



INNOVATIONS FOR SUCCESSFUL SOCIETIES

MAKING THE SYSTEM WORK: GERMANY COORDINATES A RESPONSE TO COVID-19, 2020

SYNOPSIS

When the first case of COVID-19 reached Germany in January 2020, the country's world-class medical and scientific institutions snapped into action to contain—and learn from—an outbreak in Bavaria. As the pandemic escalated, Chancellor Angela Merkel, a scientist by training, based the government's response on epidemiological models and expert advice. But Germany's strictly federalized political system reserved power for the 16 states, not the central government. To coordinate the kind of nationwide response needed to curb the spread of the virus, Merkel's government developed new coordination bodies that harmonized physical-distancing policies across the country. After a nationwide lockdown slowed the initial spread, a response model of federal government guidance and support but with decentralized, local implementation enabled Germany to quickly ramp up both testing and contact-tracing capacities. As a result, from January through October 2020, Germany contained the virus more effectively than any large country in Europe or North America. At year's end, however, political consensus about how to respond to the virus broke down. With a vaccine on the horizon and the public tired of lockdowns, states hesitated to reimpose restrictions, and new infections surged.

Gordon LaForge drafted this case study based on interviews conducted in February 2021. Case published October 2021.

THE CHALLENGE

In mid-January 2020, a Shanghai-based employee of the Webasto Group, a German auto parts manufacturer, visited the company's headquarters near Munich to participate in several days of workshops. In the days before departing China, she was in the company of her parents, who had traveled from Wuhan to visit her. After the workshops, on the flight home from Munich, the woman developed a fever. When she landed, she tested positive for COVID-19 and was hospitalized. She told her managers, who alerted the company's CEO in Munich on January 27.

At that point, Germany was only the second country in Europe to confirm a COVID-19 case

(France had confirmed two infections three days earlier).¹

Germany had many advantages that would help it confront a novel health crisis: Germany was a high-income country that spent 11% of gross domestic product each year on health care (the OECD average in 2018, the most recent year for which data were available, was 8.8%).² It had more hospital beds per 1,000 inhabitants than any country in the European Union.³ It had an advanced biomedical sector, with more than 200 private and public laboratories. And it had world-class scientific medical institutions, including universities, teaching and research hospitals, and the Robert Koch Institute. As an independent

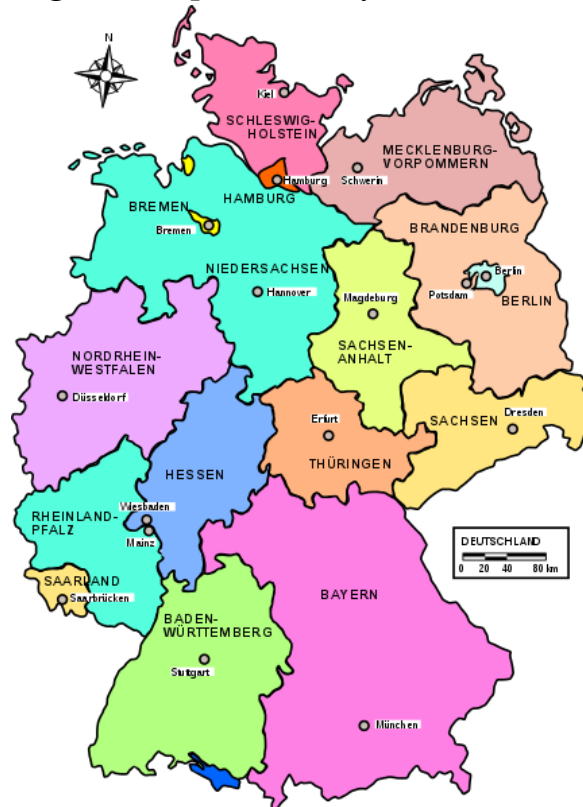
federal government agency under the Ministry of Health, the research institute was responsible for disease control, prevention, and monitoring, with 1,100 staff and an annual operating budget of 100 million euros (US\$108 million).⁴

Nonetheless, Germany faced distinct challenges when it came to addressing COVID-19. The biggest of these was the division of responsibility and authority over public health in Germany's federal system. Under the German constitution, executive powers—unless explicitly specified otherwise—resided with the 16 state governments. (Figure 1) Those purviews included, among other things, public order, interstate borders, and public health. The German Infectious Diseases Protection Act, a law passed in 2001, gave the state governments discrete powers to implement quarantines, curfews, and closures in order to curb the spread of diseases and pathogens.

