



**Global  
Governance  
Futures**

ROBERT BOSCH FOUNDATION  
MULTILATERAL DIALOGUES

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# Pandemonium: Risk Factors for Future Pandemics

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# Acronyms

<b>AIIB</b>	Asian Infrastructure Investment Bank
<b>AMR</b>	Antimicrobial Resistance
<b>ASEAN</b>	Association of Southeast Asian Nations
<b>CDC</b>	Centers for Disease Control
<b>GDP</b>	Gross Domestic Product
<b>GGF</b>	Global Governance Futures
<b>GIS</b>	Geographic Information System
<b>GPPi</b>	Global Public Policy Institute
<b>HRH</b>	Health Human Resources
<b>IHR</b>	International Health Regulations
<b>MIC</b>	Middle Income Countries
<b>MSF</b>	Médecins Sans Frontières/Doctors Without Borders
<b>NCD</b>	Non-communicable Disease
<b>NGO</b>	Non-governmental Organization
<b>OIE</b>	World Organization for Animal Health
<b>PHEIC</b>	Public Health Emergency of International Concern
<b>PTA</b>	Preferential Trade Agreement
<b>RVF</b>	Rift Valley fever
<b>SARS</b>	Severe Acute Respiratory Syndrome
<b>SDG</b>	Sustainable Development Goals
<b>TPP</b>	Trans-Pacific Partnership
<b>TRIPS-plus</b>	Trade Related Intellectual Property Standards Plus
<b>UK</b>	United Kingdom
<b>WAHIS</b>	World Animal Health Information System
<b>WHO</b>	World Health Organization
<b>WTO</b>	World Trade Organization

*Cover image: Drew Hays, University of Northern Iowa, Cedar Falls, US*

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# About the Program

The Global Governance Futures program (GGF) brings together young professionals to look ahead 10 years and recommend ways to address global challenges. Building on a decade of successful rounds of the GGF program, GGF 2027 convened 25 fellows from Germany, China, Japan, India, and the United States (five from each country). Over the course of 2016 and 2017, the fellows participated in four dialogue sessions: in Washington, DC (May 8–12, 2016), Tokyo and Beijing (September 18–24, 2016), New Delhi (January 15–19, 2017), and Berlin (June 11–15, 2017).

The GGF 2027 fellows – selected from a highly competitive field of applicants from the public, private, and non-profit sectors – were assigned to one of three working groups that focused on data governance, global health and pandemics, and transnational terrorism. Utilizing instruments from the field of futures research, the working groups produced scenarios for their respective

areas of focus. In addition to learning about and then implementing the scenario planning methodology, our fellows met with leading policy-makers and experts from each participating country, whose insights helped shape the scenarios. From their findings, the fellows produced a range of publications – including this report – that present the process of creating histories of possible futures.<sup>1</sup>

The GGF team based at the Global Public Policy Institute (GPPi) works closely with the fellows to help them achieve their goals, and in the process, cultivates a community that will extend beyond the duration of the program, thanks to a growing and active alumni network.

<sup>1</sup> The findings, interpretations, and conclusions expressed in this report are those of the authors and do not represent the views of the organizations they work for.

GGF is made possible by a broad array of dedicated supporters. The program was initiated by GPPi, along with the Robert Bosch Stiftung. The program consortium is composed of academic institutions, foundations, and think tanks from across the five participating countries. The GGF partners are GPPi, the Hertie School of Governance, the Brookings Institution, the Woodrow Wilson School of Public and International Affairs, the Tokyo Foundation, Keio University Tsinghua University, Fudan University, Ashoka University, and the Centre for Policy Research.

The core responsibility for the design and implementation of the program lies with the GGF program team at GPPi. In addition, GGF relies on the advice and guidance of the GGF steering committee, made up of senior policymakers and academics. The program is generously supported by the Robert Bosch Stiftung.

The fellows of the global health and pandemics working group would like to thank the organizers of GGF 2027, the Robert Bosch Stiftung, and everyone else who contributed to making the program possible – especially Thorsten Benner, Johannes Gabriel, Mirko Hohmann, Eka Rostomashvili, and Joel Sandhu. We are also grateful to TAU for its design work, Oliver Read and Maddie Wells for editing, and colleagues at GPPi and the GGF alumni for commenting on this report.

# Executive Summary

Since the turn of the century, a series of pandemics have incited global concern: disrupting trade, bringing travel from some regions to a standstill, and spreading panic through affected and unaffected populations alike. These outbreaks – including Severe Acute Respiratory Syndrome (SARS), swine flu, Ebola, and most recently, Zika – have drawn attention to a system of global health governance that often responds poorly to such crises. Following the containment of Ebola, reforming global health governance and improving pandemic detection and response capabilities have been high on the agendas of actors within both the public health and global security sectors. Looking forward to the next decade, this report explores how global health governance and pandemic response could evolve. It presents two hypothetical pandemic scenarios and considers how both global health actors and the broader geopolitical landscape could shape preparedness and response to these health threats. The scenarios could be considered “stress tests” for global health governance: which components of the global health preparedness and response system would be challenged, and which would prove resilient?

The first scenario takes place in a world of increasing geopolitical fragmentation and isolationism. As medical advancements in wealthy countries make continuous improvements in health and virtually eradicate many diseases, skepticism rises over the necessity of critical medical interventions. Fueled by media-induced panic, vaccine skepticism spreads across the developed world, taking root in the minds of a generation that had never seen a case of measles or polio. When a diphtheria outbreak occurs, poor geopolitical coordination and a weak response from leading global health institutions costs lives, money, and time. Tragically, vaccination could have prevented the pandemic in the first place.

The second scenario exposes the challenges that would persist even in the context of a relatively well-functioning global order and response in a multipolar world. Acting on the lessons learned from previous outbreaks, domestic and global actors are well prepared to deal with an outbreak of Nipah virus in India. But they fail to recognize the impact of downstream “fearonomic effects” – the economic consequences resulting from hysteria outbreaks and propelled by misinformation – that lead to irrational decision-making on the part of both individuals and states. Ultimately, these decisions do little to contain the virus, and

not only interfere in an effective response but wreak havoc on the governments and economies of many countries – even those without cases of the disease.

These scenarios highlight the complexities of developing an effective response to pandemic outbreaks, and draw attention to the urgent need to diversify the actors involved in both preparing for and responding to pandemics. Considering the role of non-traditional players in global health – including the effects of agriculture and animal health on outbreaks, the media’s role in shaping public response to health threats, and how best to involve the private and non-health sectors in a holistic response – will be critical in responding effectively to pandemics in the future.

# Introduction

Rudolf Virchow said that “Medicine is social science and politics is nothing else but medicine on large scale.”<sup>2</sup> Unfortunately, our global health responses, like our politics, are all-too-often reactive. We spring into panicked action only to address existing crises, rather than undertaking the slow and steady work of preventing them in the first place. In some ways, the past two decades have been an exception to this trend. Catalyzed by the HIV/AIDS pandemic and inspired by the United Nations Millennium Development Goals, we have witnessed an unprecedented period of global health governance activity. Between 2000 and 2015, countries and private donors dispensed roughly \$415 billion in development assistance for health. Much of this funding was directed towards improving baseline health indicators (e.g., immunization rates), developing and expanding access to essential medicines and vaccines, and reducing the burden of illnesses not considered to be pandemic threats (e.g., malaria). This funding was accompanied by unique attention to global health institution-building at the international level. In the wake of the 2003 SARS epidemic, states thoroughly revised the International Health Regulations (IHR) for the first time in their 150-year history and implemented a new system for global health emergency responses. Donor and implementing countries also joined with philanthropies, the private sector, and civil society to create a range of new global health partnerships focused on everything from grantmaking, to advocacy, to innovative financing mechanisms for research and development (e.g., Gavi, the Vaccine Alliance, and the Global Fund to Fight HIV/AIDS, Tuberculosis, and Malaria). However, the strengthening of health systems at the local and national level continued to be a largely neglected priority.

