



The Official HOPE  
Reference Book  
[hospitalhealthcare.com](http://hospitalhealthcare.com)



# ONCOLOGY 2020



# DRIVEN TO FULFILL THE PROMISE OF BIOSIMILARS— THE PFIZER WAY

## The Pfizer Promise is simple:

To help you provide patients with more treatment options while delivering a large portfolio of potentially cost-saving biosimilars.<sup>1,2</sup>



### Breadth of offerings

Pfizer has a large portfolio of oncology biosimilars on the market, including both cancer therapies and supportive care products, to give patients more treatment options.<sup>2</sup>



### Quality focused

Pfizer oncology biosimilars are all produced to meet the same high-quality standards as Pfizer's other biologics—using the same robust protocols for monitoring quality throughout every stage of the manufacturing process.<sup>3-6</sup>



### Manufacturing and supply experience

Pfizer leverages more than 30 years of state-of-the-art manufacturing and supply-chain experience in biologics to deliver biosimilars to patients.<sup>3,6-8</sup>

**References:** 1. IMS Institute for Healthcare Informatics. *Delivering on the Potential of Biosimilar Medicines: The Role of Functioning Competitive Markets*. Parsippany, NJ: IMS; March 2016. 2. Generics and Biosimilars Initiative. Biosimilars approved in Europe. <http://www.gabionline.net/Biosimilars/General/Biosimilars-approved-in-Europe>. Updated February 21, 2020. Accessed August 4, 2020. 3. Pfizer. Biosimilars. <https://www.pfizer.com/science/research-development/biosimilars>. Accessed June 17, 2020. 4. Pfizer. Transforming Delivery of High Quality Products. Pfizer Annual Review 2016. [https://www.pfizer.com/sites/default/files/investors/financial\\_reports/annual\\_reports/2016/transforming-delivery-of-high-quality-products/index.html](https://www.pfizer.com/sites/default/files/investors/financial_reports/annual_reports/2016/transforming-delivery-of-high-quality-products/index.html). 2016. Accessed June 17, 2020. 5. Pfizer. Heritage in Biologics. [https://www.iononline.com/SiteRepository/Biosimilar/Pfizer/Pfizer-Heritage-in-Biologics\\_25Oct19](https://www.iononline.com/SiteRepository/Biosimilar/Pfizer/Pfizer-Heritage-in-Biologics_25Oct19). July 2016. Accessed June 17, 2020. 6. Pfizer. Manufacturing and Supply Chain Excellence. <https://smarthub.pfizerpro.co.uk/supply-chain>. Updated March 2020. Accessed August 3, 2020. 7. Pfizer. Manufacturing and Supply Chain Excellence. [https://www.pfizer.com/sites/default/files/investors/financial\\_reports/annual\\_reports/2017/our-business-our-purpose/manufacturing-supply-chain-excellence/index.html](https://www.pfizer.com/sites/default/files/investors/financial_reports/annual_reports/2017/our-business-our-purpose/manufacturing-supply-chain-excellence/index.html). 2017. Accessed September 14, 2020. 8. Pfizer. Manufacturing, Quality, and Supply Chain. [https://www.pfizer.com/sites/default/files/investors/financial\\_reports/annual\\_reports/2016/our-business/manufacturing-quality-and-supply-chain/index.html](https://www.pfizer.com/sites/default/files/investors/financial_reports/annual_reports/2016/our-business/manufacturing-quality-and-supply-chain/index.html). 2017. Accessed September 14, 2020.



# Contents

- 4 The impact of COVID-19 on hospital provision: a view from the UK**  
Majid Kazmi BMed Biol MD ChB (comm) FRCP FRCPath
- 7 Examining the impact of COVID-19 on hospital provision: an Italian perspective**  
Giuseppe Curigliano MD PhD
- 9 Impact of the pandemic: a surgical oncology perspective**  
Karl Hillebrandt MD, Beate Rau MD and Moritz Schmelzle MD
- 10 Impact of COVID-19 on breast cancer care**  
Javier Cortes MD PhD
- 11 HOPE Governors' responses on the COVID-19 crisis**  
HOPE representatives

---

**Content Director – Secondary Care**

Andrea Porter

**Art Director**

James Depree

**Executive Director**

Edward Burkle

Published in the UK by Cogora Limited. 140 London Wall London EC2Y 5DN.  
Copyright © Cogora Ltd. October 2020.

The contents of this publication are protected by copyright. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means without the written permission of the publisher. The views expressed in this publication are not necessarily those of the publisher or production team. While the publisher and production team have taken every care with regard to accuracy of editorial and advertisement contributions, they cannot be held responsible for any errors or omissions contained therein.

# The impact of COVID-19 on hospital provision: a view from the UK

Chief of Cancer Services and Deputy Medical Director at Guy's and St Thomas' NHS Trust, Dr Majid Kazmi, offers his insight of how COVID-19 has affected clinical practice within his department

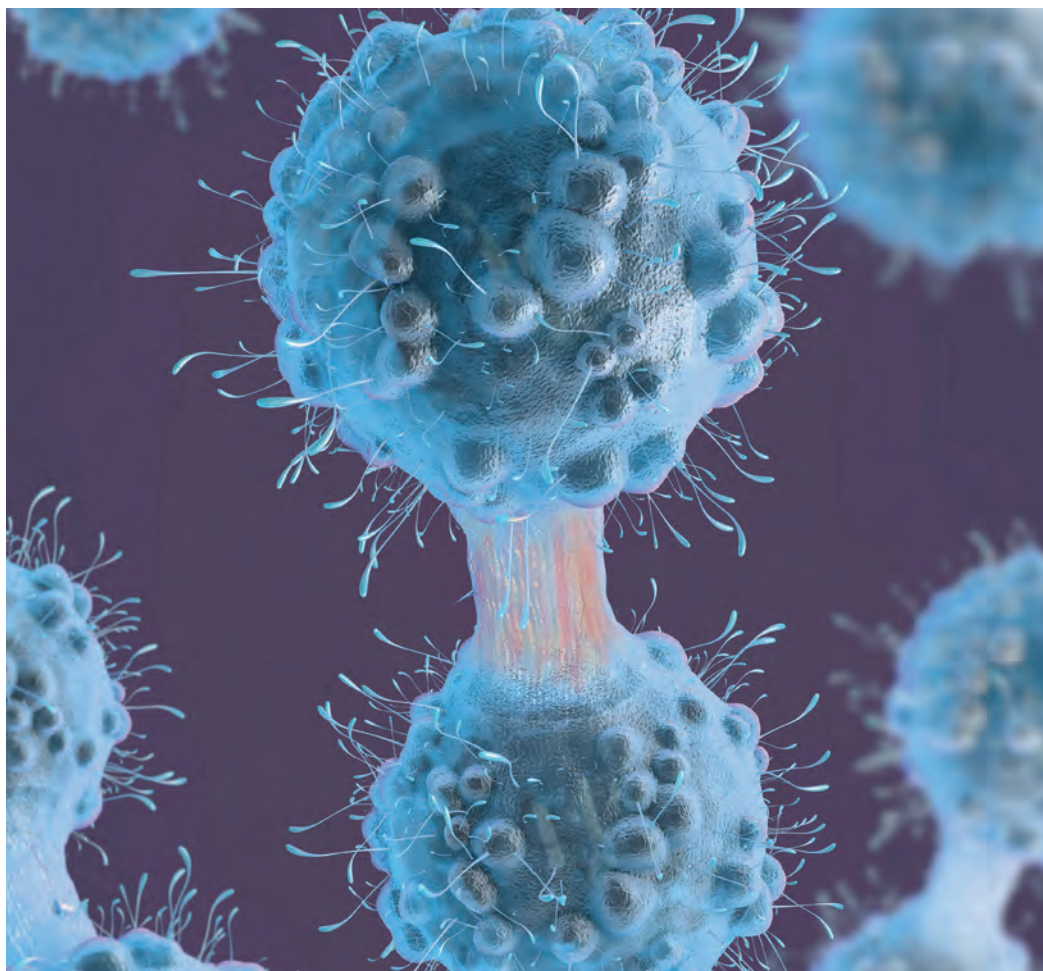
**Majid Kazmi**  
**BMed Biol MD ChB**  
**(comm) FRCP**  
**FRCPATH**

Guy's and St Thomas'  
NHS Foundation Trust,  
UK

## How has the continuum of care and throughput been impacted by the pandemic?

Dr Kazmi said that there was a significant impact on services when the lockdown occurred. However, he felt that in many respects the hospital was fortunate because back in 2016, a standalone cancer centre was opened on part of the main hospital campus and staff were able to quickly secure the entrance and exits of the building and continue to provide services such as chemotherapy, radiotherapy and outpatient work. Nevertheless, there was a particular issue with cancer surgery which had been traditionally done in the main part of the hospital rather than the new unit and Guy's was one of the most affected hospitals in the country, so it was difficult to create COVID-19

secure pathways. The top four floors of the new cancer centre were privately operated by HCA Healthcare and these were made COVID-19 secure and allowed staff to continue with cancer surgery. Guy's became a surgical hub for South East London hospitals and Dr Kazmi and colleagues worked with teams from other hospitals to prioritise cases and were able to perform surgery for the majority of high risk, urgent patients. Although the lockdown reduced the total volume of operations performed, Dr Kazmi felt that they were still able to manage a reasonable amount of cases and although non-urgent cases were initially given a lower priority, currently more of these are now being performed.



### **What new protocols or guidelines were deployed to protect patients and clinicians during the pandemic?**

Very early on, Dr Kazmi and his teams recognised that patients needing chemotherapy or surgery needed to self-isolate and insisted that all patients had two weeks of self-isolation before they came to hospital. Patients were asked to attend hospital 48 hours before their treatment and tested for COVID-19 and, if negative, they could proceed with treatment. In addition, staff were deployed to 'door duty', taking patients' temperatures and asking COVID-19 screening questions and relatives or visitors were prevented from attending. As Dr Kazmi explained, this was quite a difficult decision to take because cancer patients rely heavily on relatives and carers for support during treatment but it was necessary to reduce the number of people in attendance at the centre. Some exceptions to the rule were made for extenuating circumstances, for example, patients in end of life care where there was likely to be difficult conversations or in cases where there was a vulnerable individual who was unable to comprehend what was happening.

