

The failure of global public health governance: a forensic analysis

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Executive summary

COVID-19 HAS UNDERLINED that in a context of recurring pandemics, public health is a basic global public good, the provision of which presupposes effective and timely collective action at global level. It has exposed the limitations of the prevailing framework.

THIS POLICY CONTRIBUTION positions global public health governance in the wider debate on the reform of international governance arrangements. It distinguishes between the 'before' phase of pandemic preparedness, characterised by 'denial and neglect'; the first phase ('addressing the outbreak'), with scientific cooperation but also an uncoordinated response to the outbreak; the second phase ('responding and containing'), with a scaling up of testing, but also competition for scarce equipment and slow development of tests; the third 'protecting' phase, with the exceptional development of new vaccines but also rival vaccine diplomacy; and the final 'exit' phase, with ramping up of vaccine distribution, but also a glaring failure to vaccinate poor countries.

IN THE EVOLUTION of global governance arrangements in different policy areas, six ingredients have been important, and two were clearly present in public health: joint identification of the problem, and shared expertise, as demonstrated especially in the scientific and institutional response. This was much less the case with two others: common action principles, and transparent reporting mechanisms. Finally, there have been significant problems with the last two ingredients: there is no accepted outcome-evaluation process to assess results and adapt instruments, while trust issues continue to hamper the work of the World Health Organisation.

THE IMPORTANT DECISION already made to work towards a new pandemic treaty should be assessed against the broader reform agenda of global health security governance. Four proposals can be made in this respect. The first two relate to strengthening the WHO to turn it into a strong and independent standard-setting and surveillance authority for preparedness, prevention, and response; and to streamlining and consolidating existing institutions and initiatives to better provide essential medical supplies globally.

MEANWHILE, A G20-TYPE body should be established to provide leadership and ensure a whole-of-government approach that repositions global health governance in the world order and puts it on par with economic interdependence or financial stability in terms of governance, institutional backing and resources. Finally, adequate funding should be provided through a self-standing fund to address the shortfalls COVID-19 has revealed in preparedness of national health systems, detection and containment, and shortages and misallocations of critical medical supplies.

Recommended citation

Bucher, A., G. Papaconstantinou and J. Pisani-Ferry (2022) 'The failure of global public health governance: a forensic analysis', *Policy Contribution* 03/2022, Bruegel

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The authors thank Max Sorensen for research assistance and Bruegel colleagues for insightful comments made at a research seminar in November 2021.



1 Introduction

COVID-19 has been a harsh test for public health systems, research and innovation ecosystems, economic policy regimes, regional entities such as the European Union, and global governance arrangements. Two years after its outbreak, it is possible to start taking stock of successes and failures. Successes certainly include global scientific cooperation to identify the virus and its variants, the discovery and development of vaccines, the economic support put in place in advanced countries and, specifically, the cooperative EU response to the shock. But the failures have also been significant. They include a lack of preparedness, a muted response to the first alerts, the hoarding of specialised equipment and vaccine nationalism. The emergence of the Omicron variant in November 2021 was a stark reminder of the high overall cost of the persistence globally of extremely unequal access to vaccines and treatments.

In this Policy Contribution, we seek to understand the reasons for these failures of global collective action. As shown by *ex-ante* research (Barrett and Hoel, 2007), recently emphasised by Brown and Susskind (2020) among others, and quantified by Argawal and Gopinath (2021), public health is a global common and should have been an easy area for successful collective action: incentives to cooperate are strong; cooperation practices are rooted in history; there exists a strong epistemic community; and last but not least, collective action can rely on a long-established multilateral institution with a strong mandate, a proven track record and the tools needed – at least in principle – to tackle pandemics. And yet the initial response to the emergence of the virus was dramatically slow, and fragmentation rather than coherence and coordination prevailed after the pandemic outbreak. The very institution that should have promoted cooperation ended up as a battlefield.

The observed failures in prevention, alert, mitigation and equitable and efficient vaccine distribution raise important analytical and policy questions that we want to investigate. It is important for the future to understand whether geopolitical rivalry, domestic politics, concerns over sovereignty, misplaced selfishness, institutional decay or other factors have trumped incentives to cooperate. Beyond the public health domain, lessons drawn from this analysis are actually of wider relevance for global governance.

We first document where and how international cooperation has been lacking since the start of the pandemic. Our purpose here is not normative, but positive. We are not trying to make the case for collective action, but to find out why it has failed to deliver. And we focus exclusively on the international dimension rather than on national responses to the crisis.

To this end, we rely on a framework for analysis developed in the context of a broader project on the evolution of global collective action (Papaconstantinou and Pisani-Ferry, 2021). We draw on it to put global health governance in context and assess its relative strengths and weaknesses. And we use this framework to determine which difficulties played a predominant role in the shaping of the global community's response to the pandemic.

Section 2 starts the analysis by defining its scope: our focus is on public health and more specifically the different aspects of pandemic prevention and control during the COVID-19 crisis. Section 3 maps the response by summarising the timeline of decisions taken and attempts a first assessment of how the main institutions in this area have responded. Section 4 introduces the broader analytical framework that enables us to put those responses into the context of the discussion about the difficulties and the evolution of global governance arrangements across different policy areas. Section 5 is our attempt to understand the policy response during the pandemic in light of this broader framework. We finish in section 6 with conclusions and policy recommendations.

Public health should have been an easy area for successful collective action but the initial response to COVID-19 was slow and fragmented

2 Scope: pandemic prevention and control

Let us start by defining the scope of our analysis. Health is broader than public health and broader than health security, which itself is broader than pandemic prevention and control. We focus on the COVID-19 crisis, and limit our analysis to five distinct, partially overlapping and partially successive sequences of pandemic prevention and control.

The first is the before phase (Phase 0); this includes pandemic preparedness and the policies in place aimed at better preparing societies to handle pandemics and to contain and manage them quickly once they occur. It covers the period before the outbreak of the contagion in early 2020.

The second phase is Phase 1 of the actual outbreak: the period when national and international authorities attempted to contain the initial outbreak by issuing alerts, and by instituting travel bans and quarantines. Phase 1 can be thought of as occurring between the first alerts until the official recognition of the pandemic on 11 March 2020.

