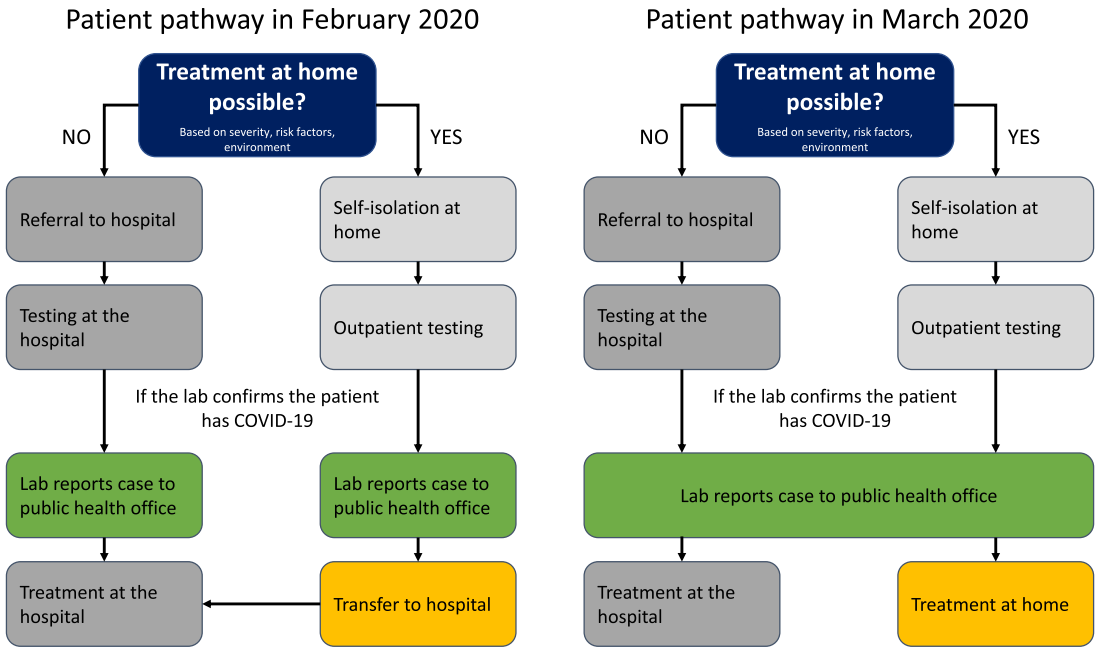

Fig. 1. Testing criteria and measures for COVID-19 in Germany
Authors compilation based on RKI publications, latest available at [17]

COVID-19 has created particular challenges for providing medical care in long-term care (LTC) facilities. The vast majority of residents in these settings are over the age of 65 years, with most having multiple chronic conditions and/or cognitive impairments. This leaves them especially vulnerable to COVID-19, while also needing continuous care for other health conditions and physical dependency. However, a need to minimize transfers to hospitals for sick residents and a desire to reduce face-to-face consultations with patients, combined with pre-existing staff shortages and lack of PPE in some countries have created significant barriers to providing essential care. Moreover, many countries limited the number of visitors to LTC facilities, raising concerns about mental health due to isolation.

Countries have introduced a variety of measures to overcome these challenges and ensure the continuing provision of medical care long-term care facilities during the pandemic. Guidance for LTC providers has, for example, been developed in a number of countries (e.g. Finland, Iceland, Ireland, Norway, Sweden, UK) to support the provision of enhanced care to those who are ill or isolating and for those with non-COVID related care needs. Some Canadian provinces have also created clinical decision-making tools to enhance coordination between long-term care and acute care facilities for the management and treatment of residents diagnosed with COVID-19.

