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

VERSION 7 OCTOBER 2022

World Health Organization

unicef
for every child

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Contents

Acknowledgements

Drafting editorial group

World Health Organization (WHO): Diana Chang-Blanc, Dirk Horemans, Ann Lindstrand, Laura Nic Lochlainn, Denis Georges Porignon, Fina Tams, Nuria Toro, Alba Vilajeliu (Responsible Officer).

United Nations Children's Fund (UNICEF): Viorica Berdaga, Sanjay Bhardwaj, Ibrahim Dadari, Clarice Lee, Gloria Lihemo, Phoebe Meyer, Shalini Rozario, Anahitta Shirzad.

Other contributors and reviewers

WHO: Danish Ahmed, Sweetc Alipon, Giorgio Cometto, Peter Cowley, Maria Tereza Da Costa Oliveira, Carolina Danovaro, Shalini Desai, Ebru Ekeman, Margherita Ghiselli, Tracey Goodman, Santosh Gurung, Quamrul Hasan, Philipp Lambach, Lisa Menning, Matthew Neilson, Katherine O'Brien, Teri Reynolds, Samir Sodha, Stephanie Shendale, Nathalie Van de Maele, Martha Velandia, Angel Grace Zorilla.

UNICEF: Azhar Abid Raza, Antoinette Eleonore Ba, Tasmia Bashar, Gunter Boussery, Zabihullah Kamran, Ephrem Tekle Lemango, Imran Mirza, Daniel Ngemera, Deepa Risal Pokharel, Helgaard Theron Raubenheimer, Benjamin Schreiber, Svetlana Stefanet.

Gavi, the Vaccine Alliance: Johannes Ahrendts, Wuraola Babalola, Sachin Jagtap, Alex de Jonquieres, Ranjana Kumar, Henry Lu, Simbarashe Mabaya, Richard Mihigo, Mwenge Abrahams Mwanamwenge, Karan Sagar, Laetitia Vionnet, Shahrzad Yavari.

Health Campaign Effectiveness Coalition – the Task Force for Global Health: Eva Bazant, Alan Hinman.

MM Global Health: Thomas Cherian, Karen Hennessey, Carsten Mantel.

United States Centers of Disease Control and Prevention: Aaron Wallace.

Members of the Immunization Agenda 2030 (IA 2030) – Strategic Priority 1: Primary Health Care (PHC) working group

Members of IA2030 – Strategic Priority 4: Life Course and Integration working group

Acronyms and abbreviations

AEFI	adverse event following immunization
AESI	adverse event of special interest
ANC	antenatal care
CBO	community-based organization
CCE	cold chain equipment
CHWs	community health workers
cPIE	COVID-19 post-introduction evaluation
CVR	COVID-19 Vaccination Registry
DTP1, DTP3	first and third doses of diphtheria, tetanus toxoid and pertussis vaccine
DTPCV	DTP-containing vaccine
EIRs	electronic immunization registries
eJRF	electronic Joint Reporting Form
eLMIS	electronic logistics management information system
EOC	emergency operations centre
EPI	expanded programme on immunization
ETEC	enterotoxigenic *Escherichia coli*
EUL	emergency use listing
FLW	frontline worker
GAS	Group A streptococcus
Gavi	Gavi, the Vaccine Alliance
HepB-BD	birth dose of hepatitis B vaccine
Hib	*Haemophilus influenzae* type b
HMIS	health management information system
HPV	human papillomavirus
HR	human resources
HWF	health workforce
IA2030	Immunization Agenda 2030
ICC	inter-agency coordinating committee
IPC	infection prevention and control
IPTi	intermittent preventive treatment during infancy
LLINs	long-lasting insecticidal nets
MCH	maternal and child health

NCD	noncommunicable disease
NDVP	COVID-19 national deployment and vaccination plan
NGOs	nongovernmental organizations
NIPs	national immunization programmes
NITAG	national immunization technical advisory group
NLWG	national logistics working group
PHC	primary health care
PHEIC	public health emergency of international concern
PIRI	periodic intensification of routine immunization
PCV	pneumococcal conjugate vaccine
RCCE	risk communication and community engagement
RI	routine immunization
SAGE	Strategic Advisory Group of Experts on Immunization
SARS-CoV-2	severe acute respiratory syndrome coronavirus 2
SIAs	supplementary immunization activities
SMC	seasonal malaria chemoprevention
SOP	standard operating procedure
SPA	*Salmonella enterica* ser. Paratyphi A
TB	tuberculosis
UCC	ultra-cold chain
ULT-F	ultra-low temperature freezer
UNICEF	United Nations Children's Fund
VE	vaccine effectiveness
VPD	vaccine-preventable disease
VVM	vaccine vial monitor
WASH	water, sanitation and hygiene
WHO	World Health Organization

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Background

At the time of developing this document, coronavirus disease (COVID-19) is still a public health emergency of international concern (PHEIC), having been declared such by WHO's director-general on 30 January 2020 *(1)*. 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 series *(2)*. 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 targeted populations quickly and widely. However, in many countries, this achievement 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 dedicating 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 over 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 integrating different components of immunization programmes, PHC and health systems. 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 present considerations and options for countries to consider and apply based on their needs and the country context.

Objectives of this document

1. To provide a **definition and principles for integrating COVID-19 vaccination** into immunization programmes, PHC [1] and other relevant health services.

2. To provide an **overview of the benefits and risks of integrating COVID-19 vaccination** into immunization programmes, PHC and other relevant health services.

[1] 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 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. A vision for primary health care in the 21st century: towards UHC and the SDGs. In: WHO/Newsroom/Fact sheets [website]. Geneva: World Health Organization; 2021 (https://www.who.int/news-room/fact-sheets/detail/primary-health-care, accessed 27 July 2022).

3. To **summarize country experiences of integrating 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** 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 for and scope of a prioritized **research agenda** to generate further evidence on **best practices** for integrating COVID-19 vaccination as part of PHC and other health services, and to inform **future pandemic preparedness**.

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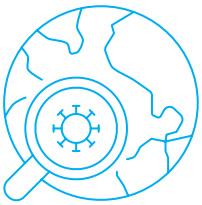
Target audience

Primary audience: national and subnational public health planners, national and subnational immunization programme managers responsible for COVID-19 vaccination and/or expanded programmes on immunization (EPIs) 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 risk communication and community engagement (RCCE), PHC and health systems strengthening.

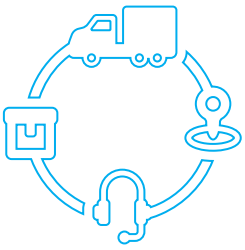
Rationale for integrating COVID-19 vaccination



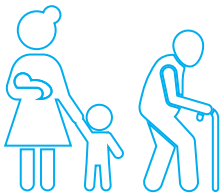
1 **Epidemiology: At the time of this drafting, the trajectory and timing for the end of the COVID-19 pandemic are uncertain and WHO has laid out possible scenarios for how the pandemic could evolve in 2022** *(3)*. Based on what is known, the most likely scenario (base case) is that severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) will continue to evolve. The severity of disease it causes might reduce over time as immunity increases due to hybrid immunity from vaccination and natural infection. By the same token, 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.[2] These considerations will have implications for the future of the COVID-19 vaccination programme in 2022 and beyond *(4)*, and for the planning and implementation of its integration into PHC. The likely need for periodic booster doses of COVID-19 vaccines for those in high-risk groups (e.g. health workers, older people, people with comorbidities, pregnant women), the majority of whom are adults, will require different delivery strategies and platforms beyond childhood vaccination. These strategies and platforms 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 resources (HR) perspective (e.g. COVID-19 mass vaccination campaigns), hence the need to regularize delivery of COVID-19 vaccines by integrating them into immunization services or other established health services for specific target groups. **The interest in integrating COVID-19 vaccination, both in PHC and within existing immunization programme services specifically, has been growing.** With a longer-term view to 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 2). However, **integration is not solely limited to co-delivery at service level. Integration also refers to merging with** other health governance functions, such as planning, programme design, budgeting and joint coordination under one ministry of health department; health workforce responsibilities and competencies; integrated outreach and meaningful engagement and building trust with communities; supply chain management and integrated programme monitoring (such as health management information systems).

