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Nepal's Readiness and Response to COVID-19

Key Initiatives, Emerging Challenges and the Way Forward

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1. Context

The corona virus-caused disease COVID-19 has drawn the attention of people around the world. It is an illness caused by the severe acute respiratory syndrome coronavirus-2 [1]. Its symptoms include fever, dry cough, sore throat, fatigue, shortness of breath, and breathing difficulties [2]. People can die as the infection can cause pneumonia, severe acute respiratory syndrome, or kidney failure. It is highly contagious.

Nepal has limited experience with several past outbreaks of virus-caused diseases that have impact the world apart from some seasonal influenza, 'avian influenza' and 'swine flu'. At the global level, some salient outbreaks include Spanish flu (1918-20), Severe Acute Respiratory Syndrome, SARS (2003), Avian Flu *(2008), Swine Flu (2009), Middle East Respiratory Syndrome, MERS (2012), and Ebola (2014-2016). Spanish Flu infected one-third of the world's population, or 500 million people, and killed an estimated 50 million worldwide, with about 675,000 deaths occurring in the USA alone. The Swine Flu pandemic, which originated in Mexico, impacted 11-21% of the then global population and killed 150,000-575,000. Ebola originated in the forested rural region of Southeastern Guinea and West Africa. There were a total of 28,616 cases and 11,310 deaths. SARS killed 10% of infected individuals while MERS was fatal in 37% of the infected population [4]. Unlike SARS and MERS, corona virus has an incubation period of up to 14 days and asymptomatic infected individuals can transmit the disease to others.*

From December 2019, World Health Organization (WHO) has been closely monitoring the basic characteristics and progress of the corona virus. Considering its prevalence, it announced the virus was "a public health emergency of international concern" on January 31, 2020 and a "pandemic[1]" on March 11, 2020. Since the declaration of a pandemic, WHO has urged all affected countries to

[1]A pandemic disease is an epidemic that has spread over a large area, that is, it's "prevalent throughout an entire country, continent, or the whole world.

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increase their performances to "isolate, test, treat and trace" in order to suppress and control COVID-19. Its mortality rate is now estimated at less than 1 percent [3] from an initial estimate of 3.4 percent (though that figure is still changing). Because of the virus's highly communicable nature, a healthy person who comes into contact with a sick person also is often infected, even though he or she may be asymptomatic.

Research has shown that even infected individuals who show improvement can transmit the virus, causing a so-called "second wave of infections," which make a continuous challenge to public health professional. COVID-19 continues to threaten and disrupt people's lives and expose them to different forms of vulnerabilities with its wide and strong shocks. Both young and old people are at risk from this pandemic though fatalities are greater among older populations.

COVID-19 disrupts familial and societal lives. It is also continuously challenging to public health professional and epidemic sociologist for its systematic response. It is both a health pandemic that is killing thousands and a socio-economic crisis that is threatening the welfare of millions [5]. Unlike other water, climate- or human-induced disasters, it is difficult to response to the pandemic because its microbes or bacteria or viruses are "invisible". As a result, microbiologists, virologists, and practitioners of public health are still in a dilemma about how to manage it safely. This pandemic has restricted people's daily lives, revised people's calendars, and forced them into self-isolation and quarantine. As COVID-19 is spreading exponentially, less developed counties like Nepal face a large risk if they do not take appropriate and effective measures in time.

1.1 Study objectives

The main objective of this study was (i) to identify the key initiatives undertaken by Government of Nepal, (ii) to assess the emerging challenges and constraints that undermine the nation's readiness and response, and (iii) to explore the way forward to reduce the likely impacts of COVID-19.

1.2 Study approach and methods

This study was largely qualitative in nature but some quantitative data were also used. It entailed a review of secondary information largely from the government's websites, daily and weekly newspapers, social media, and online news. Relevant polices were also thoroughly reviewed. Conversations were held with health workers at Tribhuvan International Airport to identify the level of screening practiced and the challenges faced in implementing it. Interactions were held over the telephone with the federal government as well as some provincial (Province 2, Province 5, Karnali and Sudurpachhim) and local (Gaur, Rautahat; Sitganga, Arghakhanchi; Kapilvastu, Kapilvastu; Nepalgunj, Banke; Dhangadhi, Kailali; Birendranagar, Surkhet, Bhimdutta, Kanchanpur; and Dasharathchand, Baitadi) governmental officials to inquire about key initiatives, challenges and the way forward. Consultations were also made in person with health specialist at Bheri hospital and Kohalpur Medical college of Banke, Rapti Academy of Health Sciences and Gorkha private hospital at Dang, Provincial health emergency operation center (HEOC) at Surkhet, Seti hospital and Navajeevan private hospital at Kailali and Dadeldhura hospital at Dadeldhura. All the information collected from various sources was then tabulated, synthesized and analysed to arrive at a conclusion.

