

COVID-19
and Influenza
Vaccination:

Global Exchange Forum

on Integrated
Immunization Programs
and Enhanced Pandemic
Preparedness

October 18-19, 2023
London, UK



THE TASK
FORCE
FOR
GLOBAL HEALTH

CDC
CENTERS FOR DISEASE
CONTROL AND PREVENTION

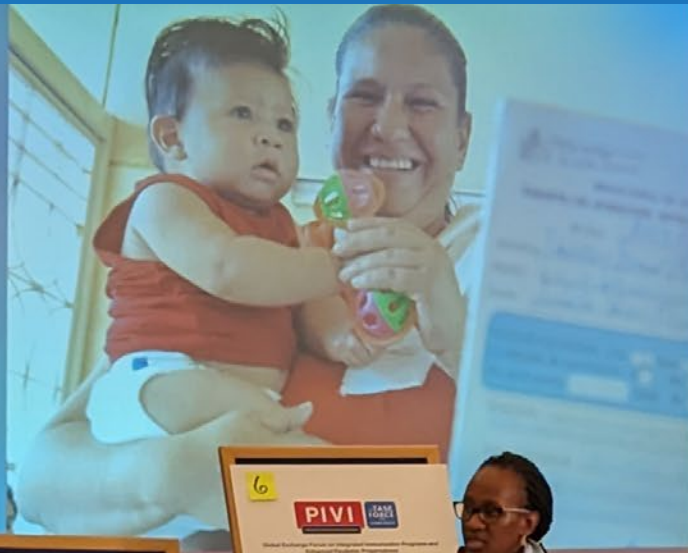
Acknowledgments:

The Centres for Disease Control and the Task Force for Global Health would like to thank the meeting participants from Ministries of Health, WHO and other UN Organizations, development partners and other contributors who willingly shared and discussed their experiences and lessons from COVID-19 vaccine introduction. We would also like to acknowledge the support provided by MMGH Consulting GmbH in co-facilitating the Global Exchange Forum, compiling the lessons and in drafting this report.

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Community acceptance and uptake

- RCE performance
- GMS implementation
- T-rolling
- Program sustainability
- Capacity to understand
- Access to services
- Community-based decision-making

How will target groups perceive this? (Risk & benefit)

Use program, staff, community training or change in staff or children in implementation

Ensuring all these steps & components are done in a coordinated manner

Use of public-private sector

Collaboration with private sector

Strong evidence on quality

Attention to acceptability & sustainability for users

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Immunization monitoring systems

Collaboration



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Acronyms

AEFI	Adverse Event Following Immunization
AIDS	Acquired Immunodeficiency Syndrome
CDC	Centers for Disease Control and Prevention
COVID	Coronavirus Disease
CSO	Civil Society Organization
DHIS	District Health Information Software
eLMIS	electronic Logistics Management Information System
EPI	Essential Programme on Immunization
EPP	Epidemic and Pandemic Preparedness
GID	Global Immunization Division
HIV	Human Immunodeficiency Virus
HPV	Human Papillomavirus
HR	Human Resources
ID	Influenza Division
IHR	International Health Regulation
IT	Information Technology
IVB	Immunization, Vaccines and Biologicals
KAP	Knowledge, Attitudes, and Practices
LMIC	Low- and Middle-Income Countries
LMIS	Logistics Management Information System
MCH	Maternal and Child health
MMGH	MMGH Consulting GmbH
MR	Measles Rubella
mRNA	messenger Ribonucleic Acid
NAPHS	National Action Plans for Health Security
NDVP	National Deployment and Vaccination Plan for COVID-19
NGO	Non-Governmental Organization
NIP	National Immunization Program
NITAG	National Immunization Technical Advisory Group
NRA	National Regulatory Authority
PHC	Primary Health Care
PIE	Post Introduction Evaluation
PPE	Personal Protective Equipment
PRET	Preparedness and Resilience for Emerging Threats
QR	Quick Response
RCCE	Risk Communication and Community Engagement
RSV	Respiratory Syncytial Virus
SAGE	Strategic Advisory Group of Experts on Immunization
SMS	Short Message Service
SPAR	State Party Self-Assessment Annual Reports
STAR	Strategic Tool for Assessing Risks
TA	Technical Assistance
TFGH	Task Force for Global Health
UNICEF	United Nations Children's Fund
WHO	World Health Organization

Executive Summary

Background:

The COVID-19 vaccination response was the fastest and largest vaccination program in history. However, this massive response strained health systems and diverted resources from essential health services. An inter-country Global Exchange Forum on Integrated Immunization Programs and Enhanced Pandemic Preparedness, organized by TFGH and US CDC and supported by WHO, UNICEF and MMGH Consulting, was held in London, UK on 18th and 19th October 2023 to discuss successes and lessons learned from COVID-19 and influenza vaccination programs. The two objectives of the forum were to leverage experiences made with COVID-19 vaccination for integrated service delivery across the life course and to sustain the momentum for building stronger immunization platforms as part of resilient primary health care (PHC) programs; and discuss ways of enhancing pandemic preparedness. The interactive meeting consisted of plenary and panel discussions, and break-out group interactions. The World Café method and a marketplace were used for sharing innovations, tools, and new programmatic approaches.

Looking Back: lessons learned from the management COVID-19 vaccination.

Country experiences discussed at the forum in each of the areas of National Deployment and Vaccination Plans (NDVPs) are summarized below.

Planning and Coordination: There was an increased understanding of the importance of planning and coordination, particularly with political actors. Multi-sectoral coordination and collaboration was enhanced across ministries and with various partners and stakeholders while ad-hoc committees and task forces were established to drive the vaccination response. The functionality, capacity, and expertise of National Immunization Technical Advisory Groups (NITAGs) was expanded. Countries with strong routine and seasonal influenza vaccination systems in place before the COVID-19 pandemic were able to respond efficiently. National Immunization Program (NIP) structures and processes could be leveraged at the various administrative levels. In some countries, pre-existing pandemic response mechanisms including

surveillance or contact tracing put in place for other diseases helped to mount a more rapid response. However, program governance and roles and responsibilities of the life course vaccination beyond childhood were often ill-defined. Countries that did not use their NIPs to lead the vaccination efforts, had to establish temporary systems that often led to duplicative efforts and misaligned data. External technical assistance was important but often difficult to organize because it came from various sources and was often duplicative and difficult to effectively manage.

Regulatory: Expedited procedures were introduced in many countries, significantly shortening vaccine and other medical product approval timelines.

Financing: Inter-sectoral collaboration created efficiencies and increased access to domestic funds. However, some complex costing and budgeting exercises and lengthy disbursement processes impacted service delivery. The management of financing flows to meet urgent needs was often challenging.

Human resources management and training: The scale of the vaccination effort necessitated a surge of the health workforce. This was often pooled across programs, with task shifting. However, surge contracts were mostly temporary. Seasonal influenza vaccination proved helpful for COVID-19 vaccination as it helped with vaccination of health workers, older adults, and those with comorbidities. A variety of platforms and refresher modules were used for health worker capacity building though virtual learning approaches but created problems for people in areas with insufficient information technology infrastructure.

Supply chain and logistics: The erratic supply of vaccines and the multiplicity of vaccine products with different characteristics complicated supply chain management. In most circumstances, careful planning of vaccines and related supplies and of cold chain equipment ensured products were available at the right time, right place and in the right condition. Supply chains were upgraded, and investments made into the expansion of cold chain and logistics including the storage needs of messenger ribonucleic acid (mRNA) vaccines (-80°C ultra cold chain). Electronic logistics management information systems to manage vaccine stock proved useful for supporting data for decision

making. Vaccination waste management capacity was substantially enhanced.

Vaccine acceptance and demand: Investments in vaccine demand generation paid rich dividends. COVID-19 vaccination increased attention to and awareness of the overall value of vaccination. Vaccination of adults and adolescents created an increased visibility and awareness of vaccination programs among the public, health workers and governments, and allowed for the emergence of new immunization champions. In some countries a lack of confidence in public health efforts also became apparent. There were negative repercussions on routine vaccine delivery and in some situations, on public acceptance of vaccination overall. In response, risk communication and community engagement (RCCE) approaches were enhanced. New ways were explored of addressing misinformation and disinformation and of providing positive information on vaccinations to the public and extending ad hoc demand generation activities. Religious groups, community leaders, civil society, and volunteers were involved in communication activities. Research methods were advanced to identify barriers and drivers of vaccination uptake, including social listening and other novel social science approaches.

Vaccine delivery strategies: Coordination and flexibility were key in meeting evolving needs. The variety of vaccines created complexities with dosing schedules (e.g., homologous or heterologous) which were often resolved in a pragmatic way. Innovative solutions were found to vaccinate priority groups with a strong focus on bringing the vaccine to the people through pioneering outreach services. New channels for service delivery were created, e.g., in schools and workplaces and in the private sector.

Vaccine safety: Pharmacovigilance needed strengthening in many countries given the scale of vaccination and the use of novel products in new target groups, especially those with existing comorbidities and the elderly. Transparent risk communication on adverse events following immunization (AEFI) was important for maintaining the community trust in vaccines.

Immunization monitoring and data systems:

Electronic immunization registries (eIR) allowed for regular and often real-time monitoring of coverage and for AEFI reporting. Pre-existing immunization registries were adapted, and new immunization information systems were created to cover the life course. Many systems also enabled the issuing of digital vaccination certificates, tracking defaulters, and sending reminders. However, systems developed within short timelines led to parallel information systems and unresolved issues related to their interoperability. This overburdened health workers' capacity and led to concerns about data quality.

Impact on routine immunization: Many countries witnessed a displacement of priorities for essential immunization and a deprioritization of other routine health programs.

Going forward: using learnings to strengthen life course approaches and integrated service delivery.