Germany's legal framework thus meant that authority to issue public health orders for containing the spread of the virus resided not with Chancellor Angela Merkel but with the heads of government of the states, usually called minister presidents. (Three of those 16 states—Berlin, Bremen, and Hamburg—were city-states, whose government head went by different titles, such as governing mayor or first mayor.) And in most of these policy areas, the implementation of orders was left up to the 400 district administrations beneath the states. (The federal government could set binding occupational health and safety standards for workplaces.)

The memory of Germany's authoritarian past created complications when it came to the implementation of certain infectious disease control measures, such as restrictions on movement, mandatory quarantines, and bans on assembly. Such measures that infringed upon civil liberties risked evoking the totalitarianism of the Third Reich or the Cold War partition, when movement between East Germany and West Germany was curtailed. That meant German

Figure 1: Map of Germany



Source: Wikimedia Commons

policy makers would have to closely adhere to democratic practices—even at the expense of speedy implementation.

Finally, Germany was facing a rare period of political uncertainty. After 15 years of leading Germany's federal government, Merkel had announced in October 2018 that she would not run in the general election scheduled for September 2021, which meant that though still popular, she was something of a lame duck, and political sparring among the minister presidents leading the states, some of whom had ambitions to succeed her as chancellor, was uncharacteristically extensive.

This mixture of legal, political, and social circumstances meant that Merkel's power to impose nationwide measures to contain the spread of the virus was limited. She and leaders in the federal government—especially in the chancellery, the Ministry of Health, and the

Robert Koch Institute—would have to find creative ways to coordinate the state governments.

THE RESPONSE

Even before the country detected its first case, German scientists and public health experts were preparing for possible arrival of the virus. On January 10, researchers in China published the genome of the novel virus that would come to be called SARS-CoV-2. Almost immediately thereafter, a team of scientists led by virologist Christian Drosten at the Institute of Virology at Charité University Hospital in Berlin, one of the world's leading research hospitals, prepared a diagnostic test for the virus. The researchers disseminated the test protocols to Germany's labs, and on January 13, the World Health Organization published them on its website.

The Robert Koch Institute began issuing risk assessments and guidelines for testing, contact tracing, case management, and other technical areas. On January 23, it started publishing daily situation reports featuring national and international developments related to the virus.

In Munich, after learning that employees had been exposed to the novel coronavirus, the chief executive of Webasto alerted the district public health department and the Bavarian State Ministry of Health and Care. Public health authorities in Bavaria, Germany's second-richest state, with a per capita GDP of US\$57,012 compared with US\$48,794 for the entire nation, had ample resources for responding.

Bavaria was the home of one of the country's preeminent disease control facilities. The Schwabing Clinic in Munich had a special unit for treating rare infectious diseases and deadly biological agents. The federal government had created the unit in 1972 ahead of the Munich Olympic Games, when fear of terrorism was high. The unit had treated Germany's lone SARS patient in 2003, and it became known as the Ebola Unit after it was retrofit to handle patients during the 2014 epidemic that originated in West Africa. (Three Ebola patients were treated in

Germany during the epidemic.) The clinic was connected to the Robert Koch Institute, the Bavarian State Ministry of Health and Care, and the nearby Bundeswehr Microbiology Institute, a military research facility that had a lab with the chemical agents and protocols necessary to perform PCR tests.

