



Centers for Disease Control and Prevention  
**GLOBAL IMMUNIZATION  
STRATEGIC FRAMEWORK  
2021–2030**



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*CDC Global Immunization Strategic Framework 2021–2030*

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# Executive Summary



**As the leading United States (U.S.) government public health institution**, the mission of the Centers for Disease Control and Prevention (CDC) is to protect the safety, health, and security of America from threats within the country's borders and around the world. CDC's investments in global health contribute to protecting the security and stability of countries around the world and responding to global health threats that may affect the United States. Immunization is among the most cost-effective ways to support a healthier and safer world.

Emerging global health challenges, such as the COVID-19 pandemic, reinforce the value of vaccination in preventing disease and the need for a flexible and sustainable approach to build immunization program capacity to save lives, prevent disability, and protect livelihoods for Americans and populations around the globe. *CDC Global Immunization Strategic Framework 2021–2030 (CDC GISF 2021–2030)* guides CDC's investments in building global immunization program capacity and scientific expertise to advance the control, elimination, and eradication of vaccine-preventable diseases (VPDs) over the next ten years.

*CDC GISF 2021–2030* contains three major components:

## GOALS

Core immunization program capacity domains that CDC seeks to strengthen.

## GUIDING PRINCIPLES

How CDC will pursue its goals.

## HEALTH IMPACT OBJECTIVES

Continuum of disease-specific impacts.

The **goals** categorize and focus the immunization program strengthening work in which CDC seeks to invest over the next decade. The goals include three central domains—**prevent, detect, and respond**—that describe the fundamental disease control functions of immunization programs. These central domains are supported by two cross-cutting domains—**sustain** and **innovate**—that enable continuous improvement in immunization program performance. Each goal has priorities and focus areas that direct CDC’s activities, highlighting where CDC can deliver the most impact to advance each goal. The **principles** are cross-cutting accelerators that will guide how work is undertaken within each goal. The **health impact objectives** support a living list of targets over the next ten years to focus the disease-specific work in which CDC anticipates investing to help regions and countries achieve multiple VPD-specific targets. This list will be updated in the next decade as targets are met and new targets emerge and are set (see [Table 2](#) and [Annex F](#) for more information).

CDC’s areas of comparative advantage include scientific and programmatic expertise, as well as its work with partners to build immunization program capacities at global, regional, and country levels that are needed to prevent, detect, and respond to VPDs. These are cornerstones for the success of *CDC GISF 2021–2030* mission to eliminate existing and new VPD threats around the world. Through disease-specific and health system strengthening efforts, immunization program capacities can be applied to control, eliminate, and eradicate multiple VPDs. As immunization programs achieve disease-specific targets, programs may be able to shift resources to maintaining the gains made and addressing other VPDs or to control and prevent emerging health threats.

## *CDC GISF 2021–2030* intends to:

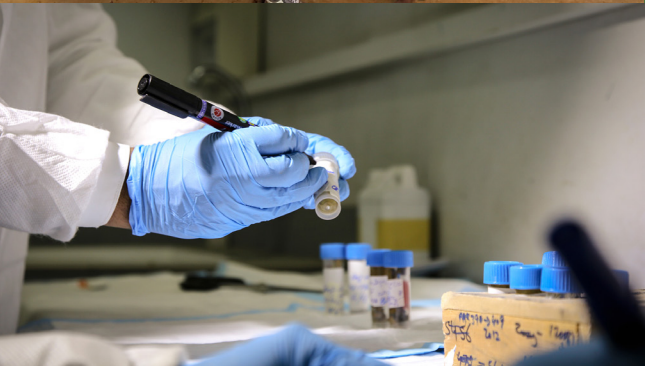
**ARTICULATE** CDC’s vision of success in global immunization and how it aligns with the global vision defined in key partner strategies, including the *Immunization Agenda 2030 (IA2030)* and Gavi 5.0.

**IDENTIFY & COMMUNICATE** CDC’s role in strengthening the capacity and performance of immunization programs at global, regional, and country (including subnational) levels within a global ecosystem of partnerships.

**DEFINE** goals, priorities, focus areas, and principles that use CDC’s comparative advantage to achieve CDC’s vision of success.

**GUIDE** the coordination of global immunization work within CDC and with partners.

CDC’s unique position within the ecosystem of global immunization partnerships allows the agency to function in multiple roles (i.e., supporting research and evaluation, providing technical assistance, or funding operational resources) depending on the local environment. CDC coordinates with partners to identify synergies and maximize complementary investments for locally tailored implementation efforts.



## **CDC GISF 2021–2030**

describes how CDC will engage globally to support the development of vaccination strategies that can prevent and respond to pandemic threats such as COVID-19, and future emerging infectious diseases, including zoonotic diseases. This approach includes:

**Innovation** to speed the availability and deployment of new vaccines and diagnostics.

Developing and implementing vaccination strategies to **prevent** transmission and disease.

Developing surveillance, laboratory and other immunization program capacities to **detect** and **respond** to outbreaks.

**Sustaining** immunization program capacity to ensure adequate resources and workforce, evidence-based decision making, and immunization safety systems that protect global and domestic populations.

In the context of global health security, the framework also positions CDC to address future public health threats that can impact economic and physical security.

**We envision  
a world with  
healthy people  
who are protected  
from vaccine-  
preventable  
disease, disability,  
and death.**



**Our mission is to provide  
scientific and programmatic  
leadership to end vaccine-  
preventable disease threats.**

# Introduction

CDC is the leading U.S. government public health institution, helping people in the United States and around the globe live healthier, safer, and longer lives. When people are protected against preventable diseases, they can enjoy greater security and stability, making greater contributions to their families, economies, and societies.

**CDC investments in global health** promote the security and stability of countries around the world, and help prevent, detect, and respond to global health threats before they affect the United States. CDC's work in global immunization to end VPD threats around the world is critical to achieving its global health vision. This work includes responding to pandemic threats, such as COVID-19, in which the development and deployment of safe and effective vaccines can play an important role.

*CDC GISF 2021–2030* describes CDC's theory of change and comparative advantage in global immunization. It will guide the CDC's work during the next ten years to advance the control, elimination, and eradication of VPDs. The goals in *CDC GISF 2021–2030* articulate CDC's aims and domains for focused investments over the next decade. The priorities highlight the most impactful and important focus areas for CDC to advance each goal.

*CDC GISF 2021–2030* builds on the success of CDC's previous strategic frameworks and global immunization work across the agency.<sup>1-5</sup> Under CDC's *Strategic Framework for Global Immunization 2016–2020*,<sup>1</sup> CDC advanced goals to control, eliminate and eradicate VPDs; strengthen country ownership of immunization programs, evidence-based policy and practices, and strategic partnership initiatives; ensure quality of vaccination delivery; strengthen immunization and surveillance information; and conduct and promote research, innovation, and evaluation.

*CDC GISF 2021–2030* builds on the previous strategy and sets the direction for the next decade of CDC's global immunization work to protect people domestically and globally, within the context of the U.S. *Vaccines National Strategic Plan 2021-2025*,<sup>6</sup> the *CDC Strategic Framework*,<sup>7</sup> and CDC's *Global Health Strategy*.<sup>8</sup> *CDC GISF 2021–2030* includes: **goals** which specify CDC's unique role to strengthen capacities and enhance the performance of immunization programs at global, regional, and country (including subnational) levels, **guiding principles** which describe how CDC will pursue its goals, and **health impact objectives** which specify the continuum of disease-specific impacts that CDC's investments will help to achieve. It is informed by and aligned to the priorities and focus areas of the *Immunization Agenda 2030*,<sup>9</sup> which was developed by the World Health Organization in collaboration with countries and partners, and sets an overarching vision and strategy for collective action on global immunization for the decade 2021–2030 ([Annex C](#)). *CDC GISF 2021–2030* is also informed by, and aligned to, the goals and objectives of *Gavi 5.0*, the 2021–2025 strategy for Gavi, the Vaccine Alliance,<sup>10</sup> and the *UNICEF Immunization Roadmap 2018–2030*.<sup>11</sup> CDC will implement its framework in collaboration with diverse partners, including other U.S. government agencies, other country governments, multilateral organizations, partnership initiatives, foundations, civil society organizations, research and technical institutes, and other partners.



# A CDC-wide Initiative



**CDC's global immunization work** in support of immunization programs outside of the United States involves multiple CDC centers, divisions, offices, and programs that provide disease-specific and/or immunization program expertise (Figure 1, [Annex A](#)) and implement activities to achieve immunization priorities and goals. All involved CDC centers contribute to CDC's human immunization work. CDC's National Center for Immunization and Respiratory Diseases (NCIRD) leads U.S. domestic immunization and VPD surveillance efforts. CDC's National Center for Emerging and Zoonotic Diseases (NCEZID) leads CDC's animal immunization work. The Global Immunization Division (GID) in CDC's Center for Global Health (CGH) coordinates global immunization goals and priorities across the agency.

Figure 1. CDC's Centers, Divisions, and Offices that advance global immunization



 Provide disease-specific and/or immunization program expertise to CDC GISF 2021-2030

# The Case for Immunization

**Immunization is an economically sound investment and is among the most cost-effective ways to improve health**, and by extension, the economic well-being of communities and nations.<sup>12-14</sup> The costs of VPDs can be substantial to families, communities, businesses, and health systems, including lost work and school days, costs of medical care, loss of livestock to zoonotic infections, diversion of resources to outbreak response, and disability and death due to VPDs. By preventing the spread of VPDs, immunization plays an important role in protecting population health, decreasing antibiotic resistance, and reducing and containing outbreaks, which can disrupt local and global economies, travel, and trade. Additionally, immunization supports a healthy and productive workforce in the global economy, advances safety

and security for Americans at home and while traveling and living abroad, and ultimately, supports a healthier and safer world. Immunization is also a foundation for primary health care. The child and adolescent schedules are closely linked with the timing of primary care visits to administer other preventive health interventions, and adult vaccination visits to primary care providers are also opportunities to provide other recommended preventive services across the lifespan. Elimination and eradication of zoonotic VPDs (e.g., rabies) can be even more cost-effective when vaccination interventions target both humans and the animal reservoir.<sup>15</sup> U.S. government investments in building global immunization program capacity provide a sustainable approach to save lives, prevent disability, and protect livelihoods for Americans and populations around the globe.

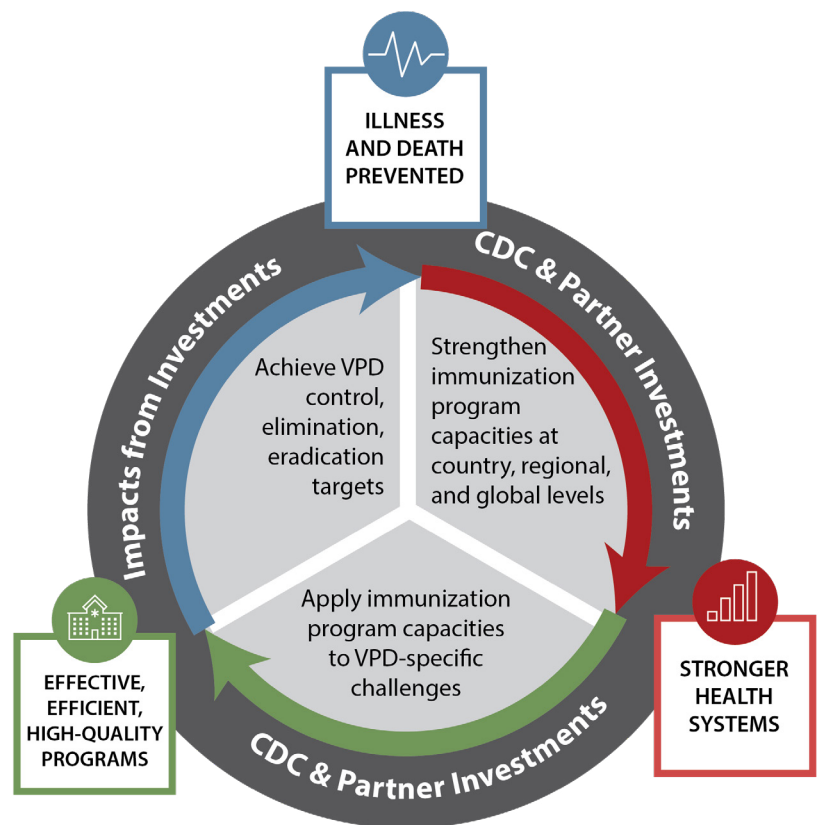


# Theory of Change

## From CDC Investments to Immunization Program Impacts

**A theory of change based on CDC's commitment to building sustainable immunization programs** provides the logical underpinning for how CDC aims to invest in achieving global immunization impact. CDC's model for preventing illness and death from VPDs begins with strengthening core immunization program capacities at country, regional, and global levels (Figure 2). Program capacities apply across the spectrum of VPDs and refer to the availability of infrastructure, resources, information, and processes needed for immunization program actions. Program capacities include political and community commitment, disease surveillance, outbreak and emergency response, ensuring vaccine safety, promoting immunization demand, vaccine introduction, vaccination service delivery, workforce development, immunization information collection and analytics, evidence generation and translation, evidence-based decision making, and sustainable financing. By strengthening capacities, the quality and speed of program actions can be increased.

