Final Report

Evaluation of UNICEF's contribution to COVID-19 vaccine rollout and distribution in the South Asia region

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[1] India is also part of the South Asia region however India recently concluded a country level assessment on COVID-19 response, hence, is not a part of this evaluation.

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List of abbreviations

Acronym	Full name
ADB	Asian Development Bank
CBO	Community Based Organization
CO	Country Office
COAR	Country Office Annual Report
COVAX- ACT	COVID Vaccine Access to COVID-19 Tools
C-19 &RI	COVID-19 Vaccine and Routine Immunization
CSO	Civil Society Organization
DHIS	District Health Information System
EVMA	Effective Vaccine Management Assessment
FR	Freezer Room
ILR	Ice Lined Refrigerator
HAC	Humanitarian Action for Children
iSCM	Immunization Supply Chain Management
LMIS	Logistics Management Information System
MOH	Ministry of Health
MRA	Medicines Regulatory Authority
NCOC	National Command and Operational Centre
NDVP	National Deployment and Vaccination Plan
NGO	Non-Governmental Organization
OECD	Organization for Economic Cooperation and Development
PHEIC	Public Health Emergency of International Concern
PSM	Procurement and Supply Management
RCCE	Risk Communication and Community Engagement
ROSA	Regional Office for South Asia
RTMD	Remote Temperature Monitoring Device
SDD	Solar Direct Drive
TNA	Training Needs Assessment
UCC	Ultra-Cold Chain
UN	United Nations
UNICEF	United Nations Children's Fund
VIRAT	Vaccine Introduction Readiness Assessment Tool
VIRAF	Vaccine Introduction Readiness Assessment Framework
WASH	Water Sanitation and Hygiene
WHO	World Health Organization
WICR	Walk In Cold Room

Executive summary

Introduction: In 2020, global efforts accelerated COVID-19 vaccine development, a process that usually takes eight to fifteen years. The first COVID-19 vaccine was developed within a remarkable one-year period to address the unprecedented pandemic. Initiatives were launched to ensure equitable access to the vaccines. One such initiative was COVAX Advanced Market Commitment (AMC), a financing mechanism for providing COVID-19 vaccines to LMICs. UNICEF was the key procurer in the partnership, which aimed to achieve global vaccine coverage. Countries also procured COVID-19 vaccines through bilateral agreements. Vaccination significantly reduced mortality rates, preventing millions of deaths globally. However, vaccine hesitancy persisted across South Asia due to safety concerns, misinformation, and distrust. This was the biggest vaccine campaign ever conducted. 3 billion COVID-19 vaccines (with India included and 950 million excluding India) were administrated in South Asia, with 69 % of total population fully vaccinated by the end of 2022.

Object of evaluation: UNICEF facilitated the provision of crucial COVID-19 vaccines and supplies across South Asian countries, with efforts to reach the last mile population. Using various funding mechanisms like COVAX and bilateral support, UNICEF ensured a robust procurement and distribution network. UNICEF's role spanned procurement, freight, logistics, and storage, bolstering vaccine campaigns, addressing vaccine hesitancy, and fostering demand through behaviour change communication. Their efforts extended to aiding national deployment plans in each country, supporting country readiness assessment for vaccine introduction, focusing on regulatory standards, cold chain equipment, storage, and capacity building. UNICEF also focused on demand creation and mitigating vaccine hesitancy and misinformation that lingered and was hindering comprehensive vaccination coverage. There is a growing emphasis on integrating COVID-19 vaccination into routine immunization, leveraging investments to strengthen the health system.

Purpose, objective, scope and methodology: The evaluation's purpose is to ensure UNICEF's accountability by independently assessing its role in COVID-19 vaccine roll-out and distribution, with findings and recommendations aimed at understanding the facilitators and barriers in the context of new vaccine rollout and distribution, fostering organizational learning and offering guidance for future public health crises. The objective of the evaluation is to document UNICEF's support in COVID-19 vaccine rollout, including in children, while gauging its impact on system strengthening in supply chain and behaviour change communication, in terms of its coherence, relevance, efficiency, effectiveness, and sustainability. It also documents the vaccine's influence on health systems and early integration into routine immunization, as well as draws lessons for UNICEF's response strategy in similar emergencies. Response efforts carried out between August 2020 and December 2022, across all areas of vaccine deployment – preparedness, policy, planning and coordination, service delivery including health human resources and duty of care elements for UNICEF staff, vaccine management, cold chain, logistics and infrastructure, and demand generation and risk communication – were evaluated. The evaluation also analysed how well issues of gender equality, disability, human rights, and equity were considered in UNICEF's efforts. The evaluation included Afghanistan,

Bangladesh, Bhutan, Maldives, Nepal, Pakistan, and Sri Lanka. India was not included as it recently concluded a country level assessment of COVID-19 response.

The evaluation relied on a mixed methods approach using both primary and secondary sources for data collection. Primary information was gathered from 17 perception survey respondents (12% female), and 70 KII participants (43% female), selected through a stratified purposive sampling method from a sample of duty bearers representing UNICEF Country Offices (CO) and Regional Office (RO), civil society organizations (CSO) implementing partners, government stakeholders, and UN partners from all seven countries and programme areas. A 'thematic analysis' was conducted to analyse the data and understand the best practices, gaps and lessons learned.

Findings

Preparedness: UNICEF, along with its partners, made a concerted effort to ensure preparedness for COVID-19 vaccine introduction. Collaborative efforts among various partners through initiatives like Country Readiness and Delivery (CRD) workstream and Access to COVID-19 Tools (ACT) Accelerator fostered coherence and harmonized response strategies within the region. The use of VIRAT/VRAF 2.0 as a structured readiness assessment tool, represents a coherent and timely response to assist countries plan for vaccine deployment. Further, alignment of VIRAT/VRAF 2.0 with National Deployment and Vaccination Plans (NDVPs) demonstrates coherence as well as focus on long-term sustainability and integration into broader health systems. KIs acknowledged the effectiveness of these adaptable global resources and tools. They noted that these tools to be relevant as they were aligned with national priorities and that they facilitated readiness evaluations, which were essential for addressing the evolving needs of countries, assisting them in identifying gaps, and planning for vaccine introduction. The survey results, with over 90% agreement from respondents, suggest that efforts to leverage existing resources and policy frameworks have been effective. However, the use of pre-existing resources also led to diversion of resources from routine immunization, underscoring the need to balance emergency responses without compromising routine health programmes.

Policy, planning, and coordination: UNICEF's engagement within the COVAX facility and its role as the procurement coordinator displays alignment with various stakeholders at international and national levels, showcasing coherence in its actions. The issuance of global guidance for NDVPs and their adoption by over 100 countries underscores the relevance of UNICEF's interventions. Through timely and effective actions, UNICEF supported countries to develop their respective NDVPs and facilitated regulatory approvals of vaccines for emergencies, not just for immediate responses but also for building sustainable systems. Financial resource mobilization efforts, which involved leveraging partnerships with entities like the World Bank and Asian Development Bank, created opportunities for strengthening funding mechanisms for future emergencies. However, initial communication gaps caused delays, which underscores the importance of enhancing timeliness in information sharing and coordination.

Vaccine, cold chain, logistics, and infrastructure: As a pivotal partner in procuring vaccines through COVAX and bilateral arrangements, UNICEF collaborated with multiple stakeholders, striving to ensure equitable access to vaccines. Relevance remained a key

feature of UNICEF's interventions, which responded directly to countries' immediate needs by aiding cold chain expansions, vaccine procurement, and distribution plans. These efforts, particularly the strengthening of cold chain infrastructure, were preceded by UNICEF-supported cold chain gap analysis, to support funding requests for cold chain expansion. Reports from countries like Bhutan, Maldives, Nepal, Pakistan, and Sri Lanka affirm that the expanded cold chain infrastructure will meet routine immunization needs for the next decade, illustrating sustainability and system strengthening. Efforts to strengthen logistics management information systems (LMIS) in countries like Nepal, Maldives, and Bhutan indicate a shift towards digitization for enhanced data visibility and analysis. Yet, the lack of fully digitized systems in several countries impeded timely data collection, impacting stock calculations and supply to sub-national level, thereby affecting efficient distribution. Challenges such as initial delays in vaccine shipments and shortages also significantly impacted the timeliness and effectiveness of distribution and administration, revealing areas that require enhancement for more robust operations. Timeliness in vaccine delivery, in 2021, faced considerable hurdles due to global production limitations, regulatory constraints, geopolitical influences, and logistical challenges. These barriers resulted in vaccine shortages and delays in shipments, impeding the achievement of vaccination targets and highlighting the complexities of ensuring prompt and widespread immunization during a global crisis. The unpredictability of vaccine availability affected planning, forecasting, and communication efforts, leading to disorder and dismay at vaccination sites when individuals couldn't receive their vaccinations. Further, the diverse storage needs of various vaccines posed additional challenges in supply chain management.

Demand generation and risk communication: Through integration of RCCE strategies for vaccines into the NDVPs and close collaboration with government bodies, UNICEF ensured compatibility and coherence within broader immunization efforts, while aligning with community needs. To address concerns about vaccine hesitancy, safety, and efficacy, UNICEF used tailored communication strategies, reflecting the relevance of response efforts to diverse community needs. Effectiveness and timeliness were evident in UNICEF's use of various communication channels, including digital platforms, social media and mass media campaigns. UNICEF’s strategic community engagement through community leaders such as religious leaders, scouts, Red Cross volunteers and influencers, allowed the organization to reach diverse populations. Further, integration of vaccine-related messaging with prevention-related messaging and WASH, for example, showcased coherence in UNICEF's response, ensuring broader coverage and optimal resource utilization. Proactive measures in evidence generation, social listening, and data-driven assessments helped counter misinformation and enhanced vaccine acceptance. The evidence-based approach, real-time data analysis, and adaptable communication strategies showcased effectiveness in adapting to community sentiments. Given pandemic restrictions on physical contact, UNICEF effectively used alternative communication channels, integrating assessment findings and adjusting strategies proactively for continued outreach, maintaining relevance and effectiveness of its efforts. Lessons learned and tools developed during the pandemic, such as the U-Report messaging platform for COVID-related communication, could potentially be used beyond the pandemic and help strengthen routine immunization efforts. UNICEF's success in countering vaccine hesitancy could serve as a foundation for similar efforts beyond COVID-19. Suggestions for

improvement include early collaboration with local governments for an integrated approach and inclusive communication strategies. The need to address vaccine hesitancy should receive continued attention so that it does not affect routine immunization programmes. Further, anti-vaccine sentiments have emerged in some regions previously known for vaccine acceptance. This underscores the need for continued vigilance and proactive measures to counter misinformation.

Service delivery, health human resources, and duty of care: UNICEF's interventions in COVID-19 vaccine service delivery demonstrated coherence as they were aligned with broader health systems and national immunization programmes. The interventions also demonstrated relevance as they involved supporting nationwide vaccination drives, addressing specific demographic needs, tailored campaigns, and local adaptation. Effectiveness was evident in UNICEF's technical assistance, capacity building initiatives for the health workforce, which also contributed to system strengthening. Strategies such as the deployment of mobile health teams were relevant to the specific context of each country. Vaccine delivery through school platforms also proved effective in reaching children. Timely deployment of resources, surge mission support, and staff recruitment reflected a proactive response to the pandemic. Challenges included managing heavy workloads due to limited logistics personnel, particularly in smaller country offices. Further, the campaign-driven, 'vertical' nature of COVID-19 vaccinations, though justifiable, ended up diverting resources from routine immunization. Integrating these efforts into primary health care systems for future emergencies could bolster coherence and optimize resource utilization. Regarding duty of care, UNICEF's measures for staff well-being during the pandemic were found to be comprehensive, including the mandate for COVID-19 vaccination among UNICEF staff.

Gender, human rights and equity: Global initiatives like COVAX aimed to ensure fair distribution but fell short of their targets, with only a small fraction of doses reaching low-income countries by late 2021. Despite supply delays and disruptions, UNICEF's efforts to ensure vaccine equity, address gender disparities, and vaccinate adolescents were significant, and acknowledged by KIs and PS respondents. Tailored plans focused on inclusivity, but challenges persisted in reaching certain populations, including pregnant women. This reflected the need to improve data collection to understand the specific social and behavioural barriers faced by different groups. Vaccination rates reflected gender disparities, often associated with cultural norms and traditions. To address this, UNICEF recruited female vaccinators and targeted female clients in places like marketplaces. Vaccination efforts for adolescents varied across countries, achieving notable success in Bhutan and facing challenges in Afghanistan and Pakistan.

Integration of COVID-19 vaccine with routine immunization emerged as a key priority. Afghanistan demonstrated commitment to integration by training staff across numerous facilities for comprehensive service delivery for COVID-19 vaccine and routine immunization. Pakistan and Nepal saw progress in storage integration, yet formal decisions awaited implementation. Sri Lanka integrated the COVID-19 vaccine early on, facilitated by its well-established healthcare system. The COVID-19 vaccines were integrated with routine services provided at established clinics. KIs expressed concerns about limited resources, waning immunity, unfeasible timelines, service duplication, and reaching hesitant

populations. The integration readiness assessments conducted by several South Asian countries indicated their varying levels of preparedness, shedding light on the diverse landscapes of immunization strategies amid the complexities of integration.

Conclusion: UNICEF played a pivotal role in shaping and implementing South Asia's COVID-19 vaccination initiatives, emphasizing equitable access through strategic planning and operational support. In addition to vaccine procurement and distribution, it focused on improving infrastructure, particularly cold chain equipment and capacity building of the health workforce. Despite challenges like supply disruption and vaccine hesitancy, the campaign significantly strengthened the healthcare system, particularly the immunization supply chain, with lasting implications for future emergencies and routine immunization. UNICEF addressed demand creation and hesitancy through innovative communication strategies and community engagement. UNICEF's methods engaged communities and promoted cultural understanding, and therefore offer valuable lessons for reaching 'zero-dose' children, introducing new vaccines in routine immunization (e.g., HPV vaccine) and NCD awareness campaigns for diseases such as diabetes, hypertension or mental health or targeting various risk factors and fostering healthier habits. UNICEF's continued advocacy and efforts for the integration of COVID-19 vaccine in routine immunization in the region demonstrated its commitment to sustainability. Overall, UNICEF's contributions made a lasting impact on South Asia's healthcare systems, laying a foundation for equity and resilience, emphasizing not just vaccination but also inclusive health access among marginalized communities.

Lessons learned: 1) Given the market-driven nature of healthcare services, it was challenging to ensure equitable vaccine access. There is a need for sustained advocacy to ensure that vital innovations like vaccines reach vulnerable populations worldwide. 2) Strong government leadership and participation led to efficient policy formulation and vaccine rollout. 3) Multi-channel communication strategies—print media, electronic platforms, and in-person engagement—proved effective in generating vaccine demand, especially in regions with limited penetration of technology. This underscored the importance of diverse forms of communication for inclusive community engagement. 4) The pandemic highlighted the importance of agility, innovation in logistics, investment in human resources, virtual platforms, and adaptable healthcare service delivery models. 5) Real-time data sharing and comprehensive data management were essential for informed decision making, indicating the need for inclusive data on behavioural barriers and demographic nuances for a comprehensive pandemic response. 6) Addressing vaccine hesitancy requires tailored strategies specific to the local context and culturally sensitive approaches that help build trust. 7) Sri Lanka's integration of COVID-19 vaccination into routine immunization highlighted the importance of early integration, streamlining frameworks and leveraging existing infrastructure.

Recommendation: Based on the findings and lessons learned, we make the following six recommendations to **strengthening the immunization system and making it more equitable**:

1. Advocate proactively for early equitable access to vaccines at a global and regional level, and strategically scale-up effective strategies for equitable access to vaccines within countries.

2. Invest in preparedness for emergency immunization at regional and country levels by advocating for flexible policies and robust information management systems.
3. Ensure that human resources planning during the emergency response considers both programme as well as operations staff.
4. Integrate COVID-19 vaccination into routine immunization to strengthen primary healthcare and MNCH services in the region.
5. Strengthen community and district health systems to reach marginalized communities using community structures.
6. Enable 'localization' of response efforts by engaging local government and actors for a more relevant, timely and effective response to future emergencies.
7. Invest in generating real-time evidence that can tell 'stories' and not just provide numbers.

Structure of the report

This evaluation report is divided into seven chapters. Chapter 1 provides the overall context of the evaluation and introduces the object of the evaluation, and UNICEF's role in COVID-19 vaccine rollout and distribution. Chapter 2 outlines the purpose, objectives and scope of the evaluation. Chapter 3 discusses the evaluation design and methodology. In Chapter 4, key evaluation findings are presented for different themes. Chapter 5 presents the conclusions of the evaluation. Chapter 6 summarizes key lessons learned from UNICEF's efforts in COVID-19 vaccine rollout and distribution in South Asia. Finally, the recommendations and key actions for improving UNICEF's response to future public health emergencies are presented in Chapter 7.

Chapter 1: Introduction

1.1 Context

On 3 January 2020, Chinese authorities officially informed the World Health Organization (WHO) about a series of concerning cases involving 'viral pneumonia of unidentified origin' detected in Wuhan. By 23 January 2020, the initial lockdown aimed at preventing the spread of this unidentified pneumonia was initiated in Wuhan, China. Subsequently, with the global confirmed cases nearing 8,000, the WHO declared the situation a Public Health Emergency of International Concern (PHEIC), on 30 January, and a pandemic on 11 March due to an alarming level of its spread and severity[2]. The first case of COVID-19 in South Asia was reported in Nepal on 23 January 2020, in a student who returned from Wuhan, China. India announced its first case in the following week. By the first week of March 2020, other countries within the region confirmed their first cases of the virus, with Nepal being the first (23 January), followed by Sri Lanka (27 January), India (30 January), Afghanistan (24 February), Pakistan (26 February), Bhutan (6 March), Maldives (7 March) and Bangladesh (8 March).[3]

As the pandemic advanced, there was a steady rise in both cases and fatalities worldwide, including within South Asia ***(Appendix 1)***. The overall caseload in the South Asia was high. The total number of confirmed cases was more than 50 million with more than half a million hospitalizations and deaths respectively (***Table 1***). India accounted for a significantly higher cumulative number of confirmed cases and deaths compared to each of the countries in the South Asia at any given data point. As of December 2023, Bangladesh had the second highest total number of cases (2,046,256), and the highest number of hospitalizations (323,857), even more than India (214,786). Pakistan had the second highest number of deaths (30,656) followed by Bangladesh (29,463). Further, the case fatality rate in South Asia was higher than the global case fatality rate (1.24% vs 0.91%) reflecting the severity of disease in SAR. Afghanistan had the highest case fatality rate at 3.46%, followed by Sri Lanka at 2.51%. Alternately, Bhutan had the lowest case fatality rate at 0.03%, followed by Maldives at 0.17% (***Table 1***). The crude case fatality rate[4] was higher for males as compared to females in Afghanistan (4.03% vs 2.99%) and Bangladesh (1.74% vs. 1.34%). However, the situation was opposite in Maldives, Nepal and Pakistan where the rate was higher for females but the difference in crude case fatality rate between males and females was

[2] WHO. (2023). *Coronavirus disease (COVID-19) pandemic. Emergencies*. World Health Organization. Retrieved from https://www.who.int/europe/emergencies/situations/covid-19
WHO. Listings of WHO's Response to COVID-19, 2020. Retrieved from https://www.who.int/news/item/29-06-2020-covidtimeline
https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline

[3] International Monetary Fund (IMF). Policy Response to COVID-19. Policy Tracker (2021). Available at https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19#B
Pulla, V., Shoukat, A., Jafar, M., Alam, M. F., Attanayake, M. T. R., Mussarat, J., Gautam, G., Lafain, R. and Prasad, S. (2022). Managing the Pandemic in the South Asian (SAARC) Countries. *Space and Culture, India*, *10*, 87-109.

[4] The crude case fatality rate (CFR), because of the calculation method, is the most accurate when the pandemic is over since there is a possibility of the delay between disease onset and outcomes. Source: Shah, M. R. T., Ahammed, T., Anjum, A., Chowdhury, A. A., & Suchana, A. J. (2021). Finding the real COVID-19 case-fatality rates for SAARC countries. *Biosafety and Health*, *3*(3), 164–171. Retrieved from https://doi.org/10.1016/j.bsheal.2021.03.002

small.[4] The caseload of COVID-19 varied relative to the country's population. While India had the highest total case count in the country among the SAR countries, throughout the pandemic, Maldives had the highest total number of cases relative to the population of the country.

Table 1: Total number of COVID-19 cases, hospitalizations and deaths in South Asia (as of 30 December 2023)[5]

Country	Total number of confirmed cases[a]	Total number of hospitalizations[b]	Total number of deaths	Case fatality rate (%)
Afghanistan	230,290	NA	7,973	3.46
Bangladesh	2,046,256	323,857	29,477	1.44
Bhutan	62,697	670	21	0.03
India	45,010,891	214,786	533,346	1.19
Maldives	186,694	9,756	316	0.17
Nepal	1,003,450	293	12,031	1.20
Pakistan	1,580,631	NA	30,656	1.94
Sri Lanka	672,685	10,723	16,888	2.51
Total – South Asia	**50, 793, 594**	**560,085[c]**	**630, 708**	**1.49**
Total - Global	773,448,535	1,120,170	6,991,829	0.90

NA = Information not available

[a] Due to limited testing, the number of confirmed cases is lower than the true number of infections.

[b] Data as of August 2023 only

[c] Total number of hospitalizations does not include Afghanistan and Pakistan.

1.2 Impact of COVID-19

COVID-19 had significant health implications, leading to heightened rates of illness and death. WHO estimated that the total number of global "excess deaths" directly and indirectly attributable to COVID-19 in 2020 amount to at least 3 million.[6,7] Infected individuals experienced varying trajectories[8]: some recovered without complications after

[5] WHO. WHO COVID-19 Dashboard. https://covid19.who.int/

[6] The term 'excess deaths' describes deaths beyond what would have been expected under 'normal' conditions. It captures not only confirmed deaths, but also COVID-19 deaths that were not correctly diagnosed and reported as well as deaths attributable to the overall crisis conditions. This provides a more comprehensive and accurate measure when compared with confirmed COVID-19 deaths alone.

[7] WHO (2021). The impact of COVID-19 on global health goals. Retrieved from https://www.who.int/news-room/spotlight/the-impact-of-covid-19-on-global-health-goals

[8] People with COVID-19 have a wide range of symptoms, from common respiratory issues like fever, cough, and shortness of breath to severe complications such as pneumonia and organ failure. They may also have extra-pulmonary symptoms affecting the gastrointestinal, cardiovascular, haematological, renal, musculoskeletal, and endocrine system. In children,

the disease phase, while others required intensive medical support, often involving ICU admissions and assisted ventilation to manage severe symptoms. The ultimate outcomes was either recovery or, death.

The impact of COVID-19 varied across population segments, particularly affecting those who were more vulnerable due to age, underlying health conditions, and compromised immune systems. This group included the elderly and individuals with comorbidities such as hypertension, diabetes, cancer, tuberculosis, HIV/AIDS, as well as those with liver or kidney diseases. For example, a pan-India retrospective study based on COVID-19 management data from the first positive case reported till 31 January 2022, indicated that age and various pre-existing comorbidities were predictors of severe COVID-19 outcomes. The analysis showed significantly high mortality rates, approximately around 80%, in patients aged 50 and above. Furthermore, the most influential risk factors for COVID-19 mortality were pre-existing comorbidities like diabetes followed by hypertension, and heart disease, with the likelihood of fatal cases increasing with the number of comorbidities present in affected patients.[9]As such, diabetes, cardiovascular or chronic kidney disease are some of the most common conditions among the adult population in the South Asia region. [10]

As illustrated in **Figure *1***, a greater number of COVID-19 deaths was seen in the older age groups 50–80, with males in this age group being more affected than females. The highest number of fatalities was seen in the group aged 50–59. There were more deaths among men than women with the 50–69 age group bearing the brunt of deaths recorded in the region.

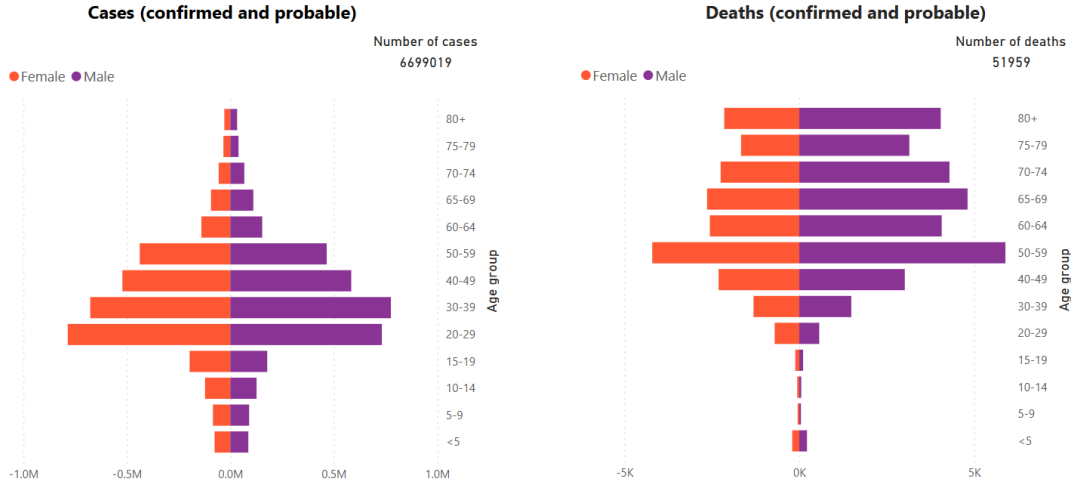
Figure 1: COVID-19 cases and deaths in Southeast Asia with age and sex reported (December 2019 – August 2022) [11]

symptoms often include respiratory issues but may also include gastrointestinal problems and skin-related issues, with the multi-system inflammatory syndrome posing specific risks, characterized by gastrointestinal, mucocutaneous, and cardiovascular symptoms. Pregnant women commonly experience fever, cough, and additional symptoms like malaise, myalgia, and sore throat, sometimes leading to viral pneumonia features, albeit with limited ICU admissions and no reported mortality. Foetal complications include preterm delivery, foetal distress, and neonatal care admission. Evidence of vertical transmission remains inconclusive, and breastfeeding is encouraged. Further, some people who have been infected with COVID-19 can experience long-term effects known as long COVID or post-COVID conditions (PCC). Long COVID is of significant concern, with individuals experiencing persistent symptoms or new-onset symptoms after the acute phase of COVID-19, lasting weeks or months. Common long COVID symptoms include fatigue, shortness of breath, chest pain, cognitive difficulties, and mental health issues.
Source: Mehta, O. P., Bhandari, P., Raut, A., Kacimi, S. E. O., & Huy, N. T. (2021). Coronavirus disease (COVID-19): comprehensive review of clinical presentation. *Frontiers in Public Health*, *8*, 582932.
Long COVID or Post-COVID Conditions. https://www.cdc.gov/coronavirus/2019-ncov/long-term-effects/index.html

[9] Singh, P., Bhaskar, Y., Verma, P., Rana, S., Goel, P., Kumar, S., ... & Singh, H. (2023). Impact of comorbidity on patients with COVID-19 in India: A nationwide analysis. *Frontiers in Public Health*, *10*, 1027312

[10] Siegel, K. R., Patel, S. A., & Ali, M. K. (2014). Non-communicable diseases in South Asia: contemporary perspectives. *British Medical Bulletin*, *111*(1), 31-44.

[11] WHO Coronavirus (COVID-19) Dashboard, https://covid19.who.int/



The gender gap observed in COVID-19 cases can be attributed to several factors. While females exhibit genetic resilience against SARS-CoV-2 infection, males are predisposed to acquiring the infection due to conditions such as hypertension and diabetes.[12] Moreover, socio-cultural aspects, notably higher rates of smoking, tobacco use, and alcohol consumption among men, contributed to their increased susceptibility to infection.[13] Women tend to prioritize hygiene practices more consistently, a significant preventive factor against COVID-19. As primary caregivers in many households, women are often seen to adopt precautionary measures earlier than men, possibly due to their caregiving roles and heightened awareness of good health and hygiene practices.[14] Further, men likely have greater access to healthcare services, including testing, due to higher levels of travel, workforce participation, and overall healthcare utilization, contributing to the observation of more reported cases among men.

