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FIGHTING A VIRUS, YET AGAIN: HOW CONTROLLING THE NIPAH OUTBREAK HELPED KERALA TO TAKE ON COVID-19

Relevant for: Developmental Issues | Topic: Health & Sanitation and related issues

An ambulance driver waits outside Cochin International Airport for the 15 students returning from China. | Photo Credit: Thulasi Kakkat

On January 30, Swaraj Round in the heart of Thrissur town was bustling as usual. Shops were open, and vehicles crowded the streets. Around 2 p.m., however, suddenly all hell broke loose. The very calm yet grave-looking Health Minister of the State, K.K. Shailaja, had just made a formal announcement on television. The **first imported case of the novel coronavirus** (COVID-19) in India had been confirmed in Kerala, she said. The patient was being monitored in Thrissur town at the General Hospital located on Swaraj Round. The patient was a female student who had returned home from Wuhan, the epicentre of the **COVID-19 outbreak in China**.

As the news spread, panic-stricken people formed queues outside pharmacies to buy face masks. Others covered their faces with dupattas and hurried home. Patients from the General Hospital quickly got themselves discharged. Breathless coverage unfolded on news channels.

The girl was one of the hundreds of **Malayali medical students studying in Wuhan** University in Hubei Province. She had come home for the Lunar New Year holidays. She had reached Thrissur on January 24 via Kolkata and Kochi. Seeing an alert about the virus, she had gone to the nearest primary health centre at Mathilakam to inform the health officials about her travel. As she did not have any symptoms then, the officials gave her the number of the District Surveillance Officer and asked her to dial the official in case she came down with a flu. When she developed a sore throat three days later, she promptly contacted the officer and was rushed to the hospital. She was placed in the isolation ward and her blood/throat swab samples were collected and sent to the National Institute of Virology in Pune for testing. Thrissur was anxious and afraid, but Kerala was prepared.

Late in December, when news about the mystery Chinese virus trickled in, Kerala, like the rest of the world, watched the evolving situation, concerned. Days later, as the number of patients with COVID-19 steadily grew, China began to initiate extraordinary measures. It temporarily shut down public transport and locked down entire cities. Immediately, in distant Kerala too, surveillance and emergency preparedness measures began to be launched.

All about the China coronavirus COVID-19 | COVID-19 patient discharged from Kerala hospital, in home

As soon as the World Health Organization (WHO) sent out a notification on the disease on January 18, all those who are part of the Integrated Disease Surveillance Programme and the district surveillance teams were alerted. They were told that increased surveillance of all SARS (Severe Acute Respiratory Syndrome) and influenza-like illnesses was required. WHO guidelines and clinical protocols were circulated to all the districts. Kerala was especially at risk as hundreds of Malayali students, who were pursuing undergraduate medical courses or nursing courses in China, were on their way home. Seventy-two of them were from Wuhan.

“The airport-based surveillance was launched on January 23,” says Amar Fettle, State Nodal

Officer for Public Health Emergencies. “We were taken aback by the large number of people we had to place under surveillance from day one. On average, we received a daily list of 100-150 persons with a recent travel history to China. Anyone with mild symptoms of flu was directly sent to the isolation wards of selected hospitals in districts. They were taken in special ambulance services that had been arranged at all the airports. Those without any symptoms were sent home with instructions that they strictly quarantine themselves at home.”

It soon became evident that all the COVID-19 cases imported to other nations were linked to Wuhan. On February 1, WHO reported that in China, 60.5% of all cases since the start of the outbreak had been reported from Hubei province. Seeing this, officials decided to change their surveillance strategy a little and observe mainly the people coming to Kerala from Wuhan. All those returning from Wuhan, whether they showed symptoms of the disease or not, were placed in isolation. And those coming to the State from other parts of China were sent home and told to remain in quarantine if they did not have any of the symptoms.

nCoV outbreak declared a State calamity in Kerala

Every district was instructed to have tertiary care facilities, including an intensive care unit and ventilator support, in at least two public sector hospitals and one major private sector hospital. The State Control Cell for COVID-19 was set up at the Directorate of Health Services in the capital. Multidisciplinary teams were set up for monitoring field surveillance, hospital admissions, logistics, etc. Expert teams prepared guidelines for surveillance, lab testing and clinical management, and disseminated them to all the districts. The Health Department’s 24X7 helpline, Disha, was publicised as the first point of contact for the public to clarify any doubts regarding COVID-19 and related issues.

Though the State was prepared to tackle any outbreak, when the first positive case of COVID-19 in Kerala was detected, authorities went into overdrive. All the health personnel in the State were asked to undertake surveillance, monitoring and contact-tracing exercises. The State had learned the importance of contact tracing during the Nipah virus outbreak of 2018.

The **second sample that tested positive for SARS-CoV-2** on February 1 belonged to a friend and fellow traveller of the girl student from Thrissur. The boy’s father recalls the sheer horror with which the family watched the news about the first positive case of COVID-19 in Kerala. “I was trembling. I immediately drove my son to the Alappuzha Medical College hospital. The scenes at the isolation ward were terrifying. Alien-like figures in full protective gear and face masks took my son inside. It sort of felt like a final goodbye,” he says. The father is quarantined at home at present. His son, who has recovered well, has been discharged.

