COVID-19
Intra-Action Review | 2022

NEPAL

Government of Nepal
Ministry of Health and Population

The report is based on the outcomes of the Intra-Action Meeting that took place on March 29-30, 2022, in Kathmandu. The data and information contained in this report have been sourced from the respective units of the Ministry of Health and Population (MoHP) and the Department of Health Services, as well as from the Provinces. It should be noted that the MoHP has not independently verified this data. As such, the accuracy and truthfulness of the information are the responsibility of the respective units and provinces that provided it. Dr Krishna Prasad Paudel, Chief, Policy Planning and Monitoring Division; Dr Guna Nidhi Sharma and Dr Samir Kumar Adhikari, Senior Health Administrators and Mr Ravi Kanta Mishra, Senior Public Health Officer reviewed the report. Mr Manish Gautam from Anweshan prepared the report.

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Acknowledgement

As the challenges of the COVID-19 pandemic gradually subside, threats still loom large. Thus, it is crucial to pause and reflect upon our journey so far.

Our collective experience through this crisis emphasizes the resilience, dedication, and unity of our nation. I am overwhelmed with gratitude towards all the divisions and departments under the Ministry of Health and Population (MoHP) for their ceaseless efforts and their undeterred spirit. From the early days of identifying the first COVID-19 patient to the formulation and refinement of response strategies and management of resources during the multiple transmission peaks, our teams have displayed unparalleled resilience and dedication.

The journey throughout the pandemic was intricate and riddled with unforeseen obstacles. Yet, the MoHP, with its divisions and departments, and in collaboration with other relevant government ministries, stood as a beacon of hope and perseverance for our citizens. This dedication, coupled with the support we received from various stakeholders, notably the World Health Organization (WHO), Country Office for Nepal, has helped us navigate through this unprecedented event.

A pivotal learning milestone within this response against the pandemic was the Intra-Action Review (IAR) that took place on 29-30 March 2022 in Kathmandu. This review meticulously analyzed our response to COVID-19, taking into account feedback from all seven provinces and evaluating the ten crucial pillars for COVID-19 response. I am hopeful that the insights gained from the IAR will bolster our strategic approach and serve as a guiding document for potential future pandemics and health threats.

The IAR offers an exhaustive analysis of our collective actions during the pandemic. It captures our successes, lessons learnt, and the areas which need to be focused on. I am confident that the findings and recommendations of this review will strengthen our preparedness for future pandemics and health threats.

In closing, I wish to reiterate my heartfelt appreciation to all my colleagues at MoHP and partners like WHO. Together, we will continue to work, learn, and strive for a healthier Nepal.

Thank you.

Dr Roshan Pokhrel,
Secretary,
Ministry of Health and Population

World Health Organization
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Message from WHO Representative

The COVID-19 pandemic has reshaped our understanding of public health and demonstrated the paramount importance of national and global collaboration among and beyond health actors for effectively addressing a public health emergency.

As the World Health Organization's Representative in Nepal, I've had the privilege of witnessing firsthand the diligence, dedication, and innovative evidence-based strategies that the Ministry of Health and Population (MoHP) of Nepal has implemented in combating this unprecedented health crisis.

The MoHP's undertaking of an intra-action review (IAR) exemplifies its commitment to continuous learning and improvement. By reviewing actions taken so far to respond to an emergency, an IAR helps to identify best practices, lessons, and gaps in a national public health response. IAR relies primarily on the personal experience and perceptions of individuals involved in the response to assess what worked and what did not, why and how to improve.

An IAR provides an opportunity to review the national functional capacity of public health and emergency response systems and to identify practical areas for immediate remediation or continued improvement of the current response to the COVID-19 outbreak.

By systematically reviewing actions taken at different stages of the COVID-19 response, the IAR provides invaluable insights into best practices, lessons learned, and areas for improvement. From policy planning, risk communication, laboratory capabilities, managing logistics, to ensuring the delivery of essential health services, the IAR delves deep into every facet of Nepal's pandemic response.

The proactive and inclusive approach adopted by MoHP, bringing together relevant stakeholders from all seven provinces, underscores the spirit of collective introspection and future planning. The IAR does not just serve as a documentation of past actions, but more importantly, as a foundation for future strategies, ensuring that Nepal remains prepared and agile in the face of events with potential health threats.

On behalf of WHO, I extend our heartfelt appreciation to the MoHP for their collaborative spirit throughout this challenging journey. The positive role played by the MoHP has set an exemplary standard, and we, at WHO, are committed to continuing our collaboration, further strengthening health security preparedness, readiness, and response to disasters and public health emergencies in Nepal.

The world is closely watching, learning, and adapting. Through collaborative support and unwavering dedication, we have, can, and will continue to create a healthier future for all.

Dr Rajesh Sambhajirao Pandav
WHO Representative to Nepal

Nepal's response to COVID-19: A Glimpse

On December 31, 2019, Chinese authorities reported to the World Health Organization (WHO) about cases of pneumonia caused by an unknown virus. A week later, on January 7, the WHO announced that it had identified the new virus; it named it 2019-nCoV, which was later changed to SARS-CoV-2. This novel coronavirus caused a respiratory disease—what became known as COVID-19—and it quickly spread around the world in the early months of 2020. On January 30, 2020, the WHO Director-General, Tedros Adhanom Ghebreyesus, reconvened the International Health Regulations (IHR) Emergency Committee (EC). It advised the Director-General that the outbreak now met the criteria for a Public Health Emergency of International Concern (PHEIC). He accepted the EC's advice and announced that the coronavirus upsurge was a PHEIC.

On March 11, 2020, the WHO declared the viral outbreak to be a global pandemic.

Nepal's First Case and Preventive Actions

Nepal registered its first COVID-19 patient on January 23, 2020. Following this, its Ministry of Health and Population (MoHP) swung into action and started taking preventive steps, including establishing health desks at Tribhuvan International Airport, then the country's only international airport. Health desks were also installed at the Nepal–China and Nepal–India Ground Crossing Points. On both sides of the border, traffic restrictions were enforced. A COVID-19 Crisis Management Coordination Centre (CCMCC) was also formed, headed by the Deputy Prime Minister. This centre became the main body that brought together stakeholders from all the ministries to put in place a uniform plan of action against the pandemic.

Then, on March 23, Nepal recorded its second case, which spurred the government to make all-out efforts to contain the virus. The government now announced stricter measures: a complete lockdown across the country; restrictions on incoming passengers, including Nepali citizens, from more than 50 countries in Europe, the Gulf and West Asia; the shutdown of all non-essential services; and a ban on all long-haul travel across the country. In addition, the nation's secondary education examinations were postponed; all gyms, health clubs, cinema halls and dance bars were ordered to close; and all gatherings of over 25 people were forbidden.

These measures were legally grounded on the Infectious Disease Control Act 2020 (1964) which was immediately activated. This enabled officials to take decisions that could aid in controlling or containing the pandemic.

Apart from making wide-ranging public health interventions, the MoHP put its primary focus on contact tracing, testing, isolation of cases, physical distancing and on quarantining.

Besides these measures, the Government of Nepal took initiatives to bring back home those Nepalis who were stranded in foreign lands. For example, on February 15, 2020, the government rescued 175 Nepali citizens—mostly students—from Wuhan, the site of the pandemic outbreak. They were quarantined and then allowed to return to their families after all of them tested negative for the virus.

The MoHP's Emergency Response Plan and Lockdowns

On May 7, 2020, the MoHP developed a COVID-19 Emergency Response Plan with the express intention to "flatten the curve" and delay the peaking of the epidemic. This plan was followed by the drafting of rapid action plans. Under these plans, adequate institutional quarantine facilities were arranged by mobilizing the available infrastructure, such as schools, colleges, hostels and hotels across the country; there was also a particular focus on Kathmandu Valley and its bordering districts. In addition, case investigation and contact tracing teams (CICT) were formed and deployed at the local level.

Since the start of the first wave of the pandemic, Nepal exercised a series of lockdowns as it was considered the best contingency plan to keep the virus from spreading. The first of such lockdowns came into effect on March 24, 2020, and lasted for 119 days.

Even during the second wave of the infection, which peaked during two weeks of May 2021, the government announced a complete lockdown. However, the Delta variant of the virus thoroughly tested the country's health system. Almost all the hospitals struggled to cope with the surge of infections, mainly due to limited resources in terms of intensive care units (ICUs), isolation wards and human hands. With the positivity rate sometimes over 45 per cent, the virus infected an overwhelming number of people, causing acute shortages by way of beds, oxygen and critical care equipment. This also had a detrimental effect on health service provisions for non-COVID-19 cases. During this time, concerns were especially raised

regarding preparedness and the availability of oxygen delivery systems in the country. In response to the Delta variant, the MoHP adopted a "COVID-19 Unified Hospital" strategy to improve upon coordination and logistics, and thereby better manage the surge in cases; this strategy incorporated 14 major hub hospitals of Kathmandu and seven hospitals, one in each province, making it a total of 21 Unified COVID-19 Hospitals (UCH).

Mission Vaccination

In the meantime, Nepal rolled out its vaccination drive on January 27, 2021, months ahead of most other countries. Equipped with a million doses of the Covishield vaccine—developed by the Oxford University and AstraZeneca, and produced by the Serum Institute of India—donated by the Government of India, Nepal began its vaccination mission by inoculating its frontline health workers, a welcome move indeed. At the same time, the government also started inoculating those belonging to high-risk groups.

The MoHP met with a few challenges during the stage of purchasing the vaccines. The biggest stumbling block came in the form of delayed delivery of the second dose by the Serum Institute of India. This had adverse implications, especially for the elderly. But all along, the Government of Nepal was in talks with multiple companies and international agencies to secure the required doses to vaccinate a majority of its population.

A little over a year later, the government has successfully inoculated a majority of its population.

The highly transmissible Omicron variant started the third wave of infection in the country; however, this time around, hospitalization and death rates did not increase with the number of positive cases.

Setting Up Benchmarks

Looking back, one of the best practices the Nepal government implemented during the pandemic was the swift activation of the Emergency Response Plan and the five rapid action plans which were based on the latest information as well as on sound epidemiological projections. Besides, the government introduced and implemented more than 70 guidelines and procedures. The development of these plans and guidelines allowed the country's health sector to fight the spread of the virus through a coordinated and concerted approach involving all the three tiers of government.

The government had also set up a knowledge café, a platform for evidence-based decision-making. Further, it had made optimum use of its resources by dedicating all its public hospitals to COVID-19 treatment. Moreover, the two annual budgets after the pandemic focused heavily on COVID-19 prevention and control, which helped the MoHP considerably in executing its plans and policies.

Another best practice that aided the country was its focus on vaccination.

The country also made impressive progress in expanding its laboratorial capacity—in less than two years, from having just one lab, Nepal now has a network of over 100 SARS-COV-2 PCR testing laboratories. This network of laboratories was crucial in increasing the testing capacity of the government; it also made it easy to quickly identify active cases and to conduct contact tracing; all this paved way for efficient treatment mechanisms. Meanwhile, adopting newer and more complex technology (such as genome sequencing) has improved Nepal's capacity to sequence SARS-CoV-2; so, it was able to detect and confirm the first case of Omicron variant in the country by the end of 2021.

However, amidst the many positive strides, there were many challenges in terms of resource management, intra-governmental communication and constant changes in focal points when it came to decision-making. Take, for instance, the case of laboratories. Despite the considerable increase in their number, the diagnostic facilities for testing and confirming COVID-19 cases were often found to be insufficient. Moreover, such services in the peripheral parts of the country were mostly inadequate. Another issue concerned the number of hospitals that provided COVID-19 treatment—although the MoHP clearly instructed all the hospitals to convert themselves into COVID-19 treatment centres, most of them struggled to do so due to financial and human resource constraints.

But taking into account the overall scheme of things, it has to be asserted that the government was largely successful in combating the pandemic. As of April 20, 2022, the total number of COVID-19 cases in Nepal was 978,684, with 11,951 deaths (which accounts for 1.22 per cent) reported.

Prevention is still the best option we have to break the transmission chain of the virus. At the moment, Nepal has managed to keep its head just above the water. But it obviously has to do much better than that and the government should remain vigilant and continue to promote the health guidelines that can help prevent the spread of the virus.

About IAR

An Intra-Action Review (IAR) is a qualitative review of actions taken so far to respond to an emergency to identify best practices, lessons and gaps in a national public health response. IAR relies primarily on the personal experience and perceptions of individuals involved in the response – to assess what worked and what did not, why and how to improve.

An IAR provides an opportunity to review the national functional capacity of public health and emergency response systems and to identify practical areas for immediate remediation or continued improvement of the current response to the COVID-19 outbreak.

The MOHP held IAR on 29-30 March 2022 in Kathmandu were health stakeholders of all the seven provinces were invited. From the beginning of the pandemic to current situation, the IAR reviewed the response to COVID-19 of all seven provinces and ten COVID-19 response pillars.

The pillars included:

- National Policy and Planning related to Control and Management of COVID-19
- Country Level coordination and Monitoring
- Risk Communication and Community Engagement
- Surveillance, Rapid Response teams, and case investigation, Point of entry, international travel, and transport
- National Laboratories
- Infection Prevention and Control
- Case Management
- Operations Support and Logistics
- Maintaining Essential Health Services and Systems
- Covid-19 Vaccination

The objectives of the IAR were:

- To provide an opportunity to share experiences and collectively analyze the ongoing in-country response to COVID-19 by identifying challenges and best practices,
- To facilitate consensus building among and the compiling of lessons learned by various stakeholders during the response to improve the current response by sustaining best practices that have had demonstrated success and by preventing recurrent errors,
- To document and apply the lessons learned from the response efforts to date to enable health system strengthening,
- To provide a basis to validate and update the Country COVID-19 strategic preparedness and response plan and other strategic plans accordingly.

Methodology of the IAR

Date(s) of the IAR activity	29/03/2022-30/03/2022
Location(s)	Nepal, Bagmati Province, Chandragiri Municipality
Set-up	☐ Online ☒ Onsite ☐ Mixed (online and onsite)
Participating institutions and entities	(Please list the main participating institutions and entities here and attach the full list of participants to the Annex)
Total number of participants and observers (if applicable)	
Period covered by the review	(23/01/2020 – 30/03/2022)
Response pillar(s) reviewed	☒ Country-level coordination, planning and monitoring ☒ Risk communication, community engagement, and infodemic management ☒ Surveillance, case investigation and contact tracing ☒ Points of entry ☒ National laboratory system ☒ Infection prevention and control ☒ Case management and knowledge sharing about innovations and the latest research ☒ Operational support and logistics in the management of supply chains and workforce resilience ☒ Strengthening essential health services during the COVID-19 outbreak ☒ COVID-19 vaccination ☐ Vulnerable and marginalized populations* ☒ National legislation and financing ☒ Public health and social measures

** The vulnerable and marginalized population were considered throughout the different pillars such as vaccination plan among others but not as a stand-alone pillar by itself*

Findings

Country Level Co-ordination

Nepal's first COVID-19 case was reported on January 23, 2020. Then, on March 23, 2020, when the second COVID-19 case was reported, the Nepal government declared a complete lockdown throughout the country. The government established health desks at the Tribhuvan International Airport, the country's only international airport, tightened security at the open border with India, and started training medical personnel and spreading public awareness. Despite such strict measures, the country's first community transmission was recorded on April 17, 2020.

While tackling a pandemic, early interventions are crucial to contain the spread of the virus. The Nepal government was swift to act and impose the strictest restrictions in the early days. The months that followed were crucial to contain the spread of the coronavirus. Through consistent inter-ministerial coordination, the government was able to develop various policies, plans and guidelines to keep the public safe. On February 26, the Incident Command System was activated to focus on discussion, coordination and response among all tiers of the government. Then on March 1 the COVID-19 Control and Management High-Level Committee was established to coordinate the federal government's response. In addition, on April 9, health cluster coordination was activated among all the partner agencies working in health sector across the country.

Thus, as all tiers of the government worked together, and a common national position on COVID-19 response was established which pushed for effective inter-country coordination in tackling the spread of the virus. As a result, there was a swift and real time sharing of COVID-19 updates, and a source of reliable and verifiable information was created that also worked as a solid mechanism for countering misinformation and rumours in real time.

However, there were many challenges along the way. Despite such efforts, there were instances of irregular participation/involvement of the health partners, which resulted in delays in COVID-19 response, especially during times of case stress, and in duplication of COVID-19 response actions. The limited number of human resources was also a major obstacle in fighting the crisis, resulting in health personnel being extremely overworked.

To overcome such obstacles, the way forward is to conduct regular coordination meetings between health authorities at all three levels of the government. Similarly, there is a need to strengthen the HEOC, which is also functioning as the national secretariat for health cluster, along with the development of technical guidelines for health cluster collaboration. Similar to the national health cluster, there is a need to strengthen the provincial health cluster secretariat.

1. Country-level coordination, planning and monitoring	
Observations	
Best practices	1. There was consistent participation in inter-ministerial coordination meetings irrespective of wave. There was a consensus and ownership among all the ministries on the response to COVID-19. **Impacts** • All sectors/ministry were aware of updates of COVID-19 • Common position in COVID-19 response was established • There was a sense of unity and common purpose • Effective inter-country (global) coordination was apparent • There was significant volume of Health Logistics Supports by development partners and diplomatic missions **Enabling factors** • The committee was chaired by the Prime Minister (CCMC) • There was regular presence of all the ministry • Novelty of the disease in terms of societal impact • Access to the global scenario • Support from the global community 2. Immediate activation of Health Cluster Coordination Meetings (HCCM) and its sustainability **Impacts** • Swift and real time sharing of COVID-19 updates • It became the source of reliable and verifiable information amid infodemics/Solid mechanism for countering misinformation and rumors in real time • Robust dialogues led to constant innovation and search for solutions • Silos was prevented **Enabling Factors** • General Emergency Preparedness of Nepal/ Exemplary for Disaster Preparedness/ Regular investment in emergency preparedness • Immediate set up of ICS • HCC Secretariat based at HEOC-MOHP/Immediate physical proximity of key stakeholder of HCC • The presence of sizable health actors in the country as Nepal being disaster prone • Inquisitiveness about COVID-19 being addressed (personal and professional interests) 3. Coordination Meeting with COVID Hospitals and Provincial Health Directorate Offices in light of ongoing federalization in Nepal **Impacts** • Coordination among federal, provincial, and local level and information sharing was improved • It helped partners to appreciate gaps and challenges and search for common solutions **Enabling Factors** • Front liners getting access to the thinking behind the response • Hub and satellite coordination network put to effective use • Well-functioning HEOC-PHEOC coordination network with a common pool of experts

4. Regular mapping of partners' support

Impacts

- Pooling and sharing of resources was possible.
- Duplication of support was minimized.

Enabling Factors

- Ready-to-use tools
- Partners accustomed to the process for reporting and recording

5. Establishment of Provincial health cluster coordination mechanism

Impacts

- Coordination among health partners within province(s) was improved
- Pooling and sharing of resources were possible.
- It helped partners to appreciate gaps and challenges and search for common solutions

Enabling Factors

- Lead taken by ICS for the establishment of Provincial Health Coordination Mechanism
- Notable presence of health partners in the provinces
- Inquisitiveness about COVID-19 being addressed (personal and professional interests)

6. Vaccine coordination

Impacts

- It resulted in timely administration of vaccines (second in South Asia).
- It helped achieve WHO's target milestone of 70% vaccination against COVID-19 of people aged 18 years and above within allocated time.

Enabling Factors

- Strong leadership and use of diplomatic channels
- Strong solidarity and coordination from partners

Challenges

1. Disinclination/Reluctance of government bodies at different levels to readily take the ownership of/ implement central decisions

Impacts

- The same processes were duplicated at all levels.
- Timely implementation of activities was difficult.

Limiting Factors

- There were layers of coordination mechanisms in 3 tiers of government
- Established health system had further changes following federalization.
- The chain of command after federalization was ever evolving.

2. Irregular participation/involvement of the health partners in the Health Cluster Coordination Meetings and activities

Impacts

- Non-participating partners were unaware on recent ministerial updates
- COVID-19 response activities were duplicated.

Limiting Factors

- Fatigue among health partners due to protracted nature of COVID-19
- Unpredictable nature of COVID-19
- Involvement in non-COVID activities

3. Difficulty for HEOC to coordinate 24/7

Impacts

- There were delays in COVID-19 response during extreme hours

Limiting Factors

- Inadequate HR

4. Irregular conduction of the Provincial Health Cluster Coordination Meetings and activities

Impacts

- Lack of identification of true needs and gaps
- COVID-19 response activities were duplicated

Limiting Factors

- Fatigue due to protracted and unpredictable nature of COVID-19
- Involvement in non-COVID activities
- Inadequate HR

Prioritized actions

a. **For immediate implementation:**
   - Develop/update the guideline for national and provincial health cluster
   - Need for capacitation of Provincial Health Cluster Secretariat

b. **For mid to long-term implementation to improve the response to the ongoing COVID-19 outbreak:**
   - Strengthening of HEOC

Risk communication, community engagement, and infodemic management

Early on in the pandemic, the government realized that providing the public with scientifically accurate, reliable information about the novel coronavirus would be instrumental in keeping COVID-19 cases under control. Thus, the government has concentrated on providing effective and accurate information to the public from the start as part of risk communication and community engagement. Towards that end, to disseminate real-time information, the government started a number of programs such as the National Press Briefing on COVID-19; a call center (1115) and a hotline number (1133); and a Crisis Media Hub (which operated 24/7). It also stepped into complete digital communication by developing an app called Hamro Swasthya App.

The government also produced a COVID-19 Communication Strategy and a separate Risk Communication, Community Engagement Directive, which would build an implementation framework and procedure at the federal, provincial, district, and local levels. It also worked on various national level campaigns, such as the Mask Campaign and Mental Health Wellbeing Campaign, together with the private sector, development agencies and government stakeholders, which received huge media coverage, saw active participation from communities across countries and support from all stakeholders.

Additionally, the Government of Nepal also focused on the capacity building of health personnel, journalist and elected officials on RCCE. This was done through a series of engagement programme with local level elected officials, provincial assembly members of four provinces, speakers and deputy speakers of all seven provinces and members of national assembly at the federal level.

As a result of all its efforts, accurate information was available to the Nepali public at all times and this was useful in debunking rumors and misinformation and keeping the public constantly in the loop of COVID-19 developments.

On the government level too, there was regular communication with stakeholders — through bi-weekly meetings, cluster meetings, instant messaging groups among partners and experts. However, there were challenges too, such as inadequate budget, limited skilled RCCE professionals, lack of consensus and non-compliance on using single logo/brand which may fail to garner trust among the public or which is risk in terms of building trust among the public) and a lack of smooth coordination between three tiers of governments.

2. Risk communication, community engagement, and infodemic management	
Observations	
Best practices	1. Regular dissemination of situation updates through National COVID-19 Press briefing **Impacts** • Well-structured national platform was established for mass dissemination • MOHP was accepted as credible source of information about COVID-19 • Quick debunking of rumors and misinformation led to informed decision making about COVID-19 • Calling ring back tones that provided messages related to COVID-19 **Enabling Factors** • Agreement with NTV for production and dissemination of health dedicated programs • Technical support from partners • Willingness of different divisions and centers of MOHP/ DoHS to contribute/ participate at the briefings • Contribution from active listening mechanism 2. Establishment of hotline and call center **Impacts** • Quick debunking of rumors and misinformation • The queries and concerns of public on COVID-19 and other operational issues were promptly responded to. **Enabling Factors** • Support from all the concerned leadership • Coordination among stakeholders for sharing of knowledge and expertise • Financial and human resource support from partners.

3. Establishment of Crisis Media Hub (running 24/7 as a newsroom)

Impacts

- Prompt content production made possible the quick debunking of rumors, misinformation and provided new and authentic information
- Influencers, private sectors became working partners
- There was strategic media engagement of international, national and local media. Additionally, the international media's attention was turned towards the unfolding crisis in Nepal.

Enabling Factors

- Support from all the concerned leadership
- Coordination among relevant departments and agencies in production and dissemination
- Financial support from partner

4. Digital Engagement via Hamro Swasthya Mobile App, MOHP/ NHEICC/ HEOC/ Partners SOCIAL Media channels and MOHP Viber Community- Boosting of social media contents to targeted population

Impacts

- Wider reach to the population with smart phones

Enabling Factors

- Larger portion of population using smart phones
- Technical support from stakeholders

5. Media Monitoring and Social Media Monitoring

Impacts

- Dynamic tracking of rumors and misinformation
- Facilitation in decision making

Enabling Factors

- Robust media landscape and high use of social media in the country

6. Community Engagement

Impacts

- Most vulnerable and marginalized groups were reached with the help of targeted community interventions like door-to-door campaigns, community information point
- Localized and targeted interventions were carried out by social influencers, elected representatives and volunteers-based organizations.
- Non-health actors such as armed police force and Nepal Police were also engaged in promoting mask use at public places and point of entries.

