

# Laying the Foundations: Disease and the Emergence of Public Health

**Article by Claas Kirchhelle**

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Pandemics permanently change the societies that they affect. The public infrastructure saving lives today may not have been built without earlier experiences of infectious diseases and ill health. Historian Claas Kirchhelle traces the history of disease, public health, and international cooperation from cholera to Covid-19. In the 21st century, threats such as zoonotic diseases and antimicrobial resistance will once again demand a collective step forward to protect human life.

***Green European Journal: How can history help us understand the current pandemic? Can we draw conclusions about the effects of pandemics through history?***

**Claas Kirchhelle:** History doesn't offer any simple answers to the current crisis, but it can highlight the underlying trends that limit our choices and shape our public health structures – and provide some warning signs along the way. Although history offers a wealth of information on how to deal with pandemics, historians have a duty to warn against attempts to oversimplify and overgeneralise alleged lessons.

Every pandemic is different. It depends on the pathogen, the society it hits, and the technology available. Pandemics can, in certain cases, bring societies together, but we have seen many other epidemic disease outbreaks that make societies more divided and unequal. It is already clear that Covid-19 will not be a great equaliser. What this pandemic does is highlight how complex and interconnected the world is.

**What role did the cholera pandemics of the 19th century have in bringing about the public health infrastructure we know today?**

The cholera pandemics that swept the globe from 1817 onwards had a huge influence on the development of modern healthcare infrastructure. They also had a powerful impact on popular culture and imagination. Though we should be careful about using modern concepts to interpret historical disease experiences before the advent of germ theory, the repeated waves of cholera drove home a message of international interconnectedness and vulnerability to disease in other areas of the world.

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Within Europe, the pandemics lent legitimacy to a group of experts who had started to use statistics to study health at the population level. The young European nation-states formed alliances with these practitioners. Key to this alliance was a common concept of health and efficiency not at the level of the individual but the population. Public health advocates argued that the state should collect and use statistics to systematically improve health and lower mortality and morbidity throughout the population. The result was large-scale investment in sanitary improvements such as water and sewer systems. This age of sanitary infrastructure projects saw effective sewage and water

management systems put in place across many larger cities.

### **What about on an international level?**

The cholera pandemics laid the foundations for today's global health framework. In 1851, at the behest of the French government several imperial powers – who at the time controlled many of the world's trade routes, territories, and peoples – came together to determine sanitary conventions and standardise quarantine rules to minimise disruptions to trade. Representatives also tried to agree on cholera's cause and procedures for notification – something that we are still struggling with. Though it took almost 50 years for international consensus and action to emerge, the repeated cholera outbreaks were a significant driver of collective international thinking about disease and public health.

### **How did the multilateral health infrastructure – today's World Health Organization – come into being?**

The brief phase of internationalism after the First World War led to the founding of the League of Nations and its Health Organisation (LNHO). The LNHO was the first large international health organisation with a global mandate. Its task was to consolidate disease reporting, aid disease prevention, and help nation-states within their territories. It was very successful, for example in helping manage epidemics in war-torn Eastern Europe, but suffered from a lack of support from the US and increasing political tensions between advocates of “horizontal” social medicine – focusing on primary care and welfare – and proponents of “vertical” technology-based health interventions.

The World Health Organization (WHO) is a reboot of this predecessor. Its remit is similar: to help nation-states combat health problems, improve and standardise disease reporting, and coordinate international interventions – which also involves working with non-governmental organisations such as the Rockefeller Foundation. The WHO thus functions as a platform for internationalist thinking and health planning.

### **The World Health Organization continues to be prey to geopolitical tensions.**

The WHO has always been strongly affected by the competing interests and ideologies of its member states and donors. This is especially true regarding whether to prioritise horizontal or vertical healthcare programmes. Historically speaking, the United States has been a major donor and so domestic US controversies over healthcare have often spilt over to the WHO. American governments have often been far more comfortable discussing technological interventions such as vaccination than expanding access to primary care. By contrast, primary care programmes were often at the heart of approaches being advocated by Communist powers like the Soviet Union and China. European powers often pursued their own (post-)imperial agendas. It would be naive to assume that the international health system has ever been or will ever be divorced from the politics and ideological biases of the major global powers.