[2] Following the declaration of COVID-19 as a public health emergency of international concern (PHEIC) on 30 January 2020, WHO provided emergency use listing (EUL) for several COVID-19 vaccine products. EUL is a procedure for streamlining the process by which new or unlicensed products can be used during public health emergencies. When the emergency is over, the products might need additional approval.



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) towards 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 2021 *(5)*. Although there is some evidence of recovery in certain settings, 2021 saw an overall decline in global administration of first and third doses of diphtheria, tetanus toxoid and pertussis vaccine (DTP1 and DPT3), resulting in about 18 million zero-dose children and over 25 million un- or undervaccinated children, 6 million more than before the start of the pandemic in 2019 *(6)*. There is an **urgent need for action 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 roll-out as a transformative opportunity for building resilient immunization programmes and to strengthen PHC *(7)*. Some of the areas of investment recommended by SAGE include health worker vaccination, immunization supply chain and logistics, digital tools, surveillance, and data and communications. Similarly, this document identifies specific areas for investments. At the same time, the strengths of existing immunization programmes and PHC can be leveraged to improve COVID-19 vaccination (e.g. monitoring and reporting systems for adverse events following immunization (AEFIs) or PHC delivery platforms such as noncommunicable disease (NCD) clinics).



4 Life-course approach: Integrating COVID-19 vaccination with other services and programmes increases the opportunity for a more **people-centred approach**[3] by delivering packages of health services that better respond to users' needs across their life course, in alignment with the goals of IA2030 *(8)*. **Traditionally,** immunization programmes have focused on children, adolescents and women of reproductive age. But the development of **"delivery platforms"** for groups at higher risk of COVID-19 (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 influenza *(9)*, shingles) or new vaccines in the pipeline[4] and additional interventions (e.g. screening for NCDs, reproductive health education, delivery of bed nets for malaria prevention) targeting these adult groups (Fig. 1). This is the opportunity to turn "life course vaccination", one of seven strategic priorities of IA2030, 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 quicker roll-out and uptake of pandemic vaccines in the future, since much of the infrastructure needed will already be present. Additionally, these vaccine service delivery platforms become opportunities to catch up individuals on earlier **missed vaccines and other interventions** due to the impact of a pandemic.

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

[4] Vaccines against other diseases targeting adult populations are in late-stage clinical trials – e.g. maternal respiratory syncytial virus, tuberculosis (TB), HIV – and might become available in a matter of years.

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, to newborns, to the elderly.

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

	Pregnant women	Newborn (<24 hours)	Infant (<1 year)	Second year of life (12–23 months)
Vaccines recommended by WHO for all immunization programmes	**TTCV** **Seasonal influenza** **COVID-19**	**BCG** **Hep B-BD**	**DTPCV PCV** **Measles Rotavirus** **Rubella Hib** **HepB PolioRotavirus**	**DTPCV booster** **Measles** **PCV3 (if 2+1 schedule)** **COVID-19**
Vaccines recommended by WHO for certain regions/ high risk populations/ immunization programmes with certain characteristics			Japanese encephalitis Meningococcus Rabies Seasonal influenza TCV Yellow fever	Cholera Hepatitis A Meningococcus Mumps Seasonal influenza Rabies TCV Varicella
Pipeline of new life course vaccines*	***Group B streptococcus*** ***RSV*** ***Zika***	***TB (next gen)***	***ETEC*** ***GAS*** ***Malaria (next gen)*** ***Norovirus*** ***RSV Shigella*** ***SPA***	***Malaria (next gen)*** ***GAS*** ***SPA*** ***RSV***
Nutrition Growth monitoring/nutrition counseling/vitamin A				
Malaria Distribution LLINs/IPTi/SMC				
Neglected tropical diseases Deworming				
Reproductive and maternal health services Family planning services		**	**	**
HIV services				
WASH Hygiene kit distribution				
Health promotion Health counselling				
Noncommunicable disease screening				

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

Child (2–9 years)	Adolescent (9–19 years)	Adult (20–64 years)	Older person (>65 years)	
Diphtheria booster Tetanus booster COVID-19	**Diphtheria booster Tetanus booster HPV COVID-19**	**Seasonal influenza COVID-19**	**Seasonal influenza COVID-19**	**Vaccines recommended by WHO for all immunization programmes**
Cholera Rabies TCV	Cholera Dengue Rabies TCV	Cholera Dengue Rabies	Cholera Pneumococcus Rabies	**Vaccines recommended by WHO for certain regions/ high risk populations/ immunization programmes with certain characteristics**
	Chikungunya Gonococcus TB (next gen)	***Clostridium difficile Chikungunya TB (next gen)***	***Clostridium difficile Chikungunya Norovirus RSV TB (next gen)***	***Pipeline of new life course vaccines****
				Nutrition Growth monitoring/nutrition counseling/vitamin A
				Malaria Distribution LLINs/IPTi/SMC
				Neglected tropical diseases Deworming
**				**Reproductive and maternal health services** Family planning services
				HIV services
				WASH Hygiene kit distribution
				Health promotion Health counselling
				Noncommunicable disease screening

* Based on data available as of July 2022; ** for caregiver.

Source: adapted from *(10)*.

BCG: bacillus Calmette–Guérin; COVID-19: coronavirus disease; DTPCV: diphtheria, tetanus, pertussis-containing vaccine; ETEC: enterotoxigenic Escherichia coli; GAS: Group A streptococcus; Hep B-BD: birth dose of hepatitis B vaccine; Hib: *Haemophilus influenzae* type b; HPV: human papillomavirus; IPTi: intermittent preventive treatment during infancy; LLINs: long-lasting insecticidal nets; PCV: pneumococcal conjugate vaccine; RSV: respiratory syncytial virus; SMC: seasonal malaria chemoprevention; SPA: *Salmonella enterica* ser. Paratyphi A; TB: tuberculosis; TCV: typhoid conjugate vaccine; TTCV: tetanus toxoid containing vaccine; WASH: water, sanitation and hygiene; WHO: World Health Organization.

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Proposed definition and principles of integrating 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. Integration and related principles are defined in this document as follows:

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 on reaching the most marginalized, 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 they are available) and assuring community participation and engagement.
Context specific	Consider feasibility; accountability; compatibility between interventions; acceptability to individuals, caregivers, health workers and communities; and account for different levels of health system capacity and resources.
Optimized service coverage and equity	With additional resources, service delivery and performance should improve with integration and fewer inequities, including through reaching missed communities and a reduction in zero-dose children and other high-risk and vulnerable groups in urban, rural and conflict areas, and other contexts.

