

Considerations for integrating COVID-19 vaccination into immunization programmes and primary health care for 2022 and beyond

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Acronyms list

AD	Auto disable
AEFI	Adverse Event Following Immunization
AESI	Adverse Event of Special Interest
CBO	Community Based Organization
CC	Cold chain
CCE	Cold chain equipment
CHWs	Community Health Workers
cPIE	COVID-19 Post-Introduction Evaluation
EIRs	Electronic Immunization Registries
eJRF	Electronic Joint Reporting Form
eLMIS	electronic Logistics Management Information System
EOC	Emergency Operations Center
EPI	Essential Programme on Immunization
FLW	Frontline Worker
FPP	Gavi Full Portfolio Planning process
IA2030	Immunization Agenda 2030
ICC	Inter-agency Coordinating Committee
ISC	Integration of Immunization Supply Chains
MCH	Maternal and child health
MoF	Ministry of Finance
MoH	Ministry of Health
NCD	Non-communicable disease
NDVP	National COVID-19 Vaccine Deployment Plan
NIPs	National Immunization Programmes
NIS	National Immunization Strategy
NITAG	National Immunization Technical Advisory Group
NLWG	National Logistics Working Group
PHC	Primary Health Care
PHEIC	Public Health Emergency of International Concern
PIE	Post-Introduction Evaluation
PIRI	Periodic Intensification of Routine Immunization
RCCE	Risk Communication and Community Engagement
RI	Routine immunization
SAGE	Strategy Advisory Group of Experts on Immunization
SIAs	Supplementary Immunization Activities
SOP	Standard Operating Procedure
UCC	Ultra-cold chain
ULT-F	Ultra-low temperature freezers
VE	Vaccine Effectiveness
VPD	Vaccine-preventable Disease
VVM	Vaccine Vial Monitor
VWA	Vaccination Week in the Americas

Background

At the time of developing this document (July 2022), COVID-19 is still a Public Health Emergency of International Concern (PHEIC) since being declared as such by the WHO Director General on 20 January 2020¹. In only 18 months, COVID-19 vaccination has been implemented in nearly all countries of the world, with over 12 billion doses delivered and 61% of the global population having received the primary series². This has been the fastest and the most complex global vaccine campaign in history. Mass vaccination campaigns were used as a main delivery approach to reach the targeted populations quickly and widely. However, in many countries, this has come at a high price. Health workers and resources have been diverted from providing essential health services including immunization to COVID-19 vaccination efforts. As a result, the risk of vaccine-preventable disease (VPD) outbreaks is increasing. Additionally, the COVID-19 pandemic response has justifiably required dedicated attention and resources to support rapid scale up and delivery of COVID-19 vaccines – at times via coordination, financing, delivery, and other approaches outside of or on top of already overburdened health systems. While this approach has put a strain on essential immunization and other national programmes, it has also resulted in new approaches, insights and innovations that can further benefit health systems for the long term.

Despite many unknowns about the future of the pandemic and COVID-19 vaccination, it is time to plan for sustainable COVID-19 vaccination as an integral part of national immunization programmes (NIPs), primary health care (PHC), and other relevant health services. Many countries are already integrating COVID-19 vaccination into their regular health services and exploring new entry points for vaccination of high-risk groups.

This document lays out key programmatic considerations essential for moving from mass campaigns for COVID-19 vaccination to integrating COVID-19 vaccination into immunization programmes, PHC and other relevant health services for 2022 and beyond. The ultimate aim is to fully explore potential areas for integration of different components of immunization programmes, PHC, and the health system. Given the evolving epidemiological nature of the COVID-19 pandemic, this is a living document and will be updated to reflect the changing context including as policies for COVID-19 vaccinations over the longer-term are formulated. Finally, the document is not intended to outline a prescriptive approach but rather to layout the considerations and options for countries to consider and apply based on their needs and country context.

Objectives of this document

1. To provide a **definition and principles for integration of COVID-19 vaccination** into immunization programme, PHC^a and other relevant health services.
2. To provide an **overview of the benefits and risks of integration of COVID-19 vaccination** into immunization programmes, PHC and other relevant health services.

^a PHC is a whole-of-society approach to health that aims at ensuring the highest possible level of health and well-being and their equitable distribution by focusing on people's needs and as early as possible along the continuum from health promotion and disease prevention to treatment, rehabilitation and palliative care, and as close as feasible to people's everyday environment. WHO and UNICEF. A vision for primary health care in the 21st century: Towards UHC and the SDGs. <https://www.who.int/news-room/fact-sheets/detail/primary-health-care>

3. To **summarize country experiences of integration of COVID-19 vaccination** and identify **approaches for integrated service delivery**.
4. To propose **key steps** to guide countries **on how to operationalize integration of COVID-19 vaccination into immunization programmes, PHC and other relevant health services** at national and subnational level: **assess their readiness, develop a plan, and identify short-term (6-12 months) capacities and investment needs**.
5. To propose the need and scope of a prioritized **research agenda** to generate further evidence on **best practices** for the integration of COVID-19 vaccination as part of PHC and other health services; and to inform **future pandemic preparedness**.

Target audience

- **Primary audience:** National and subnational public health planners, national and subnational immunization programme managers responsible for COVID-19 vaccination and/or essential programmes on immunization (EPI) and those overseeing PHC programmes.
- **Broader audience:** global, regional, and country level stakeholders and partners responsible for the design, financing, implementation, monitoring and evaluation of immunization and associated programmes including RCCE, PHC, and health systems strengthening.

Rationale for integration of COVID-19 vaccination

1. **Epidemiological: At the time of this drafting, the trajectory and timing for the end of the COVID-19 pandemic is uncertain and WHO has laid out possible scenarios for how the pandemic could evolve in 2022³.** Based on what is known, the most likely scenario (base case) is that SARS-CoV-2 will continue to evolve, but the severity of disease it causes reduces over time as immunity increases due to hybrid immunity from vaccination and natural infection. Periodic spikes in cases and deaths may occur as immunity wanes, which may require periodic boosting for high-risk populations, potentially using specific vaccines targeting the variants in circulation^b. These considerations will have implications for the future of the COVID-19 vaccination programme in 2022 and beyond and for the planning and implementation of integration into PHC. The likely need for periodic booster doses of COVID-19 vaccines for those making up high-risk groups (health workers, older people, people with comorbidities, pregnant women, among others), the majority of whom are adults, will require different delivery strategies and platforms beyond childhood vaccination which will need to be established or strengthened.
2. **Sustainability:** The need to rapidly achieve short term COVID-19 vaccination goals in 2020-2021 led to fragmentation and verticalization of programmes. The current arrangement of COVID-19 vaccine supply and delivery is temporary and may not be sustainable from a financial and human resource perspective (e.g., COVID-19 mass vaccination campaigns) hence the need to regularize delivery of COVID-19 vaccines through integration into immunization services or other established health services for specific target groups. **The interest in integration of COVID-19 vaccination, both in PHC and within existing immunization programme services specifically, has been growing.** With a longer-term view for **creating efficiencies and sustainability** through integrated delivery of health services, **some countries have already taken steps to integrate COVID-19 vaccination into immunization programmes, PHC, and other relevant health services** (see Annex A).

^b Following the declaration of COVID-19 as Public Health Emergency of International Concern (PHEIC) on 30 January 2020, WHO has provided Emergency Use Listing (EUL) for several COVID-19 vaccine products. EUL is a procedure to streamline the process by which new or unlicensed products can be used during public health emergencies, when the emergency is over, the products might need to additional approval processes.

However, **integration is not solely limited to co-delivery at service level. Integration also refers to the merging with** other health governance functions such as planning, programme design, budgeting, and joint coordination under one Ministry of Health (MoH) department; health workforce responsibilities and competencies; integrated outreach and meaningful engagement and trust building of communities; supply chain management and integrated programme monitoring (such as health management information systems).