Figure 2. CDC's Theory of Change: A continuous quality improvement cycle to achieve immunization program impact



National immunization programs at the country level (including subnational levels) are at the core of CDC's approach. Regional and global immunization program partners support national programs and need requisite program capacities to effectively fulfill their roles. Thus, all five goals in *CDC GISF 2021–2030* focus on building program capacities at country, regional, and global levels. Progress towards these goals will be measured by improvements in program capacities, which in turn will result in stronger health systems. Immunization programs provide a foundation for primary health care and act as a key driver to create a world where people in the United States and around the globe live healthier, safer and longer lives.

Applying immunization program capacities to challenges across the disease impact continuum to control, eliminate and eradicate VPDs ([Annex F](#)) is the next step in CDC's theory of change. It reflects CDC's belief that disease-specific efforts must always occur in concert with efforts to strengthen core immunization program capacities and health systems. In this step, immunization program capacities are used to design and implement VPD-specific strategies and to identify and develop solutions for programmatic challenges. VPD-specific initiatives can also reinforce program capacities to meet disease-specific objectives that may also benefit the broader health system and reveal where program capacities need strengthening. Progress is measured by improvements in the quality, effectiveness, availability, and efficiency of immunization program functions and services (e.g., coverage and equity, outbreak response timeliness and quality). Indicators used by disease-specific initiatives will assess performance in specific program functions (e.g., surveillance, vaccination service delivery).

By applying immunization program capacities to VPD-specific challenges across the disease impact continuum, CDC will help immunization programs achieve existing and new VPD control, elimination, and eradication targets when they are endorsed by country governments through World Health Organization Regional Committees and the World Health Assembly. Disease-specific impact targets provide accountability and incentives to ensure that strong, fit-for-purpose immunization program capacities are being built and applied effectively and efficiently to prevent illness and death due to VPDs.

In CDC's theory of change, efforts to achieve VPD control, elimination and eradication targets also positively affect immunization program capacities by focusing attention and increasing investment to improve an immunization program's performance. Rigorous target setting can attract more investment, which can further build capacity to achieve even more ambitious targets. Additionally, as VPDs are eliminated and eradicated, immunization program resources may be able to be allocated towards other immunization program priorities.

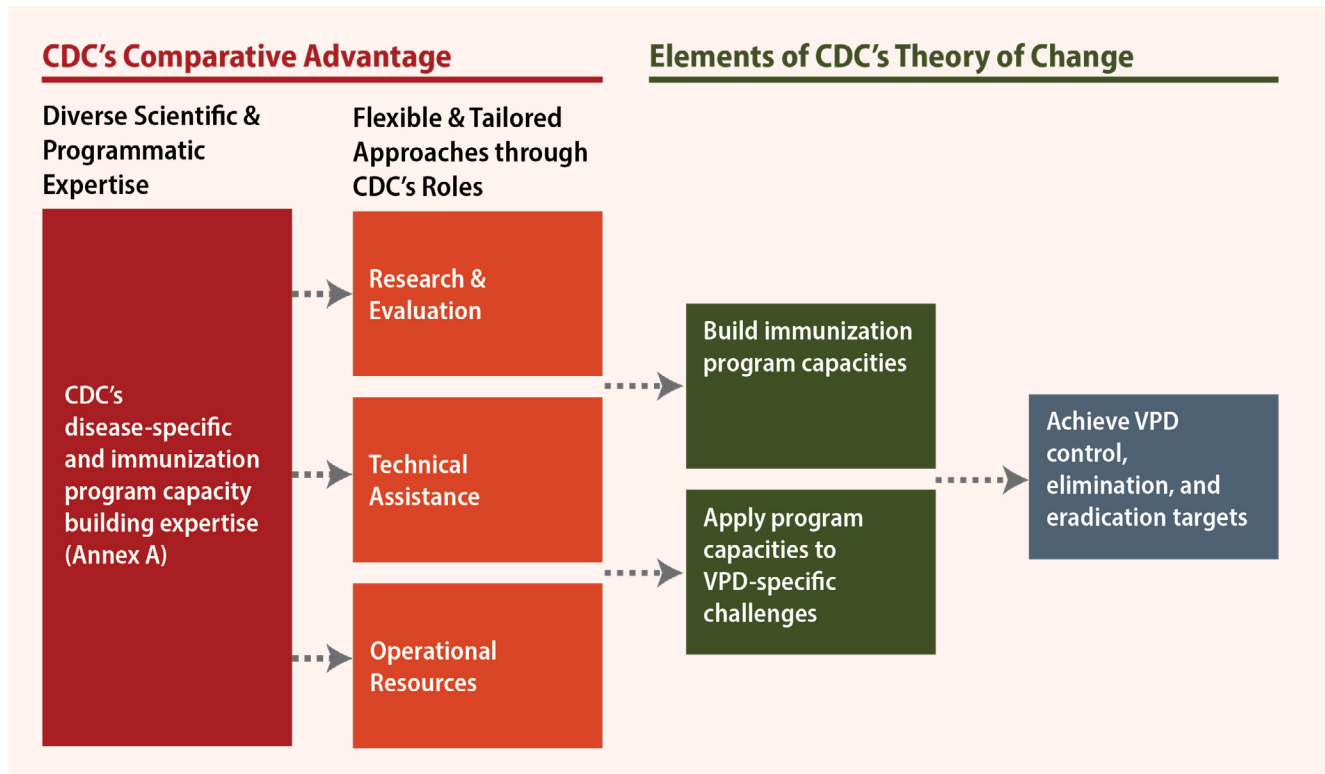
CDC's investments and comparative advantage complement investments from other partners at global, regional, and country levels. Together, these investments support capacity building and implementation to make impacts across the disease continuum. As immunization program capacities, including for sustainable financing, are strengthened, the need for support from external partners will decrease in some settings. This will allow CDC to refocus investments to maintaining the achievements and improving other VPD and immunization program capacity areas with greater need.

# CDC's Comparative Advantage to Strengthen Immunization Programs

**CDC's comparative advantage in global immunization is grounded in its longstanding epidemiological, laboratory, and programmatic expertise** related to VPDs, which can be used for both domestic and global immunization program capacity building (Figure 3; [Annex A](#)). CDC leverages the work of its scientific and public health experts supporting the U.S. domestic immunization program to provide technical advice, practical training and mentoring, and experience to national immunization programs and authorities in countries across the globe. CDC has staff with specific expertise working in international and resource-limited settings to tailor strategies to the needs in different countries and regions. At the global level, CDC contributes as a technical expert and partner to the development of global guidance, norms, standards, and resources.



Figure 3. CDC's comparative advantage links to its theory of change



CDC's comparative advantage in global immunization also lies in its unique position as a U.S. government agency with bilateral relationships with national immunization programs, including via CDC country offices and with global partners. To strengthen immunization programs, CDC's roles include supporting research and evaluation, providing technical assistance, and providing funding for immunization program operational resources; research and evaluation and technical assistance can be provided directly by CDC staff or through collaboration with external partners. CDC works with other U.S. government agencies and offices to coordinate

with countries and partner organizations on global immunization activities that advance U.S. and global health security. These agencies include the U.S. Agency for International Development (USAID), the National Institutes of Health (NIH), the Food and Drug Administration (FDA), the U.S. Department of State (DOS), the U.S. Department of Agriculture (USDA), and the Department of Defense (DOD). CDC's flexibility to engage in different roles and its ability to collaborate with and leverage other U.S. government agencies' activities informs the goals and priorities of *CDC GISF 2021–2030*.

# Enabling Partnerships

**Partnerships are essential** to the success of *CDC GISF 2021–2030*. CDC engages with multiple types of partners to collaborate in advancing global immunization progress. All partnerships ultimately support the ownership of national immunization programs by country governments (Figure 4).

## CDC's enabling partnerships include:



**COUNTRY GOVERNMENTS**, at both national and subnational levels, that bring leadership, accountability, domestic resources, and local knowledge to immunization programs.



**OTHER U.S. GOVERNMENT AGENCIES** that enable CDC to leverage and contribute to broader health, development, and health security activities.



**RESEARCH AND TECHNICAL INSTITUTIONS** (e.g., academia) that contribute to advancing research and evaluation to innovate for increased immunization program impact.



**IMMUNIZATION TECHNICAL ADVISORY GROUPS** (e.g., national immunization technical advisory groups [NITAGs], regional immunization technical advisory groups [RITAGs], WHO Strategic Advisory Group of Experts on Immunization [SAGE]) that use independent immunization experts to make evidence-informed recommendations related to immunization practices and policies.



**TECHNICAL AND CAPACITY-BUILDING NETWORKS** (e.g., field epidemiology training networks, laboratory networks, NITAG networks) that enable peer learning, and expand the availability of training and technical assistance.



**CIVIL SOCIETY ORGANIZATIONS** (e.g., non-governmental and faith-based organizations) that have strong community-level relationships and networks that are important to implement immunization program activities.



**MULTILATERAL ORGANIZATIONS** that bring a global perspective, leadership, and normative and technical guidance to global immunization initiatives, immunization program capacity development, and immunization program policies and practices.



**PARTNERSHIP INITIATIVES** that leverage the strengths of coalitions of partners, including the private sector, to develop and implement immunization program strengthening as well as VPD-specific partnership initiatives.



**FOUNDATIONS** that implement and provide financial support for immunization initiatives and activities at country, regional, and global levels.



**CDC's work with its partners**, whether in its role of supporting research and evaluation, providing technical assistance, or providing funding for immunization program operational resources, enables CDC to focus on its areas of comparative advantage, while collaborating with organizations that bring complementary expertise and roles (e.g., in commodity procurement and supply chain) to increase impact.