To strengthen medical support, Romania has introduced legislation prohibiting LTC facilities from interrupting care during the state of emergency, while LTC providers in Italy and Luxembourg are similarly required to provide medical and nursing support to all residents at all times as needed. France meanwhile is encouraging increased physician visits to care homes through higher renumeration, while Israel has established a 24-hour call center to provide medical advice to LTC facilities. Some countries (e.g. France, Iceland, Ireland, Slovenia) have also developed procedures to re-deploy health workers to care homes to support LTC staff as needed.

Fig. 2. Providing essential health services in care homes. [8,20]

nerable groups at home. For example, Croatia enabled immune-compromised patients to have blood samples taken at home. Across the world, many deaths attributed to COVID-19 took place in nursing homes, as many were not equipped to handle the pandemic, which is described in more depth in Fig. 2.

3.3. Remote consultations expanded both for monitoring of COVID-19 cases and teleconsultations

The use of remote consultations took a significant leap forward as providers searched for ways to continue to provide care while reducing the risk of transmission. In Germany, the Federal Association of SHI Physicians reported more than a ten-fold increase of teleconsultations in March 2020 (19,500) compared to January and February 2020 (1,700). Similarly, the number of doctors using remote consultations in France jumped from around 3,000 in February 2020 to 56,000 in April 2020, with GPs billing 80% of all teleconsultations. Lithuania's National Health Insurance Fund reported conducting 758,000 primary health care remote consultations in April 2020 compared to 11,000 in April 2019. In addition to conversations via telephone, video consultations have become more common. These support more advanced consultations that can in-

The uncertainty linked to the COVID-19 pandemic as well as the quarantine and isolation measures to stop the spread of the virus may have an effect in the mental health of health workers, managers of health facilities, people who are looking after children, older adults, people in isolation and members of the public more generally (WHO, 2020). For example, in Italy, the Italian Society of Psychiatry has estimated that 300,000 patients are suffering from post-traumatic stress linked to losing their loved ones, financial damage and uncertainty about the future. Meanwhile, existing mental health services faced disruptions, with some services such as in-person group therapy not feasible under the new restrictions. Norway saw a 51% decrease in volume of inpatient psychiatric care in Aril 2020 compared to the previous year.

In this context, most countries in Europe have implemented measures to tackle mental health care for the general population, with specific emphasis is supporting the mental health of the healthcare workforce.

General population

Several countries have launched websites with information to the general population on coping strategies (e.g. Poland, Portugal, Switzerland), as well as on hotlines and other services linked to mental health problems due to the pandemic. These websites usually include general information for the public, Q&A as well as specific information for the health care workers, as it is the case in Portugal (Ministry of Health, 2020). Leaflets and posters aimed to citizens in general, and to the mentally vulnerable citizens, in particular, on how to secure mental health during the epidemic have also been produced, as well as guidelines for keeping mentally and physically well. Help lines have been available for those who are feeling distressed (e.g. France, Malta, Portugal), and in some countries, psychiatrists and psychosocial professionals have been available for this purpose.

Health professionals

During the COVID-19 crisis, the mental health support to the healthcare workforce has increased in most countries in Europe, organized by the national and local authorities, but also by NGOs in the field of mental health (e.g. Malta, Romania). The support is provided either online or through dedicated phone-lines (e.g. Belgium, Denmark, Poland, Romania, Sweden). These helplines are sometimes organized at the national level (e.g. Israel, Malta, Romania, the United Kingdom) and/or by professional associations for specific professions (e.g. France, Ireland, Latvia, Poland, the United Kingdom). In Hungary and Croatia, helplines are run by universities and schools of public health. Apps and online services are available in some countries (e.g. Romania, the United Kingdom) to provide guidance and support for hours when helplines are not staffed.

In some countries, the healthcare workforce has access to 24-hour mental health support (e.g. Sweden and UK). Administrative barriers have also been removed to access mental health care. For example, all health care professionals working in the county of Stockholm can contact the mental health support without going through their manager.