- 3. Leveraging COVID-19 resources:** There is an opportunity to capitalize on COVID-19 vaccination investments, innovations, and new tools triggered by the pandemic response (e.g., digital health, real-time monitoring systems including social listening mechanisms, dashboards and visualization, SMS reminders, new ways of providing training for health workers, etc.) toward strengthening immunization programmes, PHC, and pandemic preparedness. Available evidence has shown that the COVID-19 pandemic impacted performance of immunization and other essential services in 2020 and 2021⁴. Although there is some evidence of recovery in certain settings, 2021 saw an overall decline in DTP1 and DTP3 doses administered globally resulting in about 18 million zero-dose children and over 25 million un- or under-vaccinated children, 6 million more than before the start of the pandemic in 2019⁵. There is an **urgent need for actions leading to programme recovery due to the negative impact of the pandemic on immunization programmes and PHC**. In April 2022, the Strategic Advisory Group of Experts on Immunization (SAGE) recommended that countries should leverage the COVID-19 vaccination rollout as a transformative opportunity for building resilient immunization programmes and to strengthen PHC⁶. Some of the areas of investment recommended by WHO SAGE included health worker vaccination, immunization supply chain and logistics, digital tools, surveillance, data, and communications among others. Similarly, this document identifies specific areas identified for investments. At the same time, strengths of immunization programmes and PHC can be leveraged to improve COVID-19 vaccination (e.g., existing adverse events following immunisation (AEFI) monitoring and reporting systems leveraged for COVID-19 vaccines, or established PHC delivery platforms like NCD clinics for delivery of COVID-19 vaccination).
- 4. Life-course approach:** the integration of COVID-19 vaccination with other services and programmes increases the opportunity to have a more **people-centred approach**^c by delivering packages of health services that better responds to users' needs. This package of health services responds to users' needs across their life course and is in alignment with the Immunization Agenda 2030 goals⁷. **Traditionally**, immunization programmes have been focused on children, adolescents, and women of reproductive age, but the development of **"delivery platforms"** for COVID-19 higher-risk groups (health workers, older persons, people with comorbidities and pregnant women), most of whom are in the adult age group, provides opportunities to more easily integrate other existing vaccines targeting adults (e.g., vaccines against influenza⁸, shingles) or new vaccines in the pipeline^d and additional interventions (e.g., screening for NCDs, reproductive health education, delivery of bed nets for malaria prevention) targeting these adult groups (see Figure 1). This is the opportunity to turn 'life course vaccination,' one of seven strategic priorities of the Immunization Agenda

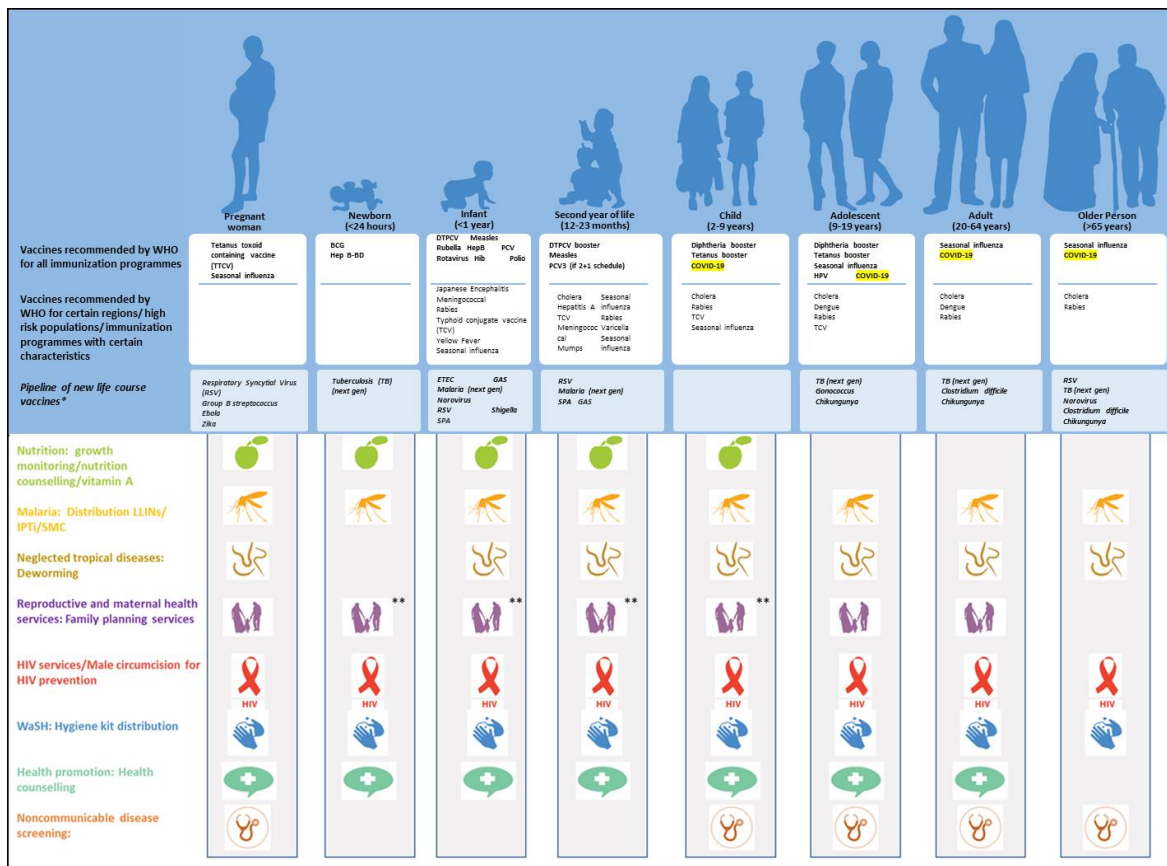
^c A people-centred approach should correspond to population needs through the design, management and delivery of services that are shaped by and responsive to the needs of individuals and communities, including addressing barriers to access to services due to age, location, social and cultural norms and gender-related factors.

^d Vaccines against other diseases targeting adult population are in late-stage clinical trials (e.g., maternal RSV, tuberculosis, HIV) and might become available in the coming years.

2030, into reality in many countries that to date have had weak or non-existent adult vaccination programmes. Having those adult immunization service platforms already developed and operational will serve as a critical cornerstone of **pandemic preparedness and response** and allow for a quicker rollout and uptake of pandemic vaccines in the future, since much of the infrastructure needed for vaccine delivery and uptake will already be present. Additionally, those vaccine service delivery platforms become opportunities to catch up individuals on earlier **missed vaccines and other interventions** due to the impact of a pandemic.

Figure 1. COVID-19 vaccine as part of a life course immunization approach and other health interventions

As illustrated below, delivery of COVID-19 vaccination as part of the life course provides opportunity to link with and strengthen immunization and essential health services for age groups across the life course – from pregnant women, newborns, to the elderly.



* Based on data available as of July 2022. ** For caregiver

Source: Adapted from the WHO. Working Together: An Integration Resource Guide for Immunization Services Throughout the Life Course.

DTPaCV: Diphtheria, tetanus and pertussis containing vaccine; ETEC: Enterotoxigenic Escherichia coli; GAS: Group A streptococcus; HPV: Human Papillomavirus; PCV: Pneumococcal conjugate vaccine; (RSV) Respiratory Syncytial Virus; SPA: Salmonella enterica ser. Paratyphi A; TCV: Typhoid conjugate vaccine; TB: Tuberculosis.

Proposed definition and principles of integration of COVID-19 vaccination into immunization programmes and PHC

Integration has different meanings and may be approached in varying ways to serve different objectives of health systems. This document defines integration and the related principles as below:

Definition *“the partial or full adoption of COVID-19 vaccination into national immunization programme services, PHC, and any other relevant health services with the overall aim of improving programme efficiency and sustainability, enhancing demand and improving user satisfaction, achieving and maintaining satisfactory coverage, and addressing inequities”*

Principles	Equity	in planning for integration, focus should be on reaching the most marginalised, isolated, and unreached communities in rural and/or urban areas with COVID-19 vaccines and other vaccines and essential health interventions.
	People - centred	focus on individual/population centred provision of packages of essential health services (assuming are available) and assuring community participation and engagement.
	Context specific	considering feasibility, accountability, compatibility between the interventions, acceptability to individuals, caregivers, health workers and communities, and accounting for different levels of health system capacity and resources.
	Optimising service coverage and equity	with additional resources, service delivery and performance should improve with integration and inequities reduced including through reaching missed communities and a reduction in zero dose children and other high-risk and vulnerable groups in urban, rural, conflict and other contexts.

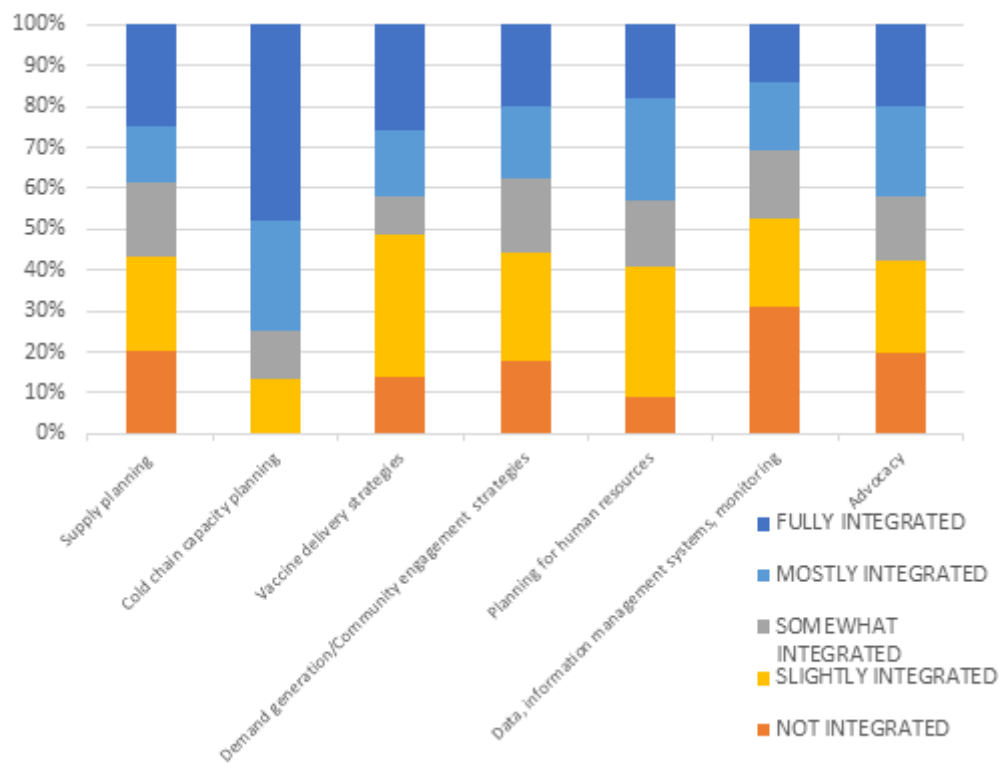
There are further assumptions which inform the definition and principles and the structure of this document:

- **Integration can have various dimensions and implications at different levels** (e.g., global, regional, country, sub-national), for different stakeholders (e.g., donors, technical agencies, NIPs, emergency preparedness, PHC programmes) and for different programme components (e.g., governance, funding, planning, supply and logistics, service delivery, demand promotion and RCCE, information systems, health workforce).
- The **WHO’s six building blocks on health systems**^e can provide a **useful framework** for countries to consider how to plan integration and/or coordination between COVID-19 vaccination, immunization programmes and the broader health system. At the same time, and in alignment with the **WHO and UNICEF Operational Framework for PHC** there is a need to recognize the importance of engaging and co-creating strategies and approaches for **demand promotion and uptake with communities**⁹. The information in the rest of the document is presented by building blocks and a specific demand and community engagement section is included.
- In many contexts, **some form of integration is already happening and country planning and implementation should build on progress underway and address existing gaps**. For example, in

^e The six building blocks are: governance and leadership, health systems financing, service delivery, health workforce, health information systems, access to essential medicines (including quality vaccines).

a survey conducted by WHO and UNICEF to explore current status, perceived challenges, and opportunities of integration of COVID-19 vaccination, countries reported a higher degree of integration for some areas such as for the supply and delivery of COVID-19 vaccines with different vaccines and common usage of cold chain facilities, as compared to the integration of COVID-19 vaccination with the overall planning and funding of combined health programmes and health workers (See Figure 2).

Figure 2. Degree of integration of COVID-19 vaccination by health system component.



- Source: Survey conducted by WHO and UNICEF to explore current status, perceived challenges, and opportunities of integration of COVID-19 vaccination and routine immunization. WHO: as of February 2022, 48 responses (5 regional offices and 41 country offices). UNICEF: as of December 2021, 54 responses (6 regional offices and 34 country offices).

Benefits and risks of integration of COVID-19 vaccination

Benefits

Some of the benefits of COVID-19 vaccination integration include, but are not limited to:

- **Increased efficiencies and programme performance:**
 - o With countries facing other competing health priorities, COVID-19 vaccination can be provided alongside other health interventions as a package of services
 - o Shared COVID-19 vaccination costs and resources with other health interventions and vice versa (of particular importance in resource-constrained settings)
 - o Services reach the most vulnerable population groups and marginalized communities

- Aligned with the strategy for reducing missed opportunities for vaccination¹⁰, COVID-19 vaccination is an opportunity to screen and catchup adults and any accompanying children for earlier missed vaccinations and other health interventions (e.g., nutritional screening, vitamin A supplementation and deworming, see Figure 1)
 - Integrating COVID-19 vaccination with other health services is anticipated to lessen the strain on the health workforce as a whole relative to providing vaccination through campaigns, in particular, beyond the initial mass vaccination efforts
 - Integration of Immunization Supply Chains (iSC) components presents various health system strengthening opportunities not only for NIPs but also for other services such as blood banks, pathology services, maternal health (oxytocin) and NCD services (insulin).
 - Encourage and improve collaboration across sectors through delivery of multisectoral initiatives such as Ministry of Social Affairs, through approaches to target high-risk groups (older adults, essential workers), and the Ministry of Education through school-based programming and targeting workforce (teachers as a high-risk group).
 - Incorporating COVID-19 funding into standard budgetary, expenditure and planning processes to benefit from existing oversight and accountability structures.
- **Potential to capitalize on COVID-19 investments, innovations, and lessons learned towards sustainability:**
- Technological upgrades for planning, microplanning, and data management for immunization programmes and PHC
 - Strengthened governance including Inter-agency Coordinating Committee (ICC), National Immunization Technical Advisory Group (NITAGs), National Logistics Working Group coordination structures (NLWG), Emergency Operations Centres (EOCs), and other working groups
 - Engagement with expanded partners, including academia, multilateral organizations, manufacturers, private sector (profit and non-profit), non-governmental organizations (NGO), community and religious leaders, other ministries and authorities (e.g., defence, army, tourist, education, etc.) for various aspects
 - Cold chain equipment expansion (including repurposing), vaccine and device management capacity, and health worker training
 - End-to-end supply chain planning, for vaccines and other ancillaries
 - Strengthened capacity for conducting vaccine effectiveness (VE) and impact studies
 - Strengthened monitoring of AEFI and adverse events of special interest (AESI), and causality assessments
 - Strengthened generation of social data on drivers of demand and uptake and listening/communication capacities
 - More timely monitoring of uptake and coverage of COVID-19 vaccination
 - Digital tools and innovations for pre-registration of beneficiaries, reminders, defaulter tracking, documentation and monitoring, and timely data analysis for ongoing improvement of services
 - Effective and efficient training and performance management skills for health workers
- **Promotion of greater demand and access to health services:**

- Gathering and using social data to understand behavioural and social drivers of vaccination and other PHC interventions, to inform the design, implementation, and evaluation of strategies, and ensure they meet the needs of the communities they are intended to serve, especially hard to reach populations.
 - Identifying potential PHC contact points with health services where vaccination can be delivered. For example, integrating access to COVID-19 vaccines with broader routine adult health service contacts such as at pharmacies, clinics for curative care or routine screening, long-term care facilities, and outposts.
 - Generating an opportunity, through COVID-19 vaccination, to access other services for the targeted groups and/or their families or the reverse, e.g., HIV or NCD clinics as an opportunity to deliver COVID-19 vaccination
 - Strengthening partnerships and engagement of trusted community representatives and community-based networks for demand generation and uptake.
 - Enhancing the capacity of the health workforce on delivery strategies tailored to specific community needs including for disadvantaged and prioritized population groups and to link families and services.
 - Institutionalizing and equipping the community health workforce to conduct appropriate community engagement and counselling for protective, preventive, and curative practices
 - Leveraging COVID-19 vaccination as an opportunity to engage and educate communities on vaccination and other health topics to create or reinforce a culture where communities value and trust health interventions. This can also benefit preparedness for and response to future pandemics.
- **Improved user outcomes and experience through a people-centred approach:**
- The development of life course entry points/delivery platforms and strategies for vaccination of health workers, older persons, pregnant women, people with comorbidities provide opportunities to integrate other vaccines and additional health interventions more tailored to these population groups in a comprehensive and practical way (*see Figure 2*).
 - In humanitarian contexts, provision of a package of essential health services including COVID-19 vaccines to respond to the overall population needs.

Risks

The integration of COVID-10 vaccination into regular immunization services comes with its own risks that require mitigation approaches and prior preparedness. Some of these risks are:

- **Multiple vaccine delivery strategies to reach different target groups, leading to logistical challenges** such as increased complexity for integrated outreach when integrating routine and COVID-19 vaccines which do not have a vaccine vial monitor (VVM), and have different formulations and cold chain storage requirements.
- **COVID-19 vaccine hesitancy spills over to increase hesitancy for broader vaccination** (for children, adolescents, adults), **PHC and other health services**, particularly in settings where the COVID-19 response has led to an erosion of trust in authorities and medical institutions.
- **Human resources become overstretched, overloading and fatiguing health workers and support staff**

- Negative impact on the quality of immunization service delivery and vaccine-preventable diseases (VPD) outbreak response, leading to poor or unsatisfactory user experience.
- Limited capacity of immunization sessions to deliver additional doses of COVID-19 vaccine.
- Insufficient government capacity to address backsliding, catchup vaccination, and sustain progress for non-COVID-19 vaccines, and integrate COVID-19 vaccine into the immunization programme.
- Limited expertise and /or hesitancy among health workers to deliver multiple interventions, especially to target populations not usually served by EPI.
- Slowed response times from shared logistics and finance staff across programmes due to increased burden of tasks generated by COVID-19 activities.
- **Insufficient access, supply chain, and logistics for COVID-19 vaccines and commodities:**
 - Ability to secure equitable access to COVID-19 vaccines through the mechanisms that exist for other vaccines.
 - Inadequate cold chain equipment for storing COVID-19 vaccines and/or inadequate expansion of existing EPI cold chain infrastructure to accommodate COVID-19 vaccines, which is already overstretched in many countries.
 - Use of stock volumes of auto-disable (AD) syringes for EPI vaccines in the absence of additional stock availability for COVID-19 vaccines.
- **Health information systems:** Integrated monitoring systems may unintentionally negatively impact (reduce) collection of data (e.g., to make a database more manageable) that are essential for operational planning
- **Financial:**
 - Imbalance of funding sources or non-synchronous funding flows between programmes may add complexities to delegating who is responsible for delivery of COVID-19 vaccine.
 - Potential for additional funding (sustained investment) to dry up after the pandemic phase.
 - Slowing-down of transition process for other vaccination programmes, especially where the country cannot reach pre-COVID-19 per capita health funding levels.
- **Uncertainty of COVID-19 pandemic future and implications for COVID-19 vaccination future needs**

How to operationalize integration of COVID-19 vaccination at national and subnational level

Countries are advised to consider undertaking the following actions as they plan, implement, and monitor the COVID-19 vaccination integration. However, depending on the level of integration, countries can choose the appropriate steps and proposed actions relevant for their context.

