Data, analysis, perspectives | No. 1, 2021

Hospital response capacity

What can Germany learn from other countries and their response to the coronavirus crisis?

- Tiered hospital systems with defined care pathways for critically ill patients are an advantage during a pandemic
- Countries with a robust digital infrastructure and fewer beds than Germany do not reach their capacity limits
- The availability of skilled personnel was a key bottleneck in all countries
- We need to establish – ex ante – clear protocols for decision prioritization and managing supply bottlenecks

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For many years, Germany had more hospitals, hospital beds and greater intensive care capacity than almost any other country in Europe. Then, like the rest of the globe, it was hit by the coronavirus pandemic. Given the massive uncertainty felt at the beginning of the first wave, the federal government decided to pay out €9 billion in compensation to hospitals for the availabiity of beds, despite the country's relatively large number of hospitals and beds. This meant that by the end of September 2020, over 300 hospitals of average size were effectively removed from the pool of those providing regular healthcare services. No other country in the world spent more money on having hospitals leave their beds empty.

We now know that this was unnecessary, in part because more than 90 percent of coronavirus patients received outpatient care. Only the critically ill were treated as inpatients.

> "We never came even close to reaching the capacity limit of intensive care during the first coronavirus wave"
>
> Prof. Boris Augurzky, RWI Essen

For the most part, it was Germany's larger hospitals with specialized units that provided inpatient care for serious cases, particularly those requiring the use of a ventilator. While this was certainly the right thing to do from a medical point of view, it did not reflect systematic hospital planning and management. The crisis mercilessly exposed weak spots in the German hospital system: Shortages in trained personnel at the country's intensive care units accounted in large part for the bottlenecks in care. Other contributing factors include the lack of regional cooperation between hospitals and the low degree of concentration in hospital care structures.

These shortcomings in the German system have long been known. Germany has paid a high (financial) price to get through the first coronavirus wave relatively unscathed despite these structural weaknesses. In addition to being expensive, high capacities also raise other questions: Were too many unnecessary operations being carried out before the crisis hit to fill existing capacity? Were necessary treatments and procedures postponed during the first wave of the pandemic, even though the resources they require were not needed for COVID-19 cases?

The pandemic has exposed the challenges facing the German hospital system: We need an inpatient care system able to adapt smoothly and quickly to a fluctuating demand that is difficult to predict. We must avoid wasting insurees' or taxpayers' money on maintaining excessive reserve stocks in the system without – at the same time –jeopardizing truly necessary care capacities, including those urgently needed during the second pandemic wave, in part due to the high infection rates.

Other healthcare systems are facing the same challenges. We have therefore consulted experts in **Denmark, Sweden, Spain and Israel** and examined the capacity of each country's healthcare system – in particular their inpatient units – to respond to the pandemic. Both the baseline conditions and crisis-management strategies in each country differed considerably.

Denmark has been able to rely on a modern hospital system with specialist services concentrated in designated sites that nonetheless features a rather even distribution of intensive care beds across the country. Sweden's hospital system, which covers a large territory, also has specialized units with relatively few beds. In contrast to nearly almost all other countries, Sweden, in its efforts to fight the pandemic, has relied heavily on people taking personal responsibility for their own activity. Spain's clinics, which are more regionally organized, had to cope with a particularly high influx of patients. Israel, as a small country, has a relatively high ratio of intensive care beds per capita.

None of these countries can or should be considered a blueprint for Germany in terms of responding to the pandemic. But there are lessons to be learned from these approaches that show how Germany could have alleviated the pressures placed on the German system during the second wave.

In principle, ensuring a healthcare system's effective response to a pandemic requires that the following be in place:

- Contingency plans that adapt to problems in a dynamic context
- A sufficiently up-to-date set of data on healthcare system capacities, the current availability of treatments and services, and the extent to which they are suitable for people with the condition in question.

Clearly differentiated approaches to adapting and applying existing contingency plans

All of the countries examined featured broadly defined contingency plans. However, only Israel, Denmark and Sweden delivered a rapid and effectively coordinated adaptation of their response to the coronavirus pandemic.