But in the wake of the 2008 financial crisis and, more recently, the apparent inward turn of Western donor states, old habits may be reasserting themselves. The global response to the 2014 Ebola epidemic, for instance, epitomized the neglect-until-crisis approach. As a result of this overwhelmingly reactive approach, when policymakers do take action, they are always “fighting the last war”; in other words, they only focus on implementing measures that might have prevented the crisis to which they are responding. Our goal is to disrupt this pattern by presenting two plausible scenarios that could play out in the next decade, and in the process hopefully facilitate discourse on global health governance.

The first scenario describes a diphtheria pandemic that emerges in North America and Europe. It highlights how the rising costs of and reduced access to healthcare, combined with growing vaccine skepticism, can influence individuals’ health decision-making, creating vulnerability to diseases long thought to be vanquished. The second scenario describes a Nipah pandemic with severe consequences for agriculture and food security, as well as for human health. It also illustrates how the pandemic of fear can be more devastating than the disease itself. In presenting these two scenarios, we are not attempting to predict the future, or even to describe probable futures. Instead, we have challenged ourselves – and now challenge our readers – to look beyond what seems likely or what might happen tomorrow, and instead consider what might be possible in the decade ahead, and what actions might encourage or prevent these outcomes. Our goal is not to convince our readers that these scenarios will come to pass, but rather to inspire thinking about how to avoid the types of crises they have yet to imagine.

<sup>2</sup> Harvard University Library Open Collections Program, “Rudolf Virchow, 1821-1902,” accessed April 26, 2017, <http://ocp.hul.harvard.edu/contagion/virchow.html>.

# Scenario 1: Diphtheria Redux

## News Analysis

### **DIPHTHERIA REDUX: AS THE DIPHTHERIA PANDEMIC RAGES, THE WORLD ASKS, 'WHERE DID WE GO WRONG?'**

June 3, 2027

BERLIN – In the winter of 1925, sled dogs raced six days through a brutal blizzard, bringing life-saving medication to an isolated Alaskan town. The medication they carried was diphtheria antitoxin, then the only known treatment for a disease that infected an average of 175,000 people and caused roughly 15,000 deaths per year in the United States alone. Now a century later, children's hospital wards around the world await their own deliveries of antitoxin.

Given all the outbreaks and pandemics that have transpired in the interim, it is hard to grasp how we could again find ourselves in this position. As recently as a decade ago, nearly 85 percent of the world's population was protected against diphtheria, thanks to a highly effective, widely available vaccine. In high-income countries, the disease had all but disappeared. However, the biggest difference between 1925 and today is also the most tragic: in 2027, we have the tools to prevent such an epidemic.

How did we get here? At first, there were a handful of diphtheria outbreaks in the US and Canada. But with childhood vaccination rates at 80-year lows, and many adults failing to get their 10-year booster shots, hundreds of millions of people in North America, Europe, and parts of Asia became vulnerable. After US President Donald Trump was voted out of office in

2024, the new Democratic President and Congress quickly repealed his administration's harsh immigration and travel restrictions. Since then, the US tourism industry rolled out the red carpet, welcoming record numbers of people to Florida, New York, and California, while also agreeing to resettle 900,000 refugees. Finally, congress repealed the Trump administration's executive order requiring that all non-business travelers returning from Muslim-majority countries be automatically added to an FBI watch-list (pending investigation). Following the repeal, almost 65,000 American Muslims seized the opportunity to perform Hajj.

However, as we have witnessed in the past three years, this mass movement of people also ushered in a mass movement of bacteria. Moreover, the emergence of antibiotic resistance has severely complicated treatment, forcing doctors to revert to older and less effective treatments like antitoxin and isolation. Add to this a vaccine shortage and you have the recipe for turning scattered brush fires into a full-scale conflagration.

Those are the epidemiological facts of the case. Stop there, and you walk away with a fairly straightforward story. Dig deeper and you find a tangled trail of individual, local, geopolitical, and global health decisions leading us back to the future.

## TROUBLED DOMESTIC RESPONSES

According to the World Bank, the majority of pandemic-affected countries are high- or upper-middle income. Yet diphtheria has tested the conventional wisdom that these “developed” health systems are largely capable of handling such a crisis. Complacency has taken a toll at every level, delaying countries’ internal response efforts.

US and Canadian public health agencies first noticed an uptick in the number of diphtheria cases as early as 12 months ago. But their warnings were written off, since similar outbreaks of measles had been appearing for over a decade without resulting in an epidemic. Even the “un-elimination” of rubella in the Western Hemisphere failed to garner attention from the public or mass media.

Despite its populist flavor, the right-wing political tide that swept the West over the last decade led to decreased public sector investment and support for social services at the national level. Public hospitals and health systems, hollowed out by budget cuts, now strain to handle large-scale delivery of even routine medical care – much less the intensive care required for patients with antibiotic-resistant diphtheria.

For individuals in North America and Europe, accessing healthcare has become increasingly difficult and expensive over the last decade. In the US, Republicans drastically reduced federal subsidies for health insurance and rolled back Obama-era Medicaid expansions, passing increased costs on to the most economically vulnerable individuals. In 2019, President Trump floated legislation that would curb rising drug costs, but American and European pharmaceutical companies joined forces to defeat his proposals. Empowered by their victory, these companies underwent a series of mergers to create three major conglomerates, dubbed “Tri-Pharma.” Against the backdrop of an increasingly powerful industry and a highly consolidated market, drug prices have skyrocketed. While European countries have not abandoned the principle of national healthcare, the combination of rising drug prices and an aging population that uses more and more services has forced governments to implement

expensive copays. And when the costs of healthcare rise, preventative services – like vaccinations – are generally the first costs people forgo.

## Vaccine Skepticism

When it comes to vaccine coverage, growing fear is an even bigger problem than growing costs. Vaccine skepticism has been fomenting on the fringes of our “post-fact” society since at least the late 1990s. But in the winter of 2018-2019, the so-called “anti-vaxxer movement” received a major boost when the seasonal flu vaccine was associated with a higher than usual incidence of severe complications, including high fever and febrile seizures in children. Public health officials went into overdrive trying to reassure the public that a higher than usual incidence does not mean a high incidence, and that the chances of being hospitalized with the flu (52 hospitalizations per 100,000 people<sup>3</sup>) remain far greater than the chances of having a severe adverse reaction to the vaccine. But today’s clickbait media environment is dominated by highly-competitive, fragmented, internet-based news delivery, and dramatic stand-ups outside emergency rooms draw more viewers than expert press conferences. Fueled by media-induced panic, vaccine skepticism has spread across the developed world, taking root in the minds of a generation that has never seen a case of diphtheria, measles, or polio.

Diphtheria might have been forgotten, but it was not gone. The bacteria continued to circulate in the population, not only among the unvaccinated, but also among asymptomatic carriers who had been vaccinated. Despite periodic reminders (e.g., the 1994 epidemic in Russia), complacency ruled.

Naturally, reduced demand led to reduced vaccine production. Vaccine skepticism and decreased access to preventative medical care account for much of the reduction in demand, but not all of it. Since 2020, Tri-Pharma has lobbied the growing number of rising middle-income countries (MICs) to shift their immunization program priorities and focus on increasing coverage with new vaccines (e.g., for rotavirus, HPV, and pneumococcal pneumonia). Tri-Pharma has argued that these diseases present a

3 William W. Thompson, David K. Shay, et al., “Influenza-Associated Hospitalizations in the United States,” *JAMA* 292, no.11 (2004): 1333-1340, <http://jamanetwork.com/journals/jama/fullarticle/199440>.

greater threat than “old” childhood diseases, like measles, mumps, and diphtheria. But since the new vaccines were still under patent, they also cost much more (driving up Tri-Pharma profits).