Since implementing this policy, although some patients have died due to complex surgery, there has been no excess mortality due to COVID-19.

For staff, daily temperature checks were undertaken initially although this was stopped after a few months as there was never an instance of a raised temperature and staff who felt unwell did not attend work. As per national guidelines, all working staff had access to full personal protective equipment as well as hand gels and this was vigorously enforced to protect patients.

### **New guidelines**

The Trust created its own set of guidelines for staff during the pandemic though these were largely based on the advice provided by the National Institute for Health and Care Excellence (NICE) and Public Health England. For instance, the Trust used NICE guidance on prioritising patients for radiotherapy, chemotherapy and surgery and in fact consultants at Guy's and St Thomas's were instrumental in writing many of these guidelines, so the guidance was not a surprise though it was necessary to explore how these national guidelines could be best implemented locally. Dr Kazmi said that the guidelines remained in draft form throughout the pandemic as live documents that could be modified and updated when new information became available.

### **Consulting online**

One major change due to the pandemic was a huge increase in virtual consultations. Dr Kazmi remarked on how literally overnight, the department shifted from none to over 80% of consultations being conducted online. Initially, consultations were held over the phone but this shifted to become virtual, making use of software such as Attend Anywhere. Currently, and depending on the type of clinic, somewhere between 40% and 60% of consultations are

face-to-face with the remainder continuing to be virtual although as Dr Kazmi acknowledges, it can be difficult with cancer patients because they often need to be seen. In addition, since treatment decisions are directed to some extent by blood tests and imaging, there was little point arranging a virtual consultation if the patient was already visiting the centre for various tests.

Virtual consultations continue to be used for some newly referred patients which allow clinicians to assess the patient and to direct the initial set of investigations more appropriately and this has been beneficial for the patient pathway, compared to in the past when every patient was seen in a clinic.

### **Patient-focused developments**

As cancer treatment decisions are often based on blood test results, a decision was made to create mobile blood testing services thus avoiding the need for patients to visit the department. Dr Kazmi described how the team worked with St John's Ambulance Service to establish mobile blood testing facilities at sites such as supermarket car parks and from where the results could be sent to the centre and interpreted by clinical staff. He thought that patients were very satisfied with this new service because it was both more convenient and safer because they no longer had to travel on public transport to the cancer centre.

Although Dr Kazmi's department traditionally followed NICE guidance for chemotherapy treatment options, during the pandemic, rapid guideline summaries created by NICE, provided clinicians with more flexibility. For example, the rapid guidance had recommended that cancer teams consider switching appropriate patients from infusional to oral chemotherapy.

Prior to the pandemic, one piece of work that had been planned by Dr Kazmi's team was to increase the use of self-administered subcutaneous medications. This was driven by the need to reduce attendance for patients who were coming to the centre to receive what amounted to a 5-minute injection, which was clearly a waste of time for both parties. The pandemic accelerated this work and patients who possessed the necessary dexterity skills, were taught how to inject themselves. As Dr Kazmi described, the shift to greater use of self-administration of subcutaneous medication while clearly of benefit to patients during the pandemic will enable increased capacity within cancer centres which has always been a major issue.

Switching patients to oral therapies enabled a further development, which was the home delivery of medication. For example, after a virtual consultation if a clinician decided to continue with the next cycle of chemotherapy, the medication was couriered to a patient and this avoided them having to attend the hospital pharmacy.

As services return to some level of normality, the cancer centre is working to re-build their chemotherapy infusion service and reverting to any pre-pandemic NICE guidance with respect to first and second-line treatment options.



### How would you summarise the impact of the pandemic and what are the key learnings?

Dr Kazmi felt concerned that as capacity begins to increase again, there is a worrying number of patients with late presentations of cancer and while this might not have an immediate effect, the full impact will not become apparent until few years' time. Dr Kazmi noted that during April 2020, the department's referrals under the governments two-week wait time, reduced from around 2000 a month to about 400. He explained that this would be a problem for time sensitive cancers which can quickly change stage and move from being operable to non-operable. He illustrated this with colorectal cancer. For example, a patient with stage 1 disease has an 80% chance of being alive at five years if operated on at that stage, although if operated on at a later stage, there is a 10–20% of being alive after five years. He thinks that in five years there is likely to be a spike in cancer mortality due to the delay caused by COVID-19.

The second learning for him was that although the NHS did a fantastic job during the pandemic, if there is a second-wave, it is vital to try and maintain as much other activity as possible. During the pandemic he described how the NHS more or less shutdown and having learnt much about the virus and how it behaves, it should be possible to quickly adapt and ensure that as normal a service as possible is maintained.

Dr Kazmi says that as a result of the pandemic, virtual consultations are here to stay. In addition, the pandemic has enabled more flexible working and not all staff need to be in the centre each day. He noted how patients too are now more likely to question why they are being asked to visit the cancer centre. While during the pandemic, there was a reluctance to visit the centre in case they caught the virus and it has taken sometime to gain back patient's their confidence, he is finding that many will question the need to visit the centre and do so only if it is really necessary.

Although it didn't happen to any great extent during the lockdown, Dr Kazmi thinks that the pandemic has provided the stimulus to increase the use of technologies such as wearables, that allow measurement of heart rate, temperature and even ECGs. Overall, these developments will facilitate more remote monitoring, with the data transferred to the clinicians. He and colleagues are working with artificial intelligence companies to develop clinical support tools to direct treatment decisions based on the latest evidence and reduce variation in clinical practice.

### How quickly do you anticipate regaining momentum post-pandemic?

Dr Kazmi stated that pre-pandemic, cancer services were struggling to meet the demands placed upon it. Now, as the pandemic resolves to some extent and services resume, there will be an uphill struggle to meet not only existing patient targets but to be able to deal with a huge backlog created by the pandemic. Although meeting the two-week wait will be challenging, a more important metric is the faster diagnosis standard which requires that at least 75% of referred patients with suspected cancer, find out within 28 days whether or not they have cancer. The other target is that by day 62, the patient should have been diagnosed and had their first course of treatment and this was a target that many hospitals struggled to meet. Work done by MacMillan suggests that even with a 20% increase in capacity over baseline it will take many months to clear the backlog.

Ultimately Dr Kazmi thinks that the pandemic has focused people's minds on how best to develop a more efficient and patient-centred service. Whereas previously there was a reluctance to start virtual consultations, having had to work virtually has made many realise how useful and easy it has become. Furthermore, it was also felt that mobile blood services would continue, as would home delivery of medicines. The pandemic has taught everyone precisely how doable these innovations are and that it can improve the effectiveness of the service.

Finally, whereas in the past hospitals have worked independently and competitively, Dr Kazmi thinks that the pandemic has resulted in a more collaborative way of working, with, for example, consultants from other hospitals coming to Guy's to operate on patients. He feels that this collaboration is here to stay although the current funding model needs to be revised as hospitals are separately funded. However, with the evidence that sharing of expertise, avoiding duplication of services and centralising procedures is beneficial, he is hopeful that in the future, funding will be delivered to complete systems rather than individual hospitals and that cancer services will become more efficient and hopefully meet the demands placed upon them.



# Examining the impact of COVID-19 on hospital provision: an Italian perspective

*Hospital Healthcare Europe* had the pleasure of speaking with Professor Giuseppe Curigliano, who offered his insight of how the COVID-19 pandemic has affected oncology services at his hospital

## Giuseppe Curigliano MD PhD

Associate Professor  
of Medical Oncology,  
University of Milan;  
European Institute of  
Oncology, Milan, Italy

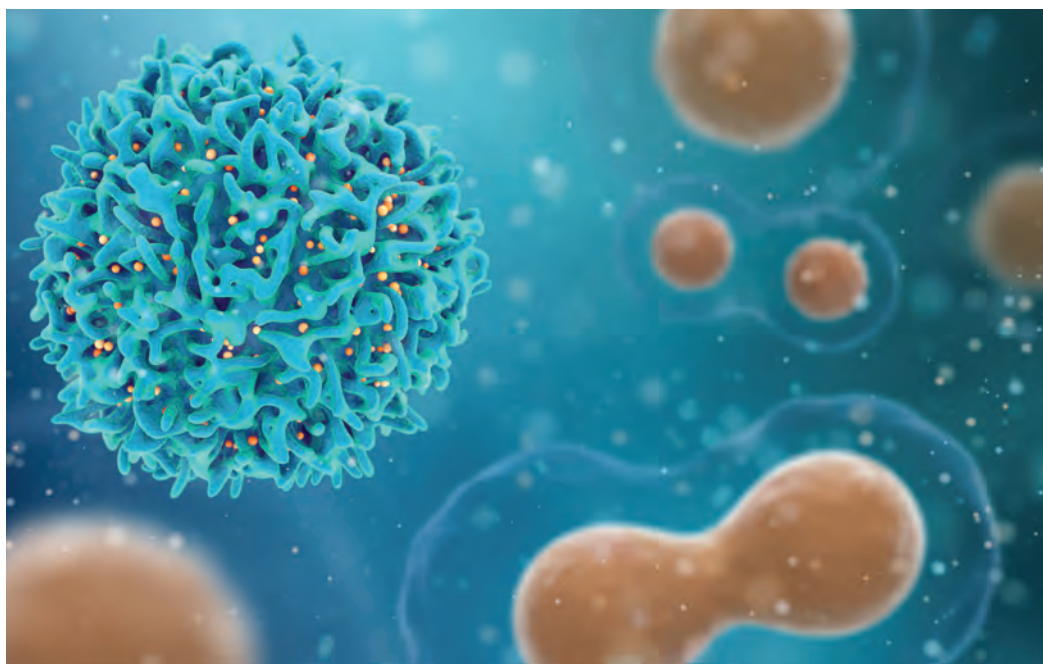
### How has the continuum of care and throughput been impacted by the pandemic?

Professor Curigliano started by noting that in Italy there has been a completely different situation to other countries. At the height of the pandemic there were over 20,000 cases of the virus with over 1000 people dying every day and by February 2020, all hospitals were effectively overwhelmed by COVID-19 patients, requiring intensive care beds and other forms of assistance. However, he said that since May 2020, the situation had been completely different with the number of cases ranging from 300 to 1,000 per day, which has meant that the management of cancer patients has returned to normal and today he is seeing the same number of patients as in December 2019, before the pandemic struck.

