Polio Eradication and Essential Programme on Immunization
Interim Programme of Work for Integrated Actions
in the context of the COVID-19 pandemic

Explanatory Note

"Integration" is one of the three pillars of the *GPEI Endgame Strategy 2019-23* and highlighted as a strategic priority in the *Immunization Agenda 2030 (IA2030)* and in *Gavi 5.0*.

While integration between the polio and immunization programmes has been ongoing, these efforts have been largely opportunistic and uneven. In order to shift to a more systematic and targeted integrated way of working, a multi-partner effort was launched at the end of 2019 to develop a "Programme of Work for Integrated Actions" (POW), under the leadership of the WHO Department of Immunization, Vaccines and Biologicals. Global and regional counterparts from both the immunization and polio programs across the GPEI partner agencies collaborated to develop an initial draft POW; however, in the middle of this work, the COVID-19 pandemic struck.

Along with massive health and economic impacts, the advent of COVID-19 brought the immunization community at large, and the polio programme in particular, unprecedented challenges. However, the altered landscape due to COVID-19 provides both a requirement and an equally unprecedented opportunity to coordinate and reimagine collaboration. Given the new context, the focus of the working group shifted to develop an *interim Programme of Work for Integrated Actions in the context of COVID-19 (iPOW).*

The iPOW summarizes the current level of integration between GPEI and EPI and, more importantly, identifies critical actions across key priority areas of work to drive synergies and materialize efficiency gains by building on initiatives accelerated by COVID-19 to ensure a successful resumption of all immunization activities.

Although the iPOW can provide tactical guidance for the short term, for integration to become more systematic, it needs to be a part of the core strategies, workplans and commitments of both the polio and immunization programs. The GPEI and the EPI programs are committed to incorporating the immediate actions proposed in the iPOW to build integration into revising the Polio Endgame Strategy and operationalizing IA2030 and Gavi 5.0. Until these broader elements are fleshed out, the implementation of iPOW will focus on several priority actions, mostly at the global level, or within the remaining endemic countries. These integrated actions, that are specifically highlighted in the text, are those that can and should move forward by the end of Q1 2021. The best practices from this period will be documented to show "proof of concept" and to inform the further mainstreaming of integration.

The aim is to finalize the iPOW within the next few months, with wide stakeholder input. Following incorporation of these inputs, the document will be brought to the EPI and Polio Ad Hoc Programme Directors Forum and the Agency Heads (through the Polio Oversight Board) for finalization and approval in October 2020. These oversight bodies will monitor and report on the implementation of the priority actions proposed in the iPOW, to ensure that this 'proof of concept' of integration is fully inculcated across immunization strategies to achieve polio eradication and wider immunization goals.

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October 2020 to December 2021

Context

The *Polio Endgame Strategy 2019-2023*, the *Immunization Agenda 2030 (IA 2030*), and the *Gavi 5.0 Strategic Plan* (2021-25) each committed to working in a new, systematic, and integrated way to protect populations. The overarching goals encompassed by these strategies are not only to achieve and sustain polio eradication, but also to attain broader aspirations of reaching under-immunized and "zero dose" children to reduce mortality and morbidity from vaccine-preventable diseases (VPDs) across the life cycle. In parallel to these global initiatives, the Global Polio Eradication Initiative (GPEI) has initiated a separate, but related process to shift functions and funding for polio eradication efforts at the country level from GPEI to national governments.[1]

Beyond the focus on immunization goals, the integration of GPEI and the Essential Immunization Program (EPI) includes a core commitment to promoting equity and strengthening immunization's contribution to primary health care and universal health coverage. This commitment entails teamwork with other health programs at all levels. In addition to establishing collaborations with emergency programs to detect and stop communicable disease outbreaks, the polio and immunization programs are also ideally positioned as entry points to further expand other essential health services – even if done incrementally.

In late 2019, stakeholders in both the GPEI and EPI proposed to align their common objectives and priorities into a **Programme of Work for Integrated Actions (POW)** which was envisioned to turn the high-level concepts articulated in their respective strategic frameworks into a comprehensive package of tangible integrated actions.

A multi-agency working group has made significant progress in drafting mutually beneficial integrated strategies for polio eradication and essential immunization efforts covering four priority areas of work: 1) comprehensive VPD surveillance; 2) community engagement and service delivery; 3) outbreak response and recovery; and 4) management and coordination. For each area of work, specific actions were being developed that could be implemented over a four-year period from 2019-2023.

The severe widespread disruptions to immunization and other public health services around the globe caused by the COVID-19 pandemic have precipitated a more urgent need for coordinated approaches. While still acknowledging the need for a longer-term POW as initially planned, this current document, i.e. the **interim program of wo**rk (**iPOW**), focuses on the immediate innovative and adaptive integrated strategies required to meet this unprecedented challenge over the next 15 months. Achieving the goal of integration over the longer term will require regularly updating the POW as a 'living document' and ensuring that it concepts and proposed actions are fully incorporated into core elements of the revised *GPEI Polio Endgame Strategy* and implementation of the *IA2030* and *Gavi Strategic Plan*.

[1] See Annex A. Interlinkages between iPOW and Polio Transition.

Objectives of the iPOW

- To briefly summarize the current level of integration between GPEI and EPI and challenges/opportunities associated with the COVID-19 pandemic.
- To identify inter-related actions across priority areas of work and coordination between GPEI and EPI that can be implemented immediately and over the coming months to address the increased direct threats to polio eradication and potential for increased morbidity and mortality from multiple vaccine preventable diseases that have been triggered by the COVID-19 pandemic.

Target audience

The primary target audience for this **iPOW** is the global agencies (i.e. BMGF, CDC, Gavi, Rotary, UNICEF, and WHO) and their respective regional offices, which form the core partnership of the GPEI and, to varying degrees, are also actively engaged globally in supporting immunization programs. The iPOW is also intended to inform and engage additional stakeholders, including donors, development partners, other regional bodies, and national governments which share a common commitment to achieving polio eradication and essential immunization goals.

Operational Scope and Timeframes

This document focuses on critical actions that must be taken at the global level. While additional steps at the regional level are also essential now, the iPOW recognizes that the scope and applicability of other proposed actions will be regionally dependent. The iPOW must be placed in the context of the baseline of GPEI-EPI integration achieved across the regions prior to the pandemic, the differential impact of COVID-19 in each country, and the current level of risk for poliovirus transmission. Based on the general approaches outlined in the iPOW, each region will be responsible for developing more specific actionable plans based on consultations with other stakeholders and their determination of which countries are a priority for integration. Since the scope and pace of integration at the country level will depend on national circumstances and capacities, the iPOW provides primarily generalized examples of actions to be taken at the country level.

While acknowledging the severe disruptions to a wide range of immunization and other health services activities caused by the COVID-19 pandemic, providing a comprehensive plan to rejuvenate all aspects of these important services is beyond the scope of the iPOW. Instead, this document focuses first on the collaborative actions between GPEI and EPI required to achieve both programs' objectives; and, secondarily, mutually beneficial actions required with other public health programs through integrated service delivery.