There is a renewed focus on integration of vaccination and other PHC services following the COVID-19 experience. The experience from COVID-19 vaccination provides a public health opportunity for transformational change from child vaccination to a life-course approach and integrated service delivery in the following areas:

Planning and coordination: To enable more integrated services, governance structures will need to be revisited and roles and responsibilities clarified between the NIP and other programs. Newly established coordinating structures, such as national task forces and other leadership and governance structures for the COVID-19 response should continue to be used. Ensuring ongoing support of higher-level decision makers for an integrated PHC approach will be difficult to achieve, as experience from COVID-19 showed that decision making has become highly political and often fragmented and this will need to be managed. Partnerships established for the COVID-19 efforts such as civil society organizations including faith-based organizations, professional associations, and the private sector will need to be sustained. Other health programs should be leveraged (e.g., non-communicable diseases, maternal and child health, HIV/AIDS, tuberculosis, and occupational health) and

joint monitoring and surveillance systems strengthened. A WHO / UNICEF support package for integrating COVID-19 vaccination into immunization programs and PHC was published in 2022 and can be used to advance integration processes in countries.

Financing: Innovative financing mechanisms for vaccination and other health services should be leveraged and funding streams harmonized to support integration. The Gavi Vaccine Investment Strategy includes several new vaccines that would benefit from integrating vaccination with other PHC services. Experience shows, however, that politics, donor priorities and health system structures can hinder or prevent integration and will need to be considered. Cost-effectiveness considerations can delay integration due to the very high start-up costs, although integration is usually cost-effective.

HR management and capacity building:

Health worker workload and well-being will require better planning and management of human resources with contingency plans for surge capacity. Health worker learning and performance management will need to be enhanced using new tools and approaches to enable the transformational change required. Pre-service training will need to be updated, with a focus on communication skills and demand creation, on data management and use of data for operations planning.

Supply and cold chain and logistics:

The enhanced supply, cold chain and logistics capacity and expertise established during the COVID-19 vaccine rollout should be used to support integrated delivery of services across the life course. New cold chain maintenance approaches, eLMIS innovations for improved data visibility, new stock management tools, QR codes and dynamic labelling systems should be used to improve overall pharmaceutical logistics management. Supply and cold chains will need to be redesigned with emergencies in mind. COVID-19 also gave a push to technology transfers and to support local manufacturing of other antigens.

Demand, vaccine acceptance and uptake:

The trust of citizens in government services and immunization services built during the pandemic response should be sustained. Ongoing regular and rapid communication and information sharing

with health workers and the public about the value of vaccines and integrated services will be critical. Different target groups will need tailored communication messages. Community leaders will need to be engaged on a continuous basis. The capacity to monitor and respond to misinformation and disinformation and promptly address rumors will need to be strengthened. Electronic tools for social listening should be further adapted for routine use in other programs.

Service delivery: Country programs can leverage the COVID-19 experience to normalize adult and adolescent immunization services. Existing touch points for high priority use groups (older adults, persons with chronic disease, immunocompromised, pregnant women, health workers) established during COVID-19 vaccination should be continued. Additional adult touch points for vaccination and other services include e.g., insurance-related, and annual checkups, medical fitness checks, travel clinics, but also community meeting places and contacts with adult caregivers of children being vaccinated, national services for the elderly, follow up appointments, pharmacies, and the social security systems. Health education for adult vaccination should be included as part of other PHC strategies and campaigns. There will be a need for additional delivery sites (e.g., in the workplace, in schools, or in old age homes) and a drive towards reducing missed opportunities in health facilities, offering vaccination to all patients and clients. Innovations and collaborations with other health programs established for the COVID-19 vaccination response can be sustained and leveraged.

Vaccine safety: Integrated pharmacovigilance systems need to be continuously enhanced, making use of strengthened AEFI monitoring systems, newly established causality assessment committees, and funding schemes to compensate for adverse events.

Monitoring and evaluation, and data

systems: Data management and information systems established for COVID-19 vaccination will need to be expanded to capture immunization information across the life-course. The interoperability of new data systems with routine Health Management Information System (HMIS) should be further developed, including new tools and approaches for real time recording

and reporting and use of data for action. Digital vaccination certificates developed for COVID-19 could also be used for vaccines against influenza, mpox, yellow fever, and ultimately for all childhood vaccines and other health services. Interoperable data systems should be promoted to enable data triangulation and used to enhance program performance. At the same time comprehensive disease surveillance and pharmacovigilance systems will need to be strengthened, building upon influenza surveillance systems where available.

Research: There is a continued need for evidence and information from special studies on specific target populations, on vaccine effectiveness or impact. In addition, knowledge, attitudes, and practices (KAP) studies and quality of service assessments should be tailored to life course programs.

Experience sharing between countries:

Countries should continue to collaborate, particularly regarding sharing of best practices. Regular situation reports and case studies on integration should be provided, and a list of global and regional resources, tools and guidance made available. Calls were made by Forum participants for regular meetings or workshops at global, regional, and national levels as well as for webinars, videos, dashboards, and podcasts. Cross-country field trips or twinning opportunities for technical staff could be good ways of sharing information and experiences, ultimately allowing for an active community of practice in integration.

Going forward: using learnings to enhance pandemic preparedness.

The COVID-19 experience provided important learnings for improving pandemic preparedness. Such preparedness was assessed in a non-representative survey among the Forum participants. Of 42 respondents, 83% stated that their countries would now be better prepared to deliver a novel vaccine to target groups; 55% believed that there would be better acceptance of novel vaccines in their countries today, while 29% were worried about decreased acceptance. Almost two thirds of respondents (61%) believed that the changes and new approaches that had been implemented in response to

COVID-19 would be sustained in their countries. PRET (Preparedness and Resilience for Emerging Threats) is WHO's new approach to improving pandemic preparedness for groups of pathogens, based on their mode of transmission. More than 80 countries have so far been engaged in simulation exercises or workshops to update their pandemic preparedness plans. PRET provides modular learning opportunities and a first module on planning for respiratory pathogen pandemics has recently been published.

In many countries, responsibility, and ownership within governments for pandemic preparedness needs to be further clarified. A legal preparedness framework and incident management structure should be in place and technical advisory groups for decision making should be sustained. Private sector collaboration is important for establishing surge capacity. To avoid deprioritization of other health programs, financing solutions should establish separate secure funding streams for emergencies. Self-assessments and simulations need to be conducted, and adequate health worker capacity-building solutions should be in place. Clear communication around when, where, and how non-emergency health services will be offered during pandemics are needed to avoid fear and panic arising and to establish trust in the communities. Communication approaches developed for COVID-19 must be refined, tailored, and continued. The connection between the scientific community and communicating with the public should be consolidated. Innovative technologies and delivery strategies should continue to be used, national stock management of PPE and drugs enhanced, including the need for rolling stockpiles and real-time monitoring of supply chains. Vaccine preventable disease surveillance efforts will require further strengthening with clear case definitions for rapid response.

Building on influenza experience:

Seasonal influenza program platforms can serve as foundations for overall pandemic readiness. In a recent cross-country assessment of low- and middle-income countries (LMICs), those with seasonal influenza vaccination programs deployed COVID-19 vaccines earlier than those without and reached higher vaccination coverage more quickly than countries without such programs, also among health workers. Persons in countries with influenza programs were

more likely to receive a recommendation from health workers to take the COVID-19 vaccines.

Staying prepared - key priorities

to act on: There is a need for overall flexibility as the next pandemic could be different from what we have seen in the past. All countries represented at the Forum reported having pandemic influenza preparedness plans, though not all were regularly updated. Pandemic preparedness should be included in national 5-year immunization strategic plans, and continuously

reviewed and updated. All systems should be scalable and adaptable and practiced at all levels with active simulation exercises, drills and post-mortem reviews that inform the revisions of plans. Legal frameworks and cross-sector coordination structures will need to be established that can be activated in case of emergencies. National regulatory processes will need to be constantly improved. There is a need to map the many tools and plans which were developed during the COVID-19 pandemic and decide what to keep.

References / additional data sources

Global resources

- WHO Information note on increasing COVID-19 vaccine uptake: <https://www.who.int/publications/m/item/increasing-covid-19-vaccination-uptake>
- Integrating COVID-19 vaccination into immunization programmes and Primary Health Care: <https://www.technet-21.org/en/topics/programme-management/considerations-for-integrating-covid-19-vaccination-into-immunization-programmes-and-primary-health-care-for-2022-and-beyond>
- Preparedness and Resilience for Emerging Threats (PRET): <https://www.who.int/initiatives/preparedness-and-resilience-for-emerging-threats>
- Guidance on developing a national deployment and vaccination plan for COVID-19 vaccines: <https://www.who.int/publications/i/item/WHO-2019-nCoV-Vaccine-deployment-2021.1-eng>
- COVID-19 vaccine post-introduction evaluation (cPIE) guide: <https://www.who.int/publications/i/item/WHO-2019-nCoV-cPIE-2023.1>

Country experiences

- The Global compendium of country knowledge on COVID-19 vaccination: <https://www.technet-21.org/en/covid-compedium>
- COVID-19 Vaccination Response: Country experiences, best practices, and lessons: <https://www.who.int/publications/m/item/the-covid-19-vaccination-response--country-experiences--best-practices--and-lessons>
- Country case studies on COVID-19 vaccination: <https://www.technet-21.org/en/covid-compedium/covid-19-vaccination-country-case-studies>
- Country evaluation reports and related publications: <https://www.technet-21.org/en/covid-compedium/review-of-country-evaluation-reports-and-publications>
- COVID-19 vaccination country experiences: <https://www.technet-21.org/en/covid-compedium/covid19-vaccination-country-experiences>

Introduction

An inter-country meeting and Global Exchange Forum on Integrated Immunization Programs and Enhanced Pandemic Preparedness was held in London on 18th and 19th October 2023. The forum discussed successes and lessons learned from COVID-19 and influenza vaccination programs. It leveraged experiences made from integrated service delivery across the life course to sustain the momentum for strengthening other immunization and primary health care (PHC) programs and discussed ways of enhancing pandemic preparedness.