2. Provisions of epidemic/pandemic in Nepal's Disaster Policies

i. Constitution of Nepal (2015)

- *Section 30: Emergency Power (273). Clause (1) If a grave emergency arises in regard to the sovereignty, territorial integrity of Nepal or the security of any part thereof, by war, external aggression, armed rebellion, extreme economic disarray, natural calamity or epidemic, the President may declare or order a state of emergency in respect of the whole of Nepal or of any specified part thereof.*
- *Clause (2) Notwithstanding anything contained in clause (1), if there arises a grave emergency in a State by a natural calamity or epidemic, the concerned State Government may request the Government of Nepal to declare or order a state of emergency in respect of the whole of the State or of any specified part thereof, in accordance with this Article.*

ii. Fourteenth Three Year Plan (2016/17-2018/19)

- *The Plan acknowledged to reduce human, physical, economic, cultural and ecological losses due to disasters. It has made strategies for different types of disasters management, such as, earthquake, flood, landslide, epidemic and others focusing on different phases of disaster management cycles, such as, preparedness, response and rehabilitation and mitigation.*

iii. Disaster Risk Reduction and Management Act (2017)

- *Section 2 (e) mentions "unnatural disaster" shall refer to epidemics, vector-borne epidemic, animal and bird flu, pandemic flu, snake bite, animal attack, or similar other man-made disaster.*

iv. Disaster Risk Reduction National Strategic Plan of Action (2018–2030)

- *Section 1: Acknowledges that hilly region is at risk of landslide and soil erosion whereas Chure and the Terai are at risk of flood, droughts, fire and epidemics. Every year hundreds of people are facing a situation of losing their life due to epidemics in some parts of Nepal. It is necessary to develop a surveillance system for regular monitoring of epidemics including influenza virus that impact animal and human health. In addition to damaging the crops, the flood causes great loss of humanitarian and physical assets and generally epidemics spread out after flood.*
- *To reduce the impact of epidemic, the action addressed to (i) establish real time outbreak and disease surveillance system, (ii) hazard assessment, mapping and delineation of hazardous areas for epidemics prone areas and make them available publicly, (iii) assess the exposure and vulnerability on the basis of sex, age and disability in epidemic prone areas using geo-spatial technology and make them available publicly, and (iv) complete the epidemic risk assessment and mapping for epidemics prone areas and make them available publicly.*

v. National Policy for Disaster Risk Reduction (2018)

- *Background section: Every year, the country suffers from great loss of human lives and damage to properties due to natural and non-natural disasters like flood, landslide, thunderbolt, fire, road accidents, and epidemics.*
- *Section 7.42: Natural hazards like flood, landslide, drought, thunderbolt, windstorm, hot wave, cold wave, fire, epidemics and glacier lake outburst will be monitored and forecasted regularly and forecast-based preparedness and response plans will be developed and implemented by developing early warning system.*

vi. National Position Paper on DRRM in Nepal Prepared for AMCDRR (2018)

- *Vulnerability and risk is compounded by changing demographics, technological and socio-economic conditions, development within high-risk zones, environmental degradation, climate change, competition for scarce resources, disability and the impact of epidemics.*

vii. Disaster Risk Reduction and Management Regulation (2018)

- *Section 3 (vi): Maintain security situation of the security personnel and volunteers mobilized during the emergency response.*
- *Section 4 (iv): Provide ideas and suggestions for the use of national and international knowledge and procedures for forecasting and control and management of pandemic and other public health related problems.*
- *Section 5 (v): Ban the fake news and information that propagate the state of fear and trauma during disaster.*

3. Key initiatives undertaken by governments

Nepal has undertaken many readiness and response-related initiatives at the federal, province and local governmental level to fight against COVID-19. It took steps to prevent a widespread outbreak of the disease by procuring essential supplies, equipment and medicine; upgrading health infrastructure; building the capacity of medical personnel through training; and spreading public awareness through the paper and electronic press and social media. The federal government established two hotline numbers, 1115 and 1133, to address public concerns and prepared and disseminated regular press briefings. Ministry of Health and Population (MoHP) has improved its websites to channel information to the public. The government has also disseminated decisions, notices, and situation updates on a periodic basis through social media and websites. The Health Emergency Operation Centre (HEOC[2])/MoHP has launched a Viber community to disseminate the latest information to the public.

In the very beginning, the GoN has made several decisions related to lockdown and instructed citizens to maintain social distancing to reduce the likely risk of coronavirus. As part of these initiatives, public gatherings were cancelled, staff were ordered to work from home, and citizens were requested to stay at home safely. In order to protect whole societies against the virus, people started to minimize social contacts and cancel all planned social engagements. The government also urged people to avoid close contact with anyone with a fever, cold or flu-like symptoms. The Indo-Nepal and China-Nepal borders were sealed to cut down on people's mobility. The government started to identify cases and to trace and contain their contacts. As part of lockdown, towns and workplaces are closed, travel is banned and air transportation is halted. The government started to prepare places of temporary quarantine and isolation beds in hospitals.