Remote counselling sessions with psychiatrists or psychologists are provided in some countries (e.g. Finland, Italy, Malta, Kyrgyzstan, the Russian Federation and the United Kingdom) for COVID-19 related stress management, burnout prevention and other mental health support. Norway has also established a buddy-system whereby health professionals can talk to a matched peer, while mindfulness sessions are being offered to hospital workers in Malta.

These measures are crucial to enable the health workforce to deliver an effective crisis response. However, many are temporary. Beyond the crisis period, providing appropriate long-term mental health support, adequate salaries and other compensation should be recognized as core components of developing a sustainable health workforce.

Fig. 3. Mental health services.

volve simultaneous sharing of test results, imaging, or other files [23]. While primary care consultations often made up the majority of virtual consultations, they have also been adopted in specialty consultations including mental health (Fig. 3).

To support remote consultations, many countries used existing or set up new telephone hotlines. Many countries use 112 as the emergency hotline, and have enhanced their screening procedures to determine whether a call is related to COVID-19. For example, Georgia forwarded calls related to COVID-19 to primary care doctors who have been specifically trained on COVID-19 protocols. In some cases, the supplementary lines were set up due to extraordinary demand on the regular emergency number. For example, Latvia set up a designated hotline for COVID-19 after the emergency number 113 started receiving an average of 4,000 calls a day instead of the regular 1,200 [7]. In Spain, initially the standard 24/7 emergency hotline was used for patients, but most regions have established a dedicated phone hotline separate from the 24/7 call center number to keep the standard emergency hotline for emergencies not related to COVID-19. Estonia and Germany both had pre-existing physician advisory lines in place, but Estonia set up a separate COVID-19 hotline to reduce the burden of calls to the GP helpline and 112.

Several countries reported setting up call lines for non-medical advice relating to COVID-19 information and procedures or chatbots on official websites (e.g., Ministry of Health or public health agencies). Norway established a helpline for general COVID-19 questions, not staffed by health care workers, while patient organizations have established additional helplines for patients with chronic diseases. Similarly, Switzerland operates a 24-hour COVID-19 hotline that provides recommendations on what to do based on symptoms, but does not provide medical advice. Austria set up a telephone helpline to guide patients to the right point of contact in order to avoid physical contacts with health care professionals and other patients. Latvia and Lithuania established special COVID-19 hotlines to provide current advice on conditions and testing.

3.4. Maintaining essential services

As an initial response to the pandemic, most countries prioritized essential services and cancelled or postponed non-urgent care (Table 1), although countries varied widely in which services they maintained and the duration of the restrictions. In the first wave of the COVID-19 pandemic, service disruption often occurred

Table 1
Countries cancelling or postponing non-urgent care and elective surgeries.

Types of care adaptations	Countries
Non-urgent care and/or elective surgeries cancelled or postponed[1]	Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Cyprus, Denmark, Estonia, France, Georgia, Greece, Hungary, Ireland, Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, North Macedonia, Norway, Poland, Portugal, Romania, Russian Federation, Serbia, Slovakia, Slovenia, Spain, Switzerland, Turkey, Ukraine, UK (England)
Physician or local decision about adaptations to care provision	Canada, Germany, the Netherlands, Spain, Sweden, Switzerland, US
Services maintained but potentially at reduced capacity	Armenia, Finland, Iceland

[1]Countries vary in how they consider non-urgent care and whether this applies in ambulatory as well as inpatient settings. In some countries (e.g., Israel) the cancellations were only applicable to the public sector and not the private sector.

Table 2
Duration of restrictions.

