

# Comparative Analysis of International Health Policies: A Comparison of COVID-19 and post-COVID-19 Health Policies

Runyi Du\*

Department of Economics, Brandeis University, Boston, the United States

\*Corresponding author: runyidu@brandeis.edu

**Abstract.** This research paper discusses the dynamics of COVID-19 health policies, focusing on the strategies of China and Germany in managing the pandemic, and exploring the opportunities and challenges in enhancing healthcare policies in the post-COVID era. The COVID-19 pandemic has exposed the strengths and vulnerabilities of healthcare systems globally, underscoring the need for adaptable health policies. China and Germany employed distinct strategies in responding to the pandemic. The paper compares these strategies and their outcomes. The comparative assessment highlights the importance of early and sustained interventions, as China's aggressive suppression approach yielded better results than Germany's mitigation strategy. The lessons learned from China and Germany's pandemic responses provide valuable insights into the importance of preparedness and adaptability in healthcare policies. These lessons should guide future policies and actions to build a better global healthcare system.

**Keywords:** COVID-19; health policies; China; Germany.

## 1. Introduction

Global pandemics, such as the COVID-19, underscore the vital importance of effective health policies. This paper dives into the dynamics of COVID-19 health policies, with a particular focus on two countries, China and Germany, and their approaches to managing the pandemic. Additionally, the paper explores the opportunities and challenges in enhancing healthcare policies in the post-COVID era, with an emphasis on strengthening healthcare systems, leveraging 5G technology, and advancing universal health coverage (UHC) in low- and middle-income countries. The COVID-19 pandemic has exposed the strengths and vulnerabilities of healthcare systems globally, underscoring the need for adaptable health policies.

China and Germany employed distinct strategies in responding to the pandemic. China's approach emphasized centralized isolation, the use of digital tools like the "Health Code," mask mandates, and work-from-home orders. Germany, on the other hand, relied on the Infection Protection Act and introduced digital tools such as the "Corona Datenspende" mobile application. This paper compares these strategies and their outcomes. The comparative assessment highlights the importance of early and sustained interventions, as China's aggressive suppression approach yielded better results than Germany's mitigation strategy.

The paper then discusses the need to strengthen healthcare systems in the post-covid period, through equitable financing and evidence-based priority setting. It also explores the potential of 5G technology in healthcare, emphasizing privacy and security considerations. Transformative changes in healthcare systems, such as the adoption of telehealth and improved data collection, are examined. The paper also underscores the imperative of advancing UHC in low- and middle-income countries by defining essential health service packages.

In conclusion, the lessons learned from China and Germany's pandemic responses provide valuable insights into the importance of preparedness and adaptability in healthcare policies. They guide future policies to build a more resilient global healthcare system.

## 2. Comparative Analysis of Health Policies in Response to COVID-19

The COVID-19 pandemic has impacted healthcare systems worldwide, revealing both their strengths and vulnerabilities. It has underscored the need for adaptable health policies that can effectively respond to unexpected crises. As the papers evaluate the global response to the pandemic, two countries, China, and Germany, stand out for their slightly different approaches in managing the crisis.

The COVID-19 pandemic has caused heavy disease burden globally, with the highest numbers of cases and deaths in the WHO Regions of the Americas and Europe. In contrast, countries in the Western Pacific Region have had much lower case and death counts. China implemented an aggressive elimination strategy with lockdowns, isolation of cases, contact tracing and travel restrictions. This allowed China to quickly bring infections to very low levels and largely eliminate local transmission. Germany initially controlled the outbreak well in the first wave with a lockdown and other measures. However, it failed to sustain low case numbers and experienced a larger second wave after relaxing restrictions too much.

### 2.1. China

China's response to the COVID-19 pandemic was firmly based in its legal framework. Several key regulations and laws played pivotal roles in guiding the country's response. These included the "Regulations on Contingent Public Health Emergencies" enacted in 2003, and the "PRC Law on the Prevention and Treatment of Infectious Diseases" from 2004. Additionally, China had the "PRC Law on Emergency Response" in place since 2007, and the "Infectious Disease Control and Prevention Act" introduced in 2016. These regulations provided a legal foundation for managing public health crises, outlining the government's powers and responsibilities in emergency situations.