Valuing the role of local governments in COVID-19 readiness and response, the Ministry of Federal Affairs and General Administration (MoFAGA) sent a letter to all local governments for (i) maintaining the minimal standard of quarantine as per the "Quarantine Operation and Management Protocol (2076)", (ii) maintaining social distancing among returnees while living

[2]MoHP, with the Secretary level decision on 12 January 2012, has established HEOC within its premises to manage health sector response in Nepal. It works as a central command and control facility for the effective administration of emergency preparedness and disaster management in any emergency situation. It also works as hub for information management, coordination and decision making for response.

in quarantine, (iii) using a single-door system while distributing relief items to affected populations, (iv) keeping a database of people returning from foreign countries and keeping them in quarantine and updating progress on daily basis, and (v) providing personal protective equipment (PPE) to medical persons but not to office bearers of local government.

Apart from such readiness, the government started to stock medical supplies and add hospitals beds to deal with the expected caseload, enhanced the capacity of hospitals, ensured of the strict quarantine of suspected cases, ran campaigns promoting hand-washing, and tested cough protocols, among other measures.

3.1 Readiness and response at the federal level

Key decisions related to the closure of borders and airlines

- Suspended international flights and imposed country-wide lockdown
- Closed border with China and completely halted Nepal-China trade from 28 January.

Key decisions related to improving the health care system

- Set up corona virus testing centers in all seven provinces of Nepal.
- Formed a high-level coordination committee led by the Deputy Prime Minister.
- Instructed public employees to report on weekends as well.
- Instructed to add 115 intensive care unit (ICU) and 1,000 isolation beds in Kathmandu Valley and advised provincial governments to setup a total of 120 ICU beds.
- Halted non-urgent health check-ups and surgeries until further notice in hospitals in Kathmandu Valley with 50 or more beds.
- Formed a team under the leadership of Secretary of the Office of the Prime Minister to monitor conditions and spur containment measures in order to rein in the outbreak.
- Decided to set up 100 isolation beds in several hospitals in Kathmandu.
- Mobilized Nepal Police Hospital, Patan Hospital and Tribhuvan University Teaching Hospital to treat the patients with the disease.
- Allocated six beds in Teku Hospital for the isolation of suspected patients.
- Create a dedicated website at MoHP in Nepali language.
- Allowed international NGOs to divert 20% of their programme budget to COVID-19 preparedness and response.
- Pledged with other South Asian Association Regional Cooperation (SAARC) countries to cooperate in controlling the disease in the region.
- Devised a treatment protocol under the aegis of the Epidemiology and Disease Control Division based on WHO and directed all private hospitals to follow the guidelines.
- Devised contingency plans to tackle the virus.
- Prepared cloth face-masks and protective gear.

Key decisions related to regularizing the service of private hospitals

- Asked both private and public hospitals with over 100 beds to begin operating separate fever clinics and to postpone elective surgeries to conserve resources for an outbreak.
- Forbade private hospitals with more than 100 beds to refer patients to other hospitals. Instead they were to treat suspected patients, wait for test results and provide free treatment.

- Accepted an additional $1.8 million from the United States Government and EURO 1 million from Germany to keep people protected from COVID-19 through readiness and response.
- Contributed NPR 100 million to the SAARC COVID-19 Emergency Fund for preparedness, response and research.

3.2 Readiness and response at province level

Province 1
- Established a Corona Action Fund with NPR 200 million.
- Agreed to prepare a 50-bed and 10-ventilator facility.
- Agreed to construct quarantine areas with a total capacity of 440 beds.
- Set up help desks and health check-up posts at four entry points along the Indo-Nepal-China borders.
- Formed and mobilized a rapid response team for COVID-19.

Province 2
- Allocated NPR 5 million to each district, NPR 2 million to provincial police, NPR 2 million to the Armed Police Force and NPR 0.5 million to the National Investigation Bureau Office from the Disaster Management Fund.
- Allocated NPR 1.2 million for critical health care and NPR 0.2 million to each district hospital.
- Established health check-points at the main land borders for crossing into India.

Bagmati Province
- Agreed to prepare quarantine facilities with a total capacity of 500 beds.
- Formed and mobilized a corona action team.
- Established health check-points at the main land borders crossing into China and India.

Gandaki Province
- Set up a Chief Minister Emergency Fund.
- Used the Gandaki Province Disaster Management Fund for emergency response.
- Assigned Lekhnath Community Lions Hospital for coronavirus treatment.
- Established health check-points at the main land borders crossing into China and India.
- Agreed to set up 111 isolation beds.

Province 5
- Established a NPR 100 million fund to tackle coronavirus.
- Agreed to establish 89 isolation beds in 14 hospitals.
- Established health check-points at the main land borders crossing into China and India.

Karnali Province
- Agreed to set up quarantine facilities with a total capacity of 1000 beds.
- Established a NPR 500 million emergency fund.
- Allocated NPR 5 million to each disaster management committee for emergency response.
- Established health check-points at the main land borders crossing into China and India.