**Figure 4. CDC's partnerships in support of country governments**





# Goals

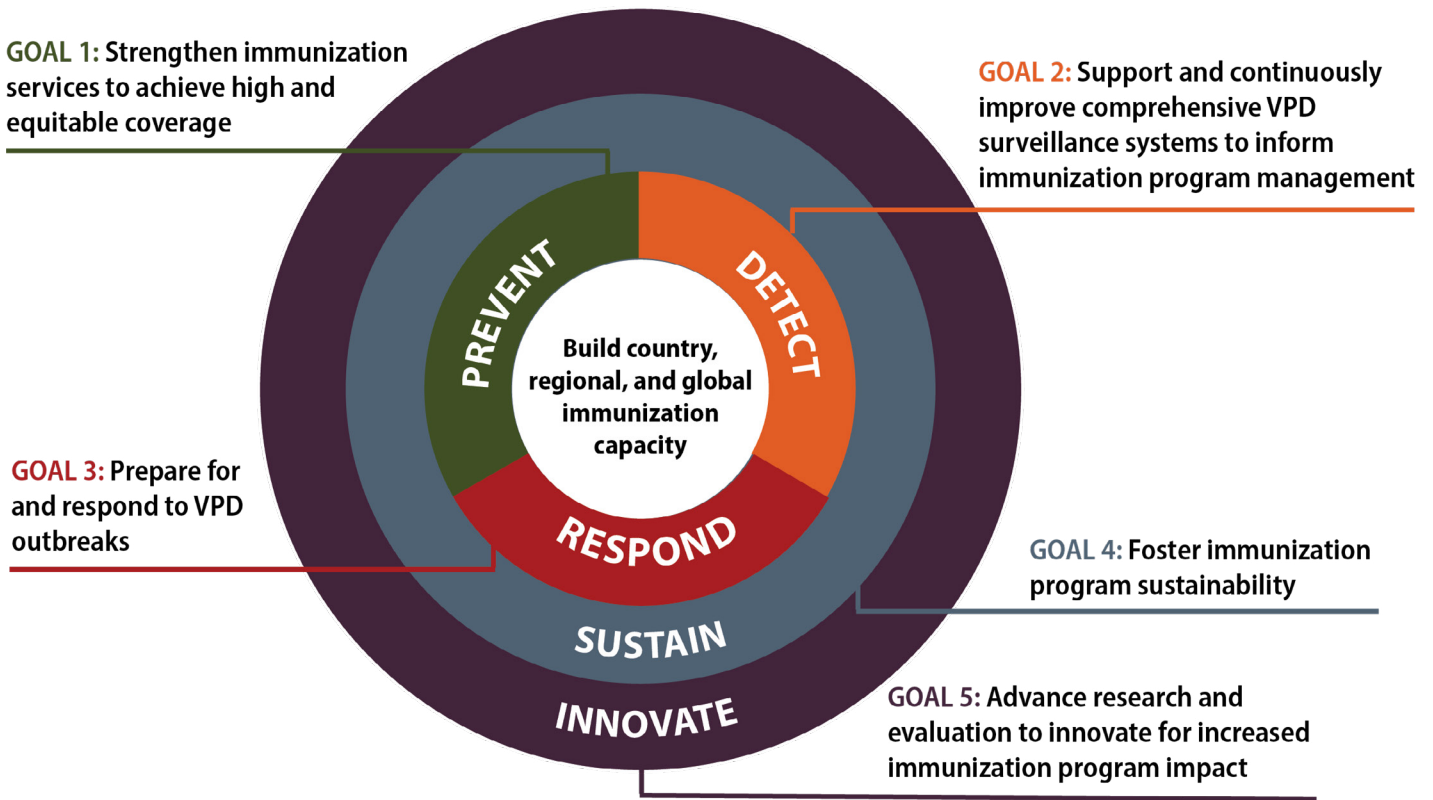
**CDC GISF 2021–2030 describes five global immunization goals** that CDC seeks to achieve to **prevent, detect, and respond** to health threats, as well as **sustain** progress and **innovate** to increase immunization program impact (Figure 5).

Each goal has supporting **priorities** and **focus areas** (described in the tables under each goal below) that align with the *IA2030* to ensure

CDC's actions under *CDC GISF 2021–2030* contribute to achieving the global vision for immunization. CDC's activities in its focus areas of comparative advantage will contribute to achieving *CDC GISF 2021–2030's* goals and priorities, which, in turn, will contribute to strengthening capacity and enhancing the performance of immunization programs around the world.



Figure 5. Overview of goals and principles



CDC applies four foundational principles to achieve the greatest impact of its global immunization work:

<b>DATA-GUIDED</b>	CDC will support the development of high-quality data analytics and promote the use of the best available evidence for optimal policy and programmatic decision making at all levels.
<b>INTEGRATED</b>	CDC will encourage a holistic approach to promote linkages between disease-specific and health system strengthening initiatives.
<b>PARTNERSHIP-BASED</b>	CDC will foster alliances that apply the strengths of each organization while ensuring impactful coordination and collaboration.
<b>FOCUSED INVESTMENTS</b>	CDC will leverage strategic information to make targeted investments to strengthen immunization programs.

# Goal 1 Prevent

## Strengthen immunization services to achieve high and equitable coverage

**Rationale:** High and equitable immunization coverage is critical to control, eliminate, and eradicate VPDs, including in animal populations for relevant zoonotic VPDs. Providing essential immunization services as an integral part of primary health care service delivery platforms across the life course is critical to achieving high and equitable immunization coverage. This includes expanding existing immunization approaches (e.g., for infants and pregnant women), developing new strategies across life stages (e.g., the second year of life, school entry, older children and adolescents, adults), and reaching special populations (e.g., healthcare workers, immunocompromised persons) and populations experiencing disadvantage (e.g., communities affected by conflict, disaster and humanitarian crisis; displaced and mobile populations). In addition, immunization programs need to address both: 1) supply-side barriers to vaccinating hard-to-reach populations; and 2) demand-side barriers to vaccinating hard-to-vaccinate populations.<sup>16-17</sup> One Health approaches that consider synergies in vaccination strategies can be important in increasing coverage, especially for some hard-to-reach human populations (e.g., nomadic pastoralists) and zoonotic VPDs for which animal vaccination is recommended to protect human health. Strong immunization information systems linked with vital statistics data and national identification systems can contribute to evaluating progress in immunization coverage, as well as identifying populations that need vaccination.

CDC works to strengthen essential immunization services in countries by supporting the development and implementation of strategies to link planning, delivery, and monitoring of vaccination with other related health interventions administered across the life course. CDC supports country efforts to identify and characterize populations at risk of low vaccination coverage, identify animal reservoirs for zoonotic VPDs, diagnose supply and demand barriers to vaccination, and develop interventions that tailor how essential immunization services are delivered. CDC also supports development of recommendations and programmatic interventions for vaccinations of migrants. Additionally, CDC helps countries develop and strengthen information systems and improve quality and use of data, including through data triangulation.<sup>18-20</sup> For program evaluation, CDC supports vaccination coverage surveys and linking birth registration and vital statistics information, where available, with immunization program registries to refine the source of denominator data and to better focus immunization efforts. From an immunization safety perspective, CDC supports the development of capacity to identify and respond to vaccine safety signals such as adverse events following immunization (AEFI) (see [Goal 4; Annex D](#)), and to communicate appropriately to maintain community trust and confidence in immunization programs. Furthermore, CDC supports the introduction of new and underutilized vaccines recommended

by immunization technical advisory groups, as well as linkages to other disease prevention and control initiatives. Examples of linkages include cholera and typhoid vaccination with water, sanitation and hygiene interventions; human papillomavirus (HPV) vaccination with school and adolescent health programs as well as cervical cancer screening and management; malaria vaccination with insecticide-treated net distribution

and other malaria control and elimination strategies; vaccination of resettling refugees during existing overseas medical examination procedures and in conjunction with antihelminthic mass drug administration; and animal rabies vaccination with deworming and spay/neuter programs. Priorities under Goal 1 are sustained by the cross-cutting capacities strengthened under Goal 4 (see [Annex D](#)).



**GOAL 1: PREVENT***Strengthen immunization services to achieve high and equitable coverage***Priority 1.1: Coverage and Equity***Identify and reach un- and under-immunized populations with tailored delivery strategies*

Focus Area 1.1.1 Promote, conduct, and support research and evaluation focused on identifying demographic, social, economic, and health system factors that influence access to vaccination services, particularly among populations experiencing disadvantage

Focus Area 1.1.2 Develop and evaluate promising vaccine delivery strategies that address the key determinants of access to vaccination services, particularly among populations experiencing disadvantage

**Priority 1.2: Demand for Immunization***Generate and sustain demand for immunization*

Focus Area 1.2.1 Promote, conduct, and support research and evaluation to understand and address challenges to demand for immunization using health communications, community engagement, and behavioral insights at the individual, community, provider, and health system levels

Focus Area 1.2.2 Develop and validate standardized qualitative and quantitative measures of vaccine demand and confidence for integration into national health systems and global health monitoring systems

Focus Area 1.2.3 Strengthen the capacity of countries to lead the development of improved demand strategies for immunization by providing technical assistance and supporting partner engagement

**Priority 1.3: Life Course Vaccination***Improve access to, and utilization of, immunization across the life course*

Focus Area 1.3.1 Identify factors hindering successful implementation of delivery strategies across the life course

Focus Area 1.3.2 Promote, conduct, and support research and evaluation on building service delivery platforms across the life course

Focus Area 1.3.3 Promote, conduct, and support research and evaluation on how to best establish integrated delivery points of contact between immunization and other public health interventions for different priority age groups

Focus Area 1.3.4 Strengthen immunization policies and service delivery throughout the life course, including for appropriate catch-up vaccinations and booster doses

**Priority 1.4: New and Underutilized Vaccine Introduction***Promote and support country decisions to introduce new and underutilized vaccines to address leading causes of VPD morbidity and mortality*

Focus Area 1.4.1 Generate rationale and evidence for vaccine development, introduction, policy recommendations, and licensure

Focus Area 1.4.2 Support countries in introducing globally- and regionally-recommended vaccines

Focus Area 1.4.3 Monitor and evaluate new vaccines and vaccination schedules

Focus Area 1.4.4 Use vaccine introduction to strengthen and extend immunization programs and health systems through the life course

**Priority 1.5: Immunization Information***Improve recording, reporting, and the use of immunization program data*

Focus Area 1.5.1 Promote standardization and integration of data processes, elements, and health information systems and tools

Focus Area 1.5.2 Identify best practices and provide guidance on information systems to improve the management and use of immunization data and its integration with other information systems (e.g., birth registration, vital statistics)

Focus Area 1.5.3 Improve practices and competencies of routine monitoring of immunization data quality and use for program decision-making

Focus Area 1.5.4 Promote cooperation between immunization programs, civil registration systems, and national identification systems to provide birth registration data for use in immunization program implementation, evaluation, and improvement

# Goal 2 Detect

## Support and continuously improve comprehensive VPD surveillance systems to inform immunization program management

**Rationale:** Comprehensive VPD surveillance systems that detect and track VPDs (including among animal populations for zoonotic VPDs that threaten human health) are important in guiding the planning, implementation, and evaluation of immunization programs; informing policy decisions; and detecting outbreaks and guiding outbreak response. To be effective, VPD surveillance systems and support functions (e.g., workforce, laboratory, monitoring and evaluation) must be sustainable and country-owned.<sup>20-22</sup> The priorities and focus areas in Goal 4 further elaborate on strengthening sustainability, which support Goal 2 priorities (see [Annex D](#)). For example, sustaining technical advisory groups (e.g., regional verification commissions [RVCs], national certification committees [NCCs]) (priority 4.2) will strengthen monitoring of VPD eradication, elimination, and control targets (priority 2.3).

CDC provides substantial technical and financial support to develop functional human and animal VPD surveillance systems. This includes assisting countries in designing, evaluating, and improving surveillance systems; developing surveillance guidance; and training those in the frontline surveillance workforce, including through the Field Epidemiology Training Program (FETP). CDC's work in strengthening VPD surveillance leverages and reinforces its work strengthening disease surveillance more generally, including country-

level investments in support of the global health security agenda. CDC has collaborated with WHO, the World Organization for Animal Health (OIE), and countries to build and maintain global, regional, and country-level VPD diagnostic capacity to detect the array of viruses, bacteria, and parasites that cause VPDs. This includes building the logistical capacity (e.g., specimen transport) to enable laboratory diagnostic testing. As a leading public health institution, CDC hosts global reference laboratories for multiple VPDs and plays a critical role in establishing and maintaining VPD laboratory networks around the world. CDC has also led the development of testing methods and laboratory capacity to detect pathogens for which vaccines are in development, including funding procurement of essential lab equipment and supplies (e.g., laboratory reagents). CDC VPD surveillance activities under Goal 2 are supported by the innovation priorities and focus areas under Goal 5. For example, CDC investments in the development and validation of new laboratory diagnostics with improved performance (e.g., sensitivity and specificity) or use characteristics (e.g., point-of-care diagnostics, multiplex bead assays for multi-antigen serosurveys, validation of alternate specimen types) will accelerate partner countries' ability to identify and respond to VPDs.