For each of the three technical areas of work (see below) , the iPOW proposes actions which are either required in direct response to the impact of COVID-19 or are deemed urgently necessary in the short- to medium-term due to their expected significant contribution to furthering integration in general. Actions highlighted in bold should be prioritized for implementation by no later than the end of Q1/2021 in order to support coordinated resumption of disrupted and/or suspended immunization activities, where safe to do so. The best practices developed over the next six months will be documented to inform the further mainstreaming of integration. The additional actions proposed in the iPOW for implementation by the end of 2021 in each priority area of work should be considered carefully and, where appropriate, included

as part of the GPEI strategy revision, and form a key commitment toward integration during operationalizing the IA2030 and Gavi 5.0 .[2]

General principles for integrating activities during the COVID-19 Pandemic

The COVID-19 situation provides new opportunities and urgency for programme integration across polio eradication and immunization. However, it also imposes several constraints and new considerations such as personal protection requirements for vaccinators which will potentially affect integration and broader efforts to provide public health service. General guiding principles for operating during the emergency phase of the pandemic have already been articulated for both the GPEI[3] and for EPI[4] and will be periodically updated. The longer- term principle which can be incorporated incrementally into both programs is to change the way immunization interfaces with health systems and delivery of primary health care.

Strategic Priorities of the POW: Key program areas of work identified for integration

Although the *Polio Endgame Strategy* and the *IA2030* identified multiple core areas where the programs could mutually benefit from integrated actions, the iPOW focuses on three strategic priority technical areas, as well as the enabling functions of management and coordination (see **Table 1**)[5]. The priority areas of work were identified based on immediacy (e.g. can address current and critical programme needs), opportunity (e.g. potential for finding synergies across programme priorities), and feasibility (e.g. concrete implementation steps can be identified). (See **Annex B** for Logic Model outlining the key inputs, processes, outputs, and outcomes proposed for each priority area of work.)

Table 1. Strategic priority areas for integration

Technical/programmatic areas of work
Comprehensive VPD Surveillance • Acute flaccid paralysis (AFP) surveillance, environmental surveillance (ES), and VPD surveillance alignment and integration • Laboratory network integration
Community Engagement & Service Delivery • Community engagement, community feedback, & demand promotion • Monitoring impact of COVID-19 and assessing vulnerability • Coverage improvement & equity programming • Capacity building & training

[2] The GPEI proposes to have a revised Endgame Strategy by Q1 2021 and EPI stakeholders are working to develop in 2021 detailed operational implementation plans for IA2030 and the Gavi 5.0 Strategic Plan.

[3] GPEI. Polio eradication programme continuity: implementation in the context of the COVID-19 pandemic. 14 May 2020. http://polioeradication.org/wp-content/uploads/2020/03/COVID-POL-programme-continuity-planning-20200512.pdf

[4] WHO. Guiding principles for immunization activities during the COVID-19 pandemic. 26 March 2020. https://www.who.int/publications-detail/guiding-principles-for-immunization-activities-during-the-covid-19-pandemic-interim-guidance

[5] Other technical areas are also recognized as critically important for integration, but they either: a) already have substantial integration –e.g. vaccine supply; or b) will require implementation over a longer time period—e.g. Integrated health information systems, and implementation research and innovation. (See **Annex D** for a summary profile of these areas of work.)

Acute Outbreaks • Preparedness and planning • Response & recovery
Enabling functions
Management & Coordination (general principles and approaches) • Oversight & strategic planning • Technical & operational management • Advocacy & resource mobilization

Comprehensive VPD Surveillance*

Pre-COVID19 situation

The GPEI and the associated Global Polio Laboratory Network (GPLN) have managed and funded extensive global networks of acute flaccid paralysis (AFP) surveillance and environmental surveillance (ES) which have been essential tools for polio eradication. Because VPD surveillance systems have frequently been characterized by fragmentation across disease-specific initiatives and by suboptimal use for immunization program decision making, some low- and middle-income countries have relied on the GPEI-managed network to provide the majority of measles, rubella, and neonatal tetanus surveillance.

Supporting the development and expansion of a comprehensive VPD surveillance system at all levels will facilitate sustaining polio surveillance, as well as strengthening other surveillance systems. Initial efforts have already been underway at the national level in many countries to transition both management and funding to more comprehensive integrated VPD surveillance systems under Ministries of Public Health. At the global level, the *Immunization Agenda 2030* and the *Global Strategy on Comprehensive VPD Surveillance*[6] propose a new paradigm for VPD surveillance to transform the polio surveillance network and ensure an integrated/comprehensive system that includes all priority VPDs. Some regions have also provided roadmaps for fully developing integrated VPD surveillance, laboratory, and interoperable information system platforms. [7]

Although integration between polio and EPI has progressed further for surveillance than in other strategic program areas, these efforts have yet to be widely institutionalized and remain largely donor funded and driven in many countries. Funding gaps at multiple levels could threaten both ensuring sustained adequate surveillance sensitivity for polio virus and achievement of various global/regional goals for VPD control or mitigation.

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[6] WHO. *Global Strategy on Comprehensive Vaccine-Preventable Disease Surveillance* (final draft, April 2020 for incorporation into IA2030.)

[7] For example, see World Health Organization Regional Office for Africa. (2019) *Investment case for vaccine-preventable diseases surveillance in the African Region 2020-2030 VPD surveillance business case.* https://www.afro.who.int/publications/investment-case-vaccine-preventable-diseases-surveillance-african-region-2020-2030

*This section focuses on the elements currently critical for integrating surveillance; however, extensive collaborative efforts to develop comprehensive VPD surveillance pre-dated the COVID-19 pandemic. See **Annex C** for additional discussion on transitioning polio surveillance to comprehensive VPD surveillance systems.

New challenges and opportunities

The COVID-19 pandemic has imposed new pressures on both polio and broader VPD surveillance networks, especially at the national level. These staffing networks and infrastructures have been expected to provide extensive support for COVID-19 case detection, including active surveillance, case investigations, and laboratory testing. Although global GPEI and EPI guidance has underscored the priority of maintaining at least a minimum level of surveillance to continue detection of polioviruses and outbreaks of epidemic-prone VPDs, the dynamic demands of COVID-19 and the disruptions of laboratory supply chains and sample shipments have resulted in quantifiable drops in surveillance quality in many vulnerable countries, including the sensitivity to detect new VPD outbreaks. Due to the demonstrated capacity of polio/VPD surveillance and laboratory networks, these assets will continue to be relied upon to provide support to the ongoing COVID-19 response needs in many countries. Even more than other aspects of immunization programs, surveillance will face ongoing challenges to maintain core functionality and continue integration.

However, the increased visibility of polio/VPD surveillance and laboratory networks due to their prominent roles in detecting COVID19 could be an opportunity to gain national funding and political support for their long-term contributions to public health. In some large countries, the expansion of testing capacity at sub-national levels prompted by the COVID-19 pandemic could potentially be sustained, if adequately funded. These efforts could dramatically contribute to the eventual goal to establish comprehensive communicable disease surveillance systems capable of detecting emerging threats in all countries.

*Proposed priority actions (also see **Annex C**)*

In the short- to medium-term, global efforts to move towards comprehensive VPD surveillance can build on implementation of previously proposed activities. [8] Further actions can be taken to align integrated training/guidance documents, ensure interoperability of polio and VPD information systems, and coordinate advocacy calls supporting surveillance. Longer term strategies should go beyond the integration of polio and EPI programs to incorporate linkages to emergency program surveillance, as appropriate, to ensure coordinated outbreak detection and response.