One notable feature of China's strategy was its approach to treating COVID-19 cases. China, along with South Korea, Singapore, and Japan starting in May 2020, adopted a strategy of centralized isolation for both severe and mild cases in hospitals or temporary hospitals [1]. This proactive approach helped alleviate pressure on the healthcare system. A remarkable example of this approach was the rapid establishment of Fangcang hospitals [2]. These large temporary allowed for the effective isolation and treatment of COVID-19 patients with various symptom severities while preventing hospitals from becoming overwhelmed. While effective at limiting spread, the lockdowns also halted economic activity and production.

China introduced a digital tool known as the "Health Code" in February 2020 [1]. This electronic permit allowed individuals to demonstrate their health status, granting access to locations where the Health Code was mandated. It served as an effective means of tracking and controlling the virus's spread. In addition to the health code regulations, mask mandates were enacted early in the pandemic and enforced in public spaces. By April 2020, mask wearing was close to 100% in cities like Beijing [3]. This measure helped reduce transmission. Work-from-home orders were issued for non-essential employees. This allowed continued economic activity while limiting person-to-person contact.

To curb the transmission of COVID-19, countries worldwide implemented various social distancing measures, each with its level of strictness. Wuhan, China, stood out as one of the strictest examples. After January 23, residents in areas with confirmed or suspected cases were under a stringent stay-at-home order, with essential supplies delivered to their homes, and citizens were not allowed to leave their homes during the most severe periods. Subsequently, extensive quarantines were required for both infected individuals and their close contacts. At the peak in February 2020, over 700 million people were under some form of quarantine [4].

#### 2.1.1 Open Questions

**Personal Freedoms:** Some of the measures implemented, particularly the stringent lockdowns and quarantine measures, have faced criticism for potentially overly restricting personal freedoms. Balancing public health imperatives with individual rights remains a complex challenge.

Inconsistencies in Local Regulations: Local COVID-19 rules enacted by city and provincial governments in China were at times inconsistent and criticized for their unclear scope. Understanding the effectiveness and rationale behind these variations is crucial for optimizing future responses.

**Long-Term Public Health Impact:** A recent study analyzing extensive mortality data in China revealed that strict anti-contagion policies, such as lockdowns, had a significant impact on reducing non-COVID deaths [5]. In the first few months of lockdowns, deaths outside of the outbreak epicenter Wuhan dropped by 4.6% compared to regions without lockdowns. Furthermore, the positive impacts on mortality continued even after most lockdown policies were lifted, with non-COVID deaths remaining 12.5% lower in areas that had lockdowns compared to those that did not. This research raises questions about the long-term public health implications of strict control policies and suggests that they may have unintentionally saved lives beyond their immediate COVID-19 containment goals. These open questions provide a starting point for ongoing discussions and investigations into the effectiveness and implications of different policy approaches in the face of unprecedented challenges. They also underscore the importance of striking a balance between public health measures and individual rights while considering the broader impacts of strict control policies on society and public health.

## 2.2. Germany

With the outbreak of Covid-19, the central regulation of Germany was the Infection Protection Act, enacted in 2000. This act provided the legal basis for managing public health crises, allowing authorities to take measures to prevent and control the spread of infectious diseases.

As the pandemic evolved, Germany implemented additional laws and regulations to address the specific challenges posed by COVID-19. Two significant new regulations were the "Protection of the Population in an Epidemic Situation of National Scope and the COVID-19 Hospital Relief Act," enacted on March 27, and "The Second Law for the Protection of the Population in the Event of an Epidemic Situation of National Significance," introduced on May 15. These laws empowered authorities to take extraordinary measures to protect public health during Covid-19. The Infection Protection Act formed the basis for its response, while subsequent laws provided flexibility to address the unique challenges posed by the pandemic.

Germany also employed digital tools to manage the pandemic effectively. On April 7, the Robert Koch Institute (RKI) introduced the "Corona Datenspende" (corona data donation) mobile application. Unlike contact-tracing apps which China had introduced, this tool focused on recording COVID-19 symptoms, not tracking individual contacts. It aimed to help identify infection hotspots and guide targeted interventions.

The new Digital Healthcare Act (Digitale-Versorgung-Gesetz or DVG) was adopted in Germany in November 2019. It aims to promote the use of telehealth and make health data more usable for research purposes. During the COVID-19 pandemic, Germany lifted previous limits on telehealth usage to allow more video doctor consultations and telehealth psychotherapy. Certified video service providers must be used. The DVG also enables certain research institutions to access demographic data from insurers for studies, in accordance with GDPR privacy regulations. Data is anonymized and aggregation and measures are taken to reduce re-identification risks.