Future challenges include helping to establish and strengthen sustainable, country-led,

comprehensive VPD surveillance systems so that the data they provide are:

- Fit for purpose (e.g., individual-level data and for laboratory confirmation).
- Coordinated across human, animal, and environmental health sectors (e.g., for zoonotic VPDs, such as rabies, brucellosis, or zoonotic influenza).
- Accessible to guide immunization programs and enable timely and effective VPD outbreak detection and response activities.<sup>22</sup>

Additionally, to implement the International Health Regulations (IHR), comprehensive, multi-sector VPD surveillance capacity at global, regional, and country levels needs to link to and support communicable disease surveillance generally. CDC works to address these challenges by promoting country ownership and working with countries to build and strengthen VPD surveillance support functions (e.g., workforce, laboratory, monitoring and evaluation) in national public health institutes and animal health institutes. CDC works to address immunization program and VPD surveillance capacity gaps identified through the Global Health Security Agenda's (GHS) planning and evaluation processes.<sup>23-24</sup>

## GOAL 2: DETECT

### Support and continuously improve comprehensive VPD surveillance systems to inform immunization program management

#### Priority 2.1: Surveillance Capacity

##### *Advance comprehensive VPD surveillance system capacity and performance*

Focus Area 2.1.1 Support the development and enhancement of VPD surveillance policies, guidelines, and standards

Focus Area 2.1.2 Facilitate the optimization of surveillance systems support functions (e.g., laboratory, logistics and communication, workforce capacity, coordination, supervision, monitoring and evaluation, program management and governance) and linkage or integration with other public health, animal health, and environmental health surveillance

#### Priority 2.2: Laboratory and Diagnostics

##### *Enhance VPD diagnostic testing and expand laboratory networks*

Focus Area 2.2.1 Support the maintenance and strengthening of global VPD surveillance laboratory networks, including providing global and regional reference laboratory capacity

Focus Area 2.2.2 Support transfer of laboratory techniques and build systems to promote and maintain quality control processes in laboratories

Focus Area 2.2.3 Provide technical leadership for developing and utilizing new modes of laboratory surveillance (e.g., environmental, serologic, molecular) to guide immunization programs

#### Priority 2.3: VPD Surveillance Information

##### *Optimize quality, sharing, and actionable use of VPD surveillance information*

Focus Area 2.3.1 Provide technical input for the development of VPD surveillance information systems that are fit-for-purpose, sustainable, and linked to other human, animal, and environmental health information systems, where appropriate

Focus Area 2.3.2 Assess VPD surveillance information systems and improve the quality of epidemiologic and laboratory data so that they are adequate for timely and effective program action

Focus Area 2.3.3 Monitor progress toward and support verification of achievement of global VPD eradication and regional VPD elimination and control targets

# Goal 3 Respond

## Prepare for and respond to VPD outbreaks

**Rationale:** VPD outbreaks represent failures of prevention efforts and often delayed detection or suboptimal monitoring of surveillance data. Disease outbreaks are one of the greatest threats to global health and security. Prevention and control of VPD outbreaks are necessary to achieve goals to control, eliminate, and eradicate VPDs, including those among animal populations for zoonotic VPDs that threaten human health. Advances in technology and mobility have made the world more interconnected, and VPD outbreaks occurring anywhere in the world can quickly become threats to global health. Furthermore, emerging infectious diseases, such as COVID-19, can become pandemic threats for which new vaccines need to be rapidly developed and deployed. Over the next decade, building capacity to deploy vaccination for outbreak response around the world will be vital, both for existing vaccines and as new vaccines are developed against

known and newly discovered disease threats. CDC has substantial capacity and expertise to prepare for VPD outbreaks by developing risk assessment and mitigation strategies. CDC also has the capacity and expertise to respond to VPD outbreaks by conducting and supporting investigations (e.g., providing epidemiologic, laboratory, and data management expertise) to identify the interventions needed to effectively control the outbreak and prevent future outbreaks, and by providing technical assistance and program operational resources to support safe, effective, and timely use of vaccination in outbreak responses. CDC works to strengthen VPD outbreak preparedness and response capacity across human and animal health sectors in other countries, including developing effective linkages between immunization programs and emergency preparedness and response mechanisms, in support of IHR and GHSA.





**GOAL 3: RESPOND**  
**Prepare for and respond to VPD outbreaks**

**Priority 3.1: Risk Assessment and Mitigation**

*Use VPD risk assessments and monitoring to optimize the quality and timeliness of outbreak preparedness and response*

- Focus Area 3.1.1 Develop and refine risk assessment tools and predictive analytics using VPD surveillance and immunization data to identify populations at risk for VPD outbreaks
- Focus Area 3.1.2 Proactively develop timely and high-quality mitigation interventions to reduce the risk and magnitude of VPD outbreaks

**Priority 3.2: Outbreak Investigation and Response**

*Conduct investigations and optimize the effectiveness of outbreak preparedness and response*

- Focus Area 3.2.1 Design, conduct, and support investigations to identify the strategies needed to effectively control VPD outbreaks and the changes in policy and practice needed to prevent future outbreaks
- Focus Area 3.2.2 Facilitate safe, effective, and timely use of vaccination in outbreak responses, including the potential use of vaccines under emergency licensure conditions

**Priority 3.3: Outbreak Preparedness and Response Capacity**

*Build country, regional, and global capacity for VPD outbreak preparedness and response*

- Focus Area 3.3.1 Train and deploy surge capacity and build long-term capacity for outbreak preparedness and response (e.g., Stop Transmission of Polio [STOP], Field Epidemiology Training Program [FETP], Field Epidemiology Laboratory Training Program [FELTP], Public Health Emergency Management Fellowship [PHEMF])
- Focus Area 3.3.2 Build institutional capacity for effective VPD outbreak preparedness and response, including strengthening linkages of immunization programs and cross-sectoral collaborations with VPD surveillance systems
- Focus Area 3.3.3 Build multi-sectoral institutional capacity for outbreak response communications and community engagement



# Goal 4 Sustain

## Foster immunization program sustainability

**Rationale:** In addition to activities to prevent, detect, and respond to VPDs directly, immunization programs at all levels need to obtain adequate financial, human, and technological resources and establish systems and processes that ensure the continued safety and benefits of vaccination. The success and sustainability of VPD control, elimination, and eradication initiatives depend on country, regional, and global commitments to investing the resources needed to build and sustain immunization program capacities to vaccinate susceptible populations, detect and respond to VPD threats, and ensure population-level confidence in the safety and effectiveness of vaccines and immunization services. Goal 4 includes the immunization program capacities to mobilize the necessary political commitment and financing, make evidence-based decisions, ensure immunization safety, and strengthen workforce capacity for all immunization program functions.

CDC works to facilitate political commitment to immunization and accountability for results, which are essential for ensuring sustainable immunization program resources, including those for animal vaccination strategies against zoonotic VPDs that threaten human health. CDC also encourages country ownership of immunization programs, including sustainable immunization financing mechanisms that reduce dependence on external resources, as well as evidence-based processes to optimize the efficient use of available resources. CDC pursues sustainable immunization financing and vaccine pricing and procurement in partnership with other global, regional, and country organizations; CDC's role is focused around evidence generation and translation, capacity building, and technical assistance.

CDC's immunization policy development and review process through the Advisory Committee on Immunization Practices (ACIP) has served as a model for developing evidence-based recommendations for immunization strategies and practices at global, regional, and country levels.<sup>25</sup> CDC continues to support the development of immunization program capacity, including NITAGs, disease-specific NCCs and RVCs, and other advisory groups. CDC also fosters linkages with partners as needed to support evidence-based decision-making processes that integrate the best available research evidence, practitioner expertise, and the characteristics, needs, values, and preferences of the population.<sup>26</sup>

CDC also works to ensure vaccine safety and supports countries in identifying and responding to vaccine-related events (VREs).<sup>27-28</sup> Goal 4 includes immunization safety because of its cross-cutting relationship to prevention, detection, and response ([Annex D](#)), as well as preserving the independence and transparency of the immunization safety function from other potentially competing objectives (e.g., ensuring high coverage). Systematically capturing when VREs occur is critical to protecting the health and well-being of individuals and ensuring public confidence in immunization. CDC supports countries in developing surveillance systems for AEFIs and adverse events of special interest (AESIs). CDC also supports countries in enacting scientifically rigorous processes, such as establishing their own AEFI causality committees or conducting vaccine safety special studies. Additionally, CDC assists countries in evaluating and monitoring the safety of vaccines for animals used to control zoonotic VPDs that threaten human health. CDC will continue to ensure that its work is in alignment with other partner strategies, such as the upcoming Global Vaccine Safety Blueprint 2.0.<sup>29</sup>

As a cross-cutting support function to all other goals and priorities, CDC supports countries to build and sustain the workforce capacity needed to provide safe and effective immunization services and VPD surveillance. A multilevel, systems-oriented approach that monitors, adapts, and innovates is critical to improving workforce capacity.<sup>30</sup>

## GOAL 4: SUSTAIN

### Foster immunization program sustainability

#### Priority 4.1: Commitment and Financing

*Foster political commitment, accountability, and sustainable financing for immunization programs*

- Focus Area 4.1.1 Improve immunization program expenditure tracking data collection and synthesis at all levels (i.e. sub-national to global)
- Focus Area 4.1.2 Build capacity for the generation and use of economic and financial information, including economic evaluation of vaccination and immunization system interventions
- Focus Area 4.1.3 Facilitate learning environments for best practices around vaccine procurement and pricing
- Focus Area 4.1.4 Foster translation of economic and financial information on the value of vaccination to support resource mobilization efforts for immunization programs within the context of primary health care
- Focus Area 4.1.5 Coordinate convenings of public leaders from all relevant sectors to catalyze commitment to extending the benefits of immunization

#### Priority 4.2: Evidence-based Decision Making

*Strengthen technical advisory groups and evidence-based decision making for immunization policy and programs*

- Focus Area 4.2.1 Conduct evaluation and operational research on best practices to strengthen NITAGs, other advisory groups, and government capacity to make evidence-informed recommendations and policy on immunization
- Focus Area 4.2.2 Design and develop sustainable training programs and support materials (e.g., performance assessment and support tools, reference and advocacy materials, peer networks) for NITAGs, other advisory groups, and other immunization program decision makers
- Focus Area 4.2.3 Design and conduct joint evaluations to assess NITAG functionality and maturity, including the quality of work processes, outputs, and integration into decision making processes

#### Priority 4.3: Immunization Safety

*Ensure effective immunization safety monitoring and risk communication*

- Focus Area 4.3.1 Build the capacity of countries, including in immunization programs and regulatory bodies, to prevent, detect, and respond to VREs, including through the development of immunization safety monitoring systems
- Focus Area 4.3.2 Provide expertise to implement effective communication strategies on the safety and efficacy of vaccines
- Focus Area 4.3.3 Conduct research to identify and mitigate safety risks for specific vaccines and delivery technologies
- Focus Area 4.3.4 Identify and assess immunization safety strategies that support strong, safe, and sustainable immunization delivery systems
- Focus Area 4.3.5 Improve the quality and use of AEFI surveillance data at national, regional, and global levels

#### Priority 4.4: Workforce Capacity

*Build workforce capacity across all immunization program functions\**

- Focus Area 4.4.1 Identify workforce capacity-development needs across immunization program functions that address barriers to immunization system performance
- Focus Area 4.4.2 Design, implement, and monitor and evaluate country-led performance improvement interventions
- Focus Area 4.4.3 Conduct research to build an evidence-base for immunization workforce development interventions

\*Immunization program functions defined according to the WHO Standard Competencies Framework for the Immunization Workforce,<sup>31</sup> including workforce for advocacy and communications; disease surveillance, investigation, and response; human resources and performance management; monitoring, evaluation, and data use; policy, planning, and finance; safety of vaccines and immunization; vaccine supplies and logistics; vaccination service delivery; and leadership and management. Workforce functions are across both human and animal health sectors (e.g., including animal health workers such as veterinarians).

# Goal 5 Innovate

## Advance research and evaluation to innovate for increased immunization program impact



**Rationale:** Country, regional, and global capacity to identify key questions and conduct research and evaluation are critical to developing and implementing innovative solutions for immunization program impact to control, eliminate, and eradicate VPDs.