Responsible integration at the country level will need to take a risk-based approach which acknowledges differing levels of technical capacity, financial resources, and relative disease burden. The process of transitioning from reliance on GPEI-funded and managed surveillance for polio (and select VPDs) to mature national infectious disease surveillance systems in all countries may need to be modified by the COVID-19 context. Success will not be defined by how many VPDs the surveillance system targets, but by the quality and sensitivity of surveillance for the highest priority VPDs.

The proposed integrated actions (with priority actions to be completed by end of Q1/2021 in **bold**) for comprehensive VPD surveillance include:

[8] See CDC. *Follow-up to the WHO Polio Transition Meeting in Montreux (2018): Consultation on Vaccine Preventable Disease (VPD) Surveillance March 27-28, 2019*; CDC Atlanta, GA, USA

AFP, ES, and VPD Surveillance

Actions	Primary Responsibility
Routinely share analysis of COVID-19 impact on polio and VPD surveillance	**GPEI STT, IVB and CDC surveillance teams**
Review global strategies for integrated surveillance to incorporate any adjustments necessary due to impact of demands imposed by COVID-19	**Global Comprehensive VPD Surveillance WG**
Utilize recent cost analysis of surveillance integration to develop global advocacy and resource mobilization plan in support of comprehensive VPD surveillance.	**WHO IVB (lead) w/ support from Global Comprehensive VPD Surveillance WG**
Explore use of the ES system to track SARS CoV2 and develop plans to extend detection to other diarrheal diseases (such as typhoid) and broader communicable disease control efforts.	**Global Comprehensive VPD Surveillance WG with GPLN and other relevant laboratory networks**
Utilizing experience gained with tracking COVID-19, develop a long-range plan for VPD surveillance to incorporate event-based surveillance and other approaches linked to emergency program surveillance networks.	Global Comprehensive VPD Surveillance WG and WHE
Establish joint workplans and eventually a unified surveillance team at the global level across polio and EPI at WHO.	POL and IVB
Conduct country by country landscape review of VPD surveillance to document degree of integration and best practices in order to select priority countries for accelerated implementation.	WHO RO's w/ CDC
Develop regional strategy for comprehensive VPD surveillance	EMRO
Develop regional operational plans for implementing comprehensive VPD surveillance	WHO RO's
Develop regional advocacy and resource mobilization plan to implement investment case for integrated VPD surveillance.	AFRO
Develop integrated training materials and networks.	WHO RO's w/ CDC
Develop country-owned plans for comprehensive VPD surveillance, including retention of existing polio workforce and integration plans adapted to local capacity as part of the polio transition process.	16 priority polio transition countries + low-middle and low- income countries

Integrated VPD Laboratories

Actions	Primary responsibility
Conduct thorough analysis of the impact of COVID-19 on prospects for further integration of polio and other VPD laboratories	**GPLN; GMLN; IVB**
Conduct similar analysis to seek options for coordinating capacity, building infrastructure, and sharing resources among VPD labs among countries	Regional polio and VPD labs
Integrate national poliovirus laboratories with other viral or infectious disease platforms wherever feasible, in order to sustain local detection capacity.	Ministries of Public Health

Community Engagement and Service Delivery

Pre-COVID19 situation

Even though strengthening routine immunization has long been a cornerstone of polio eradication strategies, the GPEI has traditionally relied heavily upon a vertical approach using supplemental immunization activities (SIAs) with oral polio vaccine (OPV) for initially eliminating polio transmission as well as preventing or responding to poliovirus outbreaks. There have been some targeted initiatives with other VPD programs to pre-emptively address gaps in coverage among communities simultaneously at high-risk for polio outbreaks and multiple other epidemic prone VPDs through combined preventive

campaigns (e.g. joint polio-measles SIAs). These preventive efforts have primarily been ad hoc and based on individual country initiatives rather than systematic global or regional risk assessments.

Renewed acknowledgement in recent years that reaching and sustaining polio eradication relies on the fundamental success of a strong essential immunization programme has led to specific action plans in the remaining polio endemic countries for 'polio eradication-EPI synergies'[9]. Through these plans GPEI and EPI are now prioritizing their efforts towards under-served populations not only to address the mutual goal of promoting equity, but also as a necessity to achieve practical disease control/eradication objectives. Yet missed opportunities still persist in how GPEI and EPI systematically share programme intelligence and activity-based microplanning to identify and follow-up zero and low-dose communities.

In addition to ongoing integration efforts within the two programs, global policies and strategies of GPEI and EPI are also increasingly focused on integrating delivery of polio and other VPD vaccines with multiple health commodities and services[10]. These high-level initiatives remain to be fully coordinated at global/regional levels or regularly implemented in the field. Yet, in the remaining polio endemic countries multiple door to door single-antigen polio campaigns have led to increasing community resistance due to public fatigue and a desire for access to a broader range of health services. Based on the premise that integrated and quality service delivery can help generate increased demand for all vaccines in high-risk polio communities, in 2018 polio and immunization partners initiated the Global Hub for Vaccination Acceptance and Demand (i.e. the "Demand Hub") to develop and promote evidence-based approaches for increasing demand for immunizations at the country level. Both endemic countries have also developed, yet not fully implemented, integrated service delivery strategies targeted to selected high risk communities.[11]

New challenges and opportunities

Since the onset of COVID-19 in March 2020, global and regional surveys have illustrated that immunization services have been disrupted in many countries, not simply due to logistical or physical distancing barriers, but because caregivers fear infection with the COVID-19 virus and are reluctant to seek preventive care.[12] In addition to disruption of local EPI delivery through fixed posts, outreach services and multiple preventive SIAs for all antigens were cancelled or postponed. Modelling and available surveillance data have shown this hiatus in vaccine delivery has resulted in widening immunity gaps and increasing disease transmission for both polio and other VPDs. This situation is especially acute among marginalized populations and countries with limited capacities. As governments seek to balance competing demands for resources to combat VPDs alongside the imperative to tackle COVID-19, there is a risk that the pandemic will exacerbate inequities in vaccination outcomes within and between countries.

At the global and regional levels, the challenges faced by countries translate into expectations as well as opportunities to align strategies, improve coordination, harmonize messaging, and generally to seek

[9] See Pakistan and Afghanistan *National Emergency Action Plans for Polio Eradication, 2019-20*.
[10] See *IA2030* and WHO. *Working together: an integration resource guide for immunization services throughout the life course*, 2018.
[11] See Pakistan and Afghanistan *National Emergency Action Plans for Polio Eradication*, 2019-20.
[12] An immunization pulse poll in the context of COVID-19 conducted between 14 and 24 April, with 801 responses from 107 countries, showed that disruption to the routine immunization program are widespread and affect all WHO regions. 64% of countries represented in the poll indicated that routine immunization has been disrupted or even suspended. https://www.who.int/immunization/GIN_March-April_2020.pdf?ua=1

efficiencies in service delivery both within and outside GPEI and EPI. The necessity to optimize the targeting of increasingly scarce financial and staff resources provides the imperative to systematize previous ad hoc efforts to delivery multiple antigens and services and give further relevance to joint global and regional efforts to support countries in planning and positioning for the rapid revitalization of services to address immunization gaps aggravated by any pause in or diminished services. In addition to revitalizing EPI the anticipated roll-out of additional vaccines (e.g. COVID-19, the second dose of IPV, and novel OPV2 [nOPV2]) over the next 12-15 months, will undoubtedly impact public perception, acceptance, and demand for immunization. Opportunities to understand this impact, adapt to community concerns, and strengthen alignment between polio and immunization programs can serve to heighten trust in immunization and overall health systems.