Phase 2 is about response and containment. It is the immediate crisis response to a developing pandemic, including the production and distribution of personal protective equipment (PPE), medical equipment and drugs. It also involves the ramping up of the capacity of health systems to cope with infections and hospitalisations. This developed over the first semester of 2020, covering the first wave; elements that developed first during that period, including monitoring measures, testing and information-sharing continue until today.

The next phase (Phase 3: Protecting) ushers in the era of vaccine research and discovery. It includes public financing (such as by the United States and the EU) and of course diverse and decentralised efforts to develop, test and produce vaccines and drugs. It can be considered to have started in January 2020 and to have lasted until vaccine approval by health authorities.

Finally, Phase 4 is about exit. This is the phase we are in today. While many elements from previous phases remain at the core of the international effort (from information sharing, lockdowns and travel restrictions, to funding of treatments and vaccines), the emphasis has shifted to the global rollout of vaccines, maximising vaccination reach and developing more effective treatments. Table 1 summarises these phases. Each of these sequences involved national as well as global or regional action. We are interested in this second, purportedly cooperative, aspect.

Table 1: A multi-stage response

	Time period	Main aim	Policy tools
Phase 0: Preparing for the pandemic	Until December 2019	Increase societal resilience, prepare health and emergency systems	Evaluation of national systems, contingency planning, stress tests
Phase 1: Addressing the outbreak	January-March 2020	Contain the initial outbreak	Alert mechanisms, travel bans and quarantines, track and tracing, tests and distribution of PPE
Phase 2: Responding and containing	First semester of 2020	Containing infection numbers, minimising human loss	Development, production and distribution of medical equipment, ramping up of health system capabilities
Phase 3: Protecting	From January 2020 until vaccine and drug approval by health authorities	Developing effective vaccines	Funding R&D, procurement policies, facilitating production capacity
Phase 4: Exiting	From January 2021	Maximum immunity, prevention of the emergence of dangerous variants	Distribution of drugs and vaccines

Source: Bruegel.

3 Mapping the response

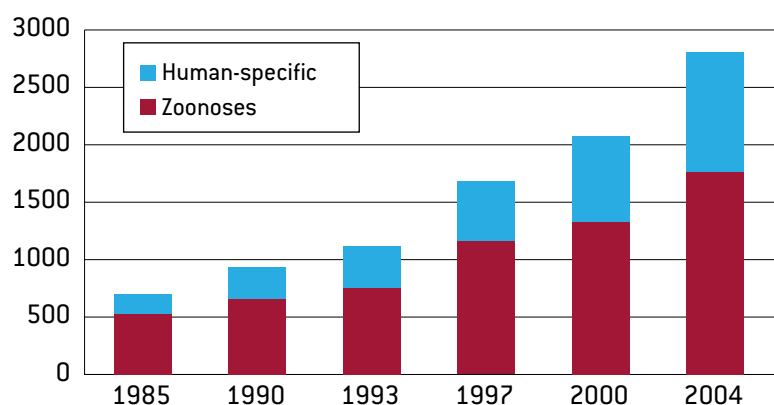
Table 2 summarises our assessment of the global response in each of the five phases. Phase zero was characterised by denial and neglect. There was persistent underestimation of the risks of new pathogens and pandemics, in spite of the scientific community having repeatedly sought to alert decision-makers about the growing risk of pathogen outbreaks and the likelihood of pandemics (Figure 1). Each epidemic episode resulted in a “*panic and neglect*” cycle (Bucher, 2021), while underinvestment in pandemic prevention and preparedness remained pervasive. In low- and middle-income countries, this was the outcome of competing health priorities, while high-income countries forgot infectious diseases and continued to see non-communicable diseases as the main challenges for their health systems.

Table 2: Main features of the global pandemic response

	Time period	Main aim
Phase 0: Preparing for the pandemic	Strengthening of the governance of the World Health Organisation	Denial and neglect of potential risks
Phase 1: Addressing the outbreak	Instant scientific cooperation Fast sequencing of the virus	Delayed and uncoordinated response to outbreak (failed surveillance, lack of mutual support)
Phase 2: Responding and containing	Scaling up of testing and large scale social distancing measures (plus economic response)	Developing effective vaccines
Phase 3: Protecting	Exceptionally rapid development of new vaccines	Competition for scarce equipment and slow development of tests
Phase 4: Exiting	Ramping up of vaccine production	Rival vaccine diplomacy

Source: Bruegel.

Figure 1: Global rise in human infectious disease outbreaks



Source: Smith *et al* (2014). Note: the figure shows number of outbreaks as recorded by the Global Infectious Disease and Epidemiology Online Network (GIDEON).

There was no lack of international guidance on, or obligations in relation to, managing health emergencies, including pandemics. The International Health Regulations (IHR) assigned a central role to the World Health Organisation for international surveillance, risk assessment and coordination. The IHR, which are legally binding, were revised in 2005 and introduced obligations for WHO member countries, including requirements on reporting

Critically, the WHO is not equipped with enforcement powers and proper accountability mechanisms

public-health events and setting up core capacities to deal with outbreaks¹. The IHR also created a new crisis coordination instrument by giving the WHO the right to declare a ‘Public Health Emergency of International Concern’ (PHEIC), to which states have a legal duty to respond promptly. The instrument has been used six times since its creation in 2007, including for COVID-19 in 2020.

Critically, however, the WHO is not equipped with enforcement powers and proper accountability mechanisms. Shortly before the outbreak of the pandemic, evaluations confirmed underinvestment in global health security, in particular, but not exclusively, in low- and middle-income countries. A 2019 study based on the available joint external evaluations (JEE) of health emergency readiness conducted under the WHO concluded, “*First, no country is fully prepared to manage disease epidemics. Second, the number of preparedness gaps, and the resulting to-do list of actions to take to fill them, is overwhelming: more than 7000 priority tasks await action. Third, JEEs have diagnosed preparedness gaps well, but few of these gaps have been filled*” (Shahpar *et al*, 2019).