The consequent increase in vaccine expenditures came at a precarious time for MICs. Though they have benefitted from high levels of bilateral and multilateral health aid in the past, many donor governments pointed to MICs’ rising gross domestic product (GDP) as a sign that they were ready to “graduate out” of health assistance. Correspondingly, MIC governments, particularly India and South Africa, wanted greater independence and ownership over their health programs, and accepted – or even sought – reduced health aid as the price of autonomy (and in some cases, despite opposition from within their own civil society sectors). However, donor pullback created gaps in immunization budgets. And as domestic funding shifted towards newer vaccines, routine childhood vaccinations, including diphtheria, began to fall through the cracks. In sum, increased economic pressures and shifting healthcare priorities – whether at the individual level (in the US and the European Union) or the national level (in MICs) – have combined to lower vaccination rates.

Finally, we have a capacity problem. As patents on the most common vaccines have expired, production has shifted to manufacturers in India. This greatly complicates procurement in the US and EU, which are locked in an ongoing battle with Indian generic producers, whom they accuse of routinely violating TRIPS-plus (Trade Related Intellectual Property Standards Plus) patent standards with respect to other medical products. This battle came to a head a few years ago, when US and European policymakers passed laws prohibiting the importation of generic vaccines and medications produced in countries like India that “fail to adhere” to TRIPS-plus.

Ironically, once the scope of the diphtheria outbreaks became clear, the same European and American leaders who had long pushed for the extra-rigorous TRIPS-plus standards quickly changed their tune, and are now attempting to sidestep their new laws by invoking the very public health emergency exemptions that TRIPS-plus was designed to eliminate. Still, supply has not caught up with demand. Although vaccine manufacturers are working around the clock, they have been unable to produce sufficient quantities to vaccinate the many millions at risk, fill national stockpiles, and meet their pre-existing

contracts with Gavi and countries that have maintained comprehensive childhood vaccination programs.

### **GEOPOLITICAL FRAGMENTATION AND A WEAK GLOBAL HEALTH GOVERNANCE RESPONSE**

The global response is no less troubled. Though the US remains the world’s dominant military superpower, the liberal international order continues to rapidly erode into geopolitical fragmentation. Between 2016 and 2020, right-wing nationalist politicians either (re)gained office or became the leading opposition group in the US, Canada, France, Germany, and other European nations. Their isolationism has strained intra-regional cooperation to the breaking point. In 2021, three years after Brexit, Greece and Spain also held referenda on whether to leave the EU; although the referenda failed in close votes, they took a heavy toll on the EU’s morale and political will. Around the same time, Sino-Russian tensions rendered the Shanghai Cooperation Organization defunct.

Geopolitical fragmentation has had knock-on effects for global health governance. Since 2016, there has been little progress in expanding and strengthening global health security mechanisms, such as the Global Health Security Agenda and the International Health Regulations (IHR). Indeed, IHR compliance has steadily declined. During a 2022 outbreak of Hantavirus, Scandinavian countries diligently complied with the IHR and quickly brought the outbreak under control. But fearful governments around the world imposed trade and travel restrictions regardless — contrary to World Health Organization (WHO) recommendations — leading to billions of dollars in economic losses for Sweden, Norway, and Denmark. This experience has dissuaded others from following Scandinavia’s example, fueling IHR non-compliance during the present pandemic.

Even with a pandemic underway, geopolitical fragmentation persists. While we have seen decent transatlantic coordination around the pandemic response, pan-Asian and inter-regional cooperation remains limited to some basic data-sharing. (This might suggest that in moments of crisis, countries with long-standing alliances and deep economic ties will still cooperate, even if some of their governments are broadly isolationist. But that is a question for political scientists.)

Perhaps counterintuitively, global health governance collaboration is having the most success in places where it is the least dependent on governments. For example, cooperation among scientific researchers has been far more robust than among governments. This success is the result of a decades-long attempt by philanthropic supporters of medical research to cultivate the fast and free exchange of data and results – for instance, through open access to medical journals. Sharing requirements encouraged a new generation of researchers to treat information as a public good, created new platforms for data-sharing and collaboration, and helped forge transnational and trans-sectoral networks. Thus, when the pandemic hit, researchers were quickly able to adapt these platforms and practices.

Most problematically, WHO is once again failing to effectively coordinate a global response. In an ironic twist, WHO has been undermined even by its greatest victories. In 2023, the agency was finally able to declare polio eradication. This was only the third time in history that humanity has eradicated a disease (after smallpox and Guinea worm). But in the wake of this success, prominent non-state donors decided to exit on a high note and turn their attention to climate change, costing WHO roughly 20 percent of its funding. The secretariat proposed a number of measures to salvage the agency's finances, including repeated pleas to unfreeze its core budget. They also recommended cutting costs by moving WHO's headquarters from Geneva to Bangkok. This suggestion touched off an unanticipated firestorm. In response to the potential move, Asian nations celebrated, temporarily uniting over what they saw as a symbolic shift in political gravity to the East. Europe fiercely resisted the change for

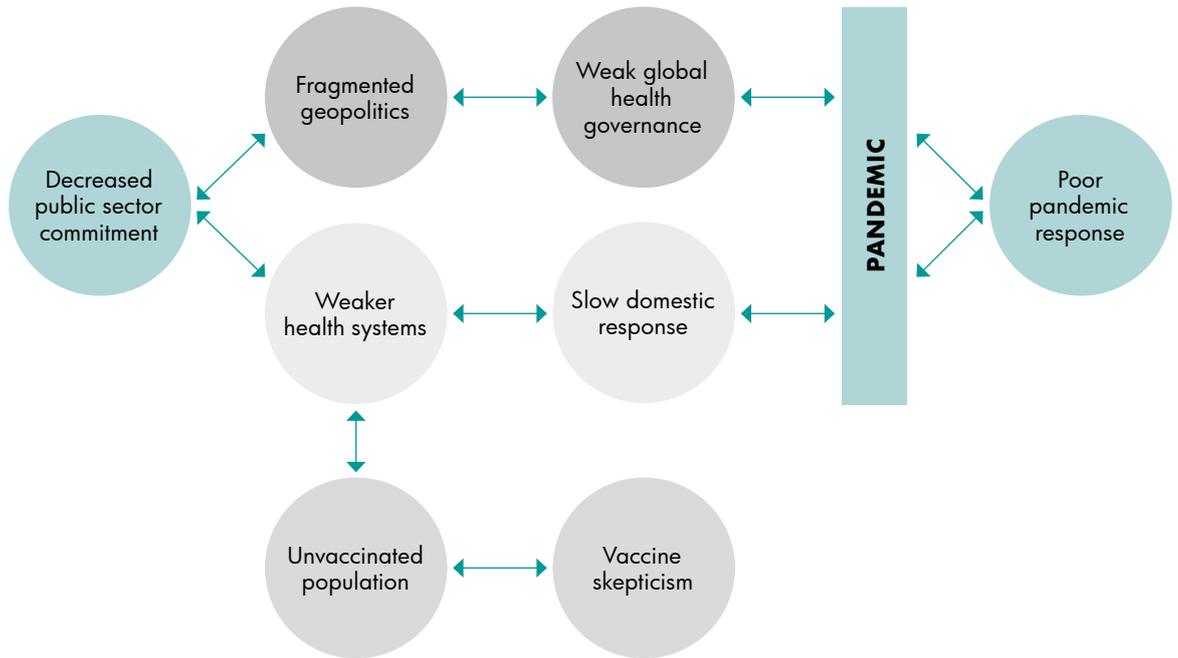
the same reason. Despite the director-general's avowal that the proposal represented nothing more than a pragmatic step, EU member states retaliated by proposing that WHO's budget be shifted entirely to voluntary contributions. In this politically fraught environment, WHO's leadership seems to consider that the only viable course of action is political timidity and non-intervention. For example, it is not surprising that WHO has failed to name-and-shame IHR non-compliers when the worst non-compliers, and those with the most diphtheria cases, are the very countries providing the voluntary contributions upon which the agency's existence depends.