Coronavirus | 15 students stranded in China brought to Kochi

The **third positive case was confirmed** on February 3. This patient too was a student from Wuhan and was kept under isolation at a district hospital in Kanhangad in Kasargod district.

“It is true that we were doing a bit of an overkill, focusing on all the Wuhan returnees and isolating them immediately,” says R. Aravind, Head of Infectious Diseases, Thiruvananthapuram Government Medical College. “But the additional measures we took paid off because all the three people who tested positive were already in isolation when we detected the virus. We would have missed these cases if we had not isolated the Wuhan returnees right away because their symptoms were very mild. They would not have been admitted in hospitals in the normal course.”

Aravind says an aggressive surveillance and quarantine strategy had been evolved following

reports that even asymptomatic patients could spread the disease. “Asymptomatic transmission could have been a game changer. That would have thrown all our control strategies out of gear. Given the huge number of potential returnees from China to the State and the high density of population here, we were willing to err on the side of caution,” he says.

The approach may not have been evidence-based, but the situation called for the State to always be one step ahead. The guidelines prepared by the team of clinicians were more elaborate and stringent than those of the WHO. The guidelines were also constantly revised. While the Centre suggested an incubation period of 14 days, the State extended it to 28 days. Test samples were required only of those admitted in hospitals with symptoms. But as the debate about possible asymptomatic transmission raged, Kerala authorities decided to collect test samples from everyone who had returned from Wuhan after January 15.

All 645 Indian evacuees from Wuhan test negative for coronavirus

In the initial days, it was difficult to conduct surveillance and impose quarantine, says V. Meenakshy, Additional Director of Health Services, Public Health: “Most people thought our response was exaggerated. We appealed to people to voluntarily report to us if they had any travel history to China because surveillance is not always foolproof. But people were trying to evade us so that they would not be forced into quarantine. Everything changed after the first positive case of COVID-19 surfaced. Suddenly self-reporting increased. Our helplines were inundated with calls.”

Surveillance officers had to undertake the painstaking exercise of contact tracing. According to the WHO, people in close contact with someone who is infected with a virus, such as SARS-CoV-2, are at higher risk of becoming infected themselves, and of potentially further infecting others. The patient’s contact with friends, co-travellers, taxi drivers, cleaning staff in hotels, people on the streets and so on had to be traced by the authorities. Needless to say, the list of contacts was endless. For the first positive case in Thrissur, 82 contacts were identified; for the infected person in Alappuzha, 52 contacts were traced.

But it was tracking the contacts of the third patient in Kasargod that turned out to be an exercise in patience and tenacity, Meenakshy says. “The patient had gone to Kolkata from Wuhan and then taken a flight to Bengaluru. He travelled in a taxi and stayed at a hotel. The next day he took another taxi to the airport and boarded a flight to Kochi. From the airport he took an auto rickshaw to Angamaly, stayed at a hotel, and later caught a train to Kanhangad. His friend and his uncle met him at the railway station and dropped him home. Retracing his route and identifying possible contacts was really a nightmare,” she says. Flory Joseph, the epidemiologist leading the surveillance team at the Kasargod district hospital, says they managed to track down 186 persons who might have come in contact with the patient. “With each person, we had to explain the situation, allay their fears, and call them daily to ensure that they were fine,” she says. This is not an unfamiliar exercise for the Health Department of Kerala which tracked over 2,500 people during the 2018 Nipah virus outbreak.

In fact, the entire framework of Kerala’s response to the threat of a possible public health emergency due to COVID-19 is based on its experience in managing the Nipah outbreak. The Nipah outbreak took the State health system by surprise. With a high case fatality rate of 88.9%, the virus created a lot of panic. By the time the outbreak was contained, 17 people had died.

Though the State identified the infectious agent with the second case and launched control measures, Nipah had already spread to multiple sites from the index case (the patient in an outbreak who is first noticed by the health authorities). Epidemiological investigations later revealed that the index case was a “super spreader”; he had transmitted the infection to 19

people. The lesson from the episode was stark: simple and universal infection control protocols in hospitals would have prevented human-to-human transmission and saved lives.

WHO to not call novel coronavirus by official name

“Following this there was a heightened sense of awareness in hospitals that simple infection-control measures such as washing hands and using personal protective equipment could ensure the safety of healthcare personnel. Nurses in all our hospitals underwent intensive training in infection-control protocols in the post-Nipah period,” says Aravind.

As part of improving disease surveillance, outbreak monitoring units were set up in all the medical colleges in the State last year. These units scrutinised patients in emergency wings and isolated those with acute respiratory symptoms as soon as they come in. Nipah struck again in 2019, but this time the health authorities managed to immediately spot the index case, isolate him, and treat him. No one else was infected.

When the COVID-19 alert was sounded, all these baseline preparations fell into place. The rest of the measures concerned logistics and management, which the State health administration managed well. Overnight, the State Control Cell set up 18 sub-divisions (for surveillance, training and awareness, sample tracing, transportation and ambulance, etc.), charted out the roles and responsibilities of each team, and micromanaged nearly everything, right down to roping in local self-government bodies for assistance and ensuring that families quarantined at home had adequate food and supplies delivered to them.