In Spain, which features the most decentralized healthcare system that grants its administrative regions considerable autonomy, planning and preparation processes were particularly problematic. In fact, with the exception of decreeing a lockdown on March 14, 2020, the federal government has taken few steps to get things under control. Urgently needed coordination, both across the country's administrative regions and between the regions and the federal government, has failed to materialize.

In Germany, the pandemic response was somewhat delayed. For starters, the federal government first had to legally secure further administrative powers to control the pandemic. It took nearly six weeks after the first detection of a coronavirus case in Germany before the federal government and the minister presidents of the Länder were able to call on hospitals to focus on the growing need for intensive care and ventilation capacities in treating COVID-19 patients.

Solid data is essential to rapid response capacity

Going into the crisis, none of the countries examined – with the exception of Sweden – had an up-to-date set of data on available intensive care capacities. Sweden has had a registry in place since 2001 that tracks the use of intensive care capacities on a weekly basis. Once the coronavirus pandemic hit Sweden, the authorities began updating the registry daily. Sweden also features a digital system in which hospitals report weekly on the number of occupied and available acute care beds. The country therefore already had – even before the crisis – the digital resources highlighted by the OECD as essential to coping with the coronavirus pandemic.

Denmark proved able to quickly update its outdated set of data on intensive care. Current figures were available as early as March 2020. Israel did not succeed in providing a current set of data until July 2020, which, however, included information on hospital bed occupancy rates.

In Spain, a lack of data caused problems for the demand-driven management of intensive care capacities. Delays in the collection of data at the regional level and in the transmission of data resulted in a major delay in the availability of updated data at the national level. It is worth noting that although information is collected in Spain, there is no broad overview of available capacities.

At the outset of the coronavirus pandemic, Germany also lacked an overview of currently available resources and capacities in the hospital sector. The statistics published in 2020 relied on data from 2017. It wasn't until mid-April 2020 that all hospitals began submitting the number of available and occupied ICU beds to the DIVI Intensiv-Register (Intensive Care Registry), which was set up under very short notice under federal mandate. And it wasn't until the end of April that the Federal Ministry of Health (BMG) call on the Länder to draw up phased plans for care provision and capacity maintenance for COVID-19 cases.

Yet Germany still lacks an up-to-date data-driven overview of available hospital capacities beyond the intensive care sector, as is the case, for example, in Denmark and Sweden. Also, unlike these states, little is known in Germany about how suitable these inpatient capacities are for treating specific types of patients. Demand-driven resource management is thus unrealistic in Germany – not only under regular conditions, but

Total capacity and number of beds occupied in intensive care in Sweden, March – June 2020