On January 27, the same day the Shanghai woman reported her case, the Schwabing Clinic received a patient from the Webasto facility who the Bundeswehr Institute lab had confirmed was positive for SARS-CoV-2. Dr. Clemens Wendtner, head of the Department of Infectious Diseases at the clinic, ordered the patient placed in an isolation room. By the time workers from the Munich public health department traced all of the contacts in what came to be called the Webasto cluster, another 15 patients tested positive and were admitted to the Schwabing Clinic.

None of the patients had severe illness. Wendtner contacted Drosten in Berlin, and together with nearly 40 other scientists, including several from the Bundeswehr lab, began scrutinizing the cluster to learn as much as they could about the virus. "We cooperated to perform rigorous sampling and analysis on the Webasto patients," recalled Wendtner. "And we learned two things: One, the virus load in a COVID-19 patient was much, much higher than in a case of influenza. And two, the virus transmitted presymptomatically. These two facts led us to realize that the country would have to shut down to slow the spread."

Wendtner shared those results with leaders at the Robert Koch Institute and with Bavaria's state minister of health by being in daily contact with them and others and sharing updates about what they were learning from patients in the clinic. He and Drosten later published their results as a paper for the scientific journal *Nature*.

Federal coordination

On January 30, as scientists in Munich were studying patients in the Webasto cluster, the World Health Organization declared a Public

Health Emergency of International Concern. That declaration prompted the German federal government to declare an Epidemic of National Concern, which triggered the formation of several crisis structures—some of them constitutional, some of them not specified in the constitution—to coordinate policy formulation and decision making.

Merkel named Helge Braun, chief of the cabinet, as the federal government's point-person for the COVID-19 response. Before entering politics, Braun had been a medical doctor. Both he and Merkel, who prior to her political career had been a PhD quantum chemist, understood the epidemiological data coming out of Munich and from international sources. They were inclined to use that data and the scientific community's recommendations as the basis for the country's response measures. But the decision was not up to them or to anyone else in the federal government. Authority for implementing public health measures—including restrictions on movement, mask mandates, business closures, and other aspects—rested with the minister presidents of the 16 states. Merkel, Braun, and the scientists knew of course that the virus did not respect political boundaries; containing its spread would depend in part on coordinating and harmonizing the responses of all of the states.

The chancellery created three coordination bodies at three different levels. The highest-level body was called the Minister Presidents Conference, a forum in which Merkel brought together the 16 minister presidents to coordinate their COVID-19 responses. The conference met irregularly—usually every few weeks. Headed by the chancellor, the leaders met to discuss and negotiate response measures and harmonize interstate policies such as health checks at borders. It was also the place where Merkel could attempt to persuade the minister presidents to adopt whatever measures scientists determined were necessary to contain the spread.

The Minister Presidents Conference had no formal powers, because the constitution made no

provision for such a body. But in practice, it provided a vehicle for consultation that could lead to agreements on key aspects of Germany's response to COVID-19.

One level below, the chancellery created a body that brought together the chiefs of staff from each of the 16 state governments. Led by Braun, this group, too, had no constitutional basis. It met weekly, with mandates (1) to make low-impact political decisions such as about the details of implementing border control measures, (2) to prepare materials and guidance for meetings of the Minister Presidents Conference, and (3) to perform other tasks as instructed by the conference.

The lowest-level body was an interministerial crisis group comprising the directors general of key departments in federal ministries and agencies. The group, which did have a basis in the constitution, had a mandate to support the two policy-making bodies above it. To that end, it aggregated information and data from across the federal government; distilled scientific evidence and epidemiological reports; prepared briefs and background materials; formulated policy recommendations; and carried out discrete tasks as instructed by the Minister Presidents Conference and the chiefs of staff group.

The interministerial crisis group was led by Major General Hans-Ulrich Holtherm. An infectious-disease physician with a PhD from the London School of Hygiene and Tropical Medicine, Holtherm had been head of health security in the Ministry of Defense before Health Minister Jens Spahn tapped him in February 2020 to become the inaugural director general of the Directorate-General of Health Security. Holtherm became the first military officer in the 71-year history of the German Federal Republic to head a directorate-general in a civilian ministry.