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### **Is global cooperation on Covid-19 new compared to earlier pandemics and epidemics?**

The reaction to Covid-19 builds on the frameworks that were put in place in response to previous pandemics but goes beyond them in the scale of resources mobilised, the coordination of scientific responses, and the rapidity of information exchange. The degree and speed of the exchange of scientific knowledge on what this disease is, how

to control it, and how to develop treatments are unprecedented. In part, this is due to lessons that were learnt after the first SARS outbreak in 2003, which resulted in updated International Health Regulations in 2005, and the swine flu pandemic of 2009, which highlighted the potential of web-based mass data sharing and rapid diagnostics via antigen detection. These information-sharing structures have dramatically accelerated communication and improved responses to Covid-19.

Politically, Covid-19 has cast a spotlight on the inherent weaknesses of our international health system. While WHO coordination of scientific research and clinical trials has been exemplary, the divided international public health response, public conflicts between prominent member states like the US and China, and uncoordinated travel bans reflect the inbuilt weaknesses of an international system which was designed to coordinate rather than dictate national responses. In many ways, the WHO has done the best it could despite structural constraints.

**In 2019, you warned that typhoid could return because the response in richer countries was based on vaccines, surveillance, and travel restrictions rather than long-term investment in water, sanitation, and healthcare access in lower-income countries. Could the same happen with Covid-19?**

Awareness regarding any disease often stops at the border. Many traditional killers like typhoid never disappeared. They only disappeared from Western memories. In the West, typhoid is perceived as a disease of the past. It is something that your grandparents might have suffered from or a disease of “other countries”. The idea of typhoid as ancient and foreign is misleading and damaging. It also leads to an unfair discourse whereby low-income countries are blamed for being “backwards” and not providing water and health infrastructures – despite being unable to afford them.

This flawed mindset hides the structural constraints outside of high-income settings. It also facilitates a mode of thinking that limits international health to providing technological fixes rather than addressing underlying drivers. The global eradication of smallpox was possible because it was relatively easy to identify cases, the vaccine was cheap, and officials could employ targeted ring vaccinations around acute cases. Strengthening health infrastructures to tackle endemic disease threats that are not amenable to a single technological intervention is much harder. In the case of typhoid, the post-war period saw many high-income countries spend heavily on stopping “exotic strains” from crossing their borders. In the medium to long term, it would have been much more effective to have funded sewage systems, clean water provision, and affordable access to basic healthcare in poorer areas of the globe.

Covid-19 will pose similar problems. Well-financed and effective surveillance, isolation regimes, and (eventually) vaccines will, in time, mean that the disease is relatively well controlled within high-income borders. However, it will flare up again if we don't find a way to design and roll out effective health interventions across the globe. The most dangerous analogy between the coronavirus pandemic and past experiences is a false sense of complacency that assumes that once a disease is no longer in our backyards, it won't come back.

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**You're an expert in antimicrobial resistance. Can you explain why it is one of the largest health challenges in the 21st century?**

Covid-19 is one pathogen that is spreading around the world and causing havoc. Antimicrobial resistance is a problem affecting multiple pathogens all at once. Antibiotics are of crucial relevance to our healthcare systems, as well as our food systems. If they no longer work due to antimicrobial resistance, this poses a potential systemic

threat to health and food security. Across the world, bacterial pathogens have already managed to acquire the ability to resist the effects of many of the drugs relied on to curb disease since the 1930s. In 2016, the [British O'Neill Review](#) made a conservative estimate that 700 000 people were dying as a result of antimicrobial resistant infections every year. By 2050, the number is projected to rise to 10 million people a year.

### **Will Covid-19 affect the problem of antimicrobial resistance?**

Traditionally, pandemics tend to exacerbate problems with antimicrobial resistance because antibiotics are used to treat secondary “superinfections”. The classic case is the Spanish flu. Many deaths were not caused directly by the influenza strain but by bacterial pneumonia. We also saw rises of global antimicrobial consumption and resistance in the wake of the 2009 swine flu outbreak.

As a historian of antibiotics, I would also stress the great danger of deprioritising antimicrobial resistance interventions amidst the current crisis. Global health only has so many resources to go around. Antimicrobial resistance was a growing topic for 20 years but, since 2015, international awareness has begun to slide. There is a well-evidenced danger that regearing global health to narrowly focus on pandemic preparedness may distract leaders from the arguably far graver medium to long-term threat posed by antimicrobial resistance. We are already seeing the first signs of this. The political economy of attention is limited. A high-level UN General Assembly panel on antimicrobial resistance in April 2020 was meant to re-galvanise the issue but it has been postponed indefinitely.