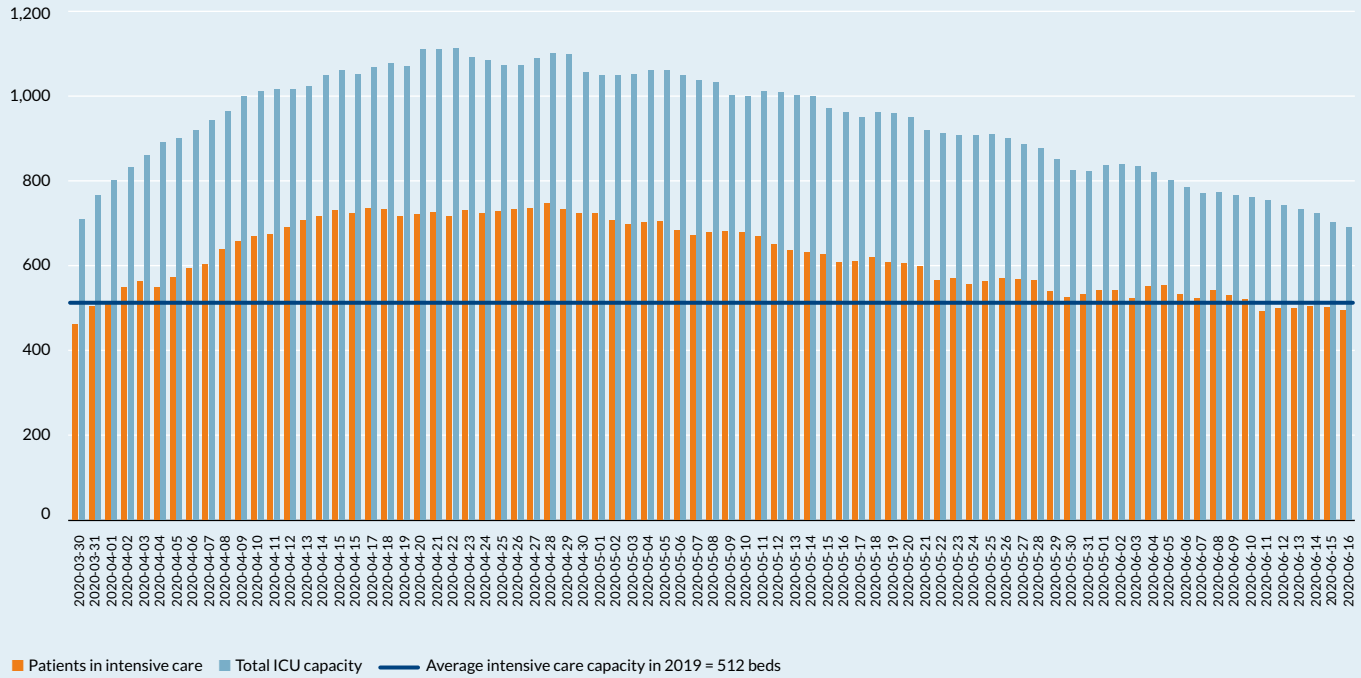

Figure 1 | Sources: Sveriges Kommuner och Landsting (2020-2). Samverkan och förnyelse. En Spaning över Omställningen i Hälso och Sjukvården under fem Månader med Corona, p. 24; Svenska Intensivvårdsregistret (SIR); Authors' calculations

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also as a short-term response to additional waves in the pandemic.

A dual strategy in each country: Introduce relief measures while increasing capacity

In all the countries examined, efforts to adjust inpatient cases focused on postponing scheduled treatment and procedures and on increasing intensive care capacities for the short term. Spain is an exception here, insofar as the federal government – demonstrating the decision-making authority of regional government – made no effort to relieve the burden on hospitals by postponing elective procedures. As a result, decisions of this nature were left entirely up to the respective regions.

Israel, Sweden and Denmark also pursued successful strategies designed to increase intensive care capacity. Similar to Denmark, developments in Sweden were characterized by a particularly high degree of flexibility. Supported by very good data, Sweden has proved able to rapidly increase and reduce capacity in line with changing demand (see Figure 1). The responsibility for making such adjustments lay with the 21 regions, albeit in close coordination and consultation with the relevant authorities and institutions at the federal level.

> "While the number of hospitals and hospital beds in Denmark have been reduced over the past two decades there is sufficient flexibility to scale up when necessary."
>
> Prof. Karsten Vrangbæk, University of Copenhagen

Germany goes its own way – at significant expense, and with insufficient focus

In Germany, attempts to manage the expansion of hospital and intensive care capacities have primarily taken the form of financial-support measures. For example, the COVID-19 Hospital Relief Act offered a lump sum for every hospital bed kept free and provided a cost subsidy of €50,000 for each additionally created intensive care bed with mechanical-ventilation capacities. These provisions imposed no qualitative requirements,

Intensive care beds in Germany and their utilization, mid-April – early July 2020 (selected days of the week)