Germany, in alignment with some other countries, did not enforce the strictest stay-at-home orders. Instead, citizens were permitted to go out under specific circumstances. Germany introduced its "limited free movement outside of people's homes" policy on March 22 [1]. While this approach allowed some freedom of movement, it still sought to restrict unnecessary activities to curb the virus's spread.

Importantly, Germany, along with South Africa, Singapore, the UK, and Italy, imposed penalties on individuals who violated stay-at-home or movement restrictions. This step was taken to enforce compliance with pandemic control measures and ensure public safety. Penalties for rule violations underscored the seriousness of the situation, emphasizing the importance of compliance with public health measures. The increased use of telehealth services enabled by regulatory changes under the

DVG could also be considered a form of social distancing, reducing in-person doctor visits. Digital Tools and Privacy Concerns: Germany's use of digital tools, such as the "Corona Datenspende" mobile application, offered innovative solutions for monitoring COVID-19 symptoms and identifying infection hotspots. Yet, concerns over individual privacy and data security persist. How can digital tools be leveraged while safeguarding personal data and privacy rights becomes the question.

Telehealth Expansion and Its Limitations: The Digital Healthcare Act (DVG) aimed to promote telehealth and make health data more accessible for research purposes. However, challenges related to the limited scope of DVG, manufacturer approval for apps, negotiations on reimbursement prices, and privacy risks have been identified.

Balancing Freedom of Movement and Public Safety: Germany's approach of permitting citizens to go out under specific circumstances rather than enforcing strict stay-at-home orders sought to balance freedom of movement with public safety. Assessing the effectiveness of this approach and its implications for controlling the virus's spread is essential. How can countries strike the right balance between individual freedoms and public health during future pandemics?

### 2.2.1 Open Questions

Digital Tools and Privacy Concerns: Germany's use of digital tools, such as the "Corona Datenspende" mobile application, offered innovative solutions for monitoring COVID-19 symptoms and identifying infection hotspots. Yet, concerns over individual privacy and data security persist. How can digital tools be leveraged while safeguarding personal data and privacy rights becomes the question.

Telehealth Expansion and Its Limitations: The Digital Healthcare Act (DVG) aimed to promote telehealth and make health data more accessible for research purposes. However, challenges related to the limited scope of DVG, manufacturer approval for apps, negotiations on reimbursement prices, and privacy risks have been identified.

Balancing Freedom of Movement and Public Safety: Germany's approach of permitting citizens to go out under specific circumstances rather than enforcing strict stay-at-home orders sought to balance freedom of movement with public safety. Assessing the effectiveness of this approach and its implications for controlling the virus's spread is essential. How can countries strike the right balance between individual freedoms and public health during future pandemics?

### 2.3. Comparative Assessment

China and Germany implemented markedly different COVID-19 strategic responses, leading to divergent epidemic outcomes. China pursued an aggressive suppression approach, imposing strict lockdowns on Wuhan province starting in January 2020 that were expanded nationally in February. This included stay-at-home orders, closing businesses, and restricting travel. China also rapidly constructed new hospitals in Wuhan and deployed healthcare workers to manage the outbreak. Importantly, China made extensive use of centralized isolation facilities to separate all cases and contacts, avoiding home quarantine. China additionally employed expansive testing and contact tracing utilizing apps, big data, and other technology to find cases. Once local transmission was largely eliminated in March 2020, with reported cases declining from over 15,000 per day in mid-February to less than 100 cases per day in March, China gradually eased lockdown measures while maintaining tight border controls. As of December 2020, China had reported 95,050 total cases and 4,764 deaths, largely attributed to the initial Wuhan outbreak [5].

In contrast, Germany relied on a mitigation approach aimed at slowing but not necessarily stopping transmission. Germany imposed a lockdown from March to May 2020 after seeing exponential case growth, banning large gatherings, closing schools and non-essential businesses. This successfully reduced infections. However, Germany then lifted restrictions gradually as cases declined, though continued at hundreds per day. Travel within Europe remained less restricted. These moves proved insufficient to prevent recurrent waves of infection. Germany ultimately implemented a "lockdown light", though schools and many businesses stayed open. As of December 2020, Germany had over

1.5 million total reported cases and 26,400 deaths, with high ongoing daily case and mortality counts [5].