### **What would a solution look like?**

We need a grand international bargain to achieve a sustainably managed global antimicrobial commons. It would have to be a bargain between high-income countries, who have historically had better and earlier access to antibiotics, and low and medium-income parts of the globe where access has been and often still is – far more limited. Global reductions of antibiotic use are necessary to reduce selection pressure for antimicrobial resistance. However, income and access inequalities mean that expecting reductions is unrealistic – this approach has been tried and it has failed. Everybody will profit from reduced antimicrobial resistance. However, high-income countries will have to shoulder some of the economic burdens involved in asking low- and medium-income areas of the globe to develop effective solutions. In general, interventions need to address the structural factors driving consumption like lack of health or veterinary care.

Who should lead this framework is another question. It would be fantastic if our existing tripartite United Nations agencies in this area – the World Health Organization, the Food and Agriculture Organization, and the World Organisation for Animal Health (OIE) – could lead it. But individual states or coalitions of states will also have to play a major role.

### **What could the EU's role be?**

Within its borders, the EU has been very progressive in terms of antimicrobial stewardship even if there is still room for more progress. Since 1998, common precautionary standard-setting regarding agricultural antibiotic use within the Single Market has been a success.

The EU has also pioneered an integrated monitoring system for antimicrobial resistance, which has successfully put pressure on states with higher usage and higher rates of resistance to implement reforms. The EU also has enormous power beyond its borders through control over market access, for example for agricultural products. Ideally, the EU would finance surveillance systems within lower-income countries to improve production standards and reduce infectious disease pressure in return for market access. But neither the EU nor the US has the power to solve the global antimicrobial resistance crisis by itself. Even the best-intended international interventions will not

work if they are not co-designed by partners in low-income countries and supported by middle-income regional stewards such as Brazil, India, and China.

**Over the last few years, the anti-vaxxer movement has been growing and the authority of the medical sciences has been challenged. Is there a crisis of faith in scientific knowledge?**

I don't see a dramatic crisis of trust in science and public health. Think about the large percentage of the world population complying with scientific advice and following quite severe public health guidance. Around the world, people are tuning into WHO press briefings, washing their hands, wearing face masks, and keeping social distance. In a way, Covid-19 has been an exercise in mass compliance with scientific expertise.

This compliance may wear thin over time – especially in politically polarised countries – and there are exceptions and rule-breakers. However, the current “crisis of faith” narrative assumes that “science” is an easy-to-follow monolithic body of expertise. This notion is naive. Science is a broad church. Different schools of expertise use different forms of data and theoretical frameworks. Opinions differ and some arguments are never fully resolved. The novelty of Covid-19 and the expectation that science will protect us means that many normal scientific controversies are receiving much more attention than usual. At the same time, the narrative of an alleged crisis of scientific authority fuels over-reporting on radical outliers of denialism. Anti-vaxxers may enjoy press coverage but research has found that the hardcore of ideological deniers is quite small. Most vaccine non-compliance has historically been based on limited access to vaccine services. People not being able to take time off to take their child for a second vaccination, for example. Even though polls show that a new Covid-19 vaccine faces challenges of vaccine hesitancy, we shouldn't exaggerate the problem.

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Dividing the public into “pro-science” or “anti-science” camps risks artificially polarising society. Most people are not uniformly pro- or anti-science. Questioning data and evidence is legitimate and people will reach different conclusions. Seeking a middle-ground of discourse about societal risks and ways to mitigate them is essential. We should pause to ask why people are perhaps not following every guideline. Public finger-pointing risks glossing over the large grey areas of compliance and semi-compliance that exist. It also aids ideologues and populists, who profit from binary thinking and falsely claim that a partial public questioning of expert authority signals buy-in to their ideological camp. Simplistically demanding that people “follow the science” without explaining why they should does not work either. Every scientist worth their salt will admit that science is complex, constantly evolving and that good scientific advice acknowledges economic and social constraints. While it is important to counter conspiracy theories and attacks on good research, scientists have to reconcile the need for clear, simple messaging and responding to legitimate public concerns. Ultimately, it is our duty as citizens to act responsibly vis-à-vis others. But talk of anti- and pro-science camps needlessly polarises a situation that is already tense enough.

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Claas Kirchhelle is an assistant professor in the History of Medicine at University College Dublin. Supported by a Wellcome Trust University Award, his work explores the global history of infectious disease surveillance. His book on the history of antibiotic use, resistance, and regulation, *Pyrrhic Progress* (2020, Rutgers University Press), won the 2020 Turriano Prize.

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