

The successful containment of COVID-19 outbreak in Union Territory of Ladakh, India, 2020

Kapil Goel¹, Amit Arora², Tanveer Rehman¹, Phuntsog Angchuk³,
Rigzin Samphel³, Tanvi Kiran¹, Bijaya K. Padhi¹, Vineeth Rajagopal¹,
Jarnail S. Thakur¹

Departments of ¹Community Medicine and School of Public Health, ²Medical Microbiology, Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh, ³Union Territory of Ladakh, India

ABSTRACT

Objectives: A three-member central Rapid Response Team (RRT) was deputed to Union Territory of Ladakh on 26th March 2020, to assess the situation and support the preparedness measures including implementation of cluster containment plan and social distancing measures for coronavirus disease 2019 (COVID-19). **Methods:** Central RRT addressed the panchayat sarpanch and religious leaders, sensitized doctors and paramedical staff on COVID-19 situation; conducted situational analysis, review of records and logistics, key informant interviews of senior administrative and healthcare officials, focus group discussions with local community people and field visits to various hospitals, isolation centers, quarantine facilities, and containment zones. **Results:** A total of 14 COVID-19 cases with no deaths were reported and nine patients had recovered till 4 April 2020. The median (range) age of positive cases was found to be 32.5 (6 months–76 years) years and overall attack rate was 1.65 per 1000 population. Ladakh Government declared Chuchot Gongma, Yokma and Sankoo as the containment zones and deputed surveillance teams. A total of 2397 persons were quarantined and 496 samples were tested from Ladakh. COVID-19 sample testing, Srinagar-Leh highway opening and Iran pilgrimage returnees were the major challenges identified. **Conclusions:** The Ladakh government must continue the robust surveillance system and stringent strategies in key areas for management of COVID-19 namely – aggressive screening and testing, isolation, quarantine, hand hygiene, respiratory etiquettes and social distancing.

Keywords: Cluster containment, coronavirus disease 2019, social distancing

Introduction

Since the first few cases of coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), were identified in China in December, 2019, the pandemic is rapidly spreading worldwide and has become a significant threat to the existence of mankind. A high attack rate

and majority of the cases being of mild symptoms along with globalization and associated stigma have facilitated this process.^[1] As of March 25, 2020, globally there were 414,179 cases and 18,440 deaths and reported case fatality rates varied from 1% to more than 7%.^[2,3] India reported its first case of COVID-19 on 30th January, 2020 and had a total of 562 active cases with 13 deaths until 25th March, 2020.^[4] Ladakh Union Territory (UT) with its two districts, Leh and Kargil, had reported a total of 14 cases with no deaths till then. The two epicenters in Leh, Chuchot Gongma and Chuchot Yokma, has a total population of about 2000 in each.^[5] The epicenters in Kargil (200 km from Leh), village Sankoo and later after central Rapid Response

Address for correspondence: Dr. Tanveer Rehman,
Department of Community Medicine and School of Public Health,
PGIMER, Chandigarh, India.
E-mail: drtanveerrehman@gmail.com

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Team (RRT) arrival, village Chiktan, have a total population of 4410 and 1285, respectively. Around two third of the inhabitants in Kargil are Shia Muslims who visit Iran each year for ziyarat, or pilgrimage. In addition, Ladakh shares border with Tibet, China and Pakistan. A complete lockdown was implemented in UT Ladakh on 22 March, 2020. In view of the above circumstances, a central RRT was deputed immediately on 26 March, in order to assess the situation and support the preparedness measures including implementation of cluster containment plan and social distancing measures for COVID-19.

Methods

Central RRT addressed the panchayat sarpanch and religious leaders, sensitized doctors and paramedical staff on COVID-19 situation; conducted situational analysis, review of records and logistics, key informant interviews of senior administrative and healthcare officials, focus group discussions with local community people and field visits to various hospitals, isolation centers, quarantine facilities and containment zones. Data were entered in Microsoft Excel sheet and results were expressed as proportions.

Results

Current situation and descriptive data of cases

On 7th March 2020, the first two laboratory-confirmed COVID-19 cases in UT Ladakh were reported. Both had returned from Iran on the same day and presented with fever, cough and breathlessness – one on 20 Feb and another on 27 Feb [Figure 1]. After two days of onset of symptoms, both were isolated in Sonam Norboo Memorial (SNM) District Hospital, Leh. They were the heads of two different families, living around one km distance from each other. On 17 March, a family friend of the index cases was tested positive, even though he had no travel history. On the same day, two individuals with contact history to people with travel history to Iran (though laboratory confirmed negative) were found to be COVID-19 positive.