The meeting was organized by TFGH and US CDC and supported by WHO, UNICEF and MMGH Consulting. It had the following objectives:

- To share lessons learned from COVID-19 vaccination response.
- To examine the role of seasonal influenza vaccination in COVID-19 vaccination and pandemic preparedness.
- To explore ways of leveraging lessons from COVID-19 vaccination for building more resilient health systems, enhancing pandemic preparedness, and building stronger immunization platforms across the life course.

The forum was conducted in an interactive manner, encouraging discussions among participants in varying settings using plenary and panel discussions, break-out group interactions, the World Café method¹ and a marketplace for sharing innovations, tools, and new programmatic approaches.

The forum provided an opportunity to look back on what has been achieved to protect populations against SARS-CoV2. More than 13.5 bn doses of COVID-19 vaccines have been administered globally since the beginning of the pandemic, compared to 700 m doses administered annually through National Immunization Programs (NIPs). While the COVID-19 pandemic continues to evolve, it is no longer a Public Health Emergency of International Concern. In response to the reduced threat the WHO Strategic Advisory Group of Experts on Immunization (SAGE) has put forward recommendations for single dose vaccination for the unvaccinated and periodic revaccination limited to priority target populations.

This report follows the structure of the meeting and summarizes the contents of the key presentations and the outcomes of the plenary and breakout discussions.

1 <https://theworldcafe.com/key-concepts-resources/world-cafe-method/>



Topic 1:

Opportunities
and constraints of
COVID-19 response
in strengthening
immunization and
health systems.

Cross-country experiences identified through program evaluations

[Speakers: Julie Carlton, Carsten Mantel]

A summary of findings from a convenience sample of reports of 20 COVID-19 post introduction evaluations (cPIEs) across all WHO regions was provided across areas of the National Deployment and Vaccination Plans (NDVP). In the area of regulatory preparedness, strengthened procedures significantly shortened approval timelines. When organizing vaccine delivery, coordination and flexibility were key in meeting evolving needs. There was a strong focus on bringing the vaccine to the clients through innovative outreach services. Some complex costing and budgeting exercises and lengthy disbursement processes impacted service delivery activities. However, careful planning of vaccines and related supplies and of cold chain equipment ensured products were available at the right time, right place and in the right condition. The engagement of health workers and community health workers in planning and taking care of their well-being was critical for success. Investments in vaccine demand generation paid rich dividends. Vaccine safety and monitoring of adverse events following immunization (AEFI) needed strengthening. Transparent risk communication was important for maintaining the community trust in COVID-19 vaccines. Strengthened monitoring and evaluation and ensuring real-time electronic management of data for analysis and action was critical for the success of the vaccine rollout.

Participants highlighted the enhanced advocacy efforts during the pandemic response, establishing new or strengthening existing partnerships, the various ways in which countries augmented and used staff and managed AEFIs and the many newly developed electronic data systems. Comments were made on misconceptions and complacency and the approaches used to sensitize communities and improve the uptake of vaccines. Questions were raised as to how the large resources invested in the COVID-19 response and the lessons learned could be used in immunization

and PHC programs across the life-course in the post-pandemic era.

Round table on generic country experience with the rollout of COVID-19 vaccination and program implementation

[Moderator: Ben Dahl]

Senior Ministry of Health staff from three countries in Europe, Africa and Southeast Asia discussed their experiences made during the pandemic vaccination response.

In Albania, planning and coordination were done at a time when vaccine supply was constrained. Hence, equity was an important consideration, ensuring that the most vulnerable were prioritized to receive the initial doses. Vaccination was performed in phases. Early on, the country vaccinated only in mass vaccination sites and targeted prioritized groups. As more vaccines became available, delivery shifted to primary care hospitals and places of work (e.g., schools, industries). Vaccine acceptance declined later in the pandemic, necessitating measures to improve acceptance and uptake. The vaccination monitoring systems were not fully aligned across the country initially; the development of a unified electronic system is now well on its way.

In Tanzania vaccination started in July 2021 in priority groups and was later expanded. By the end of 2021 only 30% of the target population had been reached. The NDVP was revised, and new strategies developed to expand delivery beyond the initial 500 vaccinating health facilities by using outreach and door-to-door vaccination. At the subnational levels, local administrations led the vaccination efforts and engaged with local communities. Implementing partners were assigned to support specific regions. The newly developed electronic COVID-19 reporting and monitoring system (Chanjo COVID) was used to

provide vaccination certificates, which increased social norming of vaccination.

In Nepal, the elderly and health workers were initially prioritized, and vaccination subsequently expanded to other priority populations. There were difficulties in securing sufficient vaccine supply in time, although funding was available. The focus was on equity and leaving no one behind and female community health workers became very important in the vaccine roll-out. Nevertheless, community education related to second and booster doses proved difficult. Cold chain maintenance was problematic, specifically with regards to ultra cold chain storage and transport. Periodic lockdowns proved difficult with 5 million Nepalese working abroad. The country works on a plan for being prepared for the next pandemic and suggests developing a uniform global monitoring system.

Panelists' suggestions of what needed to be done differently in the "next pandemic" included: (i) improved capacity to monitor and respond to misinformation and disinformation and to address rumors immediately (Albania, Tanzania); (ii) engage community and community leaders early on, starting with the planning phases (Tanzania); (iii) establish a single information system, rather than multiple systems leading to difficulties for health workers to enter data (Albania, Nepal) and (iv) better planning and management of human resources (Albania, Tanzania).

What opportunities and risks did the COVID-19 vaccine rollout present to strengthen components of immunization and health systems?

The topic was discussed in six parallel breakout groups covering the main NDVP thematic areas.

1. Planning and coordination

**[Moderator: Vinod Bura;
Rapporteur: Diana Chang-Blanc]**

Opportunities: There was an increased understanding of the importance of planning and coordination, particularly with political actors. The pandemic response created opportunities for the ministries of health to work multi-sectorial and coordinate and collaborate with other ministries and various partners and stakeholders. Several ad-hoc committees and task forces were established, NDVPs developed, and the capacity and expertise of National Immunization Technical Advisory Groups (NITAGs) expanded. In some countries, planning and coordination mechanisms, NIP structures, and processes could be leveraged at all administrative levels from past vaccination experiences such as against seasonal influenza, yellow fever, cholera, measles, or Ebola virus disease. At the health service delivery levels, targeted micro-planning approaches were strengthened.

Risks: The sporadic supply of vaccines and the multiplicity of vaccine products with different characteristics complicated planning and coordination. Countries were faced with global inter-dependencies in vaccine allocation and the need for, and relevance of, "vaccine diplomacy". The need to act quickly was a challenge, particularly for regulatory and policy bodies, given the often-limited institutionalization of standard practices. There were difficulties in effectively managing and coordinating the many global and local stakeholders. The management of the financing flows to meet urgent needs was often challenging. The coordination of the monitoring, investigation, and response to AEFIs was often inadequate and needed to be strengthened. Overall, there was a severe displacement of priorities for essential immunization by the urgency inherent to COVID-19 vaccination.

2. Human Resource management and training

**[Moderator: Reena Doshi;
Rapporteur: Shoshanna Goldin]**

Opportunities: There was a surge of the health workforce in many countries with many new people coming on board. Surge approaches included the return of retired health workers, outsourcing programmatic work such as data entry, and community health worker support for vaccine roll-out. Overall, human resources for health were pooled across programs, with task shifting to meet the surge capacity required. The workforce was also intensively trained. Training methods included virtual platforms, cascade approaches, refresher modules for new vaccines, and improved monitoring and evaluation of these approaches. Health workers gained expertise with adult vaccination (e.g., leveraging influenza experiences) that can be further used to support life-course immunization.

Risks: Many of the surge contracts were temporary, and health workers were eager to remain in their jobs though financial resources were no longer available to retain them. Infrastructure challenges with the transition to virtual training and meetings created problems for people in areas without stable internet and good information technology (IT) infrastructure. There were insufficient training videos and alternative learning approaches to improve health worker knowledge and confidence. The increasing fatigue of health workers and some reduced confidence in the COVID-19 vaccines may have affected the quality and coverage of routine immunization programs.

3. Supply chain and waste management

**[Moderator: Angela Shen;
Rapporteur: Santosh Gurung]**

Opportunities: The supply chain was upgraded, and investments were made into expansion of the cold chain including the installation of ultra-cold chain logistics, enhancing the capacity for storing other vaccines and health products requiring cold chain. Creative solutions to immediate challenges were found

such as through partnerships with industrial cold chain providers. Waste management was enhanced across departments with support from NGOs and private sector partners. Electronic logistics management information systems (eLMIS) to manage vaccine stock proved useful for supporting data for decision making along various levels of the supply chain.

Risks: The supply and cold chain will need to be redesigned with emergencies in mind with a path for routine operations and for ad-hoc public health emergency situations. An emergency set up proved costly and difficult. Relevant policies and mechanisms need to be put in place during the interpandemic period. Preventive maintenance is still needed for supply chain equipment. A global concerted action for equitable global vaccine access and distribution is needed in preparation of a future pandemic which should also address receipt of vaccine with short remaining shelf life.