Sudurpaschim Province

- Set up an emergency fund with NPR 110.5 million.
- Allocated NPR 0.5 million to sub-metropolitan cities, NPR 0.4 million to municipalities, and NPR 0.3 million to rural municipalities for readiness and response.
- Agreed to establish 47 isolation beds in 18 hospitals.
- Established health check-points at the main land borders crossing into China and India.

3.3 Readiness and response at the local governmental level

- Conducted orientations for local government officials on the scale of COVID-19 and its transmission, key symptoms and possible treatment measures.
- Promoted awareness through the distribution of information education communication (IEC) materials.
- Formed and strengthened local disaster management committees and rapid response teams.
- Established corona prevention funds and leveraged resources for these funds.
- Managed basic medicine, thermal guns, masks, gloves, and other equipment.
- Identified locations for quarantine and constructed facilities in coordination with security agencies.
- Regulated health-screening points along the Indo-Nepal border and other strategic locations.
- Screened all clients and members of the general public that entered the municipality to seek services.
- Collected details about returnee from foreign countries and kept suspected cases in quarantine by mobilizing ward members and social leaders.
- Monitored the market and ran mobile shops to reduce unnecessary crowds.
- Practiced contact tracing of returnees in coordination with security agency personnel and health workers.

4. Challenges and constraints

Nepal has taken many steps to combat the corona virus. The National Public Health Laboratory and other labs in Kathmandu and provincial centres are working with private hospitals and laboratories to provide timely and accurate diagnostics of COVID-19 with technical support from WHO and the Epidemiology and Disease Control Division of MoHP is monitoring signs of possible outbreaks. In addition, the MoHP has directed all private hospitals to have ventilator-supported ICUs on standby, prepared quarantine centres and temporary hospitals, upgraded and expanded laboratory facilities, and set up hospitals with ICU units and isolation beds, several challenges and constraints undermine the nation's readiness for and response to COVID-19. These challenges and constraints are briefly discussed below.

a. Delay in disseminating test kits and other associated instruments

Although the government did form a high level COVID-19 crises coordination committee[3], led by the Deputy Prime Minister, to deal with the corona crisis[4], that committee has not

[3]On 29 February, the government formed a high level committee to prevent and control the spread of COVID-19 under the leadership of Deputy Prime Minister Ishwor Pokhrel.

functioned well because authority and power were not fully delegated [6]. Since the outbreak, this committee has organized only one all-party meeting to discuss contemporary issues. There has been a delay in procuring polymerase chain reaction (PCR) test kits, PPE and other necessities. There have been several controversies over the procurement of these items as the process was not very transparent. Because of these hiccups, the government has not able to procure sufficient corona test kits and associated equipment from outside. When kits and equipment imported from China were said to be of low quality, the procurement bid was cancelled because the government said that the bidder could not ensure the required quality or quantity of kits and equipment.

b. Public health system is not robust

Nepal's existing public health system does not have adequate capacity to address COVID-19 or any other pandemic, for that matter. Even though many hospitals and laboratories have qualified doctors, nurses, and paramedics, they are limited in number and under-equipped to prepare for and respond to the pandemic. Since Nepal's technical and instrumental capacities are limited, the testing of cases is slow and there is much delay. Initially, laboratories were not able to test cases as they lacked the necessary reagents. To test the very first case, the Government of Nepal (GoN) decided to send samples to Hong Kong instead of buying reagents. Reagents sufficient for 100 tests were borrowed from the Centre for Molecular Dynamics and test kits were provided by the WHO [7]. The reagents cost around Rs 17,000 per test and need to be bought in bulk, sufficient for about 200 tests [8]. With limited physical facilities, suspected cases are not able to be placed in isolation beds or provided proper care and support. Though the GoN is spending time and resources on upgrading health infrastructure and building the capacity of medical personnel, those initiatives are inadequate considering the nature of pandemic.

The current check-up and testing process have many issues. People arrive from foreign countries have to have a fever check-up. Even if they have no symptoms at all (no fever), they are still asked to self-isolate for at least 14 days. If they have a fever, they are sent to a designated hospital. Because the number of returnees is large and health workers are limited, the government is not able to track all of them or trace their contacts. Thus, it is not clear whether or not all stay isolated. Airline passengers suffering from fever were asked to contact a hospital if they developed any additional symptoms, but few did so and health workers did not follow up on their whereabouts. The current monitoring system has a lot of room for the improvement.

Nepal, like many other countries, does not have adequate test kits or personal protective equipment (PPE). The GoN did not practice stockpiling such gear in advance for use during an emergency. The insufficiency of material is an important lesson for the future. Inadequate budget also limited the government's ability to arrange for kits and equipment. Even the thought of having sufficient ventilators and ICU beds in hospitals for a full-blown pandemic is unimaginable. In the view of many public health specialists, there could be many more cases of COVID-19 in Nepal than have been detected thus far because tracing and testing is poor.