Professor Curigliano felt that one of the main reasons why services were able to return to normal so quickly after the initial onslaught of the pandemic was that very early on, the health authorities took the decision to reorganise services. For example, it was decided that Professor Curigliano's hospital, which is a specialised cancer centre, should be deemed a dedicated cancer hub, to be used solely for the management of cancer patients. In contrast,

because of the sheer volume of infected patients, many hospitals were turned into treatment centres and demarcated into COVID-secure and COVID-free areas. In practice, this meant that many cancer patients were unable to receive treatment at their usual hospital but could access therapy at Professor Curigliano's centre.

Although the centre was deemed a cancer treatment hub, it was still necessary to ensure that the centre remained COVID-free. As a result it was necessary to introduce precautionary measures and every patient who came to the hospital for chemotherapy or surgery was tested upon arrival using a PCR swab. Those who tested positive were not allowed to stay at the hospital and were sent home and asked to quarantine for two weeks. The centre also instigated an active surveillance programme among the healthcare staff and which involved PCR swab testing every two weeks to ensure that the doctors and nurses did not bring the virus into the centre. Although in the UK a second wave of COVID-19 is approaching, Professor Curigliano says that due to the action of the health authorities, Italy currently has the lowest number of cases in Europe.



### **What new protocols or guidelines have been deployed to protect patients and clinicians during the pandemic?**

With the World Health Organization (WHO) producing guidelines for healthcare staff at the start of the pandemic, Professor Curigliano felt that there was no need to develop any further or specific guidance or policies for his centre and the WHO guidance was simply translated into Italian and implemented at the centre.

As in all countries, as the pandemic unravelled, there was a complete suspension of all face-to-face consultations. Though some patients were too unwell to attend the centre, many were actually fearful of catching the virus and preferred to stay at home. Consequently and in order to provide some level of continuity of care, Professor Curigliano described how he and colleagues quickly moved to undertaking video consultations using *mytime* and this became widely adopted from March 2020. The on-line consultation was used not only for new referrals, but for patient follow-ups. It proved to be an invaluable means for discussions with patients, especially when it was necessary to discuss any potential toxicities or side-effects that might arise from ongoing therapy. Professor Curigliano said that a large number of virtual consultations were undertaken. In the main, patients appeared to be happy with this mode of consulting, particularly as it provided them with access to their physician, who was able to answer any questions that they might have regarding either their condition or treatment, while having the added bonus that they did not have to leave their home.

The use of a virtual platform was also extended to meetings among clinical staff for case discussions. In addition, the technology also enabled clinicians to view any necessary patient imaging or scans and blood test results. Professor Curigliano feels that this way of working has been very useful and is still being used for case discussions.

### **Therapy switches**

The pandemic posed many problems for clinicians and two particular problems for oncology patients. Prior to the pandemic, many patients visited the centre on a regular basis to receive infusion chemotherapy. Additionally, as subsequent chemotherapy treatment cycles are dependent upon satisfactory blood test results, which would normally be undertaken at the centre, it was necessary to find an alternative solution to avoid a large number of patients visiting the centre. As Professor Curigliano explained, this was quickly resolved by arranging for blood tests to be carried out at a number of local hospitals. For example, for patients who lived several kilometres from the oncology centre, it was agreed that rather than having to visit the centre, blood samples could be taken at a hospital closer to their home, where COVID- and non-COVID pathways were quickly established and these samples then posted to the oncologist to review.

Although a very small number of patients continued with infusion chemotherapy at the

centre, Professor Curigliano described how in an effort to limit the number of individuals visiting the centre and receiving infusion therapy, his centre decided to make a wholesale change to the treatment programme for many of their patients. In a number of cases, this involved a switch from infusion to oral alternatives and some patients were changed to subcutaneous treatments that could be self-administered. Each of these new treatments were then dispensed at the hospital pharmacy and posted out to patients.

As a result of the shift changes to services, Professor Curigliano feels that while initially there had been some delays in patient screening, there were no delays in the provision of treatment and in fact, he said that no patients died during the COVID-19 pandemic period because of treatment toxicities and believes that this was entirely due to the early decision to make his hospital a dedicated cancer centre, allowing the staff to focus on providing chemotherapy rather than treating COVID-19 patients.

### **How would you summarise the impact of the pandemic and what are the key learnings?**

Professor Curigliano felt that there were several important lessons from the pandemic. Firstly and perhaps most important, was the need to re-organise services as soon as possible once authorities realised that they were dealing with a pandemic. This enabled appropriate allocation of resources dedicated to the care of those with COVID-19 but also to other specialities such as cardiovascular disease and cancer. Secondly, as some staff had succumbed to the virus, it was necessary to ensure that those treating patients were issued with personal protective equipment to reduce their own risk of infection and finally, it was important to introduce an effective test and trace system so that infected patients can be identified and quickly isolated.

### **How quickly do you anticipate regaining momentum post-pandemic?**

As Professor Curigliano mentioned, the early swift action of the Italian authorities meant that any hiatus to services was quickly resolved and that since May 2020, things were back to normal. Though virtual consultations were introduced out of necessity, he does feel that this form of consultation will remain as part of his service, post-pandemic and he himself is happy to use remote consulting. In addition, the ability to view tumours and scans on-screen also reduces the need for patient attendance at the centre, especially as they are placed together in large groups in the waiting areas. However, moving forward, virtual consultations will probably only be used for patient follow-ups, as new referrals can now be seen at the centre. He said that since May 2020 they are routinely seeing between 200 and 1000 cases per day and while it remains unclear whether the country will be hit by a second wave of COVID-19, Professor Curigliano thinks that his centre is ready and prepared to deal with it if the need arose.



# Impact of the pandemic: a surgical oncology perspective

Professor Beate Rau, Professor of Surgery at the Charite Campus, and colleagues gave their insight into how the pandemic had affected surgical oncology services at their facility

**Karl Hillebrandt MD**  
**Beate Rau MD**  
**Moritz Schmelzle MD**  
Charité Campus  
Virchow Klinikum,  
Berlin, Germany

## **How has continuum of care and throughput been impacted by the pandemic?**

During the COVID-19 pandemic, surgical therapy was severely impacted. Due to the reduced OR, ICU and normal ward capacities, elective surgery for non-malignant diseases were postponed. In our department, it was possible to treat all patients with malignant tumours regularly. However, the patient assignment to our outpatient clinic was significantly reduced. For elderly surgical patients, follow-up treatments were delayed or cancelled whereas further oncological treatment was not impaired.

## **What new protocols and guidelines were deployed to protect patients and clinicians during the pandemic?**

In our department, several new standard operating procedures (SOPs) and guidelines were established and optimised during the pandemic. First, all general recommendations have been implemented (for example, distance rules, avoidance of unnecessary contacts, face masks). Second, all patients for hospitalisation were screened for SARS-CoV-2 and isolated until the test results were negative. Furthermore, SOPs were established for surgical procedures with a high risk of exposure to SARS-CoV-2 (for example, thoracic surgeries or surgical procedures for COVID-19 patients).

## **During the pandemic how, if at all, was new or existing technology employed or adopted?**

In our department, we newly implemented the

possibility of digital consultation hours for our outpatient clinic. For interdisciplinary meetings, consultations or conferences, the use of virtual platforms (for example, Cisco Meetings, Zoom or Microsoft Teams) has been significantly expanded to reduce the risk of unnecessary person-to-person contact.

## **How would you summarise the impact of the pandemic and what are the key learnings?**

From our point of view, the pandemic largely impacted surgical treatment in our clinic and the long-term implications are still uncertain. As recognised for other diseases, hospital admissions of patients with malignant tumors was reduced during the pandemic. It is unlikely that the incidence of malignant tumours decreased during the pandemic but a delayed diagnosis and treatment of patients with tumours seems very possible. Therefore, a key learning appears to be that it is crucial to maintain the patient care (diagnostics, treatment and aftercare) of non-pandemic diseases during a pandemic.

## **How quickly do you anticipate regaining momentum post-pandemic?**

After the pandemic, we will successively (over several weeks) return to 'normal' patient care. However, we think that we will face the impact of the pandemic on non-COVID-19 diseases (especially malignant diseases) over many years and this will may indeed overwhelm our health care system.



# Impact of COVID-19 on breast cancer care

Professor Javier Cortes tells *Hospital Healthcare Europe* how the pandemic has impacted provision of breast cancer services at the IOB Institute of Oncology

**Javier Cortes MD PhD**  
Head, Breast Cancer Program, IOB Institute of Oncology, Madrid & Barcelona, Spain

## How has the continuum of care and throughput been impacted by the pandemic?

Well, I think that's clear, at least in Spain and in our hospital, but I guess also in very many other countries, that existing and new patients have experienced delayed assessments, basically because the majority of the facilities were committed to dealing with the pandemic and patients with COVID-19. This is why the prognosis of these patients will be impacted.

Also we have observed that, these six months after the start of the pandemic, that some patients have been diagnosed with stage two and stage three disease, instead of stage one and stage three, so their prognosis is worse.

## What new protocols or guidelines were deployed to protect patients and clinicians during the pandemic?

We did not implement many new guidelines and protocols. Sometimes common sense is the best thing to employ.

For example, what is very clear is that, if a patient or a person is suspected as having COVID-19, they have a different treatment procedure and pathway. They are not diagnosed or treated in the same locations as the general population, with facilities specifically dedicated to this.

In addition, for any patient who starts a new chemotherapy strategy, or needs surgery, we first have to be sure that the virus is not present. Also, we have modified some of the chemotherapy protocols. For example, we have tried to decrease the use of three-weekly docetaxel or even three-weekly anthracyclines, and we use more and more weekly paclitaxel. Moreover, we perform breath analysis every week to be sure that the patient does not have lymphopaenia.

Finally, when we have to use anthracyclines, we prefer to use them in combination with growth factors.

## During the pandemic, how, if at all, was new or existing technology employed or adopted?

So, I think that here we have different situations: that is, is regarding physicians, continuing medical locations, and meetings. Clearly digital platforms and telemedicine are being employed to much greater levels, and I do not remember the last time we had face-to-face meetings.

However, at least in breast cancer, we must not forget that physical examination is vital. This is why in general we would prefer to see patients in person if possible, although we understand that some patients prefer not to come to the Centre. For these patients, we try to use telemedicine as best possible, but the most important aspect, which is the physical examination, is lacking.