A summary of the steps to take to operationalize integration, as detailed below, include:

Step 1. Initiating/building on the integration process

Step 2. Planning and preparatory phase: Develop a country COVID-19 vaccination integration plan

Step 3. Implementation and monitoring

Step 4. Post integration follow-up actions

Step 1. Initiating/building on the integration process

- Repurpose existing EPI-related or COVID-19 vaccination technical working groups/taskforce or establish a new temporary working group (relevant ministries, stakeholders and partners; possibly subgroup of existing coordination body) to plan, coordinate, implement, and monitor integration. It will be important that relevant MoF and MoH departments are represented: director of planning, national and subnational immunization managers responsible for COVID-19 vaccination and EPI, and those overseeing PHC programmes or other health services targeted for integration.
- Conduct multisectoral consultations on potential COVID-19 vaccine integration between government entities and programmes (e.g., NIP, NCDs, MCH), civil society, donors, development partners, NITAG, NLWG, ICC and other higher-level bodies.
- Conduct a situation analysis to assess the national and sub-national level readiness and status of countries for integration of COVID-19 vaccination into NIP services, PHC, and other relevant services. A checklist for the COVID-19 vaccine integration readiness assessment is proposed (see Annex B) for general guidance. Countries will need to adapt it to their unique contexts based on their Covid-19 vaccine coverage levels, health system capacity and their overall progress towards integration. Underpinning the checklist are some key aspects to consider for integration:
 - Proportion of COVID-19 high-risk populations amongst the general population
 - COVID-19 vaccination performance (particularly primary series and booster coverage for high-risk groups) and progress towards national COVID-19 vaccination targets to date
 - Findings from any cPIE or other similar COVID-19 vaccination introduction assessment
 - Lessons learned from previous efforts to integrate health services (what worked well, what did not and why)
 - Also, for example, where relevant, lessons from the Global Polio Eradication Initiative and other disease elimination and control initiatives (e.g., influenza) should be considered and applied¹¹.
 - Health workforce competencies (i.e., prioritizing identification of those who can vaccinate and who cannot).
 - Organizational culture and effective ways to develop multisectoral regulations, procedures, and governance structures that foster efficient and timely implementation
 - Acceptability and perceptions of health workers and communities
 - Availability of financing and human resources

- Operational strategies and workflow patterns
 - This includes approaches to identify and link eligible individuals who have contact with other services (chronic care clinic/outreach, ANC, pharmacy, outpatients etc.) to Covid-19 vaccination, ideally within the same service or facility. Careful consideration must be given to patient/service-user experience, demands on workforce, workforce IPC training needs to successfully achieve linkages and other facility workflows.
- Financing models
- Quality assurance processes¹²

Step 2. Planning and preparatory phase: Develop a country COVID-19 vaccination integration plan

Where feasible and relevant, a COVID-19 vaccine integration plan could piggy-back or leverage existing COVID-19 vaccine national deployment plans (NDVPs), National Immunization Strategy (NIS) discussions, Gavi Full Portfolio Planning (FPP) processes (for Gavi eligible countries), and Covid-19 Vaccination ‘one plan, one country team, one budget’ among others.

The existing repurposed technical working groups/taskforce or new temporary group should oversee the planning process and ensure that the COVID-19 vaccination integration plan is not considered a standalone strategic effort. The integration effort should be seen as the next step to sustain and solidify the Covid-19 vaccination programme.

For developing the country COVID-19 integration plan some decisions will need to be made:

- 1) **Define national policy for COVID-19 vaccine booster doses**, including periodicity, COVID-19 vaccine product to be used, and population groups that will be targeted.
 - A. **WHO’s current recommendations¹³ for initial booster doses:**
 - booster doses should be offered based on evidence that doing so would have substantial impact on reducing hospitalization, severe disease and death, and to protect health systems.
 - **The order of implementing booster doses to different population groups should follow that which has been laid out for the primary COVID-19 vaccination series in the WHO Prioritization Roadmap¹⁴** – i.e., booster doses should be prioritized for higher priority-use groups before lower priority-use groups, unless there is adequate justification not to do so.
 - **Highest priority-use:**
 - health workers
 - older adults
 - immunocompromised persons
 - **High priority-use:**
 - adults with comorbidities
 - pregnant women
 - teachers and other essential workers
 - disadvantaged socio-demographic populations at higher risk of severe COVID-19.
 - As a general principle, an interval of **4–6 months since completion of the primary series** could be considered, especially in the context of Omicron. If more than 6

months have elapsed since completion of the primary series, the booster dose should be given at the earliest opportunity.

- Booster doses should be considered for **all COVID-19 vaccines having received EUL** as per WHO's product specific interim recommendations.

B. WHO's interim statement ¹⁵for additional booster doses beyond the first booster (<6 months since first booster)

- Additional booster doses beyond the first booster dose are currently being offered by some countries (i.e., fourth dose to older adults and a fifth dose for immunocompromised persons).
- Data on additional booster doses as of June 2022 only exists for the mRNA vaccines, and not for other vaccine platforms. The limited available data suggest that for **highest risk groups** there is a benefit that supports the administration of an additional booster dose of mRNA vaccine in:
 - health workers
 - older adults
 - immunocompromised persons

C. WHO's interim statement ¹⁶ for future additional doses:

- As per the WHO base case pandemic scenario, it is assumed that in the future additional **COVID-19 vaccine boosters will likely be recommended periodically for high-risk groups**. While seasonality is not yet fully established for SARS-CoV-2, **evidence from the past two years support the notion of more substantial transmission during the winter season**. Therefore, for countries with either a Northern or Southern Hemisphere winter season, plans for catch-up to improve primary series coverage and boosting for those at highest risk, campaigns should take seasonality into account.
- More research is needed on the performance of current and variant-specific candidate COVID-19 vaccines, including the VE, immunogenicity, and safety of an additional booster dose over time and duration of protection by disease outcome and priority use groups. SAGE as well as the Technical Advisory Group on COVID-19 Vaccine Composition continue to monitor the situation carefully and the WHO position will be reflected accordingly in future versions of this document.

2) Understand and map high-risk groups, populations have never been vaccinated, and/or those who have not completed their primary series, where these groups/populations are and how integration will reach them. For example, high-risk groups who have contact with services for other health concerns can be linked to COVID-19 vaccination and those who do not come should be identified through community engagement, community health workers or volunteers.

3) **Define other interventions that can be provided with COVID-19 vaccination.**

- Based on several **co-administration** studies of COVID-19 vaccines and inferred from co-administration studies of other **adult vaccines, WHO SAGE recommends that COVID-19 vaccines may be given concomitantly, or any time before or after, other adult vaccines** including live-attenuated, inactivated, adjuvanted, or non-adjuvanted vaccines. **For adolescents and children, evidence from co-administration studies is**

currently insufficient to make a recommendation for simultaneous administration with COVID-19 vaccines. Updates will be provided as evidence permits.

- Consider interventions by age group described in Figure 1 and country experiences in Annex A.

4) Define a combination of service delivery strategies to provide COVID-19 vaccination with other health services.

For the purpose of defining service delivery strategies for integration of COVID-19 vaccination, the following definitions are considered:

- **Routine mode:** vaccines and other health interventions can be delivered at a health facility, at mobile/outreach site, or through periodic intensification of routine immunization (PIRI) approaches.
 - o **Health facility:** immunization and other health services are delivered at a health facility (either as part of primary care or hospital-based).
 - o **Mobile/Outreach sites** (school-based or other strategies): immunization and other health services are delivered by health-facility staff through single day visits to an outreach site typically located 5-15 Km from a fixed facility. Includes temporary/mobile clinics.
 - o **PIRI:** Integrated country-specific packages of preventive services are delivered through regular events, e.g., child health days. Existing health resources and extensive social mobilization are used to achieve high coverage, typically in areas that are hard-to-reach or underserved.
- **Campaign mode:** mass immunization campaigns that rapidly deliver vaccinations to large groups of people in order to increase immunization coverage as part of disease control, elimination or eradication programmes, or in response to disease outbreaks.

The **proposed service delivery strategies (approach/location/services) in Table 1 are not exclusive and can be mixed** based on the country context and needs. The table also does not intend to outline a continuum or step by step approach of integration steps but rather a menu for countries to apply based on context. So, for example, countries with low COVID-19 vaccination coverage might start with bundling COVID-19 vaccination with other services as part of a mass campaign and evolve towards integrating COVID-19 vaccination as part of existing health services and/or new entry points (e.g., ANC clinics and HIV&TB clinics for outpatient and inpatient) provided in fixed sites at the health facilities. The target population is also identified and the implementation timeframe considering the COVID-19 pandemic phase. The level of integration with other health services; implications on cost, health workforce, logistics, and community engagement; and required health system maturity are presented on a scale (0: no implication, +: lower, ++++: higher).