In summary, China's early and continued aggressive suppression approach curtailed overall cases and maintained near zero local transmission after April 2020, while Germany's mitigation strategy failed to prevent recurrent waves necessitating repeated lockdowns. By December 2020, the death per 100,000 population in China was 0.3, whereas in Germany as 32 [6]. This highlights how early and sustained interventions may be required to minimize disruption long-term. And possible reasons for the success in China and the Pacific region include previous experience with SARS, early aggressive actions, centralized isolation of cases/contacts, extensive contact tracing and travel limits. These allowed near normal social and economic activity.

Western countries could learn from the Pacific region experience that only early, intense, and sustained measures can control COVID-19 until vaccines become widely available. An aggressive suppression strategy implemented early, as in parts of Asia, is more effective than mitigation approaches used in most Western countries. This allows low case levels and near normal social and economic functioning. China's experience shows early, and continued suppression can minimize societal disruption in the longer-term. Western nations may need to use more sustained, strict measures to control COVID-19 until vaccination.

### **3. Enhancing Healthcare Policies Post-COVID: Opportunities and Challenges**

The COVID-19 pandemic has brought reconsiderations of policies in healthcare systems worldwide, emphasizing the need for a strong healthcare infrastructure, equitable financing, and innovative approaches to healthcare delivery. The key goal in post-pandemic is healthcare policy reform, with a focus on strengthening healthcare systems, leveraging 5G technology, and advancing universal health coverage (UHC) in low- and middle-income countries. Addressing these critical areas helps to better prepare ourselves to face future healthcare challenges.

#### **3.1. Strengthening Healthcare Systems and Investment**

In response to the COVID-19 crisis, there has been a significant surge in healthcare investment. This investment aims to rectify historic underfunding and bridge infrastructure gaps that have long plagued healthcare systems. The focus is on bolstering public healthcare provisioning while also engaging private providers, adhering to economic principles. However, the challenge lies in ensuring equitable financing, especially considering insurance limitations. Negative externalities on routine health services must be addressed, and priority-setting considerations need to be broadened. The goal is to work towards universal health coverage, equity, and quality in healthcare.

Moreover, the pandemic response has provided a unique policy window for advocating even greater health investment. This is complemented by the necessity for whole-of-government coordination, a prerequisite for tackling the pandemic effectively. Moving into the post-COVID era, there is a distinct opportunity to enhance health systems, public provisioning, equitable financing, and evidence-based priority setting. This concerted effort will contribute significantly to advancing India's healthcare goals.

#### **3.2 5G Technology for Post-COVID Healthcare**

The COVID-19 pandemic has underscored the importance of accessible and widespread digital health services. 5G technology, with its enhanced mobile broadband, ultra-reliable low latency connections, and massive machine-type communications, presents a promising avenue for improving healthcare access [7]. It enables remote health services like telemedicine, rapid deployment of new e-health applications, supply chain monitoring, and contact tracing.

However, there are several challenges that must be addressed to harness the full potential of 5G in healthcare. These include privacy concerns, security considerations, scalability issues, coverage limitations, and societal acceptance. Governments and operators should prioritize 5G deployment

plans, establish private 5G networks for healthcare facilities, implement network slicing to guarantee quality of service, and adhere to privacy-by-design principles.

The capabilities of 5G technology have the potential to support healthcare policies in the post-COVID era by enhancing remote services, facilitating the quick deployment of new healthcare applications, managing healthcare supply chains through the Internet of Things (IoT), enabling patient monitoring, and supporting population-scale contact tracing [8]. However, pragmatic steps must be taken to address the implementation challenges that come with integrating 5G into the healthcare sector.

### **3.2. Transforming Healthcare Systems Post-COVID**

The COVID-19 pandemic has spurred transformative changes in healthcare systems worldwide. These changes encompass the adoption of telehealth, improved surveillance systems, new legislation governing public health measures, communication technology-based approaches, and financial models supporting research and preparedness [9]. In particular, a significant portion of patient care is expected to remain remote even after the pandemic subsides, with hybrid physical and virtual models becoming the norm.

Furthermore, the crisis has strengthened public health data collection, modeling capabilities, and international collaboration. Policymakers are likely to review and revise policies related to individual rights versus public health powers, technology regulation, and ethical concerns. Communication technology, such as telemedicine, remote monitoring, and fact-checking, is poised to play an expanded role in healthcare delivery. Additionally, partnerships that finance scientific initiatives and enhance crisis preparedness are of paramount importance.