4. Vaccine acceptance and uptake

**[Moderator: Sheillah Nsasiirwe;
Rapporteur: Lisa Jacques Carroll]**

Opportunities: Risk communication and community engagement (RCCE) approaches were enhanced. Faster communication methods to share scientific research findings were developed. Research methods were advanced to identify barriers and drivers of vaccination uptake, including using social listening. New ways of addressing misinformation and disinformation and providing positive information on vaccinations to the public were found, as well as ways of addressing the COVID-19 infodemic. Religious groups, community leaders, civil society, and volunteers were involved in communication activities, and partnerships were strengthened with the private sector. Ad hoc demand generation activities were extended. Incentives were used in some countries to increase vaccine uptake which was also promoted by the requirements for vaccination certificates for travel.

Risks: Different target groups perceived risks and benefits of vaccination differently and needed tailored communication messages (i.e., pregnant women vs. adults vs. children). Scientific messaging did not

always address misinformation and convince the public and anti-vaxxers. Some lack of confidence in public health efforts became apparent, given that vaccine demand could not be met immediately and in view of challenges with human capacity and sustainability. COVID-19 vaccination may, thus, have had a negative effect on routine vaccine delivery and in some situations on public acceptance of overall vaccination and may have led to some community hesitancy, specifically in harder to reach areas.

5. Vaccine delivery strategies

**[Moderator: Sunil Bahl;
Rapporteur: Shalini Desai]**

Opportunities: The COVID-19 efforts allowed for investigating the best ways of getting adults vaccinated and to improve coverage in this age group. This was done by integrating with routine immunization systems and other health services, outreach activities to communities and setting up mass vaccination sites. Additional stakeholders were identified to create new channels for service delivery, e.g., in schools and workplaces and through community partnerships. The private sector was often involved. Incentives were provided in many instances.

Risks: The large number and variety of vaccines created problems with dosing schedules (homologous or heterologous). It also increased health worker workload, required shifting of resources from other health programs and increased the costs of delivery.

6. Immunization monitoring systems

**[Moderator: Francisco Nogareda;
Rapporteur: Alba Vilajeliu]**

Opportunities: New immunization information systems were created to cover all ages across the life course. Such systems also enabled the issuing of individual digital vaccination certificates, the tracking of defaulters, and the sending of reminders. The interoperability between existing health information systems and real-time monitoring was enhanced in many countries and the systems further integrated beyond immunization, e.g., in the areas of surveillance, laboratory, and clinical management. Enhanced adverse events following immunization (AEFI) reporting systems were included and streamlined. Use and triangulation of data from different sources for decision-making helped to identify gaps to guide actions.

Risks: Rapidly developed systems often led to the collection of unnecessary information with unclear objectives on the use of the reported data. The collection of a large number of data points often overburdened health workers and led to concerns about data quality. Health workers' capacity in using these systems often remained weak. Many parallel information systems co-existed due to unresolved technology issues related to their integration or interoperability. Such integration requires advocacy and coordination across many programs, time, and resources, which were no longer available in the post-acute phase of the pandemic and caused challenges for sustaining the use of the information systems.



Topic 2:

Use of existing
immunization
infrastructure and
programs for
COVID-19
vaccination

Panel discussion on lessons learned / best practices in COVID-19 vaccine rollout using existing programs and infrastructure

[Moderator: Joe Bresee; Rapporteur: Amanda Bolster]

A panel of senior Ministry of Health staff from five countries in Africa, Asia, Europe and Latin America discussed lessons learned and best practices.

Existing programs, platforms and infrastructure were critical to country response to COVID-19 in countries represented in the panel. Examples included highly developed and long-standing systems including mass vaccination programs, and existing immunization registries (Chile); more recent adult vaccination programs, utilizing recent NITAG training (Lao PDR); utilizing pandemic response mechanisms (surveillance; contract tracing; political will) put in place for Ebola (Sierra Leone); relying on work done to identify risk groups for influenza (Albania); and relying on a strong health system foundation built on polio and measles response (Nepal).

Most countries relied on what they had in place and built upon it. However, many of the challenges of COVID-19 were unique and could not have been planned for. Every country had to improve its cold-chain capacity to manage the storage needs of mRNA vaccine. Setting up mass vaccination of adult populations and vaccinating close to the entire national population within a short period was new for most including the challenges of demand and insufficient supply which had to be addressed.

External technical assistance was important to all, but often difficult to organize because it came from various sources and was sometimes duplicative. Financial support and equitable access to vaccines was critical.



Key takeaways:

- While existing platforms (of varying levels) were critical to every country's response, better coordination with external partners and sharing of best practices across countries would have helped during COVID-19 vaccine rollout and can be helpful to future mass vaccination efforts.
- Strengthening overall health systems is critical. Countries with stronger vaccination systems (routine and influenza) in place before the COVID-19 pandemic were able to respond more efficiently, and able to reach larger portions of their populations both because systems were in place, specific populations were accustomed to being vaccinated, and generally because they had more resources.
- Ongoing regular communication with the public about the value of vaccine is important, as is continuing some of the non-traditional mechanisms for delivery (outreach to communities, etc.).
- The gains made such as in cold chain capacity; additional mechanisms for reaching target populations; potential integration of other vaccines; and increased training for health workers must not be lost.
- Countries must continue to collaborate and work together, particularly with data sharing, surveillance and sharing of best practices.
- NITAG functionality and including other ministries (not limited to health) was critical for the successful rollout of COVID-19 vaccination.
- Seasonal influenza proved helpful for COVID-19 vaccination – health workers were more likely to accept vaccination if they had been vaccinated for influenza.
- Prioritization was a challenge – there simply was not enough vaccine to vaccinate the highest priority groups.
- Electronic immunization registries are important, allowing for regular monitoring of coverage. But most countries' registries were not ready for the volume of data to be collected – some had to create new systems or duplicate systems that now need to be integrated or made interoperable.
- Building on the lessons from other mass vaccination approaches, e.g., polio and measles/rubella (MR), enabled flexibility and resilience to adapt to emerging issues.
- The trust of citizens in government services and immunization services that was built during the pandemic response should be sustained and leveraged for routine health service delivery.
- The International Health Regulation (IHR) processes, resilient health system, preparedness plans for future pandemics, including data and surveillance need to be strengthened.



Topic 3:

Use of COVID-19
vaccination experience
for strengthening
national immunization
programs – lessons
learned.

World Café 1

Evolution of national immunization programs as a result of COVID-19 vaccination

[Moderator: Ann Moen]

How could the lessons from COVID-19 and influenza vaccination be leveraged to strengthen life-course vaccination?

[Moderator: Thomas Cherian;

Rapporteur: Alba Villajeliu]

The various groups were asked to identify and prioritize the lessons from the COVID-19 and seasonal influenza vaccination experience and how these could be used to strengthen life-course vaccination in the following three areas: (i) additional target groups for vaccination; (ii) health system components that could be leveraged; and (iii) collaboration with other programs, sectors and partners that would need to be sustained and strengthened.

In relation to the target groups for life-course vaccination, the highest priority target groups were health workers and older adults. Medium priority groups included pregnant women, persons with chronic diseases, immunocompromised persons and under 5 children (second year of life platform). The low priority group included adolescents.

Participants gave highest priority to using the lessons from the COVID-19 vaccine rollout to: (i) strengthening leadership and governance structures established for the COVID-19 response; (ii) use of mechanisms for rapid information sharing with health workers and the public; (iii) data management and information systems established for COVID-19 vaccination to

capture vaccination data across the life-course; and (iv) disease and safety surveillance lessons to strengthen comprehensive disease surveillance and pharmacovigilance. Medium priority was given to using the experience with costing, budgeting, and financial management and with vaccine stock management.

With respect to collaborations with stakeholders beyond the NIP that could be sustained, highest priority was given to collaborations with other health programs (non-communicable diseases, maternal and child health (MCH), HIV/AIDS, tuberculosis, and occupational health). Medium priority was given to engagement with the media and collaboration with universities and technical institutions. While it was felt that collaboration between the NIP and the National Regulatory Authority (NRA) needed to be strengthened, specifically for pharmacovigilance, this was given lower priority.

How did immunization programs evolve as result of reaching new age groups?

[Moderator: Carsten Mantel;

Rapporteur: Shoshanna Goldin]

Vaccination of adults and adolescents had positive repercussions. There is an increased visibility of the vaccination programme among the public, health workers and governments. People unfamiliar with vaccination are now aware and there are

new immunization champions. New strategies to improve vaccine uptake were implemented with use of campaign approaches and introduction of new service delivery points (e.g., pharmacies). Social media professionals and celebrities promoted COVID-19 vaccination and are now active also for other vaccines. New integrated data systems were built to record vaccinations, for AEFI reporting and for case-based surveillance. These systems also allow for vaccination reminders and enable rapid data use for decision-making. Digital vaccination certificates developed for COVID-19 have been used for other vaccines against influenza, mpox, yellow fever, and childhood vaccines. Health systems were strengthened, cold chains expanded, and additional sectors engaged in microplanning processes and new collaborations between public and private sectors and Civil Society Organization (CSO) are being used to enhance vaccination programs. COVID-19 also gave a push to technology transfers and to developing production capacities which could support local manufacturing of other antigens.

COVID-19 vaccination has increased attention to, and awareness of, the value of vaccination, strengthened vaccination across the life course (children, adolescents, and adults), and resulted in new integrated data systems and uptake strategies.

What were pros and cons of health programs other than immunization leading the COVID-19 vaccination response?

**[Moderator: Julie Carlton:
Rapporteur: KC Sorensen]**

Pros: The COVID-19 vaccination response was an added branch to an already existing political commitment across many divisions with multi-sectoral collaboration. Other health programs were leveraged (e.g., HIV/AIDS clinics) and existing monitoring

and surveillance systems were strengthened. Such collaboration brought about increased funding and strengthened connections and the experience of working well together.

