



## Containment of a local outbreak of COVID-19 through community isolation and quarantine in rural Bhutan: An experience

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### ABSTRACT

**Introduction:** Bhutan experienced the third and a larger outbreak of COVID-19 in the summer of 2021, with huge surge of cases from several districts on the southern border. A remote sub-district of Jomotsangkha in Samdrup Jongkhar district, was suddenly caught with a large number of cases in May 2021. All the COVID-19 cases during the outbreak were successfully managed at the community level or with home isolation without the need for sophisticated infrastructure and specialized manpower. In this article, we discuss the advantages of community-level management of COVID-19 in the context of Bhutan's health system.

**Keywords:** Bhutan; Disease outbreak; Health services; Pandemic; Public health; Quarantine.

### INTRODUCTION

COVID-19 became a devastating public health emergency of our times with more than 770 million cases and 6.9 million deaths as of 30 August 2023<sup>1</sup>. Bhutan saw the first case of COVID-19 on 5<sup>th</sup> March 2020 at the National Referral Hospital in the capital, Thimphu<sup>2</sup>. As of August 2023, Bhutan has reported a little over 60,000 COVID-19 cases and 21 deaths<sup>3</sup>. Bhutan had successfully vaccinated 94% of the eligible population with the first dose of COVISHIELD vaccine in March-April 2021<sup>4</sup>. More than 90% of the eligible population including children have been vaccinated with at least two doses of vaccine<sup>5</sup>.

In Bhutan, the third and a larger outbreak of COVID-19 happened in mid-2021 with the majority of the cases reported in clusters in the districts located along the southern belt. Until this period of time, the national protocol for the management of positive cases required hospitalization in dedicated COVID-19 hospital. In this article, we describe the first community-level management of a local outbreak of COVID-19 in a rural setting in Jomotsangkha, Bhutan.

### Local setting – Jomotsangkha

Jomotsangkha is a remote sub-district (drungkhag) located in the southeastern corner of the country with a population of about 6000 and covers an area of approximately 800 square kilometres. In its three gewogs, Langchenphu, Serthi and Lauri, most of the household settlements are situated at more than 3 hours walking distances from the nearest farm road network making travel to hospitals difficult<sup>6</sup>. The sub-district shares border with India and people have close interactions and travel across the international border for import of essential commodities, making it a high risk zone for disease transmission. The drungkhag has three primary health centers (PHCs) and one ten-bedded hospital. The PHCs have only basic amenities, limited number of health staff with no space for patient admission and no capability to provide advanced respiratory care in case of severe COVID-19 cases.

The overall coordination for surveillance, testing and management of COVID-19 cases were done by the local COVID-19 Task Force that reported to the regional and the national task forces. The local COVID-19 Task Force comprised of relevant public service officials including drungkhag administration and had devised a mechanism to periodically test frontline workers and high-risk groups as part of the enhanced surveillance protocol. Lockdown protocols were implemented to prevent movement of people and mechanism to deliver essential services were also put in place. For the clinical management of cases confirmed with reverse transcription polymerase chain reaction test, health authorities had made arrangements to transfer all COVID-19 cases to the nearest case management centre at the Eastern Regional Referral Hospital in Mongar.

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**COVID-19 outbreak in Jomotsangkha**

Much to the surprise of the local authorities and the entire nation, Jomotsangkha became the hotspot of COVID-19 after 20<sup>th</sup> May, 2021. In a span of three weeks, a total of 179 cases were detected with highest single day case detection of 82 patients. More than 1000 primary and secondary contacts were identified by the surveillance team. The index case had travelled from another neighboring district and stayed for over a week in one of the remote villages of Jomotsangkha during which he interacted with almost all the villagers. Soon after this, three mass gatherings had happened, a funeral and two local festivals, following which the virus spread rampantly across most of the villages. Health experts opined that this was the worst case scenario for the country with an infection rate of about 25 per 1000 population<sup>7</sup>.

**Outbreak Management Approach**

As a rapid response to the outbreak, the following measures were undertaken immediately. The local COVID-19 Task Force, backed by the Regional and National COVID-19 Task Force, was instrumental in containing the situation.

**Immediate lockdown**

As soon as evidence of community transmission emerged, the entire sub-district was subjected to complete lockdown. All schools, offices and businesses were closed with many government officials deputed to meet the essential needs of the community. Essential health services, mobile clinics and ration supplies were continued during the lockdown with the help of De Suups (trained volunteers) wearing appropriate personal protective equipment (PPE).

**Risk stratification**

All the villages in the sub-district were categorized into three groups for risk identification, testing and lockdown enforcement. The Green villages had neither cases nor contacts. Yellow villages had primary and/or secondary contacts but no positive cases. The Red villages had cases and/or contacts.