The impact of the pandemic extended far beyond its direct health effects. Specific groups, such as women, children, the elderly, youth, people with disabilities, migrant workers, children on the move, refugees and internally displaced people, and healthcare professionals, experienced distinct and often intensified challenges - exacerbating pre-existing inequalities for the most vulnerable. The secondary effects resulting from containment measures might have surpass the disruptions caused solely to health services such as the indirect effect on the health and well-being of mothers, children, and adolescents (**Appendix 2**). Globally, the indirect repercussions of COVID-19 indicated a

[12] Anca, P. S., Toth, P. P., Kempler, P., & Rizzo, M. (2021). Gender differences in the battle against COVID-19: Impact of genetics, comorbidities, inflammation and lifestyle on differences in outcomes. *International Journal of Clinical Practice*, *75*(2). https://doi.org/10.1111/ijcp.13666

[13] Bwire, G. M. (2020). Coronavirus: Why Men are More Vulnerable to Covid-19 Than Women? *SN Comprehensive Clinical Medicine*, *2*(7), 874–876. https://doi.org/10.1007/s42399-020-00341-w

[14] Sarria-Guzmán, Y., Fusaro, C., Bernal, J. E., Mosso-González, C., González-Jiménez, F. E., & Serrano-Silva, N. (2021). Knowledge, attitude and practices (KAP) towards COVID-19 pandemic in America: A preliminary systematic review. *The Journal of Infection in Developing Countries*, *15*(01), 9–21. https://doi.org/10.3855/jidc.14388

monthly surge of 38.6% in maternal mortality and a 44.7% rise in child mortality across 118 low- and middle-income countries.[15] In South Asia, the scenario mirrored a similar trend with sexual, reproductive, maternal and child health services experiencing decline over six quarters spanning 2020 and 2021. The initial two quarters bore a significant impact, followed by gradual improvement thereafter. While certain measures like family planning and vaccination, along with antibiotic use for pneumonia, showed positive progress in the first quarter (Q1) of 2021, there was a subsequent decline in Q2 of 2021 which coincided with the Delta wave. The diminished utilization of crucial health services led to unintended pregnancies and elevated rates of maternal and child mortality. [16]

Further, the multifaceted repercussions of the pandemic extended to broader societal domains like the economy, education, social connections, mental well-being, and family dynamics Women were disproportionately affected by the pandemic, and were more likely to lose jobs than men or forgo work to care for others; 1.21 times more likely than men and boys to report dropping out of school for reasons other than school closures; and 1.23 times more likely than men to report that gender-based violence had increased during the pandemic.[17] Additional details of the secondary impact of COVID-19 on various vulnerable population are presented in a concurrent UNICEF ROSA evaluation on UNICEF's overall response to COVID-19.

1.4 COVID-19 vaccine development and approval

During the pandemic's first year (2020) there was a concerted global effort to expedite the development of a safe and effective COVID-19 vaccine, alongside the immediate response measures like case identification, management, and preventive strategies. These efforts for vaccine development included collaborative research, clinical trials, and regulatory approvals, aiming to combat the spread and achieve widespread immunization. Pre-pandemic, vaccine development usually took eight to fifteen years, with the fastest being four years (mumps vaccine). However, COVID-19 prompted researchers to expedite the process by conducting multiple development stages concurrently, leveraging innovative technologies as well as insights from previous vaccine studies (e.g., SARS-CoV, MERS-CoV), leading to numerous clinical trials in 2020 for COVID-19 vaccines.[18]

COVID-19 vaccines are the fastest developed vaccine. Comirnaty, also known as Pfizer-BioNTech COVID-19 vaccine, was the first COVID-19 vaccine to obtain emergency use

[15] Alabi, Q. K., Oyedeji, A. S., Kayode, O. O., & Kajewole-Alabi, D. I. (2023). Impact of COVID-19 pandemic on mother and child health in Sub-Saharan Africa–a review. *Pediatric Research*, 1-6.
[16] Owais, A., Rizvi, A., Jawwad, M., Horton, S., Das, J. K., Merritt, C., & Bhutta, Z. A. (2023). Assessing the hidden burden and costs of COVID-19 pandemic in South Asia: Implications for health and well-being of women, children and adolescents. *PLOS global public health*, *3*(4), e0001567.
[17] Flor, L. S., Friedman, J., Spencer, C. N., Cagney, J., Arrieta, A., Herbert, M. E., ... & Gakidou, E. (2022). Quantifying the effects of the COVID-19 pandemic on gender equality on health, social, and economic indicators: a comprehensive review of data from March, 2020, to September, 2021. *The Lancet*, *399*(10344), 2381-2397.
[18] Klobucista C (2022). A Guide to Global COVID-19 Vaccine Efforts. Retrieved from https://www.cfr.org/backgrounder/guide-global-covid-19-vaccine-efforts#chapter-title-0-7
Mayo Clinic (2020). COVID-19 and related vaccine development and research. Retrieved from https://www.mayoclinic.org/diseases-conditions/history-disease-outbreaks-vaccine-timeline/covid-19

authorization from the US Food and Drug Administration (FDA) and WHO Emergency Use Listing (EUL) in December 2020 [19,20]. Other vaccines were subsequently approved by WHO (**Appendix 3**). Pfizer-BioNTech COVID-19 vaccine which is a messenger RNA (mRNA) based vaccine against coronavirus disease 2019, was initially approved for people aged 16 years and above. Later, in May 2021, the authorization was expanded to include adolescents aged 12–15 years. The Moderna vaccine was included in WHO EUL in April 2021 and approved for adults aged 18 years and above. AstraZeneca COVID-19 vaccine was granted emergency use authorization in India as well as Argentina, Dominican Republic, El Salvador, Mexico and Morocco in January 2021 for the active immunization of adults aged 18 years and above. It was included in WHO EUL in February 2021. AstraZeneca partnered with Serum Institute of India (SII) for the supply of the vaccine to the Indian Government which later supplied vaccine to many low and middle-income countries including those in South Asia[21]. **Table *2*** presents the types of vaccines approved in countries in South Asia.

Table 2: Types of COVID-19 vaccines approved in countries in South Asia (as of 7 December 2023)[22]

	Afghanistan	Bangladesh	Bhutan	Maldives	Nepal	Pakistan	Sri Lanka
AstraZeneca, **Vaxzevria**		YES	YES	YES	YES	YES	YES
BBIL, **Covaxin**					YES		
CanSino, **CONVIDECIA**						YES	
Gamaleya, **Sputnik V**		YES		YES	YES	YES	YES
Janssen, **Ad26.COV 2.S**	YES	YES		YES	YES		
Moderna, **Spikevax**		YES	YES	YES	YES	YES	YES
Pfizer BioNTech, **Comirnaty**		YES	YES	YES	YES	YES	YES
Pfizer BioNTech, **Comirnaty (Bivalent)**					YES		
SII, **Covishield**	YES	YES	YES	YES	YES	YES	YES
Sinopharm, **BBIBP-CorV**		YES	YES	YES	YES	YES	YES
Sinovac, **CoronaVac**		YES		YES	YES	YES	YES

1.5 COVID-19 vaccine priority-use groups

[19] FDA (2021). FDA approves first COVID-19 vaccine. Retrieved from https://www.fda.gov/news-events/press-announcements/fda-approves-first-covid-19-vaccine

[20] WHO. COVID-19 vaccines. Retrieved from https://www.who.int/emergencies/diseases/novel-coronavirus-2019/covid-19-vaccines (accessed July 2023)

[21] AstraZeneca (2021). Serum Institute of India obtains emergency use authorisation in India for AstraZeneca's COVID-19 vaccine. Retrieved fromhttps://www.astrazeneca.com/media-centre/press-releases/2021/serum-institute-of-india-obtains-emergency-use-authorisation-in-india-for-astrazenecas-covid-19-vaccine.html#

[22] UNICEF. COVID-19 Market Dashboard. Retrieved from https://www.unicef.org/supply/covid-19-market-dashboard

The WHO Strategic Advisory Group of Expert's on Immunization (SAGE) described three priority-use groups for COVID-19 vaccination: high, medium and low [23]. The high-priority group are individuals with the highest risk of severe disease and death including health workers who frequently interaction with patients; oldest and older adults with multiple significant comorbidities; younger adults with significant comorbidities (e.g., diabetes and heart disease); children aged 6 months and above with immune compromising conditions (e.g., living with HIV and transplant recipients); pregnant women. The medium-priority group includes *healthy* adults – usually under the age of 50–60 without comorbidities, and children and adolescents with comorbidities. The low-priority group includes healthy children and adolescents aged 6 months to 17 years. Primary and booster doses are safe and effective for children and adolescents.

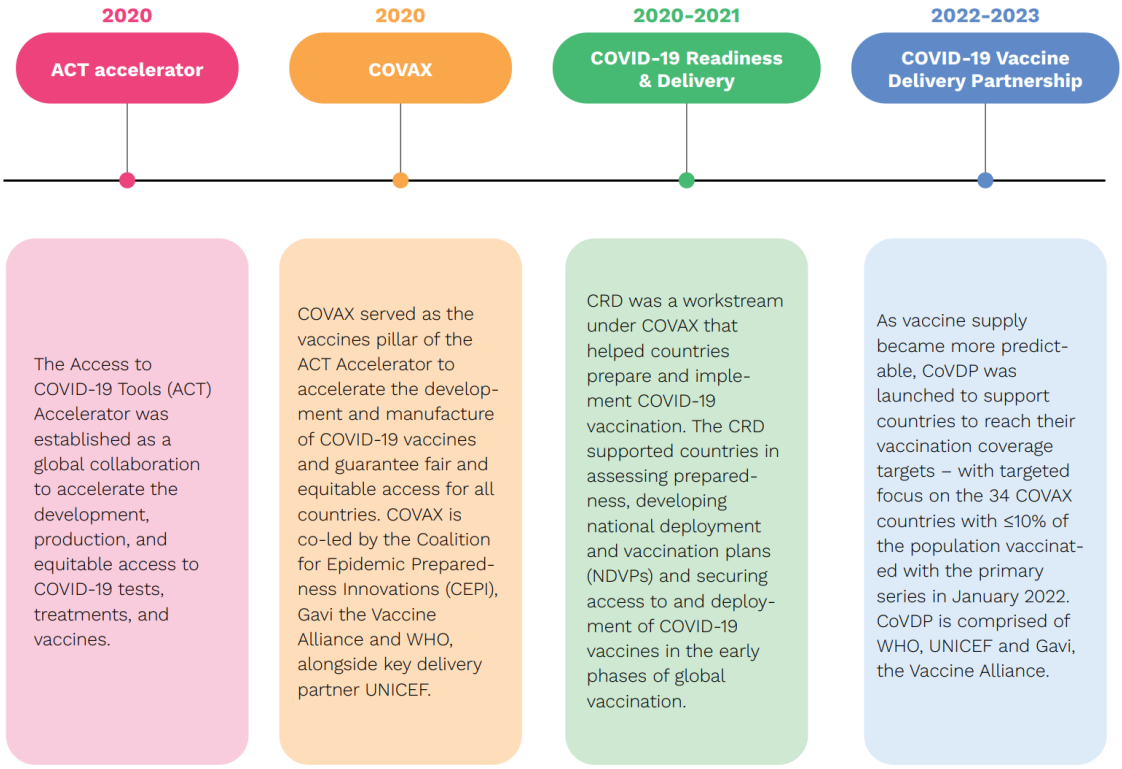
The WHO SAGE revised the roadmap for prioritizing the use of COVID-19 vaccines, to reflect the impact of new variants and high population-level immunity due to infection and vaccination[24]. In 2021, WHO set the target of 70% global vaccination coverage by mid-2022. UNICEF committed to lead the procurement and supply of COVID-19 vaccines to ensure that all countries have safe, fast, and equitable access to initial doses as soon as they were available[25]. On 24 April 2020, WHO launched the Access to COVID-19 Tools (ACT) Accelerator, a new global collaboration to accelerate development, production, and equitable access to COVID-19 diagnostics, therapeutics, and vaccines. Within the Accelerator, GAVI, CEPI, WHO and UNICEF together with multinational and developing country vaccine manufacturers begun working on the COVAX facility, a mechanism that ensured some access to the vaccine by sharing risk and increasing equitable distribution of COVID-19 vaccines.[26]

1.6 Vaccine Access modalities for equitable access

As noted in **Figure 2**, several global collaborations were established to facilitate equitable access to vaccines. These global initiatives aim to ensure that COVID-19 vaccines are distributed equitably and efficiently to all countries, regardless of their economic status, and to prevent a 'vaccine divide' between wealthy and developing countries.

Figure 2: Global collaborations supporting COVID19 vaccine development, access, and implementation[27]

[23] WHO SAGE values framework for the allocation and prioritization of COVID-19 vaccination, dated 13 September 2020
[24] SAGE updates COVID-19 vaccination guidance, dated 28 March 2023
[25] UNICEF to lead global procurement, supply of COVID vaccines | UN News
[26] COVAX Facility; https://www.gavi.org/covax-facility/
[27] UNICEF, WHO and Gavi (2023). he COVID-19 Vaccination Response: Country experiences, best practices, and lessons Available at https://www.who.int/publications/m/item/the-covid-19-vaccination-response--country-experiences--best-practices--and-lessons



Countries in South Asia received vaccine from three different vaccine access modalities, as described below:

1. **COVAX AMC of the Global Alliance for Vaccines and Immunization (Gavi)**: The COVAX Advanced Market Commitment (AMC) is a financing mechanism that aimed to provide COVID-19 vaccines to LMICs. It seeks to ensure that people in all countries get rapid, fair and equitable access once safe and effective vaccines become licensed. It is also trying to maximize the probability of success by building the largest and most diverse portfolio of COVID-19 vaccine candidates. Funded by donor countries, philanthropic organizations, and the private sector, the AMC aims to provide up to 1.8 billion vaccine doses to 92 countries by the end of 2021. Other agreements also facilitated the vaccine delivery and distribution in the region. Countries such as China and India effected bilateral agreements for the purchase of locally manufactured vaccines and donated them or participated in their distribution through the COVAX facility (in the case of India).
2. **Asia-Pacific Vaccine Access Facility (APVAX)**: The Asia-Pacific Economic Cooperation (APEC) launched the APVAX initiative to facilitate the equitable and efficient distribution of COVID-19 vaccines in the region. On 11 December 2020, Asian Development Bank (ADB) launched a $9 billion vaccine initiative—the Asia Pacific Vaccine Access Facility (APVAX) that offered rapid and equitable support to its developing member countries (DMCs), including Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan, and Sri Lanka, to procure and deliver COVID-19 vaccines. ADB financing for vaccines was provided in close coordination with other development partners including the World Bank Group, World Health Organization

(WHO), COVID-19 Vaccines Global Access Facility (COVAX), Gavi, and bilateral and multilateral partners.

3. **Bilateral and multilateral agreements**: Various countries in South Asia entered into bilateral and multilateral agreements for the procurement and supply of COVID-19 vaccines. These agreements involve partnerships between countries or with international organizations to ensure access to vaccines.

Table *3* presents the total number of vaccines delivered through the various vaccine access arrangements as of December 2023.

Table 3: Number of vaccines delivered by arrangement (as of December 2023)[28]

	Bilateral/multilateral agreements	Donations[a]	COVAX[b]	Unknown	Total doses delivered
Afghanistan	--	3,700,000	20,887,250	618,136	**25,205,386**
Bangladesh	134,213,562	35,309,610	256,951,070	--	**426,474,242**
Bhutan	198,900	1,282,500	1,134,220	22,277	**2,637,897**
India	1,165,176,072	--	240,000,000	1,022,247,564	**2,427,423,636**
Maldives	100,000	400,000	922,960	132,220	**1,555,160**
Nepal	2,800,000	9,142,000	46,273,030	13,111,113	**71,326,143**
Pakistan	125,465,439	3,220,000	131,616,190	114,751,072	**375,052,701**
Sri Lanka	18,312,650	3,500,000	5,128,210	17,187,389	**44,128,249**
Total	**1,446,266,623**	**56,554,110**	**702,912,930**	**1,168,069,751**	**3,373,803,414**

[a] The figure under 'Donations' include doses delivered through non-COVAX bilateral and multilateral donations.
[b] The figure under 'COVAX' include allocated, donated, and facilitated through COVAX.

At the beginning of 2021, most countries in the region had received their first shipment of vaccines. The first dose of vaccination was given in India on 16 January 2021, followed by Bangladesh and Nepal which administered the first dose on 27 January 2021, and Sri Lanka on 29 January 2021. Vaccination was commenced in Maldives on 1 February 2021, in Pakistan on 2 February 2021, in Afghanistan on 22 February 2021, and Bhutan on 27 March 2021. These vaccines were manufactured locally in the region. Two of the manufacturers were based in India - Serum Institute of India and Bharat Biotech. Evidently, COVID-19 vaccine geopolitics became a prominent aspect of global affairs as countries, including those in South Asia, engaged in diplomatic maneuvers to secure vaccine doses for their populations, often leading to disparities in access and distribution. This geopolitical competition underscored the complexities of international relations, highlighting the intersection of public health, economic interests, and geopolitical influence on a global scale, including that of India and China in the region. As such, Serum Institute of India was the supplier for the initial vaccine shipment for all countries in the region except Pakistan, which received its first supply from China (Sinopharm) and Russia (Gamaleya Research

[28] UNICEF Supply Division, COVID-19 Market Dashboard. Available at https://www.unicef.org/supply/covid-19-market-dashboard

Institute).[29] Except for Pakistan, India was also one of the top 7 donors of COVID-19 vaccine to these countries. [30]

Maldives, Nepal and Sri Lanka received COVID-19 vaccines from the COVAX Facility in March 2021. The three countries were the first recipients of COVAX vaccines in the region. Subsequently, Pakistan received its first consignment from COVAX in May, Bangladesh in June, and Afghanistan and Bhutan in July.

1.7 COVID-19 vaccination

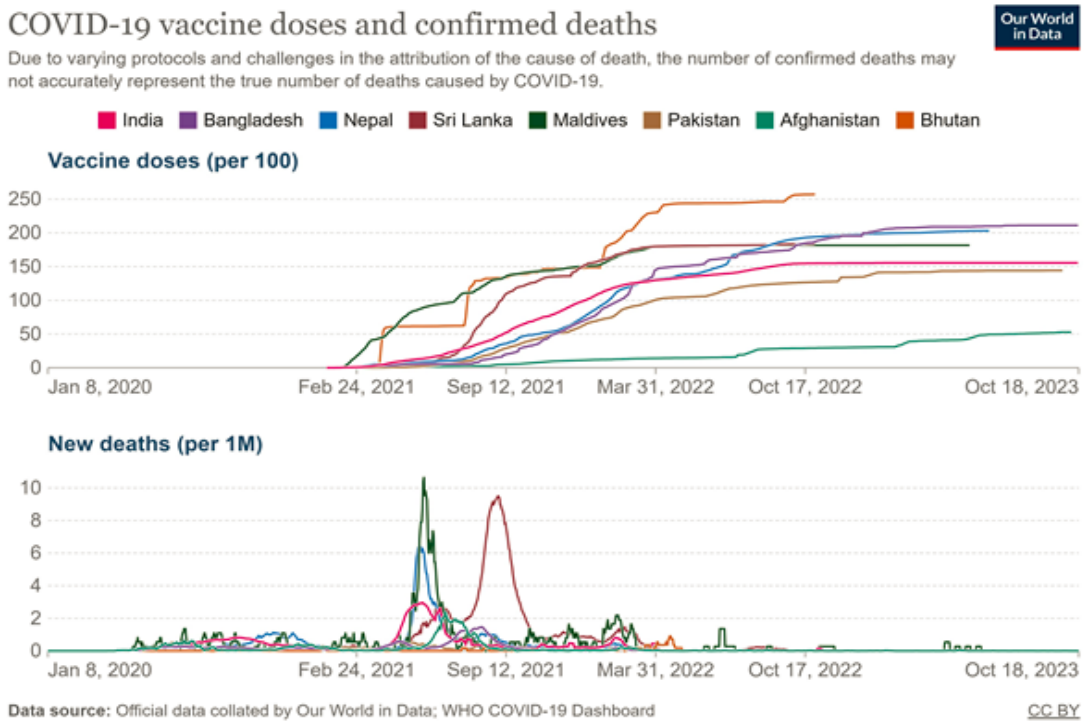
COVID-19 vaccine plays a crucial role in protecting individuals from severe illness and reducing the spread of the virus within communities. By receiving the vaccine, individuals contribute to building herd immunity, and safeguarding not only their health but also that of others, especially those who may be more vulnerable to the virus. It's an essential step toward returning to normalcy and overcoming the challenges posed by the pandemic. As of 7 December 2023, over 13.5 billion doses of COVID-19 vaccine have been administered worldwide, out of which 3 billion (22.24%) were administered in the eight countries in South Asia. **(Appendix 4 and Appendix 5)**

The implementation of COVID-19 vaccination significantly contributed to a reducing the case fatality rate (

Figure 3). Across the South Asian countries, the distribution and execution of COVID-19 vaccines reached a peak between March and September 2021. Following the surge in vaccinations, there was a significant decline in mortality rates within the countries, which underscored the importance of widespread immunization on mitigating the severity of the pandemic.

Figure 3: COVID-19 vaccination and death rates in South Asia.

[29] Hayat M, Uzair M, Ali Syed R, Arshad M, Bashir S. Status of COVID-19 vaccination around South Asia. Hum Vaccine Immunotherapy. 31 Dec 2022;18(1):2016010. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8986190/
[30] UNICEF. COVID-19 Market Dashboard. Retrieved from https://www.unicef.org/supply/covid-19-market-dashboard, and information provided by key informants.



A study by Watson et. al. (2020) assessed the global impact of COVID-19 vaccination programmes in their inaugural year. The study revealed that between 8 December 2020, and 8 December 2021, vaccinations prevented an estimated 14.4 million COVID-19-related deaths across 185 countries and territories. This figure rose to 19.8 million when considering excess deaths as a measure of the pandemic's true scope, translating to a remarkable 63% (19.8 million of the 31.4 million) global reduction in total deaths during this period. Notably, in COVAX AMC countries, approximately 41% (7.4 million of the 17.9 million) of excess mortality was averted. The study also projected the number of lives that would have potentially been saved if vaccine targets set by the COVAX facility and WHO had been met; however, due to vaccine shortages, these targets could not be achieved by the end of 2021. In low-income countries, it was estimated that meeting the 20% vaccination coverage goal set by COVAX could have averted an additional 45% of deaths, while achieving the 40% target set by WHO could have prevented an extra 111% of deaths by the end of 2021.

1.8 Cost of vaccine and vaccine delivery

WHO, Gavi, and UNICEF provided estimates for delivering COVID-19 vaccines in 92 Advance Market Commitment (AMC) countries, initially in 2020 and later revised in 2021.[31] These estimates factored the incremental costs of vaccinating healthcare workers (HCWs),

[31] WHO, Gavi, UNICEF (2021). Costs of delivering COVID-19 vaccine in 92 AMC countries. Available at https://www.corecommitments.unicef.org/kp/covax-delivery-cost.pdf

the elderly, and other priority groups, comprising up to 20% of the population. These delivery costs encompass expenses associated with administering vaccines, excluding supplies (vaccines, syringes and safety boxes). These cost estimates reflect additional health sector expenditures required for vaccine distribution, utilizing existing healthcare infrastructure, with a focus on the public health sector. The costs were estimated at global, regional, and country levels. While most costs were expected to incur at country level during deployment preparations and for administering the vaccine, there were costs associated with activities at global and regional levels for technical assistance; innovations such as smart vaccination certificates, traceability solutions, real-time monitoring, digital micro-planning, digital tools for safety monitoring; pharmacovigilance activities at regional and global levels; and post-introduction evaluations.

A total of two billion vaccine doses were secured for COVAX participating countries for delivery during 2021. Of these, 1,319 million doses are expected to be allocated to the 92 AMC countries, including 50 million doses for a humanitarian buffer and 50 million doses for a contingency buffer. Total financial costs - including country, regional, and global level costs - amounted to US$ 2.018 billion, equivalent to **US$ 1.66 per dose supplied and US$ 3.70 per person vaccinated** [32]with two doses (after accounting for wastage). (***Figure 4***)

- Total, country-level costs of delivering 1,219 million doses were estimated at US$ 1.722 billion (**equivalent to US$ 1.41 per dose supplied and US$ 3.15 per person vaccinated with two doses)**
- Technical Assistance was approximated at US$ 198 million, equivalent to US$ 0.16 per vaccine dose supplied.
- Global and regional level costs amount to approximately US$ 99 million over three years (Approximately $78 million for Innovation, $13 million for post-introduction evaluation, and $7 million for pharmacovigilance)

Figure 4: Costs of COVID-19 vaccine delivery in 92 AMC economies during 2021

[32] The costs per dose supplied was calculated by dividing total costs with total number of doses supplied (1.219 billion doses). The costs per person vaccinated with two doses were estimated by dividing total costs by 546,281,265 people vaccinated. Hence, the number of doses delivered are 1,092,562,529.

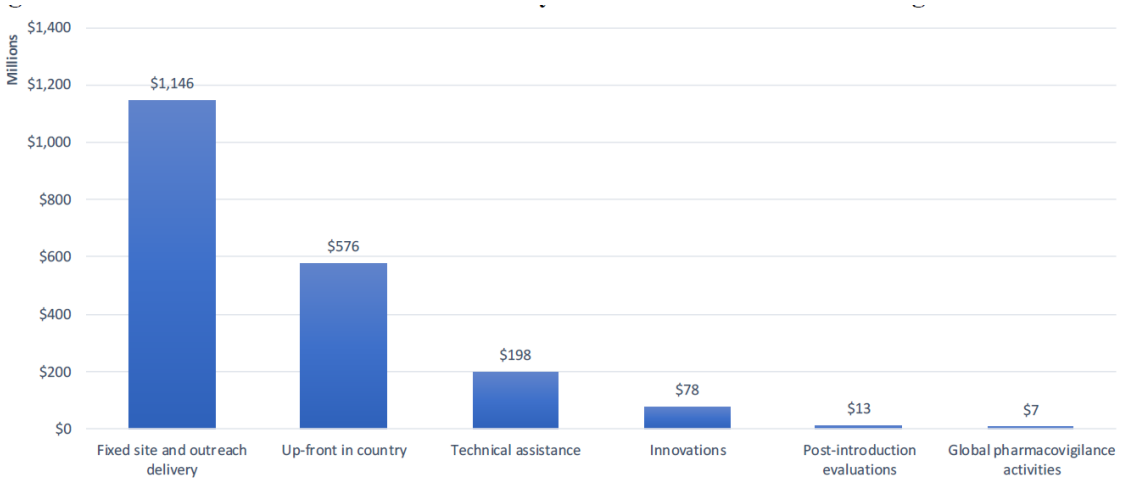


Table 4 presents the price of the various COVID-19 vaccine available in South Asian public and private market and that of COVAX. The price of the same vaccine such as Covishield varied between countries, with the ones procured through COVAX Facility, being the cheapest.

Table 4: Price of COVID-19 vaccine[33]

Vaccine name	Manufacturer (vaccine developer, if differentthan manufacturer)	Country/territory/group	Price per dose
Ad5-nCOV	CanSino Biologicals	Pakistan private market	$ 27.15
BBIBP-CorV	Sinopharm (Beijing)	Bangladesh	$ 10.00
BBIBP-CorV	Sinopharm (Beijing)	Sri Lanka	$ 15.00
Covaxin	Bharat Biotech	Nepal Private Market	$ 35.00
Covishield	Serum Institute of India (Astrazeneca)	Bangladesh	$ 4.00
Covishield	Serum Institute of India (Astrazeneca)	Bangladesh private market	$ 13.27
Covishield	Serum Institute of India (Astrazeneca)	**COVAX AMC**	$ 3.00
Covishield	Serum Institute of India	Maldives	$ 5.25
Covishield	Serum Institute of India	Nepal	$ 4.00
Covishield	Serum Institute of India	Sri Lanka	$ 5.25
Covovax	Serum Institute of India (Novavax)	**COVAX AMC**	$ 3.00
Spikevax	Moderna	**COVAX AMC**	$ 10.00
Spikevax	Moderna	**COVAX AMC**	$ 10.00
Sputnik V	Gamaleya Research Institute	Pakistan private market	$ 27.15

1.9 Vaccine hesitancy

The World Health Organization defines vaccine hesitancy as "delay in acceptance or refusal of vaccination despite availability of vaccination services,"[34] and identified as one of the ten

[33] UNICEF Supply Division, COVID-19 Market Dashboard. Available at https://www.unicef.org/supply/covid-19-market-dashboard

[34] MacDonald, N. E. (2015). Vaccine hesitancy: Definition, scope and determinants. *Vaccine*, *33*(34), 4161-4164.

greatest global health threats.[35] COVID-19 vaccine hesitancy encompasses interconnected areas: concerns surrounding vaccine safety and effectiveness, perceptions of risk, and distrust of governmental and health institutions.