Country	Date of restrictions	Date of reintroduction	Duration (days)
Albania	11 March 2020	15 May 2020	65
Austria	12 March 2020	15 April 2020	34
Belgium	14 March 2020	4 May 2020	54
Bulgaria	13 March 2020	21 April 2020	39
Croatia	16 March 2020	27 April 2020[1]	42
Czech Republic	17 March 2020	14 April 2020	28
Denmark	17 March 2020	13 April 2020	29
Estonia	17 March 2020[2]	21 April 2020	35
France	6 March 2020	11 May 2020	67
Greece	23 March 2020	4 May 2020	36
Hungary	26 March 2020	4 May 2020	40
Iceland	23 March 2020	31 May 2020	70
Ireland	28 March 2020	19 May 2020[4]	53
Israel	14 March 2020	27 April 2020	44
Italy	29 February 2020	4 May 2020	65
Latvia	14 March 2020	20 April 2020	38
Lithuania	16 March 2020	29 April 2020[5]	44
Luxembourg	18 March 2020	4 May 2020	48
Malta	17 March 2020	22 May 2020	66
Norway	12 March 2020	14 April 2020	33
Poland	23 March 2020	18 April 2020	27
Portugal	17 March 2020	3 May 2020	47
Romania	23 March 2020	15 May 2020	53
Russian Federation	16 April 2020	25 May 2020	40
Slovenia	20 March 2020	9 May 2020	50
Spain	15 March 2020	17 May 2020[6]	63
Switzerland	20 March 2020	27 April 2020	38
UK (England)	17 March 2020	29 April 2020	43
Average			46 days

Source: HSRM and [12]. Some countries had regional variations so the summary table captures the national guidance.
1: Croatia: Outpatient services reopened April 27th, while public hospitals inpatient services reopened May 4th.
2: Estonia: Elective inpatient and outpatient care only continues for those patients whose health situation does not allow for postponement of the treatment (made by the treating doctor). As of March 26th, dental care and private clinics can only provide emergency services.
3: Greece: As of May 4th, hospital doctors resumed non-emergency operations and afternoon outpatient appointments which had been suspended amid the peak of the coronavirus pandemic. Morning outpatient appointments resumed the week after, from May 11th.
4: Ireland: Screening programs restarted later, on July 6th.
5: Lithuania: Providers could only restart when they presented plans on how to do it safely, and then got the approval, plus they were not motivated to restart until July as they were paid anyway. Dental care reopened later, on May 18th.
6: Spain: reopening dates varied by region but end of lockdown provides national proxy.

at the national level. As shown in Table 2, the national restrictions on care provision ranged from 27 days (Poland) to 70 days (Iceland), with a median of 43.5 days. Nevertheless, a few commonalities can be observed, with the shared perspective that the mortality risk from postponing an intervention should not be higher than that of a severe COVID-19 case. In hospitals, essential services often included urgent consultations, necessary treatments (e.g., chemotherapy, dialysis), maternal services, and rehabilitation. In primary care, countries were more likely to continue treating chronic illnesses which would otherwise lead to deterioration of condition, neonatal screening, and infant vaccinations.

At the time of writing, limited data is available on the impact of these restrictions, as well as how this interacts with the approach taken in many countries to reserve bed and/or ICU capacities in case of a surge in cases. Further, after the initial restrictions, most countries used more local approaches to manage COVID-19 outbreaks, obscuring the situation at the national level. However, data from some countries already suggest alarming health trends for patients without COVID-19. Several countries observed drops in emergency room visits; Portugal experienced a 45% reduction in emergency room visits and five hospitals in Italy experienced a 73-83% drop in pediatric emergency department visits. Germany reported 30% fewer heart attacks and strokes, and registration of pa-

tients with suspected myocardial infarction has decreased by about 25% since the outbreak in Sweden. While reports of rationing care in hospitals were uncommon, several countries, including Estonia and Spain, developed ethical guidelines to guide clinical decision-making. In Armenia, on June 6th 2020, 200 patients were awaiting hospitalization due to shortage of beds.

In ambulatory care, countries saw a near-universal trend of decreased consultations in many specialties (largely due to the cancellation of services) combined with increased remote treatments, as described in the previous section. Norway provides a glimpse into this trend: compared to March 2019, in March 2020 Norway saw a 71% decline in outpatient consultations with chiropractors and a 55% decline in consultations with physiotherapists and dentists, while GP consultations increased by about 10%. The increase of GP consultations was driven by remote consultations, which constituted 58% of all consultations by week 12 since the introduction of physical distancing measures.

