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https://doi.org/10.47811/bhj.171

The last COVID-19 lockdown in Bhutan: a referral hospital's response to a community outbreak of the Omicron variant

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ABSTRACT

This viewpoint outlines the COVID-19 management strategies Central Regional Referral Hospital (CRRH) adopted in Bhutan during the Omicron variant outbreak. The hospital in the high-risk region provided healthcare and public health services to its catchment area during the lockdowns imposed in Bhutan. Specifically, we discuss the hospital's role in outbreak management, surveillance, isolation, patient care, and non-clinical services. Key strategies including community-based surveillance, isolation in hotel facilities, telemedicine and community engagement are highlighted. We briefly outlined lessons learned from the experience, such as the importance of community involvement and innovative approaches to healthcare delivery during pandemics.

Keywords: *Bhutan; Health Services; Lockdown; Pandemic; Public Health*

INTRODUCTION

The index COVID-19 case in Bhutan was a 76-year-old American tourist who visited Jigme Dorji Wangchuck National Referral Hospital (JDWNRH) in Thimphu on 5 March 2020 with respiratory and gastrointestinal symptoms[1]. The Health Emergency Operation Centre was activated at the Ministry of Health with support from the Technical Advisory Group. Three regional and district taskforces supported the National COVID-19 Taskforce. At the helm of the national efforts was His Majesty The King, providing overall guidance and leadership to contain the pandemic and to mitigate damage[2]. Several protracted lockdowns led to job losses and the economy nosedived[3]. Yet, the country managed to limit COVID-19 death to a few cases involving co-morbidities and the healthcare system, despite resource scarcity, did not unravel.

SETTING

CRRH is one of three tertiary hospitals in Bhutan's three-tiered state-funded healthcare system[4]. Located near the Bhutan-India international border in Gelephu, the hospital caters to the approximate 46,004 population of Sarpang district, and serves as the referral hospital for five districts[5]. Equipped with 150-beds and 479 employees, the hospital provides various specialised services and primary healthcare services[6].

Through most of the pandemic period, the southern region of the country was persistently a high-risk zone[7]. Since 15 January 2022, fourteen districts were in lockdown after detecting omicron variant on 14 January 2022. CRRH was the sole hospital providing tertiary care services for seven southern districts in high-risk zones (Figure 1).

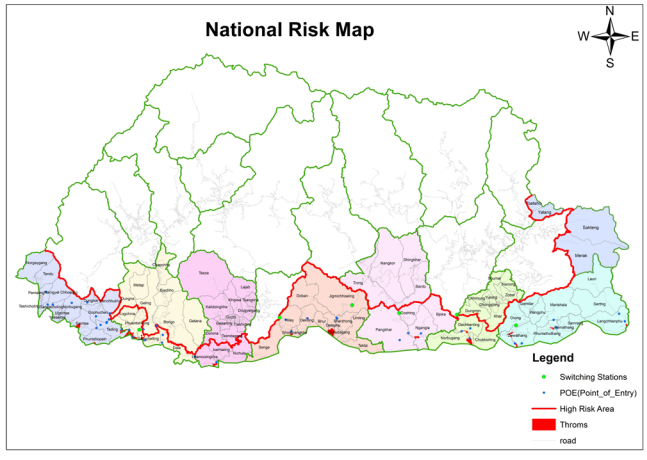

Figure 1. The red-line demarcation indicates the high-risk zone comprising seven districts in the south (Source: Ministry of Health, Royal Government of Bhutan, 25 June 2021. This map is not authoritative of Bhutan's international borders).

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OUTBREAK MANAGEMENT STRATEGY

Bhutan aligned its pandemic response with the principle of Gross National Happiness, prioritizing people's wellbeing, with a zero-death policy. The management was delegated to district COVID-19 taskforce that comprised sectoral leaders led by the *Dzongda* (District Administrator) as the incident commander[2,6].