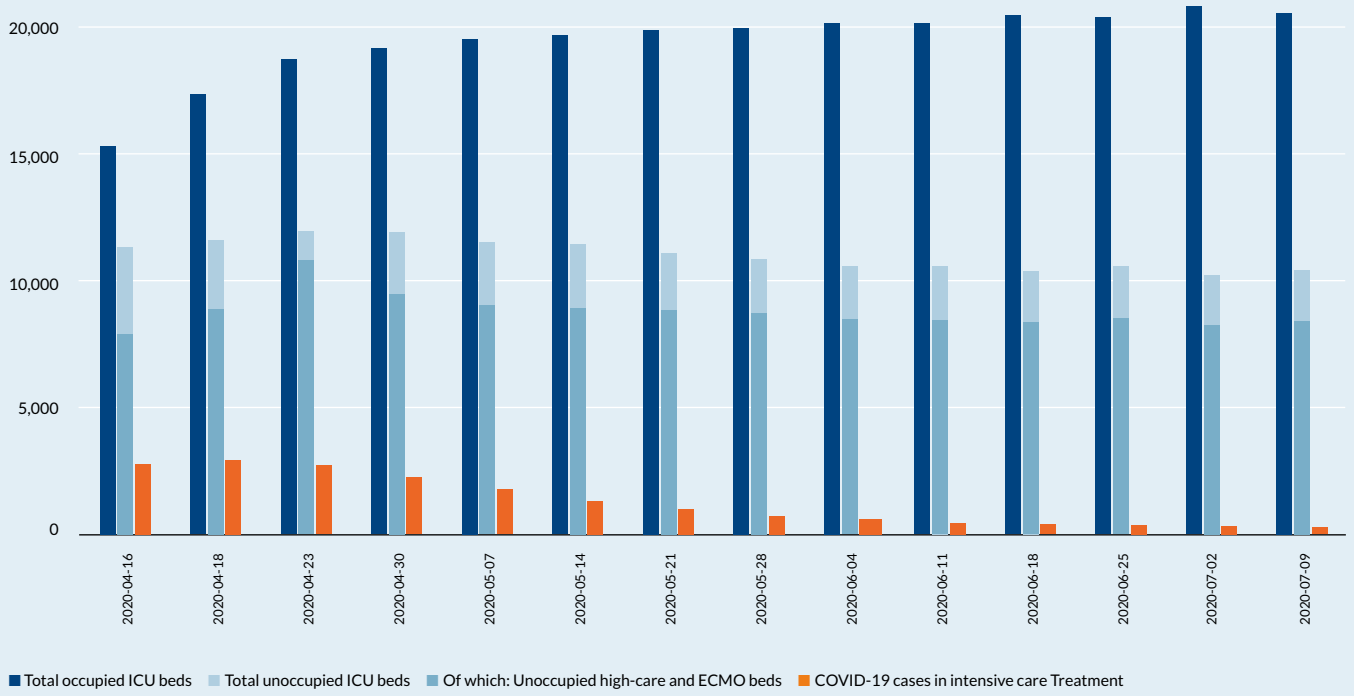

Figure 2 | Source: DIVI Intensive Care Registry (ECMO = Extracorporeal Membrane Oxygenation). During the first coronavirus wave, the number of COVID-19 patients in intensive care peaked at 2,928 on April 18, 2020.

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for instance having to do with the hospital's suitability for the care of COVID-19 patients.

The final report by the Federal Ministry of Health's COVID-19 Expert Advisory Committee, released in late April 2020, showed that Germany's approach to managing capacities by providing financial support, without establishing specific objectives, was not very efficient. According to this document, an average of less than 2 percent of all hospital beds, and only 4 percent of intensive-care beds, were actually used for the care of COVID-19 cases during the first wave of the pandemic. About one-fourth of all German hospitals were not involved in coronavirus-related care at all. Even during the second, significantly greater wave, these predominantly smaller facilities have not been in a position to treat severe COVID-19 cases adequately; nor will they be so in the future.

Yet even during the first wave, too many COVID-19 cases ended up in hospitals that were not adequately equipped, either in medical or technological terms, to provide the necessary treatment. Around 30 percent of all COVID-19 patients requiring ventilation had been transferred, which means they were often initially treated in hospitals that could not care for them appropriately. The country's lack of overarching management capabilities means that Germany had – and continues to have – little systematic ability to coordinate patient flows. During the first wave of the pandemic, patient-management mechanisms of this kind were implemented in only a few regions, or were not carried out consistently due to the lack of any legal requirement to do so.

Prioritization and rationing: Suddenly no longer a taboo

All of the countries included in this analysis have established systems of prioritization designed to ease burdens on hospitals. In doing so, they have placed a higher priority on the care of pandemic cases, as deemed politically necessary, than on the treatment of elective patients. Yet the extent to which planned procedures were delayed, and the degree to which these measures were even necessary, varied significantly from country to country.