Individuals' fears about COVID-19 vaccine safety often stem from real or hypothetical adverse events and misinformation prevalent on social media. Such misinformation, often linked to influential figures, can reduce people's willingness to get vaccinated. Surveys conducted across lower-middle-income countries in Asia and Africa have shown a negative relationship between vaccine hesitancy and perceived effectiveness. Misperceptions about the severity of COVID-19 and personal infection risk also contribute to vaccine hesitancy. Distrust in healthcare workers, scientific institutions, or health authorities can further hinder vaccine uptake where vaccines are accessible. As such, racial and ethnic minority groups may exhibit hesitancy due to their distrust of health authorities and inequitable representation in vaccine trials. Further, various demographic factors, such as, rural residence, lower income, female gender, lower education, and concerns about vaccine costs, influence vaccine hesitancy.[36] A narrative review aimed at exploring attitudes and behaviours surrounding COVID-19 vaccination in Afghanistan, Pakistan, India, and Bangladesh revealed varying levels of vaccine reluctance, ranging from 6.3% to 56.2%, with an average hesitancy rate of 31.63% across the included studies. [37] In these South Asian countries, limited public awareness about vaccine side effects, concerns about vaccine safety, and scepticism about vaccine efficacy emerged as the primary reasons for the hesitancy.[38] Similarly, a review of studies published between 1 January 2020 and 31 December 2021 found the pooled proportion of COVID-19 vaccine hesitancy across the eight South Asian countries to be 26.5%. Vaccine hesitancy was higher in Afghanistan (37%), Pakistan (33%), and Bangladesh (28.9%). Among the general population, the hesitancy rate was 29% and at the community level 27.9%. Hesitancy during the first 1–12 months since the first outbreak in each country was 27.5%[39]

Between 2020 and 2021, UNICEF conducted various community rapid assessments (CRA) through a time-series approach to provide rapid and consistent data on various social and behavioural aspects related to the pandemic including vaccine acceptance. The CRAs were conducted as multiple standalone surveys (Afghanistan, India, and Pakistan) or integrated in ongoing survey (Nepal Child & Family Tracker Survey). **Appendix 6** presents key findings related to the prevalence of vaccine willingness, reasons against COVID-19 vaccine and

[35] Lazarus, J. V., Ratzan, S. C., Palayew, A., Gostin, L. O., Larson, H. J., Rabin, K., ... & El-Mohandes, A. (2021). A global survey of potential acceptance of a COVID-19 vaccine. *Nature medicine*, *27*(2), 225-228.
[36] Lazarus, J. V., Wyka, K., White, T. M., Picchio, C. A., Rabin, K., Ratzan, S. C., ... & El-Mohandes, A. (2022). Revisiting COVID-19 vaccine hesitancy around the world using data from 23 countries in 2021. *Nature communications*, *13*(1), 3801.
[37] Ennab, F., Qasba, R. K., Uday, U., Priya, P., Qamar, K., Nawaz, F. A., Islam, Z. and Zary, N. (2022). COVID-19 vaccine hesitancy: A narrative review of four South Asian countries. *Frontiers in public health*, *10*, 997884.
[38] Ennab, F., Qasba, R. K., Uday, U., Priya, P., Qamar, K., Nawaz, F. A., Islam, Z. and Zary, N. (2022). COVID-19 vaccine hesitancy: A narrative review of four South Asian countries. *Frontiers in public health*, *10*, 997884.
[39]Islam, M. M., Yunus, Md. Y., Akib, M. S., Iqbal, Md. R., & Khan, M. (2023). *Prevalence of COVID-19 Vaccine Hesitancy in South Asia: A Systematic Review and Meta-Analysis*. *31*, 587–611. https://doi.org/10.25133/JPSSv312023.033

associations with demographic factors and behavioural patterns.[40] Measured in two countries India and Pakistan, the most cited reasons for not being able to get the vaccine included, the vaccine being available too late, ineligibility due to age limits, lack of a nearby vaccination centre, a lack of money to get the vaccine and limited knowledge of the registration system for the vaccine. Among respondents who were not willing to get the vaccine, the most common reason in both countries was a fear of side effects (India: 37% and Pakistan: 37%), a fear that the vaccine was ineffective (India: 15% and Pakistan: 10%), a desire to get 'natural immunity' (India: 9% and Pakistan 17%), and a certain proportion wanted to first 'wait and see how things unfold' (India: 5% and Pakistan: 30%).

1.10 Object of Evaluation – UNICEF's role in COVID-19 vaccine roll-out and uptake

This evaluation assessed the following aspects of UNICEF's role in COVID-19 vaccine roll-out and distribution.

- **Preparedness** for COVID-19 vaccine introduction and uptake: This included leveraging preexisting partnerships and networks, policies and strategies, monitoring and surveillance systems, immunization infrastructure including cold-chain, human resources. As a part of the CRD workstream (**Figure 2**), UNICEF and partners also guided countries readiness assessment through the development of Vaccine Introduction Readiness Assessment Tool.
- Global, regional, national and sub-nation level **policy, planning and coordination** efforts for vaccine procurement and distribution: UNICEF and WHO issued guidance for the development of a national deployment and vaccination plans (NDVP).[41] To obtain vaccines from the COVAX facility, each country developed a national deployment plan in early 2021, which were revised in late 2021/22. UNICEF also engaged in both strategic and operational capacities within the various COVID-19 response working groups in the countries.
- Assisted governments in **vaccine procurement, cold-chain expansion, logistics management and strengthening the overall immunization infrastructure**: UNICEF procured and supplied COVID-19 vaccines and other equipment to South Asian countries in various ways, including through pooled funding initiatives such as COVAX, procurement services for countries (
- ***Figure 5***), and bilateral support such as the Access to COVID-19 Tools Accelerator – Supplies Financing Facility (ACT-A SFF)[42] As the leading procurement agency for vaccines, UNICEF provided vital support for vaccine procurement and delivery, including chartered flights, ground transport and regulatory requirements. UNICEF also worked with manufacturers and partners on procurement, freight, logistics, and

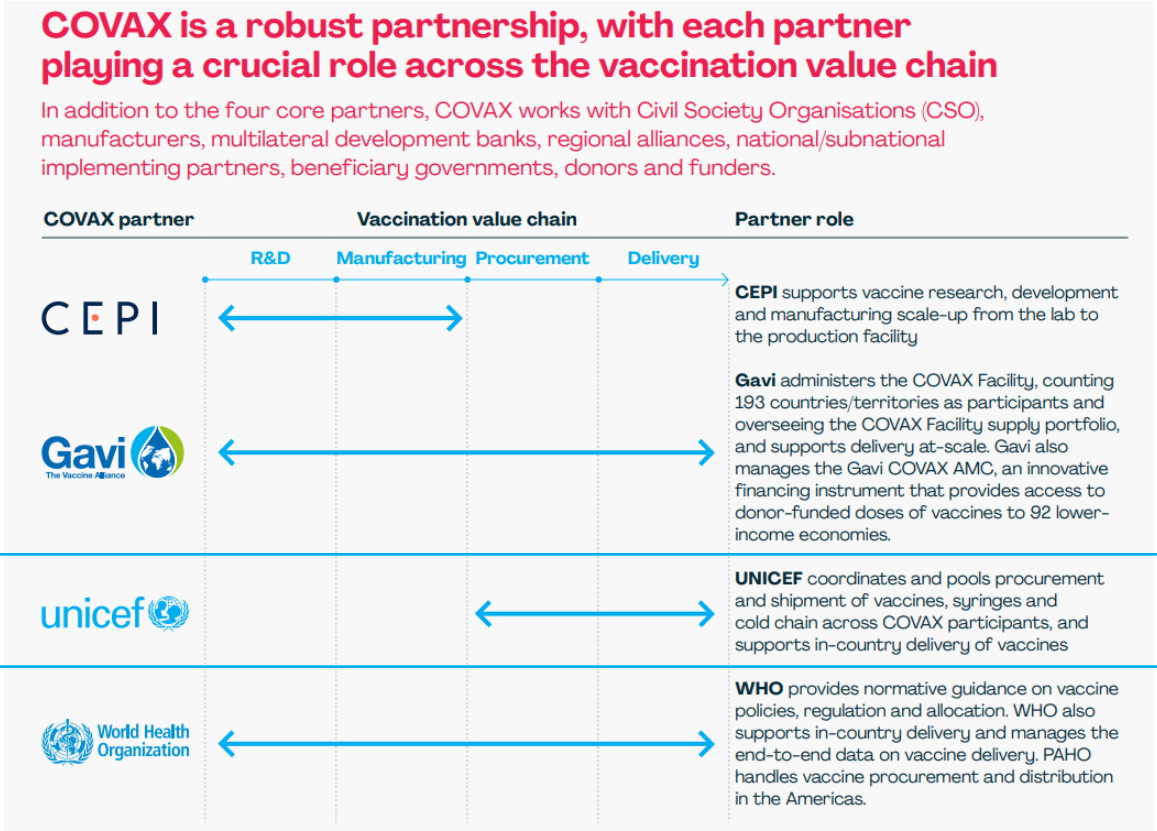
[40] United Nations Children's Fund. COVID-19 Behavioural Drivers and Patterns: A longitudinal assessment from the South Asia region. UNICEF Regional Office for South Asia: Kathmandu, Nepal, 2021.
[41] WHO and UNICEF. Guidance on developing a national deployment and vaccination plan for COVID-19 vaccines. Available at https://www.who.int/publications/i/item/WHO-2019-nCoV-Vaccine-deployment-2021.1-eng
WHO-UNICEF. COVID-19 National Deployment & Vaccination Plan (NDVP), SUBMISSION AND REVIEW PROCESS. 29 January 2021 https://www.who.int/publications/i/item/WHO-2019-nCoV-NDVP-country_plans-2021.1
[42] Responding to the COVID-19 pandemic with life-saving supplies (Supply Division), 2023 https://www.unicef.org/supply/coronavirus-disease-covid-19

storage, despite major disruption to global supply chain.[43] UNICEF country offices were instrumental in strengthening the supply chain including cold-chain expansion, as well as in logistics management information system. UNICEF also supported international sourcing, procurement and delivery of COVID-19 supplies. [44]

- **Service delivery**: UNICEF was actively involved in the delivery of vaccines through vaccine campaigns and outreach services, communication and mobilization strategies, training of health care workers, and delivery of vaccines to the last mile.
- **Demand creation and Risk Communication:** UNICEF implemented various strategies to create demand for COVID-19 vaccines. UNICEF also played a pivotal role in addressing vaccine hesitancy and fostering behaviour change communication to create demand for the vaccine.

Figure 5: Role of UNICEF in COVAX partnership[45]

[43] Bown, C. P. (2022). How COVID -19 Medical Supply Shortages Led to Extraordinary Trade and Industrial Policy. *Asian Economic Policy Review*, *17*(1), 114–135. https://doi.org/10.1111/aepr.12359
[44] UNICEF. (2020) UNICEF to lead procurement and supply of COVID-19 vaccines in world's largest and fastest ever operation of its kind. Available at https://www.unicef.org/press-releases/unicef-lead-procurement-and-supply-covid-19-vaccines-worlds-largest-and-fastest-ever
[45] WHO, GAVI and UNICEF. (2022) COVAX: Structure and principles. Available at https://www.who.int/publications/m/item/covax--structures-and-principles



By December 2021, all countries in South Asia had commenced administering the COVID-19 vaccine, first to high priority population. These vaccines were received either through the COVAX facility or another mechanism, including bilateral arrangements. While the vaccine itself became increasingly available during this period, there were numerous supply issues, delay in supply of doses from COVAX, and lack of devices. Further, as mortality and cases decreased following an increase in demand, perception of risks and severity reduced, leading to lower demand. Vaccine hesitancy and myths also remained in small pockets of the population in the region.[46]

To date, 2.6 billion doses of the COVID vaccine have been distributed in South Asia. Sixty-five per cent of the population in South Asia is fully vaccinated against COVID while 6% have received a booster dose. Seventy-two per cent of the total population in the region has received at least one dose. Four of the eight countries in the region have vaccinated more than 70% of their population. There is growing focus on the integration of COVID-19 vaccination into national immunization programmes by levering the investments made for COVID-19 vaccine rollout.

[46] COVID-19 Behavioural Drivers and Patterns: A longitudinal assessment from the South Asia region Findings from Afghanistan, India, Nepal and Pakistan November 2021; ROSA.

1.11 Linkages to SDG

The COVID-19 pandemic had a significant negative impact on the progress towards achieving the Sustainable Development Goals (SDGs).[47] Healthcare systems faced unprecedented challenges worldwide, overwhelming hospitals and healthcare facilities. The rapid spread of the virus posed severe constraints on medical resources and healthcare professionals and diverted resources away from other critical health issues. Additionally, disruptions in routine health services including essential immunisation services put vulnerable populations, especially children and pregnant women, at risk of preventable diseases. The pandemic hindered efforts to provide universal access to quality healthcare services and impacted targets specific to **SDG Goal 3 to ensure healthy lives and promote well-being for all at all ages**.

UNICEF's response in rollout and distribution of COVID-19 vaccines bolstered immunization efforts. It helped ensure equitable vaccine distribution and mitigate the pandemic's impact on global health systems. Efforts aimed at vaccinating populations worldwide have been instrumental in safeguarding public health, reducing COVID-19 transmission, and fostering progress toward achieving universal health coverage.

1.12 Intended use and users of the evaluation

The primary audience of this evaluation encompasses the UNICEF Regional Office for South Asia, the seven country offices in the region, and the respective government's health and emergency preparedness departments. The aim is to utilize the findings and recommendations to enhance emergency preparedness strategies, particularly in immunization against infectious diseases during public health crises, and to adopt a comprehensive systems approach to integrate COVID-19 vaccines into routine immunization. This evaluation is also aimed at local and international development partners as well as implementing agencies.

Insights gained from this evaluation can shape strategic planning, policy development, and implementation efforts in crucial ways. Further, recommendations derived from this evaluation can guide ongoing COVID-19 vaccination initiatives and help in identifying communities that still face challenges in accessing vaccines. Such communities need special attention in the recovery phase to prevent their further marginalization. Ultimately, the evaluation strives to make preparedness and response strategies more effective and inclusive, ultimately contributing to improved outcomes during future public health emergencies.

Chapter 2: Purpose, objectives, and scope

2.1 Purpose and rationale

UNICEF is accountable for designing and implementing programmes that meet the standards of excellence. The evaluation will promote accountability by providing an independent assessment of UNICEF's role in addressing the needs of COVID-19 vaccine. Using COVID-19 vaccine rollout and distribution as a case study, the evaluation provides findings, lessons learned and recommendations that will inform programme design/positioning and support managerial decision making at the country office level during public health emergencies. This evaluation seeks to foster organizational learning about what works and does not work during public health emergencies, especially with respect to new vaccine rollout and distribution, and provide a set of recommendations on how to deal with future public health and other emergencies.[48]

Rationale[49]: There is considerable evidence on the COVID-19 burden and impact in the region. In the past two years, UNICEF ROSA has conducted a real-time assessment (RTA) of UNICEF's COVID-19 response in South Asia as well as country-specific evaluation of COVID-19 related efforts and programme. However, to date there has been no region wide evaluation examining UNICEF's role on COVID-19 vaccine roll-out and distribution. Most importantly, questions remain regarding the extent to which the large infusion of funding during COVID-19 has led to sustainable system building in health/primary health care, social and behaviour change and immunization among others. This evaluation focuses on UNICEF's role in the introduction, roll out and distribution of the COVID-19 vaccine including roll out among children in South Asia.

Further, new waves of the COVID-19 demonstrate that the pandemic is not over yet and still remains a risk to various population such as frontline workers and those with comorbidities. There is growing focus on the integration of COVID-19 vaccination into national programmes. The ongoing COVID-19 pandemic also underscores the need to leverage investments for COVID-19 vaccine rollout for strengthening health and public health systems.

2.2 Objective

The specific objectives[50] of the evaluation are as follows:

- Assess the support and contribution that UNICEF provided to countries in the rollout of the COVID-19 vaccine, including rollout among children
- Assess the extent to which UNICEF's efforts in the rollout of the COVID-19 vaccine have contributed to system building around supply chain, risk behaviour communication and other relevant areas.
- Document the effects of the COVID-19 vaccine on the health system of selected countries.

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[48] Based on the Terms of Reference (*Appendix 7*)
[49] Based on the Terms of Reference (*Appendix 7)*
[50] Based on the Terms of Reference (*Appendix 7)*

- Document early experiences and lessons learned from efforts to integrate COVID-19 vaccination in routine immunization in selected countries.
- Document challenges, bottlenecks and lessons learned and provide recommendations for UNICEFs response/positioning around similar emergencies.

2.3 Evaluation Scope

Programmatic scope

This evaluation examined UNICEF's efforts related to rollout and distribution of COVID-19 vaccine including rollout among children in South Asia. It examined UNICEF's role in all aspects of vaccine deployment and uptake in the region, namely:

1. Preparedness
2. Policy, planning and coordination
3. Service delivery including health human resources and duty of care elements
4. Vaccine, cold chain, logistics and infrastructure
5. Demand generation and risk communication

The evaluation also examined early experiences as well as opportunities and challenges in the integration of COVID-19 vaccination into national immunization programmes.

Of note, a separate but coordinated team of consultants assessed UNICEF's overall COVID-19 response including all aspects of the response. Therefore, response efforts related to other UNICEF sectors and programmes are beyond the scope of this evaluation.

Geographic coverage: This evaluation covers UNICEF's response efforts related to the rollout and distribution of COVID-19 vaccine in seven South Asian countries – Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan, and Sri Lanka. India, the largest country in South Asia, just concluded a country-level assessment of COVID-19 response and is therefore included this evaluation[51].

Timeframe: The evaluation examined activities carried out between August 2020 to December 2022. Although COVID-19 vaccine introduction did not start in the region until the first quarter of 2021, planning and preparation for the vaccine started as early as 2020.

Relationship to other evidence-generating activities[52]: The assessment is designed to complement other data collection efforts, such as, the monitoring of Humanitarian Performance Monitoring (HPM) indicators. One of its objectives of this evaluation is to identify and fill gaps in ongoing evidence gathering efforts. This will require staying abreast of the findings from numerous rapid assessments, reviewing HPM and Results Assessment Module (RAM) indicators, reading field communications and reports, and asking questions

[51] UNICEF India (2022). Real-Time Evaluation of UNICEF's Response to the COVID-19 Crisis in India
[52] Based on the Terms of Reference (*Appendix 7*)

to further understand the reported findings or to fill a gap where no information about a programmatic response exists.

Chapter 3: Evaluation design and methodology

3.1 Evaluation design

The evaluation used a non-experimental design with mixed methods approach, combining both quantitative and qualitative data to address the evaluation questions. The data collection process is explained in section 3.2 below.

The evaluation was based on criteria established by the Organization for Economic Cooperation and Development (OECD) Development Assistance Committee (DAC): coherence, relevance, efficiency, effectiveness, and sustainability.

The criteria are defined by OECD-DAC[53] as follows:

1. Coherence: The compatibility of the intervention with other interventions in a country, sector or institution.
2. Relevance: The extent to which the intervention objectives and design respond to beneficiaries, global, country, and partner/institution needs, policies, and priorities, and continue to do so if circumstances change.
3. Efficiency: The extent to which the intervention delivers, or is likely to deliver, results in an economic and timely way. (This evaluation assessed 'efficiency' only in terms of timely delivery of vaccines because the economic impacts of the response were beyond the scope of the evaluation)
4. Effectiveness: The extent to which the intervention achieved, or is expected to achieve, its objectives and results, including any differential results across groups.
5. Sustainability: The extent to which the net benefits of the intervention continue or are likely to continue.

As it is early to assess the impact of COVID-19 vaccine roll out and distribution, 'impact'[54] was not assessed in this evaluation.

The following criterion were used to evaluate cross cutting issues of gender, equity and human rights.

1. Cross-cutting issues
   1.1. Equity: The basic fairness of the processes and outcomes of decision making. This implies that all children and marginalized communities have an opportunity to

[53] OECD (2019). Evaluation Criteria. Available at https://www.oecd.org/dac/evaluation/revised-evaluation-criteria-dec-2019.pdf

[54] Impact is defined as "The extent to which the intervention has generated or is expected to generate significant positive or negative, intended or unintended, higher-level effects."

survive, develop and reach their full potential, without being subjected to discrimination, bias, or favouritism.[55]

1.2. Gender equality: Gender equality is the "concept that women and men, girls and boys have equal conditions, treatment, and opportunities for realizing their full potential, human rights and dignity, and for contributing to (and benefitting from) economic, social, cultural and political development." [56]

1.3. Human rights-based approaches (HRBAP): Five core principles of the HRBAP are normativity, non-discrimination, participation, transparency, and accountability.[57]

A theory of change (ToC) was not constructed for this evaluation given it is not a theory-based evaluation. Further, this evaluation will not look at attribution but contribution of UNICEF's work.

3.2 Evaluation matrix and questions

Based on the scope, key evaluation questions were framed to address the purpose and objective of the evaluation. **Table 5** presents the evaluation matrix along with the evaluation questions and sub-questions. Relevant indicators and data sources used to address the evaluation questions are outlined in **Appendix 8**

Table 5: Evaluation questions on COVID-19 vaccine roll out and distribution in South Asia

Evaluation criteria	Evaluation questions
Preparedness How well did UNICEF leverage its pre-existing immunization related policies, programmes, networks, and infrastructure for COVID-19 vaccine rollout and distribution?	1. How and in what ways did UNICEF prepare for COVID-19 vaccination support? 2. What infrastructure was developed by governments to support the COVID-19 response? 3. Did UNICEF country offices have the capacity and bandwidth to provide the necessary support to ensure timely and equitable distribution of the COVID-19 vaccine? 4. How did the government leverage existing vaccination mechanisms to set up and roll out the COVID-19 vaccine? 5. How did government departments adhere to the public health emergency plans created prior to the COVID-19 pandemic? How did they make use of existing vaccination plans?
Coherence How coherent and well-coordinated were the response efforts between internal UNICEF	6. How did global developments, policies and mechanisms affect the rollout and distribution of COVID-19 vaccine? 7. What approaches (push or pull) did UNICEF-supported countries in South Asia use to distribute the vaccine and how

[55] UNICEF (2015) For every child, The promise of equity. Available at https://www.unicef.org/media/50421/file/For_every_child_a_fair_chance-ENG.pdf

[56] UNICEF ROSA. (2017). Gender equality: Glossary of Terms and Concepts. https://www.unicef.org/rosa/media/1761/file/Gender%20glossary%20of%20terms%20and %20concepts%20.pdf

[57] UNICEF. (2012). Global Evaluation of the Application of the Human Rights-based Approach to UNICEF Programming, Final Report – Volume I. UNICEF, New York, 2012.

departments and external partners, and how were they aligned with government policies related to COVID-19 vaccine rollout and distribution?	did UNICEF prepare and/or support these countries to implement the approaches? 8. Which government mechanisms supported or hindered COVID-19 vaccine delivery?
Relevance How well did UNICEF address the needs of the country and communities related to COVID-19 vaccine rollout and distribution?	9. In what ways did UNICEF's efforts around the vaccine ensure that the supply of the vaccine met the needs (demand) and how did UNICEF work with the COVAX facility and governments to ensure that needs were met including needs for accompanying commodities? 10. How did each government utilize the COVAX facility and other bilateral and existing arrangements for the COVID-19 vaccine?
Efficiency and effectiveness How well did UNICEF ensure that COVID-19 vaccines were made available in countries and distributed in communities in a timely, effective, and equitable manner to achieve the objectives and results, including any differential results across groups?	11. To what extent and how did UNICEF prepare governments to ensure timely and equitable distribution of the COVID-19 vaccine in the region? 12. What specific role(s) did UNICEF play in ensuring timely availability and effective distribution of the COVID-19 vaccine including creating an enabling and supportive environment and infrastructure? 13. What were the achievements (or lack thereof) of UNICEF's vaccine distribution efforts in different countries in the region? 14. To what extent did UNICEF-supported efforts leverage existing structures to ensure equitable distribution of the COVID-19 vaccine, including hard-to-reach/missed and marginalized adults and children in the region?
Gender, human rights and equity In its vaccine rollout and distribution efforts, how well did UNICEF uphold its key commitments, including those related to gender equality and the empowerment of women and girls, disability, age, and human rights?	15. To what extent was gender integrated in all aspects of the response? 16. To what extent did the response give special focus to adolescent girls? 17. To what extent was UNICEF able to support networks of women and youth and social and community platforms to become inclusive so that women and girls could meaningfully participate? 18. To what extent was UNICEF able to dialogue with host governments on issues related to gender equality, disability and human rights, and plan joint response? 19. To what extent was gender and disability disaggregated data available, analysed and acted upon to support vaccine rollout? 20. To what extent did the response pay special attention to care for caregivers?
Sustainability How well did UNICEF's vaccine rollout and distribution efforts contribute to strengthening existing immunization systems?	21. In what ways did UNICEF's efforts in the procurement, storage, promotion, and distribution of COVID-19 enhance/ build systems relevant to immunization including those around health work force, supply chain, infrastructure, financing, information, service delivery, and leadership and governance? 22. What role did UNICEF play in strengthening COVID-19 vaccine management systems at the facility/hospital level?

How well and to what extent has UNICEF supported the integration of COVID-19 vaccine with routine immunization?	**Integration of COVID-19 vaccine in routine immunization** 23. To what extent is UNICEF supporting governments to integrate COVID-19 vaccine with routine immunization and leverage COVID-19 investments for system strengthening? 24. What integration models are being used/proposed to integrate COVID-19 vaccination into routine immunization and at what levels is integration being pursued? 25. What entry points including service delivery points are available in countries that have not begun integration of the COVID-19 vaccine in routine immunization for both adults and children? 26. What are the anticipated effects (both negative and positive) of this integration on the delivery of the COVID-19 vaccine and other vaccinations?

Based on the findings, the evaluation addressed the following questions regarding lessons learned from UNICEF's role in COVID-19 vaccine roll-out and distribution and recommendations for better response to future public health emergencies:

i. What are the lessons learned from the COVID experience in South Asia on how to prepare for future public emergencies?
ii. What are the challenges and early lessons learned from UNICEF-supported efforts to integrate COVID-19 vaccination in other ongoing immunization campaigns?
iii. How can UNICEF work with governments to prepare them for other public health emergencies?
iv. How can UNICEF use its support during COVID-19 to further position itself including positioning itself on any new vaccination/immunization efforts as well as positioning for subsequent public health emergencies in line with its mandate?
v. What can the global community do to ensure the availability of vaccines in countries like those in South Asia that may not have the capacity to purchase new vaccines during an emergency?

3.3 Methodology

This mixed method evaluation took a blended approach with three methods of data collection: literature review, online perception survey (PS) and virtually conducted semi-structured key informant interviews (KII). The research methods for each of the three components including sampling strategy, data collection tools and sample size have been described in this section.