The healthcare sector must learn valuable lessons from the COVID-19 pandemic to bolster its capacity, flexibility, and resilience against future infectious disease threats. The crisis provides a unique opportunity to re-evaluate healthcare policies, systems, and priorities, paving the way for improved healthcare delivery in the post-COVID era.

### **3.3. Advancing Universal Health Coverage in Low- and Middle-Income Countries**

The COVID-19 pandemic has prompted low- and middle-income countries to make significant strides towards achieving universal health coverage (UHC) [10]. One crucial aspect of this progress involves defining essential packages of health services that should be publicly funded and provided to all citizens. Achieving UHC requires strong political commitment, active engagement of stakeholders, and a focus on principles such as cost-effectiveness and financial risk protection when selecting interventions.

Moreover, implementation constraints must be considered, and efforts should be made to track improvements in healthcare utilization, health outcomes, and out-of-pocket expenditures. The post-COVID era presents a unique opportunity to re-evaluate healthcare systems, priorities, and policies, with an emphasis on enhancing resilience against future threats.

Essential health service packages post-COVID should be designed inclusively, allowing for adaptation over time and balancing concrete services with the core principles driving health systems. The experiences of the pandemic underscore the urgency of UHC-oriented reforms in many countries.

The COVID-19 crisis has illuminated the path toward universal health coverage by defining essential service packages that prioritize high-impact care while progressing towards the goal of quality healthcare access for all. It is imperative that these packages are designed thoughtfully to adapt to evolving healthcare needs and challenges. The pandemic experience makes UHC-oriented reforms more urgent for many nations.

## **4. Conclusion**

The experiences of China and Germany in managing the pandemic offer valuable insights into the importance of early and sustained interventions. Looking forward, opportunities to strengthen

healthcare systems, leverage 5G technology, and advance UHC provide a roadmap for building a more equitable and resilient global healthcare landscape. The lessons learned during the covid will shape the future of healthcare policies, ultimately benefiting individuals and communities worldwide. The world has learned valuable lessons about preparedness, response, and equity in healthcare, and these lessons must guide our future policies and actions. Countries must remain committed to strengthening the healthcare systems, harnessing the full potential of technology, and ensuring that healthcare is accessible to all. This commitment is not just a response to the challenges today; it is an investment in a healthier and more secure future for generations to come.

## References

- [1] Wang D, Mao Z. A comparative study of public health and social measures of COVID-19 advocated in different countries. *Health Policy*, 2021.
- [2] Chen S, Zhang Z, Yang J, et al. Fangcang shelter hospitals: a novel concept for responding to public health emergencies. *The Lancet*, 2020, 395(10232): 1305–1314.
- [3] Bilawal Khaskheli M, Wang S, Hussain R Y, et al. Global law, policy, and governance for effective prevention and control of COVID-19: A comparative analysis of the law and policy of Pakistan, China, and Russia. *Frontiers in Public Health*, 2023, 10.
- [4] Qi J, Zhang D, Zhang X, et al. Short- and medium-term impacts of strict anti-contagion policies on non-COVID-19 mortality in China. *Nature Human Behaviour*, 2021.
- [5] John Hopkins University. Mortality Analyses. Johns Hopkins Coronavirus Resource Center. 2022. <https://coronavirus.jhu.edu/data/mortality>.
- [6] Lu G, Razum O, Jahn A, et al. COVID-19 in Germany and China: mitigation versus elimination strategy. *Global Health Action*, 2021, 14(1): 1875601.
- [7] Siriwardhana Y, Gür G, Ylianttila M, et al. The role of 5G for digital healthcare against COVID-19 pandemic: Opportunities and challenges. *ICT Express*, 2020, 7(2).
- [8] O'Connor Y, Rowan W, Lynch L, et al. Privacy by Design: Informed Consent and Internet of Things for Smart Health. *Procedia Computer Science*, 2017, 113: 653–658.
- [9] Jazieh A R, Kozlakidis Z. Healthcare Transformation in the Post-Coronavirus Pandemic Era. *Frontiers in Medicine*, 2020, 7.
- [10] Verguet S, Hailu A, Eregata G T, et al. Toward universal health coverage in the post-COVID-19 era. *Nature Medicine*, 2021, 27(3): 380–387.