Enabling Factors

- Sharing of technical expertise
- Financial and human resource support by partners

7. Setting up of formal mechanism for RCCE

Impacts

- Provision of framework and mechanism for RCCE structure at different level of governance
- Streamlined the RCCE activities and enhanced coordination among stakeholders / experts
- Sensitization and capacity building of RCCE focal points at Province level and partially at local level

Enabling Factors

- Acknowledgement of the implication of RCCE
- Active participation of stakeholders in drafting of RCCE directive
- RCCE training across sectors
- Active participation of RCCE focal points from Province and local level in the orientation programs

8. Regular communication with stakeholders: bi-weekly meetings, cluster meetings, instant messaging groups among partner and experts

Impacts

- Enhanced coordination with divisions and centers of MOHP/DoHS and partners
- Cohesiveness in RCCE activities and regular assessment

Enabling Factors

- Collaboration and partnership that were established prior to the pandemic
- Technical and financial support from partners

9. Mass Media Mobilization

Impacts

- Intensive Public awareness made possible in short duration

Enabling Factors

- Collaboration and partnership with agencies working on RCCE
- Technical and financial support from partners

10. Contents production and dissemination in local languages and use of sign language

Impacts

- Wider reach and increased coverage of targeted population
- Ownership of contents produced

Enabling Factors

- Collaboration and partnership with agencies working on RCCE
- Technical and financial support from partners

Challenges

1. Proper Resource Mobilization and Utilization among different departments of DoHS

Impacts

- RCCE activities could not yield the output and outcome as expected

Limiting Factors

- Lack of clarity on the financial issues and lack of resources

2. Limited skilled RCCE professionals

Impacts

- Restricted the ability of the organization to swiftly assess content and operationalize plans

Limiting Factors

- RCCE was not included as an essential component of national health system

3. Lack of consensus and non-compliance on using single logo/brand (of government e.g., MOHP) in the IEC/RCCE materials

Impacts

- Decrease in credibility of MOHP as the lead source for information

Limiting Factors

- Unwillingness of partner agencies and stakeholders to agree with the concept of using single logo or brand during crisis to establish trust and credibility towards government.

4. Lack of adequate budget

Impacts

- Untimely implementation of communication activities
- Increased dependency to conduct RCCE activities

Limiting Factors

- Less prioritization of RCCE as response strategy for COVID-19

Prioritized actions

a. For immediate implementation:

- Need for timely and proper implementation of the action plans
- Need for increment in the technical capacity required to smoothly and swiftly operationalize RCCE plans, programs and activities
- Use of single logo or branding in the communication materials is effective in the time of crisis or emergency and ensures trust among public.
- Media strategy and media mapping aimed at media engagement activities for timely dissemination of information to maintain public trust
- Coordination among partners and streamlining of the RCCE activities to avoid duplication of work through partners mapping

b. For mid to long-term implementation in order to improve the response to the ongoing COVID-19 outbreak:

- Community Engagement related activities to be formalized.
- Structured training for RCCE training to be developed and training to be rolled out.

Surveillance, Case Investigation and Contact Tracing

Within just five weeks of the first case detection in Nepal, as part of its national COVID-19 containment strategy, the MOHP formed Case Investigation and Contact Tracing (CICT) teams. The EDCD, the district health office team, and local level authorities coordinated the formation of the CICT to jump start strict surveillance on COVID-19 cases mainly aimed at limiting the spread of the disease. The government put in place CICT guidelines as they assembled teams and trained health professionals based on global guidance and the Infectious Disease Act 1964. In addition, the government also prepared National Pandemic Preparedness Response Plan (NPPRP) in 2019. Furthermore, authorities trained human resources dedicated to conducting CICT hotspot identification, developed a community testing guideline, and deployed technical CICT focal persons at local levels within Kathmandu valley. In addition, the government also started a call centre where the public could call in to get any of their queries related to the disease answered.

Owing to all the policies and plans in place for the implementation of contact tracing, early detection of COVID-19 cases was possible.

The factors that supported the surveillance process were the WHO guidelines, the quick approval of the CICT team management and mobilization guideline owing to the active involvement of all levels of government, motivated health workers, partner support, academia and volunteer mobilization, and ownership of the community.

There were many challenges too. For instance, at the community level, surveillance and response in case investigation, tracing, isolation, quarantine and testing were inadequate. There was also a lack of information related to the continuum of care for tracking cases and a lack of an integrated system to link laboratory, surveillance, and hospital database. This meant that community transmission could not be prevented, and health workers were overworked for months when caseloads were high.

Moving forward, there are many ways to improve surveillance and contact tracing on all tiers of the government. These include implementing event-based surveillance via improving the Alert and Response System (through call centres and media monitoring, etc.); strengthening the Early Warning and Reporting System (EWARS) to improve alert and timely response to disease outbreaks. Also, the MOHP must now work towards integrated disease surveillance at all levels of governance and all health facilities; and enhance communicable disease notification for early detection of outbreaks, outbreak investigation to establish cause, and to initiate early response. Also need to strengthen contact tracing to establish social networks of disease spread leading to better formulation and implementation of evidence-based control and preventive strategies.

3. Surveillance, case investigation and contact tracing	
Observations	
Best practices	1. Timely preparedness measures (CICT guidelines, SoPs and IEC materials) put in place based on global guidance **Impacts** • Early detection of COVID19 cases followed by implementation of contact tracing and early implementation of public health and social measures **Enabling Factors** • Availability of WHO guidance 2. Allocation of dedicated human resources for conducting CICT **Enabling Factors** • Approval of "CICT Team Management and Mobilization Guideline", motivated health workers, partner support, academia and mobilization of volunteers 3. Hotspot identification and community testing guideline **Enabling Factors** • Availability of Antigen test kits and ownership of community 4. Deployment of technical CICT focal persons at Municipal level within Kathmandu valley **Enabling Factors** • Support from Academia

	5. Sero prevalence surveillance of SARS-CoV-2 conducted nationwide **Impacts** • Better understanding of the epidemiological scenario as compared to routine surveillance • Better understanding of PHSM compliance in the community **Enabling Factors** • Support from Partners, active involvement of all levels of government and mobilization of FCHVs 6. Establishment of call centers **Impacts** • Public queries addressed and advocated for compliance of PHSM; effective contact tracing and follow up **Enabling Factors** • Existing work plan within EDCD for establishment of call centers for event-based surveillance 7. Analysis of the COVID-19 epidemiological situation shared daily with public **Impacts** • Daily updates and information disseminated to the public regarding the pandemic • Data-driven decision making made possible **Enabling Factors** • Commitment of the government to ensure transparency on the COVID-19 situation (e.g. Daily briefing, MOHP Viber group, website, Hamroswasthya app). 8. Surveillance of death cases through death case management by Army personnel **Impacts** • Recording of deaths including that of the community **Enabling Factors** • Strong inter-ministerial collaboration
Challenges	1. Suboptimal surveillance and response (case investigation, tracing, isolation, quarantine and testing) at the community level **Impacts** • Community transmission could not be averted hence resulting in sudden increase in the number of cases **Limiting Factors** • Lack of comprehensive community surveillance and response system 2. Lack of information on continuum of care for tracking of case/case profiling **Impacts** • High work burden on health workers for multiple data collection and reporting for same case **Limiting Factors** • Lack of existing integrated system to link laboratory, surveillance and hospital database 3. Lack of interest at the local level to perform contact tracing **Impacts** • Contact tracing activities did not sustain, a smaller number of tests performed, a smaller number of additional cases identified **Limiting Factors** • Less prioritization of CICT activities as compared to other regular services • Lack of incentives to perform CICT activities

Prioritized actions

a. For immediate implementation:
- COVID-19 should be part of the regular surveillance system.

b. For mid to long-term implementation to improve the response to the ongoing COVID-19 outbreak
- Expand the disease list and prioritize according to its burden for regular surveillance
- Make the event based surveillance system more systematic

Points of entry

On March 24 2020, when the government imposed a nationwide lockdown and a ban on international flights, it also blocked all border points across the shared border with India to stop the inflow of people into the nation. But to allow Nepalis stuck in foreign lands to come home, the government established multiple entry points at the ground crossings through financial and technical support from the federal government in terms of human resources, capacity building and logistics supplies.

With the help of strong collaboration with local government and their ownership and partner support, the government established and strengthened health desks where PCR tests were conducted. In addition, quarantine spaces were built in the area. This helped in early case detection and notification through screening, testing and contact tracing, eventually helping contain the spread of the disease.

However, there were many challenges. One of the most significant is the scarcity of human resources and logistics at the health desks of PoEs. As a result, health professionals' workload increased dramatically, jeopardizing their ability to control people's flow. Another challenge was limited guidance documents and a lack of an operational plan for the proper functioning of the POE health desk. All this resulted in the delayed detection of positive cases.
Nonetheless, there are lessons to be learned from all of this. One of the most important lessons learned is that, at points of entry, the MOHP should establish robust ground-crossing criteria well in advance. In addition, the IHR core capacities at the point of entries should be strengthened. Another important lesson is to train health staff to improve regular surveillance capacity at POE (screening, testing, transfer, and containment).

4. Points of entry	
Observations	
Best practices	1. Establishment of additional point of entries at ground crossings **Impacts** • Early case detection and notification from the PoEs through screening, testing and contact tracing **Enabling Factors** • Strong Collaboration with local government and their ownership • Support from partners 2. Regular financial and technical support from the federal government in terms of human resources, capacity building and logistics supplies **Impacts** • Early case detection and notification from the PoEs through screening, testing and contact tracing **Enabling Factors** • Strong Collaboration with local government and their ownership • Support from partners
Challenges	1. Unable to contain all the travelers and screen them at the ground crossing **Impacts** • Limited Screening, testing, and monitoring of travelers specially at the ground crossing resulting in cross border transmission of cases **Limiting Factors** • Wider stretch of the open border with numerous informal ground crossing point 2. Human Resources and logistics at the Point or Entry sites (Designated and non-designated) **Impacts** • Limited Screening, testing, and monitoring of travelers specially at the ground crossing resulting in cross border transmission of cases **Limiting Factors** • Lack of Organization and Management survey/ organogram and infrastructure at the Point of Entry Health Desk. 3. Limited guidance document and operational plan for proper functioning of the POE Health Desk **Impacts** • Hiring of Human Resources, coordination within the governance and cross border coordination were all delayed **Limiting Factors** • Lack of O & M survey/ organogram and infrastructure at the Point of Entry Health Desk. 4. Managing of Positive cases and high-risk migrant population including GESI (Isolation or Transportation) **Impacts** • Positive cases were stranded at the POE and they had to bear heavy cost of private vehicles to travel during lockdown and they had to wait for the lockdown to be over to travel in public vehicle. **Limiting Factors** • Lack of clear mechanism for reimbursement • Lack of Isolation facilities for travelers or holding centers at the POE

5. Lack of capacity to handle surge in travelers and transportation of samples and storage

Impacts

- Lack of proper screening
- Delayed detection of variants

Limiting Factors

- Lack of flexible Human resource deployment plan/mechanism as per the surge in travelers (Some municipalities supported from their internal resources)

Prioritized actions

- Implement event-based surveillance via improving Alert and Response System (Call center, Media monitoring, etc).
- Prompt development of federal level and local level RRT guidelines and SOPs with field level investigation.
- Recruit experts and Implement Field Epidemiology Training Program (FETP)/ Epidemic and Pandemic Preparedness and Response (EPPR) programs for RRT.
- Designate important ground crossings as IHR POE and develop SOP's and guidelines for POE and ground-crossings to strengthen core capacity at POE and ground-crossings practices and revision of tool to assess it.
- Operation and Management survey to develop organogram with permanent staffs for cross-border co-ordination.
- Line ministries and stake-holder review meeting to assess PHSM tools and multi-sectoral coordination to conduct risk-assessments.
- Activation of public health service act committee to conduct multi-sectoral co-ordination.

National Laboratory System

The National Influenza Center (NIC) at the National Public Health Laboratory (NPHL) was already a well-established unit) when the pandemic struck. In addition, because the testing techniques for influenza and SARS-CoV-2 are very similar, the laboratory staffs were trained and could quickly adapt to real time reverse transcriptase polymerase chain reaction (rRT PCR) testing for SARS-COV-2.

As the number of COVID-19 patients increased, the National Guiding Document for the SARS-COV-2 laboratory was developed. Following that, a COVID-19 laboratory network was established across the country. Laboratory staffs were trained to handle and process COVID-19 samples to operationalize this network.
However, there were other obstacles, the most significant of which was a lack of resources in terms of equipment, kits, reagents, and human resources.

During the early stages of the pandemic, testing kits were in low supply, and other supplies were also scarce.

Furthermore, communicating laboratory results to physicians, patients, and other stakeholders was inefficient, causing delays in timely diagnosis and treatment. There were also significant problems with the information management system, resulting in delayed reporting or duplication.

With so many players in the laboratory system, there were difficulties in coordination, misinformation, confusion, and conflicting interests among various organizations, all of which hampered the COVID-19 lab's smooth operation.

The NPHL and MOHP can overcome these obstacles in the future by establishing transparent governance and coordination mechanisms, as well as SOPs for stakeholders' coordination. Furthermore, training modules for PCR tests and training, establishing a robust laboratory data/ information management system, and continuing quality assurance programs are required. Investing in maintenance and effective utilization of available equipment and resources and strengthening research activities to keep technology and skill up to date must come along.

5. National laboratory system	
Observations	
Best practices	1. Established National Influenza Center (NIC) in country **Impacts** • Immediate adaptation to the RT PCR testing for SARS-COV-2 **Enabling Factors** • Similarity in Influenza and SARS-CoV-2 testing protocols • Early formulation of surge plan and staffs oriented for the same • HR trained in sample collection, packaging and transport • PCR primers (for research use) availability in one of the laboratories in the country that supported NIC initially 2. Development of National Guiding document for SARS-COV-2 laboratory establishment, testing and other procedures **Impacts** • Regulatory requirements for establishment of COVID-19 laboratories • Uniform design was ensured • Test protocols, biosafety practices were in place **Enabling Factors** • Existing guidelines, SOPs and manual in place for handling influenza viruses. More than 25 SOPs were developed and updated • International global outbreak alert and response (GOARN) expert deployed to NPHL (though for short time) • Most Laboratories were very receptive to documents prepared by NPHL and followed them 3. Expansion of testing laboratories across the country including private sector **Impacts** • Increased accessibility and increased number of tests done

Enabling Factors

- Strong political will
- Repurposing of pre-existing veterinary laboratories
- Engagement of private sector

4. Quality Assurance system developed

Impacts

- Delivery of standardized and acceptable quality of service. Quality checking of reagents and kits

Enabling Factors

- Validation of laboratories was made mandatory. Practice of EDCD / MOHP to not accept data from laboratories without NPHL's validation
- Validation protocol for COVID 19 diagnostics (kits, reagents, VTM, etc.) Approx. 26 kits were validated
- Specifications notified for PCR reagents /kits

5. Coordination and Capacity Building activities

Impacts

- Training for handling and processing of SARS-COV-2 sample was organized by COVID-19 laboratory network

Enabling Factors

- Ample TOTs and trainings (Onsite physical training), (Online training conducted for about 500 lab staffs of various levels)
- Weekly online classes for capacity building and troubleshooting
- Exchange of samples between laboratories
- Coordination of PPHLs in provinces

6. International collaboration

Impacts

- Adoption of new and complex technologies (like genome sequencing)

International presence through genome sequencing data sharing in public platforms

Enabling Factors

- Support from EDPS
- Collaborations and MTA with International organizations/ Institutions (IGIB-Delhi, PHE-UK, HU)

7. Excellent Team work at NPHL

Impacts

- Execution of tasks was made easy

Enabling Factors

- Halt in non-COVID services helped to mobilize entire staff in COVID related services
- Staffs divided into groups and given tasks according to their strength and capacity
- Extended duty hours with multiple shifts
- Highly motivated staffs without ego of post or qualification
- Free food and transportation provided by NPHL
- Hazard allowance provided by government

Challenges

1. Weak Laboratory Information Management System

Impacts

- Delays in reporting of results
- There were missing result and errors
- Duplication of data repository system at different level

Limiting Factors

- Dependency on third party for SMS
- Laboratories with multiple data management systems.
- Internet failures, system errors and human errors
- Demand of data from multiple places
- IMU application was not lab friendly

2. Increased turnaround time for result

Impacts

- Difficulty in timely confirmation of cases
- Decreased user satisfaction

Limiting Factors

- Number of daily samples were far more than the capacity of lab (from POE, palikas etc.)
- Wave of sample collection in all palikas resulting in flooding of samples at labs
- Disorganized sample collection, packaging and transport that increased preanalytical time at laboratory
- Multiple stops involved in transport causing delayed arrival to laboratory
- Pressure to release some samples before others (which disrupted the flow of laboratory process casing further delay)
- Labs were not equipped with automated systems
- Difficulty in delivering reports to patients (sent to coordinator through SMS, who would not forward it further)
- Impractical method of sending report (SMS of 500 tests to same person)

3. Maintenance of quality of reports

Impacts

- Delay in turnaround time
- Delay in contact tracing/case management
- Negative reputation of laboratory

Limiting Factors

- Rapid change in technology
- Turnover of staffs, non-compliance with SOPs
- QC sample transportation issues due to unresponsive courier and geographic difficulties
- All labs were not actively participating in quality assurance program for COVID-19
- Political pressures to open new labs without properly qualified/trained HR
- Fake report malpractice from few of the designated COVID-19 labs

4. Too many players interfering in laboratory system

Impacts

- Difficulty in coordination
- Misinformation and confusions
- Mental stress and anxiety

Limiting Factors

- Limited information sharing on lab activities from authorized source
- Vested interest of different group of people
- Negative news/information more likely to attract audience
- Pressure to locally adapt ongoing international experiments

5. Mushrooming of laboratory business including A category labs

Impacts

- Regulatory issues
- Quality assurance issues
- Unhealthy practices

Limiting Factors

- Changing decisions of government
- “Powerful” people in business
- Inadequate monitoring capacity
- Unclear guidelines regarding closure of health institutions

Prioritized actions

a. For immediate implementation:

- Develop training module for PCR test, training and refresher training
- Establish clear governance and coordination mechanisms and SOPs for stakeholders' coordination
- Establish robust laboratory data/information management system

b. For mid to long-term implementation to improve the response to the ongoing COVID-19 outbreak:

- Initiate , strengthen and continue public health programmes in selected laboratories in provinces
- Integrate Influenza -SARS-CoV-2 sentinel / non sentinel surveillance Strengthen sample transport and referral mechanism
- Continue quality assurance programmes
- Increase International collaboration for up-to-date trainings and support in testing needs
- Maintenance and effective utilization of available equipment and resources
- Strengthen Research activities to keep technology and skills up-to-date
- Mandatory Functional microbiology (including molecular) laboratory at all medical colleges with Phd courses in medical universities

Infection Prevention and Control

Prior to the COVID-19 pandemic, the Infection Prevention and Control(IPC) and Health Care Waste Management (HCWM) were given little attention. The National Health Training Center had developed an IPC and Health Care Waste Management training Manual, but it has not been updated since five years. In addition, there was no specialized division, section, or unit at the national level to oversee the IPC related activities and no national IPC program /standard.

However, a lot has happened in the two years since the pandemic began. Multiple guidance documents, such as the Pocketbook of Infection Prevention and Control for COVID-19 in Health Care Settings (May 2020 First Edition, Dec 2021 Second Edition), the Interim guidance on (HCWM, Environment cleaning and disinfection), the Dead body management Protocol, the Ambulance cleaning and disinfection, and the Interim Guidance on IPC for Suspected COVID-19, were adapted from WHO and modified, developed in the local context maintaining WHO standards. In the context of COVID-19, a Multisectoral IPC Guideline , as was as COVID-19 Preparedness and Response Infection Prevention and Control training manual were developed.

Along with the development of numerous guidance manuals, several other gaps in all of the facilities were found and addressed, and significant improvements were accomplished. IPC-

focused trainings have been conducted and IPC focal persons and committees have been formed. Similarly, COVID-19 focused IPC training was provided to Health Care Workers (HCWs)

However, many other issues remain, such as insufficient human resources, a lack of coordination and communication across the three levels of government on IPC initiatives, and the lack of a national IPC program and guideline, to name a few.

Various measures can be taken to move forward and build a more resilient infection prevention and control system. These include regular training for newly hired HCWs and a refresher course for experienced HCWs; the National IPC program and guideline and occupational health and safety policies should be developed. In addition, the Ministry of Health and Population should constantly supervise and monitor the implementation of IPC practice in health facility.

6. Infection prevention and control	
Observations	
Best practices	1. Hospital readiness assessment in terms of IPC, HCWM. **Impacts** • Improvement in facilities after identification and addressal of gaps • Health facilities developed their HR surge roster • Designation of IPC focal persons, IPC Committees developed • IPC focused trainings conducted • Facility-based IPC guideline and protocols were developed • Donation of HCWM equipment to fill gaps found during assessments **Enabling Factors** • Early initiation from MOHP, DOHS • WHO guidelines and assessment tools • Support from WHO and other stakeholders 2. Develop and disseminate guidance documents on IPC focusing health care facilities. **Impacts** • Guidance to implement IPC measures as standards. • Sensitized administration of health facilities on their role on IPC • Promotion of rational use of PPE, HCWM, environmental cleaning and disinfection • Proper patient transfer and dead body management **Enabling Factors** • Guidance documents from WHO • Early initiation from MOHP, WHO and other stakeholders to support the development of guidance document 3. Developed Multisectoral IPC Guideline in context of COVID-19 **Impacts** • Implementation of IPC measures on respective areas e.g., school, public vehicle, office, temple, gym etc. • Facilitation for standardization of IPC measures in respective areas

Enabling Factors

- Initiation of MOHP to provide clear and uniform guidance on IPC to respective areas.
- Support and willingness of partner.
- Early development of required documents by WHO with coordination of MOHP.

4. IPC in home isolation and quarantine with development of Pocketbook for people in home isolation and IEC materials.

Impacts

- Appropriate implementation of IPC measures by the public.
- Decrease in the number of hospital-visits of patients with mild symptoms.
- Helped to reduce fear among infected people and their family members regarding the disease condition.

Enabling Factors

- MOHP's initiation to decrease hospital visits and hospitalization of patients with mild symptoms.
- Willingness of MOHP to provide clear and uniform guidance on IPC for people isolating at home.
- Directives from MOHP

5. Developed COVID-19 Preparedness and Response training manual focused on Infection prevention and Control.

Impacts

- Facilitated to conduct training.
- Helped to sensitize health care workers on IPC and enhanced capacity of healthcare workers on patient care.
- Decreased fear among healthcare workers.
- Uniformity in IPC practice

Enabling Factors

- Various updated findings and guidance documents developed by WHO
- Early initiation from MOHP
- Willingness of partners to support the development of training manual

6. Training for health workers for infection prevention and control in the context of COVID-19. (Training of Trainers (ToT) and service provider training)

Impacts

- Increased the confidence of health care workers to tackle the pandemic situation.
- Decreased fear among staff regarding infection transmission
- ToT helped to develop more trained HR in respective health facility
- Effective COVID-19case management with quality care
- Transmission rate was decreased

Enabling Factors

- Willingness of HCWs to participate in the training.
- Willingness of partners to support COVID-19 preparedness and response.
- Various online trainings on IPC.
- Gaps identified during Assessment

7. Orientation and virtual training on IPC for HCWs

Impacts

- Sensitization of HCWs on appropriate use of IPC Measures
- HCWs were updated on new evidence and findings related to IPC for COVID-19.
- Boosted up morale of HCWs.

Enabling Factors

- Trend and acceptance of online training
- Directives from MOHP to follow public health measures.
- Willingness and support from supporting partners.