"The main challenge we as the government faced was, how can we have deliberative democratic processes and at the same time be quick and agile enough to tackle a dynamic, fast-moving, nationwide crisis?" Holtherm recalled.

To that end, he worked to streamline interagency coordination and the flow of information to the two higher-level bodies.

“From my military background I know that when you have a fast-developing scenario, the first thing you need is situational awareness,” he said. He asked the ministry for a modern crisis-response room, complete with screens, dashboards, and teleconferencing capabilities. His team developed comprehensive situation updates that it distributed to all departments in the Ministry of Health—which was the lead ministry in the crisis—and to the other members of the crisis group, and it hosted daily update calls, all of it to ensure that the relevant parties were in accord and had awareness of the situation as it unfolded.

Mirroring the three bodies in the federal government, each state set up its own coordination bodies. The high-level decision-making body comprised the heads of the state-level ministries; the second-highest body consisted of chiefs of staff; and the lowest was a crisis group composed of heads of departments.

After authorities in Bavaria contained the spread of cases linked to the Webasto facility, new clusters flared up across the country, sparked by inbound travelers from Italy, Iran, China, and other countries. By March 9, confirmed infections had topped 1,200, and Germany’s first deaths were being reported. (Exhibits 1 and 2)

Armed with models, data, and specific proposals provided by the Robert Koch Institute, by the interministerial crisis group, and by the nation’s scientists—including what had been learned from the first cases in Munich—Merkel and Braun led negotiations with the leaders of the 16 states to push for the adoption of public measures to slow the spread.

“It became clear that we had to take measures to limit civil rights, which had never happened before in the history of the Federal Republic,” said Holtherm. “We had to do it to avoid our hospitals’ becoming overwhelmed—as

had happened in northern Italy, parts of France, and New York. Our politicians realized that if we didn’t halt the spread of the virus and lost control of our health system, then we could lose our authority to govern the country.”

As cases continued to rise, the states adopted increasingly stringent measures: the closure of schools and nurseries, the suspension of mass events such as sports matches, limits on travel, and others. After coordinating with the European Union, Germany closed its borders. (Exhibit 4)

On March 18, Merkel gave a televised speech, calling on German citizens to comply with government measures and do their part to halt the spread of the virus. The speech sent a powerful signal: except for her annual year-end addresses, it was the only time in 15 years as chancellor that Merkel spoke directly to the German public on national television.⁵

Two days later, Bavaria’s minister president, Markus Söder, announced a near-total lockdown, modeled on one imposed in neighboring Austria days earlier. Gatherings of more than two people were prohibited, and all businesses were ordered closed, except for grocery stores, food takeouts, pharmacies, medical facilities, and a few others. Violators would be fined.

On March 22, Merkel announced that at a meeting of the Minister Presidents Conference, all 16 federal states had agreed to implement lockdowns at least as severe as Bavaria’s for at least two weeks. Some states, and even districts, imposed stricter measures; for instance, Jena, a city of 110,000, made face coverings mandatory when people were shopping or riding public transportation.

To ameliorate the consequent slowdown in economic activity—economists predicted the lockdowns would plunge the nation into recession—the federal cabinet announced a relief package of €750 billion (US\$808 billion), equal to 10% of Germany’s gross domestic product.⁶

Much of that aid was directed toward businesses of all sizes—including direct payments

for self-employed persons—with a view to averting bankruptcies and keeping workers on company payrolls.

Local implementation

The federal chancellery had worked to steer the states toward harmony on the policies and practices needed to contain the spread of SARS-CoV-2, and the Robert Koch Institute and federal Health Ministry continued to provide information and technical guidance for health and public health entities across the country. But the implementation of pandemic responses was mainly a responsibility of the 400 district governments within the states.

In Germany, mechanisms and resources for crisis management were managed at the local level. District administrations, especially their health departments, were responsible for enforcing physical-distancing restrictions and other measures decided by the state; for carrying out contact tracing; and for coordinating other aspects of the response, such as where to send patients and how to allocate personal protective equipment. “The strength of Germany is that we have local-level experts who were supported by local administrations to get the job done,” said Dr. Peter Tinnemann, an epidemiologist who headed the health department in Nordfriesland, a district in the state of Schleswig-Holstein. “Ultimately, the response was shaped on the ground.”