Warnings were issued. As noted by IPPPR (2020a), between 2007 and 2019, at least 11 high-level panels and commissions made specific recommendations to improve global pandemic preparedness. Many concluded that the WHO needed a stronger role as a coordinating organisation, and was critically in need of secure funding. Yet IPPPR (2020a) noted that “*despite the consistent messages that significant change was needed to ensure global protection against pandemic threats, the majority of recommendations were never implemented*”.

In phase 1, there was a sharp contrast between the speed and quality of scientific cooperation and belated decision-making. IPPPR (2020a) put it bluntly: “*The chronology of the early events shows two worlds operating at very different speeds. One is the world of fast-paced information and data-sharing. [...] The other world is that of the slow and deliberate pace with which information is treated under the IHR (2005), with their step-by-step confidentiality and verification requirements and threshold criteria for the declaration of a PHEIC, with greater emphasis on action that should not be taken, rather than on action that should*”.

Scientific findings were indeed disseminated remarkably quickly in relation to COVID-19. After the discovery of the virus was announced officially on 9 January 2020, Chinese sequencing data was shared already on 11-12 January with foreign health institutions, which replicated it within days. The PCR (polymerase chain reaction) test for COVID-19 was developed equally swiftly.

In contrast, the declaration of a PHEIC was made only on 30 January, a full month after Taiwan had expressed its concern about cases in Wuhan and requested from the WHO information on a new “*atypical pneumonia*”². After the virus had begun to spread from country to country, case-monitoring remained patchy and reported deaths underestimated actual mortality. COVID-19 was only declared a pandemic on 11 March 2020.

As a result, countries reacted in an uncoordinated way with a series of emergency measures, ranging from travel bans to closure of economic activities. Informed by previous public health events such as SARS, Asian countries put in place containment measures quickly. Western countries, lacking recent experience of severe infectious diseases, struggled to deploy surveillance and containment measures. Low-income countries were quickly overwhelmed as health systems were already under pressure and short of essential equipment.

In Phase 2, coordination on an overall COVID-19 response started in earnest, but was much less effective in health terms than in relation to the COVID-19-related economic shock. An overall framework was developed early; in April 2020, the United Nations proposed a response strategy for COVID-19. This was based on five pillars: health (protecting health services and systems); social protection and basic services (protecting people); economic

1 The WHO has constitutional powers to develop regulations which are binding on member countries, unless they explicitly reject them.

2 See Taiwan Centers for Disease Control, ‘The facts regarding Taiwan’s email to alert WHO to possible danger of COVID-19’, 11 April 2020, https://www.cdc.gov.tw/En/Bulletin/Detail/PAD-lbwDHeN_bLa-viBOuw?typeid=158.

response (protecting jobs and small business); macroeconomic response and multilateral collaboration; and social cohesion (United Nations, 2020).

Overall, the international community committed about \$250 billion for COVID-19³. The bulk of the support was channelled outside the health sector, to the economy at large, with \$100 billion provided by the International Monetary Fund for macro-stability and \$130 billion from multilateral and bilateral development aid providers and private organisations that provided support to mitigate the social and economic costs of the pandemic (OECD, 2020). The health-related support amounted to \$20 billion, of which only a small share was channelled through the WHO.

At a more political level, another expression of greater international cooperation was the commitment of the G20. At its meeting on 15 April 2020, it agreed a full action plan⁴. This paved the way for the establishment of the ACT-A accelerator (see below) to deliver vaccines, therapeutics and diagnostics globally (“*Enhanced collaboration and increased funding are urgently needed to support accelerated research and development for diagnostics, therapeutics and vaccines. We will work in close collaboration with G20 Health Ministers and with Trade and Investment Ministers to support the availability of essential medical supplies and pharmaceuticals.*”). However, while the overall social and economic response was put into place, solidarity in support of public-health initiatives failed to materialise.

The failures are well documented in reports such as that of the Independent Panel for Pandemic Preparedness and Response (IPPPR, 2020b). In Phase 2 of the response, the aim was to contain infection numbers and minimise human loss through the development, production and distribution of medical equipment. Yet WHO warnings of severe global shortages (resulting from limited stockpiling, hoarding, panic-buying, protectionism, cargo restrictions, trade barriers, dependence on a few supplier countries and the lack of immediate procurement funding) and associated price increases were not followed up with joint action. The shortages hit in particular low- and middle-income countries.

Similar limitations affected diagnostics. While a PCR test was available in the first weeks of the outbreak, its massive use was held up by shortages of laboratory equipment and materials. More user-friendly and affordable tests, like rapid antigen tests and self-tests, took months to emerge. The medical device industry has been very innovative since the early months of the pandemic and had developed nearly 200 test kits by April 2021. But regulatory gaps resulted in only three rapid antigenic tests – the most user-friendly category – being listed on the WHO emergency list. This created a huge gap between high-income countries able to conduct an average of 533 tests per 100,000 people each day in mid-March (2021), compared to 36 tests per 100,000 people in middle-income countries and 5.5 tests per 100,000 in low-income countries (IPPPR, 2020c).

Phase 3 was characterised by the remarkable success story of vaccine development. What has been called “*the largest and fastest accumulation of scientific research in human history*” (IPPPR, 2020c) was a different type of collective action. It mostly emerged from collaboration between scientific communities, and from the discovery of new ways to accelerate scientific enquiry and related research through greater sharing and distribution of data and findings. The rapid sequencing of the virus was followed immediately by a massive effort by researchers and large public institutions. The result was the accomplishment within a year of the type of vaccine development that would have normally taken several years (Veugelers, 2021).

The result was the combined outcome of the intensification of research throughout the world and massive injection of public funds in key countries. In the first half of 2020, WHO identified more than 300 research projects working on COVID-19 vaccines. The Coalition for Epidemic Preparedness Innovations (CEPI), a global partnership for vaccine research and

3 See the Supporting Economic Transformation programme, ‘Donor responses to the coronavirus - ongoing tracker’, (April 2020), available at https://set.odi.org/wp-content/uploads/2020/05/Donor-responses_as-of-30April-2020.pdf.