**Mass testing and screening**

During the lockdown, three rounds of mass testing with reverse transcription polymerase chain reaction were conducted in all the villages. Everyone in Red and Yellow villages was tested and one member from each household was tested from the Green villages. Testing was performed at the beginning of the outbreak and on day 14 and day 21 of the lockdown. Mass testing was a challenging task for the frontline workers as it involved hours of trekking through mountainous terrains, forests and rivers.

**Community isolation and quarantine**

As an immediate containment measure in response to the outbreak, two large community halls were converted into isolation centres. Each of these could accommodate around 50 people. One more office complex was converted into isolation

ward with a capacity to accommodate 25 cases. Basic facilities like oxygen, pulse oximeters and medicines were provided to these centres. Table 1 provides list of the community centres, the number of patients managed in each centre and their treatment outcomes.

**Table 1. Community isolation centres, number of patients and recovery rates of COVID-19 in Jomotsangkha, Samdrup Jongkhar, Bhutan, 2021**

Community Isolation Centre	Total cases	Recovered	Recovery Rate	Mortality
Lauri	49	49	100%	0
Serthi	47	47	100%	0
Jomo-tshangkha	19	19	100%	0
Home isolation	11	11	100%	0
<b>Total</b>	<b>126</b>	<b>126</b>	<b>100%</b>	<b>0</b>

While the majority of cases were managed in these three centres, there were some older adults and differentially-abled who were managed at home. Health workers monitored their health through phone calls and home visits. More than a thousand primary and secondary contacts were home-quarantined within their respective community.

**Medical response**

In response to the outbreak, the country’s highest decision makers were involved. The Prime Minister, in his capacity as the Chairperson of the National COVID-19 Task Force, convened a comprehensive meeting with the national and regional task forces. The Local Governor (Drungpa) headed the local COVID-19 Task force. Medical teams comprising of two specialists (a physician and a paediatrician), nurses, laboratory technicians and ambulances were immediately mobilized from larger hospitals. Essential supplies like oxygen, pulse oximeters portable ventilators, X-ray machines and basic medications were mobilized at the national level.

**Patient management**

Each of the community isolation centre was manned by two nurses, two De Suups and one security personnel. While the nurses provided direct patient care and sample collection, the De Suups and security personnel were involved in ensuring strict compliance to isolation regulations, reaching supplies like food and other essentials and maintaining the cleanliness of the centres. All categories of staff worked in appropriate risk-based PPE. To limit exposure to additional staff, the same cohort of staff volunteered to continue their duty till the last patient was discharged from each of these centres, followed by two weeks of

compulsory facility quarantine. Patient care included daily visits by the nurses, symptom review, vitals monitoring and telephonic follow-up with specialist doctors.

## Outcome of outbreak response

A total of 179 cases were detected in the sub-district during this outbreak. Out of these, 126(70%) cases were managed at the community isolation centres including 11 cases that were managed at home. The remaining 53(30%) cases were shifted to the district headquarters for lack of space. Of the 126 cases managed in the community centres, there were 19(15%) children and adolescents. The youngest patient was 5 months old and the oldest was 94 years old. Few patients required symptomatic treatment for cough and fever. No patient required oxygen or mechanical ventilation. Only one patient required Remdesivir and intravenous antibiotics. Patients were tested on day 21 of isolation and all patients had turned PCR-negative. The recovery rate was 100 percent with no mortality.

## DISCUSSION

The decision to isolate and manage most of the cases in the community settings became a new learning experience for the country. There were several advantages to this approach.

First, people felt more at home when they were isolated and treated within their own community. The location of the isolation facilities amongst the lush green vegetation provided a peaceful healing environment for the patients. Many were able to see their own homes and villages through the windows of the isolation centres. This probably contributed to the psychosocial aspects of healing.

Second, the cost of travel and transportation was reduced. Third, as many patients were accommodated in a single centre, the need for more medical staff was reduced, thereby reducing the risk of exposure to multiple health staff.

Strict lockdown and quarantining of close contacts at their own homes was a welcome move for the community. They were able to continue with their household chores, take care of their livestock and tend to the agricultural work as usual.

Asymptomatic or mildly symptomatic patients without significant co-morbidities were effectively managed at the community-level isolation centres. This also reduced the fear and stigma associated with COVID-19 and further enhanced community understanding and preparedness for future outbreaks<sup>8</sup>.

Community engagement has been considered a fundamental component of past outbreaks such as Ebola virus disease<sup>9</sup>. Likewise, it could help to improve trust levels of community members in government-led outbreak response efforts<sup>10</sup>. Community level management and engagement should be made a fundamental approach to any outbreaks of similar magnitude in the future.

## CONCLUSIONS

In resource-poor settings with limited hospital beds, community-level isolation centres was an effective alternative to contain COVID-19 outbreaks. The experience from Jomotsangkha in terms of outbreak response, medical management, communication with patients and logistic arrangements serve as an important case lesson in public health.

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