Districts activated crisis management systems. The local administrations that maintained those systems or that often managed disasters were at an advantage. “The country had pandemic preparedness plans, but the plans hadn’t been updated in nearly a decade and there had been little investment or training specifically in pandemic preparedness,” said Tinnemann. “But the local governments that trained or regularly responded to other disasters and emergencies were in a good position. For instance, in our district, we often deal with floods, so we had a ready crisis management system, in

which officials knew how to communicate and move resources around.”

For dealing with SARS-CoV-2 in particular, containment depended on carrying out testing and contact tracing to identify and disrupt chains of transmission. Based on advice from the scientific community, the federal guidance targeted keeping the number of new cases per week below 50 per 100,000 inhabitants. Anything above that rate, they determined, would overwhelm contact tracers—and thus, the public health system’s ability to contain an outbreak. If community transmission spiraled out of control, it would risk overwhelming the hospital system.

By using the diagnostic test developed at Charité Berlin, a network of some 200 public and mostly private labs could test for COVID-19. Though the system was decentralized, these labs coordinated with district health departments, health-care facilities, and one another; and the federal government provided support. The Ministry of Health said the government would fund all necessary tests, which gave the labs the incentive to ramp up capacity. And the Robert Koch Institute issued guidance on testing, urging symptomatic patients to be tested first, followed by those who had been exposed to a known infection.

District governments and health departments mobilized contact tracers. Many of the districts already employed public health workers called *Gesundheitsämter*, who, in addition to carrying out such duties as monitoring of the quality of drinking water, had experience in tracing contacts during other disease outbreaks, such as measles.

At the start of the pandemic, the *Gesundheitsämter* in many districts lacked resources and personnel. Several districts directed more resources to those public health workers and hired additional so-called containment scouts to trace and isolate contacts. In districts in which infections rose, local governments rallied volunteers, such as medical students, to supplement the ranks of tracers.

The federal government again provided support. The Ministry of Health earmarked €11.25 billion euros (US\$13 billion) to fund the containment scouts, and the Robert Koch Institute directly hired more than 500, deploying them to districts in need of help.

RESULTS

On April 15, three weeks into nationwide lockdown, Merkel met via teleconference with the 16 state minister presidents. After having peaked on April 2, the seven-day rolling average of new confirmed cases had fallen steadily. Germany was averaging 37 new cases per 1 million inhabitants per day—fewer than France (172), Spain (90), the United States (90), the UK (63), and Italy (60).⁷ The lockdown had reduced Germany's weekly incidence to fewer than 5 cases per 100,000 inhabitants—well below the federal government's target of 50 per 100,000.

Though media outlets reported disagreements among the states about the details and timing for reopenings, after the April 15 meeting of the Minister Presidents Conference Merkel announced a nationwide exit from the lockdown. She said that in the coming weeks, schools and shops up to 800 square meters in area would be allowed to reopen. Mass cultural events would remain prohibited until August, but physical-distancing rules would ease. She recommended people wear face coverings on public transportation and while shopping—though doing so would not be mandatory.

Infections continued to fall. After another meeting of the Minister Presidents Conference, Merkel announced that state leaders had agreed to further reopenings, but that if an area topped 50 cases per 100,000 inhabitants in a week, then lockdown measures would be reintroduced.

Subsequently, when outbreaks did occur—the largest of which was in June and tied to slaughterhouses in the state of North Rhine–Westphalia—localized lockdowns and surges in testing and tracing capacity contained them.

Based on the diagnostic test developed in mid-January and spurred by the federal

government's pledge to fund all necessary tests, Germany's network of labs had ramped up testing capacity faster than any other country outside East Asia.⁸ More than 90% of the country's tests were carried out by private labs, which worked closely with local health departments and hospitals to increase capacity when an outbreak caused a spike in demand.⁹ While many countries were struggling to increase testing, Germany had excess capacity, which enabled some states, such as Bavaria, to offer free testing to the entire population.