Countries can consider **piloting service delivery strategies** at the local level for learning and plan adjustment before they are scale up to the national level.

Table 1. Proposed service delivery strategies for COVID-19 vaccination with different level of integration.

Mode	Approach/location/services		Target population	Implementation timeframe	Level of integration	Implications				Health system maturity	
						Cost	HWF	Logistics	Community engagement		
Routine mode	Fixed site	Family practitioner (public and/or private)	Combining COVID-19 vaccination and other health interventions	General population & high-risk groups	Intermediate/long term	++++	+	+	+	++++	++++
		Health center (primary care facilities, hospitals)	Combining COVID-19 vaccination and other health interventions: -For same age group (co-delivery/co-administration with influenza vaccine) -For different age groups (e.g., whole family “approach” offering childhood vaccination and adult vaccination)	General population & high-risk groups	Intermediate/long term	++++	+	+	+	++++	++++
		Pharmacy	COVID-19 vaccination possibly combined with influenza vaccination and medicine collection	General population & high-risk groups	Intermediate/long term	++	++	+	++	+++	++
		NCD clinics (e.g., oncology, cardiology, renal clinics at primary care and/or hospital level)	Combining COVID-19 vaccination and other health interventions	Persons with comorbidities (e.g., NCD, immunocompromised patients)	Intermediate/long term	++	++	++	++	+++	+++

Mode	Approach/location/services		Target population	Implementation timeframe	Level of integration	Implications				Health system maturity		
						Cost	HWF	Logistics	Community engagement			
		HIV & TB clinics		HIV/AIDS & TB patients	Intermediate/long term	++	++	++	++	+++	+++	
		ANC clinics		Pregnant women	Intermediate/long term	++	++	++	++	+++	+++	
	Outreach (mobile teams)	School	Combining COVID-19 vaccination and other school health interventions (e.g., health education)	Children, adolescents	Intermediate/long term	++	++	++	+++	++	++	
		Integrated MCH outreach	Combining COVID-19 vaccination with routine vaccination, nutrition and reproductive health and other services	Mothers and children	Intermediate/long term	++	++	++	+++	++	++	
		Long-term care facilities, nursing homes	Combining COVID-19 vaccination and other health interventions	Elderly & persons with comorbidities	Intermediate/long term	++	++	++	+++	+	++	
		Home visits		Elderly and persons with comorbidities	Intermediate/long term	++	+++	++	+++	+	++	
	Campaign mode	Temporary fixed site	Dedicated COVID-19 vaccination center/post	Specially set up for COVID-19 mass vaccination campaign /combining with	General population	Emergency phase of a pandemic	0/+	++	+++	++++	++	+

Mode	Approach/location/services			Target population	Implementation timeframe	Level of integration	Implications				Health system maturity
							Cost	HWF	Logistics	Community engagement	
			other health interventions (e.g., NCD screening)								
	Mobile teams	Vaccination in parks, marketplace, malls, place of worship, workplace, ...	Provision of COVID-19 vaccination only/ combining with other interventions (e.g., NCD screening)	General population	Emergency phase of a pandemic	0/+	+++	++++	++++	++	+
		Long-term care facilities, nursing homes		Priority groups: elderly, people with co-morbidities	Emergency phase of a pandemic	0/+	+++	+++	+++	+	+
		Refugee camps, transit points, border checks, dormitories, NGOs facilities, detention center/prisons		General or specific population/mobile groups	Emergency phase of a pandemic	0/+	+++	+++	+++	+	+
		Home visits		Priority groups: elderly, people with co-morbidities	Emergency phase of a pandemic	0/+	++++	+++	++	+	+
	Mass vaccination	Mass vaccination	Specially set up for COVID-19 mass vaccination	General population	Emergency phase of a pandemic	0/+	++	++++	++++	+	+

Mode	Approach/location/services		Target population	Implementation timeframe	Level of integration	Implications				Health system maturity
						Cost	HWF	Logistics	Community engagement	
		campaign of other antigens and health interventions (e.g., vitamin A, malaria chemoprevention, etc.)								

- 5) **Identify key actions/investments needed. Table 2 below proposes short-term (6-12 months) capacity/functionality and priority investments needed.** These areas are not exhaustive and have been identified based on:
- **immediacy** (e.g., can address current and critical COVID-19 vaccine and immunization programme and PHC needs),
 - **opportunity** (e.g., potential for finding synergies across programme priorities), and
 - **feasibility** (e.g. concrete implementation steps can be identified).

Table 2. Proposed short-term (6-12 months) capacity/functionality required and priority investments.

Health system building block	Capacity / functionality required	Actions/Investments needed
Leadership & governance	Repurpose or align immunizations technical working groups/ COVID-19 vaccination related task forces or set up a new temporary working group to plan for integration	Strengthen multi-sectorial approaches and engagement with non-traditional immunization partners
Health systems financing	Future costs of procuring COVID-19 vaccine products and ancillaries	Estimate costs of procuring COVID-19 vaccine products, particularly for those countries that are not COVAX AMC and/or Gavi eligible based on demand forecast estimates
	Health workers costs	Estimate health workers costs for expanded service delivery within the existing and/or new service points/platforms
	Budget for COVID-19 vaccination delivery costs including human resource, capacity building, updating country guidance and tools, devices, cold chain equipment and ancillary equipment as well as cold chain maintenance, demand promotion, etc.)^f	Map costs of COVID-19 vaccine delivery and of integration and need for catalytic funding to streamline processes Adjust financing mechanisms as necessary Estimate technical assistance needs for the process of integration
Demand and community engagement	Understanding the beliefs, perceptions and experiences of the recipients of vaccination to inform the design, implementation and evaluation of targeted demand-related strategies and to ultimately help ensure more equitable access to quality services	Build and strengthen the research and evidence on behavioural and social drivers of vaccination – for any vaccine – can also be done within or beyond the immunization programme Ensure listening mechanisms are in place to understand and respond to communities’ health and PHC-related concerns Engage communities in micro planning and co-create local solutions to address barriers to uptake of health services

^f Countries which are either Gavi eligible or COVAX AMC countries might be eligible for support for integration of COVID-19 vaccination

	<p>Increase demand by leveraging broader health access points, community engagement (e.g. FLWs, CHWs), and invest in new/existing two-way communication channels targeting the different population groups</p>	<p>Explore leveraging FLWs to promote demand/acceptance for COVID-19 vaccination and other health interventions</p> <p>Consider additional or adapted demand generation and communication activities to target groups through existing/new delivery platforms and continue to reinforce vaccination as a social norm.</p> <p>Engage local CBOs, faith-based actors, community leaders, public health associations and local champions to promote an integrated communication approach at family and community levels.</p> <p>Advocate for adequate human resource and financial resources for integrated demand promotion</p>
<p>Service delivery</p>	<p>Adapt service delivery strategies – shift away from vertical COVID-19 mass vaccination campaigns to integrated service delivery; fixed-site or health-facility based vs outreach, leveraging periodic intensification to reach more communities with vaccines and PHC services</p>	<p>Map existing services/programmes for high-risk priority populations</p> <p>Identify and analyse health interventions with high potential for integrated delivery, guided by considerations regarding context; compatibility of potential interventions to be integrated; feasibility, and equity impact</p>
	<p>Define existing or new service delivery entry points and platforms for high-risk groups (e.g., ANC for pregnant women; HIV clinics for people living with HIV/AIDS; NCD clinics at primary care and/or hospital level for people with comorbidities; etc.)</p>	<p>Prioritize, design and test new delivery strategies in line with selected integration approaches</p> <p>Define/update patient flow/pathways for the delivery of joint services</p> <p>Update/develop multidisciplinary team approach including clear roles and responsibilities</p>
	<p>Look at existing mechanisms for quality of care planning, assurance, and improvement to identify where COVID-19 vaccination considerations could be incorporated¹⁷</p>	<p>Illustrative actions include incorporation of COVID-19 vaccination within performance reporting and contracting mechanisms, supportive supervision checklists and processes, risk management and adverse event reporting systems, and existing platforms for community engagement.</p>
<p>Health workforce</p>	<p>Build optimal profile (e.g., determine skills needed/type of personnel) and quantity of health workers (e.g., medical doctors, clinical officers, nurses, pharmacists, other staff as relevant) to perform COVID-19 vaccination on top of existing workload</p>	<p>Estimate HR needs for expanded service delivery within the existing and/or new service points/platforms</p> <p>Hire additional HR as needed</p> <p>Where possible, consider redeploying COVID-19 staff to EPI</p>

