How Prepared Is India to Control the COVID-19 Pandemic?

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The SARS-CoV-2 infection, COVID-19, has reached many places in India, from Kerala to Kashmir. With local spread occurring from infection seeded by importations, a nationwide epidemic of unprecedented seriousness is imminent. The Prime Minister should assume leadership immediately and a full-time war-room, run by a task force with the best national experts, must be set up, and immediate, medium- and long-term strategies designed and implemented. We have lost one month already.

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The epidemic of the novel coronavirus disease, COVID-19, instils fear and anxiety for four reasons: rapid spread, reports of many deaths, lack of specific treatment, and gaps in our knowledge about its spread and behaviour. The current epidemic is unlike all previous ones—mighty spreader, moderate killer. Pandemic influenza H1N1 (swine flu) on the other hand was a rapid spreader, but weak killer. India has faced several such "new disease" outbreaks in the last three decades. How has India fared against them? What lessons have these outbreaks taught us?

A History of Outbreaks

In 1984 HIV reached India, unnoticed. While in other countries the public health system was tracking and tackling the epidemic, the lack of public health infrastructure was sorely felt in India. In 1985, the Vellore Christian Medical College's (CMC) Centre of Excellence in Virology, funded by the Indian Council of Medical Research (ICMR), established a cell to investigate the epidemic. HIV infections were thus detected in Vellore, Chennai, and Madurai in early 1986 (John et al 1987; Simoes et al 1993).

Immediately, the ICMR established a task force to design national strategy in order to control the spread of HIV/AIDS and mitigate the human suffering it caused. The CMC's experts guided the design of interventions and "sentinel surveillance" in order to monitor progress. The task force was later absorbed into the Directorate General of Health Services; in 1992, World Bank-supported National AIDS Control Organisation took over the project. India's HIV control success story is a globally acclaimed one, thanks to an early start, a proactive task force leadership, the right interventions, and reliable data.

Unfortunately, it still remains a "vertical" one-disease programme, like those against tuberculosis, malaria, leprosy, and polio. The elimination of polio due to wild poliovirus strains taught us lessons too. A national expert advisory group guided all interventions. Real-time surveillance helped fight local spread and monitor polio epidemiology. If we had a public health department, like in Sri Lanka or Thailand, this one-disease focus, economically wasteful, would have been unnecessary. However, India did not profitably exploit the legacies of polio elimination in this decade or of smallpox eradication in the 1970s. Repeated calls to establish a public health department to subsume control of all diseases remain unheeded (Das Gupta 2005). After all, temporary shamianas, however ornate and spacious, get dismantled after use; a pukka building is a permanent asset.

In 2001, the Nipah virus outbreak hit Siliguri, West Bengal, but remained undiagnosed in spite of 66 cases and 48 deaths. It was eventually diagnosed by a laboratory in the United States (US) in 2006 (Chadda et al 2006). When it reappeared in Nadia, West Bengal in 2007 and in Kerala in 2018, outbreaks were quickly diagnosed and contained. But, are not all states, from West Bengal to Kerala, at risk then? Nipah may strike again at unexpected times and places, and every state must be prepared. The central ministry of health must ensure that all states have action plans that could be applied immediately if an outbreak occurs.

Severe acute respiratory syndrome (SARS) emerged in China in late 2002, and began spreading globally in early 2003 from secondarily infected countries: Hong Kong, Vietnam, and Singapore. India followed the World Health Organization (WHO) protocol for screening air travellers from infected places, and testing and quarantining those suspected of being infected. All nations followed the protocol, and the spread of SARS coronavirus was interrupted by mid-2003, after infecting 27 countries, with 8,096 cases and 774 deaths, a case fatality rate of 9.6%. SARS was a very weak spreader, but a mighty killer.

In 2009, India tried to stop the entry of the pandemic influenza H1N1 by screening all arrivals at airports, but, as a stealthy virus, it entered and spread fast and wide. What was appropriate for SARS prevention did not work for the flu. However, no task force was established, no strategy was designed, and all responses were reactive and ad hoc. Testing labs were few and far between, and people assembling at these labs accelerated its spread, illustrating a lack of public health wisdom. Globally, the virus has stayed on as endemic or seasonal. After the pandemic phase was over and the disease became endemic, both the government and the public lost the fear of the disease. The persistence of H1N1 virus was nonchalantly accepted and tolerated, without any control measures or even an immunisation programme using the available influenza vaccine.