3.3.1 Literature review

The evaluation team did a comprehensive desk review of key UNICEF publications on the organization's regional and country-wise response to COVID-19. Publications included country response plans, sector strategies, annual reports, situational reports, monitoring and evaluation reports, national surveys, real-time assessments, and other supporting documents like policy, planning and monitoring plans, and strategic frameworks. These

documents were sourced through the UNICEF regional and country offices and from the UNICEF website. Some documents were obtained from the health ministries of countries in the region, development partners, research organizations, and independent researchers. In addition, some online sources retrieved through a grey literature search conducted by the consultants were also reviewed. Additionally, quantitative data from UNICEF's administrative and reporting data including COVID-19 specific dashboards and WHO's COVID-19 specific database for COVID-19 data also informed the evaluation. A complete list of the documents reviewed is provided in **Appendix 9.**

The desk review was the first step in the data collection process, and it continued until the analysis phase (December 2023). The review covered publications and grey literature published or posted until the analysis phase. The desk review helped the team assess the situational context of COVID-19 in South Asia and its impact on vulnerable populations, communities, governments, and systems. The purpose of the desk review was to generate evidence on documentation, policy matters, guidelines, and standard operating procedures (SOPs). The desk review also provided a historical perspective on vaccine rollout and distribution and shed light on UNICEF's response efforts such as the provision of vaccination services, capacity building of human resources, and immunization system strengthening, as well as ongoing efforts to integrate COVID-19 vaccination in routine immunization. Most importantly, the desk review provided a basis for identifying key findings and lessons learned (based on the evaluation matrix presented in **Table 5**) and was also used to develop the questionnaire for the perception survey and KIIs. Findings from the literature review were validated during key informant interviews. Perceptions and experiences related to the findings were also gathered from key informants.

3.3.2 Stakeholder mapping for perception survey and key informant interviews

Relevant stakeholders were identified from the cohort of individuals involved in COVID-19 vaccine roll out and distribution supported by UNICEF in South Asia (**Table 6**). This was done in close coordination with relevant focal persons from UNICEF country offices in the region as well as relevant sections in UNICEF ROSA. Each CO and the RO provided a list of all the relevant stakeholders, including CSO implementing partners, government stakeholders, UN partners, and UNICEF staff from the CO and RO who were involved in vaccine rollout and distribution in the seven selected countries in South Asian (Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan, and Sri Lanka).

Table 6: Stakeholder and role

Stakeholder Cohorts	Stakeholders	Role in COVID-19 response
CSO implementing partners	INGOs, national and local level NGOs, and CBOs	- Implementation of response efforts - Monitoring of response efforts
Government stakeholders	National/federal, province and district level ministries related to health, education, social development, women and children, as well as local government bodies	- Duty bearers - Decision-makers - Strategic planning - Funding - Coordination and implementation
UN Partners	WHO, UNDP, WFP, World Bank, ADB, Gavi	- Advocacy - Funding

		- Strategic planning - Coordination
UNICEF staff	Regional Office for South Asia and country offices (Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan, and Sri Lanka)	- Advocacy - Funding - Strategic planning - Technical support - Coordination - Monitoring and evaluation of programme implementation

3.4 Sampling and data collection

3.4.1 Sampling strategy

Key informant interview: An inclusive and representative sample of partners and UNICEF staff was created using a stratified purposive sampling method. and was meant to be inclusive of the various stakeholder cohorts, relevant sectors including cross-cutting sectors and countries. The sample size was determined in consultation with UNICEF COs and ROSA. The sample ensured representation from each of the stakeholder cohorts (**Table 6**) relevant sectors including cross-cutting sectors such as health and social and behavioural change (SBC), and both males and females. There was representation from each of the seven selected countries in South Asia: Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan, and Sri Lanka. Further, participants were selected through referrals provided by informants during the KII, in order to gather further insights and broaden the scope of information gathered (snowball sampling). When available, more than one respondent from the same organization or department was allowed to participate in the KIIs. The sample also represented UNICEF staff members, other UN agencies, government, and CSO partners.

Perception survey: All selected stakeholders except for those identified for the key informant interviews were asked to complete an online perception survey. The stakeholder list was compiled by UNICEF staff from the seven COs and the Regional Office. The staff made their selection based on their experience working with the stakeholders during the pandemic.

3.4.2 Data collection tools

Perception Survey: The perception survey was designed to gather perspectives on UNICEF's COVID-19 vaccine roll out and distribution efforts. Quantitative and qualitative data were collected through close-ended and open-ended questions respectively. The close-ended questions included multiple choice answers that respondents could select from a 5-point Likert scale that allowed them to rate their agreement with the statement about various indicators identified in the evaluation matrix **(Appendix 8).** Open-ended questions allowed respondents to elaborate on their assessment, and provide examples of best practices, challenges and lessons learned. Demographic (gender, location, etc.) and data on areas of programmatic focus were also collected. The perception survey questionnaire is presented in **Appendix 10.** The perception survey was divided into two parts. The first part was specific to UNICEF's overall response to the COVID-19 pandemic (across sectors) and the second covered COVID-19 vaccine rollout and distribution. While respondents' views on COVID-19 vaccine rollout and distribution informed this evaluation,

some insights were also drawn from their views on UNICEF's overall response to the pandemic.

Key informant interview: The purpose of the KIIs was to gain an in-depth understanding of respondent's perspectives and attitudes, which could not be obtained through the perception survey or the desk review. Semi-structured interviews were conducted virtually between March 2023 and 09 June 2023. Interview questions were designed, according to the evaluation matrix **(Appendix 8)** to draw insights on the best practices, challenges and lessons learned regarding UNICEF's COVID-19 vaccine roll-out and distribution efforts, and related immunization system strengthening efforts, and the integration of COVID-19 vaccine in routine immunization. Based on their experience and expertise, KIs were asked to provide recommendations on how UNICEF could support immunization-specific preparedness and build resilience for future public health emergencies. The consultant conducting the KIIs customized the questions based on the KI's programme area of focus, country/region of operation, and the stakeholder cohort they represented. An overview of the scope, purpose of the evaluation and key evaluation questions were sent to KIs via email prior to the KIIs. The semi-structured key informant interview guide/checklist is presented in **Appendix 11**.

3.4.3 Sample size

Perception survey: The online survey was sent to **262** individuals on 17 April 2023 via email. Respondents were asked to complete the survey within two weeks. Multiple follow-up emails were sent encouraging them to complete the survey. The survey deadline was extended to 31 May 2023. A total of **80** respondents completed the survey by 31 May 2023, with a response rate of only **30.5%** despite multiple follow-ups and extension of the deadline. However, a smaller number **(17, 6.5%)** responded to questions specific to COVID-19 vaccine rollout and distribution. Of the 17, majority were male (88%), and from Afghanistan (41%), and represented national NGO/CSO implementing partner cohort (59%). Since the survey was sent out to all stakeholders engaged in UNICEF's COVID-19 response, efforts to ensure equal gender representation was not deemed necessary. The lower number of female respondents could possibly be attributed to the fact that fewer females were engaged in the response effort; however, it should be noted that this evaluation did not thoroughly assess the actual involvement of females (versus male) in the response effort.

Key informant interview: Forty-nine individual or group key informant interviews (KIIs) were conducted with 70 KIs. Almost 66% (46 out of 70) of the key informant interview participants were from UNICEF country offices and the regional office. Government stakeholders and CSO implementing partners made up 21% and 10% of the KII participants respectively. Overall, the KII had more female representation (43%) compared to the perception survey respondents (8%). A smaller proportion of KII respondents were from Sri Lanka (6%) and Bhutan (10%).

Table 7 provides an overview of the sample of perception survey respondents and key informant interview participants for each country, and stakeholder cohorts. **Appendix 12** provides gender and country representation of perception survey respondents and key informant interview participants.

Although surveying or interviewing children and communities was outside the scope of the evaluation, questions in the perception survey and the KIIs were geared towards understanding how the response efforts impacted children and communities, particularly those most vulnerable, and if the response efforts remained accountable to these key stakeholders. Further, the desk review allowed the evaluation team to gather the perceptions of the communities regarding the quality of response and its impact.

Table 7: Key informant interviews participants and perception survey respondents from each country

Country / Stakeholder cohort	Total no of respondent (Perception survey and KI)	No. of perception survey respondents (For questions specific to COVID-19 vaccines roll out and distribution)	No. of KII participants	Programme areas
Afghanistan				
Government stakeholder	14	7	1	Health
UNICEF staff			6	Deputy representative, operations, health, immunization, supply
Bangladesh				
CSO implementing partner	10	1	2	Behaviours change/risk communication
UNICEF staff			7	Deputy representative, health, SBC
Bhutan				
UNICEF staff	9	2	7	Deputy representative, health, SBC, cold chain, supply
Maldives				
Government stakeholder	11	1	6	Health, nutrition, maternal, reproductive, newborn, child and adolescent health, planning, quality assurance, EPI, public health, health promotion
UNICEF staff			4	Deputy representative, health, and SBC
Nepal				
CSO implementing partner	14	3	1	Health/SBC
Government stakeholder			2	Health, Emergency
UNICEF staff			8	Deputy representative, health, SBC, immunization, and supply
Pakistan				
CSO implementing partner	16	2	4	Health
Government stakeholder			6	Health and immunization
UNICEF staff			4	Deputy representative, health, SBC and supply
Sri Lanka				

UNICEF staff	5	1	4	Deputy representative, health, emergency, supply
UNICEF ROSA				
UN partner	8	NA	2	Health
UNICEF staff			6	Health system strengthening, oxygen services, data analyst, emergency, gender

3.5 Data analysis

Responses to the close-ended questions in the perception survey were analysed based on the distribution of the response across the multiple-choice questions and the 5-point Likert scale. A comparative chart was used to compare the percentage of choices selected (multiple choice) and agreement with each of the five options on the scale for each domain of the response. These findings are presented separately from the open-ended questions of the perception survey. The findings from open-ended questions are presented alongside the findings from the key informant interviews and the literature review.

A 'thematic analysis' was conducted to analyse the qualitative data from the perception survey and the narrative and insights provided by the KIIs. The data was examined to identify common themes – topics, ideas, and patterns of meaning that came up repeatedly. Both inductive and deductive approach was used to identify the themes. Primarily, a set of pre-determined themes, as identified in this evaluation framework was used to sort out the themes (deductive approach). These themes and relevant indicators **(Appendix 8)** relate to (but are not limited to) preparedness, policy, planning and coordination, service delivery including health human resources and duty of care elements, vaccine, cold chain, logistics and infrastructure, and demand generation and risk communication, as well as integration of COVID-19 vaccination in routine immunization, and the extent to which UNICEF contributed to immunization system strengthening through its response to COVID-19. However, if any other theme outside the framework emerged, it was also presented (inductive approach). This gave the evaluation team the flexibility to conduct systematic analysis using an existing framework for analysis while also enabling them to identify topics that were relevant but not included in the evaluation framework. The analysis took a semantic approach to identifying the themes, that is, only the explicit content of the data was taken into consideration. The team did not use a latent approach to thematic analysis, which involves reading into the subtext and assumptions underlying the data. The data analysis process followed the six steps of thematic analysis developed by Braun and Clarke:[58] data familiarization; data coding; generating themes; reviewing themes; defining and naming themes; and writing up. Further details on activities for each step are provided in **Appendix 13**. The thematic analysis allowed the team to gain a detailed picture of the respondents' perceptions and experiences with respect to UNICEF's efforts to address a novel, complex and evolving health emergency. Further, it gave the evaluation team the

[58] Braun, Virginia & Clarke, Victoria. (2019). *Thematic analysis: Handbook of research methods in health social sciences*. Springer, New Jersey, 843–860.

flexibility to define predetermined themes to frame the discussion as well as the opportunity to explore emerging themes.

3.5.1 Data triangulation

Quantitative and qualitative data gathered from the perception survey and KIIs were triangulated with the findings of the literature review and relevant databases. Findings of the literature review were used to formulate the perception survey and KII questionnaires as well as to elaborate on and customize the KII questions for stakeholders from various sectors and countries. This allowed the evaluation team to contextualize the perceptions and experiences shared by KII respondents.

To sum up, this evaluation comprises a review and analysis of UNICEF's role in COVID-19 vaccine rollout and distribution in South Asia. It highlights the weaknesses and strengths of UNICEF's efforts, lessons learned, best practices, and existing gaps in immunization efforts. Based on these findings, the report provides insights and makes recommendations for improving pandemic preparedness, ensuring vulnerable populations' access to immunization, and strengthening the system for responding effectively to future pandemics.

The draft findings, lessons learned, and recommendations were presented at a meeting held in December 2023. Staff members from UNICEF country offices in South Asia and ROSA participated in the meeting to share their reflections and insights on the findings and recommendations, and as well as any additional insights to contextualize the findings. These insights are presented in the respective sections throughout this report.

3.6 Gender, disability, equity and human rights

In March 2020, UNICEF released technical guidance on how to address gender in COVID-19 response. The guidance emphasized the following five core programmatic and advocacy actions: i) providing care for caregivers; (ii) preparing for increased gender-based violence cases; (iii) maintaining core health and education services and systems; (iv) engaging with existing women and youth rights networks to support connectivity and vital information flow (socio-economic impact), and (v) ensuring that gender data are available, analysed and actionable, and gathered from the vulnerable populations or their representatives. [59]

Where available, the evaluation focuses on how gender aspects were integrated in the response, and the gender-specific impact (in terms of effectiveness) of UNICEF's COVID-19 vaccine rollout and distribution efforts in South Asia. In addition, the evaluation looks at how UNICEF addressed marginalization, disability, equity, and human rights during vaccine rollout and distribution and whether disaggregated data were collected to inform policies.

[59] Five actions for gender equality in the COVID-19 response: UNICEF technical note. https://www.unicef.org/documents/five-actions-gender-equality-coronavirus-disease-covid-19-response-technical-note

3.7 Quality assurance mechanisms

The evaluation team put in place robust quality assurance mechanisms to ensure the quality and relevance of the evaluation deliverables. This evaluation was carried out by a team of four external consultants. They were specialists in the areas of logistics and supply chain, immunization, monitoring, and evaluation. Internally, the four evaluators held regular meetings and consultations to share their findings from the three sources of data (literature review, perception survey, and key informant interviews), and to write and revise the report as per feedback received. In addition, the consultant who worked on the UNICEF's overall response worked on the report to ensure that synergies across the two pillars of work are adequately reflected in the report.

An initial inception meeting with the ROSA evaluation team was held to define the scope of work and build a common understanding of the deliverables and timelines. The evaluation kicked off with a meeting with the ROSA health team, who gave a detailed presentation on UNICEF's past and ongoing efforts in COVID-19 vaccine rollout and distribution, integration with routine immunization in South Asia, and related challenges and lessons learned. The ROSA evaluation team remained involved in an advisory capacity to help identify sample respondents for the perception survey and KIIs, design and implement data collection tools, and draft the final report. Further, representatives from each country office helped in identifying relevant stakeholders for the perception survey and KII. The evaluation consultants held weekly touch point meetings to ensure the timeliness and quality of data collection and the final report. The evaluation team regularly met with the evaluation manager at ROSA to assess progress and ensure that all key questions in the TOR were adequately addressed and that the report was in line with the UNICEF evaluation report standards.

Two validation exercises also ensured the relevance and accuracy of the report. These included the presentation of preliminary findings at the Regional Health Network Meeting (May 2023) and a joint dissemination meeting held in December 2023 where findings from the current evaluation and from the evaluation of UNICEF's overall response to the COVID-19 pandemic were presented to UNICEF staff from all programme areas.

3.8 Risks and mitigation

- The key risk for this evaluation was related to the availability of key informants during the stipulated data collection period, which was limited to one month initially. To mitigate the risk of low participation, the perception survey deadline was extended by a month. The KII, which was initially scheduled to be completed by the end of April, was extended to June 14 to accommodate the availability of key informants.
- Given the short timeline, follow-up interviews were not feasible. However, the evaluation triangulated the findings from the perception survey, KIIs and literature review to corroborate the data gathered through various sources and methods.

3.9 Ethical considerations

The evaluation was guided by the 'norms and standards' and the 'ethical guidelines for evaluation' developed by the United Nations Evaluation Group (UNEG).[60] The evaluators followed the principles of beneficence, respect, justice, integrity, and accountability, as outlined in UNICEF Procedure on Ethical Standards in Research, Evaluation, Data Collection and Analysis.

The evaluation was conducted by four consultants, who maintained the independence and impartiality of the evaluation. Participation in the perception survey and KIIs was voluntary, and it was clearly communicated to potential respondents that non-participation would not result in any consequences. Before starting a key informant interview, the researcher explained the purpose and independence of the review to interviewees, informed them that confidentiality would be maintained, and obtained their consent. Similarly, respondents of the perception survey were informed that their confidentiality would be maintained and no direct reference to them would be made in the report. Therefore, identifying details of survey respondents and KII participants are not included in the report. People had the opportunity to opt out of the perception survey or the KIIs without any consequences. Consent was sought for the recording of the interviews from all KII participants. Recorded interviews were saved as password-protected files and only accessible to the evaluators. All KIIs and perception surveys were conducted remotely, which suited the respondents at the time.

No data was collected from children and therefore no ethical clearance was sought.

3.10 Limitations

It was challenging to gather participants for the KIIs and obtain interviews with some respondents. Similarly, the perception survey received limited response, particularly in the vaccine-related section of the questionnaire. However, these constraints did not substantially influence the evaluation outcomes. Despite difficulties, the evaluation team was able to gather sufficient overall sample from each country, achieving a level of response saturation. Furthermore, as the perception survey aimed to estimate the burden of disease or events rather than conduct hypothesis testing, it was expected that the limited response would not significantly impact the research findings.

While the mixed-methods approach is a robust design for evaluation, this study encountered limitations in sample size. The evaluation team had to use purposive sampling for KII respondent selection instead of more robust strategies like simple random or systematic sampling with a random start. Due to time constraints and challenges in gathering respondents from the intended sampling frame, the evaluation team conducted pilot testing of the instruments among consultants to review sensitive questions and assess the questionnaire/KII flow before implementation.

[60] United Nations Evaluation Group. (2016). Norms and standards for evaluation. available at https://www.oecd.org/dac/evaluation/revised-evaluation-criteria-dec-2019.pdf

The perception survey and key informant interviews were conducted online, which eliminated the ability of the researcher to pick up non-verbal cues that might have provided interesting insights. Additionally, some of the answers might reflect participants' bias towards UNICEF. This may have contaminated the data with irrelevant or potentially wrong information. The evaluators have tried to minimize this risk by triangulating the information from different sources and validation meetings. Some KII participants also noted that their recollection of the response efforts may not be entirely accurate or comprehensive due to the passage of time since their direct involvement in those efforts.

Although qualitative research provides an in-depth understanding of respondents' perceptions and experiences and help to identify emerging themes, it poses challenges in terms of measuring the findings more objectively and establishing causality. The evaluation aimed to provide evidence of UNICEF contribution and therefore did not attempt to establish causality.

Although every effort was made to ensure that the sample was representative of the different stakeholder cohorts and countries, the risk of missing some perspectives remained. As such, only a small proportion of UN partners were represented in the perception survey and KII samples. Given the diversity of the programmes and the varying geographic characteristics and geopolitical situations across the countries, it was sometimes challenging to identify common themes across the countries. Therefore, we have presented country-specific examples to highlight best practices implemented by different countries and any unique gaps and challenges each country had to face while responding to COVID-19.

Success or failure of a programme is context dependent. Therefore, the findings of this evaluation should be interpreted in relation to the type of emergency (pandemic, a health emergency) and its implications for the working modality (e.g., lockdowns, social distancing) and the overall global health architecture. The geographic, socio-economic, and political context of each of the seven countries (Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan, and Sri Lanka) should also be taken into consideration.

Chapter 4 Findings

[61]4.1 Preparedness

Leveraging pre-existing resources

UNICEF's resources and decades of expertise in immunization encompass comprehensive policy frameworks and planning structures for immunization programmes; coordination networks and partnerships with various stakeholders, including governments, health agencies, and local organizations; well-established immunization monitoring systems to track vaccine distribution, efficacy, and adverse events; experience in capacity building and training for health workers in immunization practices; expertise in social and behavioural change programming for demand creation as well as best practices for community engagement; and logistical capabilities related to vaccine procurement, storage and distribution, cold-chain and related infrastructures. COVID-19 vaccine rollout and distribution represented an unprecedented endeavour in terms of scale and pace, demanding additional resources and innovative approaches. Nevertheless, UNICEF utilized several pre-existing resources to navigate this complex landscape (**Table 8**)[62]

In the perception survey, over 90% of all the 80 respondents agreed that UNICEF adequately leveraged its pre-existing policy frameworks, processes, implementing partners, and mechanisms with over 50% of these respondents 'strongly agreeing' with these statements. Among those who only responded to vaccine specific question, 70.5% (12 out of 17 respondents) 'strongly agreed' or 'agreed' with the statement that 'UNICEF was adequately prepared to support the COVID-19 vaccination programme and that it resulted in the intended outcomes'.

While leveraging existing resources is a prudent strategy for avoiding redundancy and enhancing efficiency, the mobilization of human resources engaged in routine immunization inadvertently led to unforeseen repercussions. The utilization of the same vaccinators resulted in their diversion from routine immunization duties, causing disruptions in these essential services. This observation was highlighted by KIs from Bangladesh and Nepal, who emphasized that the initial requisites for COVID-19 vaccination in 2021, particularly in terms of cold chain and human resources, posed challenges to routine immunization efforts due to resource diversion. Similarly, in Maldives, routine

[61] UNICEF/U.S. CDC/Unique Identifier/Fabeha Monir UN0722979

[62] Information gathered from National Vaccination Deployment Plans, Situational Reports, Annual Reports and Key Informant Interviews

immunization data from various health facilities remained inaccessible due to healthcare staff being fully engaged in the COVID-19 response.[63]

Table 8: Example of UNICEF's pre-existing resources utilized in COVID-19 vaccine roll-out and distribution.

Preexisting Resources	Examples
Policies	• **All countries** leveraged routine immunization policies. • **Bhutan** used the existing SoPs and EPI manuals for healthcare workers. • **Bhutan, Nepal and Bangladesh** used existing medical waste management guidelines for disposal of damaged and expired vaccines.
Monitoring and surveillance systems	• **All countries** leveraged routine immunization monitoring and surveillance systems **Maldives and Sri Lanka** used the Country's existing AEFI surveillance system. • In **Bangladesh**, the COVID-19 vaccine programme utilized the same IPC measures and online tools (DHIS2) used Bangladesh's measles and rubella campaign that ran between December 2020 and January 2021. • **Afghanistan and Pakistan** adapted the DHIS2 platform to collect data and disseminate the results during the Covid19 vaccine introduction. Nepal used the existing online tool (e-LMIS) system to get real-time information on stock and consumption patterns.
Infrastructure	• **All countries** leveraged existing cold-chain infrastructure and vaccine warehouse to store COVID-19 vaccines.
Human resources	• **All countries** mobilized human resources including health care workers engaged in routine vaccination for COVID-19 vaccination. • **Nepal** mobilized female community health workers for COVID-19 vaccinations. • **Afghanistan** utilized the existing networks such as provincial EPI management teams (PEMTs), BPHS implementing NGOs to monitor the implementation of the COVID-19 vaccine introduction.
Demand creation strategies and communication tools	• **All countries** built upon existing demand creation strategies and communication tools used in routine immunization. These also include RCCE tools (and lessons learned) used for social, and behaviour change on prevention of COVID-19 through handwashing, physical distance and masking. • In **Nepal**, Child and Family Tracker (CFT), a telephone-based surveys was used to support evidence generation to make informed decisions regarding vaccine willingness. • Pre-existing call centres such as the 'Polio Helpline' in **Pakistan** were utilized to address COVID-19 vaccine related inquiries registration process.

[63] UNCEF. South Asia Region Situation Reports. May 2021 Available at https://www.unicef.org/appeals/rosa/situation-reports

	• Social listening tools such as U-Report in **Sri Lanka** were leveraged to ensure two-way communication on attitude towards COVID-19 vaccines.
Partnership	• Preexisting MoU with the Asian Development Bank supported a historical partnership between UNICEF and ADB to provide substantial funding for procurement of COVID-19 vaccine and related supplies in **all countries**.

Readiness assessment

UNICEF, in collaboration with other key partners such as WHO, Gavi, the World Bank, and the Bill & Melinda Gates Foundation, were involved in the Country Readiness and Delivery (CRD) workstream under COVAX. This initiative is a critical component of the Access to COVID-19 Tools (ACT) Accelerator, and it focuses on preparing countries for the distribution and deployment of COVID-19 vaccines. As part of this effort, UNICEF and its partners developed and disseminated adaptable global resources like guidance, trainings, tools, and communication materials. Their coordination and technical assistance aimed to support the implementation of COVID-19 vaccination programmes at both global and regional levels.

The CRD workstream issued the Vaccine Introduction Readiness Assessment Tool (VIRAT) to aid health ministries in charting a roadmap for vaccine introduction and identifying gaps for potential support. Expanding upon VIRAT, the World Bank devised the Vaccine Readiness Assessment Framework (VRAF) to offer detailed insights into gaps, associated costs, and financial planning for vaccine deployment. To streamline processes and ease the burden on nations while ensuring comprehensive readiness evaluations, VIRAT and VRAF were merged into the comprehensive VIRAT/VRAF 2.0. This consolidation not only reduced workload but also enabled countries to conduct a more thorough assessment of their readiness for COVID-19 vaccine introduction. VIRAT/VRAF 2.0 facilitated deeper collaboration among WHO, UNICEF, and the World Bank, pooling their strengths to extend unprecedented support to countries in their readiness efforts for vaccine deployment and pandemic response. With support from UNICEF, countries kickstarted their readiness evaluations by conducting a self-assessment using VIRAT/VRAF 2.0, providing them with a cohesive roadmap and a framework for monitoring progress as they prepared for vaccine introduction. The VIRAT/VRAF 2.0 measured readiness across 10 key areas relating to country readiness: planning and coordination; budgeting; regulatory; prioritization; targeting; and COVID-19 surveillance; service delivery, training and supervision, monitoring and evaluation, vaccine, cold chain, logistics, and infrastructure, safety surveillance, and demand generation and communication. Within these core areas, there are 50 qualitative and quantitative indicators.[64] **Appendix 14** presents the activities listed under each key area.

[64] WHO and UNICEF (2020). COVID-19 vaccine introduction readiness assessment tool. Available at https://www.who.int/publications/i/item/WHO-2019-nCoV-Vaccine-introduction-RA-Tool-2020.1

The VIRAT/VRAF 2.0 serves as a framework for countries to identify areas requiring support and to plan their vaccine introduction effectively. It is aligned with national COVID-19 response and primary health care (PHC) recovery plans, which ensures a careful evaluation of the impact of vaccine introduction on other essential health services. KIs widely acknowledged UNICEF's critical assistance to all South Asian countries for assessing readiness for COVID-19 vaccine deployment through VIRAT/VRAF 2.0. The collaborative effort among various partners and the initiatives (CRD and ACT) for facilitating the COVID-19 vaccine rollout and distribution demonstrated a concerted and cohesive approach. Further, this collaborative effort not only streamlined the process for governments but also harmonized approaches across regions.

4.2 Policy, planning and coordination

UNICEF is a key partner and leading procurer in all three official ACT-A commodities pillars (vaccines, therapeutics, and diagnostics) and supports the end-to-end supply chain for these commodities. UNICEF was appointed COVID-19 Vaccine Global Access Facility (COVAX) Procurement Coordinator and one of its procurement agents. In this role, UNICEF was responsible for the end-to-end supply chain engagement spanning procurement, international freight, logistics, and for supporting country readiness as well as delivery into the country. UNICEF also led the efforts to assess and establish country and programmatic readiness for the future receipt and deployment of COVID-19 vaccines.[65]

> *"Government leadership was equally very important to coordinate with COVAX facility as well as other bilateral arrangements. UNICEF worked very closely with the COVAX facility and the government in bringing the COVID-19 vaccines."*
>
> **– UNICEF CO, Pakistan (KII)**

COVID-19 national deployment and vaccination plans[66]

In November 2020, WHO-UNICEF issued guidance aimed at countries for formulating their national deployment and vaccination plans (NDVP), specifically tailored for the introduction of COVID-19 vaccines. This global framework served as a cornerstone for more than 100 nations for crafting their individualized NDVPs, a critical strategy for vaccine deployment. Updated in June 2021, the framework document offered a comprehensive structure for countries for developing and updating NDVPs, creating deployment strategies, implementation, and monitoring of the COVID-19 vaccine(s) in the country, aligning funding with national recovery plans, and integrating implementation into national governance mechanisms. The document offered guidance in the following areas: regulatory preparedness; planning, coordination and simulation exercise; costing and funding to ensure funds reach the point of delivery; identification of target populations;

[65] UNICEF's ACT-A Supplies Financing Facility | UNICEF Supply Division
[66] WHO and UNICEF. Guidance on developing a national deployment and vaccination plan for COVID-19 vaccines. Available at https://www.who.int/publications/i/item/WHO-2019-nCoV-Vaccine-deployment-2021.1-eng
WHO-UNICEF. COVID-19 National Deployment & Vaccination Plan (NDVP), SUBMISSION AND REVIEW PROCESS. 29 January 2021 https://www.who.int/publications/i/item/WHO-2019-nCoV-NDVP-country_plans-2021.1

vaccine delivery strategies; preparation of supply chain and management of healthcare waste; human resource management and training; vaccine acceptance and update; vaccine safety monitoring, management of adverse events following immunization (AEFI) and injection safety; immunization monitoring systems; COVID-19 surveillance; and evaluation of COVID-19 vaccine introduction. To streamline and harmonize efforts, the NDVP and VIRAT/VRAF 2.0 were aligned, offering countries a comprehensive approach to COVID-19 vaccine readiness, and to enhance efficiency.