As of October 1, 2020, Germany had recorded only 3,527 total cases per million inhabitants; the UK had 6,812, France had 9,160, and the United States had 22,000. Germany had recorded 113 deaths per million; France, 474; the UK, 622; and the United States, 628.¹⁰ International media credited the German government's data-driven approach and efficient yet decentralized testing and tracing system.¹¹

But cracks in the system had begun showing. In meetings of the Minister Presidents Conference from May through September, consensus on nationwide measures was hard to achieve, as state leaders—in response to pressure from businesses and the public—eased physical-distancing restrictions on their own. Relatively small but impassioned anti-pandemic-control protests flared up, including one demonstration of 20,000 in Berlin on August 1 that turned violent.

“From May to the beginning of October, things were good, the virus was under control, and the effect was that people started to doubt that another wave could happen,” said Holtherm. “They became less willing to accept and follow measures, and the politicians became more concerned with economic and political interests than with following the science.”

In October, cases began to surge. Several areas of the country quickly exceeded the weekly total of 50 cases per 100,000 inhabitants, thereby overwhelming contact tracers. All of Europe was caught in a second wave, and Germany was no exception.

Merkel convened the Minister Presidents Conference, but state leaders showed little appetite to send the nation back into a strict lockdown. After weeks of ever-rising case counts and appeals to the public to avoid gathering, Merkel announced the states had agreed to “lockdown light” for November, wherein bars, restaurants, cinemas, theaters, and gyms would close, but other establishments, such as schools and hairdressers, would remain open. Merkel explained that the goal was to push cases back below the 50-per-100,000-per week level, such that contact tracers could again contain the spread.

Scientists argued that the measures did not go far enough. “When the second wave started, we pushed the politicians to implement an aggressive and stringent lockdown like the first, but the lockdown we ended up getting was a compromise that was too mild and didn’t do the job,” said Wendtner.

Cases plateaued in November and then, at the start of December, began rising again, pushing intensive-care-unit occupancy to as high as 95% in some parts of the country.¹² With the Christmas holidays approaching, the minister presidents finally agreed to a more stringent lockdown.

REFLECTIONS

The success of Germany’s initial response to the COVID-19 pandemic in early 2020 owed to many factors. In addition to the country’s preexisting advantages—a world-class medical scientific community, a well-funded health-care system, and an advanced, high-income economy—Germany also had a bit of luck. “We were lucky that we caught the first case in Bavaria,” said Holtherm. “That head start enabled us to have the minor first wave and then a long summer with few cases.”

Germany’s model of decentralized, local implementation with central government coordination and support was effective in the beginning. “I think it worked well to have the Robert Koch Institute and the central

government issuing guidance and information, but also that it should be up to the local level to decide how to implement,” said Tinnemann.

Unlike such countries as the UK, which had a centralized testing system, Germany’s decentralized network of mostly private labs was able to quickly ramp up testing capacity. Districts recruited contact tracers locally in the numbers necessary to track and trace outbreaks when overall cases were low.

At the same time, the federal government provided resources and attempted to coordinate with the states to ensure public health standards and lockdown measures to curb nationwide outbreaks. The extraconstitutional structures adopted at the federal and state levels to facilitate the flow of information and to steer decision-making processes were key innovations that led to faster nationwide coordination in an otherwise slow and strictly federalized political system. “In a crisis like this you need to be agile and nimble and execute as quickly as possible, and the minister presidents conference and the two other government bodies that supported it, gave us the best chance to do that,” said Holtherm.

But the decision making itself got complicated by politics. As physical-distancing measures became less popular, states led by minister presidents opposed to Merkel’s coalition had little incentive to go along. “Merkel is data oriented and could see the second wave coming, but as an outgoing politician, she really didn’t have that much power,” said Tinnemann. “She was something of a lame duck in the eyes of the minister presidents. She had the facts and she had the willingness to coordinate another strict lockdown, but she didn’t have the authority to put it in place.”