In Spain, some regions found themselves overloaded as a result of the country's highly devolved responsibilities and lack of an overarching coordination system. However, a swift reaction by the

More than **90 %** of those infected with the coronavirus were treated as outpatients in Germany

685,000,000 euros were spent on 13,700 additional intensive care beds

4 % of intensive care beds were needed on average for COVID-19 patients during the first wave of the coranavirus

central government, along with subsequent improvements in coordination, alleviated this situation. For example, at the beginning of April, the Spanish health ministry published ethical guidelines for triage measures employed in the treatment of COVID-19 patients. Some hospitals had been forced to make decisions on rationing care even before April.

In Sweden, general guidelines on handling triage decisions in situations of scarcity had existed even before the coronavirus pandemic. These were updated quickly at the beginning of the pandemic. Although instances of high capacity utilization emerged at some times and in some places – particularly in Stockholm – there were unoccupied intensive-care beds available at all times during the first wave. Thus, triage decisions did not prove necessary.

This form of prioritization becomes problematic when it is not in fact necessary for capacity reasons, but is carried out nonetheless, for instance due to a lack of reliable and up-to-date information about available and appropriate treatment capacities. This was the case in Germany during the first wave of the pandemic. The federal minister of health's public call in mid-March 2020 to refrain from planned operations and procedures, paired with the public's concern about the risk of infection within hospitals, led to a dramatic decline in hospital intakes. For example, an initial analysis by the Scientific Institute of the AOK showed a decline in hospital stays among AOK-insured patients of 41 percent in the first quarter of 2020 as compared to the same quarter the previous year. Even acute illnesses such as heart attacks and strokes were affected.

Staffing: A key bottleneck

Our analysis shows that a lack of suitable personnel slowed the ability to react in all of the countries examined. The greatly expanded intensive-care sector was particularly affected. Hospitals seeking to compensate for the acute shortage of skilled staffers often drew on nurses from other departments, who had to be trained at short notice. In some cases, intensive-care beds were left empty due to the staff shortages.

The lack of suitable personal protective gear – and thus the increased risk of infection – also exacerbated the staff shortage in some places. In Spain, for example, healthcare workers are reported as making up a particularly high proportion of the infected population. There, healthcare employees accounted for 24.1 percent of all people infected with COVID-19, while the corresponding share in Germany was just 5.2 percent – a difference primarily attributable to the initially severe lack of personal protective equipment.

A functioning outpatient-care system is essential

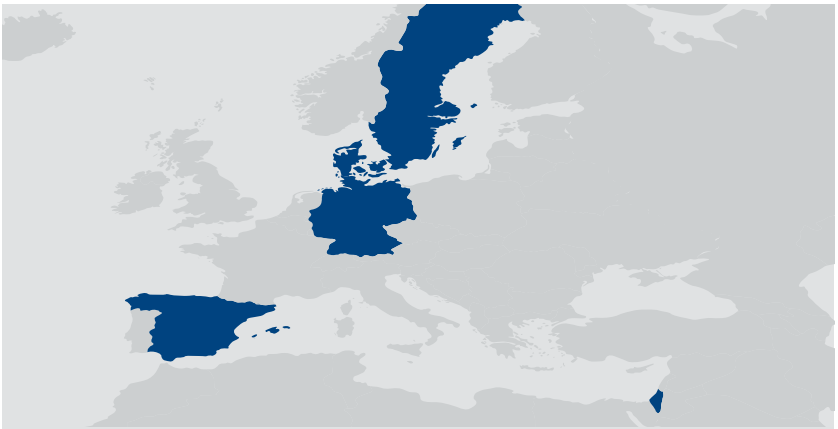
In all five countries, the aim was to treat severe COVID-19 cases primarily within hospitals, while mildly ill people were to receive outpatient care. In Israel, at the beginning of the pandemic, all

COVID-19 patients were initially admitted to the hospital. However, this policy was later changed.

Nevertheless, the hospitalization rate varied significantly from country to country. In Spain, for example, just over 55 percent of all COVID-19 cases were provided with inpatient hospital care during the first coronavirus wave, as compared to just 13 percent of such cases in Germany.