Cons: Decision making became highly political and often fragmented. There was lack of coordination and competition and sometimes confusion of funding streams. Messaging became more difficult as it required one voice. Additional training efforts were needed given that the level of knowledge of newly involved stakeholders was often inadequate, or not science or evidence based. Duplicative reporting efforts led to misaligned information. Some distrust of receiving vaccination services from those other than the usual providers was reported, and the inclusion of other programs made decision-making more likely to be politicized. Other routine immunization programs were de-prioritized. The project-driven approach led to a lack of sustainability with those outside the NIP, possibly perceiving collaboration with immunization services as only temporary. Lessons learned were often not communicated well among diverse partners.

Key Takeaways:

- Countries who didn't use their NIPs to lead vaccination, had to essentially recreate the system from top to bottom. This led to duplicative efforts, duplicative reporting, and misaligned data.
- Immunization teams were not be able to manage all the response but needed to coordinate with emergency response teams.
- Laws and regulations need to be strengthened including for disaster response coordination.
- Responsibility and ownership within the government for pandemic preparedness will need to be clarified.

What was the experience with integration of seasonal influenza, COVID-19 and other vaccination programs?

**[Moderator: Jaymin Patel;
Rapporteur: Santosh Gurung]**

Integration means different things for different stakeholders. There is a need to integrate programs and standardize global recommendations (WHO, CDC) to achieve improved country impact.

Countries had varying experience with integrating services, which were either coordinated by the NIP (Sierra Leone) or by other programs (Egypt, Jordan). Integrating monitoring and surveillance was a good starting point for countries with influenza surveillance. Integrating cold chain systems was easier than integrating service delivery or microplanning and RCCE. Influenza vaccination integration was easier in countries with a long-standing seasonal influenza vaccination program. Countries without such programs could leverage the COVID-19 programs to normalize adult and adolescent immunization services. This paved the way for Human papillomavirus (HPV) vaccination introduction (Sierra Leone) and brought the focus onto PHC as a place for preventive and not just curative care. Programmatic considerations will need to be given to the use of multiple injections if COVID-19 and flu vaccines should be given at the same visit.



Topic 4:

Use of seasonal influenza vaccination infrastructure to strengthen life-course vaccination.

Leveraging influenza vaccination programs

[Speaker: Meg McCarron]

WHO recommends influenza vaccine for health workers. As the most influential group in the uptake of vaccines, vaccination of health workers is a critical first step in establishing life course vaccination.

An evaluation was conducted by using supplementary cPIE questions covering influenza vaccination. Influenza Learning Agenda questions were analyzed for countries with and without flu programs. Low- and middle-income countries (LMICs) with flu programs reached higher COVID-19 vaccination coverage more quickly than countries without such programs, also within the health worker population. Adults with comorbidities had higher COVID-19 vaccine uptake in countries with health worker vaccination programs than in those without such programs. Countries with influenza vaccination programs leveraged established systems for COVID-19 rollout. LMICs with influenza programs deployed COVID-19 vaccines earlier than those without. Successes were due to improved regulatory approvals, better delivery platforms and vaccine implementation plans, improved microplanning, training, cold chain capacity, demand generation and communication plans, and better monitoring and supervision and use of vaccination registries. Persons in countries with influenza programs were more likely to receive a recommendation from health workers to take the COVID-19 vaccines. Health workers were also a critical gateway to reaching other priority groups for vaccination.

Going forward it will be reasonable not to have parallel programs for influenza and COVID-19 vaccination, but to integrate both within the existing NIP and PHC services.

Topic 5:
Innovations
developed and
used for COVID-19
vaccination.

Marketplace

[Facilitators: Julie Carlton, Jaymin Patel]

Innovations, tools, and programmatic approaches developed by countries for COVID-19 vaccination were presented. These platforms and approaches have been or could be useful for other immunization and PHC services.

Electronic platforms:

Jordan developed a national electronic COVID-19 vaccination platform for registration, appointment notification, and issuing of vaccination certificates, as well as for AEFI reporting. More than 25,000 daily registrations were done at peak times – with more than 4.5 m persons reached.

Thailand established the PROMPT Covid-19 vaccine management system for vaccine appointments, recording of tests and certificates, and AEFI monitoring. The system collected data from hospitals, clinics, laboratories, and drug stores. Data was visualized in a public dashboard and is available for vaccine effectiveness assessments.

Bhutan had an electronic COVID-19 AEFI monitoring and reporting system. Anaphylaxis and other serious AEFI were detected in a timely manner and managed effectively. The system also allowed for real-time coverage monitoring. Community confidence has improved using the system, and it is now being adopted phase-wise for routine immunization.

Lao PDR established a COVID-19 vaccination registry as an individual patient registry using the DHIS2 tracker platform, which was already used in other programs. It contains data from 6 million registered persons. The system sends SMS reminder and is now also used for other vaccines such as HPV, and influenza. A QR code is generated and can be printed on the vaccination card.

Chile's electronic national nominal immunization registry started in 2010 and became the official system in 2013. It processed 150,000 records per day during COVID-19 vaccination. It also generated mobility passes and digital certificates and is presently used for influenza, mpox, and Yellow fever vaccines. A stock

control system is integrated with the nominal registry, thus helping to minimize vaccine loss.

Nigeria set up an electronic management system of immunization data (EMID). This DHIS2-based system included a repository for registration, vaccination, follow-up, and logistics data at the National Primary Health Care Development Agency. It uses client ID and photo identification and was useful for defaulter tracking, planning, and scheduling. It was upgraded to include a performance-based payment system for vaccinators. The system is being transitioned for use in routine immunization, linking to open LMIS, and for sending reminder messaging. It will also be possible to link the system with the civil registration and vital statistics (CRVS).

Programmatic innovations:

Nepal managed a multi-sectoral effort to introduce COVID-19 vaccine. The country reached 93% vaccination coverage despite the initial limited availability of vaccines, and despite spreading rumors about low vaccine effectiveness. The country established good leadership, program management and accountability. The coordinated effort involved many public sectors (education, security forces, civil society, volunteers) and used cutting edge technology. It successfully prioritized target populations, used diplomatic lobbying, and generated public trust through intensive RCCE efforts.

In Lebanon, Vax Buses, a mobile and flexible approach for vaccination in remote areas was implemented. This outreach service improved equity and reduced vaccine hesitancy. Buses were starting at PHC centers and were supported by NGOs and volunteers. The buses advocated for vaccination and are a model for future pandemic response. The system also incorporated mobile applications for real-time data sharing which are now also used for routine immunization.

In Côte d'Ivoire, the program was challenged by lack of confidence in vaccines and circulating conspiracy theories. The country set up mobile units, involved opinion leaders and celebrities (soccer players), used social media (Facebook), set up toll-free numbers, and made vaccination mandatory for public events.

Sierra Leone faced a challenging lack of trust in the health system, and a prevailing notion that COVID-19 was much less deadly than Ebola with negative information about COVID-19 vaccines. COVID-19 immunization surge campaigns were initiated with intermittent mini campaigns, each lasting 5 – 7 days and targeting specific groups. Vaccines were taken to the doorsteps of people by paid health workers and community health workers. Surge campaigns led to repeated spikes in coverage, achieving 70% coverage by December 2021. While the impact was high, the campaigns were very resource intense and time consuming in planning and implementation. The country is now integrating COVID-19 and HPV vaccination with routine immunization in static and outreach services and periodic intensification of routine immunization (PIRI).



Topic 6:

Leveraging COVID-19 innovations, structures and approaches in routine immunization programs and other primary health care services

WHO/UNICEF support package for integrating COVID-19 into immunization programs and PHC

[Speaker: Alba Vilajeliu]

The Covid-19 vaccination response was the fastest and largest vaccination program in history. However, this massive response strained health systems and diverted resources from essential health services. SARS-Cov2 is still in circulation. In 2023 most (89%) deaths were in the age group above 65 years of age and in people with comorbidities or in pregnant women. WHO SAGE now recommends vaccinating older adults, adults with comorbidities, adults, adolescents and children with immunocompromising conditions, pregnant women, and health workers. The WHO COVID-19 roadmap has been simplified with a single-dose regimen for primary immunization for most COVID-19 vaccines. Monovalent Omicron XBB vaccines provide modestly enhanced protection over the existing vaccines and is the preferred vaccine, but any available WHO emergency use listed or prequalified vaccine may be used. All available vaccines continue to provide benefits against severe disease and death in high-risk groups.

COVID-19 vaccination has now become a marathon with a slower pace and a focus on sustainability. Integrating vaccination with other PHC services increases the opportunity for a more people-centered approach. The support package for integrating COVID-19 vaccination into immunization programs and PHC, published in 2022, outlines the steps for initiating, planning and developing country integration plans; their implementation and monitoring; and post integration follow-up actions. COVID-19 vaccine should become part of a life course approach using existing and future vaccines. Other vaccines that are likely to soon become available for use across the life-course include respiratory syncytial virus (RSV) for pregnant women and the elderly; group B streptococcal (GBS) vaccines for pregnant women; RSV monoclonal

antibodies for the newborn, and malaria and dengue vaccines for children. Life course approaches in vaccination and integration are being strengthened in all regions. For example, the European region focuses on recovery, strengthening of immunization programs, integration of COVID-19 vaccination into routine immunization and PHC programs. In Cambodia, screening of non-communicable diseases is done together with COVID-19 vaccination. The Gavi Vaccine Investment Strategy now explores inclusion of vaccines against GBS, shigella, dengue, and pulmonary tuberculosis. Vaccination is also being integrated with other PHC services in a more people-centered approach.

Overall, COVID-19 vaccination can be viewed as a public health opportunity for transformational change from child vaccination to vaccination as part of a life-course approach within primary health care.

World Café 2

Use of COVID-19 vaccination efforts and structures for building stronger, life-course focused national immunization systems

[Moderator: Carsten Mantel]

What capabilities or systems that were strengthened by COVID-19 vaccination could be helpful to improve routine immunization or life-course vaccinations programs, if sustained?