Ultimately, without political consensus, nationwide containment of the virus was difficult, even for a country as well-off as Germany. “In the ideal world we would have been able to implement based solely on what the epidemiological science demanded. But this has been a global health crisis, touching not only health issues, so a lot of compromise was

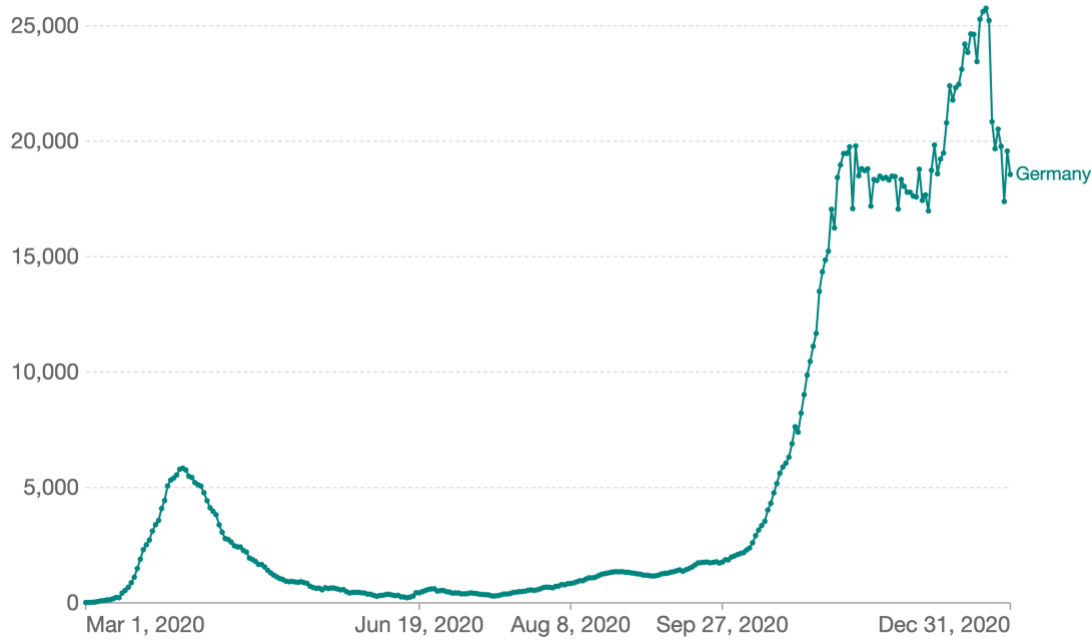
necessary to manage the competing interests that contradicted the epidemiological scientific evidence and advice," said Holtherm. "We've

seen that even the best, highest-funded public health institutions cannot overcome political decisions."

Exhibit 1: Confirmed COVID Cases

Daily new confirmed COVID-19 cases

Shown is the rolling 7-day average. The number of confirmed cases is lower than the number of actual cases; the main reason for that is limited testing.