A total of 14 COVID-19 cases (with no deaths) were reported from 31 January, 2020 to 4 April 2020 [Table 1]. The median

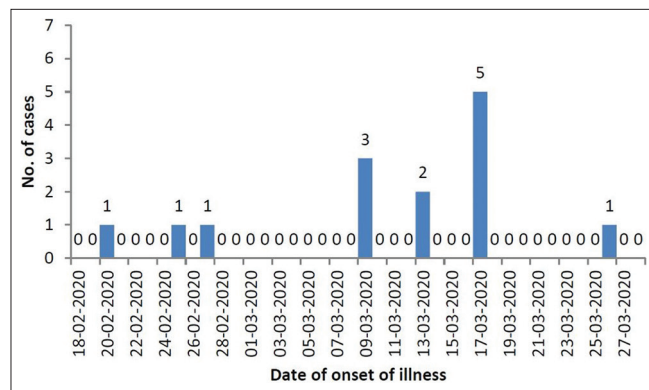


Figure 1: Epidemic curve of the coronavirus disease 2019 cases in Union Territory of Ladakh, by day of symptom onset, from 18th February to 28th March, 2020 (N = 14)

age of positive cases was found to be 32.5 years (range: 6 months - 76 years). Among the 14 cases, 8 were males (57.1%). The attack rates were higher in Leh (4.01 per 1000 population) as compared to Kargil (0.52 per 1000 population). However, the overall attack rate for Ladakh was 1.65 per 1000 population [Table 2]. The case fatality rate was 0%.

The two index cases had a history of travel to Iran and remaining cases had a contact history with the two index cases pointing towards local transmission [Table 2]. There were no evidences suggestive of community transmission.

Response of Government of Union Territory of Ladakh

The UT administration was extremely pro-active in managing and following COVID-19 related management activities. Upon identification of the index cases, they promptly swung into action and locked down the affected places two weeks before the country wide curfew – Chuchot block on 8th March and whole Kargil district on 17th March. The key to this successful containment of the clusters was strong political will. The Lieutenant Governor, Divisional Commissioner, Secretary Health and Director Health Services directly led the day-to-day situation analysis and outbreak response.

Table 1: Socio-demographic profile of coronavirus disease 2019 cases, Union Territory of Ladakh, 2020

Patient	Age (years)	Gender	Mode	District	Village
1	65	Male	Travel History	Leh	Chuchot Gongma
2	76	Male	Travel History	Leh	Chuchot Gongma
3	30	Male	Contact History	Leh	Chuchot Gongma
4	27	Male	Contact History	Leh	Chuchot Gongma
5	40	Male	Contact History	Leh	Chuchot Yokma
6	30	Female	Contact History	Leh	Chuchot Gongma
7	6 months	Male	Contact History	Leh	Chuchot Gongma
8	25	Female	Contact History	Leh	Chuchot Yokma
9	28	Female	Contact History	Leh	Chuchot Gongma
10	65	Female	Contact History	Leh	Chuchot Gongma
11	40	Male	Contact History	Leh	Chuchot Gongma
12	24	Male	Contact History	Kargil	Sankoo
13	35	Female	Contact History	Kargil	Sankoo
14	38	Female	Contact History	Kargil	Chiktan

Table 2: Village wise distribution and attack rates for coronavirus disease 2019 cases, Union Territory of Ladakh, 2020

District	Village	Population	Cases reported	Attack Rate per 1,000 population
Leh	Chuchot Gongma	2283	9	3.94
	Chuchot Yokma	458	2	4.36
	Total	2741	11	4.01
Kargil	Sankoo	4410	2	0.45
	Chiktan	1285	1	0.77
	Total	5695	3	0.52
Ladakh		8436	14	1.65