### WHERE DO WE GO FROM HERE?

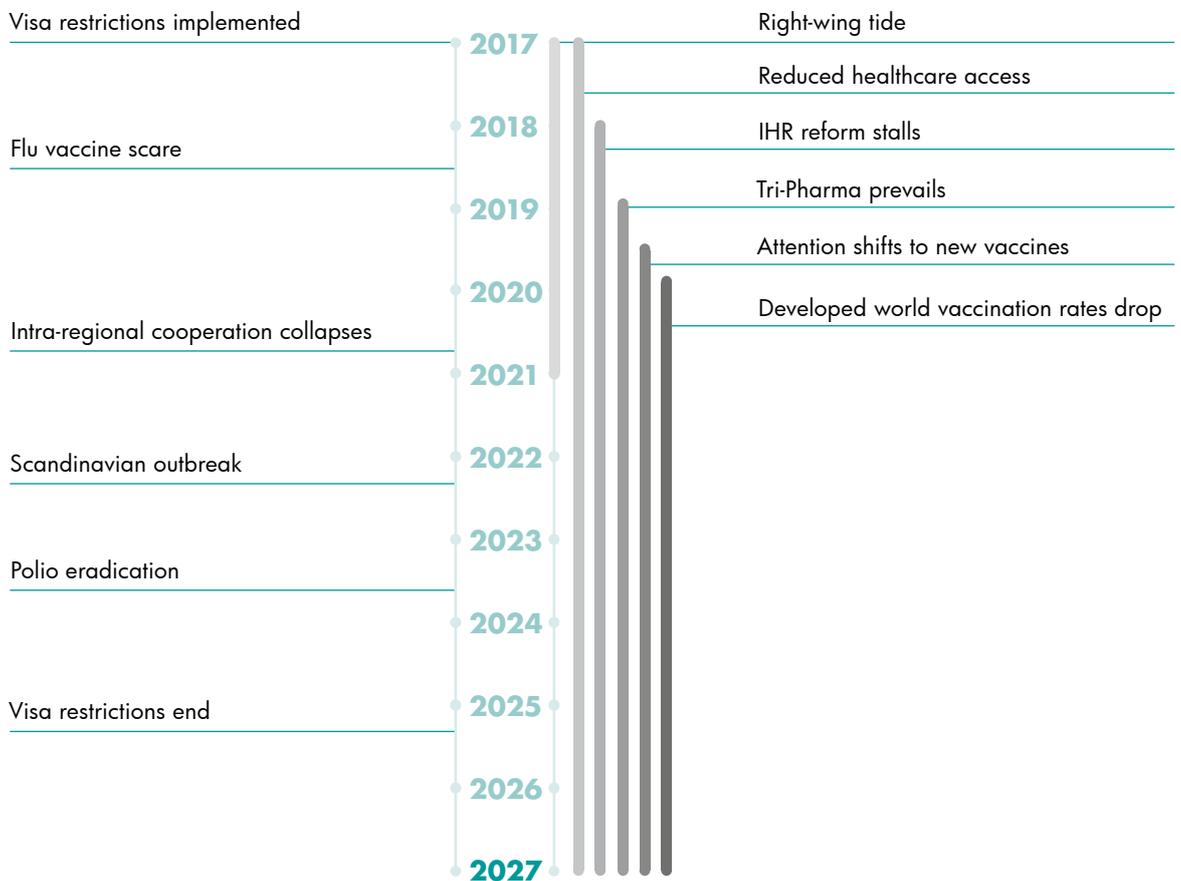
Although there will be high costs in terms of time, money, and lives, the diphtheria pandemic is projected to come under control in the coming months. Vaccine production is catching up with demand. Researchers around the world are now rushing to test new antibiotics already in development, and continue to share their results freely and openly. In the meantime, older technologies like antitoxins and isolation are doing their job. Philanthropists and community organizations have stepped in to help cover the costs of treatment, and there is significant political and public pressure for insurers to waive copays for the infected.

But the bigger picture gives less reason for confidence. The diphtheria pandemic is the 21st century's first pandemic of a vaccine-preventable disease. But without major shifts in thinking at every level, from individual decisions to global health governance, it will not be the last.

**CORE LOGICS**



**HISTORY OF THE FUTURE**



# Scenario 2: Nipah's Fear Pandemic

## News Brief



### NIPAH PANDEMONIUM CONTINUES: INDONESIA DEcriES WRONGFUL TRADE RESTRICTIONS APRIL 14, 2026

JAKARTA – Today, the Indonesian President addressed the United Nations and the World Trade Organization to appeal the wrongful trade restrictions levied on its agricultural exports by the UK, Australia, Canada, South Korea, and Mexico in response to the ongoing Nipah pandemic. Although the Nipah virus has affected other countries in Asia, Indonesia has not recorded a single case, nor have Indonesian authorities detected the virus in Indonesian swine or livestock.



## International Affairs

### SPECIAL FEATURE: LOOKING BACK AT THE NIPAH OUTBREAK THAT FUELED THE "FEAR" CONTAGION

May 2, 2027

The 2014 Ebola epidemic in West Africa took the world by surprise. Global financing for the pandemic response was slow; there was neither a vaccine nor adequate human resources. But the international community pledged never to be caught by surprise again. In the decade since, immense progress has been made in developing global pandemic response capacity and discovering new antibiotics and vaccines. In 2026, when the Nipah outbreak occurred in South Asia, we were prepared with a vaccine. We had global pandemic finance mechanisms in place, and human resources ready to deploy. Yet the outbreak still claimed over 8,000 lives and cost the global economy over \$8.4 trillion in economic damages. According to global health expert Dr. Justin T. Colesman, "We were prepared for Nipah but tragically unprepared for the pandemic of fear that followed. It was a pandemic in a true sense, hysteria that engulfed the world and impacted even countries without Nipah." All the response efforts and financing were directed towards India, Bangladesh, and Myanmar, where people were falling ill. There was no financing available for countries such as Thailand, Laos, and Cambodia where, although no human cases were found, Nipah in livestock led to massive culls, trade bans, and food insecurity. Even neighboring countries that had no cases at all – such as Indonesia, Malaysia, and Vietnam – were severely impacted by unnecessary trade bans fueled by hysteria surrounding exports from Asia.

Fear of Nipah was so great that it triggered a "vaccine race" among countries eager to stockpile already limited quantities of the Nipah vaccine. Countries such as Australia, New Zealand, and the UK bought hundreds of doses of the vaccine, citing security and agricultural concerns, despite lacking a single case. And few can forget the tearful state-

ment by Bangladesh's Minister of Health when he requested assistance with access to vaccines. Lamenting the handling of the events, Dr. Starling Jaansey of Médecins Sans Frontières/Doctors Without Borders (MSF) said, "Nipah could have been contained much faster, if only the vaccines had gone to people who needed them the most, rather than to the highest bidder," adding that, "vaccine hoarding is absolutely unethical when there is a far greater need in some countries. Countries played politics with vaccine access. Thousands of lives were lost as a result of fear and politics and not just Nipah." The US was criticized by both MSF and the Chinese government for showing favoritism when it shared its own emergency stockpile with trade partners India and Bangladesh, but refused to do the same for Myanmar, where China's Asian Infrastructure Investment Bank (AIIB) was leading response efforts, or with China itself, where the circulating virus in livestock had put millions at risk. Across the world, the ripple effects of Nipah led to hysteria among public and political leaders, causing violence and diplomatic distrust.

Among the many lessons to come out of last year's Nipah outbreak, an important takeaway was that outbreak response needs to factor in the downstream "fearonomic effects"<sup>4</sup> of the disease.

The Nipah outbreak also exposed the lack of funding for the World Organization for Animal Health (OIE), and varying standards for agricultural and animal health among countries. As world leaders gather in Geneva to discuss post-Nipah action, they will focus on the role of OIE in implementing a standardized World Animal Health Information System (WAHIS) and standardized animal health regulations. Other issues that will be discussed include increased finance commitments for OIE and

4 "Fearonomic effects" are the direct and indirect economic effects of both misinformation as well as fear-induced aversion behavior, exhibited by individuals, organizations, or countries during and after an outbreak or an epidemic.

retribution funds for countries affected by trade bans or a mass swine/livestock cull for disease risk reduction. As these meetings occur, it is worthwhile to understand how the Nipah outbreak unfolded and why the proposed measures are important.