Further assumptions which inform the definition and principles and the structure of this document include the following:

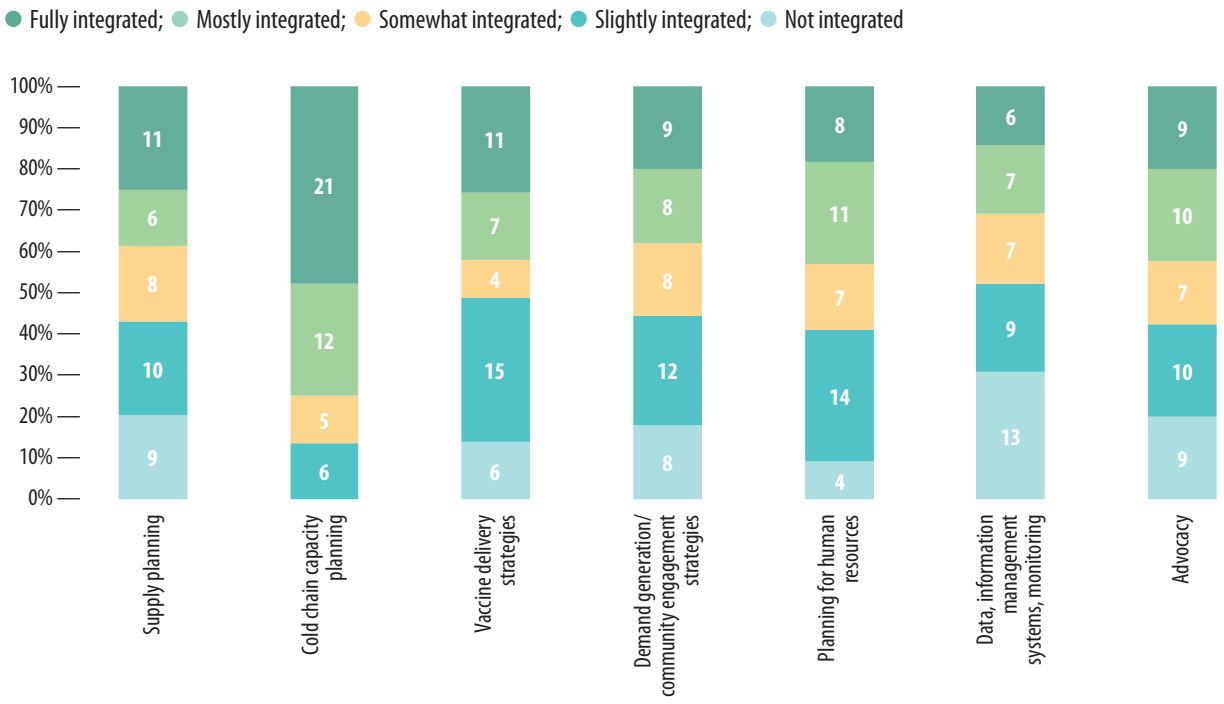
- **Integration can have various dimensions and implications at different levels** (e.g. global, regional, country, subnational), for different stakeholders (e.g. donors, technical agencies, NIPs, emergency preparedness, PHC programmes) and for different programme components (e.g. governance, funding, planning, supply and logistics, service delivery, demand promotion and RCCE, information systems, health workforce).

- **WHO's six building blocks on health systems**[5] 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 within communities** *(11)*. This is particularly important in the case of COVID-19 vaccination demand, uptake and hesitancy. The information in the rest of the document is presented by building blocks; and a specific section on demand and community engagement 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 a survey conducted by WHO and UNICEF to explore current status, perceived challenges and opportunities for integrating COVID-19 vaccination, countries reported a higher degree of integration for some areas, such as supply and delivery of COVID-19 vaccines along with different vaccines and common use of cold chain facilities, compared with integration into the overall planning and funding of combined health programmes and health workers (Fig. 2).

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

Fig. 2. Degree of integration of COVID-19 vaccination



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 integrating COVID-19 vaccination

Benefits

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

- **Increase efficiencies and programme performance by:**
  - providing COVID-19 vaccination alongside other health interventions as a package of services, especially in the face of competing health priorities;
  - sharing COVID-19 vaccination costs and resources with other health interventions and vice versa (of particular importance in resource-constrained settings);
  - ensuring that services reach the most vulnerable population groups and marginalized communities;
  - in alignment with a strategy for reducing missed opportunities for vaccination *(12)*, seizing the opportunity to screen and catch up adults and any accompanying children for earlier missed vaccinations and other health interventions (e.g. nutritional screening, vitamin A supplementation, deworming) (Fig. 1);
  - lessening the strain on the health workforce by providing vaccination through campaigns, in particular beyond initial mass vaccination efforts;
  - integrating immunization supply chain components as a way of strengthening the health system, not only for NIPs but for other services such as blood banks, pathology services, maternal health (oxytocin) and NCD services (insulin);
  - encouraging multisectoral initiatives such as collaboration with Ministry of Social Affairs to target high-risk groups (older adults, essential workers), and ministries of education through school-based programming and to target the workforce (e.g. teachers as a high-risk group); and
  - incorporating COVID-19 funding into standard budgetary, expenditure and planning processes to benefit from existing oversight and accountability structures.

- **Potentially capitalize on COVID-19 investments, innovations and lessons learned towards sustainability by:**
  - providing technological upgrades for planning, microplanning and data management for immunization programmes and PHC;
  - strengthening governance, including inter-agency coordinating committees (ICCs), national immunization technical advisory groups (NITAGs), national logistics working group (NLWG) coordination structures, emergency operations centres and other working groups;
  - engaging with expanded partners, including academia, multilateral organizations, manufacturers, private sector (profit and non-profit), nongovernmental organizations (NGOs), community and religious leaders, and other ministries and authorities (e.g. defence, army, tourist, education) for various aspects;
  - expanding cold chain equipment (including repurposing), vaccine and device management capacity, and health worker training;
  - planning end-to-end supply chains for vaccines and ancillaries;
  - strengthening capacity for conducting vaccine effectiveness (VE) and impact studies;
  - enhanced monitoring of AEFIs and adverse events of special interest (AESIs), and causality assessments;

- strengthening generation of social data on drivers of demand and uptake and listening/communication capacity;
- more timely monitoring of uptake and coverage of COVID-19 vaccination;
- making use of digital tools and innovations for preregistering beneficiaries, reminders, defaulter tracking, documentation and monitoring, and timely data analysis for ongoing improvement of services; and
- providing effective and efficient training and performance management skills for health workers.

- **Promote greater demand and access to health services by:**
  - 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 to 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 (e.g. 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 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; and
  - 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 approach can also benefit preparedness for and response to future pandemics).

- **Improve user outcomes and experience through a people-centred approach by:**
  - developing life course entry points/delivery platforms and strategies for vaccinating health workers, older persons, pregnant women and people with comorbidities, which provides opportunities to integrate other vaccines and additional health interventions more tailored to these population groups in a comprehensive and practical way (Fig. 2); and
  - in humanitarian contexts, providing a package of essential health services, including COVID-19 vaccines, to respond to overall population needs.

Risks

Integrating COVID-19 vaccination into regular immunization services comes with its own risks, which require mitigation approaches and prior preparedness. Some of these risks include the following:

- **Multiple vaccine delivery strategies to reach different target groups may lead to logistical challenges**, such as increased complexity for integrated outreach when integrating routine and COVID-19 vaccines which lack a vaccine vial monitor, and have different formulations and cold chain storage requirements.

- **COVID-19 vaccine hesitancy may spill 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.

- HR may become overstretched, overloading and fatiguing health workers and support staff. Examples are:
  - negative impact on the quality of immunization service delivery and 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, catch up vaccination and sustain progress for non-COVID-19 vaccines, or to 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 the EPI; and
  - slowed response times from shared logistics and finance staff across programmes due to an increased burden of tasks generated by COVID-19 activities.