[Moderator: Vinod Bura;

Rapporteur: Shoshanna Goldin]

Many countries established new coordinating structures, such as national centers for disease control, which continue to be used. Confidence of governments in vaccination may have increased during the pandemic, together with a higher 'health literacy' of the population. Improvements were made in the regulatory sector (e.g., in product registration). New partners were engaged in vaccination: civil society organizations including faith-based organizations and other sectors supported control efforts as part of a whole-of-society approach. New service delivery points were established which can be used for other vaccines to improve access. The supply chain, cold chain, and logistics capacity and expertise was enhanced. AEFI systems were strengthened, including the establishment of new causality assessment committees, protocols, and funding schemes to compensate for adverse

events. Health workers are now better trained and more familiar with adult vaccination, while more can be done here to continue to improve health workers' confidence. The surge capacity set up during the pandemic will likely help in the future, e.g., engaging last year medical students in the health systems. The rapid digitization of reporting systems for COVID-19 are already being used for other vaccines and health services. The pandemic also increased the awareness of the need for local vaccine production, including bulk packaging of vaccines and resources for technology transfer.

What data will need to be available to build stronger, life-course focused national immunization systems?

[Moderator: Jaymin Patel;

Rapporteur: Julie Carlton]

Data needs for life-course immunization systems are huge. Routine surveillance and burden of disease data inform health planning efforts. Data on target populations/denominators and special catchment areas (e.g., hard-to-reach populations) generated for the COVID-19 vaccination response will need to be preserved and updated to enable improved microplanning, coverage estimation and ensuring

equitable access to services for life-course approaches to healthcare. Such data will need to be triangulated from a variety of sources. Tools and processes to collect data on vaccine safety and AEFI could be used to strengthen pharmacovigilance systems. Information from vaccine recipients and communities gathered to assess vaccine acceptance (KAP studies) and quality of services will need to be periodically collected to better understand the determinants of vaccine uptake and tailor life-course programs accordingly.

In addition to routinely collected data, research efforts will be needed to provide information from special studies on specific target populations, on vaccine effectiveness or impact. Other PHC services such as maternal and child health and non-communicable diseases can provide data and evidence from the use of various delivery strategies to reach target populations. Updated information is required on vaccine supply and availability including a robust demand and supply forecasting effort. Finally, data from neighboring countries in the same region and border crossing areas should be made available to share lessons learned and best practices.

What capacity-building elements will need to be in place?

**[Moderator: Shalini Desai;
Rapporteur: KC Sorensen]**

Capacity building and training efforts should focus on the upscaling of human resources across PHC programs and beyond MCH providers. Pre-service training will need to be updated accordingly, new approaches and tools to promote health worker learning, and appropriate integrated supervisory checklists established. Health workers' capacity in advocacy should be improved as well as their skills in communication and demand creation. Such skills should be integrated within nursing, medical, and other relevant health curricula. There will need to be repeated training on data management systems and tools and on the use of the data for operational

planning and programme implementation. Cold chain maintenance will need well-trained technicians. Capacity building should include soft skills in resource mobilization, coordination, and project management of all PHC services.

Which innovations, approaches and tools will need to be further developed?

**[Moderator: Ann Moen;
Rapporteur: Santosh Gurung]**

Innovative approaches are needed for expanding immunization beyond the PHC facilities and for providing services also in secondary and tertiary care facilities to reduce missed opportunities for vaccination and to reach specific target groups such as immunocompromised persons and those with co-morbidities. New service delivery strategies (e.g., vaccination buses) and innovative mechanisms of vaccine distribution (e.g., drones for delivery) have been implemented and can be used also for other health services. Social innovations were fostered as part of community engagement and collaboration with local levels. This included new incentivizing approaches such as subsidies to health insurance. New health messaging tools were developed for active listening and rumor management and could be adapted for routine use to inform tailored approaches to improve vaccination uptake.

In the area of cold chain, new maintenance approaches were implemented, and innovations made in data visibility and stock management tools including feedback systems, QR codes for all life-course vaccines and QR scanners, and dynamic labelling to allow for shelf-life extensions. Several of these innovations could be adapted and used to improve the logistics and management systems of NIPs. New ways of integrating COVID-19 monitoring systems into the routine health information systems and of improving their interoperability with other databases could be used to

enable data-informed approaches to improve program performance. These systems should also allow to introduce comprehensive vaccination travel cards for all vaccines. New ways should also be found to transition towards comprehensive disease surveillance systems. Several innovative learning tools and approaches were used during the pandemic which will need to be sustained and further expanded. Innovative ways of financing vaccines are being considered. Combination vaccines (e.g., influenza and COVID-19) are being developed to improve uptake by reducing the need for additional shots.

Cost-effectiveness of integration or of adding new antigens to a life-course platform compared to standard practice

[Speaker: Sarah Tougher]

Integration can be defined as a combination of structures, processes, and techniques to fit the needs of the people and populations across the continuum of care (<https://pubmed.ncbi.nlm.nih.gov/23687482/>). The purpose, nature and extent of integration varies. Integration can have multiple goals and can occur at one or more functional levels: governance, financing, planning, service delivery, monitoring and evaluation, or demand generation.

Cost-effectiveness evidence is not the main facilitator for integration. Politics, donor priorities and health system structures can hinder or prevent integration even if it could be most cost-effective.

The costs and benefits of integrated delivery were compared to costs and benefits of non-integrated delivery. Allocative or technical measures of efficiency were used. Different maturity levels were seen among priority countries, with limited, planned, opportunistic, and structured integration efforts. A scoping review on

integrated health campaigns for immunization was done (not including COVID-19): Cost-effectiveness considerations often hindered integration due to the very high start-up costs, although integration is usually cost-effective. A recent landscape report on the economics of integration of insecticide treated bednets in malaria control showed that costs were lower and benefits higher. However, results are not easily transferable to vaccination. A review of benefits of integration in Uganda and Tanzania of HIV, diabetes, and hypertension treatment showed that patient benefits increased, and services were less costly for patients with multiple morbidities in integrated clinics.

It is challenging to measure the cost-effectiveness of integration due to difficulties in assessment and study design. A prospective design would be necessary, and Randomized Control Trials (RCT) would be the gold standard, but these are difficult to implement. Retrospective studies usually neglect start-up costs. Economic costs need to be included and not only financial expenditures, which are difficult to obtain. A suitable comparator is necessary, but often not appropriate if comparing regions. Inclusion of measures of benefits (improvements in coverage and health outcomes) will usually make the studies even more costly.

A guidance note on costing and budgeting of integrated COVID-19 vaccine delivery was issued by UNICEF and a framework for assessing costs and benefits of integrated delivery. UNICEF studies are underway on acceptability, feasibility, coverage, costs, and sustainability of COVID-19 vaccination.

Breakout groups on integration with other PHC services

[Moderators: Shoshanna Goldin, Alba Vilajeliu, Shalini Desai; Rapporteurs: Marc-Alain Widdowson, Reena Doshi, Sunil Bahl]

Based on the COVID-19 vaccination experience, what have been challenges and enablers to integrate adult vaccination into broader health systems (e.g., service delivery, data systems, supply and cold chain, funding, etc.)?

Challenges: Overall, attitudes and thinking towards the life-course approach to immunization are varying. Program governance and roles and responsibilities of the life course approach are often ill-defined, and it remains unclear who should be involved and who is going to lead across all levels of the health system. Some politicization of the pandemic response is expected and is to be managed. Vaccination and communication strategies are still ill-adapted to the new adult vaccination strategies. Access issues remain in many remote areas. There may be reduced vaccine confidence in some age and population groups. The PHC system is often already overwhelmed, and health workers face an increased workload, with the same people managing the NIP needing to coordinate life-course vaccination. Brain drain is an issue with well-trained staff leaving. There is a need for capacity building to include more health workers whose primary role has not been immunization. Data is often still siloed, and while there is a need to ensure data security this will need to be balanced with interoperability of data systems and the ability to access data at all levels. Supply and distribution of vaccines, storage and cold chain capacity will need to be reviewed and upgraded regularly. In some countries, adult vaccination is still to be paid out of pocket (in the private sector) and not free of charge to all recipients.

Enablers: PHC is the foundation of the life-course approach and immunization should be seen as one part of a package of services with combined programs and resources. Financing could be harmonized across programs. Clear recommendations from NITAGs and WHO are critical in informing clinicians about the indications, contraindications, and schedules for vaccination. In some countries the NIP will be best placed to manage and coordinate all vaccination efforts though care needs to be taken to manage the ensuing workload and provide additional human resources where required. Additional vaccine delivery sites will need to be established to facilitate convenient access, e.g., in the workplaces or at schools. In Nepal, a geriatric health strategy helped with mainstreaming adult vaccination. Co-administration of different vaccines is possible through improved planning and combined campaigns, and NITAG recommendations will need to be issued to support such co-administrations (as done in some countries for COVID-19 and influenza vaccines). There are opportunities to connect with professional associations, CSOs, health associations (e.g., diabetes), national services for the elderly, and religious groups to increase awareness of adult vaccination and have them champion the vaccines. This can be supported by media and journalist trainings on the different vaccines and what products are recommended for what populations with information shared through radio, tv, and celebrities. Electronic immunization registries will make it easier to track vaccine recipients across the life course.

How can existing touch points for high priority-use groups (older adults, adults with chronic diseases, immunocompromised, pregnant women, and health workers) be leveraged to offer vaccination?