Challenges	
	1. Fear among HCW regarding Disease transmission. **Impacts** • Difficulty had been experienced for Human resource management. • Quality care was compromised. **Limiting Factors** • Less evidence on disease transmission and severity of COVID-19. • Treatment and vaccines were not properly identified on initial days of pandemic. • Inadequate PPEs for Health care workers 2. HCWM and cleaning and disinfection in health care facilities and other areas are suboptimal **Impacts** • Increase in quantity of HCWs. • Improper use of disinfectant leading to instrument and linen damage. • Practice of spraying disinfectant on the people. • Waste handlers' resistance to manage waste generated from COVID-19 case management **Limiting Factors** • Least priority was given to waste management, cleaning and disinfection. • HCW and PPE disposal practice was less prioritized compared to its use. 3. Human resource scarcity **Impacts** • Staff shortages severely impacted quality of care for patients. • Work overload and fatigue among HCWs • More focus on emerging needs rather than psychological and social connection with patient, families and staffs. • Difficulties to conduct refresher and other training on regular basis for old and new staffs. **Limiting Factors** • Priority of MOHP and health facilities shifted to critical care case management. • HCWs were not adequately trained in IPC. • Hesitancy of healthcare worker in shifting to a different job during pandemic • Staff turnover. 4. HCWM training among support staff and waste handler **Impacts** • Hesitancy and resistance of waste handler to manage the waste. • Increased infection among support staffs and waste handlers **Limiting Factors** • More priority given to immediate problem (Case management) rather than potential problem of Health care waste. • Unavailability of training manual on HCWM for support staff and waste handlers. 5. Coordination and Communication among the three levels of government on IPC measures. **Impacts** • Delayed dissemination and implementation of the endorsed guidelines. **Limiting Factors** • Lack of dedicated section/unit to look after IPC related activities. • Confusion of roles 6. Lack of National level IPC Guideline **Impacts** • Confusion among health care facilities regarding IPC practice. • Lack of studies on HCAIs. • Dependency on international evidences and practices.

Limiting Factors

- Lack of national IPC Program and strategic plan.
- Lack of designated section and functional committee for IPC at national level
- Less priority given to IPC

7. Inappropriate implementation of IPC measures due to poor engineering control.

Impacts

- Transmission based precautions were not properly implemented
- Donning and doffing areas were inadequate
- Infection among staff had been increased

Limiting Factors

- Lack of National IPC program and guidelines, protocols and standards.
- Poor coordination among various ministries.

8. Surveillance of Health care workers infection

Impact

- Actual data of COVID-19 infected HCWs was not available
- Difficulty in human resource management

Limiting Factors

- No existing surveillance system
- Inadequate human resources
- Limited documents on occupational health and safety measures.

Prioritized actions

a. For immediate implementation:

- Training session (Batch) for Health Care Workers can be increased.
- Dedicated Infection Prevention and Control Section or Unit can be established to look after all IPC related Program and activities at national level. National Level IPC committee/unit can be established to look after IPC related activities.
- Periodical orientation and onsite training for support staffs and waste handlers can be conducted.
- Domestic production or early procurement of PPE with quality assurance can be done.
- Proper Health care waste management and disposal can be done.

b. For mid to long-term implementation to improve the response to the ongoing COVID-19 outbreak:

- Develop a IPC framework delineating the clear roles and responsibilities for implementation of Infection Prevention and Control at all the sectors.

Case Management and Knowledge Sharing About Innovations and Latest Research

When the pandemic hit, there were 25 hub hospitals in the country, all of which were short on beds, particularly in the ICU and HDU, as well as equipment and trained human resources to handle critically ill patients .

However, after COVID-19, things have improved. Despite the fact that the number of hospitals has remained the same, their capacity has increased, new staff has been hired and trained,

and the Ministry of Health has committed to increasing ICU and HDU beds in hospitals as well as increasing oxygen capacity by installing new PSA plants.

The government is also committed to developing and updating various case management guidance documents.

However, several problems with the country's healthcare system have been identified, including insufficient critical care facilities, the use of substandard equipment, and incorrect oxygen management, among others. Periodic modifications of the Hospital Disaster Preparedness and Response Plan (HDPRP) as well as regular monitoring of hospital preparedness are required to establish a more resilient system. A technical committee should also be formed to address limits and draft directives, regulations, strategies, guidance and training modules, among other things. Similarly, a sustainable critical care inventory for better and real-time information flow, as well as the formation of an appropriate donation policy for biomedical equipment, must be devised.

7. Case management and knowledge sharing about innovations and the latest research	
Observations	
Best practices	1. Formation of the COVID-19 Crisis Management Coordination Center or CCMCC led by the PM to better manage the crisis. 2. Designation of various levels of hospital (Level I, II & III during 1st wave) and COVID-19 Unified hospitals during 2nd wave to coordinate and better manage cases. 3. Assessment of health facilities catering COVID-19 cases; both during 1st & 2nd wave. 4. Free ambulance services were made available during the 2nd wave. **Impacts** • Severe and critical cases were referred to level III • There was better management of cases • The status of health facilities in terms of case management, IPC, WASH, HCWM, etc. was acknowledged. **Enabling Factors** • Repurposing of health care workers. 5. Beds designated and increased for severe and critical COVID-19 cases. 6. Mild & Moderate cases not requiring hospital admission were advised for Institutional/ home isolation– follow up was done by call center. Isolation centers were also set up by local level to manage mild cases in the community. 7. Government reimbursed the hospitals (both public & private) providing services to COVID-19 cases based on the severity.

8. Risk allowance given to the healthcare workers & staff involved in the management of cases along with insurance.

Impacts

- Better care of patients was ensured.
- Lesser load on already overburdened hospitals.
- Private hospitals and medical colleges also treated COVID-19 cases.
- Healthcare workers & health facilities were motivated.

Enabling Factors

- Majority of cases had mild and moderate symptoms.
- Most HCWs and many patients were vaccinated

9. Oxygen capacity assessment, mapping of the oxygen producers across the country, assessment of critical care equipment and inventory mapping conducted.

10. Oxygen scale-up was marked with the installation of PSA plants, oxygen cylinders, oxygen concentrators, and Liquid Oxygen (LO) storage tank. Subsidies in the import of oxygen-related equipment were declared.

11. Procurement or donation of biomedical equipment in large numbers.

12. Ensured 24 x 7 electricity supply in oxygen generating sites and police were deputed at oxygen producing sites.

13. Government-supported import of LO in terms of customs clearance and police escort.

14. Diversion of supply of oxygen for industrial use to hospitals

Impacts

- A solid foundation for decision-making.
- Enhancement in the country's oxygen production and management capacity.
- Better management of crowd.

Enabling Factors

- Support from MOHP and all the stakeholders. Awareness and identification of oxygen and biomedical equipment as significant aspects of health care.

15. Development of updated guidance documents for case management.

16. Immediate approval of drugs required to treat severe and critical cases in DDA.

Impacts

- Uniformity in case management
- Only severe and critical cases were admitted in HDU/ICU
- Better management of COVID-19 patients
- Drugs with unproven therapeutics were avoided

Enabling Factors

- Onsite and virtual training for management of severe and critical COVID-19 patients.
- Dexamethasone was used in patients requiring oxygen.

Challenges

1. Severity classification

2. Risk assessment for disease progression

3. Late detection and referral of severe COVID-19 cases & no proper referral guideline/ mechanism.

4. Case load exceeded the number projected by MOHP.

Impacts

- Inappropriate classification of severity (early or late ICU admission or referral)
- Lesser number of beds were allocated initially
- Large number of Healthcare workers (HCWs)infected
- Drugs with unproven therapeutics were used initially.

Limiting Factors

- Most of the clinical aspect of the disease was unknown
- Lack of proper coordination among different levels of hospitals and government.
- No proper distribution and use of PPEs

5. Highly infectious variants
6. Infection in CWs
7. Lack of correct data on the cases managed at hospital and staffs involved in management of COVID-19 cases for reimbursement.
8. Imbalance in supply and demand of staff.
   Impacts
   - Number of total cases increased.
   - Lesser number of healthcare workers due to infection.

   Limiting Factors
   - Lack of proper monitoring of the hospitals.
   - High turnover of staff due to temporary recruitment
9. Oxygen demand exceeded the supply.
10. The LO supply from India was stopped.
11. Technical failure and Human resource (HR) limitations in plants.
12. Exact and real-time mapping of oxygen capacity.
13. Large number of equipment was sent to health facilities without proper HR to operate the same
    Impacts
    - Hospitals were compelled to limit the number of patients for admission due to lack of oxygen.
    - Hospitals faced severe challenges in refilling oxygen cylinders.
    - A large number of cylinders belonging to oxygen manufacturers were lost.

    Limiting Factors
    - Lack of proper cylinder distribution, management and tracking system.
    - No proper mechanism to acquire data from hospitals across the country.

Challenges

14. Lengthy process for approval of guidance documents.
15. Inadequate Bed for critical care.
16. Lack of adequately trained HR.
    Impacts
    - Hospitals were fully occupied
    - HCWs were overstretched

    Limiting Factors
    - Inadequate ICU beds and health care workers trained for ICU management

Prioritized actions

a. For immediate implementation:

- Mapping of human resources across the country; doctors, nurses, paramedics should be available at both provincial and central level.
- Conduct more trainings and increase the number of trained HCWs who can manage and care severe and critical cases of COVID-19, can manage ARDS, ventilators etc. Develop a properly maintained repository of such trained HR with regular update of their where abouts.
- Accelerate the process for approval of guidance documents.
- Ensuring adequate supplies of medicines including oxygen and consumables.
- Filled oxygen cylinders are to be kept as buffer at government level to manage surge in demand.
- Develop a proper referral system or mechanism.
- COVID-19 related morbidity and mortality audit should be done in the hospitals.
- Mapping of biomedical equipment necessary for the management of cases, updating their status and repurposing it to health facilities with HR to manage the same.

b. For mid to long-term implementation to improve the response to the ongoing COVID-19 outbreak:

- Technical committee including multiple and relevant stakeholders for oxygen needs to be formed for addressing limitations and preparing directives, regulations, strategies, guidance and training modules etc.
- Develop a sustainable critical care inventory for better and real time information flow.
- Periodic update of Hospital Disaster Preparedness and Response Plan. (HDPRP) and conduction of regular drills.
- Develop proper referral mechanism and integrate it with ambulance dispatch center.

Operational Support and logistics in the management of supply chains and workforce resilience

A well-functioning operational system and a motivated workforce are essential for overcoming any crisis. To combat the pandemic, Nepal's existing warehouse system management (pre-COVID) was also expanded and strengthened. The supply chain management system was also improved in order to give individuals timely medical care. In addition, the Cold Chain management system was expanded at all levels of government to increase vaccine storage capacity (Federal, Provincial and Local). The country's cold chain capacity was 104,500 liters before the outbreak. During the pandemic, an additional 210,000 liters were added to the system, bringing the total to 314,500 liters.

Despite the expansions, there were still difficulties. The process of quantifying commodities (such as PPE, lab, medicines, and equipment) in real time proved difficult because of the dynamic nature of the coronavirus and Nepal's low capacity to fight the pandemic. It was also difficult to ensure COVID-19 supplies were of high quality. The main issue, though, was a lack of cooperation between the three levels of government.

To address these difficulties, open coordination efforts at all levels of government are required. Then, along with the timely release of the budget, a distribution guideline for emergencies must be prepared.

8. Operational support and logistics in the management of supply chains and workforce resilience

Observations

Best practices

1. Warehouse system management and expansion

Impacts

- Increased storage space.

Enabling Factors

- Optimum utilization of the existing human resource.
- New warehouse was completed timely and HSA space utilized for storage.
- Searched alternative available spaces (NHTC, FWD, Army, APF, etc.).
- Coordination and collaboration between government and EDPs

2. Strengthened Supply Chain Management

Impacts

- Uninterrupted distribution of the commodities.

Enabling Factors

- Cooperation and collaboration among different sectors (Province, PHLMC Hospitals, Labs, Pallika) for transportation
- MoHA, DAO continuous support during the lockdown to transport essential commodities
- EDPs support for transportation of commodities.
- eLMIS system was used for the tracking of commodities

3. Cold Chain management and expansion

Impacts

- Increased vaccine storage capacity at all levels (Federal, Provincial and Local)
- Readiness for vaccination program.

Enabling Factors

- Cold Chain of all level were utilized for storage of vaccines
- Utilization of cold chain from the private sectors for Storage of Vaccines other than COVID-19.
- Other government entities support during the COVID19 (Civil Aviation, Army).

4. Procurement process enhanced.

Impacts

- Emergency and timely procurement process was enabled

Enabling Factors

- Legal support
  a. Procurement on special condition as per the Public Procurement Act, 2063
  b. Ordinance on COVID-19
- Budget allocation sufficient and timely
- Policy direction and support from GoN/MOHP

Challenges

1. Forecasting and quantification

Impacts

- Unable to quantify the needed commodities (PPE, lab, Medicines, Equipment) on real time

Limiting Factors

- Uncertainty about the disease throughout the pandemic
- Changing case projection
- Donation items to be received was not always known timely
- Lack of tools for forecasting logistical demands

2. Quality assurance of COVID-19 commodities

Impacts

- Issue regarding quality of certain commodities arose.
  (Example: quality of Mask, PPE)

Limiting Factors

- Limitation in quality assurance capacity
- Arrival of large volume of commodities and with existing resources difficult to conduct QA
- Global scarcity of commodities and dependency on few countries for supply

3. Coordination among three tiers of government (Federal, Provincial, Local Level)

Impacts

- Difficulty in quantification of the commodities.
- Duplication in procurement process

Limiting Factors

- Lack of single coordinating structure
- Actual stock at different levels were not known
- All levels working on their own because of emergency situation

Prioritized actions

a. For immediate implementation:

- Ensure availability of distribution plans at all times
- Timely budget release mechanism by EDPs
- Quality assurance mechanism during emergencies
- Warehouse expansion at other places besides Teku (Ex-Nepalgunj, Dhangadhi)

b. For mid to long-term implementation to improve the response to the ongoing COVID-19 outbreak:

- Use of available data (epidemiological) for informing logistics planning (quantification, procurement)
- Finalize Partner mapping and coordination mechanism for logistic management at all the levels. (Multisector involvement)
- Establishment of trained human resource for emergency operations at different levels
- Strengthened Emergency procurement process
- Procurement of vehicles for transportation of commodities
- Strengthened Warehouse (As envisioned in the recent warehouse manual plan) at all levels.

Strengthening Essential Health Services during COVID-19

When the country witnessed the first community transmission of COVID-19 in April 2020, the entire healthcare system was focused on combating the novel corona virus. This meant that essential healthcare was diverted for months, and treatment for many chronic noncommunicable diseases, communicable diseases (such as HIV and tuberculosis), and other health services (such as pregnancy) were unavailable.

During the second and third waves, however, as the government began to regain control of the situation, service utilization indicators steadily improved as a result of strong commitment and swift action at all three tiers of government.

Many lessons have been learned by the essential health services sector as a result of the COVID-19 pandemic, the most important of which is the use and importance of telehealth and digital technology. This was particularly beneficial to people with disabilities, as they could

now use virtual help desks, which were not available before the pandemic. In addition, strong community engagement for HIV care delivery has also considerably improved.

Today's best course of action is to design and implement contingency plans at the national, provincial, district, and municipal levels of health units, with a particular focus on the continuity of essential healthcare services. The national response plan should prioritize essential healthcare services, with resources allocated accordingly. In addition, disability should be included as one of the variables in all health data (emergencies, HMIS etc.) in the demographic section along with gender and ethnicity.

9. Strengthening essential health services during the COVID-19 outbreak	
Observations	
Best practices	1. Health Facility Contingency plan **Impacts** • It facilitated the care pathway management • Not all health facilities developed and implemented this approach **Enabling Factors** • Earlier experience of disaster management 2. Activation of health cluster and RH and MH sub-clusters **Impacts** • Enabled the co-ordination among partners including Provincial partners • Enabled development of interim guidelines **Enabling Factors** • Good Public private partnership • Support from all three tiers of government, development partners and professional organizations 3. Reporting of every maternal death **Impacts** • PPH orientation package was developed & orientation was done for the same • In the second wave, non-obstetric complications were the leading cause of maternal death. The major contribution from COVID in this was advocacy for vaccination in pregnant women **Enabling Factors** • Good Public private partnership • Support from all three tiers of government, development partners and professional organizations 4. Modifications of service delivery mechanism (Teleconsultation, online application, provision of 3 months' supply of IFA/OCP, home based services for safe abortion and delivery of ARVs, multi-months supplies of medicines (ARVs), weekly dispensing of OST drugs, use of existing resources from health system – VL for the COVID-19 was initially done using the VL resources of HIV across the country) **Impacts** • Minimal impact on the treatment support of clients requiring daily treatment for longer time (HIV, TB, OST) **Enabling Factors** • Active involvement of community in COVID-19 response

5. Essential service delivery – a priority at the MOHP

Impacts

- Imparted a positive message towards to the health workers at all levels

Enabling Factor

- The MOHP conducted all national review meetings as planned.

6. GENDER, EQUITY & HUMAN RIGHTS:
   - GER guidance incorporated in a few clinical guidelines
   - Disability inclusion and rehabilitation guidelines were developed
   - Accessible IEC materials were developed and disseminated including sign-language interpretation in federal press briefing
   - 3-tier Disability-inclusive Covid-19 Response was developed, piloted and scaled up in 77 districts of 7 provinces
   - Call center staff were oriented on responding to GBV and sexual exploitation, abuse and harassment

Impacts

- GER inclusion analysis and assessment conducted
- Persons with severe and complete disabilities directly benefited from successful vaccine policy
- Women and girls with disabilities were given psychosocial counselling, relief measures with the support of partners. Issues of domestic and gender-based violence were addressed on time.
- Households of persons with disabilities were assessed

Enabling Factors

- Active participation of persons with disabilities in Covid-19 response
- Support from Government & partners at the federal, provincial and local government

Challenges

1. Weak referral mechanism

Impacts

- Delay in seeking care and reaching facilities
- Increased mortality due to delay in referral

Limiting Factors

- Lack of referral plan at facilities on all levels
- Complicated protocol for airlifting in case of emergencies
- Fear of infection

2. Essential health workers and resources diverted for the COVID-19 response.

Impacts

- Less priorities for the program

Limiting Factors

- Impact was seen mostly on the early phase of the pandemic.
- Lack of support on human resource from partners at MOHP.

3. MHPSS Intervention Framework developed by MH subcluster was not funded by the government

Impacts

- Delay in provision of mental health services
- Increase in suicide rate during the first lockdown

Limiting Factors

- Reliance on partners for implementation
- Lack of substantial fund mobilization on mental health from partners
-

4. Delivery of essential commodities (ARVs, RDTs) from global suppliers.

Impacts

- Stocks on the verge of shortage

Limiting Factors

- Global lockdown

5. Lock down and travel restrictions imposed by National Authorities

Impacts

- Vector control interventions require community engagement (LLINs distribution, IRS).
- Active cases reported in communities.

Limiting Factors

- Prioritization based response made at the local level despite no major outbreaks were reported during the COVId-19 pandemic

6. GER: Addressing the issues of vulnerable population groups is a cross-cutting area

Impacts

- Health inequities are higher among the vulnerable population groups and the gap will widen in the absence of a targeted, integrated approach

Limiting Factors

- Lack of data (in disability) and GER analysis of Covid-19 indicators
- Lack of targeted interventions, funding and resources

Prioritized actions

- For immediate implementation:
- All facilities to develop contingency plan for COVID and non-COVID patients
- Develop referral guideline for clear and simplified referral mechanism.
- Regular monitoring of drugs, supplies and commodities
- For mid to long-term implementation to improve the response to the ongoing COVID-19 outbreak:
- Strengthen PPP and coordination in the health system between three tiers of government
- Substantial increment in investment for NCDs and MH
- Focus and strengthen digital platform for service delivery
- Strengthen & Prioritize centers/HF for COVID 19 and other infectious diseases to support continuity of Essential Health Services delivery
- Forecasting and prescribing multi-month dispensary of medicines (e.g., 3-6 months)
- Integrate Gender Equity & Human Rights into the emergency preparedness and response framework

COVID-19 Vaccination

At a time when the rest of the world was struggling to develop systematized vaccine programs, the Nepalese government began COVID-19 vaccination on January 27, 2021. The government developed the National Deployment and Vaccination Plan (NDVP) as well as a thorough Program Implementation Guideline for the COVID-19 Vaccination Campaign, and began securing COVID-19 vaccine through COVAX facility, direct donation and government procurement. The population was thereafter vaccinated with the cooperation of all three levels of government.

As per the NDVP, the country's context and the WHO SAGE framework for the allocation and prioritization of COVID-19 vaccination, initially high-risk groups such as front liners, migrants,

refugees and vulnerable population (such as differently abled people and people belonging to geographical challenged areas) were vaccinated. Then the remaining population based on risk-benefit analysis was delivered with vaccines.

After a year of the vaccination campaign, after 50% of the total population was vaccinated, booster doses were administered to the population from 16 January 2022. As of April 2022, 19.4 million people in Nepal have been fully vaccinated, 63 percent of the total population.

The success of the country's vaccination campaign can be credited strong routine immunization program experience off several successful large scale campaigns conducted in past, and to the fast-track decision making or the 'one-team' national approach the government took to implement national strategies it deployed for the national vaccination campaign.

The government also actively worked on training health professionals on microplanning, strengthening cold chain and logistics, and vaccine safety . It also acted quickly on policy decisions and regulatory preparedness. It first amended the Drugs Act 1978 through an ordinance to allow registration of new drugs and vaccines which allowed the DDA to register the Covishield vaccine, which was donated by Government of India. Covishield got approved for emergency use in Nepal much before WHO-EUL.

The Nepal government also explored every possible alternative to reach people in hard-to-reach populations. It also established QR Code Vaccine Certifications to ensure an authentic recording and reporting system. Information regarding daily monitoring and dissemination of coverage and vaccine stock in all 753 local units was also made public daily to ensure transparency and access to foster community engagement.

Nepal's ability to roll out a robust vaccination campaign must also be given to the smooth coordination among different government bodies, such as the Independent National Immunization Advisory Committee, the National Immunization Committee, and the AEFI Committee. Similarly, the Inter-agency Coordination Committee, the COVID Advisory Committee, the Health Emergency Operation Centre, the COVID Crisis Management Centre, the District COVID Crisis Management Centre and the Immunization Committees at all levels played important roles.

There were challenges too. For example, in the early days, there was limited availability of vaccines and syringes and difficulty in managing different and new types of vaccines. For

example, there were some vaccines with large CC space requirement and specific temperature (UCC) while some had short expiry dates. Also many people did not have a Val id ID card, hence policy change was made to remove There were also challenges in relation to waste management regarding the vaccination campaign and keeping balance with other competing priorities.

However, now that more than half the population has been vaccinated and the worst is over, the government's way forward is to meet the stipulated timeline of full coverage, continuous advocacy for funds and vaccines to explore beyond NDVP prioritization, strengthening of recording and reporting system, amendment of policies to address remaining gaps in the vaccination program, including vaccinating younger age group, protecting the entire population, and reaching the unreached.

10. COVID-19 vaccination	
Observations	
Best practices	1. Quick and safe rollout/start of COVID-19 vaccination. 2. Policy decisions, regulatory preparedness on time 3. High acceptance of COVID-19 vaccines 4. Continued Monitoring and Oversight **Impacts** • 1. High coverage achieved in target population • 2. Vaccine roll out as per NDVP prioritization and securing all citizens starting from high risk groups to general population and younger age group • 3. Phase wise campaigns for the prioritized target population • 4. All citizens above 12 years of age has been provided with the primary series vaccination and planning for booster possible as per the need. • 5. Exploring new opportunities for COVID-19 vaccination program beyond NDVP. **Enabling factors** • 1. Continued efforts from Government of Nepal to ensure availability of COVID-19 vaccines • 2. Budgetary support and prioritization for COVID-19 vaccination • 3. Policy addendum and updates to meet the changing contexts and needs of vaccination • 4. Timely meetings of advisory committees for national prioritization and • 5. Safe roll out of new COVID-19 vaccines with supporting guiding documents and trainings for program managers and health workers. • 6. Strengthening of cold chain capacity at national and sub-national level
Challenges	1. Limited availability of vaccines and syringes; less predictability at early stages 2. Managing different and new types of vaccines • Vaccines with large CC space requirement and specific temperature (UCC) • Different doses and preparations • Short expiry duration

3. Digitalization of vaccination
4. Equitable Utilization of Vaccines
5. Timely reporting on HMIS in remote areas with poor internet connection, some municipalities with HR challenges
6. COVID-19 vaccination waste management
7. Creating momentum to prevent expiry of vaccines
8. Keeping balance with other competing priorities

Prioritized actions

- Meeting the stipulated timeline of full coverage
- Continuous advocacy for fund and vaccines to explore beyond NDVP prioritization
- Strengthening of recording and reporting system
- Policy addendum to address the issues in the vaccination program including younger age group
- Protecting the total Population
- Reaching the Unreached: Equitable Utilization of Vaccines

As per NDVP, marginalized population, disabled refugees were prioritized during covid 019 vaccination, also population living in 10 mountain districts of Nepal where health and geographical access is limited, the population with highlighted risk were prioritized for vaccination.