Seismic power shifts created multiple orbits of power, rivalry, conflict, and a surge in defense budgets at the expense of health budgets. At the same time, the proliferation of regional and bilateral trade agreements led to different standards for public health, food safety, and animal trade. Looking back, we can trace these changes to 2017: As the West focused inwards, China expanded its territorial claims in the South China Sea. Meanwhile, China and India continued to grow economically and rise as global powers. Completion of the Belt and Road initiative enhanced China's economic influence, while India reaped its demographic dividend, growing its workforce even as the "Make in India" initiative improved the ease of doing business and reduced the cost of living. As a result, India's GDP growth rate rose to 7.8 percent and its economy inched closer to the US in terms of GDP (at purchasing power parity). Russia also experienced something of an economic revival, following an increase in agricultural innovations and the collapse of US-led sanctions in the face of Trump's "America-first" policy.

As other nations have done before them, Russia, India, and China channeled their economic growth into accelerated military spending and alliance-building. But given that the national budget remained limited, the boom in defense budgets came at the cost of budgets for health, and especially animal health. While an increasingly multipolar world led to greater collaboration on some public health fronts, growing rivalries among power blocs caused countries to reduce allocations for WHO and instead opt for strengthening regional Centers for Disease Control (CDC) and bilateral aid programs.

In the US, increased protectionism after Trump's election in 2016 led to the collapse of the Trans-Pacific Partnership (TPP). In its wake, the number of preferential trade agreements (PTAs) increased. China took advantage of the vacuum created by the TPP's collapse to sign the Regional Comprehensive Economic Partnership with 10 ASEAN countries, as well as Australia and New Zealand. However, India refused to join on account of growing geopolitical tension with China, and instead signed a separate pact with Japan, South Korea, Taiwan, and the UK.

Soon, other bilateral and regional trade pacts, such as the Canada-EU Free Trade Agreement, and the Mexico, Indonesia, South Korea, Turkey, and Australia (MIKTA) Agreement, were signed. The growing number of PTAs effectively fragmented global trade into competing blocs, undermining the World Trade Organization and lowering standards for public health and food safety.

Growth in innovation and partnerships ushered in public health victories, while new global health actors emerged and poached technical experts from WHO. In the 2020s, apart from venerable institutions such as the World Bank, new supranational entities such as the Asian Infrastructure Investment Bank and the new Eurasian Economic Union Bank become powerful actors in global health and development financing. The success of these institutions was exemplified in 2024 when China became the world's single largest international aid donor and most important stakeholder in global health governance. After the success of the African CDC, other regional centers emerged to emulate this model (e.g., ASEAN CDC, Eurasia CDC). Growing rivalry among power blocs led countries to increase funding for regional CDCs rather than WHO. As their role in undertaking operations increased, so did their demand for technical expertise, leading to a slow erosion of WHO's technical capacity as regional CDCs wooed away technical staff from WHO's Geneva and regional offices. With the expanding role of CDCs in providing technical assistance, research, and operations, WHO slowly refocused itself on the role in which it has been most successful – as a normative organization focused on developing standards and regulations for global health.

At the same time, the private sector assumed a larger role in the global health landscape. There was a rise in millennial philanthropists inspired by the success of the Bill and Melinda Gates Foundation and the Chan-Zuckerberg Initiative, an increasing push for private sector participation in the Sustainable Development Goals (SDGs), and an emphasis on impact investment and effective altruism. Seeing health investment as a "best buy," new millennial philanthropists and members of the private sector set up foundations and campaigns to address global challenges. The crowning moment for private philanthropy came in 2022, when the Gates Foundation and Rotary International (along with the other Global Polio Eradication Initiative partners) won the Nobel Prize for polio eradication.

Widespread penetration of mobile devices and new advances in technology led to major public health victories and bolstered global pandemic response capacity. At the same time, these developments stoked fears regarding data security. Post-Ebola, with the launch of the World Bank's Pandemic Financing Unit, the UN's Contingency Fund for Emergencies, and WHO's Health Emergencies Program, there was a considerable increase in health financing for pandemic responses. With the advent of regional CDCs and the success of the US-led Global Health Security Agenda, there was a greater push for IHR compliance; by 2019, 85 countries had undergone Joint External Evaluations. The discovery of new antibiotics and vaccines reduced the fear of antimicrobial resistance and emerging threats such as Nipah virus and Rift Valley fever (RVF). The number of health workers increased to at least 2.5 health workers per 1,000 people in all regions thanks to the SDGs and training programs initiated by organizations and private foundations. This also went a long way towards enhancing global response capacity and strengthening health systems. By 2020, global mobile penetration crossed the 85 percent mark as smartphones become cheaper and more accessible. With the widespread usage of smartphones, mHealth, telemedicine, and geographic information system (GIS) technology, there was a revolution in disease diagnostics and a much-enhanced ability to conduct active contact tracing during outbreaks. However, concerns over ethical data usage and misuse of GIS data by non-state actors led to debates in many countries. As these discussions intensified and regional CDCs came under greater influence of geopolitical blocs, data-sharing became more fragmented. Thus, the trend shifted towards reduced data sharing, especially for agriculture and animal health data. Reduced animal health surveillance data sharing, combined with different reporting standards for animal health among country groups, remained unaddressed, creating ripe conditions for an epidemic despite enhanced global response capacity and IHR compliance.

Success of research and development (new antibiotics, vaccines) led to reduced fear of AMR, and global attention moved away from AMR and One

Health toward non-communicable diseases (NCDs) as a result of the epidemiological shift in India and China. In the 2020s, multiple public-private partnerships that had been launched in response to the 2014 Ebola outbreak, and the growing threat of AMR slowly bore fruit. These alliances, such as Consortium of Epidemic Preparedness and Innovations, Combating Antibiotic Resistant Bacteria Biopharmaceutical Accelerator (CARB-X), and the Global Antibiotic Research and Development Partnership, promoted the development of new antibiotic and vaccine candidates, reducing fear of AMR. While advances were made, the 2020s also saw an intensification of climate change as well as related natural disasters such as floods and droughts. Zika and other vector-borne infections became more frequent, even as technology (such as bioengineered mosquitoes) enhanced mosquito control measures. In 2024, rising sea levels and hurricane Toophan led to massive flooding in Bangladesh and Myanmar, giving rise to the biggest single-incident refugee crisis in history and sending over 10 million refugees to Northeast India. In a sudden move, the Gates Foundation, after its victory against Polio, decided to shift its focus from global health to the pressing problem of climate change and water shortages.

In addition, there was a noticeable epidemiological shift in disease burden across India, China, and Latin America, with a rising incidence of non-communicable diseases such as heart disease, stroke, diabetes, and mental illness. Aging, urbanization, and poor nutrition exacerbated non-communicable disease prevalence. By 2025, 365 million people worldwide were diabetic. Countries, CDCs, and many private foundations shifted their focus towards NCDs. With less fear of AMR, funding for OIE was cut, and incorporating the joint human-animal One Health model into national and global health policy was no longer a priority.

The first Nipah virus outbreak took India by surprise after a cluster of cases occurred simultaneously in Siliguri and Kolkata (East India). Initially, these cases were presumed to be seasonal flu but later confirmed to be Nipah, and eventually traced to index patients from Bangladesh and a homemade date palm sap drink.<sup>5</sup> By the time the Nipah outbreak in India was

5 Nipah outbreaks have previously occurred in Malaysia, Singapore, India, and Bangladesh. Nipah infection in humans has a range of clinical presentations, from asymptomatic infection to acute respiratory syndrome and fatal encephalitis. Nipah is also capable of causing disease in pigs and other domestic animals (reportedly in cow and goats). Transmission of the Nipah virus can occur through direct transmission (e.g. consumption of date palm sap contaminated by infected bat excretions), contact with infected domestic animals (such as pigs, and in some instances, goats or cows), or person-to-person through close contact or in a hospital setting.

confirmed, multiple outbreaks had occurred across India, Bangladesh, and Myanmar. The clusters were later discovered to be linked to Maha Kumbh, a once-every-twelve-years religious event that attracts tourists from across the world. The virus was soon found to be circulating among swine and cattle in Laos, Thailand, Cambodia, and China as well, striking worldwide panic (despite no human cases in these countries).

