

# Rethinking Lockdown: The Lessons, Limitations, & Future of Germany's COVID-19 Response

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## Under the Surface of Germany's Test, Trace, and Lockdown Regime

The hallmark of Germany's response to COVID-19 has, since the earliest days of the pandemic, been a high testing rate. The result has been a good understanding of the viruses spread, and a relatively low incidence of undetected clinical disease. However, because only a small portion of those infected develop symptoms, some regional studies suggest that even in Germany the actual infection rate is probably 10 times higher than the officially registered case load. Consequently we believe that the official death rate in Germany of 4.7% is probably an overestimate of around 10 times. This is supported by postmortem analyses at our hospital of COVID-19 positive patients who died, showing that at least 20% of "COVID-19 deaths" were actually not directly attributable to the virus but to unrelated preexisting deadly conditions.

Tracing the course of infections in Germany over time, a fairly rapid rise in the reproduction rate in early March is evident, but I believe a closer analysis of the way the curve developed contradicts much of what is commonly believed about lockdown: The maximum infection reproduction rate in Germany was reached around the 10th of March. Lockdown measures were subsequently put in place between the 15th and 17th of March, depending on the region and state responsible. However, by that time the reproduction rate had already dropped dramatically and started to fall below the critical figure of  $R=1$ . Clearly other factors such as improvements in hand washing, sneezing and coughing etiquette and increased testing contributed to Germany's impressive success in bending the curve quickly, even before lockdown. This begs the question, was lockdown really necessary and was it necessary in the way it was done? I think there is plenty of space for discussion on that going forward, and much will remain speculative.

## Exploring the Impact of Age on COVID-19 Mortality and Transmissions

Another important point is the age distribution of cases, because both the case fatality and infection rates differ dramatically with age. Looking at the number of positive cases per population, the younger more socially active people, and most notably young children, have much lower rates of disease compared to the higher age groups. What we are

seeing here is actually the rate of virus detection, not the actual disease rate, as many people are asymptomatic and thus never tested even in Germany. Thus the data have a certain bias. Looking at mortality data, COVID-19 induced mortality only starts to be statistically detectable above the age 50, and only becoming more relevant from the age of 60 onwards. Extremely few people below the age of 40 died, and these were primarily patients with other severe underlying diseases such as advanced malignancies.

Further highlighting the importance of age distribution, a lot of attention was given to the recent research by Professor Drosten, the virologist who discovered the SARS virus and was one of the first to develop PCR testing for COVID-19: Major differences between age groups were identified in the amount of viral material isolated from the throat of infected people. While the data is still preliminary, it suggests that children and young people under age 20 seem to become infected at far lower rates, and when they do catch the virus they have significantly lower viral loads than people above 20 and older. Furthermore, it is increasingly clear that this virus is spread primarily by a small number of so called “superspreaders,” who infect a lot of other people, rather than being spread equally by infected persons. These superspreaders are probably those with a very high viral load and subsequently a lot of viral material in their throat, and with coughing and other behaviour facilitating viral spread. What is clear is that while case numbers are reported as if every infection were equal, this is not clinically and epidemiologically the case. The highly differentiated age distribution should guide policies when going forward.

## **German Health Care System is Federally organized and backed by a High Level of Per Capita Intensive Care beds**

Stepping back for a moment, tracing infections in Germany demonstrates the impact of a regional methodology on data collection. In Germany, healthcare is organized on a federal basis around the states, with Regional Health Offices (“Gesundheitsamt”) being responsible for both data collection and local health regulations. While the National Centre of Disease Control, the Robert Koch Institute, advises the national government and compiles national guidelines, it is fundamentally reliant on the cooperation of local health offices. The main advantages of this regional approach are that it preserves flexibility, can take into account specific local conditions, enables direct communication between local healthcare providers and regulators, and empowers local agencies to react quickly to a change in the situation. The importance of this is clear when looking at the regional distribution of cases in Germany. In some areas, the rate of infection is very low. However, at the same time there are also regional hotspots: in the south of Germany related to travel and trade with northern Italy, in the west from commerce with France, and in Hamburg, in the north due to its wealthy population traveling to skiing resorts and other tourism hotspots. This variability across regions begs the question, did the whole country really need to lockdown?