The medical superintendent of CRRH, working closely with the health ministry's Technical Advisory Group and local surveillance team, advised the Sarpang district taskforce. The taskforce instituted measures to prevent outbreak, regulated mandatory quarantine for people entering the country, assessed and managed security arrangements and facilitated movement of people stranded in the region. It also coordinated trans-shipment of goods from entry point in Gelephu to other parts of the country. Data collected by the local surveillance teams helped the taskforce to designate localities into green, yellow and red zones. Green zones had no COVID-19 cases or contacts, while red zones had active cases with widespread community transmission. When communities had no positive cases for ten consecutive days, one or two individuals per household were tested to determine if they could transition from red to yellow zones. Yellow zones transitioned to green after seven days if 25% members of all households tested negative.

As lockdown protocols relaxed, the focus on cordoning areas was narrowed to specific red clusters and red buildings. A red cluster was an area comprising multiple buildings with positive cases, while a single building with active cases within a community was designated as a red building.

SURVEILLANCE AND ISOLATION

Surveillance team visited the community to collect samples, trace contacts and map out the COVID-19 cases. Between 17 January to 26 April, 6972 positive cases were detected, amongst whom 6967 recovered[6]. Only positive cases with pre-existing conditions and severe symptoms were admitted to the isolation ward in the hospital. Asymptomatic cases were isolated in hotels, preventing hospital congestion and ensuring provision of optimal care for admitted patients.

Gelephu established quarantine facilities on 16 March 2020, to provide the mandatory seven-day quarantine for domestic travelers[6]. Initially, positive cases were isolated for 21 days and discharged once all persons in the quarantine tested negative in reverse transcription polymerase chain reaction (RT-PCR). Later, quarantine days were reduced to 14, and any person who tested negative on the 14th day was discharged from the quarantine facility. When hotel facilities were insufficient to accommodate positive cases, airport apartments were converted into an isolation facility. Simultaneously, the duration of isolation was reduced to seven days. Towards the end of the lockdown, individuals completed seven days of isolation without testing before discharge. However, cross-border arrivals continued to quarantine until its official end on 4 July 2022.

COVID-19 PATIENT MANAGEMENT

Isolation ward

Anticipating hospitalizations of positive cases, a COVID-19 Isolation Ward was established in the vacant old hospital complex (Figure 2), approximately 50 meters from the current hospital. Equipped and staffed for critical care, this ward served patients referred from the central region. Admissions totaled seven in 2020, 19 in 2021 and 196 in 2022[6]. Three patients required ventilators due to pre-existing conditions, and eight deliveries were conducted.

Figure 2. The old hospital complex of Central Regional Referral Hospital, Gelephu, 2023.

RT-PCR laboratory

An RT-PCR laboratory commenced operations at CRRH on 7 July 2020, staffed by five trained professionals. The lab served as the reference laboratory for three districts and also operated as a stand-by reference lab for other districts when they were unable to transport samples to their respective reference lab due to roadblocks. The lab had performed 63,671 tests during the last lockdown[6].

Flu clinics

A flu clinic was established at the old hospital complex to manage patients with flu-like symptoms. In the upcoming days, additional flu clinics were setup in the public ground to enhance service efficiency. These operated for several months post-lockdown before they were closed as patients availing the services trickled down.

Regular health care services

Core hospital services, including the emergency department, inpatient wards, hemodialysis unit, laboratory, pharmacy and kitchen, continued uninterrupted with healthcare professionals in containment mode. Routine outpatient services were suspended from 15 January 2022. Commencing 20 January, essential medical care was delivered through a mobile clinic operating within Gelephu Thromde and its periphery (Table 1). Concurrently, the hospital initiated 24/7 teleconsultation services. Patients

requiring in-person assessment received an SMS as a 'movement pass' from their doctor to visit the hospital. Prescriptions were transmitted electronically to the pharmacy, and medications were delivered by Bhutan Red Cross Society volunteers.