National Legislation and Financing

The country's health sector was governed by a variety of strong national policies when the COVID-19 pandemic broke out, including the Infectious Disease Control Act-2020, the Public Health Services Act 2075, and the Drug Act 2035. (BS). Other systems were in use, including the HEOC, PHEOC-3, EDCD, Hub-Satellite Hospital System, and health desks at POEs. However, the country lacked policies and procedures to manage the health system through a catastrophe such as the COVID-19 pandemic. As a result, as soon as the first wave hit in April 2020, the government sprang into action, activating the provisions of the Infectious Disease Control Act as needed to combat the virus's spread.

The Drug Act Ordinance was then passed, allowing for the import, licensing, and use of EUL vaccines and drugs, as well as the COVID-19 Crisis Management Ordinance, which formally established the CCMC.

The government also revised the National Pandemic Preparedness Plan, which included a phase-by-phase response plan, resource management plans, the CICT, and a logistic supply chain management system. It also devised five Rapid Action Plans, which included principles and procedures for tracing, testing, isolation, and quarantine. In addition, more than 70 technical documents (guidelines, processes, and algorithms) for COVID-19 were implemented. The Incident Command System, which was first used in 2015 AD when a massive earthquake struck Nepal, was also activated.

In terms of finances, during the pandemic period, the government set aside a major portion of the two annual budgets for COVID-19 prevention and control, separating costs for testing, quarantine, isolation, and hospitalization at public health care institutions. For case management, it also worked with private hospitals.

In addition, weekly meetings with provincial governments and development partners were held for international aid administration. The Ministry of Health also highlighted priority areas for aligning partners' financial, technical, and logistical support. The administration also made a diplomatic request for international funding and vaccine procurement.

Despite the plans and policies in place, difficulties arose. As a result of the time constraints, there was little stakeholder involvement in the policy documents. There was a lack of a sufficient mechanism for price regulation for critical services and commodities, as well as overlapping responsibilities among entities at the federal level and the three tiers of government.

The importance of preparing national preparedness plans in advance, establishing a Center for Disease Control and Prevention (CDC), legalizing the ICS mechanism, timely reviewing the TOR of HEOC, EDCD, and other institutions, and strengthening the EWARS that is truly capable of early warning, are just a few of the lessons learned over the last two years.

11. National Policy, Legislation, Planning to combat COVID-19 pandemic	
Pre-pandemic status	
What was there	• Infectious Disease Control Act-2020, Public Health Services Act 2075, Drug Act 2035 (BS) • Incident Command System practiced in 2015 AD during Earthquake • HEOC, PHEOC-3, EDCD, Hub-Satellite Hospital System, Health Desks at POEs • Trained HRs on HOPE, IMAI, IPC, Outbreak/Disaster Management/Multi-hazard analysis-based Contingency plans up to district level • Hospital based EWARS, NPHL, NISN • Designated & Functional National IHR Focal Point, State Party Self-Assessment Annual Reporting (SPAR) every year
What was NOT there	• Tracing, Testing, Isolation, and Quarantine guidelines/procedures • Updated National Pandemic Preparedness Plan • Rapid Action Plans • CICTs • Laboratory testing capacity to detect COVID-19 • Active Surveillance System at borders • Epidemiologists in Action • Adequate Critical Care Services • Logistic Stockpile for respiratory disease outbreak • Simulation Exercises, JEE for IHR core capacities • Vaccination not done tough private sector
Legislation	• Provisions of Infectious Disease Control Act- activated as appropriate • Drug Act Ordinance for import, licensing and use of EUL vaccines and drugs • Several Orders for COVID-19 prevention and Control, incentivized frontlines, and so on • COVID-19 Crisis Management Ordinance (legalized CCMC
Policies, Planning, and technical guidance	• Incident Command System Activated (daily meetings) • National Emergency Response Plan to COVID-19 Pandemic (April 2020) that envisioned phase-wise response plan, resource management, CICT, logistic supply chain management • Five Rapid Action Plans (costed) based on epidemiological Projections • 70+ technical documents (guideline, procedures, algorithms) for COVID-19 • Technical notes and NVDP to roll out COVID-19 vaccination

Resource Management	• Initially, the resource has been managed by reprioritization of endorsed budget • Two annual budgets during the pandemic period, both have highly prioritized COVID-19 prevention and control • Costing for testing, quarantine, isolation, hospitalization was done • Real time reporting via IMU has been used for case-based payment • Collaborated with private hospitals for case management • Incentive and life insurance arranged for frontliners
Coordination with HDPs for Aid management	• Weekly meetings with provincial governments and development partners • Ministry identified priority areas to align partners' support • Partners support in three forms: financial, technical, and logistic support • International donor appeal with clear quantification of logistic items • Diplomatic communication for vaccines

Observations

Best practices	• Emergency response plan followed by Rapid Action Plans (Five) developed and executed • Rapid development of 70+ guidelines and procedures, updated and implemented • Used "Knowledge Café" platform for evidence-based decisions • Adequate resource has been re-purposed to combat the COVID-19 pandemic & utilization of local resources & international support • "Frontliners first" and refugees, marginalized population policy in vaccination • Smooth resource mobilization and case-based payment mechanism went well • Dedicated Hospitals, Motivated & Dedicated Health Workforce
Gaps and Challenges	• Drafted policy documents in a short time & fewer stakeholders' engagement • Rationale and evidence behind the policy changes could not be explained properly which may lead to poor compliance with the policies, guidelines, and protocols • Overlapping responsibilities among structures at the federal level and three tiers of governments • Proper mechanism for price regulation for essential services & commodities

Future directions

- Revision and harmonization of National Pandemic Preparedness Plan as per learnings from COVID-19
- Evaluation of IHR core capacities e.g., Joint External Evaluation (JEE)
- Establishment of Centre for Disease Control and Prevention (CDC)
- Legalize ICS mechanism
- Review the TOR of HEOC, EDCD, and other institutions and revise accordingly to avoid duplications and make more explicit
- Strengthen the EWARS that is truly capable of early warning
- Train field epidemiologists for dedicated staff
- Technological readiness for future pandemic response

Public Health and Social Measures

Everyone was worried when the country went into a nationwide lockdown on March 24, 2020. Because the world was still learning about the novel coronavirus, governments around the world decided that the best way to deal with the public health crisis was to declare a complete ban on movement and implement other protective measures such as hand hygiene, respiratory etiquette, mask wearing, disinfection, ventilation, contact tracing, isolation, and quarantine.

However, the people's compliance with public health and social measures was insufficient. There was a major knowledge gap at the time, as well as a shortage of masks/sanitizers and the ability to assess the situation in real time. As a result, the PHSM guidance was not adequately implemented, and social distancing measures and smart lockdowns were not properly implemented. As a result, the government ordered more blanket lockdowns as the only way to stop the virus from spreading, which infuriated the public.

Work must be done now to ensure that PHSM measures work the next time a health crisis occurs. Line ministries and stakeholder groups should convene review sessions to evaluate PHSM tools and coordinate multi-sectoral risk assessments. The government should also work to improve real-time data and update assessment tools. A multi-sectoral coordination committee should also be established under the Public Health Service Act.

12. Public health and social measures	
Observations	
Best practices	• No Best Practices
Challenges	1. Sub-optimal compliance to PHSM among the public (SMS) **Impacts** • Imposing longer lockdown and stringent measures. **Limiting Factors** • Knowledge Gap • Acceptance, availability, and accessibility of mask/ sanitizers (Myths and rumors) and behavior change • Pandemic Fatigue in later stages 2. Poor of Implementation PHSM Guidance (Social Distancing and smart lockdown etc.) **Impacts** • Blanket lockdown and implementation of other measures which increased noncompliance and overburden to the public **Limiting factors** • Scarcity of Real time information and infrastructure/ capacity to assess situation level • Limited applicability of tools (Same tool used for both densely and least populated areas)

3. Lack of sector wide PHSM Compliance at Service delivery (Public Transport, shop, office)

Impacts

- Public crowding to access essential services and goods

Limiting Factors

- Unavailability of alternate modality of service delivery

Prioritized actions

a. For immediate implementation:
   - Strengthen the regular mechanism for analysis of PHSM for decision support

b. For mid to long-term implementation to improve the response to the ongoing COVID-19 outbreak:
   - Coordinate with line ministries to implement uniform PHSM tools
   - Develop a standard guidelines on PHSM
   - Multi-sectoral coordination to conduct risk-assessments

Conclusion and way forward

The following conclusion and way forward were drawn from the two-day IAR meeting

Develop a resilient health system that can effectively address the current issue (including COVID-19 or other pandemics) while ensuring continuity of essential health services.

Working with all tiers of government, the Federal MOHP will continue to work towards a more resilient health system that can meet the health needs of a emergencies such as COVID-19. This includes ensuring that essential services continue to be available and accessible to all population mainly vulnerable groups during and after the outbreak. As a first step in this direction, the MOHP will work towards expanding the capacities of its emergency response teams, strengthening emergency operations centres in all provinces and providing surge capacity for workers in all aspects of emergency response – including logistics, infection prevention and control, and contact tracing. To help build critical capacity for surveillance systems to detect potential outbreaks early and control them effectively, MOHP will also assist provinces and local governments to develop comprehensive health emergency plans.

Increase investment in health sector. Make health a priority political agenda.

Improving health is a critical development challenge. But countries like Nepal with limited resources face major issues in health services, out-of-pocket payments and low domestic funds. Therefore, it is essential to invest and focus on evolving health systems so they can develop solutions to better manage these challenges. As the world came to a grinding halt during the first few months of COVID-19, it was apparent that the impact of health can go well beyond the sector and affect all sectors. A way to effectively mitigate such risk in future is to see health as a priority political agenda.

The equitable distribution and utilization of COVID-19 vaccine through continuous advocacy and policy instruments is a most.

Vaccine is the best tool we have to fight COVID-19. The MOHP remains committed to equitable distribution of COVID-19 vaccines and programs are designed to ensure that there is equitable distribution of vaccine in each setting, with a focus on reaching vulnerable population and hard to reach areas. Inadequate distribution systems and institutional capacity may also contribute to this problem. Yet, the challenges presented by different types and sizes of communities

require careful approaches, but that will be overcome with constant community engagement and advocacy. Afterall the ultimate goal of all this, as evidence suggests, will be to significantly reduce mortality related to COVID-19.

Strengthen routine surveillance system and prioritize infrastructural and HR capacity development at POE and strengthen core IHR capacities.

The federal MOHP will have to put efforts to strengthen routine public health surveillance and notification capacity, as well as infrastructure and human resources, at points of entry, which will increase resilience to outbreaks. The MOHP has to partner and provide technical assistance to provincial and local agencies to build core capabilities within the International Health Regulations (IHR 2005) framework and improve communication between the tiers of government on outbreaks. This will also entail strengthening capacities to identify diseases, implement epidemiological and laboratory surveillance and increase national coordination and cooperation to use data and evidence and best practices for rapid response. Further the MOHP has to seek to put in place mechanisms aimed at strengthening capacity of the country to prevent, detect and manage public health emergency risks.

Review and revise the health governance structure at all levels based on the lessons learnt.

There is a need to formally operationalize the public health emergency components and focus on the establishment of Centre for Disease Control and Prevention (CDC).

Integration of influenza -SARS-CoV-2 sentinel / non sentinel surveillance and strengthen sample transport and referral mechanism.

The pandemic of COVID 19 has highlighted the importance of integrated disease surveillance, which will improve access to surveillance and laboratory data, assisting public health managers and decision makers in strengthening preparedness and response. Nepal was able to build up its first SARS-COV-2 PCR testing facility at the outset of the epidemic by utilizing the country's existing Influenza Center at NPHL. When a result, an integrated surveillance plan is critical for our country, which must be based on the experiences and lessons learnt as Nepal changed its influenza surveillance infrastructure in response to the COVID 19 pandemic.

The current scenario that the country is in regards to sample transportation from fields to designated SARS-COV-2 testing facilities is as follows. Surveillance and response to communicable diseases are built on this foundation. A quick and accurate laboratory diagnosis in a safe setting is the cornerstone of any communicable disease surveillance and

response strategy. For improved preparedness and reaction, timely sample transportation is critical. As a result, the designated COVID-19 laboratories must participate in a number of External Quality Assurance Programs (EQAP) for which samples must be transferred via transportation. All of this, and the quality assurance program as a whole, can only be realized if there is a smooth national sample transit and referral process.

A prompt decision is required on the existing pool of HRH hired on contractual basis for COVID-19.

The existing pool of HRH hired on contractual basis for COVID-19 needs to be reviewed upon immediately in the wake of the fact that all their contractual agreements will expire soon. Also, a decision on their extension or termination should be duly made and communicated.

Implementation of the HRH Strategy and its timely revision.

The government has already endorsed the National Human Resources for Health (HRR) Strategy 2021-2030, Nepal. It is about time to put the strategy into action, and if any changes are needed, they will be made right away.

Institutionalizing e-Health approach (virtual working modality and integrated information management among others).

Telemedicine and Electronical Medical Records crucial for proper recording, reporting and referral services. These components should be effectively implemented and rolled out across the country in a phased manner. Telemedicine services should be expanded to all public health facilities, and private providers should also be incentivized to use these technologies for providing care to patients. It is also time to invest in creating awareness about the importance of telemedicine and its various benefits among the general population. This will go a long way in ensuring its successful adoption and implementation.

A sustainable model should be adopted for a proper usage and maintenance of the health equipment and infrastructures purchased and built during the pandemic.

Effective planning for the maintenance of health infrastructure and equipment (HF&E) plays a critical role in responding to the outbreak of infectious disease. Well maintained HF&E, supported by sufficient supplies, can facilitate identification and isolation of infected patients, assisting efforts to contain the spread of infection. Furthermore, healthcare providers need to have access to HF&E to perform their duties effectively. It is necessary to make several important considerations around HF&E such as preparedness planning; retrofitting existing HF&E; adequate supply of spare parts, consumables, and fuel; and replacement of obsolete HF&E which may not be available or reliable due to supply chain disruptions.

Also, in the long run it may not be possible to keep up with the pace of having to maintain or replace existing medical equipment that has become unavailable or require replacing. Often, hard decisions will have to be made concerning what types of necessary medical equipment will not be replaced in order to ensure availability of critical materials and supplies for patients.

Create a dedicated unit to oversee IPC programme and ensure its implementation through regular monitoring.

Infection prevention and control (IPC) is a system of measures to decrease the incidence of infection - and with it, mortality and morbidity from infection - within health care facilities. WHO defines infection prevention and control (IPC) as the processes and activities that eliminate or minimize the acquisition, transmission and spread of infection within health care facilities to ultimately prevent infections in patients. The COVID-19 pandemic revealed that many hospitals are still unprepared to ensure optimal IPC measures against COVID-19 infection. Therefore, there a need to establish a dedicated unit to oversee IPC programme in each health facilities and ensure its implementation through regular monitoring.

Roll out the training packages developed during the COVID-19 pandemic and adapt it to other emergency response.

In the past two years, MOHP remained the major ministry to respond to the threats of COVID-19 pandemic. The performance of health facilities treating the patients and officials on the ground in such situations was significantly improved due to the development of a systematic training program (COVID-19) that was initiated by MOHP. This cost-effective training program was designed in such a way that it may be used by federal, provincial, and municipal health facilities at any time during a pandemic. By offering a consistent and methodical framework within which to educate fundamentals of public health emergencies, the packages assist in ensuring the preparation of local response. These training packages helped develop competent healthcare workers to manage severe and critical cases, both pediatric and adult including the proper use of biomedical equipment. It is now time to place such packages into a structured, defined, organized and institutionalized set of plans so that more healthcare workers are trained and the health sector can respond more effectively and efficiently to future emergency situations.

Institutionalize a formal health coordination mechanism among the three tiers of the government.

In Nepal, the introduction of federalism offered up a new route for administrative change. The health sector was not an exception. However, it also exposed an underlying issue: a lack

of coordination among the three tiers of the government, which sometimes affected health response in need. Therefore, the MOHP will institutionalize a formal health coordination mechanism among the three tiers of the government that will ensure multi-sectoral collaboration and overall responsibility for improved health in the country.

Multisectoral coordination and Health in All approach should be further strengthened.

Traditionally, the health sector was regarded as a stand-alone area working in isolation of other sectors. This is no longer acceptable as health issues are now surfacing outside of the traditional health sphere and are having a serious impact on other sectors. An example of this is how a health issue, a COVID-19 pandemic, wreaked havoc in all spheres of governance and life. The Health in All approach, a comprehensive, inclusive, and transparent approach that aims to achieve universal health coverage and thereby save lives, should be practiced. Taking into account the comparative advantages of various sectors, Multisectoral coordination and Health in All approach should be further strengthened.

Institutionalize the risk communication and community engagement framework at provincial and local government.

The RCCE guideline focuses on reaching out to the local level for coordination and community engagement. This should be effectively implemented. The risk communication and community engagement should be initiated by the local and provincial level. The central will support this. Technical support will be provided by NHEICC.

Develop a formal real-time repository of equipment, HR and service availability at all levels.

The MOHP should develop a comprehensive, real-time database that catalogs all equipment, HR and service availability at all levels of the government. Specially-designed digital interfaces should allow policy makers and implementors to make decisions based on the availability of each item with full transparency. This enables health managers to make better decisions while ensuring that they have the correct machine, qualified individuals and service parts available in order to complete critical jobs.

Continue and further enhance the coordination mechanism with development partners/ NGOs, civil society and others.

The MOHP will facilitate the development partners/NGOs, civil society and others to work together in the coordination mechanism to discuss issues and concerns in partnership with other stakeholders, share information and experiences, jointly prepare strategies and approaches.

By working in a coordinated way with development partners/NGOs, civil society and others providing relevant services the MOHP aims to foster a collective working environment.

Operationalize the provisions under the Infectious Disease Control Act-2020 (1964 AD) and Public Health Services Act 2075 (2018 AD), including but not limited to, strengthened, trained, and operationally ready Rapid Response Teams (RRTs) and Emergency Medical Deployment Teams (EMDTs).

The MOHP will take a strategic, integrated approach to advancing the critical functions needed for local, provincial, and federal health security in the context of rising global infectious disease threats and emergent threats across the globe. This will be grounded on the Infectious Disease Control Act-2020 (1964 AD) and Public Health Services Act 2075 (2018 AD). The process will include strengthening the core capabilities of public health at all levels of government. It will help ensure RRTs, EMDTs and their personnel are operationally ready, have an integrated network with essential services readily available across all lines of operations, and have the necessary resources to respond. Operationalizing these provisions will also ensure that the government will not have to focus on creating different structures to respond to the health threats.

Strengthen the International Health Regulations or IHR capacities through conduct of a joint external evaluation or JEE, which leads to the development of the National Action Plan for Health Security or NAPHS.

A Joint External Evaluation (JEE) is a voluntary, collaborative, multisectoral process to assess country capacities to prevent, detect and rapidly respond to public health risks whether occurring naturally or due to deliberate or accidental events. The JEE helps countries identify the most critical gaps within their human and animal health systems in order to prioritize opportunities for enhanced preparedness and response.

The MOHP will request WHO to conduct JEE. The gaps identified from the JEE will help in developing National Action Plan for Health Security.

Strengthen coordination supported by the Health Emergency Operations Center and Provincial HEOC through additional HR, SOP updating, exercises and capacity-building.

The Health Emergency Operations Center (HEOC), since 2012, has been functioning as a central command and control facility for effective administration of emergency preparedness and disaster management in the health sector. The HEOC hosts necessary resources and data for effective coordination of response and functions 24/7 in emergencies. In federal structure, there are seven provincial PHEOCs. At this point in time there is a need to develop additional HR, SOPs and few capacities building works to strengthen these response mechanisms.

Annexes

COVID-19: Provincial Context

Nepal's political shifts were dramatic between 2006 and 2015—the country's conflict era effectively came to a close at the beginning of this decade, and a new constitution was promulgated at its end. These years witnessed Nepal make its transition into a federal state, including successfully holding local elections after 20 years, and taking a significant step forward in delegating and decentralizing authority to the provincial and local levels.

Nepal now has 761 autonomous administrative bodies: one federal government, seven provincial governments, and 753 local governments.

With this change, the onus of healthcare delivery has fallen on the local level. Consequently, the federal Ministry of Health and Population (MOHP) has to function more as a technical agency that supports the local governments. Provincially, each unit has unique geography, socio-cultural diversity, and varied economic engagements. Similarly, the provincial differences in health indicators also differs among these administrative clusters.

For this reason, understanding the provincial context of COVID-19 response is essential. During this intra-action review, the provinces were asked to present their responses to COVID-19, along with the lessons that were learnt. This portion showcases this topic.

Koshi Province

Koshi Province has a population of 49,72,021. It has 791 public and 132 non-public health institutions. These comprise of 648 health posts, 41 community health units, 18 public hospitals, 34 urban health centres, four primary health centres, one regional medical store, three hub hospitals, and nine other health facilities.

COVID-19 overview

On 23 January 2020, as soon as the first case of COVID-19 was confirmed in Nepal, preparedness activities commenced in Koshi Province—the COVID-19 monitoring, data collection, and monitoring committee was established on 31 March. Then, on 17 April, 12 samples tested positive at Bhulke in Udayapur, the first in the province. A day later, the first

health worker—from Dhankuta Hospital—was confirmed positive, while 10 positive cases were reported from Kechankawol in Jhapa. Active contact tracing and case investigations were carried out by the Provincial Health Emergency Operations Centre (PHEOC) for every positive confirmation. The total number of polymerase chain reaction (PCR) and PCR positive cases reached maximum levels during all three waves of COVID-19. However, the death trend was lower during the third wave despite a high number of positivity rates.

Classified according to districts, the highest mortality was observed in Morang, Jhapa, and Sunsari, with deaths ranging from 294 to 590. The districts with the lowest observed mortality were Okhaldhunga, Solukhumbu, and Khotang with less than 12 deaths.

The highest number of tests conducted as well as positive results recorded—both PCR and rapid diagnostic tests (RDT)—were also in Morang, Jhapa, and Sunsari. Sex-wise, the infectivity and death rates were found to be higher among males, while between the age groups, the highest infections were in people aged 21-50. Data also showed that older men (70+) had the highest death rate.

The rate of positive cases was over 22% and 25% from PCR and antigen testing respectively, with a total of more than 170,000 positive tests. While most recovered, 2260 people died due to COVID-19.

Madhesh Province

Madhesh Province, with a population of 61,26,288, is the most populous among Nepal's provinces. It has 136 local governments, composed of one metropolitan and three sub-metropolitan cities, 73 municipalities, and 59 rural-municipalities with 1271 wards. The province has 119 public health facilities: 13 public hospitals, 33 primary healthcare centres, 744 health posts, one urban health centre, and one other health facility. In addition, there are seven non-public health facilities.

COVID-19 overview

Data observation found that 232834 PCR tests were conducted during all three waves. The tests had peaked during the first wave, whereas 21,476 PCR positive cases and 831 deaths had been reported in the second wave; this was the highest among all three waves. During the third wave, there were 2738 positive cases.

Among the positive cases, 11,543 were reported among the 21-30 age group. People above the age of 60 had the highest number of deaths at 370. The province had a case fatality rate of 2.50%, and 1062 casualties till 28 March 2022, while the recovery rate was 97.25%. Regarding vaccinations, 68% of the population aged above 12 years had been fully vaccinated. Among the eight districts in Madhesh Province, the highest PCR positive cases recorded were in Dhanusha (9393) and Parsa (7265), while the lowest was in Sarlahi (3351). These figures were based on records from 11 June 2020 to 22 March 2022.

Bagmati Province

Bagmati Province, with a total population of 60,84,042, is the second-most populous among the provinces. It covers an area of 20,300 square kilometres. The province is divided into 13 districts, with Hetauda as its headquarter, and the major languages spoken are Nepali and Tamang. It has 119 local governments, composed of three metropolitan cities and one sub-metropolitan city, 41 municipalities, and 74 rural municipalities. Rural municipalities Bagmati Province has 35 public hospitals, 41 Primary healthcare centres (PHCCs), 641 Health Posts, one urban health centre. It also has 1417 non-public health facilities, the highest among the provinces.

COVID-19 overview

As of 27 March 2022, a total 38,74,844 COVID-19 PCR and Antigen tests had been conducted in Bagmati Province. Kathmandu district alone had 33,4199 RT-PCR and Antigen tests. On the other end was Rasuwa district with only 2312 tests.