There are many existing touch points which could be used for the vaccination of older adults. This includes insurance-related and annual checkups, medical fitness checks, travel clinics, but also community meeting places and adults serving as caregivers for children being vaccinated. Connections can be made with national services for elderly to facilitate vaccine uptake. Additional touch points exist for adults with comorbidities during follow-up appointments, at

pharmacies when picking up medications, or through the social security system (Cambodia has a system that allows for two appointments a year), during home visits, or through chronic disease associations (e.g., diabetes). Pregnant women can be reached and vaccinated during their regular antenatal care (ANC) visits. Health workers vaccination status should be checked as part of their onboarding to a new health facility, during training sessions, and during their pre-service training (i.e., nursing, or medical students). Across all health services, missed opportunities for vaccination in health facilities should be actively reduced, by offering vaccination to all patients and clients. Here patients could be walked to the vaccination area or be vaccinated while waiting for other services. Special occasions such as national health days, immunization weeks, etc., are already being used to increase the co-administration of vaccines in non-child target groups. Health education for adult vaccination could also become part of other health campaigns, such as for mass drug distribution (Tuberculosis (TB), HIV, Onchocerciasis mass drug administration (MDA)).

What are best practices to enhance experience sharing between countries and across regions?

Weekly situation reports, such as from WHO regional offices and other specialized health agencies are useful in enabling the sharing of experiences. Regular meetings or workshops at global, regional, and national levels as well as webinars, videos, dashboards, and podcasts are good opportunities for sharing experiences. Existing platforms can be repurposed (e.g., Regional Working Group meetings) and networks used such as Association of Southeast Asian Nations (ASEAN), South Asian Association for Regional Cooperation (SAARC), Organisation of Islamic Cooperation (OIC). Cross-country field trips or twinning opportunities and bilateral interactions between countries would allow technical staff to share information and coordinate which could lead to the establishment of communities of practice.

Plenary discussion: What do countries see for the future (5 years, 2028) of immunization programs and their integration?

[Moderator: Alba Vilajeliu]

Sierra Leone: Joint governance and/or coordination mechanisms across health programs and government sectors will be of great importance in fostering integration. The PHC system will be a good vehicle for delivering vaccination, maternal and neonatal health, and family centered PHC programs wherein immunization is delivered as a package with other services. Soon the malaria vaccine will be introduced, a vaccine which cuts across two different health programs. The collection and use of data will be improved by using electronic immunization registries and surveillance data. Storage and supply systems will need to be upgraded, and communication systems to be enhanced.

Chile: The country provides universal access to primary care with a robust NIP. Immunization is one of many health promotion activities, aligned with Sustainable Development Goals (SDG), environmental sustainability, and reducing ecological footprints. New technological innovations will be introduced to strengthen autonomous decision-making. These will include integrated immunization information systems with centralized registration systems and interoperability of electronic platforms, linked with cold chain data for stock control. Going forward, a close network of partners should be established across countries.

What are key priorities to act now to achieve this vision?

Governance structures will need to be revisited and roles and responsibilities clarified between the NIP and other programs by possibly leveraging COVID-19 task forces or their successors. Politicians will need to be on board to ensure political commitment and the support of higher-level decision-makers for immunization programs. A family-centered approach should be the vision for the way forward. Integration guidelines for all key players and departments (e.g., NIP, HIV/AIDS, Malaria etc.) will need to be developed. Social science approaches are needed, and social health security systems will need to be strengthened for all populations including the poor and marginalized. The visibility of vaccine supply and prices for forecasting will need to be enhanced. Additional financing will be needed for the roll-out of new technologies. Development partners should allow governments to lead and own the programs.

Topic 7:

Improving pandemic preparedness and retaining pandemic lessons.

Preparedness and Resilience for Emerging Threats (PRET)

[Speaker: Shoshanna Goldin]

PRET is WHO's new approach to improving pandemic preparedness for groups of pathogens, based on their mode of transmission. PRET is built from the IHR and uses experiences with State Party Self-Assessment Annual Reports (SPAR), the NDVP, the National Health Strategy, the Strategic Tool for Assessing Risks (STAR), and the National Action Plans for Health Security (NAPHS). It presently involves 15 different sectors.

PRET is accompanied by a call to action to update national pandemic preparedness plans, to increase opportunities for cross-country and multi-partner collaboration, and to provide dedicated human and financial resources. More than 80 countries have so far been engaged in simulation exercises or workshops to update their pandemic preparedness plans, others have completed updates or are in the planning phase. Taking a multi-sectoral approach to pandemic preparedness is essential to the planning process.

PRET provides modular learning opportunities. A first module on planning for respiratory pathogen pandemics was published, which comprises emergency coordination, collaborative surveillance, community protection, access to countermeasures, and clinical care. PRET contains checklists, simulation packages and advocacy tools, and provides an analysis of COVID-19 lessons, a global implementation roadmap, and an M&E framework.

Partners in PRET collaborate in a community of practice, an online peer-to-peer network, via the WHO PRET website, and a Partner Engagement Forum, besides technical meetings, and workshops. Countries updating or planning to update national pandemic plans can utilize PRET tools to prioritize key actions, advocate, and monitor progress towards objectives.

Breakout groups to discuss pandemic vaccination preparedness

[Moderators: Meg McCarron, Marc-Alain Widdowson]

An ad-hoc survey was conducted with the meeting audience on pandemic preparedness with the following results: Of 40 respondents, 83% stated that their countries would now be better prepared to deliver a novel vaccine to target groups, 15% thought that the situation would be about the same as during the COVID-19 pandemic while 2% thought it could be worse. Of 38 respondents, 55% believed that there would be better acceptance of novel vaccines in their countries today, 16% thought that there would be no difference, while 29% believed that acceptance could have decreased. Of 38 respondents, 61% believed that the changes and new approaches that had been implemented in response to COVID-19 would be sustained, 3% did not think so, while 37% were unsure about their sustainability.

Breakout groups were conducted with the following questions:

Can influenza vaccination programs be used as tool for pandemic vaccine preparedness?

[Moderator: Ann Moen; Rapporteur: Amanda Bolster]

There was agreement that seasonal influenza programs and COVID-19 platforms can serve as foundations for overall readiness. Both platforms allowed for reaching adults effectively, educating the community about protection measures, keeping the cold chain up and going, strengthening AEFI monitoring, information and data systems, and fostering vaccination of health workers to keep them safe and healthy and allowing them to become advocates for vaccination. Concerns were raised about depending on respiratory vaccine platforms as a mechanism for overall readiness, as the next pandemic may not be a respiratory disease.

The establishment of action plans for other modes of transmission should therefore also be stimulated. However, since water-borne, blood-borne, or vector-borne diseases might be more slowly transmitted, respiratory diseases still present the greatest public health risk for large widespread outbreaks.

Limitations were mainly related to general limitations to successfully vaccinating populations and not to concerns related to influenza or COVID-19 vaccination as the mechanism. Communications are critical and must be refined, tailored, and continued. And the connection between the scientific community and communicating out to the public must be continually strengthened. Equity in access to vaccines and PPE was a challenge, so these issues must be addressed before the next pandemic, e.g., through local/regional manufacturing and technology transfer. NAPHS should be regularly updated and strengthened.

What barriers are anticipated in providing vaccines to target groups in a future pandemic? How can these be overcome?

**[Moderator: Julie Carlton;
Rapporteur: Lindsay Saber]**

Major barriers to be overcome in the preparation for future pandemics and possible solutions were discussed. Turning plans into actions necessitates coordinating at the national level and repeated practicing of systems with drills with different stakeholders. National regulatory processes will need to be constantly improved. Laboratory and surveillance capacity can be improved by utilizing community networks and implementing sentinel surveillance. Any hesitancy and refusal could be overcome by enhancing communication strategies, and by building trust in the community through local leaders and through the media. This will include communication in the educational system at all levels, i.e., in schools and universities to ensure streamlined information is readily available and that people are sensitized to the pandemic plans. Crisis communication plans will need to be developed. Any misinformation will need to be monitored with social listening and information on how to react to these should first be provided to health workers who would serve as an important channel of information for communities. Any anticipated health

worker capacity imbalance will need to be counteracted by surge capacity to call upon. Sufficient cold chain capacity and accessibility at lower levels will need to be ensured. Funding will need to be made available by building capacity for resource mobilization and a focus on self-financing to promote country ownership. Vaccine and PPE production capacity to enhance global availability will need to be coordinated in a better way to allow for equitable access to these commodities, if traditional supply systems change. A climate crisis resilient approach will need to be established. Finally, there will be a need for overall flexibility as the next pandemic will be different from what we have seen in the past.

How can countries prevent other health programs from being critically deprioritized while responding to a pandemic?

**[Moderator: Francisco Nogareda;
Rapporteur: Cara Tups]**

There are four broad reasons for such deprioritization: (i) financing constraints; (ii) lack of technical leadership and guidance and politicization of decision-making; (iii) limited infrastructure, supply chain capacity, human resources, and training; and (iv) issues of access and utilization due to service disruptions and lack of good information. In each of these areas, suggested solutions will help to ensure that routine health services are minimally disrupted during a pandemic.

Financing solutions are to establish separate secure funding for emergencies, and to ensure non-emergency health program funding is protected from being diverted. Potential funding sources for emergencies will need to be mapped. Leadership solutions include performing self-assessments and conducting simulations. Technical advisory groups for decision making need to be sustained, ensuring they are independent and multi-sectoral, and that they are embedded in the legal system with clear accountability for leaders in the decisions they make. Capacity building solutions include conducting mapping and gap assessments, creating resilient, multi-sectoral plans for health facilities and human resources, conducting inter-action reviews and regular simulation exercises. Private sector collaborations are important for establishing surge capacity. There is a need for rolling

stockpiles and real-time monitoring of supply chains. Solutions related to access include using innovative technologies and delivery strategies to bring vaccines and other commodities to households (e.g., telehealth), in addition to clear communication around when, where, and how non-emergency health services are offered during emergencies to avoid fear and panic to arise and to establish trust. All these solutions can help to ensure that routine health services are minimally disrupted during a pandemic.