[4]The government has established the Covid-19 Crisis Management Centre in order to develop information systems, human resources and other resources required to combat the crisis triggered by the coronavirus infection. The center includes officials of the Ministry of Health and the Nepal Army. The center is operating under the high-level committee formed to control the coronavirus infection led by Deputy Prime Minister Ishwar Pokharel.

Nepal has limited capacity to enforce "isolate, test, treat and trace" for an effective response to COVID-19 as instructed by the WHO[5]. Medical professionals have been continuously requesting governments at all levels to implement the contact tracing of all suspected cases. Though local governmental officers, social and political cadres, NRCS volunteers, Scouts and civil society leaders could be mobilized to carry out tracing, such a practice is still not systematically in place.

In the very beginning, instead of staying in the isolation beds of designated hospital, a few people suspected of having the virus left the hospitals and travelled freely, ignoring government rules and regulations. Observing such problems, the government later provisioned security officials. Because of the absence of a robust database system, however, it is difficult to track patients' activities after they are discharged from hospital. The officials at Epidemiology and Diseases Control Division[6] said that they had been able to track and talk over the telephone with some discharged cases but not with all. This sizeable gap warrants a lot of improvement in the tracking system. Some health professionals during a consultation said:

> *"In the past, we were not prepared for a pandemic like COVID-19. We didn't have comprehensive contingency plans to address such a case. Even if we had a plan, we never realized the need to enforce it for readiness. We are still short of kits and equipment. We never realized the importance of proper stockpile of kits and equipment. There are many things that need to be considered to make a robust health care system in the future."*

c. Sub-standard facilities at temporary quarantine centres

It was good to observe that federal, provincial and local governments have started to erect some temporary quarantine centres to manage suspected cases. That itself was a novel task. But none of the quarantine centres constructed so far meet the minimal conditions of "Quarantine Operation and Management Protocol (2076)" developed by the MoFAGA. As they did not meet the basic requirements, they were simply "outbreak hotspots" instead of "safe quarantine centres". The Sphere Humanitarian Standard to fight against COVID-19, which entails (i) information, (ii) dignity, (iii) community engagement and (iv) needs of others, is not properly followed. Limited space is available to a large populations and people staying at quarantine continuously share food, water, cigarettes, chewing tobacco, soap, towels, and earphones with each other, thereby increasing risks. The rising springtime temperatures and associated diseases like dengue also add to the risks. In such an inappropriate environment, a single infected person could easily transmit the virus to several healthy people. Poor quarantine facilities also undermine the basic purpose of lockdown and social distancing. The same conditions were found in the arrangement of isolation beds located in public buildings and hospitals. Consulted health officials said that people are generally kept in quarantine when they are suspected of having the virus and then put in "isolation beds" when they come down with symptoms and test positive. But there is still some confusion about the rationale of using quarantine and isolation bed among

[5]On March 19, WHO Director-General Tedros Adhanom Ghebreyesus urged countries must isolate, test, treat every case and trace every contact to suppress and control the epidemic.

[6]This Division is responsible for epidemic/outbreak preparedness and control, malaria pre-elimination, kalazar elimination, lymphatic fileria elimination, dengue control, disaster management, control of zoonotic disease specially snakes bites and dog bites, avian influnza control and surveillance and communicable disease research.

stakeholders. Some of the health workers in Dasharathchand, Baitadi, and Bhimdutta, Kanchanpur said:

> *"To be frank, our quarantine centres look like lodges and hostels. They do not meet the basic standard protocols prescribed by the MoFAGA. Local governments have no idea how to meet the standards for quarantine and isolation beds and they have hardly consulted health technicians about such matters. Quarantine centres are run without basic amenities. Local governments are running after meeting the required numbers of quarantine spots and bed without considering their quality. Making quarantine centres is like a fashion and, to us, it is simply a waste of money, if not immediately improved. Very few returnees have agreed to stay in quarantine centres and even those who do go violate the fundamental rules of a quarantine centre as they go here and there without permission. Large populations who are outside quarantines are now roaming here and there in the village and for them it looks like Dashain when they meet relatives and friends whom they have not meet for many years. In some villages, the number of returnees is more than the number of non-returnees. This fact makes it even more difficult to manage quarantine and creates additional fears and trauma. In Bajhang and Baitadi districts, grand fairs were organized for two weeks. At them, more than 3000 people at a time participated despite the fact that local administrations had instructed that no fairs or gathering should be organized. Though the MoFAGA issued a circular to the chief administrative officers of all local levels, directing them to regulate the quarantine along the Indo-Nepal border, the situation has not changed. In Sudurpachhim Province alone, more than 132,000 people returned from India but only 2466 are in quarantine. This figure provides the actual scenario and suggests its impact on the likely risk."*