The disadvantage of a localized approach like Germany's is that national reporting is delayed. Much like in Japan, Germany always reports a drop in cases on Monday and an increase on Tuesday, because over the weekend local offices often do not report in. Furthermore, this regional organization also leads to incoherent vertical data collection. For example Germany lacks reliable national mortality figures, as they are always highly delayed, the local offices that prepare them often have limited expertise and there is always the risk of local political interference. Nonetheless, I believe that with what we know now, reacting regionally is the much more appropriate course of action.

A highly praised aspect of the German pandemic response has been its high intensive care and ventilator capacity. This is actually a symptom of structural deficiencies that, in normal times, make the healthcare system extremely expensive due to overuse of intensive care beds, and as it encourages lengthy inpatient care because hospitals get more money the longer a patient stays, especially the longer a patient is being ventilated. Nonetheless, in the case of COVID-19 these disadvantages were enormous advantages. At 25,000, German ICU capacity far surpassed that of the United Kingdom at 5,000, quadrupling it on a per capita basis. The result was that through the pandemic Germany had 12,000 unused intensive care beds. This means we could easily deal with far more cases than we have actually had to deal with.

## **Pandemic Response Must Go Beyond “Fear” & “Waiting for a Vaccine”**

This brings us to a very important question underlying the global COVID-19 response, and what is the appropriate level of fearfulness. I believe that in Germany the way in which deaths were initially reported fueled an overabundance of concern. Every day it was “the number of deaths has increased,” but, logically there is no way that the number of deaths could decrease. It is only now, later in the pandemic, that the death rate per day is being regularly reported despite the fact that, after a short initial rise, the number has declined very rapidly.

The overabundance of fear surrounding COVID-19 has obscured the ways in which our pandemic response has created other problems. For example, across Western countries, emergency admissions dropped 40%, so people with, for example, myocardial infarction did not receive the necessary emergency care. Increased mortality may therefore be related to the pandemic much more indirectly, because of reduced availability of, or willingness to pursue, health care for people with other diseases. At the same time, the economic consequences of our response are also very real, with one easy example being an increase in hunger worldwide. Very few, if any epidemiologists have adequately addressed the possibility of an increase in total mortality, resulting from not only COVID-19, but from our response to it. It remains an open question whether increased morbidity and mortality during and following the pandemic will be more due to the virus directly, or more due to the indirect secondary effects.

Because we have not been discussing the longer term consequences of our response, in Germany people have been saying “we will do a lockdown until we have a vaccine, and once we have a vaccine we will reopen the schools .” However, a vaccine against this virus will be complicated, probably delayed, and the question of who actually gets it, controversial. For example, should priority be given to the elderly, who are most at risk, but whose immune response to vaccines is weakest, or to younger people who are less at risk, but who will have a better chance of developing immunity and thus help in stopping the viruses spread?

In consideration of the above, I proposed in late March that we should open kindergartens and primary schools. The children are not really in danger and are not really a major spreader of the disease. At the same time I argued that we need a much stronger protective response for the really endangered population, the elderly and chronically diseased persons, who continued to be put at risk due to a lack of face masks and protective clothing in nursing homes. We should have better protected the elderly, while allowing infections in the younger population so that at least some degree of herd immunity could have developed to better protect all of us from future infection waves.

In conclusion, Germany’s pandemic response so far has had clear positives and negatives. Relatively low rates of infection and mortality, a high rate of testing, and a fortunate excess of ICU capacity have enabled Germany to effectively steer through the crisis so far. However, Germany missed the chance to develop a limited herd immunity, while also failing to adequately protect the vulnerable earlier in the crisis. Furthermore, children were kept out of schools leading to learning and social disadvantages without adequate medical justification. Going forward, a reassessment of Germany’s pandemic policy that incorporates the latest research to mitigate the high level of collateral damage, which includes children’s education, research activity, and long term economic vitality, is desirable.



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