

Curbing COVID-19: Kerala model

INTRODUCTION

The coastal Indian state of Kerala has put up a brave fight against COVID-19 pandemic. When even the greatest superpowers were shocked beyond words, this small South Indian state successfully flattened the corona virus curve over a longer period of time during the first two phases of this infection. The developed nations such as the United States and the United Kingdom and countries of the European Union had fallen shy to contain the pandemic; the state of Kerala in the Indian republic had sought measures which could effectively contain this pandemic at that stage. The early steps initiated by the administrative authorities with due diligence has reaped benefits not only for the entire state but has also been adopted as a model. The successful strategy of Kerala invited world attention. International news agencies prepared reports highlighting the “Kerala model.” Praises poured in from all parts of the world through social media platforms for the socially aware citizens and proactive Government.

HISTORY AND BACKGROUND

The success of the state’s war against COVID-19 has three factors to thank: strong public health system, clear risk communication and community participation. It is important to reflect at this point the long history and background of Kerala and its social movements which kept Kerala ahead and abreast in all developmental measures across the country.

The public health sector right from the days of dynasty rule has achieved high standards. The administrative reforms of the erstwhile rulers of Travancore and Cochin were hallmarked as one of the best in the field of health, education and nutrition. Emancipation of women of Kerala has a historical background too in the state where the matriarchal system was followed in respect of family and inheritance. Women in Kerala, especially the middle class and upper class had a stronger social standing even in the early days of the state’s history. As the saying goes “you educate a man, you educate a person; you educate a woman you educate a family” and it goes very true in the case of women of Kerala.

The monumental efforts by the missionaries who came to India in the field of health and education by way of opening schools and colleges and hospitals has helped the state immensely to reach its present stature in the said sectors. The highest rate of literacy, the social welfare measures as envisaged in Part IV of Constitution of India as the directive principles of state policy, the legislations there of and effective implementation has greatly helped the state of Kerala to tackle the present situation. The policies and legislations enacted by the state on health, education, women empowerment, employment benefits, maternity benefits, etc., stand tall in our country and keeps up international standards.

PRE-COVID-19

An experience of containing the NIPAH outbreak in 2018 had helped the state to prepare to emergency situations swiftly. It was during the NIPAH virus outbreak that we had to focus on contact tracing of positive cases. This previous experience of combating the NIPAH virus infection was helpful in chalking out effective strategies at the very outset itself, in the COVID-19 fight. The same administrative machinery was in force during the NIPAH virus attack. Whereas the NIPAH contagion was restricted to two districts of Northern Kerala, COVID-19 has ravaged the entire face of earth. However, the NIPAH experience galvanized the efforts in mobilizing all infrastructures in a structured and phased manner under the Government. That experience enabled us to set up specialized teams comprising public health-care experts, police officers, representatives in local self-governments and officials in district administrations, to trace the contacts of positive cases this time around.

COVID-19 AND THEREAFTER

Kerala was a potential hotspot due to its demographic peculiarity. The fight against COVID-19 in Kerala assumes a larger proportion in terms of three factors. These factors are identified as risk factors considering the social milieu of Kerala. These risks factors are as follows:

1. High density of population (859 persons per km²; its land is 3 times as densely settled as the rest of India)
2. Large nonresidential population spread across the globe (2,280,000 Keralites reside outside India)

3. Thriving tourism sector (Kerala is identified as one of the most visit places in the global tourism map).

The first case of the COVID-19 pandemic in Kerala (which was also the first in all of India) was confirmed in Thrissur on January 30, 2020.^[1,2] Subsequently, other two cases in Alappuzha and Kasaragod districts of Kerala were also reported. All of them were students, traveling from the Wuhan province of China, which was the point of origin of the disease. Following the detection of positive cases, the Government of Kerala declared a “state calamity warning.” Over 3000 contacts of the affected individuals were placed under quarantine, out of which 45 were placed in hospital quarantine. The Government of Kerala declared high alert from February 4 to 8, and on March 8, 2020, due to corona virus cases being reported from the state.^[3,4] Isolation wards with 40 beds were set up in 21 major hospitals of the state and a helpline was activated in every district.^[5] As of March 9, more than 4000 persons were under home or hospital quarantine in Kerala.^[6] As of March 4, 215 health-care workers were deployed across Kerala and 3,646 telephone counseling services were conducted to provide psychosocial support to families of those suspected to be infected.^[7] On March 10, the Kerala Government arranged special isolation wards in prisons across the state^[8] and shut down all colleges and schools.^[9] The Government also urged people to not undertake pilgrimages, attend large gatherings such as weddings and cinema shows.^[10] On March 22, Health minister of Kerala strongly warned the people to follow the orders from the Health department of Kerala.^[11] A citizen science initiative, Collective for Open Data Distribution-Keralam, by a group of technologists, academicians and students advocating open data released first bilingual (Malayalam and English) online dashboard (March 22, 2020) for nonspecialists to provide real-time analysis, and daily updates of COVID-19 cases in Kerala by leveraging publicly available data from the daily bulletins published by the Department of Health Services, Government of Kerala and various news outlets.^[12,13]