CDC advances immunization program impact by putting science into action according to the CDC Science Impact Framework.<sup>32</sup> CDC scientists collaborate with external partners (e.g., academia, civil society, multilateral organizations, and government organizations) to conduct research and evaluation to develop innovative solutions for programmatic challenges. CDC defines key questions based on disease-specific and program strengthening perspectives, conducts research, and uses monitoring and evaluation (including data analytics) to diagnose challenges and quickly learn what works. CDC then rapidly applies results to catalyze improvements in immunization policies, guidelines, and practices. With a history of expertise in laboratory science, CDC collaborates with epidemiological, behavioral, and program experts at the forefront of research to develop new vaccines, vaccine delivery methods (e.g., microneedle patch), diagnostic tests, surveillance and strategic information tools, and strategies to address immunization program challenges and maximize impact. CDC's approach to research and evaluation recognizes that scientists from multiple disciplines, across human and animal health sectors, and directly connected with country immunization programs are best positioned to identify key questions and conduct the studies needed to implement innovative solutions to programmatic challenges and to maximize the ability to prevent, detect, and respond to VPDs.

**GOAL 5: INNOVATE****Advance research and evaluation to innovate for increased immunization impact****Priority 5.1: Innovation Acceleration**

*Drive innovation needed to address key country immunization program challenges and increase immunization program impact*

- Focus Area 5.1.1 Generate evidence to address country immunization program challenges and inform decision-making and policy development at country, regional, and global levels (e.g., disease epidemiology, vaccine safety and effectiveness, service delivery, and economic evaluation)
- Focus Area 5.1.2 Accelerate the development of new vaccines, diagnostics, and technologies, needed to control, eliminate, and eradicate VPDs, and to address emerging infectious disease threats

**Priority 5.2: Research and Evaluation Capacity**

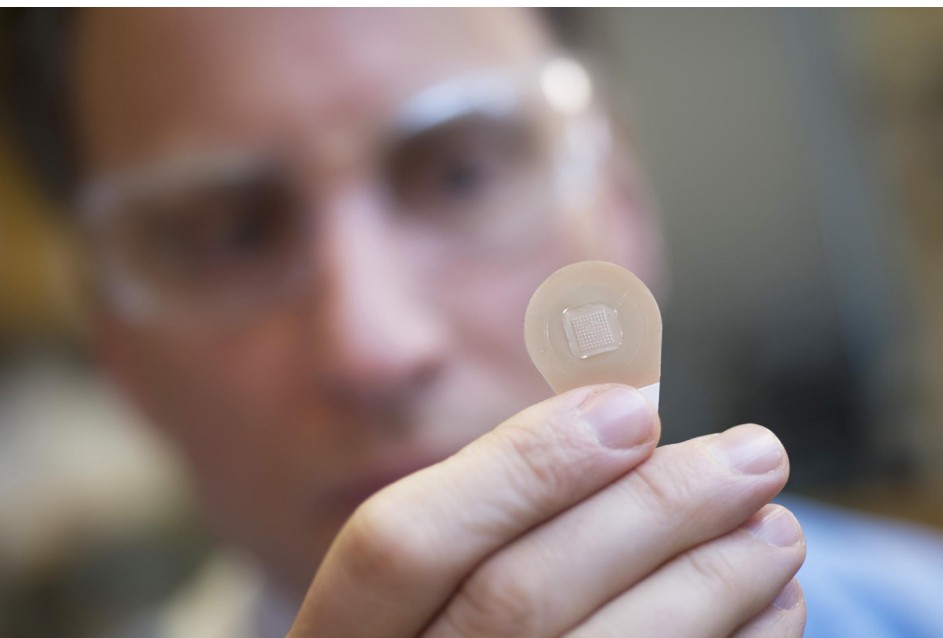
*Build country, regional, and global capacity to prioritize and conduct research and evaluation to increase immunization program impact*

- Focus Area 5.2.1 Support development of research and evaluation agendas to address key immunization program challenges
- Focus Area 5.2.2 Strengthen capacity to conduct research and evaluation through training, collaboration, and mentorship

**Priority 5.3: Evidence Translation**

*Translate and disseminate research and evaluation evidence to increase immunization program impact*

- Focus Area 5.3.1 Translate research and evaluation findings into immunization program policies, guidelines, and practices at country, regional, and global levels
- Focus Area 5.3.2 Disseminate research and evaluation findings in peer-reviewed literature, international guidance, and other fora (e.g., media, reports, conferences)



Christopher Moore [Photograph], Georgia Tech

# Guiding Principles

Following four foundational guiding principles, CDC will undertake efforts to achieve each goal that are:

- Data-guided.
- Integrated.
- Partnership-based.
- Supported by focused investments.

## Data-guided

CDC will support the development of high-quality data analytics and promote the use of the best available evidence for optimal policy and programmatic decision-making at all levels.

CDC plays an important role in developing and using high-quality data and scientific evidence to inform immunization programs. This data-guided approach will be applied across all goals, priorities, and focus areas in *CDC GISF 2021–2030*, including areas that are

traditionally data-focused (e.g., disease surveillance) and areas where data utilization is evolving (e.g., demand generation). CDC will advise and help build the capacity of partners to use high-quality data to achieve the endorsed health impact objectives.



## Integrated

CDC will encourage a holistic approach to promote linkages between disease-specific and health system strengthening initiatives.

With CDC’s expertise across multiple VPDs, and in multiple areas of health system strengthening, the agency plays a key role in bringing together disease-specific and system-strengthening initiatives across the globe, as well as identifying areas for

synergy and collaboration. To drive the achievement of health impact objectives, this approach will be applied across all goals and all VPDs in the immunization program impact continuum ([Table 1](#)).





## Partnership-based

**CDC will foster alliances that apply the strengths of each organization while ensuring impactful coordination and collaboration.**

Partnerships are key to the success of immunization programs and initiatives. CDC is committed to building stronger coordination and collaboration with immunization and health partners. CDC will also

provide the necessary data and evidence to build support for innovative and best-practice immunization interventions across all types of partners to accomplish health impact objectives.



## Focused Investments

**CDC will leverage strategic information to make targeted investments to strengthen immunization programs.**

CDC will make targeted investments around the world to strengthen immunization programs and accomplish VPD-specific health impact objectives. Because CDC's primary role is not as a funder of at-scale interventions in countries, CDC will focus investments geographically in partnership with priority countries and in support of CDC and U.S. government (USG) bilateral and regional approaches. CDC will also make investments that complement those of other partners and align

with CDC's comparative advantages in evidence generation and translation, data analytics, capacity building and technical assistance, and time-limited operational support. CDC will continue to contribute to sustaining critical functions under its core goals of preventing, detecting, and responding to VPDs, including surveillance and laboratory science. CDC aims to tailor approaches based on the country and/or regional contexts to amplify the impact of CDC's investment.

# Health Impact Objectives



**CDC's VPD health impact objectives for 2021–2030 align with the immunization program impact continuum** to control, eliminate, and eradicate VPDs. These objectives also consider CDC's role to advance the development of new vaccines to protect against high-burden diseases and diseases with epidemic potential (Table 1). The focus of CDC's work varies across the disease impact continuum and includes conventional as well as zoonotic pathogens.

The continuum begins with efforts to advance the development of new vaccines for high burden diseases, and certain VPDs with epidemic potential. Once new vaccines are introduced into immunization programs, they move to the control phase of the continuum. Control is defined as the reduction of disease morbidity and mortality to a

locally acceptable level. Some intensive control efforts with specific disease reduction targets (e.g., neonatal tetanus elimination, hepatitis B elimination among children) are categorized under the next phase of the continuum as initiatives to eliminate the disease as a public health problem. Elimination of transmission is defined as the absence of a disease or infection caused by a specific agent in a defined geographic area as a result of deliberate control efforts that must be continued in perpetuity to prevent the reemergence of disease. Finally, the continuum ends at eradication, which is defined as the worldwide absence of a specific disease agent in nature as a result of deliberate control efforts that may be discontinued where the agent is judged no longer to present a significant risk from extrinsic sources.<sup>33-34</sup>



Table 1. Immunization Program Impact Continuum

Advance Development*	Control	Eliminate	Eradicate
<b>High disease burden<sup>1</sup></b> Enterotoxigenic E. coli gastroenteritis Group B streptococcal disease HIV/AIDS Malaria Respiratory syncytial virus (RSV) disease Shigellosis	<b>With control targets</b> Influenza (seasonal) Japanese encephalitis Tuberculosis Yellow fever  <b>Without control targets—with vaccines recommended in all country immunization schedules</b> Diphtheria <i>H. influenza</i> type b disease Pertussis Pneumococcal disease Rotavirus gastroenteritis Tetanus (non-neonatal)	<b>With targets for elimination of transmission</b> Measles Rubella  <b>With targets for elimination of epidemics or as a public health problem</b> Bacterial meningitis ( <i>Streptococcus pneumoniae</i> , <i>Neisseria meningitidis</i> ) Cervical cancer (Human papillomavirus) Cholera Hepatitis B Rabies Tetanus (maternal and neonatal)	Polio
<b>Epidemic or pandemic potential<sup>2</sup></b> Chikungunya Crimean-Congo hemorrhagic fever Influenza (pandemic) Lassa fever Marburg hemorrhagic fever Middle East respiratory syndrome (MERS) Nipah virus disease Rift Valley fever Zika virus disease	<b>Without control targets—with vaccines considered based on disease burden</b> Coronavirus disease 2019 (COVID-19) <sup>3</sup> Dengue Ebola virus disease <sup>3</sup> Hepatitis A Hepatitis E Mumps Typhoid Varicella		

Information included in Table 1 updated as of February 2021.

\* CDC also works on vaccines for other diseases that are not high-burden or of epidemic potential, and on the development of new vaccines for diseases already in the control, elimination, or eradication stages of the continuum.

<sup>1</sup> [WHO Vaccine Trial Tracker](#); [Gavi Vaccine Investment Strategy](#); [IHME Global Burden of Disease](#)

<sup>2</sup> [Coalition for Epidemic Preparedness Innovations](#); [WHO Blueprint for Action to Prevent Epidemics](#)

<sup>3</sup> Based on WHO SAGE interim recommendations for [COVID-19 vaccines](#) and [Ebola vaccines](#)

CDC will help regions and countries achieve the existing disease-specific control, elimination, and eradication targets, prioritizing those that have been endorsed by country governments through regional and global mechanisms, in alignment with the *IA2030 Framework for Action* (Table 2).<sup>35</sup> Additionally, CDC will support efforts to achieve potential new and revised targets for VPDs as the immunization program impact continuum evolves over the next decade.

Table 2. Existing VPD control, elimination, and eradication targets

VPD	Incidence/ Prevalence Targets	Epidemic Targets	Mortality Reduction Targets	Endorsement Status (Source)
<b>ERADICATION</b>				
<b>Polio</b>	Interrupt transmission of all wild poliovirus	Stop circulating vaccine-derived poliovirus (cVDPV) outbreaks within 120 days of detection		Endorsed (WHA41.28, WHA65.17, WHA68.3)
<b>ELIMINATION OF TRANSMISSION</b>				
<b>Measles</b>	AFR/AMR/EMR/EUR/SEAR/WPR: Absence of endemic measles virus transmission for $\geq 12$ months in the presence of a well-performing surveillance system			Endorsed (AFR/RC61/R1, AMR/CD38/15, EMR/RC58/R.5, EUR/RC60/R15, SEA/RC72/R3, WPR/RC63.R5, WHA65.17)
<b>Rubella and congenital rubella syndrome (CRS)</b>	AMR/EUR/WPR: Absence of endemic rubella virus transmission $\geq 12$ months in the presence of a well-performing surveillance system  SEAR: 95% reduction of rubella and CRS cases compared to 2010 baseline  AFR/EMR: No target yet			Endorsed (AMR/CD44.R1, EUR/RC60/15, SEA/RC72/R3, WPR/RC68.R1, WHA65.17)
<b>ELIMINATION AS A PUBLIC HEALTH PROBLEM</b>				
<b>Bacterial meningitis</b>	Reduce the number of cases from vaccine-preventable bacterial meningitis	Eliminate bacterial meningitis epidemics	Reduce the number of deaths from vaccine-preventable bacterial meningitis	Not yet endorsed
<b>Cervical cancer (Human papillomavirus)</b>	Age-adjusted cervical cancer incidence rate $< 4$ per 100,000 women-years		Cumulative number of cervical cancer deaths averted will be 62 million by 2120	Endorsed (WHA73.2)
<b>Cholera</b>	No confirmed cases with evidence of local transmission for $\geq 3$ consecutive years	No catastrophic cholera outbreaks in fragile settings	Decreased by 90% from 2017 baseline	Not yet endorsed
<b>Hepatitis B</b>	90% reduction (equivalent to $\leq 0.1\%$ hepatitis B surface antigen prevalence) among children at age 5 years by 2030		Decreased by 65% in 2030 compared to 2015 baseline	Endorsed (WHA69.22)
<b>Rabies</b>			Zero human deaths from canine rabies by 2030 (baseline of $> 59,000$ deaths per year in $> 150$ countries in 2016)	Not yet endorsed
<b>Tetanus (maternal and neonatal)</b>	$< 1$ neonatal tetanus (NT) case/1000 Live Births in every district per year globally			Endorsed (WHA42; WHA44, WHA65.17)

