

## Situational Analysis of Pandemic Lessons and Future Preparedness

SARS-CoV-2 is the most disruptive virus the world has faced in a century, in part because of the virus but also because of human responses to it. This followed a series of recent epidemic wake-up calls that were largely ignored at the global level. Without fundamental change it will not be the last, nor even the worst, pandemic. The current heightened attention around the world is an opportunity to fundamentally reconfigure our preparedness for and responses to pandemic risk.

With the SARS-CoV-2 pandemic still ongoing and presenting an acute threat to global health, charting a path out of the current crisis is the first step. A virus that has become endemic will not disappear, nor will it be quickly eradicated. Recent mutations have made the virus more transmissible, and there is growing evidence that some of the new variants evade some current vaccine protection. It is conceivable that further mutations will produce more transmissible variants that are less virulent or even harmless, but matters could also go in the other direction. We do not yet know how long the vaccines currently available will protect, nor the extent to which they will slow transmission of the virus. A better understanding of these will empower policy decision-makers to safely release nations from lockdowns and employ test-and-trace and other interventions. Yet, political leaders are susceptible to pressures causing them to frame solutions in terms of their short-term impacts, and to take actions that are all too often aligned more with domestic political interests than with international health priorities, and are consequently insufficiently global. The lack of globally coordinated long-term strategies and planning will leave many countries vulnerable to future instances or cycles of potentially severe outbreaks, with populations still at risk of infection and the possible long-term effects of Covid-19. A global strategy and coordination is needed to guide the reconfiguration of vaccines and their manufacture and distribution internationally, to mount regular, equally accessible, and annual vaccinations.

A more effectively coordinated collective escape from the pandemic will be based on what we have learned so far, in many areas, including, but not limited to: Government preparedness (surveillance, hospitals, science investment, public engagement, and much more); the strategy and timing of lockdowns; control of cross-border population movements; provision and procurement of PPE; effectiveness of test-and-trace; protection of vulnerable populations, especially care home residents; the development and roll out of vaccines; the development of pharmaceuticals and other interventions; the use of scientific advice and public engagement in science; the impact of the virus on vulnerable communities, health and social inequality as drivers of the pandemic and in making its harms fall disproportionately on the more vulnerable. We have much to learn from how resource-poor countries have managed the pandemic and how more obviously wealthy countries failed so badly. A holistic and comprehensive reflection on the pandemic will require us to bring together the political, social, economic, and medical science dimensions to understand why certain health programmes and policies worked and others failed.

Any strategy for future pandemic response must comprise activities across several layers:

- The best way to tackle pandemics—involving the least loss of life, economic damage, and global hardship—is to stop them before they begin and to reduce

the vulnerability of populations to their impact by tackling underlying health risks and inequalities. This requires reshaping the human relationship with nature to reduce the risks of animal to human spillover events in the first instant, stronger global surveillance (viruses and the species carrying them, populations at risk, waste-water analysis, environmental sensors, monitoring, AI, etc.), global Early Warning Systems, and immediate action on pandemic threats.

- If, nevertheless, outbreaks start, the next step is quick interruption of chains of infection, and the ramping up of local and global prevention and treatment capacity. This requires better grasp of the real-time 'on-the-ground' situation—epidemiology, virology, testing, and comparable data across countries to guide responses—and stronger health systems, including in some of the poorest and most vulnerable populations on the planet.
- If the above responses fail and a virulent virus is highly transmissible, a mechanism is needed to support, ahead of that time, the research, development, and manufacture of always-close-to-ready vaccines, medicines, and diagnostic tools, and their rapid and equitable global deployment.

All of the above need stronger health systems and policy research (HSPR), especially in low and middle-income countries, that can support local evidence-based public health. This means not just an increase in funding, but also institutional capacity strengthening, so that policy can be grounded in local evidence. It also needs a mindset that actively seeks the right balance between basic science, clinical science, and health system and policy research.

All of the above need to be linked together by more effective global health governance mechanisms. We will collaborate with many others in creating an improved, possibly new, global institutional, financial, and data-gathering framework to monitor threats and coordinate responses that priorities local responders. This will build on the lessons learned from the current pandemic—its social, political, economic, and medical dimensions—and take advantage of the huge recent investments into new technology platforms as the bedrock of a future pandemic response mechanism.

The above-described situational analysis is neither meant to be an exhaustive list nor a comprehensive summary of the key issues. Its goal is to serve as a basis for discussion within the PLFP GHS group. We hope that the multi-disciplinary and international expertise gathered in the group will allow for an informed exchange on the strategies employed at various time points in different locations as well as a nuanced and open reflection on their effectiveness, underlying mechanisms, and constraining or facilitating factors. We hope that such an exchange will promote effective responsiveness to the next stages of the Covid-19 pandemic. The discourse will serve to 1) identify any key challenges or pandemic response omitted in the summary above, 2) bring clarity regarding the contextual factors, impacts, and interdependencies of pandemic response strategies utilised, and 3) serve as the basis for a future, globally co-operative, pandemic response and preparedness action plan.