In the South Asian region, each country developed its NDVP in early 2021, addressing unique rollout aspects and infrastructure needs, and revising these plans to meet evolving needs. UNICEF supported these countries to develop their NVDP, providing coordination and technical assistance, and earning commendation from KIs for its instrumental contributions. These country level NVDP encompassed crucial details such as priority populations, regulatory standards, procurement strategies, cold chain logistics, stock management, training programs, monitoring and surveillance including AEFI, waste management, communication plans, and distribution mechanisms. Additionally, they integrated monitoring and evaluation matrices to track progress throughout the vaccine delivery chain.

The NDVP serves as an important operational roadmap for countries for preparing for the introduction of the COVID-19 vaccine, assessing resource needs, and streamlining COVID-19 vaccination. These plans, once formulated, were uploaded onto the Partners Platform to facilitate streamlined collaboration and action. KIs reported that all the countries adhered to their NDVP during the COVID-19 vaccine rollout and distribution, demonstrating policy coherence as well as the relevance of the NVDP (including the revised NVDP), as no deviations were required.

Coordination role

UNICEF took a key role, engaging in a multifaceted coordination effort, including taking a leadership role in several countries. UNICEF sustained its facilitative role by establishing crucial connections between governments and the COVAX Facility, managing diverse donations from countries, and arranging bilateral/multilateral agreements for COVID-19 vaccines; while coordinating with partners such as Gavi, WHO, donor countries, and in-country development partners. UNICEF's senior staff in country offices, actively participated in strategic coordination meetings, lending crucial support to the planning and execution of COVID-19 vaccine rollouts, as noted by KIs across the countries. UNICEF teams were part of and actively engaged in both strategic and operational support teams. **Table 9** illustrates UNICEF's role in strategic planning, coordination and membership in the various COVID response working groups in the countries.

> *"UNICEF was in communication with various stakeholders. They were delivering the vaccines, cold chain and providing support to maintain the cold chain. They were providing support for all the printing materials and in demand generation. So, without UNICEF, it might have been very, very hard for national EPI to hold everything together and provide results at the national level."*
>
> **- Government KI, Afghanistan**

Table 9: UNICEF participation in different strategic committees and functional working groups as reported in KIIs

Country	Strategic/ Coordination	Functional/work group
Afghanistan[67]	Governance and coordination committee	Cold chain and logistics; planning coordination and distribution of vaccines; procurement and supply; monitoring and reporting
Bangladesh[68]	Planning and coordination committee	AEFI committee; advocacy, communication, and demand promotion; logistics working group; divisional vaccination working group; district vaccination working group; city corporation vaccination working group
Bhutan[69]	National Technical Advisory Group (NITAG's role with respect to COVID-19 vaccines)[70]	COVID-19 media and risk communication team; cold chain, vaccine management and logistics. RCCE committee[71]
Maldives[72]	National Steering Committee (NSC)	Maldives Technical Advisory Group on Immunization; AEFI Committee and Technical Advisory Group on COVID-19 Health Emergency Operation Centre (HEOC); National Technical Working Group
Nepal[73]	National COVID-19 Vaccine Advisory Committee (COVAC); federal and province level task force, coordination and collaboration	National Vaccine Logistics Working Group
Pakistan[74]	National Coordination and Operation Centre	National Technical Working Group (NTWG) sub-committee worked on (1) service delivery (2) vaccine, cold chain & logistics, (3) demand generation & communication (4) prioritization, targeting and COVID-19 surveillance, (5) monitoring and evaluation: monitoring of coverage among at-risk groups, and monitoring of vaccine impact, (6) safety, including injury prevention and AEFI detection and response.

[67] National Plan for Covid-19 Vaccination in Afghanistan, December 2020
[68] National Deployment and Vaccination Plan for COVID-19 Vaccines in Bangladesh, December 2020
[69] National COVID-19 Vaccine Deployment Plan (NVDP), Bhutan, January 2021
[70] UNICEF respondents during key informant interview
[71] UNICEF respondents during key informant interview
[72] Maldives COVID-19 Vaccine Deployment Plan, Version1.1, January 2021
[73] National COVID-19 Vaccine Deployment Plan, 2021
[74] Source: National Deployment and Vaccination Plan For COVID-19 Vaccine, Pakistan January 2021

Sri Lanka[75]	National COVID-19 coordination committee

In the perception survey, over 60% of respondents agreed (strongly agreed or somewhat agreed) that UNICEF's response efforts achieved effective coordination between programme areas within UNICEF, and governments and CSOs. Less than 60% agreed (strongly agreed or somewhat agreed) that there was effective coordination between UNICEF's and other UN partners **(Appendix 15).** However, key informants reported that there were communication gaps during the initial phase between country governments, COVAX Facility and UNICEF regarding vaccine dose allocation and timeline of shipments. A key informant in Pakistan noted that delayed vaccine shipments caused the government frustration during the initial phase of the vaccine roll out, but that UNICEF managed to resolve this communication gap, which was appreciated by the government.

Financial resource mobilization

Given the limited financial capacity of country governments, joint investment/funds were needed to support the emergency programmes including COVID-19 vaccine roll out. **Appendix 16** shows the proposal values and total COVAX vaccine doses delivered to the countries and proposal values submitted to the GoJ. In addition, resources were garnered from other sources such as Gavi COVID-19 vaccine deployment support (CDS) funding, the Asian Development Bank, and the World Bank. **Appendix 16** shows funds that the UNICEF country offices and country governments received from the COVAX Facility (TA, CCE) and other sources for the deployment of COVID-19 vaccines in South Asia.

Facilitating regulatory approval of COVID-19 vaccines

KIs from all the countries indicated that UNICEF collaborated effectively with WHO and the National Regulatory Authorities (NRA) in the country to expedite the emergency use authorization letters and approvals for COVID-19 vaccines. UNICEF coordinated with additional national line ministries, such as the finance ministry and revenue authorities for import permit and custom clearing documentation of all COVAX vaccines and ancillaries before the shipment. While no major challenges were reported, there were instances of vaccine shipments remaining on hold because of delays in import permit arrangements particularly in Nepal, Sri Lanka, and Pakistan. Demonstrating efficiency, the supply units in the respective countries were able to coordinate and resolve these problems in a timely manner. For example, UNICEF's advocacy effort influenced the passing of a new ordinance in Nepal, where COVID-19 vaccine no longer required duty exempt certificate from the Ministry of Finance. The requirement of duty exempt certificate initially delayed importation of COVID-19 vaccine. However, KIs noted the commitment and quick decision making on the government's part to aid and expedite vaccine import through policy

[75] Source: Respondent from Sri Lanka UNICEF CO during key informant interview

relaxation. KIs from Afghanistan, Bangladesh, Bhutan, Maldives, and Pakistan said the issuance of import certification and the emergency use authorization was seamless.

4.3 Vaccine Management, Logistics, and Infrastructure

UNICEF efforts included procurement of vaccines and related supplies, and cold chain equipment (CCEs) and support related to vaccine distribution and logistics, monitoring of vaccine utilization and infrastructure. UNICEF is the major and/or only partner providing support in these areas in the selected countries. As such, 53% of participants from the perception survey indicated that logistic support was one of the key areas of UNICEF support in preparing the government for the initial phase of COVID-19 vaccine rollout. ***Table 10*** outlines the role of UNICEF in COVID-19 vaccine procurement, in-country distribution, monitoring and CCE expansion.

Table 10: UNICEF's role in COVID-19 vaccine procurement, in-country distribution, and monitoring

Country	Procurement and in-country distribution of vaccines	Vaccine monitoring (vLMIS - soft infrastructure) for COVID-19
Afghanistan	Supported vaccine distribution up to service delivery point	- Excel-based LMIS - Supported tracking and analysis
Bangladesh	Govt distributed the vaccine.	- Supported inclusion of COVID-19 vaccine in DHIS2
Bhutan	Supported vaccine distribution up to regional level	- Excel based LMIS - Supported tracking and analysis
Maldives	Supported vaccine distribution	- Excel based LMIS - Provided laptops and tablets
Nepal	Supported vaccine distribution up to service delivery point	- Excel based LMIS - Provided IT equipment (50 laptops) for LMIS
Pakistan	Govt used existing distribution system to distribute vaccines.	- COVID-19 vaccine was included in existing digitized LMIS - Assisted in linking vLMIS with call centres
Sri Lanka	Supported vaccine distribution up to service delivery point	- Excel-based LMIS

Across countries, KIs and perception survey respondents from the government and UNICEF agreed that UNICEF's efforts in vaccine procurement and distribution, cold chain expansion and other infrastructure support including warehouses (hard infrastructures) and information management system (soft infrastructure) helped to strengthen the country's immunization programme. Sixty-seven per cent of survey participants indicated that UNICEF's efforts in vaccine distribution and logistics, cold chain expansion and information management systems helped to strengthen the immunization programme. KIs and the country office annual reports consistently reported that the infrastructures would be instrumental in improving the delivery of routine immunization, demonstrating the sustainability, relevance and system strengthening aspect of these efforts. Respondents from Bhutan, Maldives, Nepal, Pakistan and Sri Lanka reported that the cold chain

infrastructure expansion will adequately meet the routine immunization needs for the next 10 years.

4.3.1 Procurement

Vaccines procurement

> *"High level government authorities from the ministry level appreciated UNICEF's timely support towards cold chain expansion, vaccine management and the vaccination programme."*
>
> - *UNICEF staff- Bhutan and Sri Lanka CO*

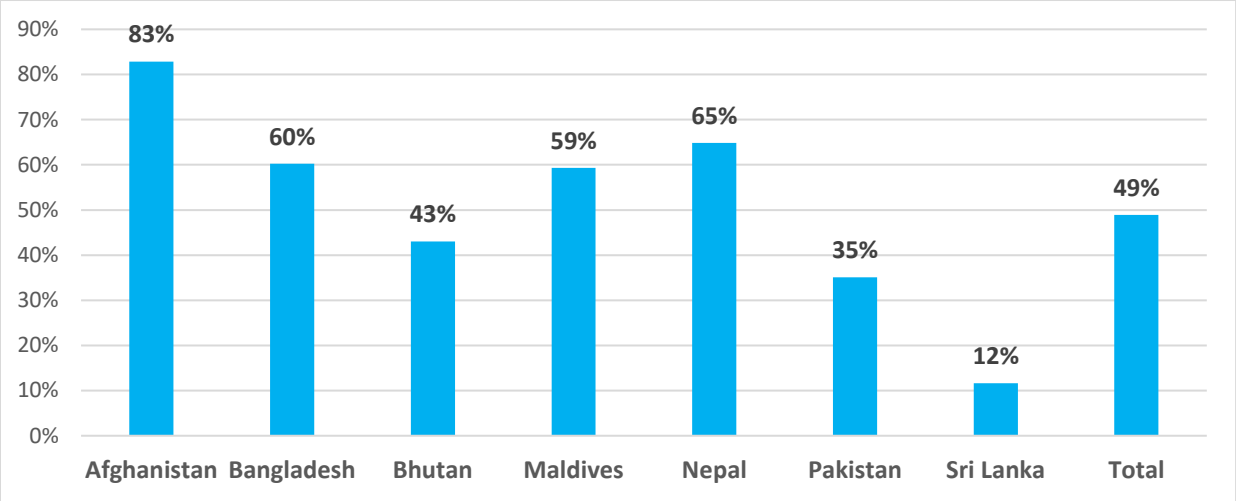
UNICEF supported the procurement and shipping of the COVID-19 vaccines and ancillaries funded and arranged through the COVAX Facility, into South Asian countries. The UNICEF COVID-19 market-dashboard and KIs indicated that UNICEF also coordinated with individual donor countries, other bilateral and multilateral arrangements with various Asian and European countries, diplomatic missions, the Asian Development Bank (ADB) and the World Bank (WB) to secure funds, procure vaccines and ship them into the country. Out of 17 perception survey participants, 57% identified vaccine procurement as one of the areas that received continuous support from UNICEF. KIs said they greatly valued government leadership in their country, which ensured effective coordination with the COVAX Facility and other bilateral arrangements.

UNICEF was a critical partner of the government, aiding in the planning and forecasting of vaccine and associated needs. UNICEF Supply Division circulated guidelines to all the country offices and the related process of demand forecasting for COVAX vaccine doses. The process built on UNICEF's existing role in forecasting vaccine demand for routine immunization. The country offices followed up with the government and key in-country stakeholders (e.g., WHO) to ensure that discussions on demand forecasting had taken place and that the templates were being populated and submitted in time, on a monthly basis.[76] Initially, considering the limited supply of COVID-19 vaccines, countries adhered to guidelines, setting a target of 3% coverage in the first phase and 17% in the second, totalling 20% by the end of 2021 within their NDVPs. This plan aimed to prioritize healthcare workers, elderly individuals, and those with underlying health conditions. In 2021, WHO set a target of 70% global vaccination coverage by mid-2022. Based on these guidelines, countries forecasted the quantity of COVID-19 vaccines needed. As the single largest vaccine buyer in the world, UNICEF was uniquely positioned to lead the procurement and delivery of COVID-19 vaccines on behalf of the COVAX Facility.[77] However, KIs in Afghanistan noted that the micro-planning was top down because of limited capacity at the sub-national level. There were some gaps in many provinces where the country team realized that the denominator for demand forecasting was not right to begin with.

[76] UNICEF, Need Based Demand Planning- COVAX vaccines, 2022.
[77] UNICEF Supply-Division-2021-HQAR

Among the different sources of COVID-19 vaccines doses - COVAX Facility, bilateral/multilateral arrangements, donations and others (**Table 3**), the aggregated contribution of vaccine doses from the COVAX Facility in South Asia (excluding India) was 49%. ***Figure 6*** shows the contribution of vaccine doses from the COVAX Facility against the total doses delivered to South Asian countries, reflecting UNICEF's contribution in vaccine procurement and delivery. Government KIs acknowledged the critical role of the COVAX Facility and UNICEF in making COVID-19 vaccine doses available in their countries.

Figure 6: COVAX doses against total doses delivered to countries in South Asia (December 2023)



Both government officials and UNICEF respondents highlighted the fact that despite extensive preparations for COVID-19 vaccine rollout in their respective countries, the anticipated vaccine shipments did not arrive as scheduled, and the quantities received were notably limited. The initial delay and scarcity and subsequent shortages at various times during this evaluation period were attributed to global challenges in vaccine production, inadequate regulatory mechanisms for governing production and distribution, inequitable distribution of vaccines in favour of the developed world for the greater part of 2021, constrained production capacities leading to delayed supplies, geopolitical influences, and specific countries' prioritization strategies. KIs also indicated that the global supply chain interruption, particularly closure of airline services because of COVID-19 prevention protocols, caused delays in vaccine shipments. Countries had to use different air routes and sometimes opt for more costly options to deliver the vaccines and ancillaries. **Appendix 17** presents an overview of UNICEF's supply lead time in 2020 (~400 days), which was more than twice that of 2023 (less than 200 days) for global freight forwarders. The unpredictability about vaccine availability posed significant challenges in both planning, forecasting, and communication efforts related to vaccination campaigns. At the point of delivery, this uncertainty resulted in chaos and disappointment as individuals who queued for hours often had to leave without receiving their vaccinations, as noted by KIs in Nepal. To address the challenges posed by supply disruption, UNICEF Afghanistan established a new supply corridor with Uzbekistan. Additional challenges in synchronization of the availability of different items for service delivery were also noted. For example, when

vaccines were available, there were instance of shortages of syringes. Lack of coordination with the agencies involved in packaging the cartons resulted in delays in some countries like Bhutan where the syringes were of the wrong size, therefore the entire process had to be repeated, resulting in delayed shipments, as noted by KI. **Table *11*** presents the specific challenges faced by each country in importing COVID-19 vaccine and other related supplies, as reported by KIs.

Table 11: Challenges in importing vaccines and other supplies, as reported by KIs[78]

Country	Vaccines Import challenges
Afghanistan	Afghanistan is a landlocked country. During the initial stage of the pandemic when airports were closed, it was difficult to bring in supplies. UNICEF supported the government and obtained approval for bringing essential supplies on chartered flights. The security situation in the country made it more difficult. There were however no issues related to import permits and emergency use of vaccines.
Bangladesh	There were no issues with the import certificate and regulatory authorization because Bangladesh prime minister's office was closely involved in the process and monitoring the COVID-19 vaccination.
Bhutan	Bringing in the supplies was challenging because of the disruption of commercial flights and the escalation of freight costs as well. Before the pandemic some of the routine vaccines such as those from the Serum Institute of India used to arrive directly from Pune, India to Paro, Bhutan. However, during the pandemic there were instances when vaccine shipments had to be re-routed from India to Bangkok and then to Bhutan.
Maldives	There were no issues with import and regulatory documentation. However, cold chain space was a challenge as it was limited during the initial phase, and donor funds couldn't be mobilized for physical infrastructures.
Nepal	As a landlocked country with limited air routes (through Doha, Qatar and Dubai, UAE), getting vaccine shipments into the country was challenging. This was particularly the case when the bubble route could only be used for passengers not for cargo such as vaccines. Chartered flights were sometimes used to get vaccine shipment. Obtaining the import license for COVID-19 vaccine took several days to weeks.
Pakistan	Airport closures made it difficult to bring vaccines to Pakistan during the initial phase. Arranging flights, particularly from Shanghai and Copenhagen, was challenging. At one point the government had to use its own government aircrafts to pick up vaccines from Shanghai and Denmark. No issues were reported with regard to the import permits except for one vaccine consignment that was supposed to come from India.
Sri Lanka	There were challenges in obtaining necessary government approvals, such as regulatory approval for the vaccines. Lack of flights during the pandemic and airport closures made movement of supplies challenging.

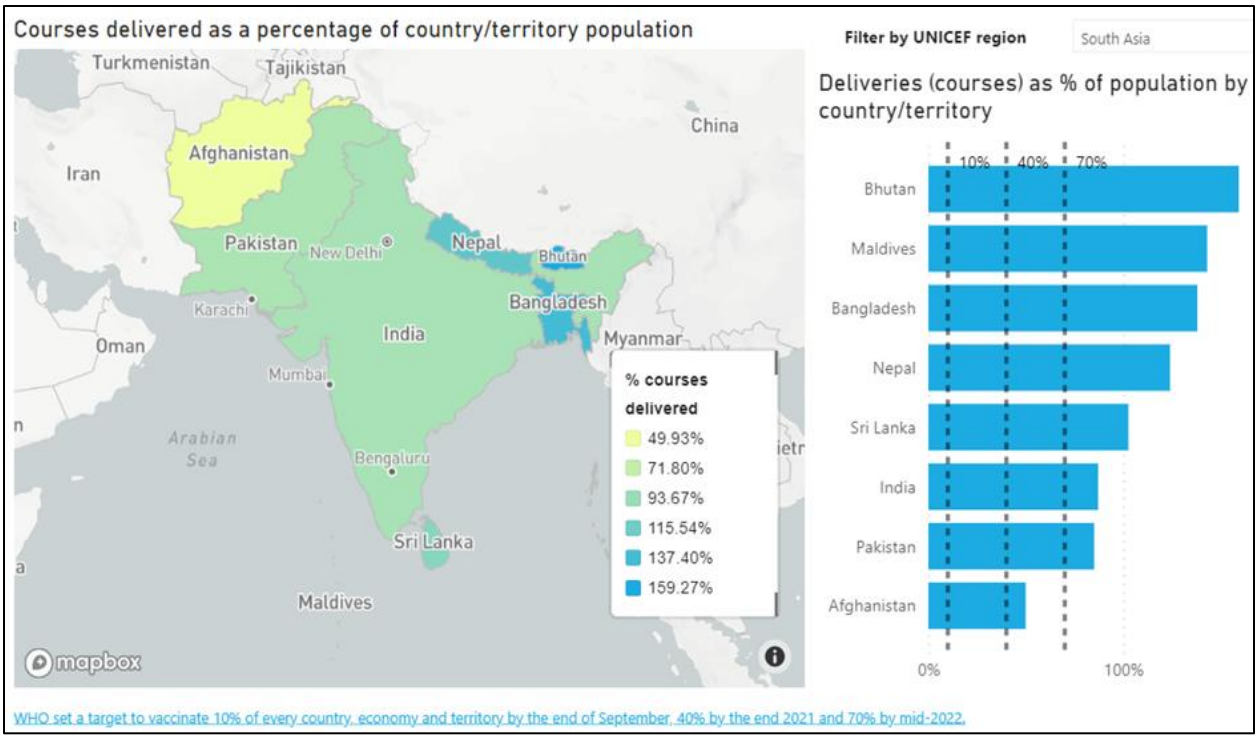
[78] Reported by Key Informants

Countries included in this evaluation started receiving COVID-19 vaccines from the COVAX Facility in March 2021; Maldives, Nepal and Sri Lanka being the first recipients. Subsequently, Pakistan received its first consignment from COVAX in May, Bangladesh in June, and Afghanistan and Bhutan in July. There was a lag period for the shipments due to high global demand for vaccines, resulting from the emergence of the Delta variant. Vaccine nationalism became more prominent, wherein countries like India, a key supplier to COVAX, prioritized their domestic populations in accessing and distributing vaccines, leading to inequitable vaccine distribution in the region. The seven countries included in this evaluation began to receive adequate supply of COVID-19 vaccines from the COVAX Facility from December 2021, with better access and vaccination coverage achieved for the target population by mid-2022.

As vaccines became more readily available in the region later in 2021, a total of 1.6 billion doses were administered in South Asia with one-third of the population (618 million people) fully vaccinated by the end of 2021.[79] By the end of 2022, efforts to procure and deliver COVID-19 vaccines in South Asian countries (with the exception of Afghanistan) had met WHO's global target of reaching 70% of the population. The total COVID-19 vaccine quantity delivered to Afghanistan until 7 May 2023 covered only about 50% of the population, which is far less than the global target. South and southeast Afghanistan comprises difficult mountainous terrain and is dominated by the Taliban. Despite continuous efforts of UNICEF and other stakeholders, including the opening of field offices in these areas and using a strong RCCE network, the uptake of COVID-19 vaccine remained low in Afghanistan. Additionally, security challenges to healthcare workers were considerably high in this area. **Figure 7** shows the total COVID-19 vaccines delivered to each country as percentage of the population.

Figure 7: Courses of COVID-19 vaccine delivered to country/territory as percentage of population (as of 07 May 2023)[80]

[79] UNICEF Regional Office, Annual Report .2021.
[80] UNICEF Market Dashboard. Available at https://www.unicef.org/supply/covid-19-market-dashboard



Cold chain expansion

UNICEF's support to cold chain expansion began by supporting government in cold chain assessments and gap analysis required for COVID-19 vaccines. The analysis included gaps in cold chain storage space (from +2°C to +8°C) and ultra-cold chain storage space (at -70°C) considering the deployment of different types of COVID-19 vaccines. UNICEF country offices supported the CCE needs assessment using the supply chain sizing tool. Through this, cold chain gaps were identified for the deployment of COVID-19 vaccines. This was a precursor to the expansion of cold chain equipment.

> *"UNICEF greatly and generously contributed towards the development of cold chain facilities in the islands. Previously, we used to rely on domestic refrigeration systems. UNICEF with the Japanese fund, was able to develop and improve our capacities in the islands with the Ice lined Refrigerators (ILRs)."*
>
> - **Government KII, Maldives**

Evidence from the comprehensive cold chain gap analysis was used to support cold chain expansion (CCE) requests. UNICEF supported development of funding proposals to procure and deploy cold chain equipment and to strengthen the cold chain and vaccine management human resources. The funding for the COVAX CCE and support from the government of Japan (GoJ) were mobilized through UNICEF. UNICEF ROSA supported country offices to develop and manage these proposals. UNICEF Supply Division supported the procurement and shipping of all CCEs in the seven countries[81]. **Table 12** shows the

[81] Gavi decision letters and KIIs from all seven country participants.

details of COVAX and GoJ's support for CCE. CCE were also supported by WFP and USAID in Nepal and Bangladesh, respectively.

Table 12: Funding proposals for CCE support

Country	COVAX vaccine doses[82]	COVAX CCE		Government of Japan CCE support (Cold chain equipment and related capacity building needs)[83]	
		Quantity[a, 84]	Budget (US$)[85]	Quantity[a]	Budget (USD)
Afghanistan	18,484,850	184[86]	922,566.00	NA	NA
Bangladesh	254,353,310	17,635	2,482,278.00	NA	NA
Bhutan	980,620	80	$50,000[87]	1,746	1,617,269
Maldives	922,960	284	50,000	2,898	1,032,719
Nepal	44,818,630	38	766,685[88]	1,084	1,243,444
Pakistan	131,616,190	552	$2.5M[89]	12,200	6,595,537
Sri Lanka[90]	5,128,210	164	3,69,112	34,170	2,952,994

NA = Information not available/Not applicable

[a] different items including small items, such as icepacks, and 30 DTRs[91]

Feedback from the KII with partners and government representatives alike indicated that UNICEF was the major or only partner supporting cold chain equipment procurement and deployment in the region. Data from the COARs and KIIs indicates that the cold and ultra-cold chain space has been adequately expanded from the national to provincial/regional and up to health facility level in South Asian countries (**Table 13**)[92].

As for the challenges related to the CCE arrangement, KIIs noted that different types of vaccines required different storage temperatures as well as cold chain maintenance during transportation. There was a need to procure and deploy the ultra-cold chain equipment (UCC) for specific types of vaccines, such as the Pfizer vaccine, which had to be stored at −70°C.