Routine public health activities, including cancer screenings and immunizations, were also affected in many countries. Some countries, including Bulgaria, Poland, and the Russian Federation, temporarily postponed some programs, while other countries considered them essential services. Slovenia paused cancer screenings, but resumed them in mid-May 2020, and expects that most cancer screening programs will meet usual targets by the end of 2020. April immunization data from Ukraine shows a decline, including a 30% reduction in measles-mumps-rubella vaccine coverage compared to 2018-2019 rates, as does population vaccination rates in Armenia, which has dropped by 27%. Further, Norway expressed concerns about the reduction in the number of new cancer cases, as the country saw a 24% drop in the number of new cases entering the cancer pathway, noting that it is not clear yet whether this reflects an actual decline in the number of cases or if the decline is caused by delayed reporting.

Overall, health systems faced a delicate balance of managing COVID-19 cases and maintaining essential services. Many countries expect to operate at lower capacity for routinely provided care, which will impact patient access and waiting times. For example, to protect patients from unnecessary contacts, health care providers used strategies such as reducing the number of people in waiting rooms, but this affected the number of patients a provider could see. The key strategies observed from the HSRM are summarized in Table 3, with several country examples.

4. Discussion

The provision of services is arguably the most visible health system function. In every country, the public primarily interacts with the health system through the delivery of care, from doctor's offices and hospitals to care provided at home, with provided services ranging from routine vaccinations to treatment of complex and rare diseases. While the pandemic has highlighted the visibility of other health system functions, in particular the public health measures necessary to prevent transmission of communicable diseases, COVID-19 has had unprecedented impacts on the provision of care.

While not the focus of this article, the initial starting point of each health system should not be understated. Health care provision varies widely across the countries studied in the HSRM, including the balance between primary and hospital care, the health workforce, and pre-existing digital tools. Some countries went into the pandemic with a relative advantage in certain areas, which both facilitated the country's initial response and eases their transition to resuming routine care. Pre-existing pandemic plans also may have contributed to the response, although all of these early advantages hinged on the governance and leadership within a particular country in how the COVID-19 response developed.

Several countries emphasized the role of the hospital in planning the response to COVID-19, but there are growing concerns about this approach. The focus on hospitals may create blind spots in the management of COVID-19 in other areas of care provision, including smaller hospitals, outpatient clinics, and long-term care facilities. Indeed, many countries experienced larger outbreaks in these settings without the accompanying support of personal protective equipment (PPE) and sufficient physical infrastructure and workforce needed to provide care; up to 47% of all COVID-19-related deaths have occurred among care home residents based on data as of June 2020 from 26 countries [3]. Additionally, the role of primary care providers in treating cases became more critical, but they may not have been supplied with the resources needed to provide the level of care required.

Some countries, such as Poland and Hungary, which initially saw low numbers of COVID-19 cases, underutilized the capacity set aside for treatment of COVID-19. During this time, however, little was known about the disease and how it would develop within the countries. Nevertheless, the decisions to dedicate capacity to COVID-19 not only affected the ability to provide care to non-COVID-19 patients, but also the capacity for specialized health professionals to conduct their training, as many were instead recruited to treat COVID-19 patients [22].

In terms of managing cases, many countries introduced new care pathways and mechanisms for patient triage and evolved their approach over time after more became known about the disease. Telephone hotlines, including new numbers specific to COVID-19 questions, were a particularly common approach due to the need of maintaining distance to reduce potential infections. However, the staffing of these lines is important. If the lines provide medical advice, they should be staffed by medical personnel, which calls into question whether there are appropriately trained personnel for this, who are also not urgently needed elsewhere. Additionally, having separately designated lines for COVID-19 reduces burden on normally operating emergency lines, but it may lead to confusion of the public if it is unclear where to seek advice.