The Nipah virus outbreak clusters in India led to widespread panic across the nation. Despite the government's efforts to quell misinformation, the high penetration of mobile devices allowed rumors to spread quickly and soon led to riots, as politicians blamed the epidemic on refugees, Muslims, and alleged "dog-eating habits" of people from Northeast India. As a result, there was a surge in violence against Northeastern Indians and Bangladeshi refugees across the country. Despite the increase in intra-regional collaboration for health, the economic rivalry between power blocs impacted the response to Nipah, even as the contagion hurt external relations. For example, the outbreak damaged Indo-Chinese relations after some Indian politicians referenced a fake news report that Nipah was a "Chinese conspiracy to slow-down India's GDP growth"; these rumors were only intensified by (correct) reports that Nipah was discovered to be circulating among pigs in China. Despite the conspiracy being proven fake, this incident contributed to the aforementioned riots. Misinformation also led people to stop eating poultry and drinking milk, further impacting the agricultural sector.

Differences in opinion between WHO and some regional CDCs regarding the level of trade and travel restrictions that should be imposed in response to Nipah sowed confusion and – despite the fact that only WHO has the formal authority to advise in these circumstances – led to a lack of harmonization in the restrictions placed on affected countries. Moreover, different public health and food safety norms written into different PTAs, and the weakening of WTO's teeth for dispute resolution, meant countries levied trade restrictions beyond even the recommended levels. When WHO declared Nipah a Public Health Emergency of International Concern (PHEIC), trade bans on agricultural products were levied on India, Bangladesh, and Myanmar, but also neighboring countries such as Vietnam, Indonesia, and Malaysia, where no human or animal cases had been reported. Reports of virus circulating among swine and cattle in China, Laos, Thai-

land, and Cambodia led to trade bans on these countries despite WHO's explicit recommendations to the contrary.

As India, Myanmar, and Bangladesh reeled under multiple outbreaks of Nipah, food and health security became a concern. Money was swiftly made available to these countries by the World Bank's Pandemic Emergency Finance Facility, the AIIB, and the UN's Contingency Fund for Emergencies. While the quick financing for emergency operations was a positive, it also led to a duplication of efforts, as multiple foundations tried to buy vaccines and send resources to some locations, while other areas or countries were ignored. In the absence of a coordinating body on the ground, unclear channels of communication and delineation of responsibilities among many NGOs and private foundations undermined the efficiency of the response.

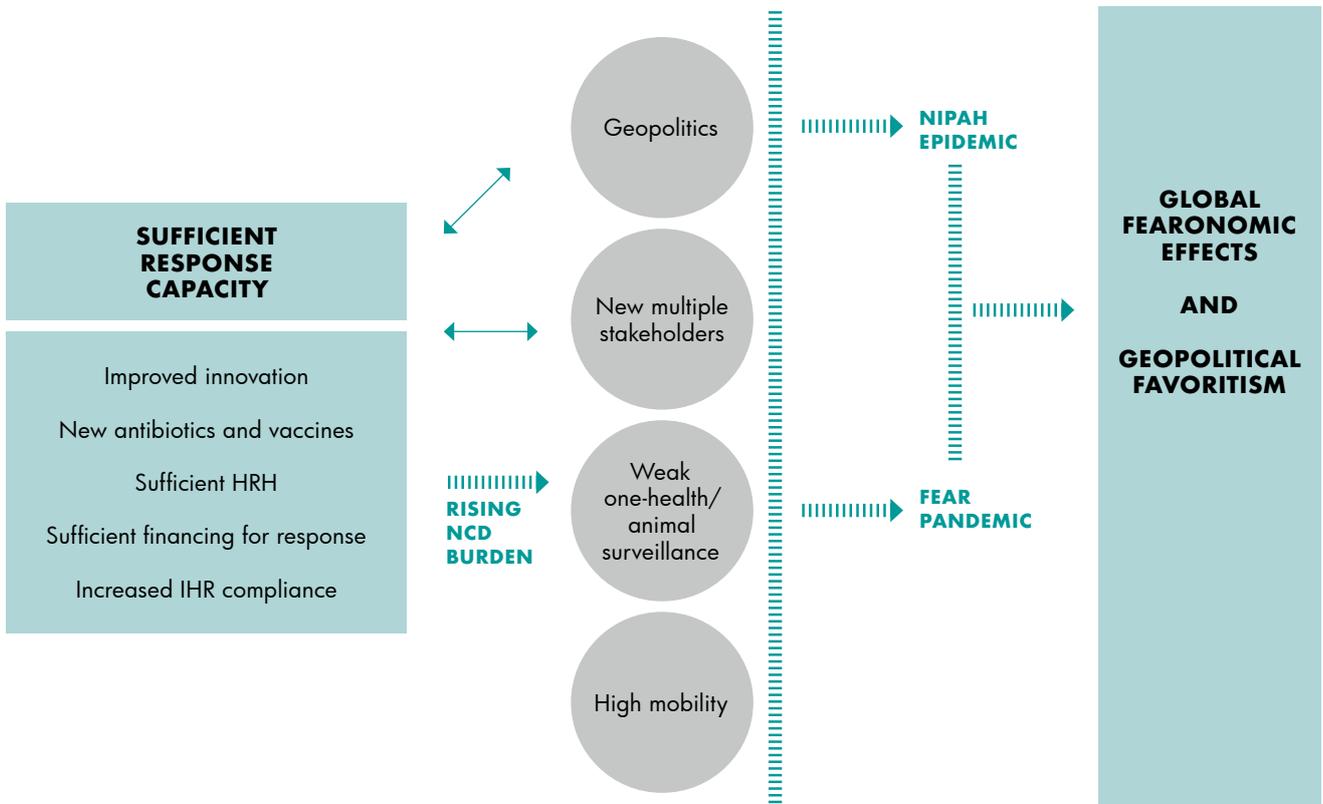
However, no financing was made available to Laos, Cambodia, and Thailand, which along with China (and a few other unaffected countries), were badly affected by trade restrictions and food insecurity after the culling of millions of livestock. A state of emergency was issued in Laos, where food insecurity due to mass culling sparked outrage and anger against the government and against WHO. Consequently, fear of the Nipah virus spread worldwide, and people became wary of South Asians, Asians from other regions, or anyone who had visited Asia. When a case of latent Nipah virus was detected in a US patient, global anxiety only intensified. Even countries without the virus were affected by trade restrictions as countries such as Australia, Canada, Japan, South Korea, and Mexico stopped imports from across Asia. Health systems in countries with and without the virus were overwhelmed, as people mistook seasonal flu for Nipah and rushed to hospitals.