## How would you summarise the impact of the pandemic and what are the key learnings?

I think, in general, that we have learnt a lot over these last six months. I would say that the pandemic has taught us that face-to-face meetings are not always required, and virtual platforms, telemedicine and mobile imaging facilities could be implemented more widely in the future. I also think that large scientific meetings and Congresses will continue to be delivered successfully via virtual platforms and face-to-face meetings might be organised less in future.

However, I feel that it is very important that telemedicine does not replace classical medicine. In my opinion, the face-to-face meetings with the patients, and being able to engage with them as human beings is more successful for both those in our care and us as clinicians.

Of course, the technology will always improve, and I think it will be used more and more, but again, not to the detriment of face-to-face meetings, at least in the breast cancer arena.

## How quickly do you anticipate regaining momentum post-pandemic?

This is a very difficult question; I would love to know the answer! I think that this will depend on the pandemic situation globally. It will depend on treatments, it will depend on signs, so I think that's going to be lower than expected, and I think that the situation will remain the same for at least the next 6-10 months. I hope that after next summer, the summer of 2021, we will be able to start to regain normality. I pray that that will happen.

# HOPE Governors' responses on the COVID-19 crisis

Data were obtained from the OECD, Eurostat and WHO. When data were not available for one of the specific years, the closer year was used (denoted by \*). The comments from the Governors were provided between June and October 2020

## AUSTRIA



**Mr Nikolaus Koller**  
HOPE Governor

### Could you summarise the most important impact on hospitals, primary care and social care?

A general impact in Austria's health care systems is the decrease of non-COVID-19 patients. One reason might be from the patient side, in that they fear a higher possibility of infection in hospitals. Another reason is that the government expected a higher infection rate and, therefore, tried to prevent a possible shortage of capacities by recommending to suspend elective interventions and examinations where medically justifiable and to intensify counselling via telecommunication.

Currently the health system is trying to move back to normality and resume all activities. However, it is seemingly more difficult than expected. It is a big priority to regain the patients trust and to convince people that treatment of any kind should not be postponed anymore as it can lead to serious health issues in the long term.

Austria's comparatively high hospital and intensive care capacities have been very valuable in tackling the crisis. In the course of

the pandemic, Austria did not fortunately come close to reaching its capacity limits.

### Did you experience major changes in the overall organisation of healthcare and, if yes, which ones?

Changes included a bigger focus on patients with severe symptoms that required intensive care and use of ventilators. In the hospital, adjusted triages were integrated to handle the increase in COVID-19 patients more efficiently and safely. In the outpatient sector, the use of teleservices such as e-medication or, particularly for psychiatric patients, teleconsultation, was made possible by social insurance.

### Have you identified possible changes to your healthcare system?

One of the main priorities regarding future changes in the health care system continues to be strengthening of primary care to ensure an efficient and sustainable health system, and also ensuring the availability of structures and the workforce required for providing high-quality health care services in extraordinary situations.

## AUSTRIA

	2002	2008	2017
<b>Total current health expenditure as % of Gross Domestic Product (GDP)</b>	<b>9.4%</b>	<b>9.7%</b>	<b>10.4%</b>
General government/compulsory current health expenditure, as % of total current health expenditure	74.8%	75.0%	74.0%
<b>Hospital current health expenditure, as % of total current health expenditure</b>	<b>n.a.</b>	<b>38.7%</b>	<b>38.5%</b>
Household out-of-pocket health expenditure, as % of total current health expenditure	18.6%	18.2%	19.2%
<b>All hospital beds per 100,000 inhabitants</b>	<b>780.7</b>	<b>769.3</b>	<b>736.6</b>
Acute care hospital beds per 100,000 inhabitants	666.7	629.3	544.7
<b>Acute care admissions/discharges per 100 inhabitants</b>	<b>25.3</b>	<b>26.7</b>	<b>24.6*</b>
Average length of stay for acute care hospitals (bed-days)	7.3	6.8	6.5*
<b>Practising physicians per 100,000 inhabitants</b>	<b>403.1</b>	<b>460.4</b>	<b>518.3</b>
Practising nurses per 100,000 inhabitants	567.7	636.0	685.0





## BELGIUM



**Mrs Valérie Victoor**  
HOPE Liaison Officer  
Representing Wallonia  
and Brussels Regions

**Could you summarise the most important impact on hospitals, primary care and social care?**

Hospitals were strongly affected, and a lack of communication between the nine health ministers in Belgium made decision making and preparations difficult. There were major dysfunctions and hospitals were left to deal with many issues alone, creating great discontent, which manifested during a visit of the Prime Minister to a hospital in which the workers formed a long queue and turned their backs to the Prime Minister to express their anger.

Furthermore, there was no preparation from the Federal health prime minister, who did not announce or prepare for the lack of protective equipment and COVID-19-specific medications. Consequently, at the start of the crisis, the hospitals had to work with less than three days' stock and quickly ran out of protective equipment. The federal minister and the competent administration regarding the hospitals have consequently been unable to supply the equipment the hospitals desperately needed. We had to help them find the necessary supplies, which sometimes had to be made by fabrication labs. There was also a scandal regarding the destruction of a stock

of FFP2 masks before the crisis and the deliberate negation to renew it from the Federal health minister.

In addition to the above problems, hospitals had to deal with a lack of coordination from the different administrations, resulting in them having to fill in many forms with different formats, and thereby increasing the already high workload.

To summarise, there was a lack of coordination, communication and help from the federal government, which led to hospitals being hugely affected by the crisis.

**Did you experience major changes in the overall organisation of healthcare and if yes, which ones?**

A major change in the organisation of healthcare included the cessation of all other activities in hospitals that were not directly related to COVID-19.

**Have you identified possible changes in your healthcare system?**

So far, no changes have been planned by the government, although the hospital federations are currently proposing changes to the government.

## BELGIUM

	2002	2008	2017
<b>Total current health expenditure as % of Gross Domestic Product (GDP)</b>	<b>9.4%</b>	<b>9.7%</b>	<b>10.4%</b>
General government/compulsory current health expenditure, as % of total current health expenditure	73.8%	77.2%	77.2%
<b>Hospital current health expenditure, as % of total current health expenditure</b>	<b>n.a.</b>	<b>33.4%</b>	<b>34.3%</b>
Household out-of-pocket health expenditure, as % of total current health expenditure	n.a	18.4%	17.6%
<b>All hospital beds per 100,000 inhabitants</b>	<b>653.9</b>	<b>624.9</b>	<b>566.4</b>
Acute care hospital beds per 100,000 inhabitants	591.9	559.4	500.5
<b>Acute care admissions/discharges per 100 inhabitants</b>	<b>16.4</b>	<b>16.5</b>	<b>16.3*</b>
Average length of stay for acute care hospitals (bed-days)	7.6	7.1	6.9*
<b>Practising physicians per 100,000 inhabitants</b>	<b>285.9</b>	<b>292.1</b>	<b>518.3</b>
1Practising nurses per 100,000 inhabitants	n.a	931.9	1096.0*

## BULGARIA



**Mr Krasimir Grudev**  
HOPE Governor

**Could you summarise the most important impact on hospitals, primary care and social care?**

It is important to note that Bulgaria was not as affected by the pandemic as some other countries. This could be due to a combination of a low number of the population being over 80 and living in nursing homes. Also, the population followed the restrictions and recommendations imposed by the government. Furthermore, some claim the percentage of the population that has been vaccinated with BCG (Bacillus Calmette-Guérin, a vaccine against tuberculosis) might have affected the infection rate.

**Did you experience major changes in the overall organisation of healthcare and, if yes, which ones?**

There has been an increase in the number ICU beds and transformation and training of existing departments to meet COVID-19 cases. Most of the hospitals were engaged, but only a few happened to receive COVID-19 patients. Private hospitals participated actively.



## BULGARIA

	2002	2008	2017
<b>Total current health expenditure as % of Gross Domestic Product (GDP)</b>	n.a	n.a	n.a
General government/compulsory current health expenditure, as % of total current health expenditure	n.a	n.a	n.a
<b>Hospital current health expenditure, as % of total current health expenditure</b>	n.a	n.a	n.a
Household out-of-pocket health expenditure, as % of total current health expenditure	n.a	n.a	n.a
<b>All hospital beds per 100,000 inhabitants</b>	651.1	660.8	745.4
Acute care hospital beds per 100,000 inhabitants	n.a	554.4	616.8
<b>Acute care admissions/discharges per 100 inhabitants</b>	n.a	n.a	n.a
Average length of stay for acute care hospitals (bed-days)	n.a	n.a	n.a
<b>Practising physicians per 100,000 inhabitants</b>	353.3	366.4	424.5
Practising nurses per 100,000 inhabitants	363.8	431.3	437.5

## DENMARK



**Mrs Eva Weinreich-Jensen**  
HOPE Governor

**Could you summarise the most important impact on hospitals, primary care and social care?**

One of the impacts seen in Denmark was a decrease in visits to primary care and hospitals of non-COVID-19 patients. Like in other countries, this was due to fear of the population becoming infected; a solution to this was the use of telemedicine. However, hospitals still have fewer patients than normal and there is a great concern that patients with cancer and other possible critical diseases will become worse as they wait longer before they contact the health care system. A solution for this problem is currently being investigated.

**Did you experience major changes in the overall organisation of healthcare and, if yes, which ones?**

Regarding organisational changes, the

government passed laws that gave the health ministry more power and that suspended some patient's rights. There has been a major transformation of units into intensive care units and training of staff to participate in the expected care for COVID-19 patients. One of the main lessons from this health crisis is that it has been possible to transform the system and adapt to an unexpected large number of patients, as well as the incredible ability to work together nationally towards the common goal of being able to treat all patients with the virus.

**Have you identified possible changes in your healthcare system?**

The creation of a national authority for emergency preparedness.