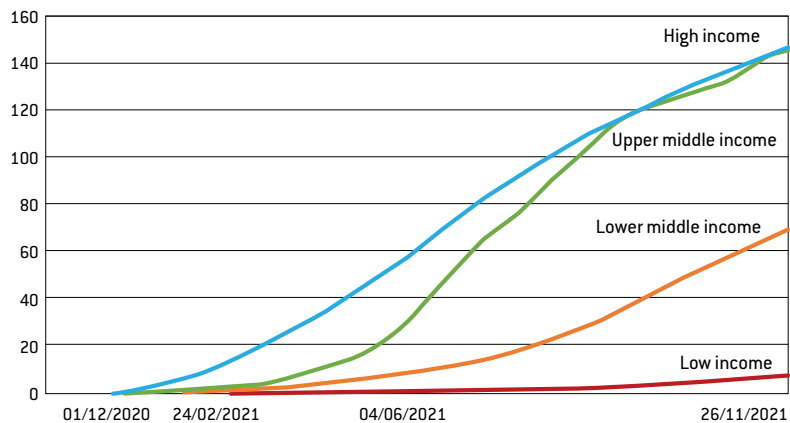
4 See <http://www.g20.utoronto.ca/2020/2020-g20-finance-0415.html>.

development for emerging infectious diseases, which was set up in 2017, was instrumental in creating a favourable research environment. But US funding was a game changer: as early as February 2020, the US activated its pandemic plan with Operation Warp Speed, with an exceptional budget of more than \$10 billion. It supported nine vaccine projects, each with an unconditional grant of between one to two billion dollars, to support research, development and investment in production capacity. By summer 2020, several vaccines were in clinical trials amid intense competition between pharmaceutical companies and between countries, with advanced vaccine projects in China, Russia, the US and Europe.

In spring 2020, the prospect of imminent market launches of vaccines marked a turning point, with growing geopolitical tensions and the emergence of vaccine nationalism. By January 2021, eight vaccines were available: four Chinese and one Russian, which were initially not put on the WHO emergency use list, and three vaccines (from AstraZeneca, BioNTech/Pfizer and Moderna) authorised in developed countries and recognised internationally. Very quickly, the innovative mRNA vaccines (BioNTech/Pfizer and Moderna) were found to be the most effective and became a gold standard on the market. Vaccine production soon became the main bottleneck. Developed countries secured the vast majority of production through advanced purchase agreements. The combination of these advance purchases with measures equivalent to export bans, most notably in the US, United Kingdom and India, and high prices, resulted in a large share of the world population being excluded from access to vaccines. Low- and middle-income countries had to choose between long delivery times for effective vaccines, or purchasing of lower quality Chinese or Russian vaccines.

To counteract vaccine nationalism, the WHO and partners established a special-purpose funding body named ACT-A, the Access to COVID-19 Tools Accelerator. COVAX, the vaccine-dedicated pillar within ACT-A, was established to organise the joint advance-purchase agreements for low- and middle-income countries. But ACT-A struggled both to raise funds from international donors and to conclude contracts with pharmaceutical companies. From summer 2020, vaccination, which was initially a success story of international research, turned into a disastrous cooperation experience characterised by a lack of solidarity. The result was a chain of sub-optimal decisions leading to highly differentiated vaccination rates. By early 2022, gaps in access to vaccines were not yet being filled (Figure 2).

Figure 2: Vaccination rates by level of income, 2021

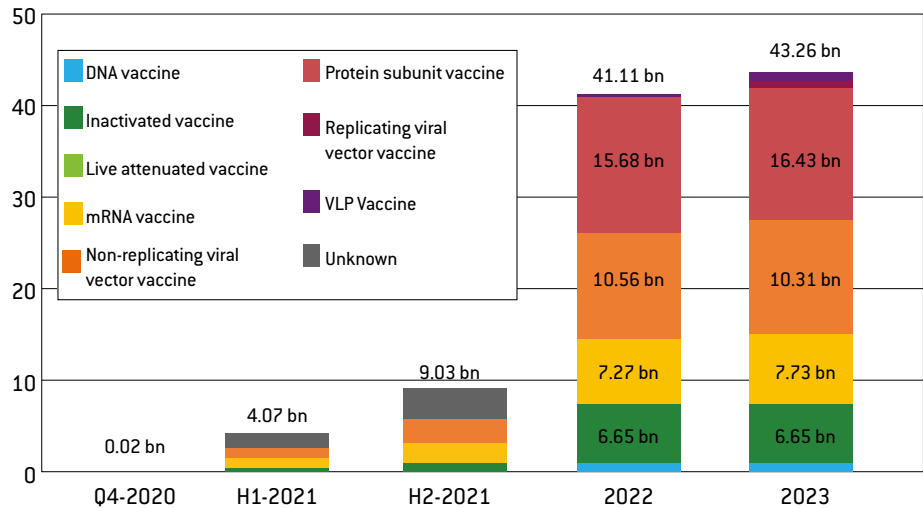


Source: <https://ourworldindata.org/covid-vaccinations>.

Phase 4 on ‘exiting’ revolves around the problems relating to vaccine distribution. At the time of writing, vaccine production no longer seems to be an issue. Consolidated information from suppliers and contracts points to a production level of 13 billion doses in 2021, of which 3 billion were mRNA vaccine doses. In 2022 it could reach 41 billion doses, including 7 billion mRNA doses. This would be enough vaccines and booster doses for the world population (Figure 3). ACT-A funding is less constrained on vaccines and the main gaps are for other cat-

egories. The bottlenecks are downstream, and they seem to be of two sorts: issues of procurement, distribution, and logistics; and vaccine take up, with a likely higher degree of vaccine hesitancy in low-income countries.

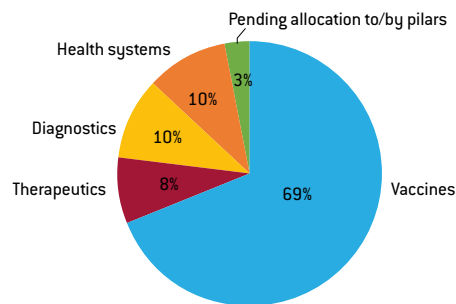
Figure 3: Vaccine production in 2021 and outlook for 2022 and 2023 (billions of doses)



Source: UNICEF Covid-19 Vaccine market Dashboard, available at <https://www.unicef.org/supply/covid-19-vaccine-market-dashboard>.