The administrative machinery of the state sprang to action as early as January 2020. The first step taken was to open a control room at Thiruvananthapuram, the state capital on January 23, 2020. Mock drills were conducted as part of the efforts to implement the measures taken for tracking, tracing and testing. Early planning involved this “3T” strategy. A water tight effective screening of the persons at the Airport was conducted. Those tested positive or showing symptoms of the disease were quarantined. After the period of institutional quarantine, a quarantine release certificate was issued to the individual.

Break the chain

Massive awareness campaigns to educate the public were conducted. Slogans like “Break the chain” was extensively canvassed in both the print and audio visual media. Break the chain has now become a house hold jargon, thanks to the extreme campaign.

SMS campaign

There was relentless effort to create awareness on social distancing (S), use of face masks (M) and use of hand sanitizer or soap (S). The demonstration of hand wash for 20 s was given to all medical professionals and also to public through the visual media. It is heartening to see that these are followed by the people of Kerala across the entire cross sections of society. Closing down of educational institutions from March 10, 2020, was declared by the state Government much before the center imposed 1st phase of lock down. Employees were asked to work from home. Health-care professionals were given training in the COVID-19 protocols instituted by the medical professionals in consultation with the administrative officials. National Institute of Virology, Pune, was requested to set up a center in Alappuzha district to speed up the process of testing. Consequently, testing laboratories were opened in Medical colleges and Government hospitals across the state. Local authorities were asked to do surveillance on people who returned from infected countries. Country went into complete lock down on March 23, 2020 onward.

The lockdown is a means to limit interaction between people so that the transmission of the virus can be curtailed. However, it is not a magic wand that can be waved to address the health emergency at hand. We will have to supplement it with identifying suspect cases, quarantining them, conducting adequate tests, treating positive cases and tracing their contacts. This is a cyclical exercise that has to be continued till all those under treatment are cured and all those under quarantine are ascertained to be negative. Under a lockdown, people are forced to give up their livelihoods and the most adversely affected ones would be the daily wage laborers. Almost all of the migrant workers in Kerala are wage laborers. To ensure that they strictly adhere to the lockdown protocols, their needs will have to be met. It is the duty of the state to ensure that their needs are met. Kerala did that by arranging relief camps for them, with adequate health-care support and supplies for personal hygiene. Over 300,000 migrant workers have been assisted through around 20,000 camps during this period.

The number of active cases initially peaked at 266 on April 6 before declining. For the first time in over 45 days, there were no new cases on May 1.^[14] However, following the

return of Keralites from other countries and states, more cases were reported in mid-May, with the biggest single-day spike (1195 cases) on 5 August.^[15] As of 5 August, there have been 29,151 confirmed cases with 17,537 (60.15%) recoveries and 94 deaths in the state.^[16] Kerala has one of the lowest mortality rate in India (0.3%) compared to the national average of 2.41%.^[17] Kerala's success in containing COVID-19 has been widely praised both nationally and internationally.^[18-24]

REPATRIATING KERALITES—THE NEW CHALLENGE

At least 4.27 lakh nonresident Keralites (NRKs) have registered on the Department of NRKs Affairs (NORKA) portal, of which about 1.69 lakh people constitute the most vulnerable sections, those who have lost their jobs, employment contract has not been renewed; those released from prisons and awaiting deportation, pregnant women, students who have completed courses and whose visa had expired. For weeks, the state health department has been engaged in setting up facilities and protocols that will be pushed into action when the expatriates come home.

Postarrival protocols

Separate mobile health applications have been created to register and track the expatriates who will arrive at three of the airports. All the details of those who have registered on the NORKA website have been plugged into the app. Using QR codes, each of the travelers can be contacted and traced. Initially, there will be a basic medical screening for those wishing to return home. Medical teams have been deployed at the arrival lounge with screening facilities. The passengers were home quarantined for 14 days and monitored by ward-level Vigil Committees in their residences. Those who wanted to stay in corona care homes were shifted to such centers near airports. 6, 57,829 repatriating Keralites have reached home as on August 3, 2020.