Maintaining essential services while continuing to provide capacity to treat COVID-19 patients is perhaps the largest challenge facing health care providers during this pandemic. A survey of the WHO European Region found high levels of disruption in rehabilitation services and dental care (for both, 91% of surveyed countries indicated disruptions), non-communicable diseases diagnosis and treatment (76%), family planning and contraception (74%), and outreach services for routine immunizations (63%) [6]. Furthermore, nearly a fifth of countries reported a complete disruption of routine outreach for immunization and rehabilitation services. This is almost certainly related to the fact that these services are often conducted by the same personnel that are responsible for surveillance of COVID-19. Additionally, there are some indications that patients hesitate to contact emergency services for symptoms such as pain in the chest, if they perceive that the emergency department is treating COVID-19 patients and/or they fear contracting COVID-19 in the hospital [10], which could be linked to the reduced number of acute health events seen in some countries. While the cancellation or postponement of services in the initial months of the pandemic may have reduced unnecessary treatments or minimized induced health system demand, many patients are likely to have increased unmet needs for health care.

With many countries continuing to offer reduced services, the public may have to accept longer waiting times. This has already been observed in some countries including England, where in March 2020 3,097 patients were waiting more than 52 weeks for treatment, which exploded to 139,545 patients at the end of

Table 3
Common approaches used to maintain essential services with country examples.

Approach	Country examples
Separate (confirmed and suspected) COVID-19 and non-COVID-19 patients	• Offered only maternal and child consultations and compulsory vaccinations without admitting other patients on Tuesdays and Thursdays (Bulgaria) • Established "infection consultation hours" in GP practices for (suspected) COVID-19 patients (Germany)
Increase the use of virtual treatments and digital services	• Received regular prescriptions on their mobile device, via text message or e-mail (Greece) • Launched a total of 174 initiatives between March 1st and June 11th 2020 to enhance the delivery of services through digital technology, of which 50 are COVID-19-specific, whereas others are dedicated to diabetology, cardiology, general medicine, oncology, neurology and psychology (Italy) • Restricted primary care physician consultations to telephone or teleconsultation (Luxembourg)
Reduce capacity of waiting areas	• Recommended no more than 3 people in the waiting room at one time (Czech Republic) • Closed down waiting rooms in some specific cases (Spain)
Prioritize treatments	• Created an 'urgency list' of procedures to prioritize when scaling up regular hospital care (the Netherlands) • Adopted different criteria to prioritize surgery in five potential scenarios depending on the epidemiological situation (Spain)
Provide staff with increased testing	• Tested all health workers after the end of the lockdown in the country on May 11th 2020 (France) • Postponed all hospital operations and redirected new patients to other hospitals in the region after detecting a COVID-19 outbreak among health personnel at a University Hospital's intensive care unit on September 29th 2020 (Norway)
Use private sector capacity	• Used the accident and emergency departments of private hospitals to treat urgent cases (Cyprus) • Conducted 'block booking' by the NHS of capacity from private acute hospitals, including their outpatient capacity, to help maintain essential services and address backlogs (England)

September 2020 [9]. While NHS England contracted with private sector providers to help alleviate this burden, different approaches to waiting list management and prioritization are likely to be essential to complement these initial efforts. It is important to note that not all countries have centralized datasets or routinely reported figures similar to that of the NHS, so the impact of the various measures taken—including reserving bed and/or ICU capacity, cancelling or postponing treatments—is not yet known.

A near-universal trend seen across the countries in the HSRM is an expansion in provision of virtual care, as it provides no risk of coronavirus transmission. Particularly for services such as prescription renewals and sick leave certificates, these options provide continuity of care with relatively low risk. However, it is not yet clear how the care-seeking behavior of patients may change and how the quality of care compares to care provided in-person, for example with mental health services. Furthermore, not all patients have access to video conferencing and other remote tools, which may lead to digital exclusion and inequitable care provision. Initial studies suggest that staff workload from remote consultations could increase by 25%, unless clinicians shorten consultation times, which has troubling implications for a workforce that is already stretched thin [19]. These impacts of the switch to remotely provided care require further evaluation and research.

