Editorial

Public Health is Key to Pandemic Preparedness

As the world is reeling under the impact of Covid-19 in 2020, health systems across the world have caved under the surging numbers of seriously ill persons crowding hospitals and fighting for life in intensive care. While hospital capacity was perceived to be the immediate challenge in the initial stages, the need for building stronger public health systems emerged as the enduring priority for pandemic prevention, preparedness and prompt response. The fact that zoonotic outbreaks have been recurring threats in different parts of the world, over the past 60 years, has placed the anticipation and attenuation of potential pandemic threats high on the global health agenda. This cannot be accomplished without strong public health systems.

It must be recognized, by all societal stakeholders, that a swift and strong surge response to a public health emergency cannot be generated by a country unless it has an efficient and equitable health system functioning competently in the steady state prior to the emergency. Even for meeting the health targets embedded in the Sustainable Development Goals,[1] a strong public health system is needed. This is especially true for achievement of universal health coverage. Only if the pre-pandemic health system is strong, can a country respond energetically to the new threat without derailing the services that are directed towards achievement of other health goals.

Early recognition of a potentially infectious disease-related pandemic threat calls for efficient microbial surveillance systems. In the context of zoonotic threats, it requires an integrated surveillance system that can quickly detect, track and curb the migration of microbes from forest dwelling animals and birds to humans, either directly or through an intermediate animal host. This calls for adoption and strengthening of the One Health approach[2] that gathers and connects surveillance data from forest dwelling wildlife, captive bred or free-living veterinary populations and human communities. Several government agencies ranging from forestry and environment to public health, agricultural universities and research laboratories need to be engaged in this collaborative effort. The Indian Council of Medical Research and the National Centre for Disease Control need to connect and convene other agencies and institutions at the Central and state level, to establish a well-functioning countrywide network that unifies and analyses data from multiple sources. Even wastewater surveillance, of sewage samples, has acquired importance in this regard.[3]

Microbial surveillance among humans requires early detection of infected persons. While testing for virus detection in nasal or throat samples is done by nucleic acid tests such as the reverse transcriptase-polymerase chain reaction (RT-PCR) or rapid antigen tests, their use is guided by reported symptoms, history of contact with an infected person or travel from a high transmission location. This requires public health personnel, both to elicit such history and to collect the samples. Detection of a positive case needs to be quickly followed by forward and backward contact tracing of persons who the infected person had interacted with prior to and after becoming symptomatic. While technology helps through digital tracing applications, even high-income countries have recognized the need for trained public health personnel as essential for effective contact tracing.[4] This is a gap that India must address.

Laboratory capacity for viral testing must be increased, with regional imbalances addressed. After the H1N1 outbreak in 2009, India expanded the laboratory network for surveillance. However, the large-scale Covid-19 pandemic required greater capacity, well beyond the available public and private laboratories. Limitation of laboratory capacity particularly posed challenges in smaller towns and rural areas of many states. While rapid antigen tests can be used for convenience, their sensitivity is lower than

that of the RT-PCR tests. Block level laboratory capacity should be created for disease surveillance. Genomic analysis is also needed to detect viral mutations and emergence of variants. Such capacity should be available in every state, for analysis of 5%–10% of samples that test positive for the virus. Screening for an infectious disease, in pandemic situations, must be an established practice at all points of entry into the country, whether by air, sea or land.

Primary healthcare is an under-recognized but highly essential component of pandemic response. Early alerts of new infections and growing clusters can come from frontline health workers, community-based voluntary organizations and citizen groups who together constitute the primary care coalition. From early case detection to contact tracing, and supported home care of mild cases to prompt referral for advanced care, primary healthcare services play a major role in pandemic response. Behaviour change communication, whether for wearing masks or accepting vaccines, works best through community networks linked to primary care. Lack of investment in urban primary healthcare has been the Achilles' heel of India's early response to the virus as it entered and spread through dense urban populations. Primary health services for urban slums continue to need attention.

Secondary level healthcare services too need to be strengthened as many hospitalized patients do not need advanced intensive care. District hospitals need to be upgraded for this purpose. Emergency medical transport systems too need to be reinforced. Critical care facilities need to be augmented in medical college hospitals and district hospitals. Restrictions on mobility have also resulted in legitimizing the use of telemedicine, which has proved to be valuable in bridging distance for providing needed medical advice directly to patients or to primary care providers.

All of these measures require greater investment in building a multi-layered, multi-skilled health workforce that can serve at different levels of healthcare. Expanding our primary healthcare workforce is an immediate priority. Training more doctors, nurses and technicians for more advanced levels of care needs investment. From epidemiologists to microbiologists and public health programme managers to behaviour change influencers, many areas of expertise would be required in greater supply for improving our pandemic preparedness and response. We need public health training institutions to grow in number and multidisciplinary strength across the country. The public health institutions will have to re-double their efforts to train a larger number of public health professionals with the right skills to manage the challenges of the present and the future. Basic public health skills should be an essential part of the curriculum for all healthcare providers. While the curriculum for doctors and nurses does include public health skills, we will have to revisit the curricula for our allied healthcare professionals so that graduates acquire and retain a broader public health perspective throughout their career. Public health skills should be a *sine qua non* for all healthcare providers, right from the frontlines to the tertiary care level.

Pandemic preparedness needs one more important ingredient to the recipe. A successful pandemic response needs team-work between functionaries at the community level, between various departments at the district level and above. Collaboration is the key to evolve a coherent and comprehensive public health response. The intersectoral collaborative response that has been evident during the pandemic must become a norm while handling future threats to health. Health administrators at the district and state level must make efforts to sustain the intersectoral collaborative mechanisms that have been developed during the pandemic response.

The recommendation of the National Health Policy (2017), to create public health management cadres[5] in every state is yet to be implemented in most states of India. The Covid-19 pandemic should dispel the inertia that enveloped our public health system and should revamp and galvanize efforts to make it ready to respond to future pandemic threats with speed and success, while delivering all other health benefits expected of it even in a non-emergency steady state.

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