## DENMARK

	2002	2008	2017
<b>Total current health expenditure as % of Gross Domestic Product (GDP)</b>	8.7%	9.5%	10.1%
General government/compulsory current health expenditure, as % of total current health expenditure	83.8%	84.0%	84.0%
<b>Hospital current health expenditure, as % of total current health expenditure</b>	43.9%	44.5%	44.3%
Household out-of-pocket health expenditure, as % of total current health expenditure	14.7%	14.1%	13.7%
<b>All hospital beds per 100,000 inhabitants</b>	428.6	357.1	260.8
Acute care hospital beds per 100,000 inhabitants	425.7	350.8	253.6
<b>Acute care admissions/discharges per 100 inhabitants</b>	14.2	13.1	n.a.
Average length of stay for acute care hospitals (bed-days)	3.7	3.5	n.a.
<b>Practising physicians per 100,000 inhabitants</b>	303.7	357.9	399.8*
Practising nurses per 100,000 inhabitants	944.1	955.3	995.0*

## ESTONIA



**Dr Urmas Sule**  
HOPE President

**Could you summarise the most important impact on hospitals, primary care and social care?**

The initial response from the Estonian government was similar to other European countries and an emergency situation was announced swiftly for the whole country. Among the decisions made by the government was the use of testing to control the situation, which had positive results. Nevertheless, one of

the issues encountered was lack of protective equipment and lack of testing reagents but this was quickly solved.

**Did you experience major changes in the overall organisation of healthcare and, if yes, which ones?**

The State Emergency Act was for the first time in use and this meant that the Health Agency nominated Chief Medical Officer to be in charge



of coordinating medical services and a group of scientific professionals were appointed for the crisis committee. Furthermore, two regional units were formed for hospital care and ambulance services. Throughout the crisis there were big regional differences, with biggest island Saaremaa being one of the hardest hit regions, needing extra support of other hospitals. Out of 4000 confirmed cases in Estonia, 575 were in Saaremaa.

#### Have you identified possible changes in your healthcare system?

There have been big challenges for the health system during the crisis, but also positive outcomes. One was the fast development of telemedicine, especially in hospitals. Before the

crisis Estonia already had in place a good telemedicine service, but these quickly increased during the crisis. Estonian Health Insurance Fund (EHIF) in cooperation with hospitals have been working towards developing telemedicine and video consultation services. To provide quality services while considering patients' needs and safety EHIF started funding tele- and video consultation services widely. The emergency situation has significantly accelerated the uptake of remote services in the health system and provided an incentive for healthcare providers to purchase teleworking equipment. Hospitals and EHIF are planning to continue developing e-services in the next years.

### ESTONIA

	2002	2008	2017
<b>Total current health expenditure as % of Gross Domestic Product (GDP)</b>	<b>4.7%</b>	<b>5.8%</b>	<b>6.4%</b>
General government/compulsory current health expenditure, as % of total current health expenditure	76.6%	77.0%	74.7%
<b>Hospital current health expenditure, as % of total current health expenditure</b>	<b>31.6%</b>	<b>47.9%</b>	<b>46.0%</b>
Household out-of-pocket health expenditure, as % of total current health expenditure	20.6%	20.7%	23.6%
<b>All hospital beds per 100,000 inhabitants</b>	<b>598.0</b>	<b>563.2</b>	<b>469.5</b>
Acute care hospital beds per 100,000 inhabitants	479.9	412.1	344.6
<b>Acute care admissions/discharges per 100 inhabitants</b>	<b>17.0</b>	<b>16.7</b>	<b>15.5</b>
Average length of stay for acute care hospitals (bed-days)	6.9	5.7	5.4
<b>Practising physicians per 100,000 inhabitants</b>	<b>309.4</b>	<b>334.2</b>	<b>346.8</b>
Practising nurses per 100,000 inhabitants	601.3	641.5	619.2

### FINLAND



**Mrs Hannele Hakkinen**  
HOPE Governor

#### Could you summarise the most important impact on hospitals, primary care and social care?

In Finland, as in many other EU countries, there was a decrease in hospital and primary care activity for non-COVID-19 patients; this has created one of the most important impacts, that is, the huge accumulation of operations and elective care for autumn and 2021.

Numbers of elective surgeries decreased when preparing for COVID-19 patients and medical personnel were trained to be able to

work in ICUs. In social care, some services were also affected, for example, some group meetings allowed a maximum of only ten people aloud and many services were carried out by phone, social media, etc.

#### Did you experience major changes in the overall organisation of healthcare and, if yes, which ones?

There were no major changes in the overall organisation of healthcare, except for an increase in e-services.

### FINLAND

	2002	2008	2017
<b>Total current health expenditure as % of Gross Domestic Product (GDP)</b>	<b>7.4%</b>	<b>8.1%</b>	<b>9.2%</b>
General government/compulsory current health expenditure, as % of total current health expenditure	73.8%	75.0%	75.2%
<b>Hospital current health expenditure, as % of total current health expenditure</b>	<b>36.3%</b>	<b>34.1%</b>	<b>36.9%</b>
Household out-of-pocket health expenditure, as % of total current health expenditure	22.0%	19.6%	20.2%
<b>All hospital beds per 100,000 inhabitants</b>	<b>735.1</b>	<b>656.8</b>	<b>328.1</b>
Acute care hospital beds per 100,000 inhabitants	383.2	349.8	279.5
<b>Acute care admissions/discharges per 100 inhabitants</b>	<b>19.9</b>	<b>17.9</b>	<b>16.4*</b>
Average length of stay for acute care hospitals (bed-days)	7.1	7.1	6.7*
<b>Practising physicians per 100,000 inhabitants</b>	<b>252.7</b>	<b>272.1</b>	<b>n.a</b>
Practising nurses per 100,000 inhabitants	1071.0	1314.0	n.a



## FRANCE



**Mrs Zaynab Riet**  
HOPE Governor

**Could you summarise the most important impact on hospitals, primary care and social care?**

France was one of the hardest hit countries. Currently it is going through phased lockdown measures, in which hospitals are still mobilised and keep beds free for COVID-19 patients. Therefore, the treatment for other patients is still impacted. Hospitals were a key element in managing the outbreak at all levels. But although hospitals were of great help, the fact that too many patients had to reach the hospital level to receive care means the system might not be as efficient and shows a lack of preparation at national and regional levels.

Another heavily affected part of the healthcare system in France were nursing homes, with two-thirds of the COVID deaths.

Primary care also struggled due to the lack of preparation; there was not enough protective material and, as a consequence, primary care doctors stayed at home thereby affecting primary care services. Also like other EU Member States, patients feared going to the doctor and the number of visits by non-COVID-19 patients were also reduced.

**Did you experience major changes in the overall organisation of healthcare and, if yes, which ones?**

The Ministry of Health called "Ségur de la santé" has organised a large consultation on how the health system should look after this crisis and to make future changes. This led to a series of measures reshaping the healthcare system.

## FRANCE

	2002	2008	2017
<b>Total current health expenditure as % of Gross Domestic Product (GDP)</b>	<b>10.2%</b>	<b>10.5%</b>	<b>11.3%</b>
General government/compulsory current health expenditure, as % of total current health expenditure	79.2%	76.6%	83.4%
<b>Hospital current health expenditure, as % of total current health expenditure</b>	<b>35.6%</b>	<b>38.0%</b>	<b>38.3%</b>
Household out-of-pocket health expenditure, as % of total current health expenditure	7.1%	10.0%	9.4%
<b>All hospital beds per 100,000 inhabitants</b>	<b>771.3</b>	<b>690.3</b>	<b>598.0</b>
Acute care hospital beds per 100,000 inhabitants	390.4	351.6	309.0
<b>Acute care admissions/discharges per 100 inhabitants</b>	<b>19.1</b>	<b>16.6</b>	<b>16.3*</b>
Average length of stay for acute care hospitals (bed-days)	5.7	5.8	5.8*
<b>Practising physicians per 100,000 inhabitants</b>	<b>n.a</b>	<b>n.a</b>	<b>n.a</b>
Practising nurses per 100,000 inhabitants	n.a	n.a	n.a

## GERMANY



**Mr Georg Baum**  
HOPE Governor

**Could you summarise the most important impact on hospitals, primary care and social care?**

As in many other countries, the German government pursued a two-sided strategy. On the one hand, social distancing measures were taken to flatten the curve and to stretch the number of infected people over time; on the other hand, measures were taken to prepare the healthcare sector for a worst-case scenario. Regarding the second aspect, in the middle of March, hospitals followed an order to scale-down elective care procedures, in preparation for an increase in demand for intensive care and ventilation capacities for the treatment of COVID-19 patients. Additional intensive care capacities, respiratory beds, and isolation areas were also installed. According to official figures from the German Federal Statistical Office, Germany has 1925 hospitals and approximately 600 hospital beds per 100,000 inhabitants. Before the COVID-19 crisis, the 500,000 hospital beds included 28,000 intensive care beds, of which 20,000 were equipped with anaesthetic and respiratory equipment. After the enlargement, Germany has 40,000 intensive care beds, of which 30,000 are respiratory beds. As a result of this internal reorganisation, the downscaling of activities and the enlargement of the capacities, hospitals have

suffered from financial losses. These will be absorbed until the end of September 2020 by means of a financial rescue package for the economic stability of hospitals. However, it is already apparent that the compensation payments for hospitals provided by this law will not be sufficient to compensate the loss of revenue and the additional costs caused by the COVID-19 pandemic and the German Hospital Federation (GHF) is now engaged in a dialogue about hospital financing in the middle and long run.

**Did you experience major changes in the overall organisation of healthcare and, if yes, which ones?**

In Germany, the Federal States (Bundesländer) are responsible for the on-site organisation and planning of hospital care. Yet, from mid-March onwards, they have aligned themselves with a federal request and enacted regulations to get hospitals to scale-down elective care procedures, as a preparation for COVID-19 patients. While, of course, respecting the principle that the evaluation of elective procedures is subject to the primacy of medicine, hospitals followed swiftly followed the federal request and the Länder regulations. They freed necessary capacities, on the one hand, for the care of patients seriously affected by COVID-19, and, on



the other hand, for all other patients in need of acute and urgent treatment. In addition to this downscaling, they installed additional intensive care and respiratory beds and created isolation areas. In general, all parts of the hospitals were involved in the treatment of COVID-19 patients. Some Länder defined coordinating hospitals for certain geographically-defined care territories. In other territories, hospitals organised themselves voluntarily in care networks.

### Have you identified possible changes in your healthcare system?

The GHF has identified different areas of changes but two in particular. First, there seems to be a certain 'change of mind' about hospital capacities in Germany. Thanks to the outstanding performance of the hospital staff and hospitals during the last months, the overall organisation of the hospital landscape in Germany is no longer under one of the most unwarranted critics of the last years; for years, politicians and health economists in Germany have complained that the country has too much hospital capacity. According to official figures from the German Federal Statistical Office, before the COVID-19 crisis, Germany had 1925 hospitals and approximately 600 hospital beds per 100,000 inhabitants. The 500,000 hospital beds included 28,000 intensive care beds of which 20,000 were equipped with anaesthetic and respiratory equipment. The capacities are widely distributed over a large area and are available in all different kinds of hospitals (regardless of the ownership, the hospital size or the degree of specialisation).