At the time of writing, more is becoming understood about the disease, including the long-term implications, which has been referred to 'long Covid' or 'long-haul Covid' [2]. While some countries, including Ireland and the UK (England), have developed strategies for long Covid that acknowledge the chronic conditions accompanying some patients with the disease and provide some level of support, the larger impact to both health outcomes and health symptoms is not yet known.

While this article describes the adaptations countries have taken in planning services, managing COVID-19 cases, and maintaining essential services, the extent to which these will become permanent features of the health system is not yet known. Some specific measures, for example physically separating patient pathways to reduce transmission, may disappear while others, such as virtual consultations, may continue. Reflections on the permanence of health system changes can begin when the COVID-19 pandemic becomes a less acute feature in the provision of health care.

5. Conclusion

In the first wave, health systems included in the HSRM took varying measures in planning services for COVID-19 patients, managing cases, and maintaining essential services for all other conditions. While the implications of these measures are not yet fully clear, some experiences should be considered for future waves. Moreover, the COVID-19 pandemic has exposed areas where policymakers should focus future policy consideration and development.

First, guidelines on how to prioritize routine care with various COVID-19 scenarios provides essential clarity for health care providers in a rapidly changing epidemiological context. Ideally, the development of these guidelines would involve medical professionals, patient groups, and other stakeholders. Once these guidelines are available, they should adapt based on scientific findings rather than political considerations. A hybrid model, of maintaining routine procedures as far as possible, while also treating COVID-19 patients, is needed, but further definition of these parameters within the country and epidemiological context is required to operationalize this.

Second, the strategy already implemented in many countries to create specific COVID-19 care zones, for example by using separate buildings, having dedicated rooms for COVID-19 patients, or specific treatment times, should be maintained throughout the pandemic. While this places extreme burden on health systems and patients requiring non-COVID-19 care, it provides the only option for preventing the spread of the disease.

Third, providers and policymakers should consider the wider effects of using digital tools on patient access. While remote consultations offer certain advantages, they do not necessarily provide the same quality of care and require patients to adapt their care seeking behaviors. Furthermore, when relying on digital tools, policymakers must ensure that they are supported through reimbursements to health care providers, necessary infrastructure, training, and more.

Last, the pandemic has proven that it requires a whole system response, beyond the borders of hospital walls, the health system, and even countries. Going forward, the pandemic should be viewed as a whole system response, keeping in mind the transitions between treatment areas and balance between different care settings. This includes considerations such as avoiding overburdening GPs, avoiding over-reliance on hospitals, and care transitions for example between hospitals and long-term care facilities. The balance between care settings will also become crucial in the context of distributing COVID-19 vaccines, and requires consideration and planning from policymakers. Historically, strong boundaries around the provision of care exist between sectors and countries, and if COVID-19 teaches us one thing, a pandemic breaks these barriers down.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of Competing Interest

We declare no competing interests.