- **Access, supply chain and logistics for COVID-19 vaccines and commodities may be inadequate. Examples are:**
  - the inability 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; and
  - use of stock volumes of auto disable syringes for EPI vaccines in the absence of additional stock availability for COVID-19 vaccines.

- **Health information systems may be negatively affected.** For example, integrated monitoring systems may unintentionally reduce collection of data (e.g. to make a database more manageable) that are essential for operational planning.

- **Financial problems may result:**
  - Imbalance of funding sources or non-synchronous funding flows between programmes may complicate delegating responsibility for delivering COVID-19 vaccine.
  - Additional funding (sustained investment) may dry up after the pandemic phase.
  - Transition to other vaccination programmes may slow, especially when the country cannot reach pre-COVID-19 per capita health funding levels.

- **The future of the COVID-19 pandemic is uncertain, which has implications for future need for COVID-19 vaccination.**


Haier
COVAX
CEPI
Gavi
unicef
World Health Organization
ACTaccelerator
Salvum
Energy Saving
COVAX
CEPI
Gavi
The Vaccine Alliance
unicef
World Health Organization
ACTaccelerator
ACCESS TO COVID-19 TOOLS

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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 integration of COVID-19 vaccination. Depending on the level of integration, countries can choose the appropriate steps and proposed actions relevant for their context.

Summary of the steps required to operationalize integration include:

Step ❶
Initiating/building on the integration process.

Step ❷
Planning and preparatory phase: develop a country-level COVID-19 vaccination integration plan.

Step ❸
Implementation and monitoring.

Step ❹
Post-integration follow-up actions.

Step ❶ Initiating/building on the integration process

- Repurpose existing EPI-related or COVID-19 vaccination technical working groups/ taskforces or establish a new temporary working group (relevant ministries, stakeholders and partners; possibly a subgroup of an existing coordination body) to plan, coordinate, implement and monitor integration. It is important that relevant ministry of finance and ministry of health departments be represented, namely 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, maternal and child health), civil society, donors, development partners, NITAG, NLWG, ICC and other higher-level bodies.

- Conduct a situation analysis to assess national- and subnational-level readiness and status of countries for integrating COVID-19 vaccination into NIP, PHC and other relevant services.
  A checklist for COVID-19 vaccine integration readiness assessment is proposed (Annex 3) for general guidance. Countries will need to adapt it to their unique context based on their COVID-19 vaccine coverage level, health system capacity and their overall progress towards integration.
  Underpinning the checklist are key aspects to consider:
  - The proportion of COVID-19 high-risk populations among 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 COVID-19 post-introduction evaluation (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 applied *(13)*.

- Health workforce competencies (i.e. prioritizing identification of 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 HR.
- Operational strategies and workflow patterns. This includes approaches to identify and link eligible individuals who have contact with other services (e.g. chronic care clinic/outreach, antenatal care (ANC), pharmacy, outpatients) 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 infection prevention and control (IPC) training needs to successfully achieve linkages and other facility workflows.
- Financing models.
- Quality assurance processes *(14)*.

Step ❷ Planning and preparatory phase: develop a country-level COVID-19 vaccination integration plan

Where feasible and relevant, a COVID-19 vaccine integration plan could piggyback or leverage existing COVID-19 national deployment and vaccination plans, national immunization strategy discussions, Gavi full portfolio planning processes (for Gavi-eligible countries) and COVID-19 Vaccine Delivery Partnership 'one plan, one country team, one budget' among others.

The existing repurposed technical working group/ taskforce or new temporary group should oversee the planning process and ensure that the COVID-19 vaccination integration plan is not considered a stand-alone strategic effort. The integration effort should be seen as the next step to sustaining and solidifying 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, the COVID-19 vaccine product to be used and population groups to be targeted.

A. WHO's current recommendation for first booster doses *(15)***:**

- Booster doses should be offered based on evidence that doing so would have a substantial impact on reducing hospitalization, severe disease and death, and that it would protect health systems.
- **A first booster dose is recommended 4–6 months after the completion of the primary series. The order of implementing booster doses for different population groups should follow the order laid out for the primary COVID-19 vaccination series in the WHO prioritization roadmap** *(16)* – 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.
- Booster doses should be considered for **all COVID-19 vaccines having received EUL** as per WHO's product-specific interim recommendations.
- For adolescents 12–18 years of age, there is currently insufficient evidence for recommending a booster dose, except for those with immunocompromising conditions.

B. WHO's current recommendation for second booster doses *(17)***:**

- To further reduce the risk of severe disease, deaths and disruptions of health services, WHO recommends countries should consider a second booster dose 4–6 months after the first booster dose for:
  - health workers
  - older adults
  - persons with moderate and severe immunocompromising conditions, regardless of age,
  - adults with comorbidities
  - pregnant women

C. WHO's considerations for future additional doses:

- For longer-term considerations, there are significant uncertainties related to the evolution of the virus, the characteristics of future variants, and the trajectory of the epidemic given increasing vaccine- and infection-induced immunity globally. According to WHO's base-case pandemic scenario, it is assumed that in the future additional **COVID-19 vaccine boosters will likely be recommended periodically (within 4–12 months after the second booster) for high-risk groups.** While seasonality is not yet fully established for SARS-CoV-2, **evidence from the past 2 years supports the notion of more substantial transmission during the winter season.** Therefore, for countries with either a northern or southern hemisphere winter season, campaign plans for catch-up to improve primary series coverage and boosting for those at highest risk should take seasonality into account.

  SAGE as well as the Technical Advisory Group on COVID-19 Vaccine Composition continue to monitor the situation carefully, and WHO's position will be reflected accordingly in future versions of this document.

2. Understand and map high-risk groups, populations that 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 that 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, SAGE recommends that COVID-19 vaccines be given concomitantly with, or anytime before or after, other adult and adolescent vaccines**, including live-attenuated, inactivated, adjuvanted or non-adjuvanted vaccines. **For 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 Fig. 1 and country experiences in Annex 2.

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 integrating COVID-19 vaccination, consider the following definitions:

- **Routine mode:** Vaccines and other health interventions can be delivered at a health facility, a mobile/outreach site or through periodic intensification of routine immunization (PIRI) approaches.
  - Health facility: Immunization and other health services are delivered at a health facility (either as part of primary care or hospital based).

- 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.
- 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 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) listed 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 to integration but rather a menu for countries to apply based on context. So, for example, countries with low COVID-19 vaccination coverage might start by combining 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 and TB clinics for outpatients and inpatients) provided in fixed sites at the health facilities. The target population is also identified along with the implementation time frame according to the COVID-19 pandemic phase. The level of integration with other health services; implications for cost, health workforce, logistics and community engagement; and required health system maturity are presented on a scale (0: no implication; +: lower; ++++: higher).

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

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

Mode		Approach/location/services		Target population	Implementation time frame	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 and high-risk groups	Intermediate/ long term	++++	+	+	+	++++	++++
		Health centre (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 and high-risk groups	Intermediate/ long term	++++	+	+	+	++++	++++
		Pharmacy	COVID-19 vaccination possibly combined with influenza vaccination and medicine collection	General population and 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	++	++	++	++	+++	+++
		HIV and TB clinics		HIV/AIDS and TB patients	Intermediate/ long term	++	++	++	++	+++	+++
		ANC clinics		Pregnant women	Intermediate/ long term	++	++	++	++	+++	+++

Table 1. *continued*

Mode		Approach/location/services		Target population	Implementation time frame	Level of integration*	Implications*				Health system maturity*
							Cost	HWF	Logistics	Community engagement	
Routine mode	**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 and persons with comorbidities	Intermediate/ long term	++	++	++	+++	+	++
		Home visits		Elderly and persons with comorbidities	Intermediate/ long term	++	+++	++	+++	+	++

*The scoring was based on WHO health systems experts' opinion (0: no implication; +: lower; ++++: higher) and needs to be adapted based on country context.