By the autumn of 2021, lack of funding was no longer the binding constraint that determined access to vaccination. ACT-A was still short of budget but had prioritised vaccination over diagnostics, treatment and the strengthening of public health systems (Figure 4).

Figure 4: Allocation of ACT-A funding in 2021



Source: WHO; see <https://www.who.int/publications/m/item/access-to-covid-19-tools-tracker>. Note: data updated on 13 January 2022.

For Africa, which has the lowest vaccination rates, there is a double penalty. First, financial commitments proved insufficient to reach the WHO-set targets to vaccinate 40 percent of the population by end 2021 and the target of reaching 70 percent by mid-2022 is unlikely to be met. In addition, commitments do not translate into deliveries. By autumn 2021, the main immediate bottleneck was upstream and resulted from a combination of factors: production lags on the side of producers, the slow and unpredictable shipments of vaccines donated by developed countries (in comparison to commitments),

and organisational problems within COVAX⁵.

The poor result in terms of vaccine provision globally⁶ can only be regarded as a failure of collective action. In May 2021, the IMF estimated it would cost the world \$50 billion to reach the vaccination targets (Agarwhal and Gopinath, 2021). By not responding to the IMF call, developed countries chose in effect persistent circulation of the virus among unvaccinated populations at the risk of more virulent mutations. The emergence of Omicron was the consequence of the vaccine divide and jeopardises the gains the health community made against the virus by providing very innovative effective vaccines early in the pandemic.

The story overall is therefore one of remarkable successes and notable failures. Was this a question of incentives for cooperation, the effect of pervasive distrust in institutions, financing channels and partner governments, or the consequence of geopolitical rivalry?

4 Accounting for failure and success in global collective action: an analytical grid

Papaconstantinou and Pisani-Ferry (2021) examined nine policy fields to assess what characteristics success or failure in global collective action can be ascribed to⁷. Their conclusion was that the observed outcome cannot be accounted for satisfactorily either by the pure economic approach that focuses on the nature of the underlying game and the resulting incentive to cooperate, or by the pure legal approach that starts from an assessment of the strength of the international rules and the formal authority of the international institution(s) in charge.

Contrary to what economic logic would suggest, failures or successes in global governance can hardly be ascribed to the sole nature of the underlying game with the different strategies of different players not leading to a cooperative outcome, and the corresponding difficulty of the collective action problem. Strong (climate, migration, taxation) or weak (health, financial safety nets, competition) incentives to free-ride can be found in the nine fields examined. But the objective degree of difficulty in cooperating is by itself no guide to the outcome. It is neither about the strength of incentives nor the strength of compulsion.

It seems, for example, obvious that all countries should be able to rely on a single global financial safety net. Yet this is less and less the case: a growing number of countries have chosen to rely on self-insurance (through the accumulation of foreign-exchange reserves) or on regional safety nets. Conversely, a global competition regime may look impossible to achieve without an implausible agreement bestowing authority to block mergers onto a supranational body; yet extraterritorial decisions by independent competition authorities come close to achieving that outcome.

Another telling example is climate-change mitigation. While it is undoubtedly true that action has been delayed for much too long because solving the underlying puzzle is daunting, the remarkably soft mechanisms of the Paris Agreement have succeeded in triggering a still insufficient, yet real momentum for decisions by governments and private players. So there is more involved in the difficulty of collective action than what can be expected from the sole nature of the underlying game.

5 Sam Fleming, David Pilling and Donato Paolo Mancini, "Erratic" European Covid vaccine donations hamper African jabs rollout, *Financial Times*, 9 December 2021, <https://www.ft.com/content/d0b53ea4-5eef-4bc7-814c-a69b0dfa1c06>.

6 See Our World in Data, 'COVID-19 vaccine doses administered per 100 people', available at <https://ourworldindata.org/grapher/covid-vaccination-doses-per-capita?tab=map>.

7 The nine fields encompass three traditional interdependence channels (trade, capital flows and migration), three behind-the-border policy coordination fields (competition, banking regulation and taxation) and three global commons (public health, digital commons and climate change).

From a legal/political science perspective, what matters instead is the strength of the set of rules and institutions that governs collective action. What should be conducive to success are an international treaty, a body of law that compels states to behave in accordance with a common norm and an established institution able to exercise surveillance⁸. Analysis however indicates that outcomes cannot be ascribed to the strength of the legal and institutional system. A good example is banking regulation: standards are established internationally (by the Basel Committee on Banking Supervision), but their application is not mandatory. Governments are free to implement them or not. Incentives arise from peer pressure and market pressure; these are reinforced by a thorough monitoring process. Conversely, the difficulties of international coordination in the very fields (trade and international finance) where it is best equipped legally and institutionally, indicate that a legal order is not necessarily conducive to cooperation.

Table 3 summarises a reading of the evidence in Papaconstantinou and Pisani-Ferry (2021). Colour codes indicate their subjective assessment of the outcome (green: positive; brown: intermediate; red: deficient). Clearly, the combination of economic logic and legal/institutional logic does not suffice to account for the results.

Table 3: Summary assessment across policy fields

	Weak legal / institutional basis	Strong legal / institutional basis
Weak incentives to cooperate	Taxation Climate action	
Climate action	Banking regulation Competition Digital networks	Trade Capital flows Public health

Source: Papaconstantinou and Pisani-Ferry (2021)

To account for success or failure in the different policy fields, six ingredients are singled out: a joint identification of the problem that collective action must address; shared expertise; common action principles involving ‘don’t do’ requirements and coherent commitments; transparent reporting mechanisms; an overall outcome evaluation process to assess results and adapt instruments; and trusted institutions.

Joint identification has to do with the definition of the problem collective action must tackle. For example, this definition is by now unambiguous in the case of climate-change mitigation (but it has not always been so). It is, however, unclear in the case of migration or the digital infrastructure, about which disagreements start with the identification of the challenge.