How can other health platforms and immunization initiatives be used to prepare for the next pandemic?

[Moderator: Ben Dahl;

Rapporteur: Lisa Jacques Carroll]

Leadership and coordination efforts and political will from the highest levels of government are important. A legal preparedness framework and incident management structure needs to be in place that delineates who should respond and which information will be updated and adapted regularly. Implementing partners that can help with the response logistics need to be mapped out. Communication networks (i.e., social media, telecommunications) should be maintained using the newest communication research methods including social listening, and involving the media, community, civil society, and community leaders in the pandemic response. Health worker surge capacity and training needs to be in place including professional academies. National stock management of PPE and drugs will have to be strengthened. Financial resources will need to be readily available and non-siloed funders identified. All systems should be scalable and adaptable and practiced at all levels with simulation exercises as well as post-mortem reviews and revisions of plans. M&E frameworks and vaccine preventable disease surveillance efforts will require clear case definitions for rapid response.

How can countries sustainably stay prepared to use vaccines, including novel vaccines, for the next pandemic and what is the best way to measure preparedness?

Have simulation exercises to assess and sustain preparedness in the inter-pandemic period been useful?

[Moderator: Thomas Cherian;

Rapporteur: Angela Shen]

All countries represented reported having pandemic influenza preparedness plans, though not all were regularly updated. It was helpful to have such plans with targets for cold chain, laboratory capacity for case detection, planning and data systems. However, preparedness for influenza pandemics did not prepare countries for several COVID-19 related issues such as prioritizing amongst the target groups based on limited supply availability, developing and running data systems to monitor vaccine uptake and their interoperability, the storage and handling of mRNA vaccines, absenteeism due to the severity of the pandemic impacting HR surge capacity, the need for rapid resource mobilization and strategies for mass vaccination to meet demand and expectations on coverage targets.

There is a need to regularly update the preparedness plans and cold chain inventories. Legal frameworks and cross-sector coordination structures will need to be established that can be activated in case of emergencies to facilitate the timely access to required resources. There should be enhanced mechanisms for procurement and vaccine manufacturing, including building bilateral relationships and establishing agreements with vaccine-producing countries for rapid access.

Countries should hold global actors accountable for ensuring equity in vaccine access. The preparedness plans had assumed that vaccines would be available immediately, but experience shows that a time without vaccines needs to be taken into account. Health worker training for pandemic response should be institutionalized and contingency plans established for surge capacity that can rapidly be deployed. It is important to continue to build trust and sensitize adults to get vaccinated. In the COVID-19 response, a lot of tools and plans were developed in a highly creative environment. Now there is a need to map these out and decide what to keep and what not. Table-top exercises and simulations will need to be done and cross-sectoral feedback loops established for sustainability.



Plenary discussion: What should partners be supporting in pandemic preparedness?

[Moderators: Meg McCarron, Ann Moen]

Country representatives shared their reflections on the immediate next steps and needs for support from international partners regarding pandemic preparedness. Pandemic preparedness plans are available but need to be tested and updated in view of gaps identified. Pandemic preparedness should be included in national 5-year immunization strategic plans, and continuously reviewed. Partners should support active simulation exercises (not only table-top exercises) of the plans and of some of the tools. Emergency Operation Centre activation for any emergency event offers the opportunity to conduct after-action reviews and plans for quality improvement. Plans will need to be agile and flexible and revised time after time, including other sector plans beyond health for the continuity of services. Advocacy by international partners at the country policy level and at the regional level should continue. Monitoring and evaluation support should be provided for assessing country preparedness.

Guidance is available from WHO and UNICEF on integration of COVID-19. A community of practice in integration should be supported and a list of global and regional resources, tools and guidance made available. WHO is ready to support this.





Wrap up

Participant survey

Preparedness for the next pandemic was assessed in a non-representative survey among the Forum participants. Of 42 respondents, 83% stated that their countries would now be better prepared to deliver a novel vaccine to target groups; 55% believed that there would be better acceptance of novel vaccines in their countries today, while 29% were worried about decreased acceptance. Almost two thirds of respondents (61%) believed that the changes and new approaches that had been implemented in response to COVID-19 would be sustained in their countries.

Participants praised the meeting for its rich content, the opportunity for actively sharing information in groups, and for bringing forward many new ideas.

COVID-19 can be considered a public health opportunity for transformational change. While the momentum is slowing down and other priorities are coming up there is a need to continue to push for integration, and to take steps on the pathway towards more client-centered systems. Partners are here to assist.



Annex

Meeting agenda

Planning Committee

- US CDC:** Meg McCarron (ID), Julie Carlton (GID), Jaymin Patel (GID), Terri Hyde (GID)
- TFGH:** Joe Bresee, Ann Moen, KC Sorensen
- WHO:** Diana Chang-Blanc (IVB), Santosh Gurung (IVB), Shalini Desai (IVB), Alba Vilajeliu (IVB), Shoshanna Goldin (EPP)
- MMGH:** Thomas Cherian, Carsten Mantel

List of participants

Countries represented

Africa	Americas	Asia	Eastern Mediterranean	Europe
Côte d'Ivoire	Chile	Bhutan	Jordan	Albania
Eswatini	Costa Rica	Cambodia	Lebanon	Armenia
Kenya		Lao PDR		Georgia
Liberia		Mongolia		Tajikistan
Nigeria		Nepal		
Rwanda		Philippines		
Sierra Leone		Thailand		
South Africa				
Tanzania				

Country details from day 1 panel discussion on best practices in COVID-19 vaccine rollout

How did preparedness plans impact COVID-19 rollout?

Chile: 26 warehouses and centralized monitoring of cold chain were established. There is a nominal information registry since 2010 with daily monitoring of coverage (set up after the influenza H1N1 pandemic) in both the public and private sector, with up to 150,000 registrations per day. It includes traceability of vaccine recipients.

Did seasonal influenza (flu) platforms bolster COVID-19 vaccination?

Albania: Health workers vaccinated against flu were more prone to also receive COVID-19 vaccines. Promotion of flu programs since 2014 helped in organization and prioritization of target groups and vaccine acceptance. Flu vaccine is now a social norm. Also helped for other population groups outside of the routine immunization program, within hospitals and primary care facilities.

Lao PDR: Flu vaccine was given to non-traditional groups. 72% knew about flu vaccine. NITAG was critical and established AEFI committees were important for COVID-19 vaccines. Social mobilization campaigns were ongoing.

Were other public health programs used to support COVID-19 vaccination?

Sierra Leone: The 2014 Ebola outbreak led to lessons learned in establishing new health system structures, including a surveillance system, contact tracing, etc. The EPI program led the COVID-19 roll-out, using the established routine immunization system, but also worked with other programs such as HIV clinics, and other ministries (education) in a

multisectoral approach. The EPI included traditional healers and trained them as vaccine champions. There is an integrated system of providing vaccines in a life-course approach with HPV and COVID-19 vaccines in schools (class 10) and during house-to-house outreach with all vaccines. A roadmap to integration was developed. Taking vaccine to the people (outreach system) substantially increased uptake.

Did strong routine childhood or other immunization programs lead to stronger COVID-19 programs for adults?

Nepal had high community participation and good government support with high public confidence in vaccination due to observed reduction in mortality and disability from immunization services. Investments in MR elimination and polio eradication helped to strengthen the resilience of the program and public confidence. In addition, dedicated health workers and RCCE strategies helped with COVID-19 vaccination.

Which type of external support was effective?

Lao PDR had external support for the development of the NDVP, and for the vaccination program in total. There was also support from the Asian Development Bank (TA funding) specifically for the subnational level and from local companies and development partners.

Nepal gathered financial support, TA, PPE support, both domestically and external.

Sierra Leone needed a lot of technical support for strengthening the cold chain capacity. Support for training of the health work force was effective in responding better to epidemics.

In Chile external TA was important including sharing of data between countries, which also improved transparency and trust in authorities by referencing global guidance.

For Albania the exchange of experiences between neighboring countries was helpful. Cold chain and promotion support was mostly from external sources.



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Summary recommendations from 20 cPIEs



Regulatory preparedness

Expand legal frameworks that were used for expediting use of COVID-19 vaccines to include other vaccines.

Improve coordination between NRA and NIP, specifically for vaccine safety monitoring.



Costing and funding

Analyze expenditures incurred to better estimate costs for pandemic response.

Establish contingency plans for rapid resource mobilization.



Planning and coordination

Provide timely global guidance, including provision of vaccine specific recommendations.

Leverage established coordination structures and strengthen broader healthcare delivery, including with development partners and the private sector.



Service delivery

Improve microplanning processes to ensure target populations are well-defined and appropriately served.

Acknowledge vital role of health workers, community health workers and volunteers in vaccine roll-out. Consider appropriate incentives to sustain their motivation.



Supply chain and waste management

Improve forecasting, allocation and vaccine stock management mechanisms for real time visibility on stock levels at all levels to enable redistribution to reduce closed vial wastage.



Human resource management and training

Develop training, recruitment, and surge capacity plans to monitor and ensure staff wellbeing.

Ensure early information sharing with health workers with sufficient detail for them to be able to respond to queries from their clients.



Acceptance and demand generation

Appropriately fund vaccine acceptance and demand activities at the service delivery levels.

Enhance mechanisms to stay ahead of misinformation and rumors.

Incorporate social listening and promptly make available targeted messages to respond to misinformation.



Vaccine safety

Enhance health worker capacity to identify, manage and report AEFI.

Ensure proper feedback of results of AEFI investigations to local levels.



Monitoring and evaluation

Harmonize electronic tools for vaccination with those for other health programs and civil registration and vital statistics systems (wherever possible).

Leverage tools developed for COVID-19 vaccination for routine immunization and other primary health care services.

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