d. Sub-standard isolation wards

Once cases are confirmed at a quarantine centre after testing, those cases are shifted to isolation beds. Hence, isolation beds should have good facilities for patients. The isolation wards allocated by many hospitals, however, are neither adequate in number nor meet basic standards. Officials shared that even the isolation ward at Sukraraj Hospital is substandard as it lacks basic facilities. Until 2019, Teku Hospital had only one designated isolation bed. It was prepared to handle the avian influenza outbreak few years back. Before the pandemic, hospitals in Nepal had few ICU beds (just three at Teku Hospital) and most were occupied most of the time. Other hospitals, like Nepal Police Hospital, Patan Hospital and Tribhuvan University Teaching Hospital, have limited numbers of isolation beds, too. The isolation beds prepared recently by provincial and local governments do not meet the government's criteria. The local government officials did not read the guidelines and follow government standards nor did they consult health technicians in order to fulfil quality criteria. The majority of newly prepared isolation beds lack needed equipment and amenities. Unless the current isolation beds are adapted to fulfil the basic criteria for isolation beds through strong monitoring and needed adjustment, these beds would not serve patients at the desired scale.

e. Running health checkpoints without enough equipment or technicians

The decision of government to seal land borders with India and China was praiseworthy. It established health checkpoints at border checkpoints with India and China starting in mid-

January 2020. Considering the increased number of suspected cases in India, Nepal put districts bordering India on high alert and arranged for health workers to make help desks along the Indo-Nepal border [9]. India, too, started screening passengers coming from Nepal. However, the check-up system at help desks was completely ad hoc because the numbers of health workers and the instruments were limited and passengers flow was high. As it was hard to manage the crowd at checkpoints, health workers were unable to carry out thorough screening. Local reporters said that hardly 50% of the passengers were checked and other escaped in the crowds. Office bearers of Dhangadhi and Bhimdutta municipalities opined:

> *"Our health checkpoints are sub-standard in terms of quality work. Health workers have inadequate masks and PPE and limited numbers of technicians have to handle large crowds. In the absence of adequate equipment and technicians, the screening work along the broader is ad-hoc. We realized that we would have been able to manage screening work far better if we had trained health workers in advance, provided kits and PPE, and provide ideas about how to control crowds. In the initial few days, border checkpoints had inadequate security personnel to control the crowds."*

In order to meet the growing needs of people, local governments have started to procure large quantities of soap, buckets, and masks, but their effectiveness is lower than expected. Some health workers in Gaur municipality of Rautahat had the following to say about the use of these materials:

> *"We are short of kits and basic health equipment. To meet the gaps and meet the need during this emergency, local governments have purchased basic kits at high prices or even from the black market. A large quantity of bars of soap and buckets were distributed to people to maintain hand-washing practices but the distribution was not very impactful. Cloths masks were procured in large quantities but not used widely as people said wearing masks is uncomfortable. The investment made in procuring the soap, buckets and masks had limited results."*

f. Inadequate coordination among governments and hospitals

Effective coordination among three tiers of governments and hub and satellite hospitals is paramount to manage the emergency situation. Despite a general willingness to coordinate at each level of government and hospital, the contribution of such enthusiasm to readiness and response is low. Each government level and hospital seems to be confused about the discharge of its respective roles. Coordination within the MoHP itself as well as between provincial assemblies and local governments is limited; whatever coordination there is simply ad hoc. Private hospitals are not providing services to help with emergency health issues despite the repeated instruction of the federal government. Coordination is still inadequate among bureaucracies, the security forces, political parties and civil society organisations. Although the Nepal Medical Association has requested large hospitals to maintain separate wards for feverish patients, progress in this area is limited. The types and modes of services they currently offer is also below expectations.

Despite the strong relationship Nepal has with India and China, the GoN was not able to harvest sufficient resources from them. It received little in the way of grants, kits and equipment for emergency response from either country. China has pledged to send a medical support team and logistics, as it has done for Iran and Italy, but the government

was in a dilemma over what and when to request support and waited until it was too late. The government is trying to address the problem politically but it needs more empirical technical expertise and knowledge in order to make good decisions. India has set up a $10 million fund and agreed that any SAARC member country can use it, but Nepal has taken no initiative to request support from this fund. The GoN has also not asked for any support from any UN agency (other than WHO) or international NGO though they could offer relief and response materials as well as mobilize trained human resources. The government could also utilize trained human resources available at international NGOs to fill in gaps in trained technicians. Very late, the Department of Health Services did finally request INGOs to provide protective gear and medical equipment and join hands in the COVID-19 emergency response but has been silent about the mobilization of trained human resources.

g. Superficial screening at Tribhvan International Airport

In order to screen passengers, the government established health desks at Tribhuvan International Airport starting in mid-January 2020. Thorough screening could help to identify who is affected or who not. A total of eight health workers were deployed for this task. But there was a poor correlation between the number of health workers and the number of passengers and the health workers were unable to process the load. The screening, therefore, was superficial. A few interviewed passengers said that they were not even asked to fill in "locator forms", an oversight which made it challenging to track them later. Because of the large crowd, health workers were not able to inform passengers how important self-quarantine was to reduce the likely risk to them, their families, and society as a whole. Some passengers intentionally skipped the screening process for fear that if something were wrong with them, they might have to go to a hospital rather than home where family members awaited them. In the opinion of health workers, screening in the initial days was sub-standard. Since they had no infrared scanners, they used only thermal scanners. Later, however, six infrared scanners were installed.

