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GUEST EDITORIAL

COVID-19 pandemic: looking back, looking forward

The COVID-19 pandemic that spread to ten countries by January 2020, and to 200 by April, still raging, is like a science-fiction drama; the whole world is its stage and all the people, actors and spectators. The script is written largely by the virus and in varying measures by scientists, media and the public.

In 2018, two United Nations agencies – World Bank and the World Health Organization (WHO), established a 'Global Preparedness Monitoring Board' (GPMB) to prepare the world to respond effectively to global health emergencies. India is represented on this Board. The first GPMB report in September 2019, aptly titled 'A world at risk' stated: 'If…what's past is prologue, then there is a very real threat of a rapidly moving, highly lethal pandemic of a respiratory pathogen killing 50 to 80 million people, and wiping out nearly 5% of world's economy. A global pandemic of that scale would be catastrophic, creating widespread havoc, instability and insecurity. The world is not prepared.' Today in retrospect, was not the ongoing pandemic predicted?

India's COVID-19 epidemic graph, a composite of overlapping epidemics in States, Union Territories, cities and villages, peaked in September this year; since then, the daily numbers of infections are declining steadily. As an infectious disease physician, let me warn that for those who have escaped infection so far, this is no good news – the epidemic is not over and risk of infection continues. One mutation, D614G has rendered the current virus strain more infectious than the parent D614, without altering immunogenic specificity. Virulence is probably declining due to other mutations, partly explaining a declining trend in case-fatality.

The Indian Council of Medical Research conducted two national stratified sample surveys (11 May–4 June 2020 and 17 August–22 September 2020) for antibodies. Together, the survey results suggest that there are 30–100 undetected infections for every laboratory-diagnosed infection. Diagnosed infections have crossed 8 million; hence the total may range between 240 and 800 million – for herd immunity between 20% and 60%. If 50% of the population is already infected, no major second wave is likely. The epidemic will transition into an endemic state in the first quarter of 2021.

The epidemic profile indicates that we have not been successful in flattening the natural curve; but why?

Current tests detect binding antibodies to a surface antigen – S1, S2, RBD or N. All these are poor correlates of neutralizing antibodies. Also, antibodies take about four weeks to reach detection level and decline in a large proportion to undetectable levels over a 2–3 month period. So the survey results could be providing us with gross underestimates.

A key control principle recommended by GPMB was the whole-of-society approach (WSA). India had rehearsed WSA for successful AIDS control in the 1980s and 1990s. Correct and comprehensive information to the public through 'information–education–communication' and culturally appropriate behaviour change education, together formed a 'social vaccine'. Red-ribbon clubs in educational institutions are its legacy. When people took personal responsibility to protect themselves and their families, half the battle was won. In 2020, this approach does not seem to have been adopted.

Wearing facial mask was needed as a new behaviour. Countries with oriental culture taught us its value – to make 'essential social contacts' safe. Countries with European culture scientifically evaluated it. Consequently, today universal mask-wearing is considered equal to a vaccine, with about 75% protective efficacy from severe disease and death.

Early on, the country attempted to block all social contacts through nation-wide lockdowns. While this did not control the spread of the virus significantly, it has resulted in severe collateral damage to the economy – for families and collectively for the nation – and to mental health in all its ramifications. We do know that local lockdowns have a useful role, if titrated against the need to flatten local epidemic curves where and when needed, but not as a prophylactic blanket over all of India.

GPMB recommended emergency vaccine development. In 2017 a 'Coalition for Epidemic Preparedness Innovations' had been established to facilitate the same. The Chief Scientific Advisor of the UK Government designed a budget-supported 'Vaccine Task Force' in May 2020, to ensure the whole of its population access to vaccines as soon as possible. It financially supported vaccine

development by small biotechnology companies and big pharmaceuticals, and negotiated advance purchase agreements so that vaccine pricing will be on no-profit basis during the epidemic. It created a registry (enrolment already crossing 295,000 volunteers) of those at high risk of severe disease, for priority vaccination. It also supported a platform of standardized high-throughput assay of binding and virus-neutralizing antibodies and T-cell immunity, available to all vaccine-developers. It developed a plan for vaccination – mass vaccination sites, mobile units and teams to visit care homes for the elderly and home-bound citizens. It also obtained regulatory approval for a cocktail of virus-neutralizing antibodies prepared by a private company, as prophylactic passive immunization for those who are severely immunosuppressed and cannot benefit from vaccine. Two vaccines – adenovirus-vectored and adjuvanted spike protein – are in phase-3 trials under its watch. Most probably, vaccine(s) will be available in the UK, months before any Indian vaccine gets regulatory clearance.

The pandemic is a spotlight on the world's vulnerabilities as sketched in the GPMB report, and on the unanticipated brokenness of the world. We should learn lessons for a future pandemic, which is more likely than not to happen; its time unpredictable.

Rational thinking, cause-and-effect logic and sanctity of verified evidence should become a part of our psyche. How are new diseases recognized anywhere? Public health surveillance is the key. It is a legal system requiring all doctors and healthcare stations to report every infectious disease event of importance, particularly in case of death, to a designated local-level (e.g. district, province) public health officer. If aetiology is not detected by the healthcare system, the Public Health Department must investigate and identify the causative microbe. For healthcare, the matter is about one patient here and there, but for public health it is about risk to the entire local community. New disease recognition is a tango between healthcare and public health. If public health fails to identify the aetiology, help from academia must be sought. Public health is accountable to the nation and to the world.

In 2002, SARS broke out in China, but was missed as a new disease. After it reached Hong Kong and Vietnam, international scientists discovered its aetiology and helped WHO to assume global leadership. WHO set ground rules for all the countries. With global compliance the pandemic was eradicated within a year – from 27 affected countries, India included. WHO's leadership, international scientific cooperation and China's the then transparency contributed to the exemplary achievement. In 2020, with 'SARS version two', all SARS success factors malfunctioned. The world did not come together to address the issue. The world exposed its brokenness, unprecedented since the establishment of the UN agencies.

Public health infrastructure, essential to establish public health surveillance in India, continues to be inadequate to prevent and control communicable diseases that are amenable to available intervention tools. To fulfill international commitments we have created vertical single-disease projects against tuberculosis, malaria, kala-azar, leprosy and AIDS. Childhood immunization programme is also vertical, without target-disease surveillance. Our Integrated Disease Surveillance Project fits with the vertical style, and fails to meet the definitional and functional requirements of public health surveillance.

Without public health surveillance we do not have reliable data on infectious diseases and consequent deaths, a stark reality made bare during the pandemic. Also, we have no platform for vaccinating a broad age range of people against COVID-19, when vaccine becomes available. If India can establish a brave new world of public health and universal primary/secondary healthcare, if only to mitigate the aftermath of the avalanche of COVID-19, then the lessons we learned from the pandemic could be used to construct our own 21st century health management system.

Since 1976, we have been discussing universal healthcare, but have not achieved it. Without public health and universal healthcare, we will not be able to control any of the many communicable diseases, including tuberculosis that kills over a thousand people each day, and the so-called diseases of the most impoverished – typhoid, cholera and dysentery. Ironically health, instead of creating wealth, drains it in India. Two of our success stories – eradication of smallpox and polio were based on international agenda and design. AIDS control was by indigenous design, illustrating our technical competence.

It is high time we designed our own health management system with the three pillars, public health, universal healthcare and meaningful research to constantly raise the bar for all of them. If we achieve this, our agonizing experience with COVID-19 epidemic can be used constructively to prepare the nation to be ready to face the next pandemic whenever it emerges.

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