Among the tests, 570,451 were confirmed positive. By mid-May 2021, Bagmati Province had witnessed around 150 deaths, the highest recorded till date. There was a surge in PCR positive cases from January 2022 to last week of January. Cases rose up to around 8000 between 17 to 24 January 2022. Records show that COVID-19 cases gradually increased from the first to the third wave. The second wave had 614 recorded deaths, the highest in the province.

With regards to vaccinations, nearly the entire population above the age of 18 had been fully vaccinated, where98.6% had received the first shot of the vaccine. Young people below the age of 17 but above 12 that had taken the first dose of the vaccine were 79.9%. Most positive cases were of people aged between 24-34; 80,788 of the positive cases were women of the 15-24 age group, and 65,814 of the positive cases were men aged 25-34.

Gandaki Province

Gandaki Province has a population of 2,403,757. It has 11 districts, consisting of one metropolitan city, 26 urban municipalities, and 58 rural municipalities. The province has 607 public and 93 non-public health institutions. These comprise of 492 health posts, 32 community health units, 14 public hospitals, 34 urban health centres, 24 primary health centres, one Provincial Health Emergency Operation Centre, two hub hospitals, and 12 other health facilities.

COVID-19 overview

In the first wave of COVID-19, the province confirmed a total of 16,609 cases with 209 deaths. At the beginning of the second wave, on 15 March 2021, there were 1211 deaths with 71,402 positive cases. The third wave had a total of 13,973 positive cases and 40 deaths.

Distributed according to districts, Kaski had the highest number of infected cases at 43,458. A majority recovered, but there were 640 deaths and three active cases. This was followed by Nawalpur and Syangja with 114,666 and 9099 infected cases and 145 and 181 deaths respectively with no active cases. Manang, Mustang, and Myagdi has the lowest infections. The highest number of deaths in the province was 16 (with 803 cases) during the sixth week, whereas there were zero fatalities on the seventh, eleventh, and twelfth weeks. The test per ratio (TPR) was the highest in the third week with 3838 cases. The lowest TPR was 0.7% during the twelfth week, with 442 positive cases. The highest number of deaths (304) occurred in the age group of 55-64 years. Segregated according to sex, the male fatality rate was 63% while for females it was 37%.

The isolation centres were occupied during the third, fourth, and fifth weeks. The highest isolation occupancy was 10%, during the fourth week. There was zero utilization of the centres during the ninth, tenth, and eleventh weeks. The intensive care unit (ICU) was required during the third, fourth, and fifth weeks, while demand decreased (1% utilization) during the ninth, tenth, and eleventh weeks. Ventilator occupancy was highest during the second week at four percent. Similar to the ICU, the need for ventilators went down completely in the night, tenth, and eleventh weeks.

Lumbini Province

Lumbini Province has a population of 44,73,576. It has 12 districts, consisting of four sub-metropolitan cities, 32 urban municipalities, and 73 rural municipalities. The province also has 735 public and 174 non-public health institutions. There are 570 health posts, 98 community health units, 20 public hospitals, 101 urban health centres, 30 primary health centres, 1898 PHC/ORC, 406 birthing center, 2841 Immunization clinic and 118 basic health services.

COVID-19 overview

The first case of COVID-19 in Lumbini Province was confirmed on 1 May 2020. The total number of cases in the first wave was 27,475 with 406 deaths. The second wave had 94,042 confirmed cases with 1995 deaths. The third wave had 42 deaths from 16,211 cases.

Among the districts, the highest number of cases was reported in Rupandehi (40,208), followed by Banke (22,394), and Dang (17,021). The lowest were in Rukum East (588), Rolpa (3316), and Pyuthan (4506). A total of 1,39,506 cases was noted until 27 March 2022, with 72 active cases and 2443 deaths.

During the first wave of COVID-19, 2,23,943 samples were tested, with a 12.27% positivity rate and 406 deaths. In the second wave, a 22% positivity rate was noted with 4,35,598 samples and 1195 deaths. The third wave had 1,27,565 sample tests, with 16,211 positive tests resulting in a 12.7% positivity rate and 42 deaths. Daily cases peaked on 23 February 2022 with 631 cases, and then decreased to 72 by 26 March. Of the 631 cases, only 31 were treated at hospitals; on 17 March, only three patients were hospitalized.

There are 13 functional laboratories in Lumbini Province. Laboratories have been proposed in Nawalparasi West and Pyuthan districts, and one non-functional laboratory in Rupandehi district. The laboratories in Banke district are located at Bheri Hospital, Nepalgunj Hospital, and Bhageshwari Pathology Laboratory. Bardiya, Rolpa, Argakhachi, and Rukum East districts lack laboratory facilities altogether. During the seventh epidemiological week, 3.47% of ICU beds and 4.07% High Dependency beds were occupied with no ventilators in use. . Ventilators were needed during the eighth week, with occupancy rate 0.23%.

As per the data available on 27th March 2022, Lumbini Province's first dose vaccination rate was 94% which is 3,721,623 people vaccinated. A total of 33,37,840 people which is 84% of the target had received both doses. Further, the province reported 3,90,365 people who received additional vaccine doses with the vaccine rate at 65%.

Karnali Province

Karnali Province has a population of 1,824,131. It has 10 districts, consisting of 25 urban and 54 rural municipalities. The province has 404 public and 60 non-public health institutions. These comprise of 13 hospitals, 333 health posts, 101 community health units, -21 urban health centres, 14 primary healthcare centres, and three other health facilities.

COVID-19 overview

(As of March 26, 2022) A total of 130,100 PCR tests were conducted in Karnali Province. Of these, 23,209 were positive. The province also had 62,428 Antigen tests, among which 15,544 were positive. While 36,927 of the positive cases recovered, there were 391 deaths. There was an increase in positive cases during all three waves of COVID-19, with the highest positive tests and deaths taking place in the second wave between weeks 15 and 27.

Among the districts, Surkhet was the hardest hit with almost 12,945 positive PCR cases; the district alone had 52,119 PCR tests. The least affected district was Dolpa with only 330 Antigen and 70 PCR cases. Surkhet (224), Salyan (53), and Rukum West (36) had the highest number of deaths.

Segregated according to sex and age, there were more deaths among males, and the highest number of deaths (22%) took place among the 51-60 age group.

Sudurpashchim Province

Sudurpashchim Province has a population of (2867833). It is divided into nine districts and 88 local governments, and is composed of one sub-metropolitan city, 33 municipalities, and 54 rural municipalities with 734 wards. The province has 511 public and 45 non-public health institutions. These consist of 14 public hospitals, 16 primary healthcare centres, 378 health posts, 57 urban health centres, 43 community health units, and three other health facilities.

COVID-19 overview

(As of March 24, 2022) A total of 5,25,681 COVID-19 tests were carried out in Sudurpashchim Province, of which 2,20,286 were PCR and 3,05,395 were Antigen. About 19.1% of the PCR and 5.7% of the Antigen tests were positive. Altogether, there were 11.3% positive COVID-19 patients reported from the province. Furthermore, data shows that there were 633 deaths; 387 and 246 had tested positive through RT PCR and Antigen tests respectively. The province had 41,730 patients that recovered. (This is RT PCR recovered cases)

With regards to vaccinations, 70% of the target population were fully vaccinated, while 68% had received the first dose. (March 22, 2022, FWD MOHP)

COVID-19 patients in the province peaked during the second wave. Among the districts, Kailali reported to have the highest number of infected patients and deaths. Most of the positive patients were between the ages of 20-29 and were mostly male.

When it came to hospitalization, the rate was higher in 2021 than in the other years. The COVID-19 bed capacity in 15 health institutions was 587, with Kanari Isolation Centre having the most beds. Furthermore, there were 464 isolation-A beds, 83 COVID-19 HDU-B, 40 COVID-19 ICU-C, and 35 COVID-19 ventilators. Sudurpashchim Province had a total of eight oxygen PSA plants in operation with daily production capacity of 341 cylinders , and 8 oxygen PSA plants in the pipeline.

Overall, 957 healthcare workers were infected with COVID-19, with recorded deaths of four workers. During the second wave, 412 (43%) healthcare workers were infected. The third wave, though, did not witness such high numbers.

1. Provincial: Policy and Planning related to control and management of COVID-19

Province	Best practice/strengths	Impacts
Koshi Province	**Leadership/Governance**: A Standard Operating Procedure (SOP) for Covid 19 management was formed **Financial**: Covid 19 Public Safety Fund Operation Procedure **Service Delivery, Health Workforce, Access to Essential Medicine:** • Koshi Hospital Covid 19 Treatment (Operation and Management) Guideline, 2077 • Establishment of quarantine, isolation and holding centers • Capacity building in human resources and PCR laboratories **Health Information system:** Development of IEC materials and documentation (CICT guideline, Pool testing and Covid -19 dead body management)	• On Provincial level, Covid - 19 management committee was formed between the Provincial government, Koshi hospital and other different stake holder. • Strengthened PHSM • Service delivery for the Covid-19 patients • Easiness in process of isolation and quarantine of Covid patients • Strengthening of hospitals and Covid management center

Madhesh Province	• Implementation of national guidelines for prevention, control, response and management of COVID-19 • Drafted and implemented Corona Virus Infection Prevention Control and Treatment Fund Rules, 2076 by the provincial government • Madhesh Institute of Health Sciences Act 2077was drafted and implemented, establishment of communicable disease and research center was agreed upon. • Provincial COVID-19 health response plan drafted with coordination of MOSD, PHD, WHO, UNICEF, UNFPA • Province level Covid-19 related Isolation Management Guideline 2077was drafted	• Appropriate action against COVID-19 during the first and second wave • Budget allocation for COVID-19 management was made easier. Total Rs 90,11,20,961 was moblized for the effort • Establishment of Provincial dedicated COVID-19 hospital at Mujeliya • Recruitment of different categories of human resources (436)
Bagmati Province	• Temporary HW recruited for COVID-19 surveillance, diagnosis and treatment by the local and provincial Government. • Adapted the federal government planning, policies and guidelines.	• Improved surveillance, diagnosis and treatment.
Gandaki Province	• **Development of 10 committees with TOR:** - Hospital management - Human Resource management - Information and Media - Ambulance management - Quarantine management - Rapid Response Team - Health Desk/Fever Clinic - Laboratory and sample collection - Market Monitoring - Logistic Management • Special incentives for frontliners from Provincial Government	• Guidance in the proper response of COVID 19 management • Motivated health workers
Lumbini Province	• Developed COVID-19 contingency plan during the first wave • Developed Isolation guideline at the provincial level and supported local government to set up quarantine centers • Joint Monitoring (with parliamentarian) of quarantine/isolation center & isolation hospitals (both waves) • Additional Financial support for the treatment of COVID Patients in dedicated hospitals • Provision of NRS 1 lakh for covid affected family due to COVID related death • Financial support for the establishment and operation of isolation centers • Mobile COVID-19 antigen test program • COVID-19 case management ayurveda guideline	• Supported in planning and preparation for the surge • Clear guidance on management of covid cases (isolation/quarantine) • Standard monitoring to identify the gaps and address the issues • Reduce burden on the poor and increase availability • Financial support to the family • Better management of COVID cases (asymptomatic/symptomatic) • Increased testing at the community level to check the transmission level • Improved healthy life style and mental health status of the COVID cases

Karnali Province	• Formation of Karnali Province COVID Control/ Management Directorate Committee under Chief Minister of Karnali Province. • Formulation of Action plan on Response, prevention and control of COVID 19 addressing roles and responsibilities of each ministry, government institutions and EDPs • Allocation of financial reimbursement for family of COVID-19 mortality by Karnali Province • Regular PCCMC to address and disseminate updated guidelines • Extension of contracts of Medical officers and specialist doctors through the COVID 19 pandemic • Establishment of oxygen plants at district level hospitals	• Establishment of Quarantine and isolation center at Local government level and district level • Establishment of 55 bedded COVID-19 dedicated hospital in Kalikot which later named and developed as Infectious Disease Hospital
Sudurpashchim Province	• Formulated policy documents, guidelines and action plans related to COVID 19 prevention and control (isolation/quarantine, health desk) • Provided instructions to health offices and hospitals • Policy decision to establish Public Private partnership in 2nd Phase • Rapid Response Action Plan was endorsed by MOSD	• Guidance in the proper response of COVID-19 management • Appropriate COVID-19 responses as per the local situation • Guidance document for COVID 19 response

Province	Enabling factors
Koshi Province	• Leadership at various strata of government • Combined effort of federal, provincial and local government • Help and support from External developing partner, non-government and other stakeholders • Guideline of Covid-19
Madhesh Province	• Willingness of stakeholders and partners • Guidelines made available by the national government • Willingness of elected representatives at various levels of governance.
Bagmati Province	• I, II & III wave of COVID-19 • Inadequate Human Resources in the early phases and peak of the delta wave
Gandaki Province	• Joint effort and support from Government and EDPs
Lumbini Province	• Resource mapping, coordination and technical support from EDPs • Technical inputs and regular meetings to develop the guideline • Development of monitoring checklist • Allocation of COVID fund by provincial government • MoSD provided NRS 20 lakhs/district in terai and NRS 10 lakhs in hilly districts • Budget allocation from MOHP to the districts (at least 10 lakh each) • Yoga practices started in the isolation centers

Karnali Province	• Timely allocation and dissemination of additional budget to district and local level government for COVID control and response activities
Sudurpashchim Province	• Joint effort and support from Government counterparts, EDPs and other stakeholders • COVID 19 response has been the common agendas for all.

Province	Challenges	Impacts
Koshi Province	• Difficulty in Implementation of the Covid- 19 guideline protocol • Unpredictable nature of disease- its natural course, infectivity and surge • Difficulty in policy implementation and resource mobilization	• Insufficient preparedness and response • Difficulty in managing cases during rapid surge of cases • PHSM could not be strengthened due to poor implementation of policy in some cases as expected • Inadequate resources in different level
Madhesh Province	• Difficulty in implementing the guidelines at the local level • Delays in formulation of plans and policies • Difficulty in predicting the case surge	• Increased case load in quarantine, isolation center, hospital impacted in treatment of people
Bagmati Province	• Continuity of Human Resources recruited for COVID-19 remains a challenge. • Continuity of Extended Services (HDU, ICU, NICU/PICU), RT-PCR laboratories post COVID is another challenge.	• Difficulty in proper utilization of extended services
Gandaki Province	• Policy implementation • Resource mobilization • Three tier coordination for COVID 19 response and management • Some of policy level of work at province dependent on federal guidance/policy (Ground crossing, lockdown, aviation rules etc.) • Lengthy official procedure needed to be followed when program or response has to be directed to local level from province. • Under staffing in the health offices (multiple job responsibilities assigned to single person)	• Proper implementation of Guidelines and SOP for COVID 19 response and management • Inadequate resources at district and local level • Duplication of work • Unable to conduct timely response and continuously changing guidelines (Province makes their own guidelines then after a few days Federal guidelines are circulated)
Lumbini Province	• Implementation of policies and guidelines • Identifying the details of the deceased person due to COVID • Incentives for the frontliners	• Delay in service delivery • The real beneficiaries might not receive the service • Many frontliners did not receive incentives
Karnali Province	• Implementation of new guidelines	• Differences in practice in the provinces.

Sudurpashchim Province	• Policy implementation • Resource mobilization • Three tier coordination for COVID 19 response and management • Some of policy level of work at province dependent on federal guidance/policy (Ground crossing, lockdown, aviation rules etc.) • Lesser involvement and participation from other provincial ministries	• Proper implementation of Guidelines and SOP for COVID-19 response and management • Inadequate resources at district and local level where response was needed most. • Timely reporting of COVID 19 and other • Inefficient coordination resulting in different response at different times

Province	Limiting factors
Koshi Province	• Constrained advocacy, accountability and monitoring • Limited manpower and materials • Redundancy of works • Limitations of different government structure/tiers • Data and information sharing
Madhesh Province	• Limited advocacy • Increased strain on limited manpower
Bagmati Province	• Unclear Guidelines from the Central Government
Gandaki Province	• Province government has limitation in implementation of guidelines at local level • Inefficient coordination resulting in different response at different levels
Lumbini Province	• Regular monitoring • Duplication of records by DHO and submit to the DAOs; Budget • Budget allocation
Karnali Province	• Frequent change in guidelines
Sudurpashchim Province	• Province government has limitation in implementation of guidelines at local level • Duplication of work • Lengthy official procedure needed to be followed when program or response has to be directed to local level from province (example: land acquisition for POE Health Desk has to follow different line ministry)

2. Provincial level coordination and monitoring

Province	Best practice/strengths	Impacts
Koshi Province	• Coordination and collaboration with the three level of government for the preparedness and readiness of the management and control of the covid 19. • Health cluster coordination meeting • Meeting held among different stakeholders frequently and when required • Monitoring and supervision of clinical settings, POE, isolation and quarantine centers	• Collaboration between various tiers of government • Control of the spread of infection in the community. • Joint effort with different stakeholder and partner organizations during normal time as well as at peak time • Appropriate dissemination of information
Madhesh Province	• Establishment of PCCMC under the chairmanship of Hon.Chief Minister to co-ordinated for the COVID-19 prevention and response. • Establishment of DCCMC at every district under the chairmanship of CDOs. • Regular coordination meeting with specialist Clinician, development partners and clusters for Monitoring and regular technical guidance • Quick response team formed for high level monitoring in collaboration with Specialist Doctor, WHO, UNFPA / UNICEF.	• Effective co-ordination structure for provincial and district level monitoring and management. • Good co-ordination between government and other development partners
Bagmati Province	• Regular coordination and communication with the District and Local Levels, ministries and other external development partners in the province. • Inter-ministerial co-ordination improved	• Improved surveillance, diagnosis and treatment.
Gandaki Province	• Recognition of partners contribution and support by the Health Directorate • Increased communication by partners when resources are available • Support in transportation • Regular Health and nutrition cluster meeting and good participation in regular meeting organized by MOHP (Health coordination meeting, WAR meeting) and near complete attendance in meeting whenever requested to attend • PHEOC playing central role for coordination and communication	• Partners feeling equally responsible to respond health team • Avoidance of work duplication among the cluster partners and decision taken as per the provincial situation and needs • Provision of timely Logistic support and response • Increase effectiveness in Joint collaboration and support during the COVID 19 crisis • Ensuring communication and coordination maintained at all levels
Lumbini Province	• Daily Incident command system meetings during the surge • Health cluster meetings held regularly • Coordination meetings held with the DCCMC and provincial government	• Regular updates on COVID cases and management • Improved coordination and awareness of all COVID related activities in one platform • Identification of issues/challenges in COVID management and cross learning

	• Monitoring of quarantine & isolation centers and isolation hospitals during first and second waves	• Gap/challenges identified which were addressed by the provincial government to uplift the quality of management
Karnali Province	• Health and Nutrition cluster coordination meeting done on a regular basis • Virtual meetings held regularly with the district and local level to tackle issues as required. • Regular dissemination of updated guidelines and directives from provincial level to district and municipal level. • Daily update published and information disseminated on the status of the COVID-19 to the federal, local level and other relevant stakeholders	• Reduction in duplication of work and improved coordination to mitigate the issues at hand. • Issues at the local level brought to attention for immediate response. • Flow of singular information dissemination to the stakeholders. • Data update/discrepancies being reported through different medium could be analyzed.
Sudurpashchim Province	• Coordination among the MoSD, CM office and Ministry of Internal Affairs and Ministry of Financial Affairs • Timely decision to mitigate the effects of COVID 19 pandemic were executed in the cluster meetings. • Hub and satellite coordination meeting, meeting with Health offices and Hospitals • DCCMC and PCCMC formed and operational • Regular participation in coordination meeting organized by Federal Government. • Joint supervision and monitoring by Provincial Line ministries for COVID 19 management (Isolation site, quarantine site, hospitals, Health desk, holding centers etc. • Frequent Coordination meeting by MoSD with the local level and stakeholders	• Unified COVID 19 responses • Avoidance of work duplication among the cluster partners • Increase effectiveness in Joint collaboration and support during the COVID 19 crisis • Decisions were taken as per the provincial situation and needs • Encouragement for timely response • Sensitization and sharing of Federal and provincial guidelines and SoP for its implementation

Province	Enabling factors
Koshi Province	• Leadership of government authorities • Task sharing • Monitoring and evaluation • Budget allocation
Madhesh Province	• Willingness of leadership • Directives from central government.
Bagmati Province	• Establishment of PHEOC • Improved co-ordination with the partners, DHOs, local bodies and ministries' offices
Gandaki Province	• COVID 19 pandemic being the common agenda to respond • Health and nutrition cluster activation and regular meeting between the cluster partners and Government counterparts • DCCMC and PCCMC being organized regularly • Dedicated staffs (Government and WHO) placed in PHEOC

Lumbini Province	• Active participation of all stakeholders • Pre-existing coordination between the government and non-government actors • Internal DCCMC meetings and willingness of the participants • Developed monitoring checklist. Further, revision of the checklist for second round of monitoring
Karnali Province	• Cluster partners' support in initiating the health and nutrition cluster meetings. • Close coordination maintained with the local level officials from and throughout the pandemic.
Sudurpashchim Province	• COVID 19 pandemic being the common agenda for different ministry • Health and nutrition cluster activation and regular meeting between the cluster partners and Government counterparts • DCCMC and PCCMC being organized in regularly • PHEOC acting as a secretariat at Provincial Level • Good Coordination with stakeholders

Province	Challenges	Impacts
Koshi Province	• Less accountability with the three level of government • Communication and Co-ordination gap • Monitoring and reporting	• Duplication of activities and effort • Delayed response • Ineffective management • Difficulty in resource mobilization
Madhesh Province	• Weak coordination with local level especially during the second wave • Communication gap	• Duplication of activities and effort • Delayed response • Ineffective management • Difficulty in resource mobilization
Bagmati Province	• Difficulty to conduct M&E in a certain interval.	• Difficulty in proper utilization of extended services.
Gandaki Province	• Ensuring that the coordination and communication is implemented at local level • Accountability in three tier government (reimbursements to private hospitals for management of covid-19 patients • Inability of Provincial team to be present in all local levels for meetings	• Difficulty in uniform response (each local level applying their own methods and mechanisms for response) • Inability to ensure when reimbursements would take place • Presence of Province would seem minimal at local levels
Lumbini Province	• Coordination with three tier government • IPC maintenance at isolation centers and hospitals	• Delay in timely response or information sharing • Increased risk of transmission
Karnali Province	• Complete participation in meetings owing to high number of meetings	• Ineffective follow through on the decision during the next meeting
Sudurpashchim Province	• Timely coordination and communication among provincial and local level. • Vertical accountability in three tier government • Most of the coordination occurring at Provincial level (Penetration at local level) • Lack of effectiveness and preparedness of Hub and Satellite Hospital Network mechanism.	• Province coordination needed to follow a lengthy formality for coordination at local level • Ownership of assigned task for timely completion • Involvement of Local level for timely COVID 19 response • Private Hospital could not be effectively brought under Hub and satellite network for C-19 case management.