Proposed priority actions

For GPEI, the priority is to implement integrated actions with EPI which seek to: 1) raise poliovirus immunity levels in the core communities with sustained endemic transmission; and 2) switch from just predicting outbreaks to preventing them in high risk geographies in other parts of the world. Similarly, GPEI resources can contribute to short-medium term EPI priorities: 1) revitalize disrupted services; 2) rectify immunity gaps through multiple coordinated, tailored supplemental delivery strategies; 3) seek opportunities for integrated service delivery especially in missed (e.g. zero-dose) communities where feasible; and 4) plan for COVID-19 vaccine delivery.[13] These steps will primarily need to be implemented at the country level and will require extensive individual program efforts beyond integrated initiatives. Nevertheless, achieving efficient, effective implementation will require complementary approaches and coordination between GPEI and EPI at the global and regional levels. Many countries may require immediate short-term support as they seek to catch up children with all missed vaccines through fixed posts or a range of outreach strategies (e.g. periodic intensification of immunization services [PIRI], mass multi-antigen vaccine campaigns, etc.). Integrating delivery of multiple vaccines as well as incorporating other health services should be a prime objective, but the scope and pace of activity will be country specific. GPEI and EPI partners at the regional level may choose to prioritize countries where integrated activities should be targeted based on risk and local capacities.

In the long-term, this shared venture on community engagement and service delivery will facilitate the ability of both programmes to scale up proven interventions for both polio eradication and essential immunization as communities adjust to the possibility of 'living with COVID-19'.

Proposed integrated actions (with priority actions to be implemented by end of Q1/2021 in **bold**) for community engagement and service delivery include:

Community engagement, community feedback, and demand promotion

Actions	Primary responsibility
Assess the global impact of COVID-19 on community attitudes towards immunization and promote tailored, people-centred strategies to increase vaccine acceptance and demand for all vaccines in high-risk settings	**Demand Hub**
Develop coordinated global messaging on introduction of new vaccines or schedule changes in either the polio or EPI programs (including COVID vaccine)	**GPEI Global Communication Group and EPI counterparts,**

[13] See WHO and UNICEF. *Re-establishing and re-imaging immunization services after Covid-19 onset* (draft), June 2020.

	including COVAX country readiness & delivery team
Develop joint regional messaging related to value of vaccination and sustaining immunization services during the COVID-19 pandemic.	**WHO and UNICEF RO's w/ support from Demand Hub**
Support countries by providing technical guidance, sharing knowledge/experiences, and providing evidence-based joint guidance in developing appropriate strategies to address identified barriers	WHO and UNICEF RO's w/ support from Demand Hub
Implement tailored, people-centred strategies to increase vaccine acceptance and demand in high-risk settings and explore integration opportunities.	All countries
Mainstream polio assets to strengthen national capacity for community engagement and demand promotion for polio, routine immunization, health, and integrated community services, in line with national transition plans	16 priority polio transition countries

Monitoring impact of COVID-19 and assessing vulnerability for polio and other VPDs

Actions	Primary responsibility
Create regular links between risk modelers for polio and other VPDs to share assumptions and results of ongoing vulnerability assessments and changing immunity profiles	**GPEI Cessation Risk Task Team + VPD Modelling Core Coordination Group**
Track disruptions to immunization services secondary to COVID-19, develop vulnerability risk assessments for each epidemic-prone VPD, and create priority list of countries which should be mutually supported by global and regional polio and immunization programs for SIAs.	**Global-Regional Risk Assessment and Mitigation Task Team for Epidemic Prone VPDs (proposed)**
Provide ongoing global guidance to countries on how to assess the evolving risks of COVID-19 and VPD outbreaks to assist in national decision-making for initiating/suspending immunization campaigns.	**WHO IVB (lead) w/ inputs from GPEI**
Determine priority subnational areas at highest risk for cVDPVs and support development and implementation of intensive EPI strengthening plans in collaboration with national governments.	WHO/UNICEF RO's polio +EPI teams (especially AFRO + EMRO); GPEI Hub, CDC, Gavi, BMGF
Determine sub-national areas and populations at highest risk for all VPD outbreaks, in order to prioritize surveillance and mitigation efforts.	Ministries of Health

Coverage improvement and equity programming

Actions	Primary Responsibility
Develop high level commitment and consensus on broad strategies for integration	**GPEI and EPI Program Directors' Forum (proposed)**
Develop coordination mechanism to: a) dialogue on potential joint strategies for service delivery in targeted countries or areas; b) align implementation of strategies related to revitalization and/or resumption of immunization services in context of COVID-19; and c) more effectively target global resources to joint vulnerable countries and explore avenues for cost-sharing.	**IVB (lead) w/ input from other EPI partners + GPEI; + RO's**
Develop global operational planning guidelines for integrated campaigns (multi-antigen + essential services)	**WHO IVB (lead), Global-Regional Risk Assessment and Mitigation Task Team for Epidemic Prone VPDs and EPI counterparts**
Develop global guidelines for COVID-19 vaccine delivery utilizing relevant polio and EPI infrastructures	**COVAX Country Readiness & Delivery Team (lead) + GPEI/EOMG and EPI**

Ensure WHO guidelines related to immunization in the context of COVID-19, including for joint regional directives on integrated service delivery, are adaptable to the country level.	**WHO RO's**
Coordinate and guide key partners on the principles of catchup strategies to reach communities in high risk districts in targeted countries.	**WHO and UNICEF RO's in collaboration with global partners**
Share micro-plans or local knowledge to identify and catch-up high-risk communities through intensified routine or PIRI.	**Country level GPEI and EPI teams**
Assess gaps in implementation of PEI/EPI synergy action plans; develop accountability frameworks;	**GPEI and EPI teams in AFG and PAK**
Implement and monitor impact of integrated service delivery plans targeting high-risk communities	**GPEI and EPI teams in AFG and PAK + relevant essential service programs + Hub**

Capacity Building and Training

Action	Primary responsibility
Develop a structured plan for a common learning platform for GPEI and EPI staff at all levels based on assessment of training needs and available materials.	WHO IVB and POL, UNICEF, + RO's
Ensure alignment (or merge when feasible) GPEI and EPI normative guidance, standard operating procedures, and training materials, including those related to COVID-19 pandemic response	WHO IVB and POL, UNICEF
Initiate regional mechanism to integrate polio eradication teams into workshops or trainings to develop common understanding of GPEI/EPI essentials, during and after COVID-19	WHO and UNICEF RO's
Revise standard operating procedures to recommend sharing results of monitoring and supervision visits of both programmes to strengthen cross-synergies	GPEI and EPI country teams

Acute Outbreaks

Pre-COVID19 situation

The GPEI has established separate polio outbreak preparedness and response teams at the global level and AFRO. For all other VPDs, similar responsibilities primarily lie with WHE global and regional units plus technical inputs by EPI staff. At the country level, International Health Regulations (2005) and WHE guidelines stress that all countries are expected to develop local core capacity to respond to all comprehensive communicable disease outbreaks.

Implementation of acute outbreak responses has only sporadically been integrated between polio and EPI with multi-antigen campaigns due to challenges in rapidly conducting joint planning and organizing field operations. The GPEI has globally adopted WHO Health Emergencies (WHE) outbreak grading mechanisms. Although polio staff have been routinely mobilized in some countries to tackle other VPD outbreaks (e.g. measles, Ebola) local coordination through Emergency Operations Centers (EOC's) has not been a consistent practice even where there have been simultaneous VPD outbreaks.