<b>AFR:</b> Africa Region	<b>EUR:</b> European Region	<b>WHA:</b> World Health Assembly
<b>AMR:</b> Americas Region	<b>RC:</b> Regional Committee	<b>WPR:</b> Western Pacific Region
<b>EMR:</b> Eastern Mediterranean Region	<b>SEAR:</b> South-East Asia Region	

Table 2. Existing VPD Control, Elimination, and Eradication Targets (continued)

VPD	Incidence/ Prevalence Targets	Epidemic Targets	Mortality Reduction Targets	Endorsement Status (Source)
<b>CONTROL</b>				
<b>Influenza</b>	Reduce the burden of seasonal influenza; minimize the risk of zoonotic influenza	Decreased risk of pandemics; mitigate the impact of pandemic influenza		Not yet endorsed
<b>Japanese encephalitis</b>	<0.5 cases/100,000 children <15 years of age in 24 countries in WPR and SEAR; reduce incidence compared to 2016 by $\geq 60\%$	Rapid detection and curtailment of outbreaks to prevent spread beyond the country	Decreased by $\geq 75\%$ from 2016 baseline	Endorsed (WHA70.16)
<b>Tuberculosis</b>	90% reduction in TB incidence rate compared with 2015 by 2035 (<10/100,000)		95% reduction in number of TB deaths compared with 2015 by 2035	Endorsed (WHA67.11)
<b>Yellow fever</b>		No yellow fever epidemics by 2026		Not yet endorsed

<b>AFR:</b> Africa Region	<b>EUR:</b> European Region	<b>WHA:</b> World Health Assembly
<b>AMR:</b> Americas Region	<b>RC:</b> Regional Committee	<b>WPR:</b> Western Pacific Region
<b>EMR:</b> Eastern Mediterranean Region	<b>SEAR:</b> South-East Asia Region	

1. Links to the latest global strategy for each disease are provided in [Annex F](#), including any targets not yet endorsed by the WHA or a Regional Committee.

CDC's work on specific diseases is described in a living annex ([Annex F](#)) that will be updated during 2021–2030, as CDC activities evolve. The list of disease-specific targets (Table 2) will be updated over the decade as existing targets are achieved and new targets are set. CDC's disease-specific work will contribute to building sustainable and country-owned health system capacities that can be leveraged across VPDs and other disease threats.

Across the immunization program impact continuum, CDC will apply its comparative advantage to lead activities under the goals, priorities, focus areas, and guiding principles of *CDC GISF 2021–2030*. These goals, priorities, focus areas, and guiding principles describe how CDC will contribute to achieving health impact objectives across the disease impact continuum. *CDC GISF 2021–2030* reflects CDC's theory of change, which describes how CDC's investments in strengthening core programmatic capacities to prevent, detect, respond, sustain, and innovate will enable immunization programs to achieve existing and new disease-specific targets over time.

# Zoonotic Vaccine-Preventable Diseases

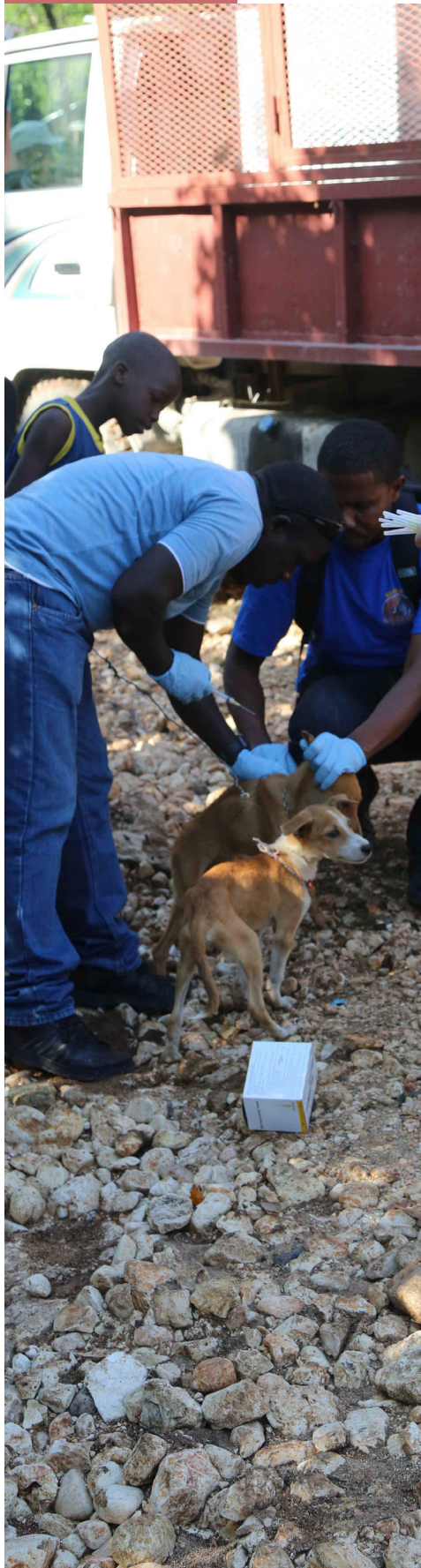
**For some zoonotic diseases** (Annex A), immunization of animals and/or humans through a One Health approach saves human lives and should be considered part of a coordinated global strategy.<sup>24, 36-39</sup>

Rabies is an important example of a zoonotic disease where human lives are saved not only by emergency post-exposure vaccination of humans but also by the proactive immunization of dogs, the primary animal reservoir. WHO's goal to eliminate dog-mediated human rabies deaths by 2030 cannot be achieved without accompanying canine vaccination strategies.

For some zoonotic diseases (e.g., brucellosis, leptospirosis, anthrax, Rift Valley Fever), effective animal

vaccines are already available but are not always used effectively; for example, brucellosis still causes chronic health impacts in humans across the globe, despite the proven success of elimination programs using animal vaccines. Other zoonoses (e.g., Crimean-Congo Hemorrhagic Fever, Nipah) would benefit from research and investments in new vaccine technologies.<sup>40</sup> Importantly, these diseases are often overlooked in global immunization programs because they are not considered important economic investments for agriculture production or strategic for human disease prevention.<sup>41</sup> The development process for animal vaccines, however, is often less





complex and faster than the approval processes for human vaccines, and early pipeline development in animals may inform the later development of human vaccines.

The control, elimination, or eradication of zoonotic VPDs often requires additional considerations to overcome unique barriers inherent in multi-species disease control programs, compared to conventional VPDs. **Prevention** of zoonotic VPDs (Goal 1) requires that relevant human and animal health agencies proactively support the development and evaluation of vaccines targeting relevant animal populations while considering the efficacy and safety of vaccines across human and non-human species that may be exposed. **Detection** of zoonotic VPDs (Goal 2) often requires participation from multiple health sectors, including public health, animal health, and environmental health. Early detection of zoonotic pathogens in animal populations often triggers One Health responses that prevent human exposures. **Response** to zoonotic VPDs (Goal 3) requires intervention methods that prioritize human and animal populations at higher risk of exposure, as well as specially trained personnel (e.g., veterinarians, ecologists, animal health specialists). Investment in animal health systems often

lags behind other public health investments, contributing to challenges in early detection and response to zoonotic VPDs. Lastly, **sustainable** approaches to controlling zoonotic VPDs (Goal 4) almost always require the implementation of control measures in animal populations. For example, addressing human rabies prevention through an approach focused only on the human health sector can drastically reduce the incidence of human rabies, but the program must remain operational while the disease is endemic in the native canine population, thereby preventing re-allocation of program resources to other immunization program priorities. It is difficult to justify the cost-effectiveness, and thus the sustainability, of a single-sector approach to control zoonotic VPDs.

CDC will strive to help the OIE and WHO regions and countries incorporate One Health principles into immunization strategies.<sup>37</sup> Important partners for animal immunization strategies to prevent and control zoonotic disease transmission include OIE, the Food and Agriculture Organization of the United Nations, and the U.S. Department of Agriculture.

# Applying the Strategic Framework

**CDC GISF 2021–2030 aims to serve as an adaptable framework** to guide the CDC’s global immunization work over the next ten years. CDC centers, divisions, offices, and programs (CIOs) engaged in global immunization work will develop a CDC-wide implementation plan to operationalize the framework and drive CDC’s approach to achieve the framework’s goals and health impact objectives. *CDC GISF 2021–2030* is also the foundation for operational and workplan development at GID. CDC and division-specific implementation plans should specify where activities align with the goals and priorities to ensure traceability. Additionally, activities should apply framework principles to accelerate progress towards building and applying immunization program capacities across the disease impact continuum.

A monitoring and evaluation framework with high-level targets for each CIO will ultimately accompany *CDC GISF 2021–2030*. CDC’s entities will regularly track progress against the targets, noting deployed resources and

program advancements. More specific progress measures should be developed and tracked at the center and/or division level based on strategic and operational plans.

CDC will continue to test the relevancy and viability of *CDC GISF 2021–2030*’s goals and priorities and update implementation plans and CIO monitoring targets accordingly. The agency is committed to ongoing review of the framework’s health impact objectives to ensure that they align with global targets.

The elimination of VPD threats occurs within a global partnership landscape. Local context and collaboration with partners will impact activity implementation, and CDC will adapt and tailor activities to different contexts. *CDC GISF 2021–2030* is also aligned with other global immunization strategies, including *IA2030* and Gavi 5.0, which will help ensure CDC’s activities complement partner activities that are focused on strengthening immunization program capacity and meeting health impact objectives.





# Conclusion

**Immunization is one of the most cost-effective public health interventions in the world.** It has the potential to improve the physical and economic health of nations, while protecting the safety and security of the U.S. Given increasing global interconnectedness, a disease threat anywhere can easily become a disease threat everywhere, as demonstrated by the COVID-19 pandemic. Immunization also serves as a gateway for primary care, connecting people to receive care who otherwise would not.

CDC brings scientific and program expertise to build immunization program capacity at local, national, and global levels across a wide array of VPDs. *CDC GISF -2021–2030* defines how the agency will structure its work over the next ten years to effectively use this expertise. This framework aims to apply successes and lessons learned to known (e.g., COVID-19) and unknown challenges. The framework's success will be measured by immunization programs' abilities to meet emerging threats, as well as to control, eliminate, and eradicate VPDs through program capacity building and achieving disease-specific health impact objectives. CDC will work to implement this framework in collaboration with partners, ensuring the agency continues to save lives, strengthen global health security, and protect Americans.