	Build capacity of existing staff on: <ul style="list-style-type: none"> • COVID-19 vaccination • Identifying, reaching/referring, and monitoring vaccination status of COVID-19 high-risk groups • Interpersonal communication • Waste management • Vaccination registration system • AEFI management & reporting 	<p>Strengthen capacity to identify target high-risk population, among other areas</p> <p>Design and implement capacity strengthening activities for providers in line with service delivery strategy (e.g., engage with ANC care-seekers on Covid vaccination)</p> <p>Enhance interpersonal communication capacities of the health workforce</p> <p>Supportive supervision and mentoring</p>
	Define the role of compensation mechanisms/incentives	<p>If relevant, design/revise the incentive policy</p>
	Engage community health workers (CHWs) to generate demand for COVID-19 vaccination and other relevant interventions	<p>Estimate CHWs needs according to the selected delivery approach</p>
Health information systems	Integrate health monitoring information systems (records, registers, electronic system covering whole data pipeline, providing performance monitoring dashboards to inform actions). The extent of integration may differ in different settings.	<p>Redesign monitoring systems to be able to identify and register vaccination of adult high-risk groups</p> <p>Leverage COVID-19 data platforms for EPI and other services</p> <p>Expand or scale up promising HMIS to improve routine monitoring</p>
	Integrate reporting systems for COVID-19 vaccination (e.g., electronic) and EPI (e.g., paper based)	<p>In situations where EPI (e.g., paper based) and COVID-19 vaccine reporting systems (e.g., electronic) are different, the co-delivery of both interventions, might require planning to shift to electronic platforms</p>
	Strengthen vaccine-preventable disease surveillance	<p>Leverage COVID-19 disease surveillance to strengthen VPD surveillance and vice versa</p>
	Strengthen AEFI and AESI systems	<p>Leverage pharmacovigilance improvements for COVID-19 to strengthen it for other vaccines</p>
Access to essential medicines (including quality vaccines)	Strengthened vaccine storage and cold chain, distribution planning (e.g., CCE and UCC requirements, temperature monitoring, VVM / short expiry), and waste management	<p>Estimate storage, cold chain, and distribution capacity needs for delivery of additional vaccines and increased wastage</p> <p>Explore leveraging investments made in electronic Logistics Management Information Systems (eLMIS) to be extended to essential vaccines</p> <p>Consider private sector engagement (e.g., Third-party logistics) for training on different vaccine management (VM) aspects related to COVID-19 vaccine roll-out also strengthening regular VM activities for EPI (e.g., stringent temperature management including controlled storage room temperatures)</p>

	End-to-end supply chain planning (e.g., strengthened vaccine stock management, CCE Inventory management through Thrive360 and digital reporting platforms, and waste management)
Integration of immunization supply chains components	Preventive and corrective maintenance of cold chain equipment
Share COVID-19 vaccination costs and resources with other health interventions (e.g., HR, capacity building, updating country guidance and tools, cold chain equipment maintenance, etc.)⁸	Improve last-mile delivery of bundled essential PHC supplies including vaccines
	Map costs of COVID-19 vaccine delivery and for integration as well as the need for catalytic funding to streamline processes
	Adjust financing mechanisms as necessary
	Estimate technical assistance needs for the process of integration

Step 3. Implementation and monitoring

The existing repurposed taskforce or new temporary group should oversee the progress on implementation and monitoring of integration of COVID-19 vaccination.

- Define **indicators for monitoring progress**:
 - COVID-19 vaccine coverage of primary series and booster dose by high-risk groups (health workers, older people, people with comorbidities, pregnant women)
 - Trend of number of zero dose children (DTP1 and DTP3 coverage) as an indicator for EPI and PHC performance
 - Positive and negative impacts of integration of COVID-19 vaccination into PHC and immunization programmes. Specific indicators (existing or new ones) can be defined (e.g., Percentage of health facilities that have integrated COVID-19 vaccination into NIP/PHC programs; percentage of fixed/outreach/PIRI sessions conducted with COVID-19 vaccination included, etc.).

Existing indicators on immunization programmes and COVID-19 vaccination that are reported through regional and global reporting systems can be leveraged for this purpose (e.g., electronic Joint Reporting Form (eJRF)).

Step 4. Post integration follow-up actions

Learning and implementation research agenda on integration

Integration is a process, and it may not necessarily have a defined beginning and an end. However, the overall journey will need to be guided by continuous inquiry, learning and improvement. Implementation of integration will need to be refined and optimized until it ensures reaching and sustaining higher coverage including to less-served populations. The health system capacity needed to sustain integrated delivery of COVID-19 vaccine will require continuous investment and it needs to be built incrementally.

⁸ Countries which are either Gavi eligible or COVAX AMC countries might be eligible for support for integration of COVID-19 vaccination

Considering the importance of evidence, learning and adaptation to improve programme success, it will be important to define **key implementation research questions on integration of COVID-19 vaccination. These could include:**

- Which **factors (enablers, barriers) at different levels of the health system and in the environment** affect whether integration of COVID-19 vaccination is considered, planned, initiated, and sustained (or stopped)?
- What are the **outcomes** from different integrated approaches?
 - What are the **levels of acceptability** among the general population, COVID-19 high-risk groups, and health workers at different levels? And has there been documented impact of integrated interventions?
 - Are the **levels of coverage** of COVID-19 vaccination and other health interventions maintained or increased? Is the coverage **equitable** for all groups, and if not, why not?
 - What is the **effect on the efficiency and cost-effectiveness** of COVID-19 vaccination?
 - What is the potential for **sustainability** of the integration of COVID-19 vaccination?

This can also help to identify what **additional evidence** is needed to facilitate wider integration of COVID-19 vaccination and document lessons learned and best practices for future investment on **pandemic preparedness and response.**

Post integration evaluation

This could be conducted the first 6 months following the initiation of the process of integrating COVID-19 vaccination into immunization programmes and PHC. The COVID-19 Post-Introduction Evaluation (cPIE)¹⁸ or the new vaccine's Post-Introduction Evaluation (PIE)¹⁹ could be adopted for this process. The process should include desk review of relevant country documents such as the COVID-19 vaccine delivery plans, national demand promotion and communication plans, field work and observation at different facilities, data collection and analysis using standardized questionnaire, and presentation and documentation of findings. Findings from this evaluation can provide lessons and examples of models of different combinations of delivery approaches for other countries yet to undertake integration and for future integration processes.

Annex

Annex A. Country examples of integration of COVID-19 by health system building block.

Service delivery		
Approach	Delivery strategy	Country examples
Co-delivery of COVID-19 vaccination with other vaccines for the same target populations using existing delivery platforms	<i>Mass campaign/PI RI/outreach /health facility based</i>	-Panama: during Vaccination Week in the Americas (VWAs), co-administration of COVID-19 and influenza vaccination house to house and in health facilities.
Collaboration between COVID-19 vaccination and other existing immunization delivery platforms targeting different age groups	<i>Mass campaign</i>	-Angola: planning integration of COVID-19 vaccination campaign with measles outbreak immunization campaign response in 2022 -Nigeria: Planned integrated measles SIA with other interventions. Targeting about 5 million children, the campaign will provide measles vaccination and vitamin A supplements to children under age 5, essential immunizations to those up to 23 months, and COVID-19 shots to adults ages 18 and older. A total of 1,800 vaccination teams will serve each stream, providing services from fixed and temporary fixed posts that include public and selected private hospitals, schools, religious houses, and the homes of influential community leaders ²⁰ .
	<i>Outreach / health facility based:</i>	-Bangladesh & India: same health centre (fixed/outreach) providing essential immunizations and COVID-19 on different days -Maldives: same health centre (fixed/outreach) providing essential immunizations and COVID-19 on same days, different times -Sri Lanka ²¹ : 50% of health centres (fixed/outreach) providing essential immunizations and COVID-19 on same days, same timings . Essential immunizations sessions provided opportunity to screen parents for COVID-19 booster doses and provide/motivate for vaccination. Targeted questions facilitated to identify high-risk unvaccinated household individuals and get them to community or mobile clinics. - Philippines ²² : 60% of the health facilities visited during the cPIE reported integration of other services. For outreach, health workers provide COVID-19 to adults (including pregnant women) and essential immunizations and nutritional screening and vit A supplementation to children in different settings, same day in same village . Health workers provide education/IPC to vaccine hesitant. -Ethiopia: in specific regions, during childhood immunisation sessions, caregivers are also screened and offered COVID-19 vaccination. Also, those attending the youth friendly clinics are also screened and offered COVID-19 vaccination. -Honduras & Yemen: all health facilities offer COVID-19 vaccines and other essential vaccines. -Iraq: intensification of integrative immunization (3IS program), where integration refers to COVID-19 and essential immunizations. Sent community mobilizers to promote COVID-19 vaccines but also to check records of children and identify those who have missed doses of vaccines. Data from February 2022 shows that essential immunization coverage in those districts has gone up.