The coronavirus pandemic has turned this organisation into an advantage. Our hospital landscape has proven to be a viable network.

Second, it transpires that Germany has to reconsider its hospital financing system. The financing of the German hospital system is based on two pillars. On the one hand, the Federal States (Bundesländer) are bound to bear the investments into the infrastructure. For 20 years now, the Bundesländer have been neglecting this legal obligation to finance, in a sufficient manner, the investments of hospitals. The German hospitals have proven that they are willing to do everything to guarantee the protection of the population, also under never-before-seen health crisis circumstances. In order for the hospitals to be able to continue to provide these services and its quality in the short-, medium- and long-term, the GHF is calling for funds for the modernisation of the structural and medical infrastructure as well as for funds for digitisation, as one of the major future challenges. By contrast, the larger part of the financing is based on the hospitals activity: the health insurance funds pay for the costs of the treatment which is implemented by applying the G-DRG (German Diagnosis Related Groups) system. In a situation where we need to be ready and prepared to scale down activity at every moment, the strong focus on activity in hospital financing is no longer appropriate. The GHF is therefore entering into a dialogue about a system that reconciles the financing of activities and the financing of the costs of maintaining (crisis) capacities.

## GERMANY

	2002	2008	2017
<b>Total current health expenditure as % of Gross Domestic Product (GDP)</b>	<b>10.1%</b>	<b>10.2%</b>	<b>11.2%</b>
General government/compulsory current health expenditure, as % of total current health expenditure	77.7	75.3	84.4
<b>Hospital current health expenditure, as % of total current health expenditure</b>	<b>29.6%</b>	<b>28.8%</b>	<b>28.3%</b>
Household out-of-pocket health expenditure, as % of total current health expenditure	12.5%	14.0%	12.5%
<b>All hospital beds per 100,000 inhabitants</b>	<b>887.0</b>	<b>821.4</b>	<b>800.2</b>
Acute care hospital beds per 100,000 inhabitants	663.5	613.0	601.5
<b>Acute care admissions/discharges per 100 inhabitants</b>	<b>20.2</b>	<b>21.2</b>	<b>23.7*</b>
Average length of stay for acute care hospitals (bed-days)	9.6	8.3	7.6*
<b>Practicing physicians per 100,000 inhabitants</b>	<b>332.1</b>	<b>354.1</b>	<b>424.9</b>
Practicing nurses per 100,000 inhabitants	1018.3	1113.1	1293.3

## IRELAND



**Mr Eamonn Fitzgerald**  
HOPE Vice-President  
and Governor

### Could you summarise the most important impact on hospitals, primary care and social care?

Ireland has suffered quite a number of fatalities and while it is currently easing the lockdown measures, there is still fear of a second wave.

The most important impact on hospitals, primary care and social care has been disruption for patients and clients of social care services being able to access during the lockdown period. While emergency admissions have been accommodated in hospitals, there has been a dramatic reduction in any elective admissions and many screening programmes have been put on hold. Furthermore, people

have stayed away from their GPs and suffered as a consequence from timely healthcare provision for both acute and chronic conditions. For example, there have been fewer cancer screening programmes, and fewer oncology and cardiology patients; this will have consequences in the long-term. Social care settings, in particular nursing/residential care facilities, have been very significantly affected by COVID-19 infection of the residents.

### Did you experience major changes in the overall organisation of healthcare and, if yes, which ones?

The major change in the overall organisation of



healthcare has most notably been in the acute hospital sector. The state entered into a 90-day agreement with the private hospitals sector comprising 19 acute hospitals to provide access to the state for the total capacity of all the private hospitals as part of a Common Purpose Agreement in response to the global pandemic. The effect has been to make available critical care capacity as well as 2000 additional in-patient beds and the provision of a significant amount of complex cardiac surgery and interventional care.

All patients treated during this period were deemed to be public patients and no patients with private health insurance were admitted and/or treated as a private patient.

Essentially private patients have not been able to access private hospitals for the past three months.

### Have you identified possible changes in your healthcare system?

Some of the changes identified in the healthcare delivery system are most notably in virtual and remote care. There has been a proliferation of consultations provided remotely via Zoom, Skype and other virtual platforms. Social distancing is going to fundamentally impact the volume of patient care capable of being provided versus pre-COVID-19 levels.

Waiting lists and waiting times for access to care have deteriorated significantly and the cost of healthcare provision has risen considerably. There is an absolute imperative for a strategic partnership to be entered into between the public and private healthcare sectors in order to have any chance of improving citizens' access to diagnostic and therapeutic care.

## IRELAND

	2002	2008	2017
<b>Total current health expenditure as % of Gross Domestic Product (GDP)</b>	<b>6.7%</b>	<b>9.1%</b>	<b>7.2%</b>
General government/compulsory current health expenditure, as % of total current health expenditure	79.0%	79.3%	73.3%
<b>Hospital current health expenditure, as % of total current health expenditure</b>	<b>n.a</b>	<b>n.a</b>	<b>37.2%</b>
Household out-of-pocket health expenditure, as % of total current health expenditure	10.5%	11.9%	12.3%
<b>All hospital beds per 100,000 inhabitants</b>	<b>578.1</b>	<b>485.3</b>	<b>295.7</b>
Acute care hospital beds per 100,000 inhabitants	280.7	252.7	276.6
<b>Acute care admissions/discharges per 100 inhabitants</b>	<b>14.1</b>	<b>13.5</b>	<b>13.9*</b>
Average length of stay for acute care hospitals (bed-days)	6.5	6.2	5.6*
<b>Practising physicians per 100,000 inhabitants</b>	<b>n.a</b>	<b>n.a</b>	<b>30.6</b>
Practising nurses per 100,000 inhabitants	n.a	n.a	n.a

## LATVIA



**Mr Jevgenijs Kalejs**  
HOPE Governor

### Could you summarise the most important impact on hospitals, primary care and social care?

From mid-March, hospitals only treated emergency cases and COVID-19 patients, but they have recently opened up to outpatients. However, there are huge waiting lists, sometimes up to a year, as a consequence of stopping normal activity.

There was also an initial problem with equipment, but there were not many health care workers infected.

Another important impact is the financing of the abnormal costs created by the crisis. There is still no bonus from governments or coverage of additional expenses, for example,

for protective equipment.

### Did you experience major changes in the overall organisation of healthcare and, if yes, which ones?

Some changes that are currently taking place are the reduction of healthcare activity in rural areas and an increase in capital areas by the government.

### Have you identified possible changes to your healthcare system?

There will also be a hospital reform by the end of the year, which is said to include fewer workers and health budget reduction.

## LATVIA

	2002	2008	2017
<b>General government/compulsory current health expenditure, as % of total current health expenditure</b>	<b>49.6%</b>	<b>60.3%</b>	<b>57.3%</b>
Hospital current health expenditure, as % of total current health expenditure	n.a	42.6%	32.3%
<b>Household out-of-pocket health expenditure, as % of total current health expenditure</b>	<b>47.6%</b>	<b>37.3%</b>	<b>41.8%</b>
All hospital beds per 100,000 inhabitants	786.7	776.5	556.7
<b>Acute care hospital beds per 100,000 inhabitants</b>	<b>552.3</b>	<b>527.7</b>	<b>329.9</b>
Acute care admissions/discharges per 100 inhabitants	18.6	20.7	14.7*
<b>Average length of stay for acute care hospitals (bed-days)</b>	<b>8.0</b>	<b>7.1</b>	<b>5.9*</b>
Practising physicians per 100,000 inhabitants	278.9	323.3	320.5
<b>Practising nurses per 100,000 inhabitants</b>	<b>456.4</b>	<b>555.3</b>	<b>456.8</b>



## LUXEMBOURG



**Mr Marc Hastert**  
HOPE Governor

**Could you summarise the most important impact on hospitals, primary care and social care?**

Luxembourg created a National Crisis Cell and local crisis cells in hospitals, which involved hospital workforce at all levels. Some of the impacts on healthcare systems include the cancellation of scheduled non-emergency interventions, the reorganisation of hospitals in COVID-19 zones and non-COVID-19 zones, and limited access by visitors to hospitals. Patients were informed that they will have to designate a visitor, who will be badged.

Furthermore, Advanced Care Centres (ACC) were generated; these are itinerant treatment centres that have the medical equipment necessary for initial treatment. However, emergencies had to respect the usual pathways in place in Luxembourg and not go through the ACC. However, if a patient sees his/her state of health deteriorate during treatment at the ACC, a medical evacuation is planned. The ACCs were designed to operate through two strictly separate consultation channels: the first is designed to accommodate patients with signs of COVID-19 virus infection; and the second allows patients who do not have signs of COVID-19 infection to come to the centre.

Acquisition of additional equipment, such as respirators and additional computer tomographies (CT-scans) was necessary. This was done following objective, transparent and verifiable criteria to ensure safety. Similarly, acquisition of protective equipment took place via a National Logistics Unit following an agreement on standards for the use of this equipment.

**Did you experience major changes in the overall organisation of healthcare and, if yes, which ones?**

Changes in the overall organisation of healthcare include an increase of intensive care while still keeping enough beds available for

other pathologies. A seizure of hospital and intensive care bed capacities is carried out twice a day, at 8 am and 4 pm.

Other changes include the development, together with hospital pharmacists, of a procedure for managing stocks and orders of drugs with a view to equitable distribution via an objective criterion. A new national regulation allowed the Luxembourg market to be considered as a single official hospital, which allowed Luxembourg to be active on the Belgian market. Also, Luxembourg allowed transfer of 12 French COVID-19 patients requiring intensive care (called the Grand Est solidarity action).

Work was also carried out to ensure good national coordination. Data sheets with COVID-19 indicators were completed every morning by hospital departments. The Minister received the information collected daily in the form of a 'dashboard'.

Similar to other populations, there is a fear and hesitancy to visit the hospital or primary care; therefore Luxembourg tried to raise awareness of the issues and the serious consequences that they could have for the future health of the patients.