h. Weak information management system

A strong database is crucial for disaster readiness and response. In particular, a comprehensive, up-to-date database system can help to trace returnees. Though health emergency operation centres (HEOCs) have been established at the federal and provincial levels, but such institutions have not been fully operationalized to coordinate and manage information. The National Disaster Risk Reduction Management Authority (NDRRMA) is another entity responsible for disaster preparedness and response in the country. The NDRRMA recently developed apps[7] to monitor the quarantine but their effectiveness has not yet been assessed. The government has not strategically mobilized HEOCs and NDRRMA to maintain a joint database or coordinate to implement disaster preparedness and emergency response measures. Available data are scattered and therefore cannot be analysed properly. Though many hub and satellite hospitals have developed rosters of trained medical technicians and protocols for their immediate deployment during an emergency, such arrangements were not utilized much to promote disaster preparedness and response. The Indian Prime Minister facilitated the establishment of the COVID-19 Emergency Fund for the SAARC[8] region and some part of this fund was allocated to "Disease Surveillance Software with SAARC partners" and conducting coordinated research

[7]COVID-19 integrated information system & quarantine monitoring system.

[8]SAARC was established with the signing of the SAARC Charter in Dhaka on 8 December 1985 which comprised of eight member states. Its objectives, among others, are to promote the welfare of the peoples of South Asia and to improve their quality of life; and to accelerate economic growth, social progress and cultural development in the region and to provide all individuals the opportunity to live in dignity and to realize their full potentials.

on controlling epidemic diseases in the SAARC region, but the full scope of this provision has not been realized.

Several evaluations in Nepal revealed that during disaster and emergency period, there have been cases of social exclusion [10], risk of stigma [11], discrimination [12], sexual and gender-based violence [13]. Research on these issues along with clinical sociology has been limited. Without it, however, effective societal practices and relevant indigenous knowledge and wisdom was not able to be mainstreamed for managing the outbreak through community resilience. People's level of awareness, degree of sensitization and opportunities to build capacity building are not adequate. Case studies and impact stories, if produced, will help policy makers to manage emergencies but such studies are not a priority of the government.

i. Limited risk awareness among health agencies and civil societies

The health-sector emergency preparedness and response mechanism in Nepal is still weak. Information and coordination mechanisms, along with needed policies and strategies for health emergency preparedness and response, are limited. Since there is limited risk awareness among health agencies and civil society organizations, trained and skilled volunteers have not been mobilized properly and their readiness and response capacities are inadequate, too. The majority of health institutions have neither kits nor equipment in adequate quantities to combat the emergency. They also lack a proper mechanism to stockpile kits and medicines for emergency purposes. The guidelines on safe hospitals and health facilities prepared by DIPECHO projects[9] with funding support from ECHO were also not appropriately utilized. Civil society organizations have limited risk awareness and not all health institutions have emergency preparedness and response plans for managing COVID-19. Health-sector contingency plans developed in the past were not properly used to ensure readiness and response to COVID-19.

5. Way forward

Below are some recommendations to increase the effectiveness of Nepal's readiness and response to COVID-19 in the immediate future.

a. Currently, there is a large gap in terms of the capacity of hospitals and laboratories. Their capacities need strengthening in order to promote readiness and response to COVID-19. Hence, it is required to:

- Provide as many test kits as possible without dely.
- Provide necessary equipment, including PPE, surgical masks, gloves, goggles, face shields, spray machines, and infrared thermometers to the hospitals.
- Mobilize private hospitals to serve patients with fever and flu and other non-corona related diseases.
- Increase the ICU capacities of hub and satellite hospitals.
- Make ambulance monitoring committees more responsible to ensure that ambulances are ready 24/7 in collaboration with the Nepal Ambulance Society and local governments.
- Fill the gaps in blood availability in coordination with the blood banks of the Nepal Red Cross Society and other relevant agencies.

[9]WHO-led consortium run Hospital Disaster Preparedness Projects under DIPECHO Cycles VI to VII within Kathmandu valley and cycle IX in outside of Kathmandu (in Province 5 and Sudurpachhim Province).