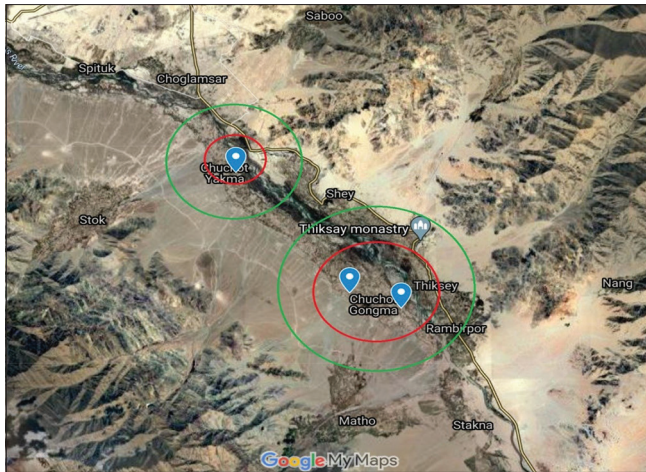


Figure 2: Containment and buffer zones with epi-centres in Chuchot Gongma & Yokma, Leh district, Ladakh

Contact tracing

More than 2000 individuals were traced who were either contacts of COVID-19 patients or have travelled from affected countries and they were constantly monitored for Influenza-like illness (ILI) symptoms for 28 days. Around 611 local people with travel history landed in Leh on 22 March and the authorities were facing difficulty in tracking such a vast number. The central RRT suggested to take help from school teachers, community leaders, volunteers and other departments like telecommunication for contacting them and tracking them for ILI symptoms daily. A total of 2397 persons were quarantined (1292 Leh and 1105 Kargil) from Ladakh till 5 April 2020.

Initial hurdle

There was an agitation in the community after a taxi driver tested positive after testing negative twice. He had been a regular visitor to SNM hospital, where his father-in-law was admitted after testing COVID-19 positive. The villagers had also developed a stigma against outsiders like laborers from Bihar, Nepal, etc., The central RRT advised the Block Medical Officer (BMO) to spread awareness messages daily in the villages through public addressal mechanism to prevent such misconceptions and reduce this alienating behaviour.^[6] It was estimated that around 1000 laborers were supposed to start the road maintenance and construction work in the two highways, Leh-Kargil and Leh-Manali, for Border Road Organization overseen by the Indian Army. Central RRT advised to postpone the work till further notice.

Containment planning and implementation

A 3 kms radius around the epi-center was considered as containment zone and additional 7 kms radius as buffer zone. Administrative orders were issued to close schools, colleges, work places, mass gathering events and meetings in public or private places including religious places in containment and buffer zones. Essential commodities were served to every household in the containment zone by the local administration. The villagers seemed to be very cooperative and understood the importance

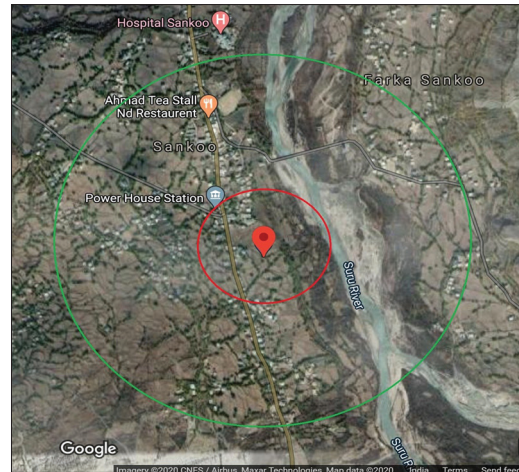


Figure 3: Containment and buffer zone showing epi-center in Sankoo sub division, Kargil district, Ladakh

of lockdown, social distancing measures, hand hygiene and respiratory etiquettes.

Human resource

Teams were constituted from different departments – health educators, junior health educators, nursing orderlies, accredited social health activists, anganwadi workers and pharmacists. The staff recruited were trained in field by the BMO.^[7] The teams disseminated Information Education Communication (IEC) materials regarding social distancing and hand hygiene by visiting each and every house. Special outpatient department (OPD) clinics were started in the morning (8 am – 2 pm) to screen for ILI symptoms, conduct general OPD services, continue routine immunization and allay fear among people. Health workers and officials all worked almost without a break, successfully preventing a further wave of human to human transmission.

Mapping

The maps [Figures 2 and 3] that the teams had provided to the central RRT had some minor deficiencies like cardinal directions were missing; the epicenters, containment and buffer zones were not clearly marked and the available health facilities were not mapped.^[8] The central RRT took a session on how to do geographical mapping, conduct an epidemiological assessment for cluster containment and plan for the prevention of the disease spread. Central RRT recommended to disinfect 300 meters around the epicenters and the affected houses with sodium hypochlorite (1%) and cleared the doubts that the staff had regarding containment microplanning.