Anticipating a Pandemic

We will skip, for brevity, the chikungunya (2002) and Crimean-Congo haemorrhagic fever (2011) outbreaks and fast-forward to 2020. The behaviour of the coronavirus, called SARS-CoV-2 that causes COVID-19, is closer to pandemic flu H1N1 that has persisted as seasonal flu, than SARS that was eliminated quickly. SARS-CoV-2 cannot be blocked with screening of passengers arriving from infected countries for various reasons. Like with the H1N1, the virus can escape detection in spite of screening. We must anticipate widespread transmission and eventual endemic persistence.

On 2 February 2020, SARS-CoV-2 had reached 24 countries outside of mainland China, Hong Kong, and Macau. Within a week, three persons were diagnosed with infection in Kerala. Recognising its seriousness, establishing a national task force should have been the immediate next step. By end February, the number swelled to 43 countries and in first week of March, to 78. Early in the second week in March the number of infected countries has already increased to over 100. Screening and quarantining infected persons will work only to an extent in slowing down the spread of the virus, which is now happening at a furious rate, and in some places, stealthily.

Community transmission, without contact with persons with COVID-19, is already a recognised threat in Singapore and the US. The number of infections is increasing rapidly in India too; as of 11 March, 63 infected people have been detected. As the virus adapts more to humans over time, we expect its virulence declining, but infectiousness increasing. It is likely that the virus will spread universally, reminiscent of a pandemic flu, and finally become endemic. This projection is not comforting as mortality depends on spread, virulence, and healthcare standards.

Inhaled viruses infect the upper respiratory tract (URT) or lungs, or both—a function of the distribution of virus-binding receptors. H1N1 infects the URT and is easily transmitted as droplets expelled by cough/sneeze contain a high load of the virus. SARS coronavirus infected only the lungs and was not easily transmitted. SARS-CoV-2 infects both the URT and lungs, and is hence easily transmissible like influenza. Transmission happens during close contact, via droplets of oral/nasal fluids disseminated by cough/sneeze that are then inhaled by those in the vicinity, and via "fomites," viruses deposited on surfaces, carried by fingers after touching door handles, table tops, towels, etc, and self-inoculating by touching one's nose, eyes or mouth. Fortunately, it is less virulent, with a case fatality rate of 2%–3% in Wuhan, China, the epidemic epicentre, and about 1% or lower outside China.

The case fatality rate in India needs to be monitored well. If the standard of care is not as good as in other countries, our case fatality rate will be higher, as illustrated below and by the H1N1 experience. We are 1.3 billion in number, with 800 million adults. Children seem to be mostly spared, but that may be just illusory in the absence of good epidemiology and robust data. If 10% of adults get infected (80 million) and 10% of them developed severe illness (8 million; in particular, the elderly, those with diabetes, chronic lung diseases, etc, who are more vulnerable), 80,000 may die at a 1% case fatality rate, and 1,60,000 at a 2% case fatality rate, all in one year. We can only imagine the magnitude of problems if more people get infected, say 20% or even 50% to 60%. In addition, healthcare workers have an unfair burden of infection, accounting for some 2% of all cases in China. If the same were to befall health workers in India, our ability to handle patients in hospitals would be under severe stress. Our economy too, already not robust, will further fall. This is not a forecast, but just an estimation for planning responses.

If a rural farmer develops pneumonia, the probability of a cause-specific diagnosis is near zero. A rich business person in a city will most likely get a diagnosis, the cost paid out of pocket. If someone brings in a COVID-19 infection and travels to a place distant from a city, a rural farmer getting COVID-19 is not an unrealistic or far-fetched possibility. Most district hospitals, however, do not yet have influenza diagnostic capacity. If the coronavirus infection reaches an unexpected place, a cluster may develop before the diagnosis is established. Then it will be difficult or even impossible to trace and track all persons in contact with every infected individual. Hence, universal healthcare and public health with readily reachable laboratories are essential. Universal quality healthcare is the right of citizens, and every case of respiratory distress syndrome, or for that matter any severe illness like encephalitis, even in the remotest villages, deserves diagnosis by laboratory methods.

The Way Ahead

While access to up-to-date laboratory tests is an obvious need, India urgently requires short-, medium- and long-term strategies. Health management must be supported by research, which is both curiosity-based and problem-solving. Curiosity-based research is mostly done by academia in universities, while problem-solving research cannot wait for slow academic performance, but should be commissioned and funded by the health management system for quick answers.