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# Annex A

## CDC Centers, Divisions, Offices, and Programs that Advance Global Immunization

Immunization Program Areas of Expertise as Aligned to the CDC GISF 2021-2030 Priority Areas	Disease-specific Expertise		CDC Organization
	1.1 Coverage & Equity	1.2 Demand for Immunization	
1.1 Coverage & Equity			<b>CENTER FOR GLOBAL HEALTH</b> Division of Global Health Protection Division of Parasitic Diseases and Malaria Division of Global HIV and TB Global Immunization Division
1.2 Demand for Immunization			
1.3 Life-Course Vaccination			
1.4 New & Underutilized Vaccine Introduction			
1.5 Immunization Information			
2.1 Surveillance Capacity			
2.2 Laboratory & Diagnostics			
2.3 VPD Surveillance Information			
3.1 Risk Assessment & Mitigation			
3.2 Outbreak Investigation & Response			
3.3 Outbreak Preparedness & Response Capacity			
4.1 Commitment & Financing			
4.2 Evidence-based Decision Making			
4.3 Immunization Safety			
4.4 Workforce Capacity			
5.1 Innovation Acceleration			
5.2 Research & Evaluation Capacity			
5.3 Evidence Translation			

\* Diseases that are zoonotic

Immunization Program Areas of Expertise as Aligned to the CDC GISF 2021-2030 Priority Areas

CDC Organization	Disease-specific Expertise	1.1 Coverage & Equity	1.2 Demand for Immunization	1.3 Life-Course Vaccination	1.4 New & Underutilized Vaccine Introduction	1.5 Immunization Information	2.1 Surveillance Capacity	2.2 Laboratory & Diagnostics	2.3 VPD Surveillance Information	3.1 Risk Assessment & Mitigation	3.2 Outbreak Investigation & Response	3.3 Outbreak Preparedness & Response Capacity	4.1 Commitment & Financing	4.2 Evidence-based Decision Making	4.3 Immunization Safety	4.4 Workforce Capacity	5.1 Innovation Acceleration	5.2 Research & Evaluation Capacity	5.3 Evidence Translation
<b>CENTER FOR PREPAREDNESS AND RESPONSE</b>																			
National Authority for Containment of Poliovirus	Polio																		
Division of Emergency Operations																			
<b>NATIONAL CENTER FOR EMERGING AND ZOONOTIC INFECTIOUS DISEASES</b>																			
Division of Foodborne, Waterborne, and Environmental Diseases	Cholera; Enterotoxigenic E. coli gastroenteritis*; Shigellosis; Typhoid																		
Division of High Consequence Pathogens and Pathology <sup>^</sup>	Anthrax*; Brucellosis*; Coronavirus disease 2019 (COVID-19)*; Crimean-Congo Hemorrhagic Fever*; Enterotoxigenic E. coli gastroenteritis*; Ebola virus disease*; Influenza (seasonal, pandemic)*; Lassa fever*; Leptospirosis*; Marburg hemorrhagic fever*; Middle Eastern respiratory syndrome (MERS)*; Monkeypox* <sup>†</sup> ; Nipah virus disease*; Rabies*; Rift Valley Fever*; Smallpox																		
Division of Global Migration and Quarantine	Chikungunya; Coronavirus disease 2019 (COVID-19)*; Dengue; Diphtheria; Ebola virus disease*; Hepatitis A; Hepatitis B; Influenza (seasonal, pandemic)*; Japanese encephalitis; Measles; Mumps; Pneumococcal disease; Polio; Rabies*; Rubella; Tetanus; Tuberculosis; Varicella; Yellow fever																		
Division of Vector Borne Diseases	Chikungunya; Japanese encephalitis; Yellow fever; Zika virus disease																		
Immunization Safety Office																			

<sup>^</sup> Includes One Health Office responsible for cross-agency coordination for zoonotic infections and activities involving public health, animal health, and environmental health.

\* Diseases that are zoonotic

<sup>†</sup> Diseases affecting humans that are prevented by vaccinating animals and for which no human vaccine is available.

Immunization Program Areas of Expertise as Aligned to the CDC GISF 2021-2030 Priority Areas

CDC Organization	Disease-specific Expertise	1.1 Coverage & Equity	1.2 Demand for Immunization	1.3 Life-Course Vaccination	1.4 New & Underutilized Vaccine Introduction	1.5 Immunization Information	2.1 Surveillance Capacity	2.2 Laboratory & Diagnostics	2.3 VPD Surveillance Information	3.1 Risk Assessment & Mitigation	3.2 Outbreak Investigation & Response	3.3 Outbreak Preparedness & Response Capacity	4.1 Commitment & Financing	4.2 Evidence-based Decision Making	4.3 Immunization Safety	4.4 Workforce Capacity	5.1 Innovation Acceleration	5.2 Research & Evaluation Capacity	5.3 Evidence Translation
<b>NATIONAL CENTER FOR HIV/AIDS, VIRAL HEPATITIS, STD, AND TB PREVENTION</b>																			
Division of HIV/AIDS Prevention	HIV/AIDS																		
Division of Viral Hepatitis	Hepatitis A; Hepatitis B; Hepatitis E																		
Division of TB Elimination	Tuberculosis																		
<b>NATIONAL CENTER FOR HEALTH STATISTICS</b>																			
Global Program for Civil Registration and Vital Statistics Improvement																			
<b>NATIONAL CENTER FOR IMMUNIZATION AND RESPIRATORY DISEASES<sup>†</sup></b>																			
Division of Bacterial Diseases	Bacterial meningitis ( <i>Streptococcus pneumoniae</i> , <i>Neisseria meningitidis</i> ); Diphtheria; Group B streptococcal disease; <i>H. influenzae</i> type b disease; Pertussis; Pneumococcal disease; Tetanus																		
Division of Viral Diseases	Cervical cancer (Human papillomavirus); Coronavirus disease 2019 (COVID-19)*; Measles; Middle Eastern respiratory syndrome (MERS)*; Mumps; Polio; Respiratory syncytial virus (RSV) disease; Rotavirus gastroenteritis; Rubella; Varicella																		
Influenza Division	Influenza (seasonal, pandemic)*																		

<sup>^</sup> Includes One Health Office responsible for cross-agency coordination for zoonotic infections and activities involving public health, animal health, and environmental health.

\* Diseases that are zoonotic

<sup>†</sup> CDC's Immunization Services Division provides consultation and support as needed to contribute expertise from CDC's U.S. domestic immunization program to other countries and partners.

# Annex B

## Abbreviations

**ACIP:** Advisory Committee on Immunization Practices

**AFP:** Acute flaccid paralysis

**AEFI:** Adverse event following immunization

**AFENET:** African Field Epidemiology Network

**AFP:** Acute flaccid paralysis

**BCG:** bacille Calmette-Guérin

**BSL:** Biological safety level

**CCHF:** Crimean-Congo Hemorrhagic Fever

**CCHFV:** Crimean-Congo Hemorrhagic Fever virus

**CDC:** Centers for Disease Control and Prevention

**CEPI:** Coalition for Epidemic Preparedness Innovations

**CGH:** Center for Global Health

**CIO:** Centers, Institute, Offices

**COVID-19:** Coronavirus disease 2019

**CRS:** Congenital rubella syndrome

**cVDPV:** Circulating vaccine-derived poliovirus

**DOS:** U.S. Department of State

**DOD:** U.S. Department of Defense

**DPDM:** Division of Parasitic Diseases and Malaria

**DFWED:** Division of Foodborne, Waterborne, and Environmental Diseases

**DGMQ:** Division of Global Migration and Quarantine

**EMPHNET:** Eastern Mediterranean Public Health Network

**FDA:** U.S. Food and Drug Administration

**FETP:** Field Epidemiology Training Program

**GBS:** Group B Streptococcus

**GHSA:** Global Health Security Agenda

**GID:** Global Immunization Division

**GPEI:** Global Polio Eradication Initiative

**GNN:** Global NITAG Network

**GVAP:** Global Vaccine Action Plan

**HBsAg:** Hepatitis B surface antigen

**HIV/AIDS:** Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome

**HPV:** Human papillomavirus

**IA2030:** *Immunization Agenda 2030*

**IANPHI:** The International Association of National Public Health Institutes

**IHR:** International Health Regulations

**IIS:** Immunization information systems

**KEMRI:** Kenya Medical Research Institute

**KWTRP:** KEMRI-Wellcome Trust Research Program

**MNT:** Maternal and neonatal tetanus

**MNTE:** Maternal and neonatal tetanus elimination

**MR:** Measles and rubella

**NCCs:** National Certification Committees

**NIH:** National Institutes of Health

**NITAGs:** National Immunization Technical Advisory Groups

**NT:** Neonatal Tetanus

**OIE:** World Organisation for Animal Health

**PfSPZ:** Plasmodium falciparum sporozite (PfSPZ) Vaccine

**PHC:** Primary health care

**RITAGs:** Regional Immunization Technical Advisory Groups

**RCs:** Regional Committees

**RSV:** Respiratory Syncytial Virus

**RVCs:** Regional Verification Commissions

**RVF:** Rift Valley fever

**SAGE:** Strategic Advisory Group of Experts on Immunization

**SEAR:** WHO South-East Asia Region

**SIA:** Supplemental immunization activities

**START:** Strengthening Technical Assistance for Routine Immunization Training

**STOP:** Stop Transmission of Polio

**TB:** Tuberculosis

**TEPHINET:** Training Programs in Epidemiology and Public Health Interventions Network

**TTCV:** Tetanus toxoid-containing vaccines

**UHC:** Universal health coverage

**UNICEF:** United Nations Children's Fund

**U.S.:** United States of America

**USAID:** United States Agency for International Development

**USAMRD-A:** U.S. Army Medical Research Directorate-Africa

**USG:** United States Government

**VDPV:** Vaccine-derived poliovirus

**VPD:** Vaccine-preventable disease

**VRE:** Vaccine-related events

**VRP:** Virus replicon particle

**WHA:** World Health Assembly

**WHA67.6:** Sixty-Seventh World Health Assembly

**WHO:** World Health Organization

**WPR:** Western Pacific Region

**ZIKV:** Zika virus



# Annex C

## Alignment of *CDC Global Immunization Strategic Framework 2021-2030* with *Immunization Agenda 2030* and Gavi 5.0

### **CDC GLOBAL IMMUNIZATION STRATEGIC FRAMEWORK 2021-2030**

### **IMMUNIZATION AGENDA 2030**

### **GAVI 5.0**

#### **Goal 1: PREVENT**

Strengthen immunization services to achieve high and equitable coverage

#### **Strategic Priority 1:**

Immunization Programs for Primary Health Care/Universal Health Coverage

#### **Strategic Priority 2:**

Commitment & Demand

#### **Strategic Priority 3:**

Coverage & Equity

#### **Strategic Priority 4:**

Life Course & Integration

#### **Goal 1:**

Introduce and scale up vaccines

#### **Goal 2:**

Strengthen health systems to increase equity in immunization

#### **Goal 2: DETECT**

Support and continuously improve comprehensive VPD surveillance systems to inform immunization program management

#### **Strategic Priority 1:**

Immunization Programs for Primary Health Care (PHC) & Universal Health Coverage (UHC)

#### **Goal 3: RESPOND**

Prepare for and respond to VPD outbreaks and emergencies

#### **Strategic Priority 5:**

Outbreaks & Emergencies

#### **Goal 4: SUSTAIN**

Foster immunization program sustainability

#### **Strategic Priority 1:**

Immunization Programs for Primary Health Care/Universal Health Coverage

#### **Strategic Priority 2:**

Commitment & Demand

#### **Strategic Priority 6:**

Supply & Sustainability

#### **Goal 1:**

Introduce and scale up vaccines

#### **Goal 3:**

Improve sustainability of immunization programs

#### **Goal 5: INNOVATE**

Advance research and evaluation to innovate for increased immunization program impact

#### **Strategic Priority 7:**

Research & Innovation

#### **Goal 4:**

Ensure healthy markets for vaccines and related products

# Annex D

## How Priorities in Goal 4 Support Core Goals in *CDC Global Immunization Strategic Framework 2021-2030*: Immunization Safety Example

All Goal 4 priorities are cross-cutting to sustain the core CDC GISF Goals 1, 2, and 3 of preventing, detecting, and responding to VPDs. The priorities of Commitment and Financing (4.1), Evidence-Based Decision making (4.2), and Workforce Capacity (4.4) contribute to sustaining all other priorities in the CDC GISF. Priority 4.3 for Immunization Safety provides an example of some of the specific linkages between Goal 4 and Goals 1, 2, and 3 (Annex Table D1).