Acknowledging that poor EPI coverage is a substantial risk for emergence of cVDPVs, standard operating procedures (SOPs) for polio outbreak response call for developing immediate plans with local EPI

managers to strengthen basic services in the aftermath of cVDPV outbreaks as part of preventing future occurrences.[14] However, such cooperative plans have rarely been developed or implemented.

New challenges and opportunities

When the COVID pandemic began, the GPEI was facing extensive outbreaks of circulating vaccine-derived poliovirus (cVDPV), mostly in Africa, but also in the WPV endemic countries (Afghanistan and Pakistan) and scattered across several other regions. Multiple other VPD outbreaks (especially measles) were also occurring in many of these same countries.

Following the declaration of the global pandemic, WHO initially proposed that all mass vaccination campaigns, including those targeting ongoing polio and other VPD outbreaks should be temporarily suspended. Halting these SIAs has likely resulted in expanding VPD outbreak transmission in many areas. Attempting a cohesive assessment of when to resume outbreak SIAs vs. the potential risk that these efforts may aggravate COVID-19 transmission is a complex decision-making process and is complicated by differing parameters for determining the risk of the underlying outbreak.[15] Furthermore, variable strategies required by different antigens (e.g. vaccination with an oral vaccine vs. injectable vaccines) can make field integration problematic especially given strict requirements for vaccinator safety. Even adding additional services or commodities during acute outbreak immunization responses can tax local infrastructure and staff capacity. However, the obvious need for consistent global guidance, country demands for efficiency and desires to address multiple challenges through a single integrated effort strengthen the impetus towards integrated approaches across several program areas, including outbreak response and recovery.

Although further integrating active VPD surveillance during the COVID-19 pandemic can be problematic due to increased demands on local surveillance officers, there is an immediate need for sharing data on new or expanding outbreaks. Further Integrated surveillance approaches, including linkages with WHE, should enhance the early detection of new VPD outbreaks. (Also see **Surveillance** section above).

Proposed priority actions

Proposed integrated actions (with priority actions to be implemented by end of Q1/2021 in **bold**) within the strategic priority area of acute outbreaks include:

Outbreak Preparedness and Planning

Action	Primary Responsibility
In collaboration with emergency partners, revise outbreak response planning tools and guidance to emphasize integrated preparation and planning, including joint capacity building of National EOCs in managing VPD outbreaks.	WHO POL/IVB +WHE
Develop and conduct joint polio/VPD outbreak preparedness training	WHO polio/EPI + WHE in AFRO and EMRO
Use Joint External Evaluations (JEE) to specifically monitor and plan for developing an integrated response capacity for all VPD outbreaks.	Ministry of Health

[14] See GPEI. *Standard Operating Procedures: Responding to a poliovirus event or outbreak,* V3.1. March 2020. http://polioeradication.org/wp-content/uploads/2020/04/POL-SOP-V3.1-20200424.pdf

[15] Framework for decision-making: implementation of mass vaccination campaigns in the context of COVID19 pandemic. https://www.who.int/publications/i/item/WHO-2019-nCoV-Framework_Mass_Vaccination-2020.1

Outbreak response and recovery

Action	Primary Responsibility
Include EPI staff as part of any Regional Polio Rapid Response Team now and gradually expand scope to provide technical support to all epidemic prone VPD outbreaks.	**WHO RO's**
Include a root cause analysis jointly conducted by polio and immunization teams as part of the initial polio outbreak assessment, in order to draft integrated recovery plans with the national EPI program.	**WHO RO's + National EPI program**
Develop global emergency response platforms (e.g. management structures, financial mechanisms, etc.) to facilitate polio and VPD outbreak responses where feasible.	GPEI + WHE
Fully implement and monitor progress in following-up EPI recovery plans developed as part of polio outbreak assessments	National EPI programs
Establish joint national (and where required, sub-national) Emergency Operations Centers (EOCs) to coordinate country responses to polio and VPD outbreaks.	National EPI programs

Management and Coordination

Pre-COVID19 situation

The management and coordination architecture across polio and immunization stakeholders is complex. On the GPEI side, there is a heavy global management and coordination infrastructure, with specific groups having clearly defined roles and responsibilities across the partnership for strategic, technical, and operational aspects of the program. Decisions are taken by consensus.

Collaboration mechanisms across the global immunization program are not as clearly structured. Management and coordination are highly variable and fractured across Gavi / WHO / UNICEF and multiple NGO's. Within the framework of *IA2030*, there is an active discussion to create "communities of practice" or other more deliberate venues for collaboration and alignment across the immunization community, which will be fleshed out as a part of the *IA2030* ownership and accountability framework. However, these are not yet operational.

The lack of integrated global/regional management and coordination is often cited as the biggest challenge hampering collaboration on the ground. Coordination between polio and immunization stakeholders is often ad hoc, non-systematic, and individual dependent. GPEI functions more like an emergency programme, and given its global eradication goal, focuses on centralized decision-making. On the other hand, the immunization program concentrates on increasing national ownership, capacity and longer-term systems strengthening. Structural differences also play a role, especially in WHO HQ and the two regions (AFR and EMR) where polio and immunization teams maintain separate structures and budgets. This is true also for other GPEI partners, where the polio and immunization teams are often separate. At the country level, there tends to be more venues for coordination of planning and implementation, except in polio endemic countries, where the EPI and polio eradication programs have historically tended to operate in silos.

Despite these challenges, there exist certain "best practices". The joint GPEI/EPI Immunization Management Group (IMG) globally coordinated the introduction of IPV and successfully planned and implemented the world-wide synchronized switch in 2016 from tOPV to bOPV. Many stakeholders refer to that mechanism as a successful endeavor. At the country level, the polio outbreak response in Papua

New Guinea (PNG) was utilized to deliver other antigens (MR) and commodities (vitamin A) and provided an opportunity to assess and advocate for addressing gaps and in EPI by strengthening provincial health authorities. In the endemic countries, EPI/PEI synergies have been increasing at the field level, and the Polio Technical Advisory Groups (TAGs) are looking at essential immunization more systematically. As noted above, the strategic plans of polio and immunization stakeholders (e.g. GPEI *Endgame Strategy*, *IA2030* and *Gavi 5.0*) have endorsed the concept of integration, and the need for coordination across multiple program functions to improve programmatic and financial efficiencies.

New challenges and opportunities

The COVID-19 pandemic underscores the urgent need for efficient coordination across polio and immunization partners and provides a unique opportunity for the programs to concretely address the expressed goal of integration. Immunization services have been either seriously impacted or disrupted in many countries due to the pandemic. The resumption of SIAs – polio and other VPDs -- will have to be carefully coordinated and prioritized, in order to avoid gaps, duplications, or putting an unnecessary burden on countries caused by multiple activities of individual interventions.

COVID-19 has underscored not just the need for better coordination at the country level, but also globally, in order to ensure aligned and coherent policies and guidance for polio and immunization. Some informal mechanisms have been established to foster alignment between the programs in their response to the pandemic.[16] Putting in place the mechanisms necessary to ensure the continuity of this coordination will set the ground for a new, longer term, systematically integrated way of working. Within the context of the ongoing GPEI governance internal review, there may be opportunities to articulate these mechanisms. Similarly, the ownership and accountability mechanism that is currently being fleshed out for IA2030 offers opportunities to work in a more holistic and integrated manner with disease-specific initiatives, like polio.