	• Inadequate Skilled and Specialized Health care workers at various level and frequent turnover of HCWs	

Province	Limiting factors
Koshi Province	• Insufficient plan for coordination and monitoring • Limited human resources
Madhesh Province	• Insufficient plan for coordination and monitoring between the government
Bagmati Province	• Geographical Constraint • Staff turnover • Lack of Budget
Gandaki Province	• Health section unit of local level less accountable to province government • Dedicated focal person to follow up from Federal level • Burden of work in Provincial offices
Lumbini Province	• Lack of plan for coordination at all levels • Lack of adequate resources and funds • Overwhelming visitors
Karnali Province	• Virtual/on-site meeting timings clashes
Sudurpashchim Province	• Health section unit of local level less accountable to province government • All three-tier government are independent of their own • Sanctioned position remaining vacant • Job security (short term contract, motivational allowances, hazard allowances) for temporarily recruited HCWs

3. Risk communication and community engagement

Province	Best practice/strengths	Impacts
Koshi Province	• **Leadership/Governance:** For the first time in the province, case investigation and contract tracing (CICT) teams were formed for the purpose of risk communication and community engagement. • **Financial, Service delivery, Health workforce, Technologies, Health Information system:** - Recruitment of human health workforce and IT officer - Software development and back up storage of Reporting data - Daily preparation and dissemination of situation update - Media monitoring and rumour verification - Promotion of PHSM policies - Awareness and screening at POE.	• Improved coordination and sharing of information. • Contact tracing and control of the diseases. • Public Health Social Measure policies.
Madhesh Province	• Mass media Campaign using FM, and social media • Parliamentarians and representatives involved in risk communication • Spokesperson dedicated for the Province and every COVID-19 hospital • Call center established, press briefing and reporting done regularly. • Establishment of Information center at MOSD • Information center at MOSD and later at PHEOC performed essential media monitoring and rumor verification.	• Timely Risk communication • Use of social medias and other mass medias ensured the reach among public.
Bagmati Province	• Optimal use of available online media platforms such as provincial webpage, social media channels, emails and Viber group.	• Beneficiaries receiving on-time official information related to COVID-19
Gandaki Province	• Daily report with press briefings and its dissemination in social media and official webpage (Health Directorate). Digital records maintained. • Viber group created (District Hospital, Health Office and Ayurveda centers, District Administration Office) • 1092 (hello doctor) 24 hours on call service with Medical Officers and Psychosocial counselors. Referral mechanism with real time bed occupancy updates from PHEOC with the support of CICT facilitators. • Weekly virtual meeting with District Health Offices, Hospitals and Ayurveda centers	• Regular dissemination of information to wider network (to concerned authority and offices) • Timely dissemination of information to public • Identification of population at risk for sample collection and testing • Increasing compliance of mask use during the campaign

	• Promotion of PHSM measures (mask campaign, distribution of mask, health awareness information, set up of hand hygiene station at various places,) • Response in pocket outbreaks and mass community RDT tests in all Districts (deployment of Provincial RRT team)	
Lumbini Province	• Preparation and dissemination of COVID-19 situation report on a daily basis • Conducted media briefing from MOHP (daily during surge and accordingly when not) • Media monitoring was also done on a weekly basis • Social media pages (Facebook and viber groups) were formed for active dissemination of awareness • Hotline establishment for COVID • Rumor verification and outbreak investigations • Distribution of masks and spread of COVID awareness by the security forces/ EDPs/ community volunteers	• Regular updates of the situation to all the stakeholders at all levels • Active dissemination of current situation as well as continuous advocacy on the crucial need to follow the public health social measures to the general public • Public could use the hotline to get information regarding COVID prevention and transmission • Debunking of rumors and actual situation update to prevent chaos • Increase in people wearing masks and limiting transmission
Karnali Province	• Awareness Campaign via mass media campaign (TV, Radio, News Paper) • Mask Khai Campaign at municipal level • Health Desk at Babai, Kuine, Kapurkot and Airport • Establishment of CICT team • Mobilization of FCHVs for the mask campaigns • IEC/BCC materials developed and distributed to the local level	• Increase in awareness at grassroot level regarding COVID-19 • Limiting the possible outbreaks
Sudurpashchim Province	• Daily COVID-19 situation updates analysis and report generation from PHEOC • Regular Covid-19 press/media briefing from the MoSD • CICT team formation and mobilization • Promotion of PHSM measures (mask campaign, distribution of mask, health awareness information, hand hygiene station set up at various places, media mobilization for information dissemination) • Call center to follow up active C 19 by District Police office Kailali, Health Office • Circulation of details of returnees at PoE to local level • Rumor verification and preparation of official report form the concerned health office • Mobilization of tole health committee, FCHVs • Establishment and operation of woman holding center at Dhangadhi as a joint collaboration between government, EDPs and other stakeholders	• Regular dissemination of information to wider network/stakeholders • Public were timely informed about the risk • Proper case investigation was done in the very early days of C 19 pandemic • Identification of population at risk for sample collection/testing • Majority of COVID 19 cases at home isolation were informed and followed up for their health • Mitigation of unwanted circulation of fake news • Increase compliance of mask use during the campaign • Woman were provided with safe woman friendly isolation center. • 4+ PoE health desk are in operation • Increase confidence in public regarding C 19 vaccines, increase health seeking behaviours and varying level of adherence to PHSM

	• Nomination of RCCE focal person at local level of province and various levels of orientation/training on RCCE • Active screening of Returnees at PoE • Local level actively managed the quarantine and isolation site during the first wave of Covid- 19	

Province	Enabling factors
Koshi Province	• Role of PHEOC, PEOC and other Stakeholder • Task sharing
Madhesh Province	• Elected representatives, local level leaders participating in RCCE activities • RCCE guideline published by central government
Bagmati Province	• Availability of the internet in most places. • Increased number of social media users
Gandaki Province	• Operation and functional status of PHEOC • MoSD taking as credible source of information to the public • Proper coordination for sample processing and testing within the province and beyond
Lumbini Province	• Regular update from the DHOs and labs to prepare the situation report. • Support from the DHOs and PHEOC to prepare the content • Support from EDP to the provincial government in terms of human resources • Active coordination of the provincial and local level stakeholders • Promotion of the PHSM implementation by miking or advocacy
Karnali Province	• Proper coordination between Health Service Directorate and Local Level Government • Coordination with the local government • Ownership taken by the local Government to run the health desks • Directives in creating CICT team from the federal and provincial level • Daily allowances/incentives provided to those FCHVs involved in the activities • Leadership from HSD and MoSD in developing/adopting new IEC/BCC material
Sudurpashchim Province	• Operation and functional state of PHEOC • MoSD was a credible source of public information for Covid-19 at Province level • COVID 19 was a common agenda and cases were handful during the early days of pandemic • DPO Kailali actively following up the cases • Proper coordination for sample processing and testing within the province and beyond • Better coordination and support among Local level, EDPs and related stakeholders • Dedicated HCWs, FCHVs • Mobilization of media

Province	Challenges	Impacts
Koshi Province	• Limited trained human resource • Difficulty in information dissemination because of various barriers. • Pocket-size screening at POE. • Inadequate dissemination of IEC materials.	• Delayed contact tracing • Cases overload • Limited case detection at POE • PHSM
Madhesh Province	• No mechanism to encounter rumours, misinformation and address concerns during early stages • There is a lack of media monitoring mechanism. • Especially catered risk communication materials must be created in local language. • Limited Human resource to promote RCCE	• Spread of misinformation
Bagmati Province	• Community engagement activities are low related to COVID-19 containment	• Community engagement comparatively low compared to the risk communication
Gandaki Province	• Developing the messages in local dialect • Inadequate public health messages in hoarding boards	• Message to public not in large scale • Lack of proper monitoring or reporting mechanism of people entering community coming from outside town
Lumbini Province	• Continued implementation of the hotline • Active monitoring of the social media pages • Despite continuous advocacy PHSM implementation was a challenge • No dedicated focal person for RCCE at the local level • Active monitoring of implementation of PHSM in the remote areas	• Despite the implementation, the usage of the service was not found to be optimum • Timely dissemination of correct information • Increased transmission of COVID-19 among the general public • Regular dissemination of information to the public • People in the remote areas are devoid of awareness and resources to prevent the disease
Karnali Province	• Flow of verified information to and from local level • Existing cultural and social beliefs • HCWs practising and delivering different modalities of care required for the control of disease	• Increased effect of rumors and falsified information creating panics and stereotype about COVID 19 in the community. • Confusion in the community on which guideline to follow
Sudurpashchim Province	• Resources mobilization for RCCE activities • CICT team not effectively functional • Mobilization of RCCE focal person (recently nominated) • Budgetary and financial adequacy for RCCE activities • Dedicated hotline and call center to follow C 19 cases • Active media (social) monitoring • Risk Message delivery to people (at remote places) • Geographic remoteness for message delivery • Long land border between India and Nepal (Porous Border)	• Quality and effectiveness of work • HCW cannot be capacitated for effective RCCE at local level • Lack of proper conveyance of messages, lack of proper data capture/recording/ reporting mechanism • Unsupervised entry of returnees from the porous border

Province	Limiting factors
Koshi Province	• Risk communication and Community engagement ineffective in the local areas • Limited human resources and logistics at POE • Open pores border with neighbouring country.
Madhesh Province	• Risk communication and community engagement capacity was relatively poor before the commencement of crisis.
Bagmati Province	• Geographical constraints • Lockdown • Lack of trained HR
Gandaki Province	• Lack of resources to monitor all the ground crossing • Local level are not accountable for data recording and reporting to province
Lumbini Province	• Re-establishment of the service • Lack of awareness, laid back attitude • Lack of human resources • Accessibility, geographical constraint, poverty, lack of resources and will power
Karnali Province	• Unavailability of Network and internet facility. • High level of false information/rumors regarding the COVID-19 disease in circulation at the grassroot level. • Continual change in guidelines and directives
Sudurpashchim Province	• Adequate and dedicated HCWs for assigned task • No commodity no program • Geographic remoteness, multiple reporting and communication channel/mechanism • Efficient linkage and accountability among the three tiers of government • Lack of resources and capacity mobilization to supervise and monitor all Porous PoE

4. Surveillance, Rapid response Teams and Case investigations, Point of entry, International Travel and Transport

S.N.	Province	Best practice/strengths	Impacts
1	Koshi Province	• **Leadership/Governance:-** Regular cross-border coordination meetings • **Financial :-** Allowance for Hazard and overtime duty • **Service delivery** • Large scale antigen testing in POE, where PCR testing is not available • Strengthening of PPHL. • Free ambulance service and sab bahan. • **Health workforce:-** Recruitment of Public health officer. • Activation and mobilization of CICT team at different local bodies.	• Improved coordination and sharing of information for the early detection/ management of suspected/ confirmed cases . • Availability and accessibility of covid 19 testing • Effective contact tracing for covid cases and home isolation

		• Task sharing and mobilization of school teachers and ayurvedic health worker • **Technologies:-** Transporting sample from POE to NPHL for gene sequencing. • **Health Information system** • Distribution of Covid-19 IEC materials awareness and pamphlets.	
2	**Madhesh Province**	• Establishment of screening services at point of entries using antigen testing. • CICT training conducted for all 8 districts and all 136 palikas for co-ordinators, Doctors and public health officials • Quick response team formed for high level monitoring in collaboration with Specialist Doctor, WHO, UNFPA / UNICEF. • Isolation done by local level for international travellers and migrant workers • Regular Cross border co-ordination meeting	• Screening of entrants at POE reduced the chances of cross border spread of COVID-19 • Improved coordination and sharing of information for the early detection of suspected/ confirmed cases and for monitoring contacts • Increased testing • Increased contact tracing • Improved surveillance
3	**Bagmati Province**	• Provincial and district level RRT teams formed. • CICT support teams formed at all districts • CICT teams formed at all the Palikas according to the guidelines.	• Early detection of the suspected cases. • Reporting of the events of outbreak improved • COVID 19 data update, analysis and dissemination to public • CICT conducted to some extent
4	**Gandaki Province**	• Establishment of Health Promotion and observation center (PHSM adherence and its advocacy and health information, counselling and awareness) at Interprovincial junctions. • Deployment of Provincial RRT teams to all Districts targeting covid high risk areas and conduction of mass Rapid Antigen tests. • Development of IEC materials (monthly contract with all radios and government television) and its dissemination. Daily media briefing from PHEOC.	• Improved coordination and sharing of information for the early detection of suspected/ confirmed cases and for monitoring contacts • Timely identification of high risk areas and its control of possible outbreaks by identifying the positive cases • Uniform dissemination of public health messages
5	**Lumbini Province**	• Several rounds of CICT training provided at the provincial and district level • Health desk establishment at 6 PoE (3 majors) • CICT team formation	• Increased number of health workers oriented on CICT • Screening of COVID cases along with other diseases at PoEs • CICT conducted
6	**Karnali Province**	• Screening at entry Point at Babai, Kapurkot, Kuine and Surkhet Airport • CICT teams formed at local levels • Antigen testing to the general public made easily accessible. • Free tests (PCR/ Antigen) provided to those being referred. • Verification of high number of caseload reported in an isolated geographical location. • Directives on COVID-19 testing regularly followed by the local level.	• Early detection of suspected/ probable COVID-19 cases • Close contacts of the COVID-19 cases also tested • Those suspecting of being close contacts with COVID-19 cases could freely get tested on their own. • Active surveillance of possible outbreak improved. • Information on updated guidelines were disseminated indirectly through the district level hospitals

7	**Sudurpashchim Province**	• Regular cross-border coordination meetings • Institutionalization of Health desks of province (5 HD, 2 with proper support from Federal Govt) • Regular screening of returnees (C-19, malaria, TB, HIV etc.,) • Management of COVID 19 case at POE. (transport facilitation from HD to Isolation site) • Increase in testing facility (RT PCR testing and Antigen RDT testing capacity) • Local resource mobilization for sample collection, transport and testing	• Improved coordination and sharing of information for the early detection of suspected/ confirmed cases and for monitoring contacts • Almost all of the returnees entering Province from designated POE were screened with Antigen test • Timely identification of disease of public concern (COVID , Malaria, TB etc) to mitigate the chances of community spread • Population at risk were tested for COVID 19

Enabling factors

S.N.	Province	Enabling factors
1	**Koshi Province**	• Political and financial support from three tiers of government and other NGOs etc. • Reporting and recording . • Improved surveillance
2	**Madhesh Province**	• Relationship had been established prior to the response • Willingness of all stakeholders to undertake regular meetings • Political and financial support from provincial government
3	**Bagmati Province**	• Co-ordination strengthened before the response. • Political support • Financial support (Provincial and Federal) improved. • Stakeholders meeting conducted regularly. • Commitment of the local unit in the CICT team formation.
4	**Gandaki Province**	• Supportive MOHP and local levels and proactive HD • Good coordination and communication among Provincial/District Offices and Hospitals • Active PHEOC team
5	**Lumbini Province**	• Joint technical and financial support of government and EDPs • Monitoring & surveillance of the site, Joint collaboration of all stakeholders • Trainings on CICT
6	**Karnali Province**	• Health desks established at the check points B. Trainings provided to those recognized by the local government as the members of the CICT team. • Regular antigen test sites established, and dates made known to the locals. • Government ownership in providing free of cost tests for COVID-19. • Pre-established relationship on verification of data in between the provincial and district.
7	**Sudurpashchim Province**	• Relationship had been established prior to the response. • Willingness of all stakeholders to undertake regular meetings. • Regular support from central level. • Dedicated team, proper coordination, regular logistic support, HR support from EDPs. • Proper coordination and regular technical support from PHEOC in surveillance of COVID-19 and it's follow up.

Challenges		
Province	**Challenges**	**Impacts**
Koshi Province	• Coordination at local level ineffective. • CICT not formed at some places and did not sustain. • Testing insufficient at POE due to high transition of people during surge of cases • Delay in transport of samples to the PCR testing lab . • Ineffective case detection at PO	• Response not coordinated between partners, health authorities and the central level • Duplication of activities and effort. • Delayed diagnosis and quarantine. • Local Community transmission
Madhesh Province	• Open border with neighbouring country posing threats to mitigate cross border transmission • Lack of timely coordination from local level in second wave	
Bagmati Province	• Local level RRT teams not functional. • Very low Palika-level antigen testing and reporting. • Ineffective CICT	• Unable to initiate CICT effectively. • Untimely Outbreak investigation. • No proper CICT in II web and late
Gandaki Province	• Lengthy period of pandemic causing exhaustion among CICT team • RRT guideline still in interim stage • Manual management of line lists • Lack of adequate equipment, commodities in health desk/health promotion centre operation	• Less effective CICT towards the end of the third wave • Unclear roles and responsibilities of RRT teams • Response not coordinated between partners, health authorities and the central level • Inability of health workers to provide proper services (lack of equipment, no proper holding or waiting areas for the travellers)
Lumbini Province	• Optimum CICT • Effective functioning of health desks • Timely reporting/recording of data	• Ineffective control of transmission • Import of disease and increased transmission • Real time data in not available
Karnali Province	• Managing the flow of returnees to Karnali • Differentiating the returnee migrant workers from the domestic travellers. • Management of holding centers/Quarantine centers. • Recording/documentation at check points and of CICT done. • Transport of positive cases detect at the checkpoints to their destination.	• Symptomatic cases also travelling in the same vehicle, posing higher threat to COVID-19 negative people. • Increasing the possibility of community transmission • Inability to quantify the number of cases being infected from returnees.
Sudurpashchim Province	• Coordination at local level ineffective • Lack of leadership in PoE health desk operation • HD in operation are yet to be upgraded, Holding center not fully operational • Lack of Effective Case Investigation and contact tracing • Massive Mobilization of Rapid Response Team for suspected/outbreak was not seen	• Response not coordinated between partners, health authorities and the central level • Duplication of activities and effort • Issues in managing the returnees during the different wave of COVID 19 • CICT could not be done efficiently

Limited factors		
S.N.	**Province**	**Limited factors**
1	Koshi Province	• Insufficient plan for district level coordination • Irregular participating in coordination meeting. • Unguarded pores border.
2	Madhesh Province	• Lack of human resources for CICT activities. • Poor condition of health desk at POEs
3	Bagmati Province	• RRT teams are not much functional • Limited HR multi-tasking (Vaccine campaign, CICT, regular work, antigen test). • Poor incentives, lack of trainings, low motivation, lengthy forms.
4	Gandaki Province	• Limited health workers and having to conduct regular health activities by CICT team • Not updated RRT guideline • Lack of software and programs • Inadequate government land in the health desk/health promotion centers, lack of funds in local level to continue the operation
5	Lumbini Province	• Lack of incentives, lack of HR • Lack of manpower, crowd management at certain hours • Lack of human resources, lack of skilled staff
6	Karnali Province	• Inadequate Human resources dedicated for COVID management. • Lack of infrastructures at check points for proper management. • Lack inter/intra-district level coordination. • Complicated and time consuming CICT forms • Multiple destinations and limited number of vehicles.
7	Sudurpashchim Province	• Lack of a plan for district level coordination • Completion and operation of Health desk not yet started • Dedicated and Adequate Human resources (Functional CICT team)

5. Laboratories

Best Practices		
Province	**Best Practices/strength**	**Impacts**
Koshi Province	• Establishment of PCR testing lab in different region of Provinces. • Under construction of the Molecular lab and research center in the Koshi Province. • Free service for PCR testing	• Early diagnosis, isolation and treatment of the covid-19 patients. • Availability and accessibility of PCR testing.
Madhesh Province	• All district have established COVID-19 PCR labs provinding free testing facilities • Enhanced capacity of PPHL with facilities including gene sequencing. • Regular supply and procurement of PPHL and other government laboratories have been made easier through PHLMC • Free PCR in all 8 districts through government labs. • Massive upscaling in PCR and antigen testing capacity of the province.	• Free PCR and increase in testing capacity of the province • Use of antigen testing increased the total test conducted by significantly large amount
Bagmati Province	• Total 61 RT-PCR laboratories • (11 under PPHL) • Private: 38 • Public: 23	• The weekly no of exceeding the recommended minimum number of tests per week per total population.
Gandaki Province	• Development of PCR test protocols (before provision from Federal government) • IPC training to all District laboratory technicians • Procurement of own PCR machines and Reagents • Recruitment of laboratory technicians from District Hospitals during high burden cases • Supported neighbouring Province (Lumbini) for conducting PCR tests during first wave Additional PCR laboratories established	• Immediate operation • Safe working environment • Ability of Province to conduct timely and adequate tests • Laboratory functional for extra hours • Showcasing good coordination and support to other Provinces • Increase in capacity of District hospital to operate PCR laboratory
Lumbini Province	• Total 13 laboratories established • All laboratories are following basic laboratory biosafety practices including use of PPE and all clinical samples are processed in a biosafety cabinet. • Regular quality control check	• Increase in testing capacity of the province, timely diagnosis and interference in transmission • Equipment maintenance and calibration to ensure quality. • Standard check
Karnali Province	• Establishment and functionalization of PCR laboratories at 4 strategical location (Jumla, Dailekh, Rukum West and Surkhet) Adequate supply of logistics needed for COVID 19 testing (VTMs, RDTs, etc)	• Increased capacity in surveillance and screening of COVID 19 cases • Timely detection of COVID 19 case for prompt management.

	• Availability of RDTs (Ag) at Local government level. • Information management via IMU and vertical reporting to PHEOC	• Data organization and management for timely detection of possible outbreak scenarios in different geographical location
Sudurpashchim Province	• 8 functional PCR Molecular Lab in the province • PPHL taking leadership in sample shipping from PCR laboratories to NPHL for QA in a regular basis • Sample collection from Health desk (PoE) for Further testing and sequencing in regular. • All PCR laboratory recording and reporting completely under IMU Nepal • Increase in sample collection/testing for COVID 19 detection (popularity of Antigen Testing)	• 8 out of 9 districts of the province has in house RT PCT testing facility • Public confidence increased in sample testing due to Quality of testing, timely testing and reporting of testing • Participation of Province in timely detection of new variant at central level.

Enabling Factors	
Province	**Enabling factors**
Koshi Province	• Full utilization of limited resources • Task sharing. • Dedicated team and competent director.
Madhesh Province	• Willingness of provincial government to invest in Laboratory capacity building • Active leadership in PPHL and PHLMC ,PHD and MOSD other laboratory facilities
Bagmati Province	• Provincial Government more responsible. • Federal Government located in the same province. • Involvement of the Private sector.
Gandaki Province	• Deployment of expertise from the Province • PHEOC proactively leading the trainings in coordination with Provincial and District Hospitals and Health Offices • Proper planning and funding • Good coordination and willingness of Districts to support • Decision making capacity of Health Directorate • Proper planning and funding
Lumbini Province	• Joint coordination with private hospitals to establish PCR labs in the province • Ensuring bio-safety cabinet and all equipment • Proper identified channel and regular coordination
Karnali Province	• Budget allocation from local and provincial govt. • Recruitment of skilled and trained Human resources on a contractual basis for immediate functionalizing PCR labs. • Coordination between the laboratories and Health Service Directorate. • Conduction of virtual and on-site training for proper recording and reporting of cases.

Sudurpashchim Province	• Collaboration from Local level, Province level and Federal Level. • Regular support on Logistics from Local level , Province , Federal level and EDPs. HR support from EDPs as well • Good coordination role from PPHL (within the province) and NPHL • Regular follow up and technical support from PHEOC for full IMU Nepal app implementation.

Challenges and Impacts		
Province	**Challenges**	**Impacts**
Koshi Province	• Limited resource and manpower • Large number of sample collection and testing • Upgrading the PPHL for advance molecular lab.	• Constrict chemical agent for testing of the covid-19. • Delay diagnosis leading to community spread of diseases.
Madhesh Province	• Pending of test results at the beginning of the crisis. • Human resource and consumables inadequate to run the labs at full capacity during the early stages	• Low level of testing at the beginning leading to over lodgment of cases in quarantines
Bagmati Province	• Inadequate Human Resources. • Continuity of lab after COVID-19 remains a challenge.	• Low testing
Gandaki Province	• Timely dissemination of report during peak number of cases • Limited date of expiration of reagents • Finding vendors to transport samples to NPHL (during initial phases) therefore usage of hospitals/health office vehicle just for few sample transportation • Not all PCR laboratory are functional	• Delay in result relaying • Difficulty in estimated number for procurement • Unnecessary usage of resources for testing when sample volume is very low. • Can cause issue (delay in tests and results) in next potential outbreak
Lumbini Province	• Regular monitoring and supervision of labs • Maintenance and repair of equipment	• Poor documentation • Confusion regarding latest updates • Disruption in operations and service
Karnali Province	• Continued Functioning of PCR laboratories. • Continued supply of PCR Testing Kits/ Reagent. • Timely dissemination Test report. • Proper dissemination of Cold box for sample transfer.	• Irregular functioning laboratories causing problem for sample dissemination. • Delayed dissemination of reports. • Delay in definitive case management.
Sudurpashchim Province	• Increase in the volume of Health care waste related to COVID 19 • Lack of Proper disposal of Mask • Crowd in the health facilities with patient party. • Lack of regular logistic support and maintenance of hand hygiene station in the health facilities.	• Improper waste management • Pollution and nuisance in the workplace and health facilities • Risk of COVID 19 transmission in health facilities • Sub optimal functional status of Hand hygiene station.

	• Lack of technical body to monitor and supervise widely used PPEs. • Lack of proper screening of patient for COVID 19 while visiting the hospital. • (C 19 Suspected case with other illness directly visiting the ER)	• Influx of varying quality of PPEs and commodities.