Surveillance

A meticulous surveillance system was put into place in not only the two affected villages in Leh and one in Kargil, but scaled up in neighboring villages and in the town too. In the afternoon (3 pm – 6 pm) the teams visited the containment houses for ILI symptoms. Contact tracing of individuals with travel history (Iran, Saudi Arabia, Italy, etc.) were done and

their houses were also visited on a daily basis. Registers were maintained for the above.

Perimeter control

There was no unchecked influx or outward movement of population in the containment zone except for maintaining essential services (including medical emergencies) and government business continuity. The authorities at these entry points informed the incoming travelers about precautions to be taken. The local administration posted signs to create awareness to inform the public about the perimeter control and social distancing including hand hygiene and respiratory etiquettes.

Establishing surge capacities

A total of 17 ventilators were available in Leh and 10 in Kargil. Mahabodhi Karuna Charitable Hospital (MKCH) (which was currently non-functional) was inspected to assess the feasibility of converting it into a COVID-19 specific hospital. From the public point of view this was advantageous because this 42-bedded hospital is at a distance of 8 kms from the main town. The central RRT recommended that MKCH can be made into a facility exclusive for COVID – 19 patients without disturbing the services of SNM Hospital. The issue for oxygen cylinder was taken care by making a temporary manifold pipeline system in ground floor. MKCH and SNM hospitals should be prepared and increase the total number of ventilators in UT Ladakh to 50 as the number of cases may increase in subsequent weeks.

UT Ladakh had a capacity to quarantine more than 1700 people and the administration adopted a very stringent policy of quarantining each and every traveler (national/international) returning back to their hometowns irrespective of having ILI symptoms. Following this policy, more than 250 individuals were put under strict facility quarantine in various hotels and got their throat swab tested. The civil administration did the utmost to maintain the well-being of these individuals by providing them with meals, quality accommodation and in some cases entertainment means (television/internet etc.). Most of the facilities had separate toilets and food was being catered from outside. Biomedical Waste (BMW) management bins were not available.^[9] The records of any fumigation and disinfection activities were not present.^[10] The central RRT recommended the symptom records to be maintained on a daily basis and the authorities to ensure proper heating equipment in rooms. Other than SNM Hospital Flu OPD, all other Flu OPDs did not follow guidelines pertaining to screening of COVID-19.^[11] This included none of the following: separate entry/exit for patients, circle marking for patients to stand one meter apart, OPD registers, surgical masks or sanitizers at the entry point, Flu OPD forms, display of IEC materials and colour-coded BMW management bins. The central RRT pointed out the above lacunae and took a session on how to improve the Flu OPD services.

Laboratory testing and pre-hospital care

Though UT Ladakh, with 2.74 lakh population, does not have a COVID-19 lab, it ensured testing of more than 400 persons in

the past three weeks – one of the highest in the country in terms of population ratio. A total of 496 samples (238 Leh and 258 Kargil) were tested from Ladakh till 5th April 2020. Laboratory testing was done in National Centre for Disease Control and UT was facing difficulty in sample transportation all the way to New Delhi. This not only leads to delay in testing time, but also may result in degradation of the sample (resulting in false negative results). The Central RRT advised them to set up an in-house testing facility as soon as possible and hire a microbiologist. The central RRT cleared the doubts of the medical staff regarding the revised guidelines for patient testing, quarantine and discharge.^[12] There were four dedicated ambulances for COVID-19 suspect/patient transfers and these were disinfected after every trip following the national guidelines.^[13]

Infection prevention and control practices

The hospitals ensured that all healthcare staff were trained after attending a session of Training of Trainers in New Delhi in washing hands, respiratory etiquettes, donning/doffing & proper disposal of personal protective equipment (PPE) and BMW management. All positive COVID-19 cases were in a ward with good ventilation and were wearing triple layer surgical masks at all times.^[14] Environmental cleaning was done twice daily and consisted of floor mopping with Lysol and cleaning of surfaces with sodium hypochlorite solution. Adequate stock of PPE, N-95, viral transport media kits, surgical masks and sanitizers was there and registers for these were being maintained in all hospitals.

Clinical management

The hospitalized cases were isolated and given symptomatic treatment and they were discharged when consecutive two samples were tested negative and the patient was free from symptoms.^[15]

Intensive risk communication

The risk communication material was prepared in local (Bodhi) language and distributed in containment zones and rest of Ladakh. The central RRT trained 20 volunteers from Nehru Yuva Kendra and National Social Service from Ladakh on basics of COVID-19 & current status. Daily media bulletins were issued by the government and all available channels of communication (including public addressal mechanism by taking help of Sarpanch, religious heads) were judiciously used to counter rumors and disseminate COVID-19 related updates and information like respiratory etiquette, social distancing and hand hygiene.