Going Forward

Systematic integration is not just about activities, but about the processes by which they are set, managed, and coordinated. GPEI and EPI's approach to integration needs to be thoughtful, strategic, and practical. This means going beyond setting up an integration focused working group but rethinking—from the top down—how priorities are set, workplans are jointly developed and taken forward, and staff held accountable. It means a shift in current thinking and way of working – which reverberates from leadership through to program staff- so that working in a truly integrated manner is the default position, not something that is done if convenient, when time or budget allows, or a pandemic necessitates.

This is an opportune moment to instill this new way of thinking and working. Covid-19 is already pushing the two programmes to work in a more systematically integrated manner than ever before, both at the operational and policy level. As GPEI revisits its strategy through 2023, and the immunization stakeholders are working on operationalizing Gavi 5.0 and IA2030, this is the moment to make this change and put integration front and centre.

[16] For example, the Covid 19 Immunization Partners Coordination Group (CoIPC) and regular, informal collaboration between the programs at the working level to provide global guidance documents.

Some proposed changes that could have significant impact are as follows[17]:

Global level

Oversight and Strategic Planning

- Ensure systemic integration through the Program Directors' Forum (including representation of the directors of both polio and EPI from all implementing partners).
- Ensure active cross inputs from both programs in developing (not just vetting) all high-level strategies and policies, along with operational and accountability plans (e.g. include representative EPI inputs to current GPEI strategy revisions and management reviews; engage GPEI in the further development of *IA2030 and Gavi 5.0)*
- ~~Ensure coordination and alignment of policy development and technical guidance, with a focus on both science and implementation impact.~~

Technical and Operational Management

- Ensure alignment, and wherever feasible—joint, global technical and policy guidance from the GPEI and EPI programs with a focus on both science and implementation impact. Inputs and/or collaboration with other relevant programs (e.g. WHE) should be included where relevant.
- Systematize cross representation from each program in relevant management groups (e.g. GPEI's EOMG and Hub; EPI's Rejuvenation WG) and/or establish joint groups (e.g. Global Comprehensive VPD Surveillance WG, proposed Global-Regional Risk Assessment and Mitigation Task Team for Epidemic Prone VPDs). GPEI and EPI should jointly engage with other essential public health programs where feasible (e.g. Campaign Integration Working Group).

Advocacy and Resource Mobilization

- Establish formal ties between GPEI advocacy and fundraising efforts with the IA2030 and Gavi 5.0 advocacy and resource mobilization strategies

Regional level

Oversight and Strategic Planning

- Building on relevant existing structures (e.g. Routine Immunization Technical Advisory Group, Steering Committee on Transition) to engage multiple key partners from polio and immunization to ensure regional leadership across the programs are well coordinated and aligned. Depending on regional capacities, other relevant programs (e.g. WHE) should be included.

Technical and operational management

- Systematically ensure joint work planning by regional teams (as is being done for COVID-19 SIA restart)
- Building on relevant existing structures (e.g. Gavi Regional Working Group (RWG) / Partnership Engagement Framework (PEF); EMRO Technical Working Group on Transition) as feasible, engage multiple key partners from both programs to select priority countries to target coordinated support and develop plans for systematic integrated activities.

[17] For specific technical management and coordination priority actions, also see **Surveillance, Service Delivery, Outbreak** sections above.

- In addition, ensure multi-partner, multi-program coordinated management of targeted support to strengthening EPI among selected communities at high-risk for polio outbreaks (for AFR and EMR) and/ or recovery activities to any polio outbreaks (all regions).
- Systematically include polio into Gavi Regional Working Group (RWG) / Partnership Engagement Framework (PEF) discussions, including joint resource needs.

Country level

The iPOW primarily focuses on integration activities to be conducted at the global and regional levels and only provides some selected examples of actions to be undertaken at the country level, particularly where there are currently separate polio and EPI programs. Accordingly, the management and coordination steps required at the national level will be highly dependent on each country's current status of integration between the polio and EPI programs and the degree to which local systems are dependent on external funding and management.

While all countries should strive towards developing comprehensive public health service delivery and communicable disease surveillance systems, the pace and scope of these efforts will be guided by local situations and program objectives (e.g. relevance of polio transmission). Specific steps towards integrated management and coordination should be developed in concert with regional and, as required- global, support.

Monitoring the iPOW

Tracking progress towards the high-level goals of integration will ultimately be encompassed in processes inherent to overseeing the implementation of the broad strategic plans of both GPEI and EPI. As part of their wider interest to ensure systemic integration, the Program Directors' Forum, along with concurrent inputs from other key stakeholders and donors, will be responsible for the ongoing monitoring of global implementation of the iPOW itself. Regional Directors of WHO and UNICEF plus relevant counterparts will be expected to provide direction and oversight of regional integration plans and the success of national implementation as required.

Annex A. Interlinkages between iPOW and Polio Transition

"Integration" and "transition" are interrelated, but separate processes. The differences and interlinkages are explained in the table below.

The ultimate objective of polio transition is to shift functions and funding from GPEI to country governments. Given the fragility of many of the polio transition priority countries, however, this will happen in a gradual and phased manner, where support from partners (especially WHO and UNICEF) will still be needed until the governments are ready to take over. Therefore, the activities identified in the iPOW can help deliver that support in a more efficient, coherent, and integrated manner, and help move more smoothly towards a successful transition.

	Polio Transition	**Integration / iPOW**
Objective	Mainstream functions supported through the GPEI into country health systems Shift funding from GPEI to country governments	Close and systematic collaboration between polio and immunization stakeholders for mutual gains
Focus	Country	Global, regional, country
Lead	Country MoH (supported by WHO and UNICEF)	Polio and immunization partner agencies (coordinated action among partner agencies will drive country progress)
Strategic Framework	"Strategic Action Plan for Polio Transition" presented to the 68th WHA	Polio Endgame Strategy 2019/23 (Integration Pillar) IA2030 Gavi 5.0
Coordination	Polio Transition Steering Committees (WHO HQ, ROs)	Multi-partner mechanisms, with a "light touch" global coordination body

Annex B. Logical model for each Priority Area of Work (October 2020- December 2021)

Build & strengthen comprehensive VPD surveillance and laboratory networks

Input Needed	• Polio AFP & Environmental Surveillance Networks (all levels) • Global polio laboratory Network (GPLN) • Other VPD surveillance systems (case-based, sentinel, community-based) • WHE outbreak/event- based surveillance network • Other VPD laboratory networks (GMLN, other) • Donors and other relevant stakeholders
Process to follow	• Build on the *Global Strategy on Comprehensive VPD Surveillance* which identifies potential areas for integration and actions required at global, regional, and country levels • Build on *Follow-up to the WHO Polio Transition Meeting in Montreux (2018): Consultation on Vaccine Preventable Disease (VPD) Surveillance* • Build on existing regional polio and VPD surveillance frameworks • Identify effective alignment with WHE surveillance and early warning systems
Key Global & Regional Outputs	• Analysis of COVID-19 impact, including plans for integration of polio and other VPD surveillance/labs • Finalized Financial Resource Requirements (FRRs) for comprehensive VPD surveillance • Resource mobilization strategies for implementing the Global and AFRO strategies for comprehensive VPD surveillance • Multi-partner advocacy and communications plan to raise awareness of VPD surveillance • EMRO regional strategy for comprehensive VPD surveillance
Outcome	• Improved collaboration, coordination, and integration of polio and other VPD surveillance/laboratory activities to provide sensitive detection of VPDs as part of comprehensive communicable disease surveillance systems at global, regional, and national levels.