Routine outpatient services resumed on 10 March 2022, at an off-site location to minimise COVID-19 transmission to hospitalized patients. The mobile clinic and teleconsultation services were subsequently discontinued. Referrals to JDWNRH and India continued throughout the pandemic, totaling to 18 patients during the last lockdown[6]. However, accompanying healthcare professionals, drivers, patients and attendants adhered to strict COVID-19 protocols, including restricted dining, limited interactions in Thimphu during patient handover and mandatory overnight quarantine.

Table 1. Healthcare services provided by the Central Regional Referral Hospital during the last lockdown extending from January to March, 2022[6].

Services	Number (N)
Emergency services	2237
Hospitalization	456
Laboratory tests	38, 689
Ultrasound scans	1331
X-rays	1072
CT scans	133
Hemodialysis	526
Pharmacy services	10,262
Mobile Clinic services	2462
Teleconsultation services	2077
Tele-counselling	252

NON-CLINICAL SERVICES

Volunteers

The whole community showed resilience and solidarity for collective response to the pandemic. Bhutan Red Cross Society members and hospital staff volunteered to transport discharged patients and deliver prescribed medicines to patients. Local businesses contributed equipment and food supplies to the hospital. Orange exporters, for instance, donated oranges to the patients and frontliners in isolation and quarantine facilities.

Social media unit

Leveraging the widespread use of Facebook in the country, CRRH disseminated critical health information, vaccine-related updates and countered misinformation throughout the lockdown via the hospital's Facebook page. The page actively promoted the national campaign of "Our *Gyenkhu* — our responsibility" to uphold COVID-19 protocol adherence[8]. The page also highlighted the sacrifices and hard work of various hospital teams to keep them motivated, posted notes of gratitude for volunteers and maintained a consistent online presence with 34 posts between 16 January and 17 March 2022.

Engineering and maintenance team

The hospital's engineering team operated in shifts from a containment facility to ensure uninterrupted supply of essential utilities, including water, electricity, heating, ventilation, air conditioning and medical gas. The team also erected a medical camp tent near the COVID-19 Isolation Ward and established a dedicated hemodialysis unit for COVID-19 positive end-stage renal disease patients, thereby eliminating the need for referrals to Thimphu.

Desuups

Desuups, volunteers trained under Royal Command with a focus on community service, played a critical role during the lockdown. Desuups stationed in the hospital supported healthcare professionals by providing catering services for isolated patients and augmenting the hospital's security team. Another group collaborated with the Isolation and Quarantine team, caring for positive cases, relaying patient needs and disinfecting vacated rooms. Additionally, Desuups assisted the community by delivering essential items and groceries to households in Gelephu.

LESSONS FROM THE LAST LOCKDOWN

Isolating asymptomatic and mildly symptomatic cases in hotel facilities prevented hospital congestion while providing economic support to the hotel industry. The community's unified response, evidenced by volunteerism and donations, was important in the pandemic response and containment. Such community engagement, as seen in past outbreaks of Ebola, as well as the national campaign of "Our *Gyenkhu* – our responsibility" encouraged people to take responsibility in breaking the chain of infection[8,9].

Local-level efforts and contributions, such as those by CRRH, contributed to Bhutan's globally recognised success in pandemic management. The success shows that a decentralised approach, coupled with effective communication, can effectively mitigate the impact of a pandemic on a healthcare system.

Although the hospital's primary healthcare services were disrupted during the lockdown, which could have negatively impacted preventive and promotive health, the hospital implemented alternative measures such as teleconsultation services and a mobile clinic to mitigate these effects.

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AUTHORS CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

MT: Concept, data collection, manuscript writing, editing and review.

TD: Concept, manuscript writing, editing and review

ST: Data collection, manuscript writing, editing and review

CG: Concept, manuscript writing, editing and review

Authors agree to be accountable for all respects of the work in ensuring that questions related to the accuracy and integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

None

GRANT SUPPORT AND FINANCIAL DISCLOSURE

None