ANC: antenatal care; COVID-19: coronavirus disease; HWF: health workforce; MCH: maternal and child health; NCD: noncommunicable disease; NGOs: nongovernmental organizations; TB: tuberculosis.

Table 1. *continued*

Mode		Approach/location/services		Target population	Implementation time frame	Level of integration*	Implications*				Health system maturity*
							Cost	HWF	Logistics	Community engagement	
Campaign mode	Temporary fixed site	Dedicated COVID-19 vaccination centre/ post	Specially set up for COVID-19 mass vaccination campaign/combining with other health interventions (e.g. NCD screening)	General population	Emergency phase of a pandemic	0/+	++	+++	++++	++	+
	Mobile teams	Vaccination in parks, marketplaces, malls, places of worship, workplaces…	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 comorbidities	Emergency phase of a pandemic	0/+	+++	+++	+++	+	+
		Refugee camps, transit points, border checks, dormitories, NGO facilities, detention centres/prisons		General or specific populations/mobile groups	Emergency phase of a pandemic	0/+	+++	+++	+++	+	+
		Home visits		Priority groups: elderly, people with comorbidities	Emergency phase of a pandemic	0/+	++++	+++	++	+	+
	Mass vaccination	Mass vaccination	Specially set up for COVID-19 mass vaccination campaign of other antigens and health interventions (e.g. vitamin A, malaria chemoprevention)	General population	Emergency phase of a pandemic	0/+	++	++++	++++	+	+

5. Identify key actions/investments needed. **Table 2 proposes short-term (6–12 months) capacity/functionality needed and priority investments.** These areas are not exhaustive and have been identified based on:

- **immediacy** (e.g. they 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 and governance	**Repurpose or align immunization technical working groups/COVID-19 vaccination-related task forces or set up a new temporary working group** to plan for integration.	Strengthen multisectoral approaches and engagement with non-traditional immunization partners.
Health systems financing	**Estimate 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 forecasts.
	Estimate health worker costs.	Estimate health worker costs for expanded service delivery within the existing and/or new service points/platforms.
	Budget for COVID-19 vaccination delivery costs, including HR, capacity building, updating country guidance and tools, devices, cold chain equipment and ancillary equipment as well as cold chain maintenance, demand promotion, etc.).[5]	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	**Understand the beliefs, perceptions and experiences of vaccination recipients** to inform the design, implementation and evaluation of targeted demand-related strategies and ultimately to help ensure more equitable access to quality services.	Build and strengthen 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 microplanning and co-create local solutions to address barriers to uptake of health services.
	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.	Explore leveraging FLWs to promote demand for/acceptance of COVID-19 vaccination and other health interventions. 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. Engage local CBOs, faith-based actors, community leaders, public health associations and local champions to promote an integrated communication approach at family and community level. Advocate for adequate HR and financial resources for integrated demand promotion.

[5] Countries which are either Gavi or COVAX AMC eligible may qualify for support for integrating COVID-19 vaccination.

Table 2. *continued*

Health system building block	Capacity/functionality required	Actions/investments needed
Service delivery	**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.	Map existing services/programmes for high-risk priority populations. 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.
	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).	Prioritize, design and test new delivery strategies in line with selected integration approaches. Define/update patient flow/pathways for delivery of joint services. Update/develop multidisciplinary team approach, including clear roles and responsibilities.
	Look at existing mechanisms for quality of care planning, assurance and improvement to identify where COVID-19 vaccination considerations could be incorporated *(18)*.	Illustrative actions include incorporating 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.
Health workforce	**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.	Estimate HR needs for expanded service delivery within the existing and/or new service points/platforms. Hire additional HR as needed. Where possible, consider redeploying COVID-19 staff to EPI.
	Build capacity of existing staff on: • COVID-19 vaccination • identifying, reaching/referring and monitoring the vaccination status of COVID-19 high-risk groups • interpersonal communication • waste management • vaccination registration systems • AEFI management and reporting.	Strengthen capacity to identify target high-risk populations, among other areas. Design and implement capacity-strengthening activities for providers in line with service delivery strategy (e.g. engage with ANC care seekers on COVID-19 vaccination). Enhance interpersonal communication capacities of the health workforce. Provide supportive supervision and mentoring.
	Define the role of compensation mechanisms/ incentives.	If relevant, design/revise the incentive policy.
	Engage CHWs to generate demand for COVID-19 vaccination and other relevant interventions .	Estimate CHW needs according to the selected delivery approach.
Health information systems	**Integrate health monitoring information systems** (records, registers, electronic systems covering the whole data pipeline, performance monitoring dashboards to inform actions). The extent of integration may differ in different settings.	Redesign monitoring systems to identify and register vaccination of adult high-risk groups. Leverage COVID-19 data platforms for EPI and other services. Expand or scale up promising HMISs to improve routine monitoring.
	Integrate reporting systems for COVID-19 vaccination (e.g. electronic) and EPI (e.g. paper based).	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.
	Strengthen VPD surveillance.	Leverage COVID-19 disease surveillance to strengthen VPD surveillance and vice versa.
	Strengthen AEFI and AESI systems.	Leverage pharmacovigilance improvements for COVID-19 to strengthen them for other vaccines.

Table 2. *continued*

Health system building block	Capacity/functionality required	Actions/investments needed
Access to essential medicines (including quality vaccines)	**Strengthen vaccine storage and cold chain, distribution planning** (e.g. CCE and UCC requirements, temperature monitoring, VVM/short expiry) and **waste management**.	Estimate storage, cold chain and distribution capacity needs for delivery of additional vaccines and increased wastage. Explore leveraging investments made in eLMIS to be extended to essential vaccines. Consider private sector engagement (e.g. third-party logistics) for training on different 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). 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 chain components.	Ensure preventive and corrective maintenance of cold chain equipment. Improve last-mile delivery of bundled essential PHC supplies, including vaccines.
	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)**.[6]	Map costs of COVID-19 vaccine delivery and 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.

AEFI: adverse event following immunization; AESI: adverse event of special interest; ANC: antenatal care; CBOs: community-based organizations; CCE: cold chain equipment; CHWs: community health workers; COVAX AMC: COVID-19 Vaccines Advanced Market Commitment; COVID-19: coronavirus disease; eLMIS: electronic logistics management information system; EPI: Expanded Programme on Immunization; FLWs: frontline workers; Gavi: Gavi, the Vaccine Alliance; HMISs: health management information systems; HR: human resources; NCD: noncommunicable disease; PHC: primary health care; UCC: ultra-cold chain; VM: vaccine management; VVM: vaccine vial monitor; VPD: vaccine-preventable disease.

Step ❸ Implementation and monitoring

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

- 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 in number of zero-dose children (DTP1 and DTP3 coverage) as an indicator for EPI and PHC performance.
  - Positive and negative impacts of integrating 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 programmes; percentage of fixed/outreach/PIRI sessions conducted with COVID-19 vaccination included).

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).

[6] Countries which are either Gavi or COVAX AMC eligible may qualify for support for integrating COVID-19 vaccination.

Step ❹ 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 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 vaccines will require continuous investment, and it needs to be built incrementally.