Co-delivery of COVID-19 vaccination with other health interventions (e.g. screening of NCDs, malnutrition, etc.) for the same target population	<i>Mass campaign</i>	-Cambodia²³: Campaign integrating vaccine and non-communicable disease screening). In early 2021, Cambodia implemented a pilot program in 10 large vaccination sites to provide adults over 40 with diabetes and hypertension screening while they received their COVID-19 vaccinations. A survey showed the pilot’s high acceptability by the healthcare workers. Only 28 percent of the health care workers had previous experience screening patients for NCDs, yet 100 percent thought it was good to provide NCD screening during COVID-19 vaccination. Average screening time was quick, at less than two minutes for blood glucose and less than three minutes for blood pressure. In the future, the plan is to strengthen NCD screening through integration with COVID-19 vaccine delivery boosters at health centre level. The COVID-19 booster could become the cornerstone for an “annual health check-up”.
	<i>PIRI</i>	-Nigeria: specific states adopted the “whole family” approach which combines COVID-19 vaccination with healthcare services like childhood vaccination, malnutrition, and screening for NCDs. -Panama: during VWAs in addition to COVID-19 vaccination, screening of hypertension, diabetes, and cervical cancer was conducted.
	<i>Health facility based</i>	-Tanzania: partnered with the HIV program to vaccinate people living with HIV/AIDS with COVID-19 vaccine. Also, established collaborations with physicians treating Chronic diseases (diabetes, hypertension, etc.) to provide COVID-19 vaccination on specialist clinic days.

Demand and community engagement	
Approach	Country examples
Leveraging of existing or new partnerships, within and beyond the health sector, to promote and advocate for COVID-19 vaccination. For example, in the youth sector or in water and sanitation, combining existing health promotion activities with COVID-19 vaccination delivery strategies.	-Tanzania: engagement of the Tanzania Football Federation to promote vaccination - Niger: engaged local customary and religious authorities to address misinformation -Indonesia: engaged religious authorities and other partners to address misinformation nationwide
Building on community-based interventions of other health services, e.g., to include COVID-19 vaccination with efforts to increase access to handwashing facilities and infection prevention control measures in health facilities, schools and public places, particularly those that place a focus on connecting disadvantaged or vulnerable groups to health services.	-Afghanistan: cross-sectoral community engagement activities to share information on safe water, hygiene, and vaccination -Yemen: community midwives (as community trusted influencers) trained on COVID-19 and essential immunizations and other family health practices, including malnutrition
Building on targeted communications and educational activities, including COVID-19 vaccination or essential immunizations into messaging on other health interventions that are delivered via mass media, digital solutions, and a range of dialogue-based approaches.	-Nepal: promoting COVID-19 safety measures together with essential immunizations, particularly targeting children -Cameroon: coupled vaccination with existing health communication activities

Health workforce

<i>Trained workforce to identify missed populations</i>	-India: integration of enumeration and mobilization efforts by health workers while undertaking a community survey for essential immunizations. These surveys were used to identify and enlist eligible beneficiaries for both essential immunizations as well as COVID-19 vaccines. In a joint exercise conducted in Uttar Pradesh 70,000 teams visited more than 35 million households in January 2022 and were able to identify 700,000 people aged 60 years or more with missed COVID-19 vaccine and 400,000 children aged less than two years with due essential immunization dose/s.
<i>Leveraging Polio workforce to support COVID-19 vaccination</i>	-Somalia: training of trainers for COVID-19 vaccination, recruiting vaccinators, developing microplans
Health information systems	
<i>Leverage COVID-19 vaccine electronic registries for EPI (electronic immunization registries [EIRs])</i>	<p>-Lao PDR: the COVID-19 Vaccination Registry (CVR) is based on DHIS2 module and it can capture individual's vaccination episodes, has the capacity to send automated reminders, supports planning and action at health facility level through detail reports/dashboards, and the system extends from web-based pre-registration to vaccination certificates. The plan before the pandemic was to pilot an EIR and now Lao PDR will leverage CVR for essential immunization implementation.</p> <p>-India²⁴: an electronic registration system (CoWIN) for COVID-19 vaccination was developed to effectively register priority groups, schedule appointments, generate vaccination certificates, and monitor AEFI. CoWIN is planned to be adapted for use as an eIR for recording immunization sessions' data at all immunization delivery sites.</p> <p>-Indonesia: digital home-based record (HBR) using Peduli Lindungi apps which currently used as individual COVID-19 vaccination registry (to be piloted during National Immunization Month/Bulan Imunisasi Anak Nasional (BIAN))</p>
<i>Strengthened vaccine-preventable disease (VPD) surveillance</i>	-Timor Leste: planning to integrate COVID-19 vaccination and VPD surveillance programme.
<i>Strengthened AEFI & AESI surveillance surveillance</i>	<p>-Philippines: enhanced AEFI surveillance, and structure and function of expertise of Regional AEFI Committee and National AEFI committee to conduct causality assessments.</p> <p>-Bolivia: established mass COVID-19 vaccination campaign sites complying with AEFI's technical standards for prevention and care that can be reproduced for other mass vaccination campaigns. ²⁵</p>
Access to essential medicines (including quality vaccines)	
<i>Strengthened country regulatory capacity and processes</i>	-Philippines and Indonesia: fast tracked the process of EUL authorization which could be capitalized for future emergency related products
<i>COVID-19 cold chain equipment (CCE) investments for essential immunization CCE expansion, or repurposing of UCC both related to essential immunization activities, but also for other outbreaks (e.g. Ebola) as well as for integrated PHC (e.g. blood banks).</i>	<p>-Cambodia: Cold chain (CC) assessment and distribution delivery was integrated with essential immunizations in the sense that when planning CC capacity, looking at COVID-19 vaccines and other existing vaccines to see any gaps of capacity at different levels of the health system.</p> <p>-Nepal: Window of opportunity to strengthen cold chain capacity for EPI after COVID-19 pandemic. Established and made functional new provincial vaccine stores in selected provinces. Expansion of existing cold chain space at center, province, and district vaccine stores. Capacity to manage bulk shipment for regular as well as new vaccine introduction. Remote temperature monitoring devices being introduced to enhance real time monitoring of vaccines.</p>

Innovations in supply and logistics management (electronic Logistics Management Information System [eLMIS])

-Senegal: use of Logistimo (eLMIS), a real-time stock monitoring tool in each health facility, rationally redirecting stock flows to points of case based on consumption rates.

-India: adaptation of the existing eLMIS (eVIN) to accommodate the COVID-19 vaccine roll-out needs while maintaining essential immunizations during the pandemic. eVIN was migrated to a locally developed open-source platform in 2020. Since then, the system has been scaled nationally in all public health facilities and is now fully managed and funded by the government. As a mobile application, it allows for the digitized management of vaccine inventories by cold chain handlers directly from smartphones, providing real-time information on vaccine stocks and flows, and monitors the storage temperature in those cold chain points where it is implemented. It ensures >99% availability of essential immunization vaccines.

-Indonesia: expansion of Logistimo (SMILE) for EPI, a real time vaccine and logistics supply at the health facilities.

Health systems financing

Mobilization of country resources from government budgets and partner funding for both COVID-19 vaccination and EPI

-Rwanda: procurement and cold chain for COVID-19 vaccines and other EPI vaccines.

Leadership & governance

Expanded partnerships and coordination mechanisms among different programmes (e.g. beyond traditional immunization partners including south-south collaboration: pandemic preparedness, global health security, etc.)

-Yemen: Integrated MNCH/EPI outreach and mobile services 4 times a year in the context of non-functional health facilities increased DTP1 and DTP3 coverage in 2020.

Joint governing bodies integrating the government accountability mechanisms

-India: task forces at state/ district/ urban areas developed for monitoring polio data were integrated for EPI and now start discussing COVID-19 vaccination.

Annex B. Checklist for the COVID-19 vaccine integration readiness assessment

The following checklist is provided as a suggested list of questions to guide countries as they assess their readiness for planning and implementation of COVID-19 integration. Countries may find items in the checklist more or less relevant depending on their context and the steps they have already taken towards integration. Table 1: *Proposed service delivery strategies for COVID-19 vaccination with different level of integration* can help to identify approaches for integrated service delivery and Table 2: *Proposed short-term (6-12 months) capacity/functionality required and priority investments* to identify actions/investments.

Health system building block	Action	Yes / No	If no, specify action/ investment required
Leadership and governance	Does the proposed integration of COVID-19 vaccination have high level support among relevant government leadership (e.g., Immunization Interagency Coordination Committee, COVID-19 task force, national managers of NIP and PHC programmes)?		
	Is integration planning linked with relevant country policy and strategy documents (e.g., National Health Strategic Plans, NDVP, NIS, National Health Promotion Strategy, etc.)?		
	Has a working group or equivalent to oversee the integration planning and implementation, including participation from relevant programmes, been defined? If yes, specify		
	Do you have a timeline agreed for integration?		
Health systems financing	Have costs of procuring COVID-19 vaccine products, supplies, cold chain equipment and supplies and ancillaries been estimated and sourced?		
	Have costs of HR, training, outreach and communication needs been estimated and sourced, including mapping of both current and future sources?		
	Do you have an estimate of the funding needs to streamline processes to integrate COVID-19 vaccination into NIP and PHC?		
	Have opportunities for cost sharing across interventions and resource mobilization been identified?		
	Have health budgets and expenditure changes been analysed to consider where inefficient resource use may be occurring due to lack of COVID-19 vaccine integration?		