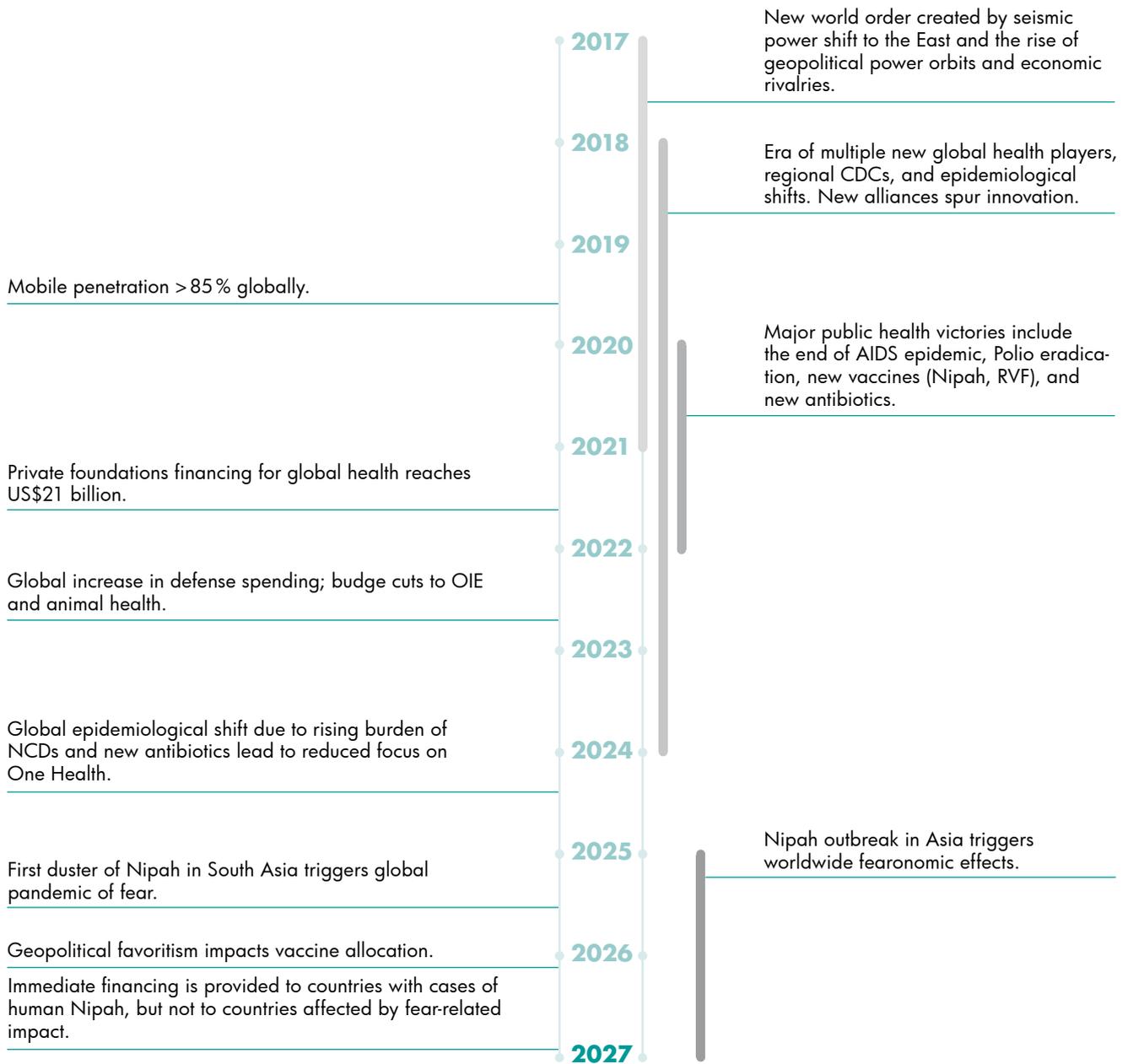
Although a Nipah vaccine existed, stocks were limited. The fear of Nipah triggered a race among countries eager to get access to the limited amount of vaccines stocked by two pharmaceutical companies. Influential and wealthy nations brought stocks of vaccine to pacify their own populations' fears and to share with their trading partners and allies (as the US did with India and Bangladesh). This hoarding exacerbated shortages and, as a result, WHO was unable to acquire sufficient supplies for countries with virus in circulation. Citing security and agricultural concerns, countries such as Australia, New Zealand, and the UK were the first to buy

hundreds of doses of Nipah vaccine, despite no evidence of Nipah transmission in the countries. This stockpiling of vaccine by unaffected countries fueled global tensions.

While the economic cost of the Nipah outbreak was estimated to cost affected countries over \$3 trillion, the impact of the fear pandemic on other countries was estimated to be over \$8.4 trillion. As a result, countries have been discussing enforceable legal obligations to regulate the abuse of trade restrictions in the aftermath of a contagion like Nipah, as well as establishing an external WHO-WTO-led accountability commission with power to impose sanctions on countries that flout WHO guidelines during a PHEIC. Funding for OIE was increased, and there has been a push to strengthen and standardize animal disease reporting and to share animal surveillance data. It was recently revealed that the Nipah virus had been circulating in pigs

across several countries that never reported their data, both because they had no human cases, and because they feared trade losses. Discussion has also centered on creating a new pandemic coordinating body – one that could coordinate multiple stakeholder response, resolve issues among CDCs, improve vaccine allocation by reducing geopolitical favoritism, ensure synchronized response to future health emergencies, and potentially even provide restitution funds for countries affected by mass cullings. WHO is being touted as the secretariat of the pandemic coordination body, given the agency's close ties with OIE and its role as a global normative agency. WAHIS regulations, analogous to IHR, will also be introduced soon, making it compulsory for countries to report certain diseases in domestic and wild animals. Hopefully, with appropriate measures in place, the world will be protected from the next pandemic of not only Nipah, but of fear.





# Discussion

In the wake of recent pandemics, including SARS, swine flu, and Ebola, much of the post-mortem analysis of what worked and what went wrong has focused on global, national, local, and even community governance responses. This attention is not misplaced, as both past outbreaks and our scenarios show that glaring weaknesses in pandemic preparedness and response capacity persist; however, it is insufficient. Health experts and other actors more traditionally involved in pandemic response must also recognize the

importance of personal health choices and the popular imagination in determining the arc of an epidemic, from preventing an outbreak in the first place to responding when one occurs. This requires looking beyond the public health sector to understand the role of the media in propagating or combatting misinformation, the role of animal health and climate change in contributing to the environmental conditions around an outbreak, and the potential for new technologies to improve disease surveillance and reporting.

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## Any Effective Response Must Look Beyond Public Health Institutions

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Responses to recent disease outbreaks have inevitably focused on how public health institutions built to deal with public health can be strengthened to respond better in the future, or propose new bodies to address weaknesses in responses among existing organizations. Much of this focus is valid: WHO must be ready to throw itself into responding to future outbreaks assiduously and without regard to the political consequences, or face further sidelining and irrelevance. When multiple stakeholders are engaged in crisis response, they often struggle to coordinate amongst themselves, leading to duplication of efforts and inefficient responses. In the coming years, major powers including China and India will play an increasingly significant role in responding to global threats, contributing important resources and geopolitical diversity while also increasing the number of actors on the global stage.

Yet even under ideal governance conditions, improved institutions are not enough: our scenarios demonstrate that even a comparatively effective international response to multiple outbreaks could not fully control the cascading sequence of events. Better financing and human response capacity will still struggle in the face of the “fearonomic effects” activated by pandemics. An effective response to pandemics must go beyond the public health sector. As the second scenario highlighted, non-health sectors can prove critical in pandemic outbreaks. Infections can jump easily from animals to humans, highlighting the importance of animal health and agriculture to pandemic preparedness. Transmission is not the only concern: the majority of antibiotics are now used to control animal health, contributing to an overuse of antibiotics and rising antimicrobial resistance. Public health actors have a clear interest in ensuring high standards for animal health.

Lessons learned from developing reporting standards and guidelines for health emergencies

could be well applied to developing this vital area of global governance.

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## Pandemic Preparedness Must Be Ready to Respond to Both New and Old Threats

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It is commonly assumed that pandemics are likely to arise from emerging infectious diseases, or diseases emerging in unexpected places – as with Ebola in West Africa, or the Zika virus in Brazil. While recent pandemics demonstrate the importance of remaining vigilant against such threats, pandemics can also emerge from diseases that appear to have largely been eradicated (as illustrated in the “Diphtheria Redux” scenario). Public health victories last only as long as public health vigilance is maintained.

Recent outbreaks of measles resulting from falling vaccine rates in some communities in the US and Germany highlight the dangers of complacency and the potential for diseases to re-emerge if adherence to preventive measures (like vaccines)

falls. As we demonstrate in our scenario, outbreaks of far deadlier diseases such as diphtheria – which can kill as many as one-in-five children under five – could have far-reaching consequences, particularly in countries where health systems are weak and vaccination rates low.