Considering the importance of evidence, learning and adaptation to improve programme success, it will be important to define **key implementation research questions on integrating 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** of 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 the impact of integrated interventions been documented?
  - Are the **coverage levels** of COVID-19 vaccination and other health interventions being maintained or increasing? Is 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 integrating COVID-19 vaccination?

Answering these questions 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 in pandemic preparedness and response.

Post-integration evaluation

Post-integration evaluation could be conducted during the first 6 months following initiation of the process of integrating COVID-19 vaccination into immunization programmes and PHC. The cPIE *(19)* or the new vaccine's post-introduction evaluation *(20)* could be adopted for this process. The process should include desk review of relevant country documents, such as COVID-19 vaccine delivery plans, national demand promotion and communication plans, fieldwork and observation at different facilities, data collection and analysis using standardized questionnaires, 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 1. Methods for the development of this operational document

Process

To develop this document, the Expanded Programme on Immunization (EPI) Unit of the Department of the Immunization, Vaccines and Biologicals (IVB), in collaboration with UNICEF, engaged a wide range of experts and stakeholders. A WHO-UNICEF task team was established in January 2022 to develop this operational document on outlining considerations for integration of COVID-19 vaccination into immunization programmes, PHC and other health services, in response to needs expressed by Member States. The WHO-UNICEF task team included leadership and technical staff from immunization and health system strengthening teams, including experts on COVID-19 vaccine introduction. The task team reviewed existing guidance documents on COVID-19 vaccination, essential immunization, health system strengthening and primary health care; executed a rapid survey to WHO and UNICEF Regional and Country Offices; and solicited ongoing feedback on the document production through a broad consultative and iterative review process. The consultative process included a wide range of immunization and subject matter experts at global, regional, and country level (see acknowledgements section). The task team met on a biweekly basis to review and guide progress.

The document

Four streams of work were undertaken in parallel by WHO and UNICEF to inform the shape and content of this operational document. The methodology used consisted of the following:

Workstream 1: publications review

A publication review of current WHO and UNICEF strategic and technical immunization documents to ensure consistency and to bring together relevant guidance in one document that cohesively provides considerations for COVID-19 vaccination integration. The documents included in the review met the three criteria below:

- Documents described as a guidance, manual, or tool that refer to integration of health interventions or COVID-19 vaccination; AND
- Document available in English; AND
- Published after 2015.

Based on this joint publication review, the following documents were selected and used to inform the content written for this document's objectives 1 (definition and principles), 2 (benefits and risks), 3 (how to operationalize integration) and 4 (generate further evidence):

- **Strategizing national health in the 21st century: a handbook** (). WHO; 2016
- **Planning guide to reduce missed opportunities for vaccination** (). WHO; 2017
- **Working together: an integration resource guide for immunization services throughout the life course** (). WHO; 2018
- **Operational framework for primary health care: transforming vision into action** (). WHO -UNICEF; 2020

Workstream 1: publications review *continued*	• **Immunization Agenda 2030: a global strategy to leave no one behind**. WHO; 2020 • **Guidance on operational microplanning for COVID-19 vaccination**. WHO; 2021 • **COVID-19 vaccine post-introduction evaluation (cPIE) guide: interim guidance**. WHO; 2021 • **Role of the polio network in COVID-19 vaccine delivery and essential immunization. Lessons learned for successful transition**. WHO;2022 • **Quality immunization services: a planning guide**. WHO; 2022 • **WHO SAGE roadmap for prioritizing uses of COVID-19 vaccines**. WHO; 2022 • **Global COVID-19 vaccination strategy in a changing world**. WHO; 2022
Workstream 2: rapid survey	In January 2022, to better understand the status and perceived risks and opportunities for integrating COVID-19 vaccination, WHO and UNICEF task team conducted an online rapid survey targeting Regional and Country Offices. Forty-eight responses from WHO (5 regional offices and 41 country offices) and fifty-four from UNICEF (6 regional offices and 34 country offices) were received. Responses were retrieved and analysed using excel. The survey informed the content for objectives 2 (benefits and risks) and 3 (country experiences).
Workstream 3: consultations	Subsequently, consultations were conducted with the 6 WHO Regional Offices and UNICEF Regional Offices and purposively selected Country Offices with immunization advisors and health systems experts to better understand the benefits and risks of integration of COVID-19 vaccination and how integration had already been achieved in different settings. Additional country examples on integration of COVID-19 vaccination for each health system building blocks, and demand and community engagement area were gathered. The consultations informed the content for objectives 3 (country experiences), 4 (how to operationalize integration) and 5 (generate further evidence).

Workstream 4: draft development

Based on the publications review, rapid survey, and consultations, an initial version was drafted and circulated for input and comments to WHO (within IVB; Integrated Health Services; Primary Health Care; Health workforce; Health Systems Governance and Financing; and Maternal, Newborn, Child and Adolescent Health & Ageing) and UNICEF colleagues at global level. The cumulative feedback was integrated into a second version and then shared with WHO and UNICEF Regional Offices. Feedback was also solicited from immunization partners and subject matter experts through a broad consultative and iterative review process (Gavi, the Vaccine Alliance, Health Campaign Effectiveness Coalition – the Task Force for Global Health, MM Global Health, United States Centers for Disease Control and Prevention, COVID-19 Vaccine Delivery Partnership). The working draft was uploaded into a shared folder and the task team substantially reviewed and strengthened it based on received suggestions. A more advanced version was discussed with the immunization and health systems experts that are members of the Immunization Agenda 2030 (IA 2030) – Strategic Priority 1: PHC working group[8] and Strategic Priority 4: Life Course and Integration working group[9].

Contributors and IA2030 working group members were assessed for potential conflict of interest as part of their participation in global IA2030 meetings. Received comments and inputs were consolidated and discussed by the task team and decisions were made to include or expunge suggestions. The streams 3 and 4 were iterative and built on each other. The document was subjected to professional writer review and copy-editing.

At the time of this drafting, the trajectory and timing for the end of the COVID-19 pandemic are uncertain. To address this limitation the document specifies that the current version has been based on the WHO base-case COVID-19 pandemic scenario, as described in the 2022 COVID-19 strategic preparedness, readiness and response plan, and the Global COVID-19 vaccination strategy which leads to end of 2022. Given the evolving epidemiological nature of the COVID-19 pandemic and since WHO is planning to embark on a consultative process to develop a Global COVID-19 vaccination strategy for 2023 and beyond, WHO and UNICEF will look at the need to update this document when the new Strategy is published. New available data, latest SAGE COVID-19 vaccine-related recommendations, and additional country lessons from planning and implementing integration of COVID-19 vaccination into immunization programmes and PHC will then be also considered to develop an updated version. The same comprehensive review process will be used as for the development of the first version.

[8] IA2030 SP1 WG: Folake Olayinka, Chair (USAID); Jessica Shearer (PATH); Samir Sodha (WHO); Viorica Berdaga (UNICEF); Tariq Masood (WHO Sudan); Lisa Hilmi (CORE Group, Civil Society); Feng Zhao (WB); Christopher Morgan (JHPIEGO); Nihinlola Mabogunje (CSO); Graca Matsinhe (JSI); Rispah Walumbe (AMREF/UHC); Tokunbo Oshin (Gavi Sec); Thomas O'connell (Academia); Suraya Dalil (WHO); Tova Tampe (WHO); Amal Amoune- Naal (WHO).