As many people present during interaction with community were wearing N-95 masks, the central RRT apprised them of the fact that these masks are not required to be worn by the general public and informed them regarding rational use of PPE, N95 and surgical masks and how to dispose them.^[16,17]

Innovative steps taken by Ladakh Government

The UT officials made an appeal to the retired doctors to join the OPD of hospitals for 3-4 hours to assist the medical

employees and reduce their workload in this hour of crisis. The administration ordered the suspension of operation of commercial vehicles which were plying on some routes. In the incoming days, the administration is introducing free ambulance services for the benefit of patients.^[18] Kargil administration added a pair of soaps in order to promote hand hygiene to the 5 kg food kit (comprising of rice, wheat, sugar, salt and milk powder) for migrant laborers.

Discussion

With just five laboratory-confirmed positive cases left, the UT has the potential to become one of the first COVID-19-free zones in the country. Ladakh's fight against COVID-19 serves as a model for other regions. It attributes the success to the hard work of doctors and paramedics and leadership of the region. After the first COVID-19 patient, a 68-year-old man, in the UT was detected from the village Chuchot, the entire area was cordoned off and a containment zone was formed immediately on March 8. As per the ranking of states and UT, on the basis of the number of samples sent per population of a million, the UT of Ladakh stands at number one in the country.^[19]

Epidemics require drastic and urgent steps on infection prevention and control measures to avoid further escalation and spreading of the disease. Ladakh Government needs a large number of healthcare workers for intensive house to house screening, tracing of the contacts, collecting sample & testing, monitoring of the population and isolating and quarantining the cases and suspects, respectively. Sudden detection of the primary cases in Leh even after entry point screening at airport and inter district borders, threw multiple challenges for the UT. As per the field evidence and documents collected by the Central RRT, the situation is under control in UT Ladakh. This can be attributed to the sparse population, geographical isolation, quick formulation and implementation of the containment plan, mobilization of adequate human resources and active surveillance. However, there is little room for complacency and contact tracing needs to be strengthened in Kargil district. Due to the over stretched working hours and stress related to COVID-19 patient care, the treating physicians were unaware of the current guidelines and protocols related to infection prevention and control and COVID-19 management. It was strongly emphasized that all the medical personnel regularly and frequently visit the government websites like Indian Council of Medical Research (www.icmr.nic.in) and Ministry of Health and Family Welfare (www.mohfw.gov.in) in order to be updated about the latest guidelines related to COVID-19. Even then they had isolated the primary cases and the attendants at the first contact with health system and sent their throat swabs for testing without delay. This highlights the need for greater involvement of primary care physicians in defining and implementing health policies aimed at controlling such a pandemic, as well as the need to strengthen academic research in primary care with respect to testing, contact tracing, surge capacity, use of PPE and management of COVID-19 patients. Primary

care is the first point of contact for patients with symptoms, worries, anxiety and questions concerning the pandemic. In the meantime, regular health problems do not cease to exist. So, a person-centered care needs to be maintained in the shift to telephone consultations with a comprehensive approach for COVID-specific risk management to include the psychological, sociocultural and existential dimensions in which the general practitioner operates.

The Ladakh Government decided to establish in-house testing facility at SNM District hospital, Leh in a couple of months. The 434-km long Srinagar-Leh National highway remains closed in the winters due to heavy snow on Zojila pass. Although the administration has asked police to keep drivers and their helpers away from the local population in Kargil and Ladakh, chances of interaction and mingling are high when trucks and oil tankers will bring essential supplies inside the region.^[20] The safe bringing back of 1,200 pilgrims, mostly from Kargil, who are either stranded in Iran or in different parts of the country remains a challenge for administration.

Conclusion

The COVID-19 situation in UT Ladakh is under control as the government has been very proactive in strengthening the health care services. The local communities are participating with full enthusiasm in maintaining the social distancing and are also cooperating fully during the lock down period. The government must continue the robust surveillance system and stringent strategies in key areas for management of COVID-19 namely – aggressive screening and testing, isolation, quarantine, hand hygiene, respiratory etiquettes and social distancing.

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Conflicts of interest

There are no conflicts of interest.

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