Table 13: ***UNICEF's role in cold chain expansion (country examples)***

Country Examples	Type of Support
	Type of cold chain expansion (CCE)s provided (procured, deployed, and/or installed) - Examples

[82] https://www.unicef.org/supply/covid-19-market-dashboard (Accessed on 7th May 2023)
[83] ROSA CCE proposal to the Government of Japan, 210215
[84] ROSA COVAX CCE summary, 050221 Excel data sheet.
[85] Gavi decision letters against the country's COVAX CCE applications
[86] Independent review committee report- COVAX CCE application for Maldives, May 2021
[87] ROSA COVAX funding slide. The amount is from application for COVAX CCE support for Bhutan.
[88] COVAX CCE application, Nepal, October 2020
[89] ROSA COVAX funding slide. The amount is from application for COVAX CCE support for Pakistan.
[90] COVAX CCE application, Sri Lanka, February 2021
[91] ROSA COVAX CCE summary, 050221 Excel data sheet.
[92] Country Office Annual Reports and KIIs

Afghanistan	Ultra cold chain, cold rooms, new solar power refrigerators called solar direct drive (SDD) installed. This includes 600 refrigerators/freezers to provincial health facilities, plus deployment of six walk-in cold rooms and three walk-in freezers in Herat, Nangarhar and Pakitia for regional cold rooms nine vehicles with refrigeration facilities. One national and three regional cold chain repairing workshops were established as part of the overall system strengthening for vaccine and cold chain management
Bangladesh	Cold rooms, ice lined refrigerators, temperature monitoring devices, ultra-cold chain (UCC), contracted third party for refrigerated trucks and dry warehouse
Bhutan	Walk-in cold rooms, ice lined refrigerators, refrigerators, deep freezers and temperature monitoring devices at central, regional and PHC levels.
Maldives	Ice lined refrigerators, deep freezer and temperature monitoring devices, and temperature monitoring systems
Nepal	74 vaccine refrigerators (36 in-line refrigerators and 38 solar direct-drive refrigerators) and 9 x 40m3 walk-in cold rooms at national and province level stores, ultra-cold chain equipment, 1,109 freeze-preventive vaccine carriers and 19 walk-in refrigerators 53 long-range cold boxes (LRCB)
Pakistan	100 units of ultra-cold chain equipment procured and installed, 17,000 units of cold chain equipment, walk-in cold rooms, ice lined refrigerators, remote temperature monitoring devices, dry storage for syringes. 48,000 other cold chain equipment (e.g., cold boxes, vaccine carriers...) procured and delivered.
Sri Lanka	1 new walk-in cold room and / or freezer procured and installed. 13 new cold chain equipment (2-8°C refrigerators) procured and installed. 4,000 other cold chain equipment (e.g., cold boxes, vaccine carriers) procured and delivered. 3 cold chain equipment maintained (ultra-cold units for mRNA vaccine storage, Walk-in cold rooms and / or freezers, 2-8°C refrigerators)
	Other support
Bhutan, Nepal, Sri Lanka	Needs assessment for expansion of cold chain and gap analysis
Bangladesh, Bhutan, Sri Lanka	Recruitment of cold chain specialist
Afghanistan, Bhutan and Maldives	Non-fit for purpose CCE replaced: kerosene powered not-fit-for-purpose refrigerators (**Afghanistan);** domestic refrigerators used for vaccine storage (**Bhutan**)
Pakistan and Maldives	Cold chain and vaccine management trainings

	Outcome
Afghanistan	Completed the solarization of cold chain to 77.5 per cent of the total of 2,400 EPI centers.
Bhutan	Cold chain storage capacity was increased from 95,000 litres to 372,638 litres at different temperatures (i,e. +2°C to +8°C, -15°C to -25°C and -70°C to -86°C), , which is three-fold. Expanded cold chain system would cover the country's cold chain needs for the next 10 years.
Maldives	The expanded cold chain system would cover the country's cold chain needs for the next 10 years.
Nepal	The expanded cold chain system would cover the country's cold chain needs for the next 10 years.
Pakistan	The expanded cold chain system would cover the country's cold chain needs for the next 10 years.
Sri Lanka	Cold chain needs fulfilled for the next 10 years.

4.3.2 Distribution

As a member of various strategic and working committees in the countries, UNICEF supported the development of strategic distribution plans, making efforts to reach all eligible members of the population irrespective of their age, gender, caste, religion, disability status, and beliefs.

Vaccine administration in the region followed WHO recommendation, i.e., prioritizing frontline workers, the elderly, and people with co-morbidity and low immunity. Younger age groups became eligible as the pandemic progressed. Depending on the availability of appropriate vaccines, some countries in the region also started vaccinating children aged 12–17 years while others-initiated campaigns for the age group 5–11 years. One such campaign was launched in Pakistan. Funded by USAID, the campaign was implemented by partners including JSI, UNICEF, and WHO. UNICEF led the advocacy, communication and social mobilization (ACSM) before and during the campaign The campaign successfully vaccinated more than 7.5 million children.[93]

UNICEF directly and indirectly supported the distribution of vaccines up to the last mile. UNICEF directly supported the governments in Afghanistan, Bhutan, Maldives, Nepal, and Sri Lanka to distribute the COVID-19 vaccine up to province or regional level and in some cases up to the last mile. In Pakistan and Bangladesh, UNICEF only supported the development of the strategic distribution plan while the country governments distributed the vaccines. UNICEF provided refrigerated vehicles to the government of Bangladesh for vaccine distribution. Efforts were made to distribute the vaccines equitably using surface, water and even air transportation to access the hard-to-reach communities. For example,

[93] JSI-USAID (2023). Case study: Paediatric COVID-19 Vaccination Campaign 2022.

in Bhutan and Pakistan helicopters were used to bring the vaccines to communities situated beyond the road networks.

All countries in South Asia received a limited amount of COVID-19 vaccine doses during the initial phase of COVID-19 vaccination. Vaccine doses were distributed from national to sub-national level initially using a pull approach and targeting priority groups, such as the elderly and populations with comorbidity. When countries started receiving the required vaccine doses, countries used the informed push approach to distribute vaccines doses from the national to sub-national level. KII participants indicated that the push distribution approach considered factors such as the needs at the sub national level to meet its targets, and the availability of cold chain storage space at lower-level stores. The push approach helped the countries to ensure that the national level stores were not congested and have vacant space for incoming shipments of COVID-19 vaccines. Key informants from different countries said they used a mix of push-pull approaches depending on their suitability and efficiency under the given circumstances in order to distribute the vaccines from the sub-national to the last mile.

Distribution was challenged by the remote and difficult terrain of some of the countries. For example, KIs from the Bhutan Country Office noted that the difficult terrain of Bhutan made vaccine distribution challenging and costly, requiring air transportation of vaccines and ancillaries. South and southeast Afghanistan has difficult mountainous terrain and is dominated by the Taliban, which made distribution efforts challenging. Further, as different types of COVID-19 vaccines required different storage temperature ranges, handling and administering the vaccines was difficult, particularly at the sub-national and lower-level facilities. For example, in Sri Lanka even small districts received different types of COVID-19 vaccines, which meant health workers needed different types of training based on the vaccine type. In Nepal, the Pfizer vaccine arrived in the country but was used after about one month because of the lack of the required type of syringes. In some instances, the COVID-19 vaccines received had a short shelf life. It was difficult to utilize these vaccines before they expired. KIs from UNICEF country offices in Bhutan, Afghanistan, and Pakistan noted challenges in managing vaccines with a short shelf life. In Bhutan, a substantial volume of vaccines had to be transferred to another country, highlighting the complexities of handling time-sensitive doses. Afghanistan faced issues with vaccine expiration within government facilities due to vaccine hesitancy impacting uptake. Similarly, in Pakistan, managing vaccines with a brief shelf-life posed difficulties exacerbated by geographical challenges, especially in reaching marginalized communities. These accounts underscore the logistical hurdles and hesitancy issues that affected vaccine management and distribution strategies in different regions.

4.3.3 Logistics management information system

KII noted that UNICEF supported the countries in the region to review and update the vaccine management manuals, guidelines, and SOPs to include COVID-19 vaccines. Afghanistan, Bhutan, Maldives, Nepal and Sri Lanka reported that UNICEF supported vaccine utilization and vaccination data management using the existing excel based vaccine logistics management information system (LMIS) for monitoring and tracking the vaccines and timely analysis of vaccination data. (**Table *10***) In Bangladesh, UNICEF coordinated and advocated with the Health Management Information System (HMIS)

department within the Ministry of Health (MoH) to include COVID-19 vaccines in the District Health Information Software (DHIS2). Pakistan used the existing Vaccine and Logistics Management Information System (vLMIS) for tracking, monitoring and analysing the vaccination data. UNICEF country offices in South Asia except in Bangladesh and Pakistan have started supporting the strengthening of the logistics management information system (LMIS) to fully digitize the system, as noted by KIs. UNICEF Nepal Country Office collaborated with USAID's procurement and supply management (PSM) project to upgrade the LMIS at national and provincial levels. UNICEF in partnership with USAID also provided 50 laptops and desktop computers for the LMIS, as noted by KI. UNICEF Maldives Country Office provided laptops and tablets for the LMIS. In Bhutan, the country office has incorporated the LMIS digitization plan in its annual plan. Government key informants in Afghanistan said that an online checklist supported by an NGO (Arca Swiss) is being used to monitor COVID-19 vaccines. In Sri Lanka the existing public health information management system in use is not yet fully digitized.

Given that the vaccine logistics information management system is not fully digitized in the countries other than in Pakistan and Bangladesh, data visibility, collection, and analysis for COVID-19 vaccines and ancillaries were difficult. It also affected stock calculations and timely supply to the sub-national level with pooling of resources in some places and stock-outs in others.

4.4 Demand creation and risk communication

UNICEF played a vital role in risk communication and community engagement (RCCE) efforts during the COVID-19 pandemic, particularly in generating demand for the COVID-19 vaccine. The organization employed various strategies such as deployment of RCCE staff from their country offices to assist governments directly and facilitating the recruitment and retention of consultants dedicated to RCCE and demand generation activities. As previously noted, one of the significant hurdles encountered was vaccine hesitancy, a challenge UNICEF actively addressed by tailoring information, education, and communication (IEC) materials to tackle specific local factors contributing to hesitancy. Due to prevailing restrictive measures across the countries, direct face-to-face engagement to raise awareness about COVID-19 prevention and stimulate vaccine demand remained unfeasible, particularly during the early phases, as noted by KIs across the seven countries. Mobility restrictions compelled organizations like UNICEF to pivot their strategies, relying heavily on alternative channels such as digital platforms, media campaigns, and remote community engagement initiatives to effectively disseminate crucial information and bridge the gap in outreach efforts during these challenging times.

The UNICEF Regional Office of South Asia (ROSA) facilitated a comprehensive approach to support country offices in their COVID-19 vaccine communication and demand generation efforts. This involved the rollout of a risk communication and community engagement (RCCE) strategy as the foundational framework. To enhance engagement, the U-Report South Asia platform was established, successfully attracting over 113,000 young individuals. This platform served as a pivotal two-way channel for communication in local languages, focusing on various youth-centric issues, notably exploring attitudes towards the COVID-19 vaccine. Additionally, ROSA's RCCE working group collaborated with expert contractors to integrate standardized questionnaire modules into RapidPro, a real-time

monitoring tool. This integration aimed to effectively measure and address vaccine hesitancy, ensuring a coordinated and data-driven approach in boosting vaccine acceptance and uptake among communities.[94]

UNICEF's support across various South Asian countries in RCCE-related strategy, coordination, and policy development has been instrumental in aligning efforts with government priorities and strengthening existing risk communication and demand creation policies and tools. These concerted efforts (**Table 14**) have strengthen coordination, align strategies with government priorities, and enhance the effectiveness of vaccination campaigns across the region.[95]

Table 14: Examples of UNICEF's support in RCCE-related strategy, coordination and policy development [96]

Country	RCCE related strategy, coordination and policy development (examples)
Bangladesh	UNICEF supported the integration of an advocacy, communication, and demand promotion component into the national COVID-19 vaccine deployment plan developed by the government.
Bhutan	Collaborated with the Ministry of Health in the development and implementation of RCCE interventions, thereby bolstering the national vaccine rollout plan as well as rolling out the risk communication and community engagement (RCCE) strategy.
Maldives	As a member of the RCCE cluster alongside the Health Protection Agency, UNICEF strategically coordinated communication efforts and engagement initiatives related to COVID-19 prevention measures and vaccine rollout. UNICEF also supported the COVID-19 national vaccine communication strategy, which the HEOC used to guide all activities of the 'Dhifaau' vaccination campaign.
Sri Lanka	UNICEF's initiatives included the formulation of a community engagement and social mobilization strategy, a vital component within the overarching National COVID-19 Vaccine Communication Strategy. Additionally, UNICEF facilitated the gathering of civil society organizations hosted by the Ministry of Health to inform them and actively engage them in community engagement interventions.

UNICEF employed a multi-faceted media approach to demand creation and risk communication. To promote vaccine uptake, extensive radio and community media outreach, along with social media campaigns, were utilized, engaging diverse populations. Targeted video content was created to address vaccine hesitancy, offering clarity on safety and efficacy concerns, especially once vaccines arrived and became available. Digital and

[94] UNICEF Regional Office Annual Reports, published between August 2020 and Dec 2022. Retrieved from https://www.unicef.org/appeals/rosa/situation-reports
[95] UNICEF COs Annual Reports and Situation Reports published between August 2020 and Dec 2022.
[96] UNICEF COs Annual Reports and Situation Reports published between August 2020 and Dec 2022.

social media engagement played a significant role in disseminating information about vaccination campaigns, sharing details about the national vaccine deployment plans, and enhancing visibility. Additionally, UNICEF's collaboration with crisis media hubs, community radio broadcasters, and dedicated helplines effectively addressed queries, disseminated crucial information, and built trust in vaccination efforts through mass and social media platforms. These efforts collectively contributed to raising awareness, fostering trust, and encouraging vaccine uptake across different segments of the population. Government leadership also played a critical role in vaccine demand creation. For example, in Bhutan, exemplary leadership from the highest level and solidarity with different sectors both at the central and the district levels, through coordination and engagement contributed to the success of the COVID-19 vaccination campaign. **Table 15** presents examples of UNICEF-led or supported media campaigns and their reach in South Asian countries.[97] Similarly, UNICEF's community engagement strategy employed diverse approaches to promote COVID-19 vaccination. Efforts involved training and mobilizing local influencers, including health workers, religious leaders, and school representatives, to educate communities about vaccine benefits and address hesitancy. Collaborations with district offices, religious leaders, and community volunteers facilitated targeted engagement in isolated regions, refugee camps, and remote communities, ensuring access to vital information on COVID-19 prevention and vaccination. These initiatives, utilizing leadership networks, behavioural change communication sessions, and grassroots outreach, aimed to increase awareness, trust, and participation in vaccination drives across diverse populations within the region. **Table 16** presents examples of UNICEF-led or supported community engagement efforts and their reach in South Asian countries.[98] The wide reach of these mass media and social media campaigns and community engagement strategy demonstrates the effectiveness of UNICEF's efforts in risk communication and demand creation, which was also widely acknowledged by KIs across the countries. Further, many KIs also noted that these efforts, tools and lessons learned can be utilized in routine immunization, particularly to reach 'zero-dose children'.

Table 15: Examples of UNICEF-led or supported media campaigns and their reach[99]

Country	Media Campaigns and Reach (Examples)
Afghanistan	Media campaign broadcasting key messages about COVID-19 vaccination reached approximately **6 million people** across the country. 15 radio programmes and five round-table discussions on TV regarding COVID-19 vaccination reached **346,423 people**. **Tailored communication materials were designed** to improve the demand and uptake of vaccination in women
Bangladesh	Over **66 million people** were reached through radio and community media to generate demand for COVID- 19 vaccination. Bangladesh Betar and Community

[97] UNICEF COs Annual Reports and Situation Reports published between August 2020 and Dec 2022.
[98] UNICEF RO and COs Annual Reports and Situation Reports published between August 2020 and Dec 2022.
[99] UNICEF RO and COs Annual Reports and Situation Reports published between August 2020 and Dec 2022.
UNICEF, WHO, Gavi. (2023) The COVID-19 Vaccination Response: Country experiences, best practices, and lessons

	radio Naf broadcasted 66 programs on COVID-19 prevention, vaccination and referral services provided by the SARI ITC.
Bhutan	UNICEF Bhutan harnessed technology and the growing social media platforms through intensive online campaigns, engaging children and young people. Together, three social media handles (Facebook, Twitter and Instagram) recorded a total of **108,855,515 impressions** which is the number of times the UNICEF's messages on vaccination, COVID-19 safety protocols, parenting, immunization, education, and mental health were seen.
Maldives	With lowered uptake of booster doses, UNICEF supported the development of six videos for the HPA to encourage all eligible groups (including adolescents aged 11-18 years) to get vaccinated by re-engaging the public on safety measures against COVID-19. UNICEF also developed 7 videos to highlight the arrival and distribution of COVAX vaccines and supplies across the country to promote public engagement and boost trust in the safety of vaccines. To engage the unvaccinated groups, UNICEF supported HEOC to develop social media content (videos) featuring young people, musicians, a pregnant woman and others stating their reasons to get vaccinated and asking everyone to do so. To explain the process of getting vaccinated (to address barriers), UNICEF supported the production of three videos and print materials that guided people on how to get registered and vaccinated at designated centres.
Nepal	UNICEF Nepal supported the production and airing of 55 episodes of Corona Capsule radio programme reaching more than **14 million people (43 %female)** with messages on COVID-19 vaccine, preventive behaviours, treatment and testing. Altogether 100 multi-media products on COVID-19 and vaccines were produced by the UNICEF-supported crisis media hub. These contents were produced and disseminated through MoHP's Viber group and social media, UNICEF and other RCCE members and partners' radio network and community activities. UNICEF's own social media content on COVID-19 prevention, vaccination, and response efforts gathered **230.4 million impression**s, with an aggregate reach of **98.6 million users and 19.6 million audience engagements**. UNICEF in partnership with the Association of Community Radio Broadcasters Nepal trained 32 radio personnel in collecting concerns, questions and grievances related to the COVID-19 response, secondary impact of COVID-19 and vaccination. Over **7 million people** were reached through dedicated radio and television programmes with various contents on COVID-19 including vaccine availability and efficacy. UNICEF reached around **9.2 million people** on social media with content and messages including those on vaccine arrivals in the country.
Pakistan	To create a positive and enabling environment around the benefits of vaccines, **over 90 million people** have been reached through mass and social media platforms. UNICEF support to the COVID-19 helpline was a key in building trust between the government and the population, as well as in the overall management of the pandemic, as it successfully informed callers on vaccination eligibility, process, locations, and information on vaccines and their safety. Information materials were displayed in Afghan refugee camps to promote vaccination.
Sri Lanka	UNICEF supported MoH to promote visibility of the National Vaccine Deployment Plan focussing on the activities around COVAX and COVID-19 vaccination through digital and social media engagement, reaching over **5.7 million people** with over **38,000 views and 55,000 engagements.** Around **500,000 most vulnerable people** living in the plantation sector were reached via risk communication messages disseminated through public address systems to promote protective practices, increase booster dose uptake and update on the new variants of COVID-19. A

	mass communication campaign to promote the uptake of COVID-19 booster vaccine was carried out through TV, radio and print media reaching a nation-wide audience of over **15 million people**.

Table 16: Examples of UNICEF-led or supported community engagement and its reach[100]

Country	Community Engagement and Reach (Examples)
Afghanistan	**Seventy-seven community health workers, 50 religious leaders and 161 school management Shura members** were oriented on the benefits of the COVID-19 vaccine. **Sixty-six social mobilizers** supported COVID-19 campaigns reaching **28,000 community members** to discuss the benefits of COVID-19 vaccination. A total of **316,818 community members** were sensitized on the benefits of COVID-19 vaccination, to address COVID-19 vaccine hesitancy. In eastern region **500 mothers and adolescent girls** were educated on COVID-19 prevention measures, and on how to access vaccines and other services. In addition, **2,661 members** of various community platforms were mobilized and trained on addressing COVID-19 hesitancy and improved their knowledge and skills on promoting COVID-19 vaccination.
Bangladesh	District information offices and religious leaders played a key role in vaccine communication reaching isolated areas. A total of **38,838 people (20,806 female and 418 PwD)** in Rohingya refugee camps and **13,643 (7,694 female and 103 PwD)** in the host community were informed about key life-saving behaviours and referrals to services with a focus on COVID-19 prevention and vaccination. In Cox's Bazaar, UNICEF and partners reached **136,232 people (81,896 female) in 51,907 households** through infection prevention and control sessions conducted by community volunteers on COVID-19 prevention and vaccination.
Bhutan	To prepare for the first dose of COVID-19 vaccination, **30 chairpersons of the local government and 60 district scout secretaries and leadership scouts** participated in virtual Q&A sessions with experts from the health ministry, and initiated community engagement activities in their respective communities to promote the vaccine. To promote the second dose of COVID-19 vaccine, an estimated **100,000 people from remote communities** in 14 of the 20 districts were reached through training and the mobilization of an estimated **21,212 influential people** like local government leaders, religious leaders, community health workers, schoolteachers, village elders, and private businesspersons. Further, an estimated **11,000 young people and children** were reached with lifesaving messages through the scout networks.
Maldives	UNICEF facilitated behaviour change communication sessions for around **600 people.** They include **20 vaccination campaign teams; over 200 participants from the media, medical associations and resort/hotel vaccinators; 20 community mobilizers** from the Maldivian Red Crescent to engage the public around COVID-19 prevention and vaccination; and more than **350 health-care workers** from the atolls in the series of sessions done to drive national demand for vaccines. To prepare school communities for the arrival of Pfizer vaccines to be administered to children aged 12-17 years, UNICEF supported online training sessions for **131 doctors** and

[100] UNICEF RO and COs Annual Reports and Situation Reports published between August 2020 and Dec 2022.

	healthcare workers (vaccine demand generation and addressing mis/disinformation and hesitancy), as well as nearly **3,000 parents**. To improve COVID-19 vaccination rate among young people, UNICEF worked with the HEOC and trained student unions of local universities and colleges, who in turn trained their peers to develop communication and advocacy materials including eight videos (different concepts) and posters to be used in the joint campaign run by all the academic institutions, with the aim to reach students in the capital and in the outer islands.
Nepal	More than **7.2 million people** were reached with COVID-19 preventive and vaccination contents through megaphone announcement, radio programme and community volunteers. Altogether, **10,750 people** engaged with COVID-19 and vaccination content sharing through door-to-door visits and megaphone announcement in 79 municipalities.
Pakistan	With a particular focus on high-burden districts, and through health alliances and the RED (reach every door) approach, **91,398 religious leaders** were engaged and mobilized to promote a higher risk-perception towards COVID-19 and its hidden dangers. Preaching from local mosques, religious leaders reminded followers to complete all vaccination doses, and follow SOPs and limit social gatherings. They also encouraged women to get vaccinated.
Sri Lanka	UNICEF worked with the DPCCS to elevate the voices of adolescents and youth through U-Report Sri Lanka, a mobile messaging platform, which engaged **13,000 U-Reporters** in 2021 (total U-Reporters: 20,000) to solicit feedback using 'Polls with Purpose' on COVID-19 vaccines among other issues.

UNICEF has played a vital role in shaping evidence-based risk communication and demand creation strategies across South Asia through robust evidence generation efforts. These include comprehensive monitoring, social listening, and data-driven assessments capturing community sentiments, understanding vaccine acceptance levels and reasons for vaccine hesitancy, and gauging public attitudes. These efforts have helped ensure that risk communication and demand creation strategies are relevant, adaptive, and aligned with the evolving needs and perceptions of the communities. (**Table 17**)

Table 17: Examples of efforts to generate evidence for risk communication and demand creation strategies.[101]

Country	Efforts to generate evidence for risk communication and demand creation (Examples)
Bangladesh	Rapid assessments in various locations provided critical insights about vaccine acceptance levels. These findings served as a basis for creating tailored communication strategies for addressing specific concerns and hesitancies surrounding COVID-19 vaccination.

[101] UNICEF RO and COs Annual Reports and Situation Reports published between August 2020 and Dec 2022.

Maldives	Preliminary assessments gauged public sentiments via social media analysis and focus group discussions, offering an initial understanding of community perspectives on vaccines and immunization.
Nepal	Regular insights derived from radio listening groups, Nepal Scouts, and Red Cross volunteers served as valuable inputs shared with the Ministry of Health and RCCE stakeholders. This real-time data allowed for adjustments in RCCE actions, ensuring alignment with community needs and sentiments.
Pakistan	Eleven knowledge, attitude and practice (KAP) surveys; four direct observation surveys; 48 weekly social media analytics and media monitoring; and seven anthropological studies, were conducted. The findings improved overall pandemic response plans and strategies to increase vaccination uptake among women and adolescents. These initiatives significantly contributed to refining pandemic response plans and strategies, resulting in a notable decrease in vaccine rejections (from 26% to 19%).
Sri Lanka	In Sri Lanka, the KAP survey specifically focused on booster vaccines and aimed to gain crucial insights on public eagerness and hesitancy, guiding targeted communication approaches and interventions.

Perception survey respondents and KIs expressed appreciation for UNICEF's efforts, and its effective interventions in demand generation and risk communication. They highlighted UNICEF's strength in coordination, advocacy, and communication. For instance, the establishment and activation of a multi-stakeholder platform for RCCE coordination received praise for ensuring consistency, optimal resource utilization, broader outreach, and minimizing confusion and duplication of efforts. UNICEF's technical proficiency and its ability to collaborate with implementing partners and governmental bodies stood out as key strengths. Furthermore, UNICEF's approach of integrating pandemic-related activities across various sectors such as protection, WASH (water, sanitation, and hygiene), and health significantly improved intervention coverage, leading to better overall outcomes in their response efforts, demonstrating coherence in response efforts. For example, in Afghanistan, integration of COVID 19 prevention messages and COVID 19 vaccination into the RCCE package and community engagement interventions were found to be cost-effective and efficient at national and community levels.[102]

The experience gained during the COVID-19 pandemic has deepened UNICEF's understanding of community perceptions and attitudes towards vaccines. The organization has gained a better understanding of vaccine acceptance as well as of strategies for countering misinformation. These insights are incredibly valuable, not just for COVID-19 vaccination but also for enhancing routine immunization programmes including rolling out of other vaccines such as the HPV vaccine for adolescents. One key aspect of this system building effort is the utilization of tools and messaging frameworks developed under risk communication and community engagement (RCCE). These resources have been crucial in addressing misconceptions, promoting accurate information, and fostering vaccine acceptance within communities. The success of these strategies indicates they could

[102] UNICEF. Afghanistan Country Office, Annual Report 2020

potentially be applied beyond the COVID-19 context to bolster routine immunization efforts for children, adolescents and other vulnerable populations, which underscores their sustainability.

UNICEF received high praise for its effective RCCE initiatives. However, KIs have recommended early collaboration, including during regular programming, between UNICEF and government bodies, particularly local governments, to align social and behaviour change (SBC) efforts. This proactive engagement of local governments in UNICEF's SBC related efforts can create a conducive environment for seamless collaboration in emergencies while ensuring a stronger, more integrated approach. There were also suggestions from KIs for improvement, such as using a more inclusive communication approach, engaging field offices early on, and enhancing coordination with various stakeholders.

Issues of vaccine hesitancy have been reported from a few KIs in Afghanistan, Pakistan and Bangladesh where the commonly cited factors/barriers to vaccination included vaccine safety, vaccine efficacy, perception of risk, and mistrust of government or other organizations related to manufacturing and distribution of vaccines. One KI also raised concerns about the risk of vaccine hesitancy around COVID-19 infiltrating into routine immunization. Globalization and the infiltration of global politics into local spheres have heightened the risk of the emergence of anti-vaccine sentiments and groups, even in countries previously known for widespread acceptance of vaccines. For instance, Nepal, a country historically open to vaccination, faced the emergence of anti-vaccine groups spreading messages against the COVID-19 vaccine—a phenomenon previously unseen in the country, as highlighted by a government KI.

4.5 Service delivery and human resources

UNICEF's critical role in spearheading and supporting COVID-19 vaccination campaigns across South Asian countries demonstrates its commitment to public health and community well-being. Through collaboration with the respective governments, UNICEF played a crucial role in orchestrating nationwide vaccination drives, adapting to the local context, bolstering capacity, and fostering trust in vaccination programmes amid diverse challenges and in varying regional contexts. This included deployment of mobile health teams, creation of additional vaccination sites, extended operating times for vaccination sites and deployment of vaccination teams at targeted sites such as workplaces (

Table 18)

Table 18: Best practices to expand reach and uptake of vaccines[103]

Country	Best practices to expand reach and uptake of vaccines (examples)
Afghanistan	• The success of COVID-19 vaccination, with over 3.5 million people inoculated, was largely attributed to **targeted site-to-site campaigns**. • Utilizing **mobile health teams** for vaccine dissemination allowed UNICEF to reach diverse communities across the country, ensuring broader coverage and accessibility to immunization services. • Given the practicality of a single-dose vaccine and the logistical challenges of administering two doses in **hard-to-reach places,** the **single-dose Johnson & Johnson vaccine was provided**. • In Afghanistan, additional 800 vaccination sites were established including those in hard-to-reach areas. • Through political advocacy to ensure the appointment of an adequate number of **female health workers, and tailored communication materials** to improve the demand and uptake of vaccination in women.
Bangladesh	• A **nationwide mass vaccination campaign** led to the vaccination of millions, with over 3.7 million individuals (45% female) in rural areas and 1.3 million (44% female) in urban regions receiving the COVID-19 vaccine, signifying a concerted effort to reach various demographics by the end of 2021. • **Local community and religious leaders** were mobilized to help identify the unvaccinated population, and/or encourage uptake of vaccines. • **Dedicated vaccination teams** targeted more female clients in places like marketplaces and other **areas where female presence was significantly high.** • Established a **web portal** known as **"Surokkha"** to register the beneficiaries in phases as prioritized in the NDVP, schedule vaccination appointments, and send reminders for follow-up doses.
Bhutan	• **Nationwide mass vaccination campaigns**, guided by a comprehensive vaccine deployment plan. **Advocacy initiatives**, including campaigns for children aged 5–11 years, were successfully executed. • Involvement of leaders from their countries, notably **prominent figures receiving vaccinations publicly**, significantly contributed to fostering trust and promoting vaccine acceptance. • **Helicopters** were used to bring the vaccines to communities situated beyond the road network. • **Local community and religious leaders** were mobilized to help identify the unvaccinated population, and/or encourage uptake of vaccines.
Nepal	• The extensive network of **female community health volunteers** were mobilized for the vaccination campaign. • Involvement of leaders from their countries, notably **prominent figures receiving vaccinations publicly**, significantly contributed to fostering trust and promoting vaccine acceptance.