Demand and community engagement	Does data exist on the behavioural and social drivers of COVID-19 vaccination and its relationship to EPI and PHC services / Is there a need to gather additional data?		
	Have learnings from this data on behavioural and social drivers of vaccination been considered in the design of the integration plan?		
	Have strategies for integrated demand generation in target groups through existing platforms been identified?		
	Is there a plan to engage community representatives and community-based networks / groups?		
Service delivery	Have groups to be targeted for COVID-19 boosters been defined according to WHO recommendations?		
	Have existing health services and programmes, including in other sectors and services which interface with high-risk groups (e.g., aged-care) and COVID-19 vaccination been mapped?		
	From the programmes identified in mapping, have the approaches most appropriate and feasible for integration been identified?		
	Is there a plan for testing/pilot integrated COVID-19 vaccine delivery with those services?		
	Have patient flows been defined and updated, and has this been properly communication to workers at delivery site? (Taking into account patient waiting times and possibility of joining multiple queues)		
	Have roles and responsibilities for all workers at service sites been specified and understood by those workers?		
	Has the availability of infrastructure at service sites been assessed and a plan created for any needed upgrades?		
Health workforce	Has a mapping of HR capacity to accommodate absorption of COVID-19 vaccination into NIP and PHC been done? If not, is there a plan to hire additional HR or redeploy staff from COVID-19 activities to the service targeted for integration? (Consider available financing and need for advocacy)		
	Has a capacity building and training plan been developed for workers newly involved in COVID-19 vaccination or whose role will be impacted by integration?		

	Are there plans to conduct integrated microplanning sessions for COVID-19 vaccines as part of NIP, PHC, and any other relevant health services?		
	If CHWs will have a critical role for COVID-19 vaccination, have considerations (including training needs) for integrating COVID-19 related functions into CHW package of services been defined?		
	Are there existing structures for supportive supervision which could be expanded to include COVID-19? If not, is there a plan to implement supportive supervision?		
Health information systems	Can pre-existing HMIS systems be updated to identify and register vaccination of high-risk groups? OR Can data platforms deployed for COVID-19 be expanded to cover reporting for the integrated service?		
	Will disease surveillance conducted for COVID-19 be aligned and leveraged to strengthen VPD surveillance?		
	Has it been defined how COVID-19 be included in AEFI surveillance system, or how COVID-19 may be used as an opportunity to strengthen this system?		
	Are there plans for trainings at national and sub-national level to ensure workers can meet changed responsibilities for reporting to HMIS and/or for disease and AEFI surveillance?		
Access to essential medicines (including quality vaccines)	Has a joint RI and COVID-19 comprehensive forecasting and supply planning exercise been completed based on stock management and inventory data?		
	Have the resources and additional capacity needed for storage, cold chain, and distribution of COVID-19 vaccines been estimated?		
	Have the logistics SOPs been adapted to include COVID-19 vaccines?		
	Has the possibility to bundle COVID-19 vaccine supply with other essential PHC supplies been explored? [Consider particularly in context of last mile access]?		
	For any dual temperature ultra-low temperature freezers (ULT-Fs) deployed at subnational level ^h in smaller/medium size countries, has it been considered to retain and operate them as regular freezers (e.g. -20C to -40C) in the EPI programme?		

^h With the new TRIS formulation storage at ultra-low temperature should mainly be focused at central level, given the improved thermostability profile.

	For any additional ULT-Fs, has dual temperature equipment (e.g. operating at –86C and –20C-40C) been considered for future integration into the EPI Programme?		
	Have opportunities to incorporate digital platforms (e.g. eLMIS, analytics dashboards, warehouse management systems, etc.), covering COVID-19 and any commodities at integrated service sites been identified?		
	Have preventive and corrective maintenance plans, including staff training, for cold chain equipment been established?		
	Is there a robust integrated waste management plan in place, governance mechanism, wastage tracking, reverse logistics (for redistribution) to minimize wastage, etc.?		
Monitoring and Evaluation	Is there a strategy for capturing and adopting the lessons learned on integration of COVID-19 vaccination including impacts on coverage and equity for COVID-19 vaccines, essential immunizations, and PHC services?		
	Is there an M&E plan for integration and responsibility for implementing this plan assigned?		
	Have the standard operating procedures for monitoring and supervision visits been revised to include COVID-19 vaccination?		

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- ¹ WHO. COVID-19 Public Health Emergency of International Concern (PHEIC) Global research and innovation forum. 12 February 2020. [https://www.who.int/publications/m/item/covid-19-public-health-emergency-of-international-concern-\(pheic\)-global-research-and-innovation-forum](https://www.who.int/publications/m/item/covid-19-public-health-emergency-of-international-concern-(pheic)-global-research-and-innovation-forum)
- ² WHO Coronavirus (COVID-19) dashboard. <https://covid19.who.int/>
- ³ WHO. Strategic preparedness, readiness and response plan to end the global COVID-19 emergency in 2022. 30 March 2022. <https://www.who.int/publications/i/item/WHO-WHE-SPP-2022.1>
- ⁴ WHO. Third round of the global pulse survey on continuity of essential health services during the COVID-19 pandemic: November–December 2021: interim report, 7 February 2022. <https://apps.who.int/iris/handle/10665/351527>
- ⁵ 2021 WHO/UNICEF Estimates of National Immunization Coverage (WUENIC 2021). Progress and challenges with achieving universal immunization coverage. 14 July 2022. <https://www.who.int/publications/m/item/progress-and-challenges>
- ⁶ WHO. Highlights from the Meeting of the Strategic Advisory Group of Experts (SAGE) on Immunization 4-7 April 2022. https://cdn.who.int/media/docs/default-source/immunization/sage/sage-pages/sage_april2022meetinghighlights_11apr2022_final.pdf?sfvrsn=c2bd9f68_1
- ⁷ Immunization Agenda 2030. A global strategy to leave no one behind. <https://www.immunizationagenda2030.org/>
- ⁸ WHO. Vaccines against influenza: WHO position paper – May 2022. <https://www.who.int/publications/i/item/who-wer9719-185-208>
- ⁹ WHO – UNICEF. Operational Framework for Primary Health Care. Transforming vision into action. 2020. <https://apps.who.int/iris/bitstream/handle/10665/337641/9789240017832-eng.pdf?sequence=1&isAllowed=y>
- ¹⁰ WHO. Planning guide to reduce missed opportunities for vaccination. 11 October 2017. <https://www.who.int/publications/i/item/9789241512947>
- ¹¹ WHO. Role of the polio network in COVID-19 vaccine delivery and essential immunization. Lessons learned for successful transition. 2022. <https://apps.who.int/iris/bitstream/handle/10665/355292/9789240050204-eng.pdf?sequence=1>
- ¹² WHO. Quality immunization services. A planning guide. 2022. <https://apps.who.int/iris/bitstream/handle/10665/354403/9789240048775-eng.pdf?sequence=1>
- ¹³ WHO. Interim statement on the use of additional booster doses of Emergency Use Listed mRNA vaccines against COVID-19. 17 May 2022. <https://www.who.int/news/item/17-05-2022-interim-statement-on-the-use-of-additional-booster-doses-of-emergency-use-listed-mrna-vaccines-against-covid-19>
- ¹⁴ WHO. WHO SAGE Roadmap for prioritizing uses of COVID-19 vaccines. 21 June 2022. <https://www.who.int/publications/i/item/WHO-2019-nCoV-Vaccines-SAGE-Prioritization-2022.1>
- ¹⁵ WHO. Interim statement on the use of additional booster doses of Emergency Use Listed mRNA vaccines against COVID-19. 17 May 2022. <https://www.who.int/news/item/17-05-2022-interim-statement-on-the-use-of-additional-booster-doses-of-emergency-use-listed-mrna-vaccines-against-covid-19>
- ¹⁶ WHO. Interim statement on the use of additional booster doses of Emergency Use Listed mRNA vaccines against COVID-19. 17 May 2022. <https://www.who.int/news/item/17-05-2022-interim-statement-on-the-use-of-additional-booster-doses-of-emergency-use-listed-mrna-vaccines-against-covid-19>
- ¹⁷ WHO, Organisation for Economic Co-operation and Development & International Bank for Reconstruction and Development. Delivering quality health services: a global imperative for universal health coverage. 2018. <https://apps.who.int/iris/handle/10665/272465>
- ¹⁸ WHO. COVID-19 vaccine post-introduction evaluation (cPIE) guide: interim guidance, 25 August 2021. <https://apps.who.int/iris/handle/10665/344721>
- ¹⁹ WHO. New vaccine post-introduction evaluation (PIE) tool. <https://apps.who.int/iris/handle/10665/70436>
- ²⁰ Health Campaign Effectiveness Coalition. June Health Campaigns – News round-up.
- ²¹ SEARO Regional Working Group meeting March 2022. WHO. Sri Lanka country experience on combining routine immunization sessions and COVID-19 vaccination.
- ²² Philippines. cPIE results. April 2022.

²³ CHAI. December 2021. <https://www.clintonhealthaccess.org/integrating-early-non-communicable-disease-screening-and-counseling-with-covid-19-vaccinations-in-cambodia/>

²⁴ Investigation the Use of Digital Solutions in the COVID-19 Pandemic. An exploratory case study of eIR and eLMIS in India. https://apctt.org/sites/default/files/2022-02/Tech_Monitor_Oct-Dec_2021.pdf

²⁵ Bolivia. Mini-cPIE results. November 2021.