- Mobilize UN agencies and international NGOs to help arrange medical appliances and necessary technical support.

b. Despite its many efforts, the government has still not able to trace suspected cases. It also not able to manage diagnostic kits for rapid testing. To address this shortcoming, it is necessary to:

- Mobilize political and social cadres, female community health volunteers, Red Cross-trained volunteers, members of rapid response teams and thematic task forces, Scouts, and leaders of civil society organizations to conduct screening and trace contacts.
- Systematize testing in collaboration with provincial and local government authorities.
- Engage provincial HEOCs in contact tracing and risk communication.
- Strengthen provincial public health laboratories so they can carry out rapid testing.
- Improve temperature screening, classify suspected cases, and transfer patients to designated hospitals for diagnostic tests and further treatment.
- Test everyone who has returned from foreign countries with active outbreaks.
- Use local radio stations to encourage returnees to contact local governments and instruct them to practice self-isolation by sharing the rationale for isolation and the mechanism of punishment as per policy.
- Transfer more health workers and security officials from comparatively less affected areas to highly impacted areas until they are needed elsewhere.

c. The current capacities of health professionals in terms of their knowledge about how to respond to the pandemic is inadequate. It is urgent to build the knowledge and skills of health professionals by implementing the following measures:

- Impart trainings and orientations to doctors, nurses, and paramedics on contemporary COVID-19- related issues, protective measures and treatment procedures.
- Organize a series of trainings on hospital-based infection control and case management.
- Mobilize relevant experts in pandemic response and use already prepared guidelines, referral protocols, manuals, rosters, and deployments protocols to enhance surge capacity.
- Update and use health-sector contingency plans promptly.

d. Though different tiers of government have invested a lot of resources in the construction and systematization of quarantine centers and isolation beds, there is much need for improvements. To increase the effectiveness of these centers and beds, we must:

- Prepare, improve, and add physical amenities to quarantine facilities as per the protocols of the government (MoFAGA) and standards set forth in the "Sphere Guideline".
- Increase awareness of people through radio and TV programs so that they understand how important quarantine, self-isolation and isolation beds are for the emergency response.
- Coordinate with our Indian counterparts to systematize the quarantine centers currently managed along the Indo-Nepal border by sharing each other's learning and good practices.
- Develop flyers that outline the "do"s and "don't"s of quarantine, self-isolation and isolation beds and disseminate them widely.

e. A robust database system is paramount for the success of an emergency response but Nepal's information management system is still weak. To strengthen it, these steps are required:

- Maintain a database on COVID-19 by acknowledging and supporting the crucial roles that health emergency operation centers (HEOCs) and the National Disaster Risk Reduction Management Authority lay in collecting data.
- Develop "disease surveillance software" in collaboration with other SAARC countries by exploring the possibilities described under the SAARC COVID-19 Emergency Fund.
- Assess the major institutional/technical gaps, and strengthen the capacities of provincial HEOCs by providing trained human and financial resources.
- Mobilize the federal HEOC and provincial HEOCs in an intensive manner, keeping in mind the capabilities they demonstrated when playing crucial roles during the earthquake of 2015 and the dengue outbreak of 2019.

f. People have limited awareness and knowledge about the prevention of the spread of COVID-19 since risk communication protocols are missing. To address this gap, it is imperative to:

- Develop issue- and audience-based IEC materials (videos, public service radio/TV announcements, posters, brochures, leaflets, flyers, etc.) targeting risk communication and dissemination.
- Impart information and education sessions at the community level through virtual meetings and orientations and radio programs.
- Run webinars and online sessions facilitating knowledge sharing and learning for health professionals.

g. Knowledge management requires learning from the past and developing strategies for the future. To accomplish this end, proper documentation of the processes and approaches employed during emergency response is urgent. To promote documentation, it is necessary to:

- Carry out research and study of the learning acquired during Nepal's response to COVID-19.
- Develop knowledge products such as case studies and impact stories and disseminate the major outcomes to a wide range of stakeholders.

h. Social science research plays an instrumental role in identifying approaches for supporting culturally-sensitive outbreak response efforts and post-pandemic recovery strategies. There is a need for emphasizing clinical and social research. For this, it is necessary to:

- Increase investment in interdisciplinary social research on infectious diseases and pandemics in order to assess human behavior and the societal context and the roles they play in making response to COVID-19 effective or not.
- Mobilize the private sector to leverage resources for small studies in the name of "corporate social responsibilities".
- Sensitize policy makers to look at the corona outbreak from a "social science lens" as well as a health perspective.

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NDRC Nepal

Established in 2007, with the vision of "building a resilient society", National Disaster Risk Reduction Centre (NDRC Nepal) has been working closely on disaster risk reduction, climate change adaptation, natural resource management and contemporary socio-economic issues. It works on research, evaluation, project implementation and knowledge management and reaches up to 70 districts out of 77 in Nepal. It works with governments, bilateral, UN agencies, networks, and civil society organizations. It has well-established networks with government and strong partnerships with national and regional organizations. With its novel works, it has received (i) International Prize (Judges' Choice) for Solution Search: Farming for Biodiversity (Reward on Innovative Biodiversity Conservation) in 2017 and (ii) Adaptation at Scale Prize: Reward on Innovative Climate Change Adaptation in Nepal in 2016. Currently, the author is associated with NDRC Nepal as an Advisor. He was founder Chairperson and immediate past Executive Director of NDRC Neapl.

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