ORAL HEALTHCARE DELIVERY

The state of Kerala has more than 20,000 plus registered dentists and the dentist to patient ratio in the state is 1:3500. The five public tertiary dental teaching hospitals in Kerala always play a key role in dental health services. Moreover, there is a large network of dental units under the Directorate of Health service of Kerala in all general hospitals, district hospitals, taluk hospitals and in major community health centers. During the lockdown period, the patients were mostly depending on these dental hospitals in the public sector. Therefore, a critical challenge for them was to prevent nosocomial COVID-19 transmission

and provide health services for the general population. The health department has issued advisories regarding standard operational procedures and a state level training program was initiated regarding infection control protocol for dental healthcare workers and dental auxiliaries. In order to save resources and to avoid unnecessary exposure to infected patients, there was the need to schedule intervention depending on their priority. The major aim was to protect patients as well as the dental staff from unnecessary infection, and to keep the healthcare system running effectively.

Triage and prioritizing of procedures was introduced in all institutions. To ensure early recognition and isolation of patients with COVID-19, a point-of-care risk assessment was implemented to assess the likelihood of infection. This includes an evaluation of clinical presentation (body temperature, respiratory symptoms) and a review of epidemiological and clinical history (contact with patient with confirmed infection or respiratory symptoms, fever in the past few days). The use of personal protective equipments was selected depending on the planned procedure and the infection status of the patient. When performing a clinical examination, wearing a surgical mask, goggles and gloves and the use of antiseptic mouth rinse to reduce the viral load in the oral cavity was recommended. It was ensured that cleaning and disinfection procedures are followed consistently and correctly in the examination room after each patient. Because of the fact that there are a high number of asymptomatic SARS-CoV-2-positive patients, all patients should be assumed to be infective.

Respiratory droplets and close contact are the main routes of transmission of COVID 19. Prolonged exposure to high concentrations of aerosol in a relatively closed environment is a risk of aerosol transmission. Many dental procedures produce aerosols and droplets that are contaminated with bacteria, viruses, and blood and have the potential to spread such infections to dental personnel and other people in the dental office. The availability of reliable testing for SARS-CoV-2 will be an important step forward in the future to distinguish between infected and non-infected patients. Until then, especially aerosol-generating procedures require special attention in every patient with unclear infection status.

Early identification and isolation of patients infected with SARS-CoV-2 are the main measures to prevent virus transmission. Multidisciplinary evaluation of multilevel surgical-risks, discussion of possible alternative nonsurgical therapies and shared-decision-making with the patient was followed. Where surgery remains indicated, judicious

preoperative planning and development of COVID-19-specific peri-operative protocols to maximize the safety and quality of surgical care were implemented. As early as possible, strategies have to be developed that facilitate the return to a situation in which the full scope of procedures is provided again, once the peak of the COVID-19 pandemic has been overcome. SARS-CoV-2 might accompany healthcare over a longer period. However, from a certain point of time onward, COVID-19 should no longer hamper comprehensive patient treatment, including elective procedures. As soon as possible, adequate infrastructures have to be implemented that respect the new requirements.

CONCLUSION

Comparative analysis will invariably become the premise for understanding the experiences of various countries. The experiences of New York and Kerala are compared to highlight the stark difference in the approach of two systems. The population of Kerala is 33 million whereas that of New York is 19 million. The per capita income of Kerala is \$2937 while that of New York State is \$88,981. There are 1.8 hospital beds for every 1000 people in Kerala whereas the corresponding figure for New York is 3.1 beds. Kerala has 1.7 doctors per 1000 persons; New York is credited with 3.8 doctors. However, the total corona positive cases in Kerala as on May 11 was 512 and the state had reported just four deaths. On the corresponding date, New York had over 3.4 lakh corona positive cases with more than 27,000 deaths. Kerala has the lowest mortality rate as well as the highest recovery rate with respect to corona virus infections. A scientific testing strategy, aggressive contact tracing and cluster management strategy helped Kerala in preventing community spread for a considerable time period. Ninety percent of the positive cases were detected among people who were kept under observation in the first two phases of corona virus infection in Kerala. The credit should go to Kerala's robust local governance, effective social structure and well-knit multi-layered public health structure.

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Conflicts of interest

There are no conflicts of interest.

R Heera, R Rajeev

Department of Oral Pathology and Microbiology, GDC,
Thiruvananthapuram, Kerala, India

Address for correspondence: Dr. R Rajeev, Department of Oral Pathology and Microbiology, GDC, Thiruvananthapuram - 695 011, Kerala, India.
E-mail: drrrajeevmds@gmail.com

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