The return of previously contained diseases presents a curious paradox: it is not unlikely that wealthy countries with strong health systems will be the drivers of these pandemics. Achievement and innovation, including new treatments and improved diagnostics, combined with medical skepticism driven by decades of medical progress, could be the very factors that lead to regression.

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## Strengthening Efforts to Fight Misinformation

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As health improves, it becomes easier to question or even dismiss the same medical achievements that facilitated this progress. Rising vaccine skepticism among highly educated, privileged communities in Germany, the US, and elsewhere illustrates this trend. With the effects of vaccine-preventable diseases largely invisible in most wealthy countries, major public health achievements are taken for granted, while hysteria over

extremely rare side effects is amplified. In an environment where rejecting accepted scientific findings becomes the norm, such trends are likely to continue, if not become amplified. Once vaccination coverage falls below a certain threshold (roughly 90 percent for most infectious diseases), herd immunity no longer protects the unvaccinated, and infectious diseases can spread much more quickly through the population. As the

first scenario demonstrated, the consequences of an outbreak can be severe.

The media landscape is increasingly fragmented, with the public consuming information through traditional media, new online channels, and social media. During times of crisis and information asymmetries, keeping the public accurately informed becomes a growing challenge – and with higher stakes. Sensational media coverage can cost both lives and money: misinformation about disease transmission or virulence, rumors reported as fact, gross generalizations about life and health care in foreign countries, and other examples of poor reporting can spread rapidly and push people to make decisions that are more harmful than the pandemic itself, as illustrated in the “Pandemonium” scenario. Even absent a pandemic, the media plays an important role in educating the population about health; this includes propagating (or dispelling) vaccine skepticism. The costs of misinformation are high, and the downstream consequences significant.

Unlike travel and trade, media coverage lacks industry guidelines. While some news and journalism organizations have developed reporting standards and guidelines, these only pertain to times of crisis, such as responding to incidents of terrorism. Further, social media channels have an increasing role in disseminating information during crises. Both social media channels and traditional media could consider guidelines – developed in concert with domestic or international public health agencies – for disseminating information during pandemics and other health crises to ensure more accurate and responsible coverage. Whether such guidelines would be effective remains to be seen, but their need is clear: responding to fear and misinformation will be one of the most critical challenges in handling future pandemics.

# Scenario- Planning Methodology

Scenarios are comprehensive, consistent descriptions of possible future situations and respective plausible trajectories. They illustrate not only potential situations, but the events leading up to them. Scenarios do not have any claim to predict; they are instruments of anticipation, not foreknowledge.

Scenarios are constructed in a group process to balance cognitive biases such as status quo or wishful thinking, which are unconsciously at work when we think about the future. The group process

of scenario construction is structured in a manner to critically reflect on perspectives and assumptions, and avoid groupthink; at the same time, the process ensures shared understanding and new or insightful aspects that would not have occurred to participants individually.

What follows is a short outline of the process the Global Governance Futures working group on global health governance used to create scenarios and facilitate discussions on their implications.

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## Environment Scanning, Factor Assessment, and Key Uncertainty Projections

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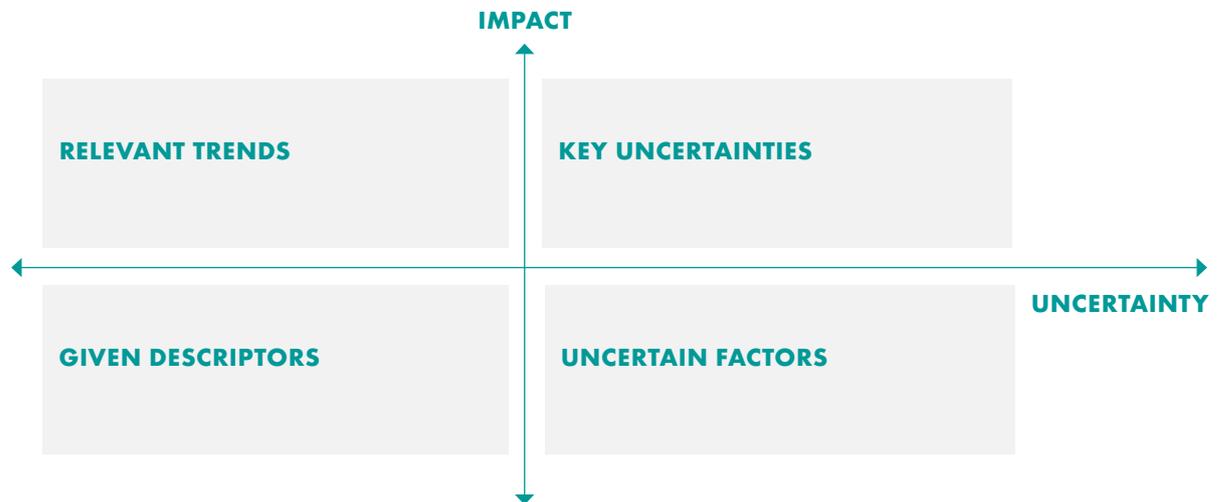
After the group decided to research the question “What kind of pandemic responses might we face in 2027?,” they defined their scenario topic as “Pandemics 2027” and conducted a structured brainstorming session to identify factors that somehow influence the scenario topic (environment scanning). At this stage, the objective was to

collect a wide range of potentially influential factors in order to proactively prescind from established thinking models, theories, and linear extrapolation. This produced a list of 45 factors from various spheres of influence (such as politics, economy, society, technology, ecology), as shown on the following page.

Global Context	Health Systems	Type of Disease	Social, Economic, Cultural	Planetary Health	Global Stewardship and Governance	Tech and Research & Development	Response
Mobility	Health financing	AMR	Urbanization and population density	One Health/ Planetary Health	Global leadership	Vaccine/ diagnostic development and capacity	IHR capacities and compliance
Domestic civil unrest and war	Surveillance system & capacity	Multiple pathogens	Demographics	Climate change impact	Global capacity	False drugs	Community mobilization
International war	Human resources	Mode of transmission	Equity		Competition with other sectors on international level (e.g., SDGs)	TRIPS exceptions exercised	Public health domestic laws
Non-health world events	Supply chains	Emerging and/or re-emerging pathogens	Health education/ knowledge		Outcome of the last major pandemic	Research and Development Ethics	Misinformation
Regional integration	Weak health systems	Bioterrorism	Religious/ socio-cultural practice		Risk of US/ EU being affected by a pandemic		For-profits in pandemic response
State of international economy and trade		Disease stats	Country and economic demographics				Non-profits
Original location of pandemics			Health status				On-the-ground leadership
			Poverty				
			Infrastructure (e.g., roads, electricity, sanitation, and hygiene)				

Next, the group assessed the uncertainty and impact of each factor in order to reduce complexity and focus on the factors with the highest potential for change. These so-called key uncertainties

are factors that (in relative terms) influence “Pandemics 2027” more than other factors and that are rather unpredictable in their outcomes in 2027 (unlike trends; see illustration).



The group decided on eight key uncertainties to create different scenarios:

1. Disease, including original location of index case and non-natural influences
2. Mobility
3. Surveillance and response-relevant innovation
4. WHO's role in general
5. Geopolitics
6. Domestic response

7. State of the global surveillance system
8. Global response capacity and political will

The group developed a set of alternative assumptions for the future outcome of each key uncertainty (projection). Relevant trends and other factors were not eliminated from the process, but were set aside until after the scenario construction.

## Scenario Construction

The eight key uncertainties and their respective projections were used to create raw scenarios: consistent combinations of assumptions about the future. Using a morphological analysis, the group created a consistent set of projections from each key uncertainty. The morphological analysis was performed as an iterative process to enrich the raw scenario framework with background knowledge, explaining the conditions under which a certain assumption about the future is

actually valid. The group split in scenario teams to further develop the abstract raw scenarios. After describing a coherent situation in the year 2027, the scenario groups back-casted a respective development path by defining preconditions for the 2027 snapshot. After creating timelines, the groups engaged in a scenario writing process to make the scenarios communicable to a broader audience unfamiliar with the behind-the-scenes discussions.

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