References

[1] Azoulay E, de Waele J, Ferrer R, et al. International variation in the management of severe COVID-19 patients. Crit Care 2020;24:486. doi:10.1186/s13054-020-03194-w.
[2] Callard F, Perego E. How and why patients made Long COVID. Soc Sci Med 2021;268:113426. doi:10.1016/j.socscimed.2020.113426.
[3] Comas-Herrera A, Zalakaín J, Litwin C, et al. Mortality associated with COVID-19 outbreaks in care homes: early international evidence. LTCcovid.org, International Long-Term Care Policy Network. CPECLSE; 2020. 26 June 2020. Available at https://ltccovid.org/wp-content/uploads/2020/06/Mortality-associatedwith-COVID-among-people-who-use-long-term-care26-June.pdf .
[4] Eurostat Self-reported consultations of a medical professional by sex, age and degree of urbanisation; 2020. Available at https://ec.europa.eu/eurostat/databrowser/view/hlth_ehis_am2u/default/table?lang=en .
[5] Eurostat Hospital discharges by diagnosis, in-patients, per 100 000 inhabitants; 2020. Available at: https://ec.europa.eu/eurostat/databrowser/view/hlth_co_disch2/default/table?lang=en .
[6] Jakab M, et al. Managing health systems on a seesaw: balancing the delivery of essential health services whilst responding to COVID-19. Eurohealth 2020 2020;26.
[7] LSM.LV (2020). "Tālrunis pieteikumiem par Covid-19 analīzēm – 8303" [phone for applications for COVID-19 analysis –8303]. 13 March 2020. Available at: https://www.lsm.lv/raksts/zinas/latvija/talrunis-pieteikumiempar-covid-19-analizem-8303.a352236/
[8] Ministry of Health. Programa Nacional para a Saúde Mental. National Mental Health Program 2020. Available at https://saudemental.covid19.min-saude.pt/ .
[9] NHS (2020). Statistical press notice: NHS referral to treatment (RTT) waiting times data March 2020. 14 May 2020. Available at: https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2020/05/Mar20-RTT-SPN-publication-version.pdf
[10] NOS (2020). "'Spoed is spoed: denk niet ze zijn vast te druk'" ["Speed is speed: don't think they are too busy"]. 28 March 2020. Available at: https://nos.nl/collectie/13838/artikel/2328656-spoed-is-spoed-denk-niet-ze-zijn-vast-te-druk
[11] Phua J, et al. Intensive care management of coronavirus disease 2019 (COVID-19): challenges and recommendations. Lancet Respir Med 2020;8:506–17 2020Published Online April 6, 2020 https://doi.org/10.1016/.
[12] Reed S. Resuming health services during the COVID-19 pandemic: what can the NHS learn from other countries? Nuffield Trust; 2020. July 2020.
[13] Tobaiqy M, et al. Therapeutic management of patients with COVID-19: a systematic review. Infect Prev Pract 2020;2(3):100061. doi:10.1016/j.infpip.2020.100061.
[14] Tsang T, et al. Effect of changing case definitions for COVID-19 on the epidemic curve and transmission parameters in mainland China: a modelling study. Lancet Public Health 2020;5(5):e289–96.
[15] Rajan S, et al. What have European countries done to prevent the spread of COVID-19? Lessons from the COVID-19 health system response monitor. Health Policy 2021 Forthcoming.
[16] Rechel B, Maresso A, van Ginneken E. Health systems in transition: Template for Authors. Copenhagen, Denmark: World Health Organization (acting as the host for, and secretariat of, the European Observatory on Health Systems and Policies); 2019.
[17] Robert Koch Institut (2020). "COVID-19-Verdacht: Testkriterien und Maßnahmen [COVID-19 suspicion: test criteria and measures]. Available at: https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Massnahmen_Verdachtsfall_Infografik_DINA3.pdf?__blob=publicationFile
[19] Salisbury C, Murphy M, Duncan P. The impact of digital-first consultations on workload in general practice: modeling study. J Med Internet Res 2020 2020;22(6):e18203. doi:10.2196/18203.
[20] WHO (2020). Mental health & COVID-19. Available at: https://www.who.int/teams/mental-health-and-substance-use/covid-19.
[21] Winkelmann J, et al. Countries responses in ensuring sufficient physical infrastructure and workforce capacity during the first COVID-19 wave. Health Policy 2021.
[22] Williams G, et al. What strategies are countries using to expand health workforce surge capacity during the COVID-19 pandemic? 2nd ed. Eurohealth 2020;26.
[23] Richardson E, et al. Keeping what works: Remote consultations during the COVID-19 pandemic. Eurohealth 2020;26(2):73–6.