Limiting Factors	
Province	**Limited factors**
Koshi Province	• Reliability and validity of the PCR testing • No molecular lab in the province
Madhesh Province	• Limited resources, HR, logistics, guidelines ,knowledge, research etc in the early stages.
Bagmati Province	• Budget not available for further continuation of HR. • Limited HR focusing on Vaccination campaigns.
Gandaki Province	• Dedicated HR for recording and reporting (staff recruited were only surge team) • Unpredictable pattern of the disease trend • Lack of mechanism of contract with transportation vendors. Budget and SoP for sample transportation • Lack of Repair and maintenance expertise
Lumbini Province	• Lack of manpower for regular monitoring • Lack of identified channel in case of repair and maintenance
Karnali Province	• Unavailability of Skilled and trained human resources needed for PCR labs. • National scarcity of PCR testing Kits. • Overloading for samples in relation to limited testing capacity.
Sudurpashchim Province	• Lack of existing resources for Health waste care management in the most health facilities. • Waste treatment facilities in health facilities. • Municipality lacking the proper waste disposal/treatment plant

6. Infection Prevention and Control

Best Practices and Impacts		
Province	**Best Practices/strength**	**Impacts**
Koshi Province	• **Leadership:-** HCW guideline and PHSM promotion and advocacy • IPC hospital modality • IPC and critical care training to HCW. • Dissemination of Hard/soft copies of IPC pocket book • Isolation, quarantine and testing centre opened up	• Capacity building • Implementation of IPC activities • Reduced infectivity rate in the hospital
Madhesh Province	• Hospital preparedness plan being developed by COVID dedicated hospitals. • HCWM facilities being established at major hospitals. • Multiple rounds of virtual and on-site trainings related to IPC.	• Standard IPC guidelines being followed • Decreased number of Infection among heath care workers
Bagmati Province	• National guidelines adapted on time for CICT, case management, IPC. • Incentives for infected health care workers. • Timely supply of PPE and other IPC commodities to hospitals and laboratories. • Nosocomial infection was reduced.	• Preparing time for separate provincial guideline was saved. • Incentives provided a morale boost to healthcare workers
Gandaki Province	• One round of Orientation on IPC provided to all District Hospital and 15 Private Hospitals in Kaski. Second round of refreshers training ongoing (6 Hospitals completed). • Hand washing centers placed in all District Hospitals with the support of partners	• Safe working environments and minimizing infection spread from Hospitals
Lumbini Province	• Increased number of handwashing centers established in many centers • Continuous advocacy of preventive measures in the hospitals/centers • Trainings at provincial and local level • Quarantine management with support from EDPs such as tent, washing station, toilet, drinking water	• Control of COVID transmission • Support in reduction of transmission • Capacity building of the health workers • Increased quality of management
Karnali Province	• Distribution and procurementof adequate numbers of PPEs and disinfecting reagents. • Separation of COVID specific wards allocating donning/ doffing areas. • Management of duty staffs working in COVID wards. • Virtual / physical training on COVID specific IPC / HCWM.	• Motivated staffs to work in COVID wards. • Limited transmission of COVID infection. • Decreased Cross-transmission of COVID infection between staffs. • Updated information regarding IPC/HCWM specific to COVID 19 infection ultimately limiting transmission.

	• Adaptation of PHSM measures. Distribution of IPC related signages hung in high traffic area in the hospitals. • Installation of hand wash units with availability of soap/sanitizers in multiple location. • Temperature screening at the hospital entry point/fever clinics initiated. • Segregation and disposal of COVID health care waste.	
Sudurpashchim Province	• COVID 19 dedicated Hospital was constructed (pre-fab structure) and bed capacity were increased in existing hospital. • Procurement of Ventilators and other equipment for critical care services (province and Federal government • Recruitment of more than 150 Health care worker by province government for C 19 response • Increase in oxygen supply chain management (Oxygen Concentrator, oxygen cylinder , liquid Oxygen storage tank and oxygen plant) • Distribution of ayurvedic medicines, Yoga campaign in Quarantine and Isolation centers. • Operation of Isolation site nearer to PoE for returnees. • Services for COVID 19 started from Private hospital.	• Increase in hospital bed capacity 10/10 bed in Distrcit Hospital, 60 in Tikapur Hospital, 100/100 in Provincial Hospital • Hospital capacity for critical care increased (increase in HDU bed, ICU bed, ventilators in hospital) • Increased sufficiency of Oxygen supply chain management in the province. • Increase in public trust and belief.

Enabling Factors	
Province	**Enabling factors**
Koshi Province	• Training • Coordination • Regular advocacy
Madhesh Province	• Availability of Protocols and IPC materials • Trainings
Bagmati Province	• Motivated healthcare workers. • Presence of the tertiary hospitals and Medical colleges in the Kathmandu Valley. • Virtual and onsite trainings on IPC. • IPC guidelines.
Gandaki Province	• PHEOC proactively leading the trainings in coordination with Provincial and District Hospitals and Health Offices

Lumbini Province	• Joint collaboration of all government and non-government actors • Visible posters/flex prints/flip chart at various sites in the hospitals • Distribution of IEC materials, guidelines • Monitoring of isolation centers/hospitals
Karnali Province	• Federal/ provincial and support from EDPs. • Active participation and dedication from health staffs. • Motivation and dedication of staffs to tackle COVID pandemic. • Development of guidelines and support from EDPs • Ownership from the hospital management committee to develop/ improve their own IPC measures/protocol
Sudurpashchim Province	• Different batches of Critical care training of HCWs (Medical Officers/ Nurses). • Collaboration and support from Different stakeholders

Challenges and Impacts		
Province	**Challenges**	**Impacts**
Koshi Province	• Insufficient trained and dedicated manpower • Inadequate logistics and manpower • High transmission rate of covid-19 • Lack of appropriate PPE • Not following the guidelines • Hospital waste management issues	• Improper HCWM • Risk of transmission • Workload burden • Mental burden and Psychological problem
Madhesh Province	• IPC and health care waste management activities poor in government district hospitals • Lack of proper air-conditioning making it difficult to use full body PPE in summer times. • Physical infrastructure was poor in provincial hospitals during early stages.	• Lack of proper provision for health care waste management
Bagmati Province	• Most of the healthcare workers were infected with COVID-19	• Difficulty in providing quality health care services to the COVID-19 cases. • Essential health care services were affected in majority of the hospitals. • Compromised quality of the care to the COVID –19 cases, especially critical cases.
Gandaki Province	• Frequent turnover of HR	• Multiple orientation and training required
Lumbini Province	• Lack of HR (Dual role of many) • Implementation of IPC guidelines	• Decrease in standard of IPC • Decline in quality of IPC maintained

Karnali Province	• Limited space in the hospital setting in the district and municipal level to maintain the standard requirements as per guidelines on IPC. • Treatment of Health care waste in all the facilities. • Adherence to IPC measures among health workers working in non-COVID wards	• Difficulty in maintaining PHSM in the hospital setting. • Increased risk of transmission. • Transmission of COVID Infection among health workers working in non-COVID wards.
Sudurpashchim Province	• Increase in the volume of Health care waste related to COVID 19 • Lack of Proper disposal of Mask • Crowd in the health facilities with patient party. • Lack of regular logistic support and maintenance of hand hygiene station in the health facilities. • Lack of technical body to monitor and supervise widely used PPEs. • Lack of proper screening of patient for COVID 19 while visiting the hospital. • (C 19 Suspected case with other illness directly visiting the ER)	• Improper waste management • Pollution and nuisance in the workplace and health facilities • Risk of COVID 19 transmission in health facilities • Sub optimal functional status of Hand hygiene station. • Influx of varying quality of PPEs and commodities.

Limiting Factors	
Province	**Limited factors**
Koshi Province	• Human resources • Logistics inequalities • Guidelines dissemination • Vaccination hesitancy
Madhesh Province	• Increased workload of staff. • Poor compliance to IPC measures in later stages of COVID-19
Bagmati Province	• Inadequate HR.(Doctors, Paramedics and nurse) • Poor construction of COVID wards resulting in poor ventilation and cleanliness. • Workload. • Lack of critical care training, critical care HR).
Gandaki Province	• Inadequate HR in the Province
Lumbini Province	• No dedicated budget • IPC committee not activated due to diversion of HR to case management
Karnali Province	• Gap in planning and policy making to address communicable/ infectious disease treatment wards at district level hospitals. • Unavailability of resources and logistics for treatment of Health care wastes. • Management of suspected COVID 19 cases in non-COVID wards before lab confirmed positive case.
Sudurpashchim Province	• Lack of existing resources for Health waste care management in the most health facilities. • Waste treatment facilities in health facilities. • Municipality lacking the proper waste disposal/treatment plant

7. Case Management

Best Practices		
Province	**Best Practices**	**Impacts**
Koshi Province	• **Leadership:** Integrated guideline planning under the ministries and secretary . • Free dedicated hospital for covid-19 • Recruitment of dedicated human resource for covid-19 • Arrangement of medical supplies and logistics • Oxygen plant construction and increase in oxygen supply • Support from private sector • Resources pooling and reallocations of the Nursing staff and medical officer from district hospitals . • Quarantine center for health worker . • Hazard allowances and Social security	• Increase in number of general and ICU beds with ventilators • Increase in oxygen supply chain • Case load handled to certain level. • Health care equality and equity
Madhesh Province	• Significant upscaling of Hospital capacity at provincial level. • Dedicated COVID-19 hospital established at mujeliya • Case management done as per national and international guidelines	• Standardized treatment delivered • Increase in number of ICU beds and ventilators
Bagmati Province	• 599 Beds were added for COVID-19 case management in the provincial hospitals. • 534 additional human resources were recruited from the Provincial Government. • COVID-19 hospitals/wards were established. • More than 120 private hospitals/ medical colleges involved in case management. • Critical care and IPC training (on-site and virtual) was provided. • COVID-19 command hospital established in Bir.	• The infrastructures, PCR laboratories, beds, equipment, oxygen plants and O2 concentrators added contributed to the upgrade of the health care facilities post COVID-19. • The trainings capacitated healthcare workers
Gandaki Province	• Increase in hospital bed capacity and services • Increase in oxygen supply chain management (Oxygen plant, oxygen cylinder, liquid Oxygen storage tank • Development of case management protocol and training to all District Hospitals • Risk allowances from Province itself to frontline health workers	• Sufficient Adequate bed for patients • No shortage of oxygen in the Province • Supported Health Workers in managing of cases • Motivation of Health Workers

Lumbini Province	• Set up of 4 COVID dedicated hospital further managing HR, logistics and consumables • 583 temporary HR was allocated for the FY 76/77 and filled • Provided ECCT training to more than 300 Health Personals • HDU establishment in 7 hospitals • Oxygen plant maintenance at 2 sites • MoU with 2 private hospitals for COVID management • Referral system developed	• Separate service for COVID and non-COVID cases reducing the likelihood of transmission • Specialist, Medical doctors, Nursing staffs, Paramedics, supporting staffs recruited in 4 covid dedicated • Capacity building of health workers delivering COVID services • Better management of COVID cases • Increase oxygen delivering capacity • Increase delivery of COVID services in the province during case surge • Awareness of bed capacity and availability
Karnali Province	• Separation of COVID-19 and Non-COVID-19 wards/ICU/HDU/PICU in the hospitals. • Construction of Isolation center in each municipality and establishment of HDU/ ICU at hospitals at the district level. • Deployment of Medical officers at Strategical location (in all 10 districts) for quarantine and isolation management. • Recruitment of HR dedicated for COVID-19 Management. • Conduction of COVID specific (IPC/ management/Critical Care) Trainings. • District-municipality oxygen cylinder exchange/support	• Operating protocols developed to have dedicated COVID-19 service delivery HCWs. • B. Management of COVID 19 cases at municipality and District level facilities. • Easy accessibility of COVID 19 services • Decreased COVID 19 referral and burden at hub hospitals. • Ensured continued functioning of the isolation centers, if/when HWCs also had to be isolated • Capacity building of HCWs in treating COVID-19 cases • Time duration required for immediate oxygen cylinder replenishment reduced, leading to timely service delivery at local level isolation centers.
Sudurpashchim Province	• COVID 19 dedicated Hospital was constructed (pre-fab structure) and bed capacity were increased in existing hospital. • Procurement of Ventilators and other equipment for critical care services (province and Federal government • Recruitment of more than 150 Health care worker by province government for C 19 response • Increase in oxygen supply chain management (Oxygen Concentrator, oxygen cylinder , liquid Oxygen storage tank and oxygen plant) • Distribution of ayurvedic medicines, Yoga campaign in Quarantine and Isolation centers. • Operation of Isolation site nearer to PoE for returnees. • Services for COVID 19 started from Private hospital.	• Increase in hospital bed capacity 10/10 bed in Distrcit Hospital, 60 in Tikapur Hospital, 100/100 in Provincial Hospital • Hospital capacity for critical care increased (increase in HDU bed, ICU bed, ventilators in hospital) • Increased sufficiency of Oxygen supply chain management in the province. • Increase in public trust and belief.

Enabling Factors	
Province	**Enabling factors**
Koshi Province	• Coordination • Leadership of government institution and partner. • Enthusiastic health worker • Financial allotment by the province government.
Madhesh Province	• Budget channelled for health facility capacity building • Good leadership
Bagmati Province	• Support from the various agencies, local/International public and private partners, civil societies, business groups/houses.
Gandaki Province	• Adequate fund allocated for the upgrade • Proper coordination and communication, adequate funds • Utilization of available expertise from Hospitals (Federal/Provincial) • Allocation of adequate funds
Lumbini Province	• Pre-existing non-functional infrastructure used as COVID dedicated hospital and budget allocation • The development of contingency plan based on which this was developed • Regular coordination and support from EDPs for successful conduction • Budget allocation for COVID, • Active monitoring and discussions of gaps during ICS meetings • Meeting with APHIN, NMA, NAN • Coordination and joint support of hospitals, government and EDPs
Karnali Province	• Support from Federal Government, Provincial Government and EDPs. • Dedication of Local Government in response of COVID 19. • Allocation of medical equipments, devices and hospital logistics to cater to COVID-19 cases in all the district. • Procurement/donations received of hospital commodities such as Hospital beds, ventilators, oxygen concentrators etc. • Planned government training activity for HR capacity building, additionally financial/ technical support from EDPs active in Karnali province. • Coordination from District Health Services with the municipalities.
Sudurpashchim Province	• Different batches of Critical care training of HCWs (Medical Officers/ Nurses). • Collaboration and support from Different stakeholders

Challenges and Impacts		
Province	**Challenges**	**Impacts**
Koshi Province	• Hospital incapacity during massive covid-19 surge. • Inadequate human resources and medical supplies at different district hospital • Oxygen crisis during second wave . • Untrained human resources	• Case overload in hospital (Inpatient care) • Increase morbidity and mortality especially during second wave.
Madhesh Province	• Limited Human resource. • Massive case surge especially during second wave	• Increased mortality • Overwhelming of hospital services during second wave and oxygen related crisis
Bagmati Province	• Difficulty in managing separate HR for COVID-19 wards. • Timely training on case management/IPC/ critical care remains a challenge	• Low quality of care to the COVID-19 cases.
Gandaki Province	• Under staffing of Skilled and specialized Human Resources	• Exhaustive hours for health workers
Lumbini Province	• Oxygen demand vs supply was a major challenge • Lack of human resources • Maintenance of infrastructure /equipment in the hospitals • Referral of cases in the province • Health care waste management (HCWM)	• Difficulty in managing cases during the peak of second wave • Ensuring continuity of services specially if there is another surge of cases • Disruption in providing services • Might lead to increased morbidity or mortality due to delay in receiving services • Increased chance of spread of disease due to mismanagement
Karnali Province	• Continuation of Quarantine centers at Municipality level. • Locating and identifying spaces (buildings) for providing COVID 19 health services. • COVID 19 Testing / Quarantine management /Isolation management of returning migrant workers. • Counselling of COVID-19 cases at the grassroot level. • Unavailability of specific medications to treat COVID-19. • Conduction of Physical Training session. • Continued supply of adequate Oxygen.	• Quarantine centers de-operationalized after the first wave of COVID-19 in most districts. • Increase risk of transmission amongst the family and community members from returning migrant workers. • Delayed initiation of COVID-19 specific services (Isolation/treatment) • Incomplete case investigation and contact tracing as well as follow up. • Stable COVID-19 cases opting to get treatment at higher facilities resulting in high case flow in hub hospitals. • Increase in number of referred cases to higher centers. • Quality and Timely Patient care
Sudurpashchim Province	• Inadequate skilled and specialized HCWs. • Unable to distribute the committed hazard allowances to HCWs. • Timely release of fund to Isolation centers and Hospital (for Managing C 19 cases)	• Impacts in proper service delivery. • Demotivation to Health facilities managing the COVID 19 cases • Effect in Provincial C 19 case management • Impact on timely treatment of referred cases.

	• Critical care services could not be resumed in many hospitals despite physical infrastructure were set. • Inadequate HR support (specialized HR) from federal government when province needed most • Proper referral mechanism was an issue for Severe and Critical case of C 19	

Limiting Factors	
Province	**Limited factors**
Koshi Province	• Human resources. • Funds. • Hospital resources and management.
Madhesh Province	• Inadequate resources including physical resources and human resources.
Bagmati Province	• Inadequate HR • Lack of preparedness on case management
Gandaki Province	• Inadequate HR
Lumbini Province	• Non-functional plants, large catchment area (including Karnali and partially Sudurpashchim), and stoking of cylinders at home • Lack of consultant doctors, turnover of the temporary appointed personnel • Lack of clarity of the responsible body/process for repair or maintenance. • Weak referral system, hub-satellite network not functional systematically • HCWM least prioritized area to prevent transmission
Karnali Province	• Utilization of School buildings for quarantine centers could only be done temporarily. • Lack of Proper/ buildings dedicated for quarantine center. • Lack of mechanism to gather information about returning migrant workers from ground crossing / secondary entry point. • Low level of educational and awareness • Increased rumors and falsified information through social media. • Scarcity of medicine supply at national and international level. • Nation-wide Lockdown measures. • Nation-wide oxygen scarcity during the peak of COVID-19 cases. • Unavailability of Oxygen plants in the province, leading to total dependence in oxygen refilling on oxygen plant in Nepalgunj, Lumbini province.
Sudurpashchim Province	• Sanctioned manpower in health facilities was based on old recommendation, (revision of sanctioned HR is needed) • Lack of proper reporting, clearer instructions and communications • Financial burden for air lifting, • Recipient Medical Hospital not well prepared for proper case management. (Burden of C 19 cases in major hospital throughout the nation)

8. Operational Support and Logistics

Province	Best Practices/Strengths	Impacts
Koshi Province	• Essential medical supplies procured at different level • Strengthen oxygen plant capacity • Availability of antigen Kits • Support from partner organization for various medical equipment. • Ware house planning	• Proper management of covid cases
Madhesh Province	• PPEs, test kits, and other essential supplies being done smoothly by PHLMC • Support from partners in logistics • Significant improve in Oxygen capacity in the province with establishment of PSA and bulk oxygen plants in major hospitals	• Proper use of PPEs , tests kits and other supplies being done
Bagmati Province	• Oxygen plants have been established in all the District Hospitals except in Rasuwa. • Adequate procurement and supply of test kits, reagents, antigen test kits, PPE and other IPC commodities by the PHLMC, central store and support from the partners' agencies.	• Adequate supply of commodities and Oxygen was maintained except during the peak of the Delta wave.
Gandaki Province	• Establishment of ICU and provision of Ventilators in all District Hospitals • Establishment of oxygen plant in District Hospitals, coordination with NEA for continuous supply of electricity, procurement and combined pooling of oxygen tanks by HD, PPHL, PHTC and PHLMC. • First Provincial Infectious and Communicable Disease Hospital established (even before circular released from Federal Gov). • Ensuring each District health office and Hospitals have functional vehicles. Provision to those lacking vehicles. • Partition in all ambulances	• Critical care service to general population at their own Districts • Adequate Oxygen • Catering isolation services to large scale population • Timely transportation of samples, HR and sometimes even patients • Safe environment for drivers and other non-infected travellers
Lumbini Province	• Regular 3W & 4W mapping of resources and equipment • Local production of PPE during the first wave	• Sharing of information and proper allocation of resources accordingly • Demand vs supply was met
Karnali Province	• A. Procurement/ provision of PPEs, RDTs, VTMs and necessary commodities. Procurement at local level made as deemed necessary. • B. Transportation facility of samples to PCR labs. • C. Availability of Oxygen cylinder and concentrator at local level. • D. Installation of Oxygen Plants at district levels.	• A. Increase in screening, surveillance and service delivery • A1. Improved readiness of the HCWs to treat COVID-19 cases. • A2. Limiting HCWs to be directly exposed to COVID-19 at high risk area such as hospitals. • B. Timely collection and dispatch of samples for COVID-19 testing.

		• C. Decreased dependence on the district hospitals to care for mild/moderate cases. • D. Enabled the district to sustain the oxygen requirement of the districts.
Sudurpashchim Province	• Supply Chain Working Group Formation & Regular Meeting being organized • Pool system is applied in Supply system • ELMIS is started from central to Palika levels. • PHLMC in coordination with MoSD, EDPs and Provincial Hospital along with stakeholder played a critical role in Oxygen supply chain management during the second wave of C 19. • COVID 19 vaccine warehouse has been constructed in the Province • Proper management and coordination from the PHLMC in maintain the regular supply of COVID 19 commodity (PPEs, Sanitizer, dead body bags) and Laboratories commodities (test kits, reagents , extraction kits etc.)	• All Facilities supplied commodities Timely & Stock status is updated so Stock Out Timely Detection . • It helped in further action. • Provincial vaccine storage capacity increased. • Proper support in the operation of C 19 response.

Province	Enabling factors
Koshi Province	• Coordination • Transportation. • Support from local Partners and NGOs.
Madhesh Province	• Timely procurement and stocking • Leadership • Advocacy
Bagmati Province	• Support from the external partners and satisfactory supply chain management.
Gandaki Province	• Timely allocation of funds • Timely allocation of funds • Proper pre-planning • Timely allocation of funds • Good coordination with Districts and Ambulance committees
Lumbini Province	• Regular coordination meetings among the stakeholders • Budget allocated by the provincial government
Karnali Province	• Allocation of budget from MoSD for the local level • Assistance from External development partners for procurement and management of necessary items. • Ownership from the local level authorities. • Allocation of budget to build oxygen plants by the MoSD. • Establishment of Provincial Health Logistic management Center at Surkhet (currently at Nepalgunj). • Effective coordination between the government offices to assist in transport.
Sudurpashchim Province	• Regular Support on logistic from local level, federal level, province level & EDPs. • HR Support /logistic support from EDPs as well • Good co-ordination role from PHLMC within the province & Management Division. • Federal support • Good coordination and support from different stakeholders.