Community Engagement and Service Delivery

Input Needed	• GPEI partners (BMGF, CDC, Gavi, Rotary, Unicef, WHO)—global & regional levels • EPI partners (multiple) at global & regional levels • Coalition for Health Campaign Effectiveness • Other relevant essential health service programs (e.g. WASH, nutrition, malaria, etc.) • Donors and other stakeholders
Process to follow	• Build on *Re-establishing and Re-imagining Immunization Services After Covid-19 Onset* for blueprint of broad priorities in the short-medium term • Build on *IA2030* and *Working together: an integration resource guide for immunization services throughout the life course* for longer term vision • Utilize existing strategies and experience from polio endemic countries, including Hub initiatives • Build on current preventive SIA SOPs and prior experience from multi-antigen SIAs • Build on *Campaign Effectiveness Landscape and Case for Action*
Key Global & Regional Outputs	• Consensus among global stakeholders of high-risk areas in which interventions can be jointly implemented and better accessed with equitable strategies for delivery of all vaccines • Global operational planning guidelines (including cost-sharing) for integrated campaigns • Mechanism and joint action plan developed to pursue coordinated interventions in targeted countries: integrated multi-antigen campaigns, and PIRIs / catchup vaccination activities • A common agreed global or regional framework for capacity building of PEI staff on routine EPI that enables them to support routine immunization activities more effectively • Regional plans for targeting support for integration to prioritized countries
Outcome	• Decreased VPD mortality and morbidity in marginalized communities

Acute Outbreaks

Input Needed	• GPEI partners (BMGF, CDC, Gavi, Rotary, Unicef, WHO)—all levels (especially Rapid Response Teams) • EPI partners (multiple) • WHE –all levels • Donor and other stakeholders
Process to follow	• Build on current outbreak response guidelines for polio and measles • Build on WHE emergency preparedness and response guidelines • Build on prior joint outbreak response experience
Key Global & Regional Outputs	• Revised outbreak response tools and guidelines • Comprehensive VPD and WHE outbreak response strategy • Collaboration between polio and EPI in regional Rapid Response Teams
Outcome	• Increased efficiency in VPD outbreak response, faster stoppage of outbreaks, institution of recovery plans to prevent further outbreaks

Annex C. Comprehensive Vaccine-Preventable Disease (VPD) Surveillance

Integration of Activities for Polio Eradication and Essential Immunization

Background

The World Health Assembly (WHA) endorsed the Strategic Action Plan on Polio Transition in May 2018, which identifies the capacities and assets, especially at the country level, required to maintain a polio-free world after eradication, to strengthen immunization systems including vaccine-preventable disease (VPD) surveillance, and strengthen emergency preparedness, detection and response capacities. As part of its commitments under the Strategic Action Plan, the World Health Organization (WHO) convened a meeting of key polio eradication stakeholders in Montreux, Switzerland on 13-14 November 2018, to review the implementation of the plan and discuss possible future governance options (1).

One of the conclusions of the Montreux meeting was the agreement that WHO would take the lead to convene follow-up discussions in the coming months on the pragmatic implications of polio transition -- the process of transferring the necessary functions and funding from the GPEI to maintain a polio-free world -- across the four thematic transition priorities identified at the meeting: comprehensive VPD surveillance; emergency preparedness and outbreak response; strengthening immunization system delivery; and poliovirus containment (10). WHO collaborated with the U.S. Centers for Diseases Control and Prevention (CDC) to host a follow-up discussion on the transition priority of comprehensive VPD surveillance on 27-28 March 2019 in Atlanta (1)?

Most countries have national case based VPD surveillance in place for polio, measles, and neonatal tetanus. In many countries, poliovirus surveillance may already be nested within VPD or broader communicable disease national surveillance systems, with sentinel case-based surveillance for one or more of a variety of other diseases. The polio program supports much of the VPD surveillance infrastructure in many countries, particularly the cost of laboratory networks, surveillance officers, field investigations, and data management. There is a risk of losing these VPD resources as funding for polio diminishes the closer, we get to certification (5,9,11,12).

A major goal of GPEI and polio transition is to ensure that AFP surveillance remains a priority in a post-certification world in the absence of Global Polio Eradication Initiative (GPEI) and its dedicated funding. Critical to sustaining a polio-free world is maintaining high sensitivity to detect poliovirus in high priority countries that pose a risk to global eradication as outlined in the GPEI Post-Certification Strategy (PCS) [http://polioeradication.org/polio-today/preparing-for-a-polio-free-world/transition-planning/polio-post-certification-strategy/]. For this reason, it is essential to GPEI that VPD surveillance systems continue and improve in quality so that polio eradication can be sustained under an integrated framework. At the Montreux meeting a discussion took place on how the current fragmented VPD surveillance system could be transformed into a more cohesive and comprehensive system. Currently, a Global Comprehensive VPD Surveillance Strategy led by WHO has been developed (2), which will be included in the Vision and Strategy for Immunization 2021-2030, the new Immunization Agenda 2030 (3).

Introduction

Surveillance for vaccine-preventable diseases (VPDs) provides continuous, long-term evidence-based information that allows for timely detection and response to disease. VPD surveillance in low- and middle-income countries has historically focused on polio, measles, rubella, and neonatal tetanus surveillance, and has been characterized by fragmentation across disease-specific initiatives and suboptimal use for immunization program decision making. By contrast, Immunization Agenda 2030 and the Global Strategy

on Comprehensive VPD Surveillance proposes a new paradigm for VPD surveillance that is integrated/comprehensive and includes more VPDs. The design is driven by the objectives of surveillance and the information generated links directly to immunization program management. For most VPDs, laboratory confirmation of disease and case-based data to pinpoint disease will be required (4-7).

Key definitions for this discussion are (2):

- **Comprehensive**, encompassing all vaccine-preventable disease threats faced by a country, in all geographic areas and populations, using all laboratory and other methodologies required to detect diseases reliably; and
- **Integrated**, wherever possible, taking advantage of shared infrastructure for components of surveillance such as data management and laboratory systems.

The Global Polio Eradication Initiative (GPEI) funds much of VPD surveillance efforts and has laid the groundwork for laboratory networks, linkages of laboratory and epidemiologic surveillance, and indicator-based performance quality measures. Gavi has funded many of the sentinel site networks to measure impact of vaccine introduction. The true extent of VPD surveillance cost has not been characterized, partially because of the large portion of VPD surveillance resources that are covered by GPEI (e.g., infrastructure, staff, logistics) and other partners. Once polio is eradicated, VPD surveillance is at risk of losing its primary funding stream (i.e., polio) and an overall decrease in attention and performance quality (5,9,11,12). There is a desire by many in the immunization world to prevent this from happening by establishing a comprehensive approach to VPD surveillance (4,7).