On the ground, though, the families of those who had tested positive went though trying times. “We were already worried about our son, but what really hurt us was the lack of support from the local community,” says the father of the boy in Alappuzha. Soon after he tested positive, the boy’s image in a family photograph began to circulate on social media. Not only was he accused of spreading the virus, but people even began avoiding his grandfather’s store, causing him big losses in business. The Nooranad police have since arrested two persons in connection with the social ostracism the family faced. The antagonism displayed by the local community towards the family only died down when the Health Department began organising awareness campaigns at the grassroots. The department also mobilised its district mental health teams to offer psycho-social support over the phone to the stressed families that had been quarantined for 28 days.

Explained | When can people transmit the novel coronavirus?

News about the virus has also affected local businesses. Parassini Prakashan, a bus conductor, says he is struggling to run the service from the Kanhangad bus stand via the district hospital as no one wants to travel by that route any more. Almost all the small and medium businesses in the locality of the district hospital have been affected. COVID-19 has also spelled bad news for Kerala tourism, already impacted by two consecutive floods and the Nipah outbreaks. There were mass cancellations of tour packages after SARS-CoV-2 was reported.

On February 3, when the third positive case of COVID-19 was flagged, the government declared the virus a State-specific calamity. The declaration, which raised many eyebrows, was hastily withdrawn four days later when there were no more positive cases. Kerala remains on high alert and surveillance is still on. But the State rapid response team, which met on Wednesday, decided to relax the quarantine guidelines and relieve over a thousand people from their ordeal.

There is elation now. Some say there is overconfidence at having “got everything in control” and having successfully managed to limit the outbreak in the State to just three cases with no case of human-to-human spread. However, epidemiologists and public health experts warn that it is

too early for the State to blow its own trumpet as the situation surrounding COVID-19 is still fluid and evolving. The epidemic continues to spread in China and beyond, but there is a lot that remains unknown: What are the virus reservoirs? What are the transmission dynamics? What is the period of infectiousness?

“We need to watch closely the recovery of the patients who tested positive. We need to watch them and their contacts for four weeks and make sure that they are not developing any new illnesses. How sure are we that we have only three positive cases or that there are no cases in the rest of India? We have no idea about the impact of environmental factors on virus behaviour. For Kerala, it is early days yet,” says E. Sreekumar, a senior scientist at the Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram.

No surveillance is ever foolproof. The crucial question is whether the State is accounting for the gaps in surveillance and ready with a Plan B if the scenario changes and local transmission of the disease does happen. “Kerala has a very responsive health system which has jumped into fire-fighting mode. It has mobilised all its resources to detect and contain COVID-19. But this is not a sustainable model; soon the system will wear itself out. The real strength of a health system is in its ability to keep its regular disease surveillance system alive and active through the year, pick up unusual disease trends and undiagnosed deaths, and analyse data meticulously so that it is equipped to deal with surprises without taxing the entire system,” says G. Arunkumar, Director, Manipal Institute of Virology. Both the Nipah episodes in Kerala were not picked up by the Integrated Disease Surveillance Programme, which means that the State has a long way to go, he says.

“While rejoicing over the ‘success’ of having contained the Nipah outbreak to the lone index case in 2019, we must understand that not every case of Nipah becomes a ‘super spreader’,” he says. In 2019, the index case did not lead to further infections because the patient had encephalopathy and not respiratory symptoms. Arunkumar, who led the epidemiological investigation that unravelled Kerala’s first Nipah encounter, cautions the State against relying too much on its Nipah strategy while dealing with COVID-19. “Drawing upon the experience of fighting Nipah is fine, but it is crucial to understand that Nipah and COVID-19 do not share the same epidemiology. The surveillance and control strategies for each are different. Nipah is not capable of sustained transmission and disappears when the virus runs its natural course. But COVID-19 is a multi-focal outbreak with a potential for sustained transmission. The odds that it is going to be a long-term problem requiring long-term engagement are quite high. Kerala would do well to be prepared for it,” he warns. Also, because of the mild nature of the illness caused by COVID-19, it is unlikely that the system will pick up low-level community transmission of the virus right now. In China too, the outbreak was picked up only when a sudden cluster of viral pneumonia cases appeared in hospitals, he says. The next step for Kerala would be to set up a surveillance mechanism for detecting viral pneumonia clusters, especially among older individuals, in hospitals, Arunkumar suggests. Testing all X-ray-positive viral pneumonia cases in hospitals for COVID-19 would help the State pick up the first case of the viral illness if the virus is active in the community, he says.

While Kerala rejoices, it would do well to prepare for the long haul as **China continues to report more deaths** due to COVID-19.

With inputs from from Mini Muringatheri in Thrissur, Sam Paul A. in Alappuzha, and C.P. Sajit in Kasargod

In one week, the number of people found infected by the novel coronavirus grew from 332 people in 13 Chinese provinces and four nations to 4,474 cases in 30 provinces and 18 countries