Shared expertise has to do with the process through which a common knowledge base is produced and updated. For all the disagreements over the pace of greenhouse gas emission reductions or about effort-sharing, most governments rely on Intergovernmental Panel on Climate Change (IPCC) expertise to gather the evidence, assess future risks and evaluate required efforts. This requires intermediaries able to establish connections between scientific discussion and political decision. This role can be assigned to an institution equipped with an independent staff (like the IMF in the field of international economics), but the experience of the IPCC shows that this is not indispensable. Without a shared expertise, however, the discussion, if any, tends to become exclusively transactional.

Common action principles provide the basic grammar of interaction. International trade was long protected from the escalation of disputes by the fact that fundamental principles

⁸ This approach takes root in Hans Kelsen’s theory of international law. Kelsen (1934) considered that international law must “obligate the states to a specific rule of conduct” and apply sanctions in case of non-compliance.

were laid out in the General Agreement on Tariffs and Trade. Countries could disagree and fight with one another over sectoral issues, while still playing by the same rules. Donald Trump's open advocacy of trade wars and his contempt for established principles destroyed this capital. Conversely, the strength of cooperation between central banks or competition authorities results from their strong adhesion to common principles (such as the avoidance of beggar-thy-neighbour exchange rate policies, or reliance on the effects doctrine for determining the scope of extraterritoriality).

Transparent reporting mechanisms are essential for assessing whether or not partners play by the common principles and deliver on jointly-defined action plans. Such mechanisms play a key role in the field of banking supervision. They are part and parcel of the commitment states enter into when joining the IMF. Their establishment has been instrumental in forging consensus on advances in international tax coordination. Conversely, they are completely absent in fields like migration or digital infrastructure.

An *outcome evaluation process* provides the necessary feedback loop that makes it possible to assess if action carried out is actually conducive to reaching the desired outcome. This is lacking, for example, in the case of trade, where the perception of a growing disconnect between policy choices and the stated goal of prosperity has greatly contributed to undermining support for openness. Instead, a strength of the United Nations Framework Convention on Climate Change process is that pledges (but, admittedly, not yet actual policies) are at least instantaneously aggregated and compared to the yardstick offered by net-zero scenarios. This type of recursive process is indispensable in fields where rules aren't binding and institutions are weak.

The value of a *trusted institution* is that being nimble, institutions are able to adapt to changing circumstances. Challenges evolve and new problems appear. Rules that were perfectly adapted in another context are not suitable when confronted with new issues. This clearly applies to pandemics. These share common characteristics but each brings some novelty also, requiring adaptation. The same applies to international finance: the IMF was created to manage fixed exchange-rate interdependence between a group of financially autarkic Western economies. It has had to adapt to a fundamentally different world.

5 Public health governance: the record in perspective

The assessment presented in section 3 highlights successes and failures of collective action during the successive pandemic phases. The question we want to tackle now is what in the structure of the underlying game, the legal infrastructure, the institutional set-up or other factors affecting the behaviour of players can account for this outcome.

The case for global collective action for pandemic prevention and containment is obvious: viruses know no borders. The global community therefore needs to manage the externalities of pathogen outbreaks. It is in the self-interest of high-income countries to support the fight against pandemics in low- and middle-income countries. This support needs to be fast, strong and sustained to avoid contamination and also mutation of the pathogens into more virulent variants. In practice, global governance should put in place financial mechanisms to help low- and middle-income countries build the core capacities needed for their health systems to be able to prevent, detect and contain epidemics and treat infections. This goes beyond the logic of development assistance, which responds to solidarity and poverty-reduction objectives.

Moreover, pandemic prevention and preparedness require functions that are public goods, such as research or product development and manufacturing of therapeutics and

vaccines (Brown and Susskind, 2020). Provision of these benefits the whole world and, in the absence of global governance, there is a risk of free riding or under-provision. In infectious diseases research for instance, the landscape is dominated by the US, which delivers 60 percent of research (Policy Cure Research, 2020). The experience of the COVID-19 vaccines also shows that the first vaccines to be authorised globally came from projects that were given large and unconditional grants by the US Biomedical Advanced Research and Development Authority. This support was given equally to American and European firms, while support provided by the EU, for instance, was weak.

But the dominant feature is under-provision: the WHO was never given the resources to organise, or even coordinate, the provision of global public goods and coordination functions. It has a budget of roughly \$2.5 billion per year. Any additional programme is financed by voluntary contributions, which are earmarked for specific programmes or targets and make financing uneven and unpredictable. Specific philanthropic organisations have partly filled the gaps: the Bill & Melinda Gates Foundation (\$5 billion), the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), and GAVI (the Global Alliance for Vaccines and Immunisations) for vaccination. Research governance relies on a very loose scheme led by the WHO. The Coalition for Epidemic Preparedness Innovations (CEPI), created in 2016, was a game changer: it doubled the research budget for infectious diseases and was operational in time to organise the development of COVID-19 vaccines. Overall pandemic prevention and preparedness lack a proper governance structure and adequate funding.

A natural starting point to understand what went wrong is therefore to examine more precisely the nature of the underlying game. The game, indeed, differs from phase to phase, as summarised in Table 5, in which the shaded areas in each phase indicate the nature of the game being played, as explained below.

Table 5: Characteristics of the underlying game at each stage of the pandemic response

Problem/aggregation structure	Weakest link	Summation w/ threshold	Summation	Best-shot
Phase 0: Preparing				
Phase 1: Addressing the outbreak				
Phase 2: Responding and containing				
Phase 3: Protecting				
Phase 4: Exiting				

Source: Bruegel.

Adequate prevention of pandemic diseases requires a maximum number of countries to reach a minimum level of preparedness. As there is *ex-ante* uncertainty on where a pandemic may first emerge, overall protection increases with the number of countries covered. But in each of them, there is a threshold, in terms of vigilance, early diagnosis, information-gathering and other factors, below which action is ineffective. This game structure corresponds to what is known as a *summation with threshold* aggregation technology (Bucholz and Sandler, 2021).

The outcome of Phase 1, instead, did not depend on the summation of individual efforts. The containment and eventual eradication of a contagious disease depends on the effectiveness of action wherever the disease has emerged. Containment of the COVID-19 virus would have required early effective action in China, but also in all countries where it had begun spreading. Failure to act in any of these countries would have defeated action everywhere else. This game structure, which is known as a *weakest link game*, is particularly vulnerable to collective-action failures. Its character is well captured by the motto ‘no one is safe until everyone is safe.’