Province	Challenges	Impacts
Koshi Province	• Oxygen scarcity during peak surge • Unavailability of essential medicines • Communication gap • Trained human resources • Storage of equipment and supplies • Limited budget allocation. • Unpredictable demand.	• Improper delivery of PPE, Oxygen and test kits. • Difficult follow the Public procurement act and regulation
Madhesh Province	• Some of the oxygen plants facing technical issue	• Possible Lack of oxygen if encountered another surge similar to the magnitude due to technical issues
Bagmati Province	• Shortage of PPE, test kits during the initial outbreaks and peak of Delta wave. • Oxygen shortage during the Second wave.	• Compromised IPC and case management. • Inadequate testing during the first wave and peak of the second wave.
Gandaki Province	• Coordination with all 3 levels with supply chain management • Lack of warehouses in strategical locations in District level • Provision of contingency plan	• Duplication in procurement • Timely resource mobilization of commodities and equipment and medicines in necessary locations • Preparedness and response can be fast
Lumbini Province	• Maintaining one door policy • Transportation of oxygen from one district to another	• Duplication of support of lack of support to the needy • Lack of oxygen supply
Karnali Province	• Timely procurement and Distribution of Logistics to local level. • Timely Refilling of Oxygen Cylinders. • Utilization of oxygen concentrators • Continued operationalization of Oxygen Plant • Utilization of ICU equipment like HFNC, Ventilators available at district level.	• Increase in case complication • Patient referral to higher centers. • Delay in Health Care Service delivery • Increased Financial Burden to a community and institution.
Sudurpashchim Province	• Co-ordination at local level is so difficult. • Lack of adequate budget & HR in PHLMC. • Lack of Well-equipped warehouse in province & local level. • Reformation of Organizational Structure with changing role and scope of PHLMC • Provision of fund during the time of contingency.	• Missing forecast meeting supervision & Monitoring so duplication purchasing commodities. • Less effective service delivery. • Timely Mobilization of budget during the time of contingency

Province	Limited factors
Koshi Province	• Disproportionate demand and supply of logistic management • Rapid surge of cases.
Madhesh Province	• Biomedical engineers/ staff are limited in number for timely recruitment
Bagmati Province	• Limited time for the preparation. • Confusion created due to unknown nature of the virus.
Gandaki Province	• Independent Government structure • Lack of funds and ownership of local level where the warehouse is placed • Activities were response oriented. Could focus more on preparedness too.
Lumbini Province	• Direct distribution from the central ministry without cc to the provincial ministry • No rationale distribution
Karnali Province	• Increase demand (Nation-wide / international level) of COVID 19 specific commodities. • Dependence on Nepalgunj for oxygen refilling leading to increase time consumption. • Unstable electricity supply/low voltage supply. • High operational cost to run via generators. • Trained and skilled HRs especially for critical care.
Sudurpashchim Province	• Lack of Plan-for commodities purchase forecast. • No clear linkages /legal provisions for vertical and horizontal coordination. • Lack to internalize the importance of logistic section in health services esp. in Province and Local level

9. Managing Essential Services

Province	Best Practices/Strength	Impacts
Koshi Province	• Continue of ongoing services in regard to vaccination, MCH and programs • Running regular OPDs with some exception	• Continuity of care to focused population
Madhesh Province	• Essential health services continued by rotation of staff at various hospitals of the province with some exceptions	• EHS were not affected in majority of hospital except at few by making alternative arrangements
Bagmati Province	• Essential health care services, MCH and regular vaccination was continued between the lockdown and after the establishment of COVID-19 hospitals.	• Continuation of essential health care services.
Gandaki Province	• Allocation of dedicated hospitals for vulnerable group (pregnant women, old people etc.)	• Continuation of essential services

Lumbini Province	• Separate COVID hospitals were set up ensuring the continuity of essential services • Allocation of budget to 12 local level in each district for hearse van • Established GPS system in the Ambulances and Ambulance app	• Regular health services were provided to the public despite the pandemic • Separate vehicles were used for the transportation of deceased bodies limiting the chance of transmission • Public could contact/track ambulances nearby to receive early service
Karnali Province	• A. Continuation of Emergency/ OPD/IPD/ CEONC services in the district hospitals. • B. Continuation of Active Case Surveillance / Active Case Detection of other communicable diseases like Malaria/ Kala-Azar during COVID 19 pandemic. • C. Operationalization of Private Hospitals through government channel to provide essential health care services during peak COVID 19 Waves. (e.g. in Rukum West Through support of Musikot Municipality)	• **A.** Continued essential health care services. • **B.** Continued Surveillance, detection and treatment of other communicable diseases limiting its potential Outbreak.
Sudurpashchim Province	• Continuation of regular program • Safe abortion service sites mapping done • Health services were provided as COVID and non COVID 19 health services • Training to HCW on Psychosocial Counselling	• Services delivery continued from health facilities • Prevention of possible outbreak due to routine immunization

Province	Enabling factors
Koshi Province	• Leadership • Coordination • Dedicated staff
Madhesh Province	• Leadership of hospitals and public health officials • Dedicated work staff
Bagmati Province	• Strong political and professional commitment.
Gandaki Province	• Supportive Hub and satellite Hospitals
Lumbini Province	• Regular ICS meetings that discussed the gaps/challenges and way forward to maintaining continuity of the services
Karnali Province	• **A.** Implementation of PHSM in the hospital waiting area after the nation-wide lockdown was lifted. • **B.** Continuous Monitoring and supervision mechanisms like EWARS and support from
Sudurpashchim Province	• Dedicated HCWs and support from EDPS

Province	Challenges	Impacts
Koshi Province	• Discontinuity in routine immunization services and MCH-delivery • Majority of resources targeted for covid management with limited resources left for existing NCDs and Mental Health • Difficult accessibility to health center for NCD • Infection amongst HCW	• Discontinuity of care • Neglecting NCD care
Madhesh Province	• Threat of loss of progress made against TB, NCD and other diseases of concern	• Increased burden in other areas • Disruption of regular health services including immunization among others.
Bagmati Province	• Continuation of the Essential health care and vaccination services effectively remains a major challenge.	• Low Service delivery and uptake. • Services Indicators are declining or becoming stagnant
Gandaki Province	• Disruption of regular health services during increasing cases	• Disruption of regular/essential health service to general public
Lumbini Province	• Running of routine vaccination was a challenge during the first wave • Health care workers being infected during each wave • Proper utilization of the ambulance app	• Children were refrained from getting vaccinated • Disruption in the health services provided to the public • Despite the implementation, the usage of the service was not found to be optimum
Karnali Province	• **A.** Providing regular services for Maternal and Child Health • **B.** Limited number of HCWs for service delivery	• **A.** Decreased number of ANC/PNC visits. • Increase in Disease morbidity. • Difficulty providing Quality and timely services.
Sudurpashchim Province	• HCW being infected during the services delivery • Service delivery and logistics were affected. • Patient reaching the health facilities during the lockdown. • Underutilization of Health services during pandemic (Family planning devices) • Limitation of specialized and proper care availabilities in COVID ward • Proper and efficient delivery of Psychosocial counselling	• Under staffing at health facilities • Increase in financial burden due to market shutdown • Issues of Mobility/Transportation of HCWs for service delivery. • Haemodialysis to C 19 cases, Caesarean/ normal delivery needed for pregnant ladies with C 19, operative services to C 19 cases • People were worried due to COVID 19 (fear and anxiety)

Province	Limited factors
Koshi Province	• Lockdown • Limited transportation facilities • Infection transmission among HCW. • Less staff turnover due to infection, death and reallocation
Madhesh Province	• Limited number of HR being used in COVID-19 control and management • Limited facility for transportation during the lockdown.
Bagmati Province	• Restricted mobilization, inadequate HR and increased infection among the HCWs.
Gandaki Province	• Rapid increase of case burden
Lumbini Province	• Maintaining public health social measures during the vaccination program • Lack of adequate human resources and 14 days isolation period. • Lack of awareness of the service among the general public
Karnali Province	• Mobilization of existing human resources for responding to COVID-19 pandemic and regular hospital services. • A1. Unavailability of transportation during the lockdown period. • A2. Limited number of ambulance services in hard to reach areas • C. Unfulfilled sanctioned HCWs position in the province.
Sudurpashchim Province	• Lockdown • Lack of transportation means, • Issues of market availability for procurement • Lack of expertise pool for COVID ward

10. COVID-19 Vaccination

Province	Best Practices/Strength	Impacts
Koshi Province	• Increased vaccination site and coverage. • Inter-sectoral coordination • Better promotion, awareness and advocacy • Maintained supply chain	• Majority had access to vaccination • Higher vaccination coverage • Gradual reduction in the hospitalization rate and complications.
Madhesh Province	• Use of mobile vaccination vehicles for vaccination campaigns • Risk communication about COVID-19 vaccination being done, use of community leaders to encourage vaccination • Regular meeting with vaccination coordinators of all districts • Training and sensitization for adequate reporting to officials • Collaboration with partners	• Gradually increasing vaccination coverage • Increasing awareness about the need for COVID-19 vaccination • Reporting status improving

Bagmati Province	• Wide-spread coverage of Vaccination in 13 districts • Community awareness programmes were initiated • Awareness programme focused to the low coverage local units. • Community level/door to door vaccine campaign was initiated in the low coverage local units.	• 99% full dose vaccine coverage among the 18 years and above • 57.7% children between 12-17 years are fully vaccinated. • Relatively low hospitalizations and severity in the third-wave of the pandemic credit given to the vaccine campaign.
Gandaki Province	• Heli transportation of vaccines in hard-to-reach areas • Highest in target achievement in vaccinating	• Availability of vaccines in all areas of the Province • Majority of targeted population vaccinated
Lumbini Province	• Trainings at both provincial and local level • Preparation of vaccine situation report and dissemination • Management of post vaccination AEFI	• Capacity building of health personnel • Awareness among all the stakeholders on the situation and identification of the drawbacks/way forward • Decline in major AEFI
Karnali Province	• Quick and safe roll out of vaccines to district and local government level. • Maintenance of cold chain of vaccine throughout the transfer and vaccination. • Frequent training and guidance from Province level • Several webinars for COVID-19 vaccination conducted with high participation, including with community radio journalists, medical professionals, journalists, and medical doctors • Regular monitoring and supervision from Provincial level • Timely address and respond AEFI cases.	• Increase participation on COVID 19 vaccination during early phase. • High acceptance of COVID-19 vaccines like for routine vaccines • Minimal number of reported AEFI cases. • Equitable vaccination distribution. • Improved documentation and reporting.
Sudurpashchim Province	• Regular C 19 vaccination sessions at health facilities and additional sites. (Regular in ground crossing) • Regular Mobile vaccination team mobilization campaign in crowded population (DAO, bus parks, health offices, festivals, Custom offices) • FCHVs mobilization in C 19 vaccination campaign • Home visit and line listing at local level to find out the unvaccinated population. • Mobilization of Provincial fund for COVID 19 vaccination transportation. • Prioritization of front liners and population at risk for C -19 vaccination (When C-19 vaccine stock was limited) • Inter District Vaccine redistribution • Provincial planning and initiation for full COVID 19 vaccine coverage area declaration. • Vaccination of eligible population including booster doses (foreign national included)	• Integration of C 19 vaccination with routine immunization. • Assessment of available population for vaccination • Equitable distribution of vaccine was ensured during the limited vaccine logistics • Decrease in vaccine wastage • Vulnerable people provided with Covid vaccination

Province	Enabling factors
Koshi Province	• Leadership • Easy vaccine availability and accessibility. • Dedicated HCW • Support from EDPs and NGOS organization
Madhesh Province	• Availability of Vaccines • Dedicated health care workers for vaccination • Collaboration with development partners • Vaccination campaigns
Bagmati Province	• Increasing awareness among the public regarding the importance of COVID-19 vaccination. • Continuous nation-wide vaccination campaigns, media coverages and the involvement of public figures in promoting these campaigns.
Gandaki Province	• Supporting partners • Proper coordination, communication, logistical management
Lumbini Province	• To be provided by the central level • Pre-existing channel for daily situation report preparation • Continuous surveillance & monitoring of the sites
Karnali Province	• High level financial and political commitment at all levels • Establishment of Provincial Cold room and strengthening of district level and local level cold rooms. • Policy decisions, regulatory preparedness on time • Formation of technical committee to identify gaps and improve vaccination target. • Support from EDPs.
Sudurpashchim Province	• Dedicated HCWs and FCHVs for C- 19 vaccination and well-practiced micro planning. • HCWs with long experience on vaccination with routine immunization program. • Better C-19 vaccine logistic management and dedicated mobile vaccine team. • Regular Consultative meeting with district with support from EDPs • Province and local level following through the federal guidelines creating uniformity in C 19 vaccination • Province in drafting the SoP/guidelines for full C 19 coverage area.

Province	Challenges	Impacts
Koshi Province	• No uniformity in data collection and reporting. • Discrepancy in type of vaccine. • Difficulty in maintaining cold chain at local level	• Supply and demand disproportion. • Vaccine wastage • Inaccurate data recording
Madhesh Province	• Lack of reporting and recording after vaccination • Logistic challenges such as syringes and vaccine supply	• Decreased vaccination coverage
Bagmati Province	• Circulating Myths on COVID -19 vaccine among certain population • Unavailability of vaccine during the early phase.	• Hesitancy for vaccine uptake during the early phases.

Gandaki Province	• Inability to track third doses (people getting vaccinated saying first dose)	• Inaccurate data
Lumbini Province	• Dealing with vaccine hesitancy in the early phase • Adequate number of health workers providing the service • Timely reporting & recording of data	• Decline in number of vaccinated group • Disruption in providing services • Lack of real time data
Karnali Province	• Vaccinating of all groups/sub-groups in Karnali. • Some vaccines have very large cold chain space requirement – this requires multiple phasing and implementation challenge. • Timely reporting in HMIS is a challenge • Different types of vaccines being used (as per availability) pose challenges in training.	• Delays in achieving target vaccination coverage.
Sudurpashchim Province	• Target population set by the MOHP not tally with the available population. • Mobile population (many people travelling to India and big cities for opportunities • Recording and reporting issues (internet issues d/t geographic remoteness, under staffing • Management of HC wastage generated from the Vaccination sites • COVID 19 vaccine storage capacity at local level. • Geographic remoteness for vaccine logistic and supply chain.	• Decrease in available population for vaccination • Low vaccination coverage due to under reporting in initial days • Hazard due to Health care wastages • Limited sub center and storage capacity • Increase in financial cost in vaccine transportations

Province	Limited factors
Koshi Province	• Difficulty with cold chain maintenance. • Transportation • Insufficiency of equipment, technical connectivity in regard to data management.
Madhesh Province	• Lack of dedicated structure for regular COVID-19 vaccination • Availability of syringes in early stages • Disruption of regular supply from central level.
Bagmati Province	• Unauthentic news portals covering false information regarding the effectiveness and questioning safety of the vaccines. • Pre-existing mindset on vaccine business. • Fear of dying with AEFI. • Fear of being infertile due to vaccine. • Geographical constraints.
Gandaki Province	• Manual recording of vaccinated population

Lumbini Province	• Public awareness about the safety and efficacy of vaccination • Dual responsibilities of health workers and infection from COVID • Limited number of HR
Karnali Province	• Enumeration of some target groups/sub-groups due to lack of living database becomes a challenge. • Limited availability of vaccines and less predictability • Geographical/seasonal challenges – vaccination continued even in rainy seasons, many areas have landslides, some areas have flooding. • Remote areas may not have internet connection, some municipalities may have HR challenges
Sudurpashchim Province	• Lack of adequate and dedicated person for recording and reporting • ICT equipment and internet connectivity due to geographic remoteness • Lack of existing waste management plan. • Vaccine needed to be carried by human in geographic remote places

Key Points to Highlight

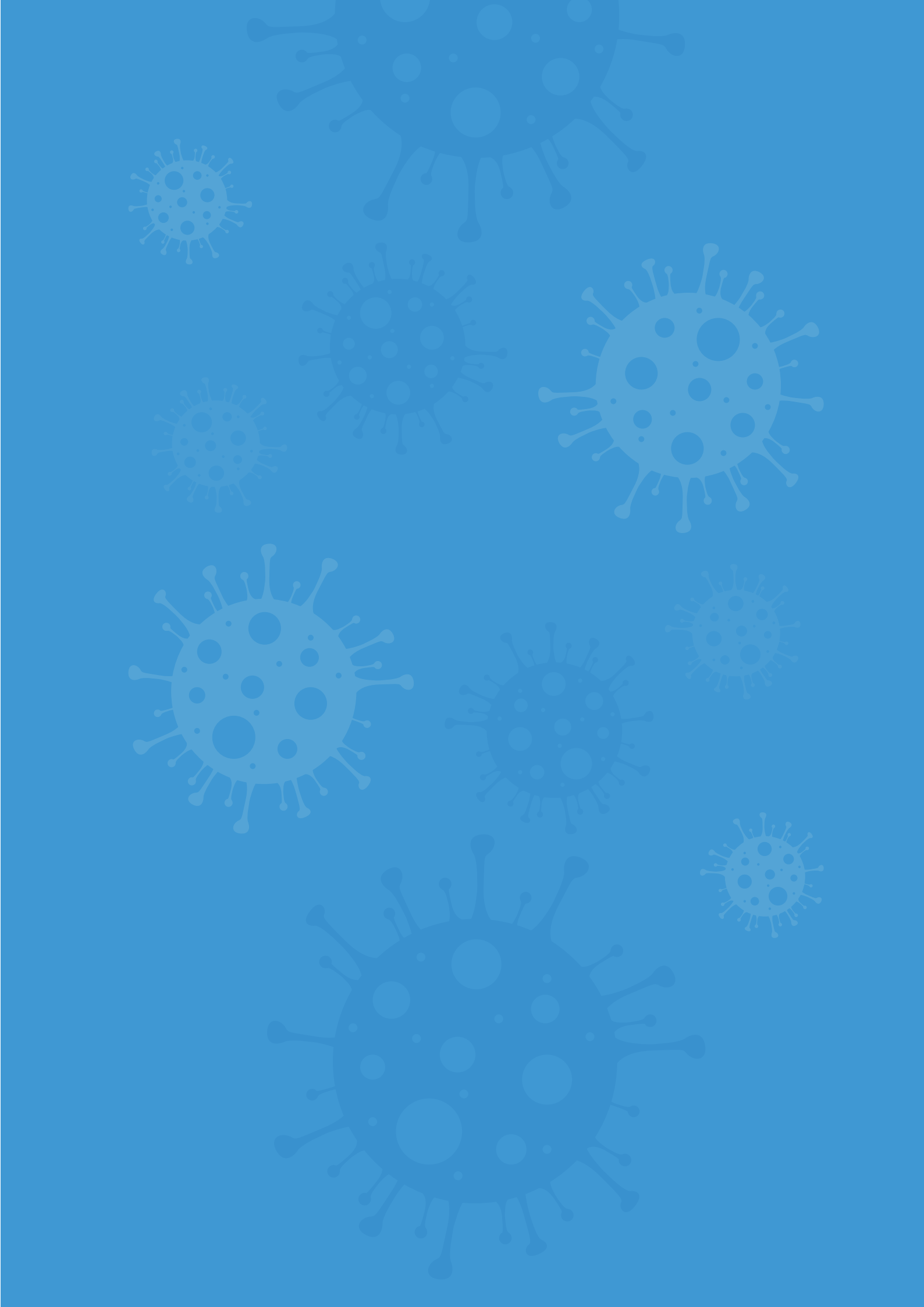
Province	Key Points
Koshi Province	• Primary prevention is equally important as secondary and tertiary • Coordination among different stakeholders and inter/intra sectoral coordination is very crucial for fighting pandemic • Appropriate data keeping, recording and analysis very important for planning any disease condition • Capacity building and preparation of experts in adequate amount is really helpful • Strengthening laboratory capacity helps early detection, management and prevention of pandemic • Appropriate documentation and communication helps in timely dissemination of information and helps in policy and planning too • Logistics in form of medicines, equipment, oxygen etc. play vital role in pandemic.
Madhesh Province	• Co-ordination in-between levels of governance is vital for proper management of any crisis • Adequate budget was released to mitigate COVID-19 crisis from the province level • COVID-19 had challenged our existing health services and facilities the response to which has been upscaling and capacity building of the system • Madhesh province is sensitive to cross border spread of diseases due to open border with neighboring country • Establishment of several more Well-equipped health desk at POEs is necessary • Increased advocacy for PHSM is required with regulations and implementation. • Vaccination coverage of the province is on the course of improvement with increase in reporting after trainings and sensitization, multi-sectoral approach is vital to improve the vaccination coverage to expected levels • Hospitals and other health facilities have improved their services including Oxygen production and stocking of essential kits / reagents • Efforts has been made from policy making level at the province to help facilitate COVID-19 prevention, management and response • Human resource crisis was averted by proper hiring and timely payment of risk allowance
Bagmati Province	• 11 PCR Laboratories established under the PPHL.(Total laboratories established 62; Public and Private) • Mobilization of School Health Nurses in the COVID-19 response activities. • Installation of Oxygen plants in 12 District Hospitals. • 534 additional (Temporary) health care workers were recruited. • Dissemination of the important information on COVID –19 through regular radio airing, Social media channels, Website, emails and Viber groups. • Formation and mobilization of CICT teams in the Palika level & RRT team at provincial and district level. • Onsite and virtual trainings on Critical care, IPC,HCWM, diagnosis and Case management.
Gandaki Province	• There should be an integrated disease surveillance and recording system • Emergency funds should be easy to use • Three tier coordination needs to be strengthened • DHEOC could be equally important during large scale health events therefore should be established • Develop health emergency contingency Plan in local levels • Emergency Preparedness and Response Drills should be frequent • Partners to have emergency funds/resources allocated (besides their regular activities)

Lumbini Province	• COVID-19 fund allocated • 4 Separate COVID dedicated hospitals • Capacity building of HR (ECCT, IPC, CICT, Antigen, IMU) • Provincial guidelines developed • Multi-sectoral collaboration from the beginning • More focus on treatment than preventive (even from LLG) • CICT & Incentive of the frontliners major issues observed • Good acceptance of vaccines • Antigen acceptance • Management of holding centers is a challenge • Overall, the major challenges observed were CICT and incentive of the frontliners in the province • Delay in delivery of certain vaccines • Budget allocation for COVID related emergencies • Development of provincial guidelines • Need of capacity building of the existing HR • Multisectoral collaboration and coordination is a challenge • Acceptance of antigen during the initial period was a challenge • Establishment of dedicated hospital was a good practice to ensure continuity of essential services • Management of holding centers at PoEs are a challenge • Preventive aspect of disease should be prioritized by all level of government
Karnali Province	• Formation of Karnali Province COVID Control/Management Directorate committee under Chief Minister of Karnali Province. • Regular dissemination of updated guidelines and directives from provincial level to district and municipal level. • Awareness Campaign via mass media campaign (TV, Radio, News Paper) • Mask Khai Campaign at municipal level • Antigen testing to the general public made easily accessible. • Free tests (PCR/Antigen) provided to those being referred. • Verification of high number of caseload reported in an isolated geographical location.
Sudurpashchim Province	• Collaboration among the Government counterparts and EDPs for COVID 19 response despite the existing limitations and challenges • Regular support from Federal government, province government and local government in a unified COVID 19 responses. Increase in capacities of Health system in terms Physical infrastructures, trainings, equipment, services delivery • Health Desk at PoE have been promoted and in process of further improvement. • Increase in coordination among the three tiers of Government due to COVID 19 pandemic.

Way Forward

Province	Key Points
Koshi Province	• Primary prevention is as crucial as secondary and tertiary prevention. • Coordination among different stakeholders, along with inter sectoral and intrasectoral collaboration, is essential for combating pandemics. • Proper data management, including collection, recording, and analysis, is vital for planning and responding to disease outbreaks. • Capacity building and the preparation of a sufficient number of experts are key to effective public health responses. • Strengthening laboratory capacity is crucial for the early detection, management, and prevention of pandemics. • Effective documentation and communication are necessary for the timely dissemination of information, aiding in policy making and planning. • Logistics, including medicines, equipment, and oxygen, play a critical role in pandemic response.
Madhesh Province	• Advocate for a cohesive and unified pandemic response strategy. • Bolster resilience of integrated institutional and community health systems. • Implement ONM surveys in hospitals based on MSS guidelines to address human resource shortages. • Encourage local production of health logistics. • Address the urgent need for skilled human resources in critical care management. • Ensure permanent, resourceful, and smooth functioning of Points of Entry (POEs) for communicable disease control. • Enhance CICT with strong government coordination. • Prioritize health sector funding in budget allocations.
Bagmati Province	• Human Resources • Long term recruitment of the HR as per the need in the hospitals. • Operation, Support & Logistics: • Adequate budget allocation and HR deployment are needed to continue existing extended services including oxygen plants. • Continuous advocacy to PHSM compliance. • Awareness campaigns by miking, jingles, and other mediums. • Continuous advocacy on Case investigation and contact tracing • HR allocation in palikas to conduct CICT as case load is in declining trend. • Case management • Strengthen referral system (App) • Monitoring of home isolated cases
Gandaki Province	• Implement an integrated disease surveillance and recording system to enhance real-time monitoring and response. • Simplify access to emergency funds for swift utilization during health crises. • Strengthen coordination across three-tier government structures to ensure unified response efforts. • Establish DHEOCs and develop local health emergency contingency plans for comprehensive preparedness.

Lumbini Province	• Enhance the CICT and ensure appropriate incentives for frontliners. • Address delays in vaccine delivery to ensure timely immunization. • Increase budget allocations specifically for COVID-19 related emergencies. • Develop and implement provincial guidelines for managing health crises. • Invest in capacity building for the current human resources to improve response capabilities. • Foster multisectoral collaboration and coordination to tackle public health challenges more effectively. • Improve public and healthcare professional acceptance of antigen testing during initial outbreak periods. • Support the establishment of dedicated hospitals to maintain essential health services during pandemics. • Address challenges in managing holding centers at Points of Entry (PoEs) to better control disease spread. • Emphasize the importance of disease prevention measures across all government levels for a proactive health strategy.
Karnali Province	• Coordination between the three tiers of government is a crucial and must be strengthened. • Allocation of adequate fund for emergency situations (outbreaks/earthquake/flooding, etc.) and should be made easier to utilize. • Province must ensure that contingency plans are in place. • Support from the federal level to conduct simulation/drills/table top exercises. • Human resource/expertise and infrastructures to be improved/increased.
Sudurpashchim Province	• Provincial preparedness for possible health emergency should be provincial priorities for possible disaster management. • Legal framework binding all three tiers of Government should be promoted by Federal government for strengthening coordination and accountabilities in health system. • Learning from the COVID 19 pandemic should be included in health planning and policy. • A dedicated and skilled workforce is the backbone for pandemic management. Government should prioritize the HR management at Health Facilities and offices. (Job securities, trainings, accountabilities of job, review of sanctioned HR status) • Resources added during the Pandemic needed to be planned for efficient usage in non-pandemic time. (RT PCR laboratories, Holding center, Oxygen plant etc.) • Effective mobilization of RRT/CICT should be prioritized and made operational for outbreak management. • Restructuring of Health system within the three tiers of government.



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