It is still well worth, nay imperative, that a task force is established with the best brains—experienced and competent. The task force members should be dedicated full-time to this one epidemic, work full-time and make daily decisions. All officers in government departments

have their regular work, and so a task force made up of such officers will not be efficient—if they are to serve on the task force they should be relieved from regular work and assigned to the task force full-time. The task force, which should be established by the Prime Minister, must guide immediate crisis management and also design short-, medium-, and long-term strategies for control of infection and community outbreaks. A crucial function of the task force would also be to disseminate authentic information on outbreaks and squash fake news.

Gathering of real-time information for immediate action, and not merely summary reports on statistics, is the function of true public health surveillance. Following the 1994 putative plague outbreak in Surat, the Government of India had appointed a Technical Advisory Committee, which recommended district-level disease surveillance in all districts in India (GoI 1995). Instead, a secondary data collating mechanism, called Integrated Disease Surveillance Project (IDSP), was launched (John and Jitesh 2016). So, today we have no reliable or real-time counts on flu cases and mortality. The reported case fatality rate in 2017–19 ranged between 4.2% and 7.4% (NCDC 2020). A review quoted 981 deaths among 27,236 lab-confirmed cases of flu in 2015, with a fatality rate of 3.6% (Murhekar and Mehendale 2016). A publication from Bhubaneswar, Odisha, reported a 15% case fatality rate in hospitalised patients (Dwibedi et al 2019). In other countries, the case fatality rate for flu is 0.1%; the 30-fold to 150-fold higher case fatality rate in India is probably, partly, due to the lack of intensive care facilities in many hospitals.

To recap, a health management system is complete only when both arms of modern medicine—universal healthcare and public health—are functional in all population units in a competent and standardised manner. However, India's healthcare is not "universal," but patchy and mal-distributed. When we look at the potential of COVID-19 developing into a national-level epidemic in the coming days, with no task force in charge and no national strategy, but only reactive responses, no functional public health and no public health surveillance, and no strengthening of healthcare services in all districts with adequate laboratory diagnostic capacities, is it going to be business as usual in India?

REFERENCES

Chadda, M S, J A Comer, L Lowe et al (2006): "Nipah Virus-associated Encephalitis Outbreak, Siliguri, India," *Emerging Infectious Diseases*, Vol 12, No 2, pp 235–40.

Das Gupta, Monica (2005): "Public Health in India: Dangerous Neglect," *Economic & Political Weekly*, Vol 40, No 49, pp 5159–65.

Dwibedi, B, J Sabat, S Dixit et al (2019): "Epidemiological and Clinical Profile of Influenza A(H1N1) pdm09 in Odisha, Eastern India," *Helion*, Vol 5, No 10, e02639, viewed on 6 March, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6812237/.

GoI (1995): "Report of the Technical Advisory Committee on Plague," Government of India, New Delhi.

John, T J, P G Babu, H Jayakumari and E A F Simoes (1987): "Prevalence of HIV Infection in Risk Groups in Tamilnadu, India," *Lancet*, Vol 1, No 8525, pp 160–61.

John, T J and V Jitesh (2016): "India's Integrated Disease Surveillance Project: An Appraisal," *Frontiers in Social Pediatrics* (second edition), A K Patwari and H P S Sachdev (eds), New Delhi: Jaypee Brothers Medical Publishers, pp 267–75.

Murhekar, M and S Mehendale (2016): "The 2015 Influenza A (H1N1) pdm09 Outbreak in India," *Indian Journal of Medical Research,* Vol 143, No 6, pp 821–23.

NCDC (2020): "Seasonal Influenza (H1N1)—State/UT-wise, Year-wise Numbers of Cases and Deaths from 2013 to 2020 (till 23rd February, 2020)," National Centre for Disease Control, Ministry of Health, Government of India, New Delhi, viewed on 6 March, https://ncdc.gov.in/showfile.php?lid=280.

Simoes, E A F, P G Babu, H M Jayakumari and T J John (1993): "The Initial Detection of Human Immunodeficiency Virus 1 and Its Subsequent Spread in Prostitutes in Tamil Nadu, India," *Journal of Acquired Immune Deficiency Syndromes,* Vol 6, No 9, pp 1030–34.