**Have you identified possible changes to your healthcare system?**

After the current events, it is clear that a reorganisation of our health system is necessary. The health crisis has highlighted the limits of our current resources and there are many lessons to be learned. Changes include a better maintenance and availability of reserves of beds and equipment. The creation of a National Hospital Logistics Centre (including central purchasing), will take over the activity of the National Logistics Cell and develop it. There is also a need to strengthen the role of hospitals to enable them to face future health crises, as well as a public service able to respond to vital priorities.

## LUXEMBOURG

	2002	2008	2017
<b>Total current health expenditure as % of Gross Domestic Product (GDP)</b>	<b>6.7%</b>	<b>6.5%</b>	<b>5.5%</b>
General government/compulsory current health expenditure, as % of total current health expenditure	83.0%	87.3%	84.0%
<b>Hospital current health expenditure, as % of total current health expenditure</b>	<b>30.4%</b>	<b>31.9%</b>	<b>32.5%</b>
Household out-of-pocket health expenditure, as % of total current health expenditure	13.9%	10.1%	10.5%
<b>All hospital beds per 100,000 inhabitants</b>	<b>n.a</b>	<b>556.8</b>	<b>466.2</b>
Acute care hospital beds per 100,000 inhabitants	n.a	432.2	377.5
<b>Acute care admissions/discharges per 100 inhabitants</b>	<b>17.3</b>	<b>15.7</b>	<b>13.6*</b>
Average length of stay for acute care hospitals (bed-days)	7.5	7.3	7.3*
<b>Practising physicians per 100,000 inhabitants</b>	<b>225.7</b>	<b>271.6</b>	<b>298.5</b>
Practising nurses per 100,000 inhabitants	776.4	n.a	1,172.5

## PORTUGAL



**Prof Carlos Pereira Alves**  
HOPE Governor

**Could you summarise the most important impact on hospitals, primary care and social care?**

The government has announced that Portugal will be on contingency status until 14 October 2020. The political consensus and a good response of the health system helped in it never becoming overwhelmed, although the number of ICU beds being are lower in Portugal compared with other EU countries. Portugal only reached a maximum of 60% rate of occupation of ICU beds. Several campaign hospitals were prepared but practically never used. The low occupancy of beds meant other patients from areas such as, cardiology and oncology could be treated. However, hospitals also faced strong shortages of material in the beginning but after one month this was quickly controlled.

In September 2020, the number of daily cases increased as in all over Europe and we witnessed a slow pressure on the hospital system but without alarm.

The crisis has had a big impact on training, elective and non-emergency surgeries, which had to be stopped. The Ministry of Health is asking for plans to resume normal activity; but patients do not go to hospital as much as they did before, 70% of daily emergencies have disappeared. The low activity of hospitals will create economic problems because there is an activity-based funding mechanism. Central government will have to change the funding criteria of hospitals if they want the activity objectives to be met.

Additionally, private home care has been impacted badly.

**Did you experience major changes in the overall organisation of healthcare and if yes, which ones?**

Several campaign hospitals were prepared but practically never used. Only non-essential activity stopped at an early stage.

There is an effort throughout the system to replace on-site activities with virtual ones. The use of medical tele-appointments increased significantly as home working was adopted whenever possible. Delivery of hospital-only medicines is now done through hospitals instead of pharmacies.

Also, there have been many efforts in creating designated pathways to separate ingoing and outgoing patients and staff.

**Have you identified possible changes to your healthcare system?**

As mentioned above, the low hospital activity will create funding and financing problems as a consequence of the activity-based funding mechanism that is currently in place. Hence, the central government will have to change the funding criteria of hospitals if they want the activity objectives to be met. There is general consensus that though the economic impact of this crisis will be high (experts anticipate a 7%-9% GDP budget deficit in 2020) the National Health Service (SNS) must be reinforced in terms of the resources available.

## PORTUGAL

	2002	2008	2017
<b>Total current health expenditure as % of Gross Domestic Product (GDP)</b>	<b>8.6%</b>	<b>9.4%</b>	<b>9.0%</b>
General government/compulsory current health expenditure, as % of total current health expenditure	72.6%	68.4%	66.3%
<b>Hospital current health expenditure, as % of total current health expenditure</b>	<b>38.1%</b>	<b>38.3%</b>	<b>42.2%</b>
Household out-of-pocket health expenditure, as % of total current health expenditure	22.6%	25.8%	27.5%
<b>All hospital beds per 100,000 inhabitants</b>	<b>356.7</b>	<b>339.1</b>	<b>339.3</b>
Acute care hospital beds per 100,000 inhabitants	351.2	332.7	324.7
<b>Acute care admissions/discharges per 100 inhabitants</b>	<b>11.1</b>	<b>11.3</b>	<b>10.8</b>
Average length of stay for acute care hospitals (bed-days)	7.2	6.8	7.2
<b>Practising physicians per 100,000 inhabitants</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>
Practising nurses per 100,000 inhabitants	n.a.	n.a.	n.a.

## SPAIN



**Mrs Sara Pupato Ferrari**  
HOPE Governor

**Could you summarise the most important impact on hospitals, primary care and social care?**

Spain has been strongly hit by the Coronavirus pandemic. During the first wave, the peak was acute and had a great impact on hospitals, public or private, and on the healthcare and social systems in general. This crisis has damaged Spain's image as one of the healthiest nations, with the highest life expectancy in Europe and a robust healthcare system.

Currently, at the end of October 2020, there are already a million cases in Spain, the fatality

rate is 3.5 (0.6 for second wave) and hospital admissions are growing in all regions. The whole country has 14% beds occupied in hospitals (17,000 persons), 25% of ICU beds occupied (around 2350 persons). Cumulative incidence of cases per 100,000 inhabitants is around 600.

Spain was on state of emergency until 21 June 2020. The 17 regions were coordinated by the Ministry of Health. There was also a centralisation of material purchasing due to the initial problems with acquisition of material. Now the different regions are able to organise the strategic storage of material and to make



purchase by themselves.

One of the undesired side effects of the pandemic is that patients with common diseases avoid going to hospitals while COVID-19 patients are being treated. As an example, Spain had 40% fewer myocardial infarction patients reported by hospitals compared with 2019, which might have affected the general death rate.

Like most countries, Spain is counting fatalities of those who have tested positive for coronavirus. For this reason, during the first wave, several deaths were not registered as caused by COVID-19, as they occurred in nursing homes without having a positive test.

Currently, within a severe second wave that is striking most of European countries, the Parliament has agreed on declaring a second state of alarm, in order to allow Autonomous Communities to adopt stricter lockdown measures if necessary.

Primary care is under great pressure under this second wave. Many professionals are positive or are at risk hence must stay at home. There is also a shortage of nurses and doctors.

Nursing homes have limited and even forbidden visits and are now better prepared than in the first wave.

The Track and Trace system has been implemented and diagnostic capacity has also increased. There is no longer a scarcity of PPE and critical care equipment. Information systems have improved although some autonomic regions still have delays in reporting. But the biggest issues are the understaffing and under strain health workforce.

#### **Did you experience major changes in the overall organisation of healthcare and, if yes, which ones?**

The health crisis caused by the COVID-19 emergency has forced hospitals and health services to look for new forms of organisation to respond to the health emergency. The adoption of innovative solutions and new organisational processes have given an essential role to medical services and managers and have guided the needs of infrastructure, patient flows and the material needed.

New healthcare facilities were created mainly in Madrid and Barcelona. Primary care was reorganised mainly in the form of telemedicine.

There has been a blurring of traditional medical specialties with the implementation of multi-professional groups or 'COVID teams', with the active participation of nursing, which has played new roles, enhancing telemedicine.

In the direct care of admitted patients, digitisation or telemedicine initiatives have been implemented or expanded. By telemonitoring in conventional hospitalisation rooms, with reduced devices that are easy to use and sterilise, and through telecare, or virtual consultations, to increase the number of visits

and reduce the exposure of professionals and the consumption of protective equipment. As well as calls with mobile devices to the patient or family. Home control of patients at intermediate risk, not admitted to hospitals, has been done in many centres with their active participation and the help of oximetric control devices, video calls and structured interviews. Avoiding unnecessary face-to-face consultations has been controlled by collecting samples in special devices or at home, by conducting virtual telephone consultations and with the home delivery of the medication for hospital use. Geolocation has been used for contact study and to ensure population estrangement. In short, the different modalities of telemedicine and communication technology have expanded exponentially in a few weeks.

The Ministry of Health has recently agreed with regions on a new Coronavirus alert system to clarify and to have a more homogeneous system in place. It is a risk system evaluating the situation with four levels of alerts and certain thresholds that should be evaluated in the different regions.

#### **Have you identified possible changes in your healthcare system?**

A seroprevalence study on 90,000 persons was performed after the first wave. Only 5% of population on average had been infected in July. The study is envisaged to be performed again during November 2020.

Due to the economic situation, a new guaranteed minimum income has been approved for vulnerable people.

In July, the Spanish Congress reached a broad agreement among political parties for introducing reforms in the public healthcare system focussed on public health, primary healthcare and digitalisation.

The Ministry of Health agreed with the Autonomous Communities on a new package of coordination measures to strengthen control of COVID-19. The Declaration of Coordinated Actions includes measures related to vaccination, screening, coordination with local authorities and an implementation of the new national seroprevalence study.

The role of citizens as an engine of change, together with that of professionals, has proved to be essential, emphasising their responsibility in self-care, in the fulfilment of social isolation and in the rational use of health resources.

Within the drama that has caused so much personal and collective suffering and subsequent economic catastrophe, we must draw on the best lessons learned to improve the health system as a whole, to make it closer and adaptable to the needs of patients, to avoid unnecessary clinical events and face-to-face visits and to make it more personalised, more efficient, and of higher quality.