In Phase 2 – at the time of the outbreak – there was no real game to speak of anymore. As virtually all countries were attempting to cope with the same danger, interactions between them played a secondary role. There was certainly a competition for scarce resources, including masks, PPE, ventilators and tests, in which some countries outbid partners and practiced hoarding. Such behaviour was unfortunate, especially for low-income countries, which were left deprived of critically important resources. But it affected the distribution of cases and deaths more than the overall outcome.

The game in Phase 3 was entirely different. The issue then was no longer to protect everyone in order to protect each and every individual, but to muster enough financial and individual forces to develop and produce vaccines. This could have been the result of a collective effort organised under the auspices of the WHO. But self-interest could also drive any country that was large enough and sufficiently scientifically developed to do it by itself. This is actually what happened with Operation Warp Speed, the US government endeavour which, together with lower-scale European initiatives, resulted in the development and accelerated production of mRNA vaccines. The game here was what theorists call a best shot game, where the outcome is determined by whoever makes the best effort. Unsurprisingly, it was the US that played this role, to the benefit of the other countries.

The last phase (in which we are in at time of writing) is best characterised by a game of *summation with threshold*. Health experts no longer consider that the virus can be eradicated, but they emphasise the need for joint containment. The more countries reach a minimum level of vaccination, test and treatment, the lower the risks of new variants spreading and escaping control. Accordingly, the aim of the WHO’s vaccination strategy (World Health Organisation, 2021) was to vaccinate 40 percent of the population in all countries by end-2021 and to reach 70 percent in all countries by mid-2022 (the first was missed and the second is unlikely to be reached).

Game-theoretical approaches therefore contribute to characterising collective action challenges in the various phases of the pandemic. But they do not suffice to explain why coordination of efforts has been so hard to achieve throughout.

Turning to vertical aspects, Table 6 applies to public health the six ingredients identified in the previous section. In the pandemic, the first two, joint identification of the problem and shared expertise, were clearly present (green in Table 6), as demonstrated especially in the scientific and institutional response. This was less the case with the next two ingredients, common action principles and transparent reporting mechanisms (orange in Table 6). For these, the record is mixed, as shown by the difficulties in agreeing on common measures and in accurately reporting the various elements of pandemic management. Finally, there have been significant problems with the last two (red in Table 6): there is no accepted outcome-evaluation process to assess results and adapt instruments, while trust issues continue to hamper the work of the WHO.

Table 6: Applying the six ingredients to public health

The six ingredients	Public health score
Joint identification of the problem that collective action must address	
Shared expertise	
Common action principles: “don’t do” requirements and coherent commitments	
Transparent reporting mechanisms	
An overall outcome evaluation process to assess results and adapt instruments	
A trusted institution (or institutions)	

Source: Papaconstantinou and Pisani-Ferry [2021].

Moreover, the obstacles to collective action in pandemic preparedness and response also include a number of complementary issues:

- **The importance of sovereignty.** Public health is at core a sovereignty issue. A state's responsibility for the health of its citizens cannot be easily shared. Despite the external-ity argument, it has proved for example very difficult for some national governments to export vaccines before they ensure sufficient provision for their own citizens.
- **Budgetary cost.** Maintaining public health in the face of a pandemic, while ensuring resilient health systems and proper preparedness, is costly. The budgetary pressures favour non-cooperative behaviour and complicate collective action.
- **Breadth of approach required.** By nature, pandemic preparedness and response cuts across government policy areas and departments. As with similar public good problems, such as climate mitigation, this requires a 'whole of government' approach, which in turns complicates collective action.
- **Nature of international cooperation.** Public health authorities are under the control of governments. Unlike other policy areas, cooperation between countries cannot rely on the operation of a network of independent regulators sharing common norms and principles, such as in the case of central banks.
- **Fragmentation.** The institutional landscape in health is fragmented. WHO has strong legitimacy but it has never been in command of financial channels. Dedicated bodies such as CEPI and GAVI are small and lack the capacity to scale up. The Bretton Woods institutions would have the capacity but do not enjoy trust.

6 Conclusion and policy directions

The current global public health governance system is clearly not well equipped to deal with the implications of new (and possibly recurrent) pandemic emergencies (Brilliant *et al*, 2021). How likely is it that COVID-19 will bring changes leading the shortcomings being addressed?

A very positive development came from the November 2021 World Health Assembly (WHA) special session⁹, where it was decided to start the process of drafting and negotiating an international agreement, treaty or convention on pandemic preparedness, to be completed in time for the WHA 2024 meeting. It is a unique opportunity to establish a legally binding framework to manage global health security as a global public good. If it succeeds, it would be the second convention under the auspices of the WHO, after the 2004 Framework Convention on Tobacco Control.

In his concluding remarks to the WHA special session¹⁰, WHO Director General Tedros A. Ghebreyesus said: *"The adoption of this decision is cause for celebration, and cause for hope, which we will need. Of course, there is still a long road ahead. There are still differences of opinion about what a new accord could or should contain."*

It is difficult to predict the outcome of this process and whether it will succeed in filling the gaps and overcoming the bottlenecks in global governance that we have identified. We offer in these conclusions some considerations for further reflection.

We expect that this new convention could help strengthen the WHO. But a WHO convention might not fix several issues which require agreement beyond the global health

⁹ The WHA is the decision-making body of the WHO. It is composed of delegations from all WHO member states and determines the organisation's policies. The WHO formally consists of the WHA, the Executive Board and the secretariat.

¹⁰ See <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-special-session-of-the-world-health-assembly--01-december-2021>.

community. The following areas might call for new governance models: (i) entrusting the WHO with new responsibilities, such as the transfer of the ACT-A competence on medical counter-measures; (ii) implementing the needed ‘whole of government approach’; and (iii) making the WHO the financial authority to finance global health security.