Cutting or eliminating VPD surveillance funding may appeal to donors and governments in the short-term because it may seem less obviously urgent or lifesaving compared to other immunization program investments, but surveillance systems are a long-term investment with strong economic rationale. Timely outbreak detection and response results in lower costs and fewer lives lost than would occur with later detection and larger and more costly responses. Long-term data can be used to convince governments on the impact of vaccines and the need to fund EPI programs. The task now is to provide an argument to governments and donors about the necessity of continued and adequately resourced VPD surveillance (4).

1. Key points about the relationship between polio and VPD surveillance

- Polio is the foundation for national VPD surveillance systems in many low- and middle-income countries.
- Polio funds a significant amount of the VPD surveillance system, e.g., human resources, logistics, infrastructure.
- Even with polio support, current funding is insufficient to achieve various global/regional VPD goals.
- Careful planning and consideration need to be undertaken to ensure all the gains in VPD surveillance are not lost during polio transition.
- In the transition and post-eradication phase when GPEI and its funding no longer exists, polio surveillance will rely on the established VPD surveillance system to sustain achievements and maintain optimal surveillance performance quality.

2. Why is comprehensive VPD surveillance needed and critical?

- **EPI/NIPs:** VPD surveillance is an essential tool for EPI program management. Country programs should outline their own disease priorities and key objectives for each disease under surveillance

as an integral part of discussions relating to surveillance prioritization and design. The primary question in deciding whether to undertake surveillance for a particular VPD is whether surveillance data will inform key vaccine policy and immunization strategy decisions.

- **Ministry of Health/government health agencies:** Understand VPD burden, impact of vaccination, resource allocation across VPDs and other areas, opportunities, and impact of integration with other non-VPD surveillance and health services, outbreak response cost/politics/public trust implications
- **Ministry of Finance/Treasury:** Potential outbreak response cost savings/macroeconomic impact of averted/quickly controlled disease outbreaks
- **Elected officials/leaders:** Outbreak response cost/macroeconomic impact/politics/public trust implications
- **Donor governments: U**nderstand and help mitigate disease threats elsewhere that can quickly spread to donor countries
- **Other donor organizations/international health and development agencies: U**nderstand burden to prioritize investments, measure impact of investments in vaccination
- **Pharma/private sector:** Understand market and need for new products, reduce risks to supply chains, labor force, and business operations from outbreaks
- **Academia/research:** Research, evidence generation, innovation in vaccines, treatments, public health interventions, surveillance, and information system improvements, etc.

To clearly articulate the critical need for a comprehensive VPD surveillance system, the GPEI Integration Working Group recommends that GPEI pursue the following short-term objectives to demonstrate the necessity of continued and adequately resourced VPD surveillance.

Expected Outcomes (2020-2021)

1. Improved collaboration, coordination, and integration of polio and other VPD surveillance activities (9,10,12).
2. Improved collaboration, coordination, and integration of polio and VPD lab network activities (5,11).

Expected Outputs (2020-2021)

1. Completion and publication of the "Global Strategy on Comprehensive VPD Surveillance."
2. Complete the estimation of the global Financial Resource Requirements (FRRs) for comprehensive VPD surveillance, 2021-2030 (Pallas et al, work in progress).
3. Launch of a resource mobilization initiative to implement comprehensive VPD surveillance globally and the investment case for VPD surveillance in the African Region (8).
4. Development of an advocacy and communication plan to raise awareness about the VPD surveillance strategy and its importance to program success (1).
5. EMRO to develop a regional strategy for comprehensive VPD surveillance along the lines of the African Region strategy.

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Annex D. Additional areas of work for integration

In addition to the three priority areas of work covered above, other technical areas are also recognized as critically important for integration, but they either: a) already have substantial integration; or b) will require implementation over a longer period beyond the timeframe of the iPOW. The status and potential for integration in these areas is briefly summarized below. However, specific steps for global actions in these important areas will need to be developed as part of future strategic planning

Vaccine demand and supply

WHO EPI representation and close collaboration with Gavi and all implementing partners in the GPEI Vaccine Supply Task Team (VSTT) ensures integrated global forecasting for demand of all polio vaccines (including IPV). The global procurement and distribution for polio vaccines, and indeed all vaccines across both programs, is managed and coordinated by UNICEF through their supply network down to the country level. There is sufficient global IPV supply to now introduce at least one dose into EPI schedules for all countries. The *IPV Supply and Procurement Roadmap* developed with inputs from both programs seeks to provide a sustainable global supply of IPV at affordable price for Gavi and lower-middle income country markets.

The COVID pandemic has markedly disrupted vaccine supply chains resulting in delayed and/or more costly deliveries for all vaccines. The interruptions to both routine vaccination and SIAs has also created increased demands on national cold chain storage capacity and potential for expiring vaccines. Global distribution of COVID vaccines may also impact the distribution of all other vaccines at least for a set time period.

In the short to medium term, these challenges further highlight the imperative for close coordination at global and country levels as immunization activities resume. In the longer term, both programs need to be actively engaged in helping to shape the polio vaccine market and stockpile requirements. If cVDPV2 outbreaks continue, substantial collaboration will be required to determine vaccine requirements, procurement, and implementation process for potentially re-introducing tOPV into EPI.

Health Information Systems

In addition to epidemiologic data, programmatic data, including monitoring results of SIAs, for the polio program has primarily been consolidated from country and regional sources into a global Polio Information System (POLIS) database. A separate system covering other VPDs has been developed through the WHO Immunization Information System (WIISE). While the WHO Health Emergencies (WHE) Program provides information on outbreaks and their management, overall communicable disease data remains scattered through multiple data bases at the global level. There are ongoing initiatives to align global data collection for POLIS and WIISE starting with converging geo-reference data. Regions have already attempted to develop more consolidated systems not only for collecting surveillance data, but also programmatic information for their countries. For example, the District Health Information System (DHIS2) development in AFR is proceeding with WHE and POL as part of the steering committee to ensure that polio and other outbreak prone diseases are included in the system.

As with the collection of epidemiologic data, the COVID pandemic has created challenges for all health information systems covering immunization programs. While many resources have been redirected to the monitoring COVID cases, the priority for POLIS and WHO Immunization Repository has been to provide a common source to track the impact of the pandemic on program implementation.

In the short to medium term, the key action is to utilize the current POLIS to track the impact of COVID-19 and upgrade the system to facilitate use by other VPDs. The longer-term aim is to share data with the WHO Immunization Information System (WIISE) in a consolidated system as close monitoring of polio data will be required for many years post-eradication. Although there are significant challenges to global assimilation of multiple data bases due to variable program objectives, establishing links to other primary health care data systems, especially with WHE, will be important to foster broader integration with immunization programs at all levels.

Implementation research and innovation

The primary research areas that are relevant to both GPEI and EPI programs are focused on IPV or fostering new approaches to integrated surveillance. Multiple studies are in progress or planned to develop alternate IPV, including: Virus Like Particle vaccine, Micro Array Patches with IPV, Sabin IPV (sIPV), and adjuvanted IPV. These new IPV and delivery mechanisms could markedly expand supply, increase efficiency of delivery, and even potentially lower the cost of the vaccine. Importantly for the long term, WHO and manufacturers are collaborating to maximize containment and ensure safer IPV production. On the surveillance front, proof of concept demonstrations is in progress to develop new techniques for use of ES to detect other VPDs.

The primary impact of the pandemic may have been to shift some research priorities to immediate requirements to address COVID vaccine development. Additional direct benefits to polio/EPI integration from ongoing research are promising, but more likely to be available in the future beyond the iPOW.