Denmark and Sweden focused most consistently on ensuring that primary-care contacts with medical staffers and healthcare centers took place digitally or via telephone to the greatest extent possible, with the aim of preventing further infections. In this regard, both countries benefited from mechanisms for digital communication between patients and the healthcare system that had already been used successfully for many years.

At the beginning of the pandemic, for example, Sweden rapidly posted dedicated coronavirus information pages for the public on its national healthcare portal, including a self-assessment questionnaire. Patients in Sweden were initially tested only upon admittance into the hospital; however, from May 2020 onward, members of that country's public generally had the ability to order a self-test online or via telephone, and carry it out at home. Alternatively, they could be tested at mobile test stations or at a healthcare center. Swedish authorities recommended going to a hospital emergency room only in more severe cases. This approach helped reduce the burden on inpatient capacities significantly.



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Lessons learned for improving crisis response capacity

In international comparison, Germany successfully navigated its way through the first wave of the pandemic. This is in part attributable to the fact that it was hit relatively late by the first wave of the pandemic. As a result, it could learn from what other countries were experiencing. Another factor, however, is the fact that Germany has by international comparison a relatively high hospital and intensive care capacity.

But what appears at first glance to have been an advantage came with a high price tag: Germany spent billions of euros to keep hospital beds vacant. It rationed resources for planable treatments and procedures, which is sure to have negative consequences that can only be assessed over time. In addition, we now see that this capacity, in an everday context, is in fact an overcapacity that involves both overuse and misuse of the system.

This has never been a good strategy and it will prove unsustainable in the long term because, at some point, Germany, like other states, will not be able to finance such a system. Furthermore, Germany faces an ongoing shortage of qualified personnel, and the German public is loathe to accept a sub-standard quality of care forever.

"Krankenhausstrukturen und Steuerung der Kapazitäten in der Corona-Pandemie – Ein Ländervergleich." Our study (in German) is available free of charge at https://bertelsmann-stiftung.de/krankenhauslandschaft.

Recommended actions

Strengthen the resilience of inpatient care

The following changes are needed to improve the German health system's response capacity to external shocks such as pandemics:

Governance

- Germany needs coordinated planning for pandemic or disaster events of national scale. This includes defining protocols for scenarios involving triage decisions.
- Germany needs a transparent overview, updated at least once a week, of available capacities in all inpatient care areas.
- The DIVI Intensive Care Registry should not be treated as a temporary solution – and must serve as a model for additional digital solutions in other care areas.

Capacity and materials maintenance

- Hospitals must be required to maintain the protective materials and technological equipment stocks they need to respond appropriately to pandemics and disasters; this maintenance must be fully refinanced.
- Flexibility management must be introduced to ensure hospitals and intensive care units can respond dynamically to short-term fluctuations in demand during a pandemic or disaster event.

Patient flow management

- Transferring critically ill patients to appropriate hospitals must be regulated by binding principles, particularly during pandemic and disaster events in which highly specialized, complex care is provided in geographically concentrated hospital structures.
- Funds to maintain unoccupied beds should be paid only to hospitals with a proven high level of expertise in the relevant medical field.

Staff

- Additional staff, particularly in highly specialized areas of healthcare, cannot be recruited or trained overnight. This requires instead a long-term strategy.
- Increasing staff in these areas involves improving the attractiveness of such professions, especially nursing. It also involves taking a more structured approach to fostering specialization among students and trainees in vocational training settings.
- Plans for short-term training measures are also required in order to rapidly and flexibly increase the number of qualified personnel quickly when needed.

SPOTLIGHT HEALTHCARE is an initiative of the "Improving Healthcare – Informing Patients" program at the Bertelsmann Stiftung.Published several times a year, SPOTLIGHT HEALTHCARE addresses topical issues in healthcare. The Bertelsmann Stiftung is committed to promoting a healthcare system relevant to public needs. Through its projects, the Stiftung aims to ensure the provision of needs-based and sustainable, high-quality healthcare in which patients are empowered by access to readily understandable information.

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Publisher:
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© Yurii Zushchyk - stock.adobe.com

Layout: Dietlind Ehlers
Printing: Gieselmann Druck und Medienhaus

ISSN (Print): 2364-4788
ISSN (Online): 2364-5970

Publication date:
March 2021