[9] IA2030 SP4 WG: Aaron Wallace, Co-Chair (US CDC); Stephanie Shendale, Interim co-chair (WHO); Tosin Ajayi (CHAI); Jane Barrett (International Federation of Ageing); Nicholas Diamond (Asia-Pacific Economic Cooperation (APEC) Life Sciences Innovation Forum (LSIF)); Modibo Kassogue (UNICEF); Oya Zeren Afsar (UNICEF); Rebecca Fields (JSI); Christopher Morgan (JHPIEGO); Mohammed Osama Mere (WHO EMRO); Angel Grace Zorilla (WHO WPRO).

Annex 2. Country examples of integration of COVID-19 by health system building block

Service delivery		
Approach	**Delivery strategy**	**Country examples**
Co-delivering COVID-19 vaccination with other vaccines for the same target populations using existing delivery platforms	Mass campaign/PIRI/outreach/ health facility based	**Panama** During Vaccination Week in the Americas, 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	Mass campaign	**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 aged 18 and older. A total of 1800 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 *(21)*.
	Outreach/health facility based	**Bangladesh and 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** 50% of health centres (fixed/outreach) providing essential immunizations and COVID-19 on **same days, same times**. Essential immunization sessions provided opportunity to screen parents for COVID-19 booster doses and provide/ motivate for vaccination. Targeted questions facilitated identification of high-risk unvaccinated household individuals to get them to community or mobile clinics. **Philippines** 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 vitamin A supplementation to children in **different settings, same day** in the same **village**. Health workers provide education/IPC to the vaccine hesitant. **Ethiopia** In specific regions, during childhood immunization 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 and Yemen** All health facilities offer COVID-19 vaccines and other essential vaccines. **Iraq** Intensification of integrative immunization (3IS programme), where integration refers to COVID-19 and essential immunizations. Community mobilizers are sent to promote COVID-19 vaccines and also to check records of children and identify those who have missed doses of vaccines. Data from February 2022 show that essential immunization coverage in those districts has gone up.

Service delivery		
Approach	**Delivery strategy**	**Country examples**
Co-delivering COVID-19 vaccination with other health interventions (e.g. screening for NCDs, malnutrition) for the same target population	Mass campaign	**Cambodia** *(22)* Campaign integrating vaccine and NCD screening). In early 2021, Cambodia implemented a pilot programme at 10 large vaccination sites to screen adults over 40 for diabetes and hypertension while they received their COVID-19 vaccinations. A survey showed the pilot's high acceptability by health care workers. Only 28% of health care workers had previous experience screening patients for NCDs, yet 100% thought it was good to provide NCD screening during COVID-19 vaccination. Average screening time was quick, at less than 2 minutes for blood glucose and less than 3 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".
	PIRI	**Nigeria** Specific states adopted the "whole family" approach, which combines COVID-19 vaccination with health care services such as for childhood vaccination, malnutrition and screening for NCDs. **Panama** During Vaccination Week in the Americas, in addition to COVID-19 vaccination, screening for hypertension, diabetes and cervical cancer was conducted.
	Health facility based	**United Republic of Tanzania** Partnered with the HIV programme to vaccinate people living with HIV/AIDS with COVID-19 vaccine. Also established collaborations with physicians treating chronic diseases (e.g. diabetes, hypertension) to provide COVID-19 vaccination on specialist clinic days.

Demand and community engagement	
Approach	**Country examples**
Leveraging existing or new partnerships, within and beyond the health sector, to promote and advocate for COVID-19 vaccination	**United Republic of Tanzania** Engaged the Tanzania Football Federation to promote vaccination. **Niger** Engaged local leaders 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 IPC measures in health facilities, schools and public places, particularly those that focus on connecting disadvantaged or vulnerable groups with health services	**Afghanistan** Cross-sectoral community engagement activities to share information on safe water, hygiene and vaccination. **Yemen** Community midwives (trusted influencers) trained to provide COVID-19 and essential immunizations and other family health practices, and to treat 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	
Approach	**Country examples**
Training workforce to identify missed populations	**India** Integrated 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 and COVID-19 vaccines. In a joint exercise conducted in Uttar Pradesh, 70 000 teams visited more than 35 million households in January 2022. The teams were able to identify 700 000 people aged 60 years or older with missed COVID-19 vaccinations and 400 000 children aged less than 2 years with due essential immunization dose/s.
Leveraging polio workforce to support COVID-19 vaccination	**Somalia** Training trainers for COVID-19 vaccination, recruiting vaccinators, developing microplans.

Health information systems	
Approach	**Country examples**
Leveraging COVID-19 vaccine electronic registries for EPI – electronic immunization registries (EIRs)	**Lao People's Democratic Republic** The COVID-19 Vaccination Registry (CVR) is based on the DHIS2 software module. It captures an individual's vaccination episodes, has the capacity to send automated reminders, and supports planning and action at health facility level through detail reports/dashboards. The system also includes web-based preregistration and vaccination certificates. The plan before the pandemic was to pilot an EIR. Now, the country will leverage the CVR for essential immunization implementation. **India** *(23)* An electronic registration system (CoWIN) for COVID-19 vaccination was developed to effectively register priority groups, schedule appointments, generate vaccination certificates and monitor AEFIs. The plan is to adapt CoWIN for use as an EIR for recording immunization session data at all immunization delivery sites. **Indonesia** Digital home-based record using the PeduliLindungi app, which is currently used as individual COVID-19 vaccination registry.
Strengthening VPD surveillance	**Timor-Leste** Planning to integrate COVID-19 vaccination and VPD surveillance programme.
Strengthening AEFI and AESI surveillance	**Philippines** Enhanced AEFI surveillance, and structure and function of expertise of regional AEFI committee and national AEFI committee to conduct causality assessments. **Bolivia** Established mass COVID-19 vaccination campaign sites complying with AEFI technical standards for prevention and care that can be reproduced for other mass vaccination campaigns.

Access to essential medicines (including quality vaccines)	
Approach	**Country examples**
Strengthening country regulatory capacity and processes	**Philippines and Indonesia** Fast-tracked the process of EUL authorization, which could be capitalized for future emergency-related products.
Investing in COVID-19 CCE for essential immunization CCE expansion or repurposing UCC for both essential immunization activities and other outbreaks (e.g. Ebola) as well as for integrated PHC (e.g. blood banks)	**Cambodia** Cold chain assessment and distribution delivery were integrated with essential immunizations in the sense that when planning cold chain capacity, COVID-19 vaccines and other existing vaccines were looked at to detect any capacity gaps at different levels of the health system. **Nepal** Window of opportunity to strengthen cold chain capacity for EPI after the COVID-19 pandemic. Established and made functional new provincial vaccine stores in selected provinces. Expanded existing cold chain space at central, provincial and district vaccine stores. Capacity being built 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.
Innovating supply and logistics management (eLMIS)	**Senegal** Use of Logistimo (eLMIS), a real-time stock-monitoring tool in each health facility, rationally redirecting stock flows to points of care based on consumption rates. **India** Adapted the existing eLMIS (eVIN) to accommodate 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 digitized management of vaccine inventories by cold chain handlers directly from smartphones, providing real-time information on vaccine stocks and flows. eVIN also monitors storage temperature in cold chain points where it is implemented. It ensures > 99% availability of essential immunization vaccines. **Indonesia** Expansion of Logistimo (SMILE), a real-time vaccine and logistics supply tool at health facilities, for the EPI.

Health systems financing	
Approach	**Country examples**
Mobilizing country resources from government budgets and partner funding for both COVID-19 vaccination and the EPI	**Rwanda** Procurement of COVID-19 vaccines and cold chain equipment and other EPI vaccines leveraging domestic and partner funds.