A stronger WHO

A global public good requires a trusted institutional set up with supranational powers and adequate resources. The WHA initiative could lead to significant measures to strengthen WHO leadership. Both the Independent Panel for Pandemic Preparedness and Response and G20 High Level Independent Panel (G20 HLIP, 2021) have made recommendations on this. The new convention could replace the current voluntary peer-review process of national preparedness plans with transparent regular audits carried out by the WHO, as is the case in other fields, such as financial stability. Indeed, the International Monetary Fund regularly carries out standardised Financial Stability Assessments comprising for each country an evaluation of potential risks, an assessment of national financial stability policy frameworks and an assessment of the authorities’ capacity to manage and resolve a crisis. In 2010, they were made mandatory for the 25 countries that are home of systemically important financial institutions¹¹. The same logic should apply in the field of public health.

The WHO should also be given strengthened investigative powers in case of outbreaks. As indicated by experience, reliance on information provided voluntarily by member states can result in losing precious time at the critical moment when containment is still possible. The WHO should also remain the single coordination authority for surveillance and the single institution entrusted with the responsibility of declaring a Public Health Emergency of International Concern. Such changes would turn the WHO into an independent standard-setting and surveillance authority for preparedness, prevention and response. A new Pandemic Treaty would confer on the WHO the legitimacy needed to act in the name of global public health, and it would equip it with the extraordinary competences required to counter extraordinary threats. These are responsibilities and competences that cannot be divided.

Responsibility for global medical countermeasures

The creation of ACT-A in the early months of the pandemic was an unprecedented global solidarity effort to provide medical countermeasures. But the experience has shown that a political mandate from the G20 with some financing was not enough to build a proper global response. While the players in the global health field should be thanked for having built a coalition of the willing in the middle of a pandemic, they struggled at each stage: to collect funds, conclude procurement contracts, organise logistics and ensure that programmes reached their ultimate beneficiaries in low-income countries. Transaction costs have prevented collective effectiveness. This difficulty reflects a fragmented landscape where responsibilities are shared between the WHO and other institutions, and where the WHO has no comparative advantage. Organisations including CEPI, UNICEF, Unitaid, GAVI, GFATM and the Bill & Melinda Gates Foundation deliver targeted services, either focusing on diseases or specific programmes like immunisation.

This is not to say that everything should be centralised and standardised. Coalitions of the willing are here to stay. But to be better prepared for future outbreaks, the world needs a permanent ACT-A or at least, a permanent coordination centre, which would work with the different partners or regions, in peace and crisis times. The mechanism should be tailor-made to different tasks: research, technology-sharing and capacity-building for medical supplies, and their procurement and distribution. This requires streamlining and consolidation among existing institutions and initiatives; the WHO with its limited financial and operational track record is not necessarily the best candidate to coordinate ACT-A functions.

¹¹ See <https://www.imf.org/en/About/Factsheets/Sheets/2016/08/01/16/14/Financial-Sector-Assessment-Program>.

A 'whole-of-government' approach

COVID-19 has shown that global health security requires global health governance in the world order to be repositioned and put on par with economic interdependence or financial stability, in terms of governance, institutional backing and resources. Experience has also demonstrated that health ministers by themselves cannot deal with the management of a pandemic. Lockdowns, travel bans, border controls, mass vaccination (and the associated incentives) and the introduction of vaccination certificates are not decisions they can take alone. Such decisions necessarily involve first-order trade-offs between preserving individual liberty and ensuring collective security, or between saving lives and saving jobs, to give just two examples. Political leaders and parliaments are necessarily involved, as they are in the funding of frontier research into the development of targeted vaccines or treatments, and in the subsequent procurement.

This calls for a 'whole-of-government approach' that simultaneously addresses the many aspects of pandemic threats, within countries and at global level. At the global level, coordination between the WHO and other global agencies is called for. These should include the UN Food and Agricultural Organisation, the World Organisation for Animal Health, the UN Environment Programme, the World Bank, the IMF, the UN Office for Coordination of Humanitarian Aid, the World Trade Organisation and other regional organisations, which are indispensable partners in the fight against pandemics.

The future WHO Convention would not be able to organise this coordination because of the implications such coordination would have for sister organisations in terms of resources and mandates. All proposals currently discussed in international forums such as the IPPPR and G20 HLIP (2021) focus on a global body in which the WHO would play a major role, but which would integrate a broader range of parties. The central body would provide political impetus and coordinate relevant parties for pandemic prevention and response¹². Proposals include the creation of a UN-based Global Health Threat Council at heads-of-state level, or a Global Health Threat Board based on an extended G20, in which finance and health ministers would sit together. Common to all proposals is strengthening of the WHO in parallel, but none consider WHO-centred governance as the way forward.

Adequate funding

With better governance and leadership, the global health community will be in a stronger position to address funding issues. COVID-19 has revealed shortfalls everywhere: in the preparedness of national health systems, surveillance both for outbreak detection and containment, shortages and misallocations in critical medical supplies. No country should again experience shortages of masks and oxygen at the peak of the pandemic. The emergence of the Omicron variant is a reminder of the cost of failing to vaccinate low-income countries. All countries have an interest in getting this right as early as possible¹³. The G20 HLIP has estimated that pandemic prevention and preparedness would cost the world \$15 billion per year.

In the 1990s, joint efforts led to the setup of the Global Environment Facility. It is a vehicle to mobilise and distribute funding across agencies in order to realise the commitments under international environmental and climate change conventions. Global health security threats resemble in many ways environmental disasters, and in designing a pandemic prevention and preparedness mechanism, the global health security constituency should learn from and replicate what has worked in the environmental field.

In short, in light of the experience of COVID-19, the roadmap for the treaty should help reform the WHO to turn it into a strong and independent standard-setting and surveillance authority. But further reflection is needed on the other pillars of global governance: specific

¹² See for example the foreword in G20 HLIP (2021).

¹³ It should be noted that the cost of developing and producing COVID-19 vaccines has been remarkably low.

Financial issues would be magnified in a pandemic in which containment or treatment prove much more costly, as for example for HIV/AIDS.

cooperation schemes or structures for operational aspects linked to essential medical supplies, a G20-type body to provide leadership and ensure a whole-of-government approach at global level, and, finally, a self-standing fund.

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