## SPAIN

	2002	2008	2017
<b>Total current health expenditure as % of Gross Domestic Product (GDP)</b>	<b>6.8%</b>	<b>8.3%</b>	<b>9%*</b>
General government/compulsory current health expenditure, as % of total current health expenditure	71.0%	73.6%	70.8%*
<b>Hospital current health expenditure, as % of total current health expenditure</b>	<b>37.9%*</b>	<b>40.5%</b>	<b>42.5%*</b>
Household out-of-pocket health expenditure, as % of total current health expenditure (2018)*	24.9%	21.0%	22.2%
<b>All hospital beds per 100,000 inhabitants</b>	<b>n.a</b>	<b>n.a</b>	<b>329 (2018)**</b>
Acute care hospital beds per 100,000 inhabitants	n.a	n.a	233 (2018)**
<b>Acute care admissions/discharges per 100 inhabitants</b>	<b>11.8</b>	<b>11.4</b>	<b>11.6 (2018)**</b>
Average length of stay for acute care hospitals (bed-days)	7.0	6.5	5.45 (2018)**
<b>Practising physicians per 100,000 inhabitants</b>	<b>313.0</b>	<b>354.5</b>	<b>400 (2018)*</b>
Practising nurses per 100,000 inhabitants	407.5	482.2	590 (2018)*

\* OECD Health Statistics 2020. <http://stats.oecd.org/Index.aspx?DataSetCode=SHA>

\*\* Ministerio de Sanidad. Sistema de Información de Atención Especializada (SIAE)

## SWEDEN



**Mr Erik Svanfeldt**  
HOPE Governor

**Could you summarise the most important impact on hospitals, primary care and social care?**

The Swedish Government employed a partially different strategy than other European countries. There was never a complete lock down; Sweden instead established restrictions that were sustainable for a long time. In the Spring, Sweden had a higher total number of deaths than neighbouring countries, but the number of new deaths in COVID-19 has since dropped significantly. COVID-19 has hit Stockholm much harder than other parts of Sweden.

Sweden had a low number of ICU beds before the crisis, but the hospitals managed to increase this number very quickly. The maximum expanded capacity level was never reached. There was also an initial lack of certain equipment and pharmaceuticals.

A big problem was elderly care, not least in nursing homes. There is a clear policy to provide basic healthcare in nursing homes, but they are basically designed for encouraging social contacts and not for fighting pandemics. Nursing homes were closed for visitors from March, and social care staff have been given

extensive training in patient safety.

**Did you experience major changes in the overall organisation of healthcare and, if yes, which ones?**

As in other countries, some elective surgeries and planned treatment were postponed, and non-emergency dental care was cancelled. Therefore, there was less pressure on other parts of hospital services (cardiology, cancer) and less pressure on primary care. Now there is a huge 'healthcare backlog' to be dealt with.

Hospitals managed to transform wards into ICU, to transfer healthcare professionals from one part of the system to another, and also to recruit staff from other sectors. There has also been an increase of digital services.

**Have you identified possible changes to your healthcare system?**

Future changes, that we can foresee, include the creation of stocks, an increase of digital care and reviews of existing emergency plans. Furthermore, there will probably also be a discussion about responsibility: who and what level (local, regional, national, EU) should be responsible for what?

## SWEDEN

	2002	2008	2017
<b>Total current health expenditure as % of Gross Domestic Product (GDP)</b>	<b>8.3%</b>	<b>8.3%</b>	<b>11.0%</b>
General government/compulsory current health expenditure, as % of total current health expenditure	82.2%	81.9%	83.7%
<b>Hospital current health expenditure, as % of total current health expenditure</b>	<b>n.a.</b>	<b>n.a.</b>	<b>38.0%</b>
Household out-of-pocket health expenditure, as % of total current health expenditure	16.8%	16.9%	15.0%
<b>All hospital beds per 100,000 inhabitants</b>	<b>312.9</b>	<b>280.5</b>	<b>222.5</b>
Acute care hospital beds per 100,000 inhabitants	282.7	255.1	203.6
<b>Acute care admissions/discharges per 100 inhabitants</b>	<b>15.3</b>	<b>15.7</b>	<b>13.9*</b>
Average length of stay for acute care hospitals (bed-days)	6.6	6.2	5.4
<b>Practising physicians per 100,000 inhabitants</b>	<b>327.8</b>	<b>374.2</b>	<b>411.7*</b>
Practising nurses per 100,000 inhabitants	1014.3	1096.0	1090.2*



## UNITED KINGDOM



**Mr Niall DICKSON**  
HOPE Governor

**Could you summarise the most important impact on hospitals, primary care and social care?**

The UK has suffered a general increase in demand across the whole health and social care system, having to even establish field hospitals across the country. Furthermore, the initial focus on acute care to mitigate those more in need has led to mental health, primary health, community and social care being overlooked and lacking capacity.

Similar to other countries, the UK also suffered supply challenges, particularly for the procurement and distribution of personal protective equipment across the system, especially in primary, community and social care. This has created staff anxiety and lack of confidence, but the situation is resolving slowly.

There have been significant workforce issues, as staff members fell sick, or were required to quarantine or shield at the same time as an increased need for services. This led to the reallocation of staff to sites in need, including task shifting and bringing staff back from retirement.

In terms of support for the health service and preparing it for the challenges of COVID-19, focus was rapidly shifted away from elective and other routine care, which was paused, care quality inspections were scaled back, and national coordination of the crisis response was put in place.

All of the factors above have culminated in significant financial stress with increased costs across all parts of the health and care sector.

The UK government has provided increased funds, although we expect challenges in the medium-long term.

**Did you experience major changes in the overall organisation of healthcare and, if yes, which ones?**

The pausing of non-urgent services to meet COVID-19 demand has caused much concern about unmet need, including fewer presentations to the emergency department with heart attacks and stroke and fewer people accessing cancer screening; and concerns about growing waiting lists.

There are concerns about restoring non-urgent services when there is still a risk of a second peak; plus, the usual increased winter demand towards the end of 2020. As we move into the service restoration phase, there is a challenge in delivering care in facilities that separate people who are positive and negative for COVID-19.

We are also expecting increased demand for mental health services and rehabilitation services.

**Have you identified possible changes to your healthcare system?**

As mentioned above, possible changes to the healthcare system include the increase of waiting lists as well as the restructuring of healthcare in COVID-19 and COVID-19-free areas. Other changes include a demand on mental health and rehabilitation services.

## UNITED KINGDOM

	2002	2008	2017
<b>Total current health expenditure as % of Gross Domestic Product (GDP)</b>	<b>6.6%</b>	<b>7.6%</b>	<b>9.6%</b>
General government/compulsory current health expenditure, as % of total current health expenditure	79.7%	82.8%	78.8%
<b>Hospital current health expenditure, as % of total current health expenditure</b>	<b>n.a.</b>	<b>n.a.</b>	<b>41.8%</b>
Household out-of-pocket health expenditure, as % of total current health expenditure	11.3%	9.4%	16.0%
<b>All hospital beds per 100,000 inhabitants</b>	<b>397.9</b>	<b>333.3</b>	<b>253.7</b>
Acute care hospital beds per 100,000 inhabitants	n.a.	n.a.	211.4
<b>Acute care admissions/discharges per 100 inhabitants</b>	<b>11.2</b>	<b>13.0</b>	<b>12.5</b>
Average length of stay for acute care hospitals (bed-days)	7.5	6.3	6.0
<b>Practising physicians per 100,000 inhabitants</b>	<b>210.0</b>	<b>256.6</b>	<b>281.1</b>
Practising nurses per 100,000 inhabitants	865.4	866.7	782.5



# DRIVEN TO FULFILL THE PROMISE OF BIOSIMILARS— THE PFIZER WAY

## The Pfizer Promise is simple:

To help you provide patients with more treatment options while delivering a large portfolio of potentially cost-saving biosimilars.<sup>1,2</sup>



### Breadth of offerings

Pfizer has a large portfolio of oncology biosimilars on the market, including both cancer therapies and supportive care products, to give patients more treatment options.<sup>2</sup>



### Quality focused

Pfizer oncology biosimilars are all produced to meet the same high-quality standards as Pfizer's other biologics—using the same robust protocols for monitoring quality throughout every stage of the manufacturing process.<sup>3-6</sup>



### Manufacturing and supply experience

Pfizer leverages more than 30 years of state-of-the-art manufacturing and supply-chain experience in biologics to deliver biosimilars to patients.<sup>3,6-8</sup>

**References:** **1.** IMS Institute for Healthcare Informatics. *Delivering on the Potential of Biosimilar Medicines: The Role of Functioning Competitive Markets*. Parsippany, NJ: IMS; March 2016. **2.** Generics and Biosimilars Initiative. Biosimilars approved in Europe. <http://www.gabionline.net/Biosimilars/General/Biosimilars-approved-in-Europe>. Updated February 21, 2020. Accessed August 4, 2020. **3.** Pfizer. Biosimilars. <https://www.pfizer.com/science/research-development/biosimilars>. Accessed June 17, 2020. **4.** Pfizer. Transforming Delivery of High Quality Products. Pfizer Annual Review 2016. [https://www.pfizer.com/sites/default/files/investors/financial\\_reports/annual\\_reports/2016/transforming-delivery-of-high-quality-products/index.html](https://www.pfizer.com/sites/default/files/investors/financial_reports/annual_reports/2016/transforming-delivery-of-high-quality-products/index.html). 2016. Accessed June 17, 2020. **5.** Pfizer. Heritage in Biologics. [https://www.iononline.com/SiteRepository/Biosimilar/Pfizer/Pfizer-Heritage-in-Biologics\\_25Oct19](https://www.iononline.com/SiteRepository/Biosimilar/Pfizer/Pfizer-Heritage-in-Biologics_25Oct19). July 2016. Accessed June 17, 2020. **6.** Pfizer. Manufacturing and Supply Chain Excellence. <https://smarthub.pfizerpro.co.uk/supply-chain>. Updated March 2020. Accessed August 3, 2020. **7.** Pfizer. Manufacturing and Supply Chain Excellence. [https://www.pfizer.com/sites/default/files/investors/financial\\_reports/annual\\_reports/2017/our-business-our-purpose/manufacturing-supply-chain-excellence/index.html](https://www.pfizer.com/sites/default/files/investors/financial_reports/annual_reports/2017/our-business-our-purpose/manufacturing-supply-chain-excellence/index.html). 2017. Accessed September 14, 2020. **8.** Pfizer. Manufacturing, Quality, and Supply Chain. [https://www.pfizer.com/sites/default/files/investors/financial\\_reports/annual\\_reports/2016/our-business/manufacturing-quality-and-supply-chain/index.html](https://www.pfizer.com/sites/default/files/investors/financial_reports/annual_reports/2016/our-business/manufacturing-quality-and-supply-chain/index.html). 2017. Accessed September 14, 2020.