Leadership and governance	
Approach	**Country examples**
Expanding partnerships and coordination mechanisms among different programmes (e.g. beyond traditional immunization partners, including South–South collaboration, pandemic preparedness, global health security)	**Yemen** Integrated maternal, newborn and child health/EPI outreach and mobile services four times a year (in the context of non-functional health facilities) increased DTP1 and DTP3 coverage in 2020.
Setting up joint governing bodies to integrate government accountability mechanisms	**India** Task forces in state/district/urban areas developed for monitoring polio data were integrated for EPI and are now starting to discuss COVID-19 vaccination.

AEFIs: adverse events following immunization; AESI: adverse event of special interest; CCE: cold chain equipment; COVID-19: coronavirus diseases; DTP1, DTP3: first and third doses of diphtheria, tetanus toxoid and pertussis vaccine; EIRs: electronic immunization registries; eLMIS: electronic logistics management information system; EPI: Expanded Programme on Immunization; EUL: emergency use listing; IPC: infection prevention and control; NCDs: noncommunicable diseases; PIRI: periodic intensification of routine immunization; SIA: supplementary immunization activity; VPD: vaccine-preventable disease.

Annex 3. 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 implementing 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 can help to identify approaches for integrated service delivery and Table 2 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. ICC, COVID-19 task force, national managers of NIP and PHC programmes)?	Yes ☐ No ☐	
	Is integration planning linked with relevant country policy and strategy documents (e.g. national health strategic plans, NDVP, NIS, national health promotion strategy)?	Yes ☐ No ☐	
	Has a working group or equivalent to oversee the integration planning and implementation, including participation from relevant programmes, been defined? If yes, specify.	Yes ☐ No ☐	
	Have you agreed a timeline for integration?	Yes ☐ No ☐	
Health systems financing	Have costs of procuring COVID-19 vaccine products, supplies, cold chain equipment, and supplies and ancillaries been estimated and sourced?	Yes ☐ No ☐	
	Have costs of HR, training, outreach and communication needs been estimated and sourced, including mapping of both current and future sources?	Yes ☐ No ☐	
	Do you have an estimate of the funding needed to streamline processes to integrate COVID-19 vaccination into NIP and PHC?	Yes ☐ No ☐	
	Have opportunities for cost sharing across interventions and resource mobilization been identified?	Yes ☐ No ☐	
	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?	Yes ☐ No ☐	

Health system building block	Action	Yes/No	If no, specify action/investment required
Demand and community engagement	Do 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?	Yes ☐ No ☐	
	Have learnings from this data on behavioural and social drivers of vaccination been considered in the design of the integration plan?	Yes ☐ No ☐	
	Have strategies for integrated demand generation in target groups through existing platforms been identified?	Yes ☐ No ☐	
	Is there a plan to engage community representatives and community-based networks/groups?	Yes ☐ No ☐	
Service delivery	Have groups to be targeted for COVID-19 boosters been defined according to WHO recommendations?	Yes ☐ No ☐	
	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?	Yes ☐ No ☐	
	From the programmes identified in mapping, have the approaches most appropriate and feasible for integration been identified?	Yes ☐ No ☐	
	Is there a plan for testing/piloting integrated COVID-19 vaccine delivery with those services?	Yes ☐ No ☐	
	Have patient flows been defined and updated, and has this been properly communication to workers at delivery sites? (Take into account patient waiting times and possibility of joining multiple queues.)	Yes ☐ No ☐	
	Have roles and responsibilities for all workers at service sites been specified and understood by those workers?	Yes ☐ No ☐	
	Has the availability of infrastructure at service sites been assessed and a plan created for any needed upgrades?	Yes ☐ No ☐	

Health system building block	Action	Yes/No	If no, specify action/investment required
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.)	Yes ☐ No ☐	
	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?	Yes ☐ No ☐	
	Are there plans to conduct integrated microplanning sessions for COVID-19 vaccines as part of NIP, PHC and any other relevant health services?	Yes ☐ No ☐	
	If CHWs will have a critical role in COVID-19 vaccination, have considerations (including training needs) for integrating COVID-19-related functions into the CHW package of services been defined?	Yes ☐ No ☐	
	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?	Yes ☐ No ☐	
Health information systems	Can pre-existing HMISs 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?	Yes ☐ No ☐	
	Will disease surveillance conducted for COVID-19 be aligned and leveraged to strengthen VPD surveillance?	Yes ☐ No ☐	
	Has it been defined how COVID-19 will be included in the AEFI surveillance system or how COVID-19 may be used as an opportunity to strengthen this system?	Yes ☐ No ☐	
	Are there plans for training at national and subnational level to ensure workers can meet changed responsibilities for reporting to the HMIS and/or for disease and AEFI surveillance?	Yes ☐ No ☐	

Health system building block	Action	Yes/No	If no, specify action/investment required
Access to essential medicines (including quality vaccines)	Has a joint routine immunization and COVID-19 comprehensive forecasting and supply planning exercise been completed based on stock management and inventory data?	Yes ☐ No ☐	
	Have the resources and additional capacity needed for storage, cold chain and distribution of COVID-19 vaccines been estimated?	Yes ☐ No ☐	
	Have the logistics SOPs been adapted to include COVID-19 vaccines?	Yes ☐ No ☐	
	Has the possibility to bundle COVID-19 vaccine supply with other essential PHC supplies been explored? (Consider particularly in the context of last-mile access.)	Yes ☐ No ☐	
	For any dual-temperature ultra-low-temperature freezers (ULT-Fs) deployed at subnational level[10] in smaller/medium-size countries, has retaining and operating them as regular freezers (e.g. –20°C to –40°C) in the EPI programme been considered? For any additional ULT-Fs, has dual-temperature equipment (e.g. operating at –86°C and –20°C to –40°C) been considered for future integration into the EPI programme?	Yes ☐ No ☐	
	Have opportunities to incorporate digital platforms (e.g. eLMIS, analytic dashboards, warehouse management systems) covering COVID-19 and any commodities at integrated service sites been identified?	Yes ☐ No ☐	
	Have preventive and corrective maintenance plans, including staff training, for cold chain equipment been established?	Yes ☐ No ☐	
	Are a robust integrated waste management plan, governance mechanism, wastage tracking and reverse logistics (for redistribution) in place to minimize wastage?	Yes ☐ No ☐	
Monitoring and evaluation	Is there a strategy for capturing and adopting lessons learned on integrating COVID-19 vaccination, including impacts on coverage and equity for COVID-19 vaccines, essential immunizations and PHC services?	Yes ☐ No ☐	
	Have a monitoring and evaluation plan for integration and responsibility for implementing this plan been assigned?	Yes ☐ No ☐	
	Have the SOPs for monitoring and supervision visits been revised to include COVID-19 vaccination?	Yes ☐ No ☐	

AEFI: adverse event following immunization; CHWs: community health workers; COVID-19: coronavirus disease; eLMIS: electronic logistics management information system; EPI: Enhanced Programme on Immunization; HMISs: health management information systems; HR: human resources; NDVP: COVID-19 national deployment and vaccination plan; NIP: national immunization programme; NIS: national immunization strategy; PHC: primary health care; SOPs: standard operating procedures; WHO: World Health Organization.

[10] With the new Tris buffer formulation, storage at ultra-low temperatures should mainly be focused at central level, given the improved thermostability profile.

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World Health Organization
Avenue Appia 20
1211 Geneva 27
Switzerland
Website: www.who.int

UNICEF
3 United Nations Plaza
New York, NY 10017
USA
Website: www.unicef.org

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