[103] UNICEF RO and COs annual reports and situation reports published between August 2020 and December 2022. UNICEF, WHO, Gavi. (2023) The COVID-19 Vaccination Response: Country experiences, best practices, and lessons KII respondents from Afghanistan, Pakistan, Nepal, Bangladesh and Maldives

	• Given the **cold chain requirements**, the government of Nepal rolled out the Pfizer vaccine, targeting children aged 12 years and above, which were **administered from 24 selected tertiary level hospitals nationwide**. • Vaccination teams **travelled for days on foot**, specifically in mountainous areas of Nepal. • KIs reported **accompanying people with disabilities to vaccination centres** (in some cases, even carrying them). • **Local community and religious leaders** were mobilized to help identify the unvaccinated population and/or encourage uptake of vaccines. • Reaching high-priority groups through **door-to-door campaigns.**
Maldives	• **Local community and religious leaders** were **mobilized** to help identify the unvaccinated population, and/or encourage uptake of vaccines
Pakistan	• With the focus on enhancing female uptake of COVID-19 vaccines in regions like Khyber Pakhtunkhwa and Balochistan, resources were deployed for **female vaccinators.** • Vaccination teams **travelled for days on foot**, specifically in mountainous areas of Azad Jammu Kashmir. • **Helicopters** were used to bring the vaccines to communities situated beyond the road network. • Migrant populations and nomadic communities were also reached **based on the polio vaccination database.** • COVID-19 **mobile vaccination and integrated health service camps** were set up across Pakistan including seven were in refugee camps in Karachi, two in Hyderabad, and four in Islamabad, **reach unregistered Afghans and others without formal papers**. Vaccination counters were established at border crossings. The vaccination drive was supplemented by 63 integrated health camps providing a variety of additional PHC interventions. • **Integrated mobile COVID-19 vaccination vehicles** were being used to reach hard-to-reach and marginalized populations (including Afghan refugees). • Reaching high-priority groups through **door-to-door campaigns**.
Sri Lanka	• **Mobilized all health workers and medical officers** for the vaccination programme to ensure that all the eligible populations who could not reach the immunization centres were still able to access the vaccines. • Making COVID-19 **vaccination available in facilities that provide services for high-risk groups** (including NCD clinics).

However, KIs from regional and country offices, as well as governments have recognized the 'vertical' nature of campaign-driven COVID-19 vaccinations, and its limitation such as resource diversion from routine immunization. While recognizing the unprecedented nature of the COVID-19 pandemic and the circumstances in which vaccination had to be given, KIs recommended that these efforts, where possible, should be integrated into the primary healthcare system in the future.

UNICEF provided crucial technical assistance for planning and executing the COVID-19 vaccination campaign (***Table 19***). For example, the partnership between UNICEF and WHO in Maldives facilitated the development of an electronic immunization registry for COVID-19 vaccination and supported the rollout of training modules to educate health workers to use the system. The electronic immunization registry significantly contributed to system strengthening and improving immunization programming and response in terms of enhanced real-time data tracking and informing decision making for vaccination

campaigns. As such, with UNICEF's support, 90 facilities, including all Greater Malé region facilities, atoll and regional facilities, and almost 50 per cent of children born in 2022 were added to the system and 9,200 children were tracked in the system.[104]

KII participants consistently spoke of the relevance of UNICEF-supported capacity building of cold chain and vaccine management staff, given the scale of the vaccination needs and new cold chain system that were introduced. UNICEF facilitated remote virtual training as well as onsite trainings on COVID-19 vaccination, cold chain, vaccine management and logistics management information system for government staff to ensure that the vaccination efforts would be effective. For example:

- **Bhutan and Nepal** country offices conducted human resource capacity and training need assessments (TNA).
- **Bhutan** conducted training of 22 vaccine and cold chain/biomedical engineers and coordinated with local academic institutes to include the cold chain and refrigeration training, with the goal of producing local cold chain technicians. UNICEF Bhutan conducted a training of trainers (TOT) workshop for 40 district health officers and maternal and child health focal persons on cold chain equipment management and maintenance; and training for 30 health staff and caretakers on cold chain equipment handling and routine maintenance in three districts (Samdrup, Jongkhar and Chukha). Trained their health and communications staff to improve their communication skills and build trust and allay fears among beneficiaries.
- **Nepal** conducted training on COVID-19 vaccine management for 200 personnel from UNICEF, other UN partners, NGOs, and the government.
- Training programmes for thousands of newly recruited vaccinators and support for vaccine procurement and cold chain system strengthening contributed significantly to **Pakistan's** impressive vaccination figures (millions of adults and children). In 2022, 3,000 newly recruited vaccinators were trained, reaching 100% of target.[105]
- In **Sri Lanka,** 1 578 COVID-19 vaccinators and support staff received training on COVID-19 vaccine delivery (e.g. IPC, AEFI and identification of missed population). 228 staff were trained on logistics or waste management (e.g., Immunization supply chain, Ultra-Cold Chain, Effective vaccine management, Reverse logistics)

Through these efforts the country offices ensured sustainability with regards to human resource capacity. KIs noted that the enhanced human resource capabilities can be leveraged for routine immunization.

Table 19: The training of HCWs, TA (as of May 2021)

[104] UNICEF RO and COs Annual Reports and Situation Reports published between August 2020 and Dec 2022.
[105] UNICEF RO and COs annual reports and situation reports published between August 2020 and December 2022.

Country	Immunization supply chain staff training (GoJ proposal)[106]	Healthcare facility staff and community health workers trained in infection prevention and control (IPC)[107]
Afghanistan	NA	3039
Bangladesh	NA	9671
Bhutan	956	N/A
Maldives[108]	87	N/A
Nepal	13	25,190
Pakistan	1753	303,401
Sri Lanka[109]	1578	N/A

Operational mechanisms and human resources at UNICEF Country Offices

UNICEF country offices received substantial reinforcement through surge mission support from regional offices and headquarters. New staff were recruited and deployed at national and sub-national levels across various countries to provide essential technical assistance for the seamless rollout of COVID-19 vaccines. Specific thematic areas received targeted support, exemplified by the Bhutan Country Office's addition of one cold chain staff member, the Nepal Country Office's recruitment of 13 cold chain consultants, and Sri Lanka's enlistment of one EPI and one cold chain consultant. KIs from UNICEF country offices noted they faced overwhelming workloads during the COVID-19 pandemic and had to grapple with the sudden increase in responsibilities related to pandemic response and the COVID-19 vaccination initiative. This increase was notably evident in supply and procurement, with expenditures skyrocketing up to tenfold. Existing staff dedicated to supply and procurement worked tirelessly around the clock to meet the escalated demands, a challenge exacerbated in smaller country offices where limited logistics personnel struggled to manage the intensified workload. For example, KIs noted that there was only one supply and logistics staff each in Bhutan, Sri Lanka, and Nepal country offices to handle both regular and emergency activities. **Table *20*** presents the number of immunization staff at the country level, which KIs said were insufficient to meet COVID-19 vaccination needs. KIs noted that the regional office's initiative to hold monthly conference calls with the country offices from mid-February 2020 was crucial for streamlining communication across various levels within the organization. These calls served as a platform for sharing updates at global, regional, and country levels, fostering a conducive environment for informed decision making for response planning. The opportunity to exchange critical information in real time facilitated the alignment of strategies and resources, enabling a more coordinated and effective approach to tackling the emerging challenges posed by the pandemic. Internally, the organization's commitment to maintaining regular and timely communication with staff members played a crucial role in ensuring transparency and clarity amidst uncertainty. Further, UNICEF was also active in regular calls, established in

[106] ROSA CCE proposal to government of Japan, 210215
[107] UNICEF ROSA, SAR Global COVID-19 Indicators
[108] Independent review committee report- COVAX CCE application for Maldives, May 2021
[109] COVAX CCE application, Sri Lanka, Feb 2021

2022, bringing together Gavi, EP, UNICEF supply division, and partners for concerted support for timely supply of vaccines through COVAX and address bottlenecks around supply., forecasting, manufacturers requirements, regulations, and import restrictions to be timely completed.

Table 20: Immunization staff at country level[110]

Countries	Number of Staff
Afghanistan	11
Bangladesh	3
Bhutan	1
India	21
Nepal	12
Pakistan	10

Duty of care

The creation of a duty of care group and the signing of Memorandums of Understanding (MoUs) with hospitals helped ensure the well-being of UN staff. For example, converting an IOM clinic into a UN clinic in Nepal not only provided a dedicated healthcare facility but also instilled confidence among staff members, especially those experiencing mild COVID-19 symptoms. This move alleviated concerns and offered immediate access to medical care within the UN's ecosystem, providing a sense of security and support. This proactive approach recognized the unpredictable nature of the pandemic, ensuring that adequate medical facilities were readily available for any UN personnel in need of hospitalization. The significance of these coordinated efforts cannot be overstated; they not only prioritized the health and safety of UN staff but also reflected the collective commitment of agencies to provide comprehensive care and support during challenging times. The prompt implementation of work-from-home measures showcased a proactive response, prioritizing the safety and well-being of employees. Additionally, providing support to staff members affected by COVID-19 demonstrated a commitment to the welfare of the workforce, establishing a supportive environment amid personal and professional challenges. Overall, these measures underscored the organization's dedication to adaptability, employee care, and cohesive internal communication to navigate the complexities brought about by the pandemic.

UNICEF has implemented a global mandate requiring COVID-19 vaccination for all staff members and associated personnel engaged in UNICEF activities, encompassing consultants, interns, secondees, and others collaborating with UNICEF. This requirement

[110] Data provided by UNICEF. Positions that have Health, or Immunization, or Cold Chain, or Child Survival, or Supply, or SBC in their post title, OR belong to functional area Health, or Health and Nutrition, Supply Chain, SBC*, Programme Planning*, M&E* that have contributed to Immunization. (* refers to HQ duty station positions), OR are working beyond Immunization programmes with cross sectoral areas funded by immunization.

applies irrespective of whether individuals are working on-site or teleworking, with exceptions granted only to those entirely remote and not engaging directly with UNICEF premises, programme sites, or communities. Those who do not meet vaccination requirements may face separation from service, with termination provisions in place as of 30 September 2022, for non-compliance. UNICEF has stopped recruiting new staff or complementary personnel who fail to meet these vaccination criteria. Medical exemptions may be considered, validated by authorized UN or UNICEF medical officials for staff, while complementary personnel can provide self-certification for exemption on medical grounds without detailed medical information. The mandate highlights that exemptions based on religious grounds will not be granted, except for limited medical contraindications. Additionally, temporary postponement of vaccination due to COVID-19 illness or severe allergic reactions to the vaccine components might be considered. As of 5 December 2023, 100% (2,071) of UNICEF country offices and regional office in South Asia have been vaccinated[111] against COVID-19. **(Appendix 18)**

4.6 Gender, human rights and equity

Vaccine equity between countries

Vaccine equity has been defined as vaccine allocation across all countries based on needs and regardless of their economic status.[112] During the initial year, access to the COVID-19 vaccine was far from equitable, exacerbating the existing disparities between countries in access to essential health commodities. A comparison between the initial COVID-19 vaccine accessibility in high-income countries and countries in the South Asia Region demonstrates this inequity (**Appendix 19**). For example, India, the second most populous country in the world, was the first country in South Asia to receive COVID-19 vaccine doses but the number of doses was 30% less than the doses the UK had with half of the population of India. Evidence reveals that 75% of all vaccines were distributed to just 10 countries, and only 0.3% of doses were administered in low-income countries.[113] Global initiatives such as COVAX fell short of their goals of equitable access, and their multilateral targets to vaccinate 70% of the population of all countries by the middle of 2022.[114] As vaccination started gaining momentum in low-income countries (including those in South Asia) in November-December in 2021, 63% of the population of upper-middle and HICs had already been vaccinated (**Appendix 19**). Further in May 2021, India (a key supplier to COVAX) decided to halt vaccine exports as COVID-19 cases were surging in the region, to prioritize its own citizens. The suspension disrupted the anticipated vaccine rollout, significantly

[111] All UNICEF personnel are required to be vaccinated with the 'primary series' of a WHO-'emergency use listed' (EUL) approved vaccines (e.g., AstraZeneca/Oxford; Johnson and Johnson; Moderna; Pfizer/BioNTech; Sinopharm; Sinovac; COVAXIN; Covovax. Registered manufacturers and vaccine brand names may vary by country and vaccine regulatory authority. Booster vaccinations were strongly encouraged.
[112] Global dashboard of vaccine equity. https://data.undp.org/vaccine-equity/
[113] Holder, Josh. (2021). Tracking coronavirus vaccinations around the world. *New York Times.*
[114] Haldane, V., Ariyarajah, A., Berry, I., Loutet, M., Salamanca-Buentello, F., & Upshur, R. E. (2023). Global inequity creates local insufficiency: A qualitative study of COVID-19 vaccine implementation challenges in low-and-middle-income countries. *PloS one*, *18*(2), e0281358.

impacting the vaccination campaigns in these countries, which were also grappling with rising infection rates.[115]

Equitable access in countries

Despite these challenges, UNICEF and partners persevered and continuously coordinated with the COVAX and the global community for the equitable access to COVID-19 vaccines for countries. UNICEF advocacy and support for countries in the region ensured that the vaccine (ultimately) reached all the eligible populations including those in underserved communities, hard-to-reach areas and socio-economically marginalized communities. UNICEF supported procurement, shipping and in-country logistics including equitable distribution, installation and functioning of the cold and ultra-cold chain equipment across all levels of the vaccine supply chain system, to ensure access to efficacious vaccine, including those living in remote locations. UNICEF supported the strategic distribution plan which included reaching all eligible members of the population irrespective of their age, gender, caste, religion, disability status, and beliefs. UNICEF supported countries to develop COVID-19 distribution plans based on the strategies in NDVP and micro-planning processes which prioritized the target groups including vulnerable populations, hard-to-reach people, people with disabilities, the elderly, and people with comorbidities.

Development partners like UNICEF consistently and actively advocated and supported the update of strategy and guiding documents such as the NDVP. This ensured amendment as per available global evidence on population groups that were not specifically mentioned in the guidance documents, such as pregnant and lactating mothers, youth, people with various chronic medical conditions and genetic disease conditions, paving the way for vaccination to these groups.[116] All countries, except Afghanistan, have prioritized pregnant women in their national vaccine deployment plans (NVDP) in COVID-19 vaccine rollout. However, as a region, there is limited disaggregated data for coverage of pregnant women. Bhutan reported 9,900 doses were administered to pregnant women (3,389 full vaccinated, 2,365 received first booster dose, 608 received second booster dose); using the denominator of around 11,000 new births per year, around 30% pregnant women were fully vaccinated.[117]

All respondents, whether representing government or UNICEF, unanimously reported that maximum efforts were made to access those hard to reach. UNICEF used innovative approaches to reach marginalized and hard-to-reach communities. (

Table 18)

[115] Steinhauser, Gabriele; Hinshaw, Drew, & McKay, Betsy. (2021). Why a grand plan to vaccinate the world against COVID unravelled. *Wall Street Journal.* Available at https://www.wsj.com/articles/why-a-grand-plan-to-vaccinate-the-world-against-covid-unraveled-covax-11622045728

[116] Key informant interview and perception survey findings

[117] UNICEF ROSA. COVID-19 Vaccine Deployment, 2022

Six of the seven countries have achieved high primary series coverage among healthcare workers and older populations. The exception is Afghanistan, with only 21% healthcare workers fully vaccinated. As of 2022, majority of the seven countries had extended eligibility for booster doses to all adults (or those 12 years and above, including in Bhutan, Maldives, Nepal) rather than using targeted strategies to reach those most at risk. As booster dose coverage is low, it is likely that many/harder-to-reach high-priority groups have not been reached with boosters. Bhutan, Maldives and Sri Lanka have commenced targeted campaigns to reach those above 65 years, and those 18 years and above in high-risk populations for second booster doses. Bhutan and Maldives have commenced the second booster dose campaign to reach all vulnerable populations (elderly >65 years, 12+ years with comorbidities, healthcare workers, other frontline workers). However, disaggregated data by priority group is limited, and further breakdown would help identify poorly served groups.[118]

Gender

In 2019, UNICEF ROSA developed a gender and immunization guide to support health professionals to effectively integrate a gender perspective at all points in the immunization programme. This document, which also guided COVID-19 vaccination programmes, provided guidance on how to identify gender norms, roles and relations that affect health-related behaviours, outcomes and health sector responses and adequately reflect the concerns and interests of both women and men, girls and boys in the immunization and health system.[119]

Among the 80 perception survey respondents (including those who responded to vaccine specific questions), over 90% agreed that UNICEF's response and related programmes were effective to meet the needs of girls and women, with 66% strongly agreeing with the statement, and none stating any disagreement. The agreement was less strong for the effectiveness of the response in meeting the needs of persons with disabilities and of marginalized groups with low incomes or from remote geographies, with 41% and 39% strongly agreeing, and 43% and 51% somewhat agreeing with these statements, respectively. Three per cent strongly disagreed that the response efforts met the needs of persons with disabilities **(Appendix 15).** However, several KIs noted that collection of disaggregated data alone is not enough and there is a need to understand the reasons behind the observed impact. As such, one KI specifically made this recommendation with regard to social and behaviour change strategies for immunization, where there is a need to gather evidence on barriers to behaviour change and vaccine acceptance that are unique to specific vulnerable groups. Only such information (reasons behind observed impact) can inform (gender-) transformative programming, and disability-responsive programming. Across the South Asia region, not all countries have gender disaggregated data. Available

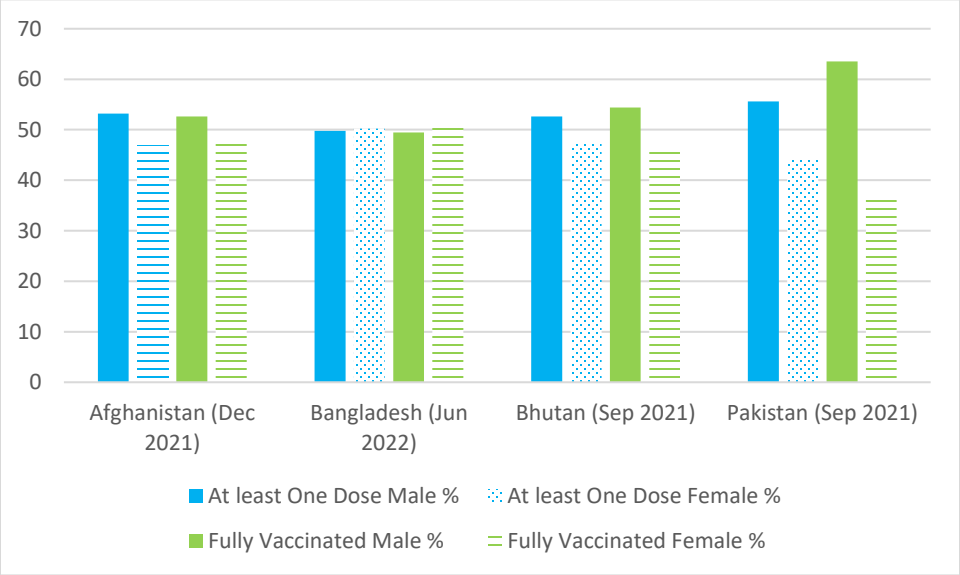
[118] UNICEF RO and CO annual reports and situation reports published in 2021 and 2022, as reported by KIs. UNICEF ROSA. COVID-19 vaccine deployment, 2022.

[119] WHO and UNICEF. (2019). Immunization and gender: A practical guide to integrate a gender lens into immunization programmes. Available at https://www.alignplatform.org/resources/immunization-and-gender-practical-guide-integrate-gender-lens-immunization-programmese

data shows a negligible gender gap in Bangladesh while in Pakistan there are discrepancies between fully vaccinated male and female individuals (***Figure 8***) Meanwhile KIs suggested that UNICEF's response was effective from the perspective of gender and marginalized groups. This gap is associated with the willingness of being vaccinated at the client level.

In Khyber Pakhtunkhwa (KPK) province of Pakistan and southern provinces of Afghanistan, there were significant gaps between male and female vaccinations, as reported in KIIs. In both areas, the main reason was women not getting vaccinations from male vaccinators. Various steps were taken to address the issue by involving community and religious leaders. Female vaccinators were also recruited as part of the vaccination team, trained and deployed to provinces like KPK and Balochistan where there was female vaccination hesitancy. The existing lady health worker programme in Pakistan was utilized and healthcare workers from the programme were mobilized for female vaccination.[120] Bangladesh regularly monitored the vaccination data and found that initially male vaccination coverage was higher (53%) than female. In April 2021 the strategy was reviewed and updated to reach more female clients.[121] The dedicated vaccination teams targeted more female clients in places like marketplaces and other areas where female presence was significantly high. This flipped the vaccination rate in Bangladesh; data from Fall 2022 revealed that more females were vaccinated than males.

Figure 8: Gender disaggregated status in South Asia[122]



[120] JSI-USIAD. Supporting the COVID-19 response in Pakistan: Ensuring health workers have the knowledge and skills to combat COVID-19 and prevent future pandemics.
[121] UNICEF. Gender and COVID-19 vaccine, 2021
[122] The COVID-19 sex disaggregated data tracker. https://globalhealth5050.org/the-sex-gender-and-covid-19-project/the-data-tracker/?explore=variable

Paediatric Vaccination

In all countries, except Afghanistan, the COVID-19 vaccine drive reached adolescents 12-17 years through school-based platforms and vaccination sites.

- As of 26 January 2023, **Bangladesh, Bhutan, Nepal** have made COVID-19 vaccines available for all children aged years and above.
- In **Maldives, Pakistan and Sri Lanka** COVID-19 vaccines are available for children aged 12 years and above.
- Further, there are ongoing plans in **Maldives** to make vaccination available for children aged 5-11 in the coming months,
- In **Pakistan** vaccines for children aged 5-11 years are currently being rolled out in some provinces, with plans to expand to the rest in the coming months.
- **Afghanistan** has not yet started vaccinating children against COVID-19.[123]

As of August 2022, over 114 million children aged 12–17 years had received at least one dose (out of the two-dose regime) of COVID-19 vaccine. None of the children in Afghanistan have been vaccinated, and Pakistan has only vaccinated 45% of children aged 12–17 years with at least one dose. For the remaining countries, over 80% of children aged 12-17 years have received at least one dose, with Bhutan vaccinating 99% of the 12–17 years with at least one dose (out of the two-dose regime). ***Figure 9*** provides information on the vaccination rate in children aged 12–17 years in South Asian countries. Further, 97% of children aged 5–11 years in Bhutan have received at one dose (out of the two-dose regime) of COVID-19 vaccine.[124]

COVID-19 vaccinations in children have contributed to creating safer school environments, by reducing transmission rates and fewer outbreaks, fostering a sense of security among students, educators, and families. As noted in Maldives, COVID-19 vaccination programme for all students aged 12 years and above (32,000), 9,000 teachers and all school staff and parents enabled safe reopening of schools in August 2021.[125] Such immunization drives can safeguard the health of the school community, allowing for a more confident return to in-person learning while mitigating the risk of infections within educational settings. As such, a cross-sectoral rapid assessment conducted by UNICEF Bangladesh and partners on child safety concerns after school reopening – where 557 parents (84% female) were interviewed nationwide – revealed that 38% were concerned about the non-availability of vaccines at schools.[126]

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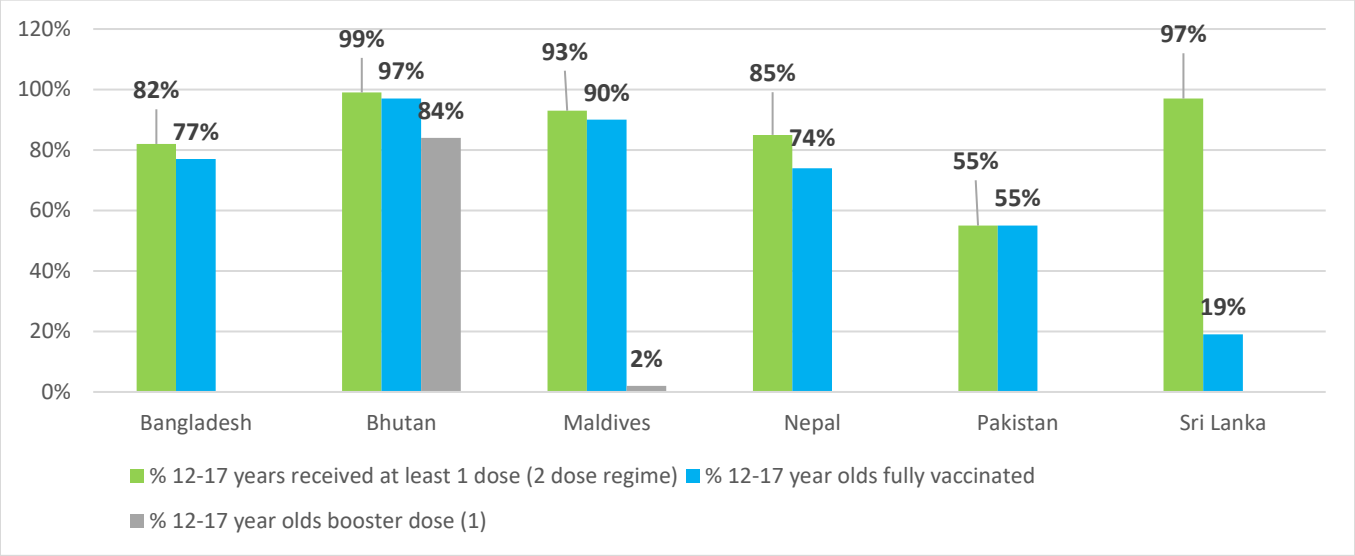
[123] UNICEF (2023). Children and COVID-19 vaccines. Parents' Questions Answered. Retrieved from https://www.unicef.org/rosa/stories/children-and-covid-19-vaccines
[124] SAR pediatric vaccination coverage data updated 22 August 2022.
[125] UNICEF Maldives Country Office Annual Report 2021.
[126] UNICEF Bangladesh Country Office Annual Report 2021.

There are concerns with school dropout observed between the first and second doses of the primary vaccination series in this population. KIs noted that this may be partially attributed to the timing of the second dose, as the target population might not yet be eligible for their second dose within the recommended schedule. However, in Sri Lanka where only 19% have received the second dose (versus 97% receiving the first doses), the dropout reflects the impact of enforced school closures and disruptions caused by exams.

In Pakistan, surveillance data (as per KI) revealed another concerning trend – gender disparity in vaccination rates among 12–17-year-olds. The data indicated that a larger proportion of males in this age group have completed their vaccination compared to females. This disparity raises important questions about access, outreach, and potential barriers that might be affecting vaccination uptake, especially among female adolescents in the country.