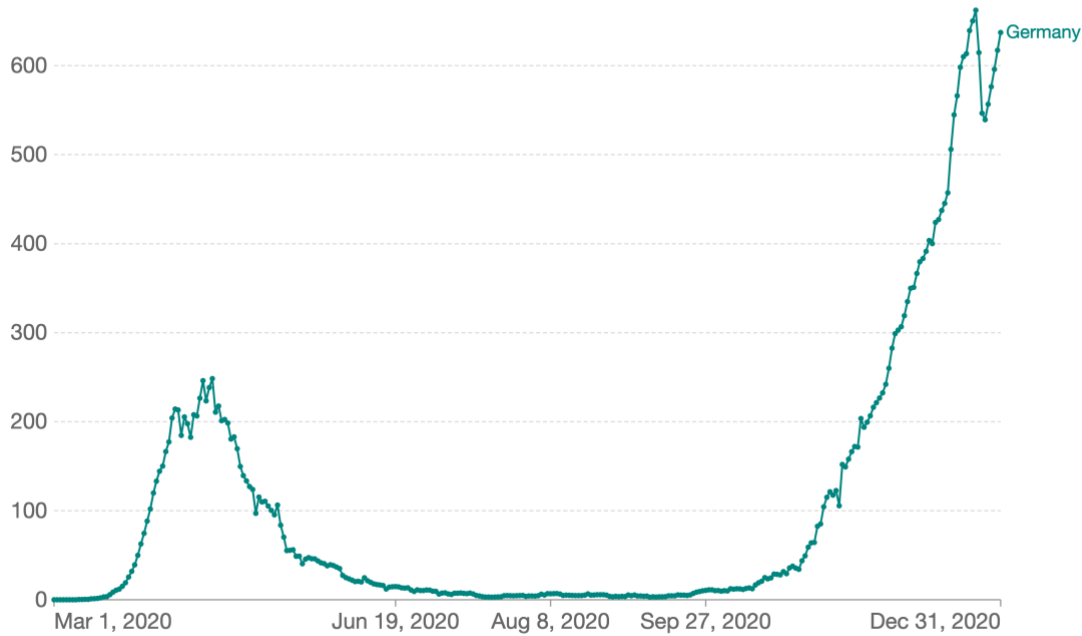
Source: Johns Hopkins University CSSE COVID-19 Data

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Exhibit 2: COVID Deaths

Daily new confirmed COVID-19 deaths

Shown is the rolling 7-day average. Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.



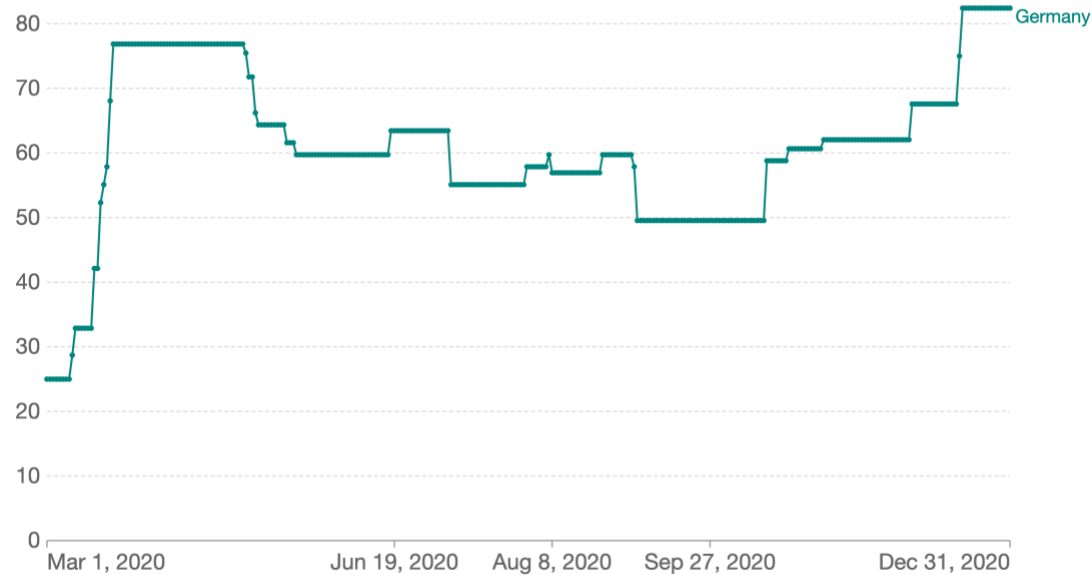
Source: Johns Hopkins University CSSE COVID-19 Data

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Exhibit 3: Government Stringency Index

COVID-19: Stringency Index

The stringency index is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest). If policies vary at the subnational level, the index shows the response level of the strictest subregion.



Source: Hale, T., Angrist, N., Goldszmidt, R. et al. A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker). Nat Hum Behav 5, 529–538 (2021). <https://doi.org/10.1038/s41562-021-01079-8>
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