Figure 9: COVID-19 vaccination rate in children aged 12 -17 years in South Asian countries[127]



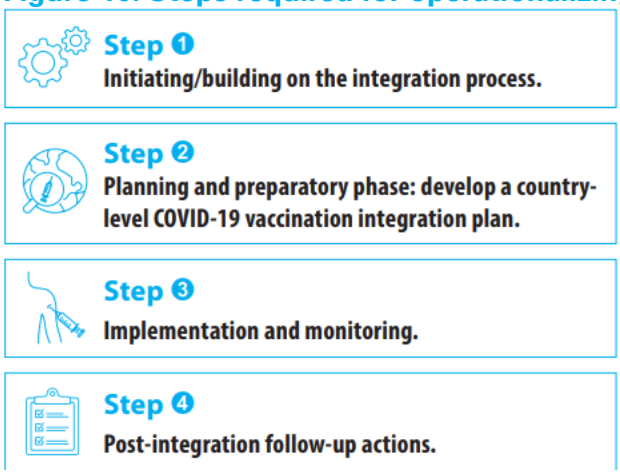
4.7 Integration of COVID-19 vaccine and routine immunization (Sustainability)

The rapid implementation of COVID-19 vaccination programmes in the midst of a global pandemic has been an unprecedented achievement. The scale and speed of this global vaccination campaign have been historic, with over 13.5 billion doses administered worldwide, out of which 3 billion (22.24%) were administered in the eight countries in South Asia by 7 December 2023 (with India included and 950 million excluding India). However, this success has come with a price for several countries. Redirecting health resources toward COVID-19 vaccination efforts has strained essential health services, including immunization programmes, leading to an increased risk of outbreaks from vaccine-

[127] SAR pediatric vaccination coverage data updated 22 August 2022.

preventable diseases. Weak health systems bore the additional burden, albeit justifiable, of dedication resources for coordination, financing, delivery and other approaches to support the rapid scale-up and delivery of COVID-19 vaccines. Despite these challenges, the pandemic response has spurred new approaches and insights, encouraging the integration of COVID-19 vaccination into national immunization programmes and primary health care systems. As nations navigate the uncertainties surrounding the pandemic's future, strategic planning for sustainable COVID-19 vaccination within broader health services has become imperative. In 2022, WHO and UNICEF published a document, 'Considerations for integrating COVID-19 vaccination into immunization programmes and primary health care for 2022 and beyond' which lays out key programmatic considerations essential for moving from mass campaigns for COVID-19 vaccination to integrating COVID-19 vaccination into immunization programmes, PHC and other relevant health services for 2022 and beyond. [128] The document proposes key steps to guide countries on how to operationalize integration of COVID-19 vaccination at national and subnational level: assess their readiness, develop a plan and identify short-term (6–12 months) capacities and investment needs. (**Figure *10***)

Figure 10: Steps required for operationalizing integration [129]



The integration of COVID-19 vaccination into routine immunization programmes is crucial for several reasons. Firstly, the trajectory of the pandemic remains uncertain, indicating a need for periodic booster doses for high-risk populations. Integrating these vaccines, specifically targeted at adults, necessitates different delivery strategies beyond childhood vaccination. Secondly, the urgency to achieve short-term COVID-19 vaccination goals in 2020–2021 led to fragmented and unsustainable delivery approaches, highlighting the need

[128] WHO and UNICEF (2022). Considerations for integrating COVID-19 vaccination into immunization programmes and primary health care for 2022 and beyond. Retrieved from https://iris.who.int/bitstream/handle/10665/366171/9789240064454-eng.pdf?sequence=1 .
[129] WHO and UNICEF (2022). Considerations for integrating COVID-19 vaccination into immunization programmes and primary health care for 2022 and beyond. Retrieved from https://iris.who.int/bitstream/handle/10665/366171/9789240064454-eng.pdf?sequence=1 .

to normalize vaccine delivery by integrating them into immunization programmes, PHC and other relevant health services. Thirdly, leveraging the investments, innovations and new tools developed during the pandemic response can bolster immunization programmes, primary healthcare, and pandemic preparedness. These included digital health, real-time monitoring systems, including social listening mechanisms, dashboards and visualization, SMS reminders; new ways of providing training for health workers. Simultaneously, the robust infrastructure and capabilities of current immunization programmes and primary healthcare systems can be utilized to further advance COVID-19 vaccination efforts, such as utilizing established systems like monitoring and reporting mechanisms for adverse events following immunization (AEFIs) and leveraging primary healthcare delivery platforms such as non-communicable disease (NCD) clinics to facilitate COVID-19 vaccine administration. Lastly, integrating COVID-19 vaccination into existing services provides an opportunity for a more comprehensive life-course and people-centred approach, [130] enabling broader reach and improved response across various age groups, while aligning with the goals of 'life course vaccination' of IA2030.[131] This integration is a transformative opportunity for building resilient immunization programmes and to strengthen PHC. [132]

Integration of COVID-19 vaccine is defined as "the partial or full adoption of COVID-19 vaccination into national immunization programme services, PHC and any other relevant health services with the overall aim of improving programme efficiency and sustainability, enhancing demand and improving user satisfaction, achieving and maintaining satisfactory coverage, and addressing inequities." [133] Integration should be context-specific and based on the principles of equity, people-centeredness, and optimization of service coverage. The integration of COVID-19 vaccination into existing health services presents numerous advantages. These include enhancing programme efficiency and performance by offering COVID-19 vaccines alongside other health interventions, sharing costs and resources among health services, reaching vulnerable populations, and seizing opportunities for previously missed vaccinations and health interventions. Integration of COVID-19 vaccination and routine immunization programme can be an indirect measure of sustainability of interventions introduced for the COVID-19 vaccination, as it promotes utilizing of COVID-19 investments, fostering demand for health services, and improving user outcomes through a people-centred approach. However, these benefits come with certain risks, such as logistical complexities, potential vaccine hesitancy affecting broader

[130] A people-centred approach should correspond to population needs through the design, management and delivery of services that are shaped by and responsive to the needs of individuals and communities, including addressing access to-service barriers due to age, location, social and cultural norms, or gender related factors.
[131] One of the goals of the Immunization Agenda 2023 is Life-course & Integration (All people benefit from recommended immunizations throughout the life-course, effectively integrated with other essential health services.) Available at https://www.immunizationagenda2030.org/strategic-priorities/life-course-integration
[132] WHO and UNICEF. (2022). Considerations for integrating COVID-19 vaccination into immunization programmes and primary health care for 2022 and beyond. Available at https://iris.who.int/bitstream/handle/10665/366171/9789240064454-eng.pdf?sequence=1 .
[133] WHO and UNICEF. (2022). Considerations for integrating COVID-19 vaccination into immunization programmes and primary health care for 2022 and beyond. Available at https://iris.who.int/bitstream/handle/10665/366171/9789240064454-eng.pdf?sequence=1 .

vaccination programmes, strain on healthcare workers, inadequacies in access and supply chain logistics for COVID-19 vaccines, challenges in health information systems, financial issues, and uncertainties surrounding the future need for COVID-19 vaccination. [134]

KIs from UNICEF regional office noted that integration of COVID-19 vaccination and routine immunization programme with other stakeholders remains a priority. The integration of COVID-19 vaccination into routine immunization programmes has also been a focal point across several countries, showcasing varying degrees of progress, challenges, and strategic considerations. Across the countries, there was consensus that the existing immunization programmes would shoulder the responsibility of COVID-19 vaccination when these programmes are integrated, given that the same teams providing services for routine immunization to children or women, were extending their efforts to encompass COVID-19 vaccination. Through the integration of RI and C-19, the services could be conducted through the modality of 'co-location', which refers to operations at the same fixed sites or clinics; 'co-delivery' pertaining to the use of same mobile vaccination units and outreach teams, or 'co-use' pertaining to the use of the same immunization infrastructure such as transportation, cold chain supply and storage.

Afghanistan leveraged existing immunization resources and used a vertical system to deliver COVID-19 vaccines. KIs have highlighted current plans to train 650 vaccinators for both routine and COVID-19 immunization signifying a strategic shift towards comprehensive integration at the service delivery level in **Afghanistan**. Further, the commitment for integration is demonstrated in the plans to train the staff in all the 2,600 facilities in the country to provide COVID-19 vaccination. KIs recognize the potential benefits of integration, such as provision of multiple services in a single location. While storage integration of COVID-19 vaccines with other vaccines has been achieved in **Pakistan**, formal programmatic decisions are pending. **Pakistan** initially administered logistical support and vaccine distribution through the routine immunization programme, a practice that could potentially be leveraged for integration. Government KIs from **Nepal** indicated progress towards official authorization for integration. Some of them suggested including other vaccines like those for influenza, which have a potential to be a pandemic in the future. KIs also suggested focusing on specific populations such as health workers and population with co-morbidities at the initial stages. KIs noted that the conversation around integration continues to evolve, and its timeline remains uncertain in Nepal. There's a lack of clarity regarding the waning of immunity and the feasibility of incorporating the COVID-19 vaccine into routine programmes. KIs also suggested that integration could include nutrition, cholera or WASH services along with immunization services, depending on the ongoing programmes in the respective countries., **Sri Lanka** initially delivered COVID-19 vaccine through vertical programmes (campaign-mode), but was later delivered as a part of an integrated service package. KIs attribute this shift to the economic crisis

[134] WHO and UNICEF. (2022). Considerations for integrating COVID-19 vaccination into immunization programmes and primary health care for 2022 and beyond. Available at https://iris.who.int/bitstream/handle/10665/366171/9789240064454-eng.pdf?sequence=1 .

faced by the country. This successful assimilation was facilitated by an existing infrastructure that allowed COVID-19 immunization to seamlessly align with routine services provided at polyclinics, which have antenatal clinics, and immunization is part of the package delivered to antenatal mothers, and children.

Despite the absence of explicit barriers, considerable challenges were identified concerning the system's capacity and available resources. A key informant representing a UN partner said they anticipated multiple challenges in integration, related to funding, capacity building, monitoring, and maintenance. KI from Afghanistan noted challenges related to the differing age groups targeted by routine immunization (children and pregnant women) and COVID-19 vaccination (adults). KIs from Pakistan raised concerns regarding potential negative impacts on routine immunization outreach due to lingering COVID-19 vaccination hesitancy. Challenges, including possible duplication and accessing hard-to-reach areas, were also foreseen by KIs, accompanied by apprehensions that vaccination fears might impede routine immunization uptake.

The varied experiences underscored the complexities and nuances of integrating COVID-19 vaccination into routine immunization programmes. They showcased diverse progress, challenges, and strategic considerations across different national contexts. Key informants emphasized the importance of strategic planning, stakeholder collaboration, and addressing hesitancy challenges to achieve effective integration. As countries navigate the integration, their experiences illuminate the evolving landscape of immunization strategies amidst the ongoing COVID-19 pandemic, offering insights into the multifaceted aspects of incorporating novel vaccination programmes into established healthcare frameworks. Between December 2022 and January 2023, Bangladesh, Bhutan, Maldives, Nepal, and Sri Lanka ranked their readiness for planning and implementing COVID-19 integration, on a self-assessment COVID-19 Integration Readiness Checklist, developed by WHO and UNICEF (**Appendix 20)**.[135] The rating guide is presented in **Appendix 21.** The countries have rated their readiness with regards to eight dimensions:

- Leadership and governance, including political commitment, availability of governance and policy frameworks, and linkages to national health strategy.
- Health System Financing, including estimation and sourcing of relevant costs and identification of purchasing and payment systems.
- Demand and community engagement including integrated communication strategy, engagement of community and other stakeholders and availability and application of robust social listening and behavioural data.
- Service delivery including identification of models of care and availability of physical infrastructure, identification of entry points and target groups, and quality of care mechanisms.

[135] WHO and UNICEF (2022). Considerations for integrating COVID-19 vaccination into immunization programmes and primary health care for 2022 and beyond. Retrieved from https://iris.who.int/bitstream/handle/10665/366171/9789240064454-eng.pdf?sequence=1 .

- Health workforce including resourcing of primary healthcare workforce, community health workers and related plans for capacity building.
- Health information including availability of digital platforms, reporting procedure and tracing mechanisms.
- Access to essential medicines including mechanisms for demand forecasting, procurement, supply planning, and stock management and availability of required cold chain and storage.
- Monitoring and evaluation strategy

Based on the ranking, Nepal and Sri Lanka appear to have advanced towards integration with action in place or ongoing with regards to leadership and governance, health system financing, service delivery dimensions of the checklist. Maldives and Bangladesh have actions in place or ongoing with regards to health information dimension. Maldives has only partially completed action with regards to service delivery dimension. (**Appendix 20)**

Chapter 5 Conclusion

The evaluation emphasizes UNICEF's critical role in bolstering South Asian countries' COVID-19 vaccination initiatives, showcasing its proactive involvement in shaping the strategic direction of the vaccination programme and providing operational support. UNICEF's involvement shaped national deployment and vaccination plans (NDVPs), supported the country's vaccine introduction readiness assessments, and secured substantial funding through novel partnerships for vaccine procurement and distribution and cold chain support. UNICEF's accomplishments ensured **equitable access** to vaccines, by fostering effective coordination with COVAX and global partners, reinforcing the region's healthcare resilience. UNICEF's impact extended far beyond vaccine distribution, encompassing comprehensive support in developing robust cold chain storage infrastructure, updating vaccine management manuals and guidelines, and empowering staff with enhanced capacity in cold chain and vaccine management, as well as communication skills. The COVID-19 vaccine campaign orchestrated by UNICEF reflected excellent strategic planning and multifaceted execution and was able to reach marginalized populations and address barriers that lead to vaccine hesitancy. UNICEF's holistic approach combined robust infrastructure, strategic messaging, and community participation, culminating in widespread vaccine acceptance and uptake across South Asian countries. However, the campaign encountered multifaceted challenges, including inequitable access to vaccine, and hurdles in reaching remote areas due to logistical issues, as well as vaccine hesitancy. Overcoming these hurdles required extensive community engagement, tailored messaging, and partnerships to foster trust and confidence in vaccines. Despite these challenges, the campaign's implications for system strengthening were profound. Investments in cold chain infrastructure, enhanced data management systems, community engagement strategies, and workforce capacity building efforts underscored the campaign's lasting impact on the region's healthcare infrastructure. These efforts fortified the immunization supply chain, enhancing readiness for future emergencies as well as strengthening the system for routine immunization. UNICEF's continued advocacy and effort in the integration of COVID-19 vaccine in routine immunization in the region demonstrated its commitment to sustainability.

Leveraging innovative communication strategies, collaboration with local influencers, and targeted campaigns across multiple platforms, UNICEF effectively addressed public concerns, dispelled myths, and generated demand for COVID-19 vaccinations. Similar strategies can be utilized in introducing new vaccines such as the HPV vaccine. Strategies such as door-to-door vaccination campaigns; utilizing mobile health teams for vaccination; setting up vaccination counters at strategic locations; reaching mothers at places they frequently visit (e.g., marketplaces); use of digital innovation like 'Surokkha' to register, schedule and send reminders for vaccination; and engagement of community leaders and healthcare workforce to identify unvaccinated children can be leveraged to reach zero-dose children. UNICEF's effectiveness in reaching the elderly and adults during the vaccination drives demonstrated the effectiveness of integrated service delivery (e.g., vaccination at NCD clinics or hospitals); tailored communication strategies; simultaneous use of multiple media including social media; partnership with private sector including pharmacies; after-hours service delivery; and engagement of trusted community leaders and local influencers in healthcare initiatives. These lessons can be applied to NCD prevention and management initiatives to raise awareness about the risks, prevention, and management of NCDs among different age groups and communities. Moreover, UNICEF's experience in navigating cultural sensitivities and tailoring messages for diverse populations during the vaccination drives can be instrumental in developing culturally appropriate NCD awareness programmes. The emphasis on inclusive and targeted communication, coupled with community involvement, could be critical in addressing the growing burden of non-communicable diseases, fostering healthier communities, and promoting overall well-being.

In conclusion, UNICEF's multifaceted contributions during the pandemic has left an indelible mark on healthcare infrastructure, equity, and resilience. UNICEF not only facilitated widespread vaccine coverage but also paved the way for sustained healthcare access and equity among marginalized communities, establishing a solid foundation for future health endeavours in the region.

Chapter 6. Lessons learned.

1. **Strong government leadership is the linchpin for the success** This was evident in the proactive engagement of government stakeholders in setting the strategic direction for COVID-19 vaccine roll-out and distribution within the emergency response systems. Strong government leadership was instrumental in expediting the vaccine authorization processes, paving the way for efficient vaccine rollouts. Government participation was also crucial in building the public's trust in the vaccines.
2. **The market-driven nature of health services posed challenges for equitable access to critical resources.** Despite initiatives like COVAX, delays in vaccine distribution persisted, disproportionately affecting poorest, marginalised and groups. Ensuring that life-saving health innovations, particularly vital vaccines, reach the most vulnerable populations requires ongoing and persistent advocacy to overcome systemic barriers to equitable access and distribution. The experience with the COVID-19 vaccine highlights the critical need for a proactive approach to healthcare accessibility, in order to prioritize the most vulnerable communities worldwide.

3. **Community mobilization and generating demand for vaccines require a multifaceted approach.** Utilizing print media enables UNICEF to reach populations with limited access to digital resources, such as in rural areas, ensuring broader coverage and accessibility. Electronic channels, including radio, television, and online platforms, cater to diverse audiences, delivering timely and accessible information. In-person engagement, such as community meetings or outreach events, fosters personal connection, enhancing understanding and acceptance of vaccination initiatives. This approach is particularly effective in regions with limited technological penetration or where face-to-face communication is culturally valued. Employing this multi-channel strategy maximizes outreach, fostering comprehensive community engagement and enhancing vaccine uptake across diverse demographics and settings.

4. F**lexibility, agility, and rapid adaptation is critical in addressing public health emergencies**. Establishing alternative supply routes and exploring new modalities for vaccine distribution (e.g., use of helicopters and drones) were important strategies employed by UNICEF. Amid movement restrictions, virtual platforms became vital for trainings and meetings, ensuring continued operations. However, challenges arose in regions with limited infrastructure, affecting the effectiveness of remote work. Innovative healthcare models, like Afghanistan's family health house and mobile health services, proved essential in reaching remote areas with limited accessibility. The pandemic also necessitated the diversification of information dissemination channels. With restricted mobility, reliance on social media and web-based communication surged, presenting both opportunities and challenges. Health authorities, UNICEF and partners shifted from traditional print media to online campaigns and digital engagement to generate vaccine demand. While these platforms expanded reach, they also contributed to the infodemic. There was also need for flexibility and investment in human resourcing at the operational level at UNICEF country offices, particularly in the supply and logistics division, which was substantially short-staffed given the scale of operation.

5. R**obust evidence generation and real-time data monitoring and sharing are critical for an effective response**. Organizations made significant efforts to ensure comprehensive data sharing across platforms, e.g., through the development and utilization of dashboards and real-time data instruments. Entities like WHO, CDC, UNICEF, and UNFPA established dedicated COVID-19 pages, facilitating regular updates and information dissemination. However, certain areas demanded improvement, such as data on trainings and human resource capacities, as well as gender, age, and disability disaggregated data, which are crucial for a comprehensive pandemic response. A critical insight surfaced about the necessity of data on social behaviour change barriers related to immunization and vaccine hesitancy specific to diverse demographic groups. Identifying and addressing these unique barriers are crucial for tailoring effective strategies to combat hesitancy and enhance vaccine uptake. Therefore, a comprehensive data management strategy, inclusive of varied information facets, is essential for informed decision making and targeted interventions in future health emergencies.

6. **Vaccine hesitancy has multiple facets and requires tailored strategies that align with local contexts and are culturally sensitive**. The public's acceptance of vaccination was

notably swayed when prominent leaders and influencers publicly shared the fact that they had got vaccinated. This significantly contributed to building trust and fostering acceptance among the population, revealing the importance of influential figures endorsing vaccination to instill confidence in the masses. Countries like Nepal, where vaccine acceptance is historically high, also faced the risk of global vaccine politics, negatively influencing public perception. Recruitment of female vaccinators in Pakistan, not only improved access but also significantly contributed to alleviating hesitancy among females which was primarily linked to cultural norms rather than concerns about the vaccine itself. This showcases the importance of culturally sensitive approaches in vaccination campaigns.

7. Sri Lanka's integration of COVID-19 vaccination at the early stages highlighted the **significance of timely integration efforts in immunization programmes.** Albeit due to the economic crisis, by initiating integration in early phases of COVID-19 vaccines introduction, Sri Lanka facilitated a streamlined and effective approach compared to other countries that faced delays in integration. In contrast, for several countries this was a missed opportunity, which is now impacting and delaying the planning and implementation of integration of COVID-19 vaccination programmes, with COVID-19 vaccination limited to 'vertical programmes'. The experience in Sri Lanka showed that early integration facilitates smoother merging of novel vaccines with routine immunization. This approach leveraged existing infrastructure, personnel, and service points, reducing operational obstacles and ensuring a more coordinated framework for vaccine delivery.

Chapter 7 Recommendations

COVID-19 vaccination has played a critical role in mitigating the impact of the pandemic. COVID-19 vaccines which were developed at an unprecedented pace, and the subsequent the immunization campaigns offered the possibility of combating the spread of the virus. Governments, organizations, and healthcare systems worldwide mobilized to ensure widespread distribution and administration of vaccines. Vaccination efforts aimed not only to protect individuals from severe illness but also to curtail transmission and achieve broader community immunity. However, these endeavours were not without challenges, which included logistical hurdles, vaccine hesitancy, and equitable access issues. These challenges highlighted the need for a coordinated and inclusive approach for achieving immunization coverage worldwide.

The evaluation gathered data from both primary and secondary sources. Based on the findings and lessons learned, **Table 21** presents recommendations and key action items on how UNICEF can **build an equitable immunization system** that can be adapted to address disasters and emergencies in a timely and effective manner, including escalation of service delivery for affected persons. The draft recommendations were reviewed by the UNICEF evaluation team and validated by representatives from the relevant programme teams from ROSA. Based on their feedback, the recommendations and action items were revised to current form. Regional or Country office to whom these recommendations are directed at (and recommended to implement) have also been identified.

Table 21: Recommendation and Key Actions

Recommendation 1: Advocate proactively for early equitable access to vaccines at a global and regional level, and strategically scale-up effective strategies for equitable access to vaccines within countries.		**Responsible Regional or Country Office**

Key action items:
- Learning from COVAX experience identify systemic barriers to equitable access to vaccine and other health commodities in a global, regional and national market.
- Within countries, consider scaling up of effective strategies implemented during COVID-19 vaccination to reach hard -to-reach communities for routine immunization, 'zero-dose' children, during the introduction of new vaccines (e.g., HPV vaccine) or in initiatives related to NCD prevention with a key focus on women.
  - Door-to-door vaccination campaigns.
  - utilizing mobile health teams or female community health volunteers for vaccination at homes and communities.
  - Setting up vaccination counters at strategic locations including partnership with private pharmacies to set up vaccination stations at their pharmacies.
  - Reach women in health facilities that are offering specific services for women and girls
  - Reaching mothers with child-immunization related communication at places they frequently visit (e.g., marketplaces)
  - Engagement of community leaders and healthcare workforce to identify unvaccinated population.
  - Integrated service delivery (e.g., vaccination at NCD clinics or hospitals).
  - Offering after-hours (evening and weekends) service delivery
  - Use of digital innovation like 'Surokkha' to register, schedule and send reminders for vaccination to facilitate vaccine uptake.
- Gather evidence on the impact of inequitable access to COVID-19 vaccine in countries and globally. Use this evidence for continued advocacy, along with partners, for mitigating the systemic barriers to equitable access to vaccine and other health commodities.
	Based on 'Lessons learned' (6.2, 6.4, 6.5)
	
	High Priority
		Regional Office (Lead)
		Country Offices (Support)

- Continue to strengthen COVAX and ACT-A mechanism to ensure this system remains 'live' for regular immunization programming, and for future emergencies, and to make it more effective in providing equitable access, and to ensure equity and regularity in the provision of emergency supplies during any future pandemic		
Recommendation 2: Invest in regional and country preparedness for emergency immunization by advocating for more flexible policies, robust information management systems, and multiple and local supply systems		**Responsible Regional or Country Office and Sectors**
Key action items: - Collaborate with relevant ministries to establish clear policies and streamlined procedures within countries to facilitate the importation of vaccines and emergency supplies during critical situations, including efficient import protocols or blanket authorizations for vaccine permits and emergency use authorizations. Working alongside national governments, efforts should focus on implementing expedited approval and authorization processes specifically designed to address emergencies. - Continue to support countries to move towards setting up a digitized logistics management information system (eLMIS) to make tracking and monitoring of vaccines, ancillaries, and cold chain equipment more efficient, ensuring availability of quality data for informed decision making. - As part of the emergency preparedness plan, ensure mapping of alternative supply and transport routes within countries and in the region for any future emergencies/pandemics. - Consider partnerships with private sector and application of innovations for alternate distribution channels (e.g., use of drones, partnership with pharmaceuticals to leverage their distribution system)	**Based on 'Lessons learned' (6.1, 6.2, 6.4)** **High Priority**	Regional Office (Support) Country Offices (Lead)
Recommendation 3: Ensure that human resource planning during emergency response is taken into consideration for both programme as well as operations staff		**Responsible Regional or Country Office and Sectors**

Key action items: - Develop the policy and implement to ensure the inclusion of a budget line for operational support (i.e., operation staffs) while developing the programme planning and implementation.	**Based on 'Lessons learned' (6.4) Medium Priority**	Regional Office (Support) Country Offices (Lead)
Recommendation 4: Strengthen routine immunization by integrating COVID-19 vaccination and related infrastructure, and to further support primary healthcare and MNCH services in the region		**Responsible Regional or Country Office and Sectors**

Key action items:
- Continue to support COVID-19 vaccine integration in routine immunization:
  - Conduct regular dialogue with stakeholders at all levels of policy making, programme design and implementation and supply chain, up to the last mile.
  - Design and implement an exploratory and feasibility exercise to identify potential areas of integration.
- In future emergencies, consider integration at the outset of novel vaccination introduction to ensure seamless integration.
- Explore whether integration of COVID-19 and routine immunization is an opportunity to integrate other services, such as nutrition, WASH, other vaccines (e.g., influenza) to strengthen the primary health system
	Based on 'Lessons learned' (6.7)
	
	High Priority
		Regional Office (support) Country Offices (Lead)

Recommendation 5: Strengthen community and district health systems to reach marginalized communities using community structures		**Responsible Regional or Country Office and Sectors**
Key action items: - Build capacity of local health-workforce in communication skills required to address vaccine hesitancy and identify barriers to vaccine uptake. (Routine immunization and COVID-19). - Create inherent mechanism with local healthcare structure to identify unvaccinated population (routine immunization and COVID-19). - Consider investing in scaling up of female community health volunteers and mobile health teams to deliver immunization services at home and communities.	**Based on 'Lessons learned' (6.1, 6.3, 6.4)** **Medium Priority**	Regional Office (support) Country Offices (Lead)

- Integrate COVID-19 vaccinator workforce in routine immunization, particularly female vaccinators. - Assess the extent and areas of local health resource diversion during COVID-19 vaccination to comprehend its impact and in maintaining readiness for future emergencies.		
Recommendation 6: Enable 'localization' of response efforts by engaging local actors for a more relevant, timely and effective response to future emergencies.		**Responsible Regional or Country Office and Sectors**
Key action items: - Regularly **map out existing and emerging local community mobilizers and structures** (volunteers, entities, associations, particularly those working with girls and marginalised communities including people with disabilities) that are trusted by the community and can be mobilized during emergencies as well as engaged during regular programming. - **Continue to engage governments, particularly local governments and the private sector (e.g., mobile phone operators, radio and television stations)** in demand creation, risk communication, and social and behaviour change messaging, with a goal to transfer ownership of these activities to local authorities.	**Based on 'Lessons learned' (6.1, 6.3, 6.4)** **Medium Priority**	Regional Office (support) Country Offices (Lead)
Recommendation 7: Invest in real-time evidence generation that can tell 'stories' and not just provide numbers to inform the response to future emergencies.		**Responsible Regional or Country Office and Sectors**
Key action items: - Collect robust baseline disaggregated data and conduct systematic impact assessment of COVID-19 vaccination efforts on various groups including gender, age, priority groups, those with co-morbidities, health workers. - Continue to leverage and improvise the diverse models of data monitoring innovations in regular programming, while ensuring they are not only gathering 'numbers' but also used to understanding the 'stories' (facilitators, gaps and barriers) beyond those numbers, particularly reasons for vaccine hesitancy that are unique to	**Based on 'Lessons learned' (6.5, 6.6)** **High Priority**	Regional Office (Support) Country Offices (Lead)

each group and are increasingly being influenced by globalization.		