All Immunization Safety Focus Areas (FAs) support **Goal 1** (Strengthen immunization services to achieve high and equitable coverage). Ensuring that vaccine products are safe and that there are adequate systems in place to deliver vaccines safely and to monitor for any safety-related events helps to build confidence in immunization services, which can increase coverage, particularly among groups for which safety concerns have historically limited vaccination uptake. For example, as vaccine-related events (VREs) can affect

**Annex Table D1. Examples of linkages between Immunization Safety Focus Areas and CDC GISF core goals 1, 2, and 3**

<b>Priority 4.3. Immunization Safety</b>			
<b>Focus Areas</b> ( <i>short label</i> )	<b>Goal 1: Prevent</b>	<b>Goal 2: Detect</b>	<b>Goal 3: Respond</b>
4.3.1: Capacity to prevent, detect, and respond to vaccine-related events	Focus Area 1.2.3		Priorities 3.2, 3.3
4.3.2: Effective communication strategies on vaccine safety and efficacy	Priority 1.2		
4.3.3: Research to identify and mitigate safety risks	Focus Areas 1.1.2, 1.3.4, 1.4.1, 1.4.3		
4.3.4: Strategies for safe immunization delivery	Priority 1.1		
4.3.5: AEFI surveillance quality and use	Priority 1.5	Priority 2.3	

demand for immunization, FA 4.3.1 to “build capacity of countries to prevent, detect, and respond to vaccine-related events, including through the development of immunization safety monitoring systems” links to and works in concert with FA 1.2.3 to “strengthen the capacity of countries to lead the development of improved demand strategies for immunization by providing technical assistance and supporting partner engagement.”

FA 4.3.2 is to “provide expertise to implement effective communication strategies on the safety and efficacy of vaccines,” which supports Priority 1.2 (Demand for Immunization) by equipping immunization programs with unbiased evidence and options for tailored communication approaches to increase confidence in vaccines and immunization delivery systems. FA 4.3.3 to “conduct research to identify and mitigate safety risks for specific vaccines and delivery technologies” helps advance multiple aspects of the coverage and equity priorities under Goal 1, including evaluation of determinants of vaccine access (FA 1.1.2), policy development for life course catch-up and booster vaccinations (FA 1.3.4), generating evidence for vaccine introduction decision-making (FA 1.4.1), and monitoring and evaluation of new vaccine and vaccination schedules (FA 1.4.3). FA 4.3.4 supports strategies to ensure that immunization delivery systems are safe in support of Priority 1.1 (Coverage and Equity) to reach un- and under-immunized populations with vaccination services; such strategies may include health care worker training, job aid and other reference material development, and supportive supervision incorporating vaccination cold chain maintenance, administration, and safety elements. FA 4.3.5 to increase quality and use of AEFI surveillance information links to and complements Priority 1.5 (Immunization Information), as data on AEFI should be part of the set of immunization information—including vaccine supply, vaccinations administered, and coverage—used to assess immunization program performance and to inform actions to achieve high and equitable coverage.

CDC’s work under its Immunization Safety FAs will also help sustain capacities under **Goal 2** (Support and continuously improve comprehensive VPD surveillance systems to inform immunization program management) and Goal 3 (Prepare for and respond to VPD outbreaks). For example, FA 4.3.5 to improve the quality and use of Adverse Events Following Immunization (AEFI) surveillance supports Priority 2.3 (VPD Surveillance Information) by enabling triangulation across multiple information systems to identify risks and enable effective immunization program action. FA 4.3.1 builds capacity to respond to VREs, which links to and supports Priorities 3.2 (Outbreak Investigation and Response) and 3.3 (Outbreak Preparedness and Response Capacity), such as when safety concerns underlie low vaccination coverage that creates conditions for an outbreak, or when vaccine-derived pathogens cause outbreaks (e.g., for circulating vaccine-derived polioviruses).

Together, CDC’s work under these Immunization Safety Focus Areas will help sustain the immunization core capacities that are necessary to achieve the *CDC GISF 2021-2030* core goals of high and equitable coverage, high-quality surveillance systems that inform immunization program decision making, and rapid outbreak response.

# Annex E

## Addressing VPDs in Mobile Populations (Refugees, Immigrants, Migrants)

Refugees and other displaced populations may be at increased risk for VPDs due to limited access to immunization and other health services, combined with difficult living conditions. Such populations may be overlooked in national immunization strategies. For example, US-bound refugees have had variable access to immunization services before resettlement. However, VPD outbreaks can affect the resettlement process, leading to disease-related morbidity and mortality, travel delays, and disease importation resulting in US-based contact investigations which place a burden on state and local health departments. In response, and in partnership with the Department of State, CDC developed a comprehensive overseas immunization program for US-bound refugees in 2012. This strategy, which will continue to be followed 2021-2030, protects an at-risk and disadvantaged global population; VPD outbreaks affecting resettling refugees; responds through enhanced immunization guidance; includes development of an extensive global infrastructure and capacity-building among international implementing partners, ensuring the program's sustainability; and utilizes innovative and collaborative approaches for vaccine schedule development, vaccine procurement and delivery (sometimes to remote locations), cold chain management, and counseling and education, and monitoring for AEFIs.

# Annex F

## Living Annex of CDC Disease-Specific Activities Across the Immunization Program Impact Continuum

*This reference list current as of February 22, 2021*

**Note:** *The latest global strategy for diseases with globally- or regionally-endorsed targets, or proposed targets, for VPD control, elimination, or eradication are listed below.*

### ERADICATE

**Polio.** As a founding partner of the Global Polio Eradication Initiative, CDC is committed to achieving a world free of polio. CDC works toward achieving polio eradication by focusing on developing and implementing strategies to 1) interrupt wild poliovirus transmission in all remaining reservoirs, 2) stop all circulating vaccine-derived poliovirus (cVDPV) outbreaks and eliminate the risk of VDPV emergence, 3) ensure sensitive poliovirus surveillance through integration with comprehensive VPD and communicable disease surveillance, 4) prepare for and respond to poliovirus outbreaks, and 5) strengthen immunization programs and health systems to help achieve and sustain polio eradication. CDC also continues to work to achieve certification-standard acute flaccid paralysis (AFP) surveillance globally and execute a global containment plan to minimize the risk of poliovirus introduction from laboratories and vaccine production facilities after polio eradication is achieved. When polio eradication is achieved, and CDC transitions its efforts from polio to other VPDs, it will leverage its success in polio eradication to inform and strengthen other initiatives to eliminate VPD threats.

- Latest Strategy: [Polio Endgame Strategy 2019-2023](#)

### ELIMINATE

#### **Elimination of transmission**

**Measles.** CDC's work to help countries develop and implement measles elimination strategies is closely aligned with its overall immunization program strengthening efforts. In addition, because measles is one of the most contagious VPDs, it is often the first VPD detected in under-immunized populations. Thus, CDC's focus to help countries strengthen measles surveillance can help detect populations unreached by immunization programs and, by extension, overall immunization program weaknesses. CDC also supports WHO regions to develop strategies to verify elimination of measles virus and rubella virus transmission and monitor progress towards elimination.

- Latest Strategy: [Measles and Rubella Strategic Framework 2021-2030](#)

**Rubella.** CDC works with regions and countries to develop strategies to eliminate rubella transmission, including introducing rubella vaccine. Since surveillance for rubella is integrated with surveillance for measles, CDC works to improve surveillance strengthening activities to ensure that surveillance systems can effectively monitor and verify rubella elimination.

- Latest Strategy: [Measles and Rubella Strategic Framework 2021-2030](#)

**Elimination as a public health problem**

**Bacterial meningitis.** In Africa, CDC's work to eliminate meningitis as a public health problem focuses on helping countries in the Africa meningitis belt 1) introduce meningococcal vaccination into national immunization schedules; and 2) develop capacity for meningitis surveillance to detect and rapidly respond to outbreaks, as well as monitor the impact of immunization strategies. CDC's work supports the Defeating Meningitis by 2030 Roadmap, the first such global roadmap for meningitis, which sets a path to tackle the main causes of acute bacterial meningitis (i.e., meningococcus, pneumococcus, *Haemophilus influenzae* and group B streptococcus). Its three goals are to (i) eliminate bacterial meningitis epidemics, (ii) reduce cases and deaths from vaccine-preventable bacterial meningitis, and (iii) reduce disability and improve quality of life after meningitis due to any cause.

- Latest Strategy: [Defeating Meningitis by 2030 Roadmap](#)

**Cervical cancer (Human Papillomavirus (HPV)).**

CDC's immunization-related work to eliminate cervical cancer caused by HPV as a public health problem focuses on helping countries to introduce HPV vaccination into national immunization schedules. This immunization-related work is part of a comprehensive cervical cancer elimination program that includes CDC support to screening, management, and treatment, as well as monitoring and validating progress towards cervical cancer elimination.

- Latest Strategy: [Global Strategy Towards Elimination of Cervical Cancer as a Public Health Problem](#) [DRAFT ONLY]

**Cholera.** CDC's work to eliminate cholera as a public health problem focuses on helping countries to 1) identify cholera "hotspots," the relatively small areas most heavily affected by cholera; 2) stop cholera transmission in "hotspots" through the use of cholera immunization, and improved water, sanitation and hygiene; and 3) develop capacity for early detection and rapid response to contain outbreaks.

- Latest Strategy: [Ending Cholera - A Global Roadmap to 2030](#)

**Hepatitis B.** CDC works to eliminate hepatitis B as a public health problem by 1) helping WHO regions develop hepatitis B control and elimination goals and establish regional verification mechanisms to monitor progress towards achieving the goals; 2) helping countries to develop and implement hepatitis B immunization strategies, including hepatitis B birth dose introduction and improvements with timely birth dose coverage; 3) conducting seroprevalence studies to measure the impact of hepatitis B immunization, and to provide the evidence for hepatitis B birth dose introduction; and 4) supporting innovation and research by developing improved and easier-to-deliver vaccines (e.g., microneedle patches) and diagnostics.

- Latest Strategy: [Global Health Sector Strategy on Viral Hepatitis 2016-2021](#)

**Rabies.** CDC works to eliminate dog-mediated human rabies by focusing on helping countries to 1) use routine rabies vaccination campaigns for dogs and effective use of rabies vaccine for humans as post-exposure prophylaxis, and 2) develop capacity for rapid and accurate rabies diagnosis, and rabies surveillance. CDC has supported WHO, the WHO SAGE Working Group on Rabies Vaccines and Rabies Immunoglobulins, and OIE in evidence review and recommendations for policy making around the use of rabies vaccines for humans and animals.

- Latest Strategy: [Zero by 30: the global strategic plan to end human deaths from dog-mediated rabies by 2030](#)

**Tetanus (maternal and neonatal).** CDC's work to eliminate and sustain elimination of maternal and neonatal tetanus (MNT) as a public health problem focuses on helping countries and WHO regions to 1) achieve, validate, and sustain MNT elimination; 2) develop action plans to sustain MNT elimination; 3) generate evidence for the introduction of tetanus (and diphtheria) booster doses to promote tetanus (and diphtheria) protection throughout the life course; and 4) strengthen tetanus surveillance. The maternal and neonatal tetanus elimination (MNTE) strategy has broader impact on maternal and newborn health outcomes and survival.

- Latest Strategy: [Guide to sustaining maternal and neonatal tetanus elimination \(MNTE\) and broadening tetanus protection for all](#)

## CONTROL

### **Diseases with established control targets**

**Influenza (seasonal).** CDC works to help countries develop and implement strategies to prepare for pandemic influenza and to control and prevent seasonal influenza. Strategies include supporting countries to establish, expand, and maintain influenza surveillance and laboratory capacity; assistance at country, regional, and global levels to develop pandemic influenza policies and plans; and research and evaluation to assist countries in developing the evidence base for seasonal influenza vaccine introduction decision making, including estimation of the health and economic burden, vaccine effectiveness, vaccination cost, and cost-effectiveness. CDC is also a WHO Collaborating Center, providing support to national influenza centers around the world to prevent, detect, and respond to influenza.

- Latest Strategy: [Global Influenza Strategy 2019-2030](#)

**Japanese encephalitis.** CDC works to help countries in the WHO Western Pacific Region and South-East Asia Region develop and implement strategies to improve surveillance, introduce Japanese encephalitis vaccination in national immunization schedules, and increase vaccination coverage.

- Latest Strategy: [Global Vector Control Response 2017-2030](#)

**Tuberculosis.** CDC works at national, regional, and global levels to support efforts to evaluate new vaccine candidates and optimize bacille Calmette-Guérin (BCG) vaccination programs.

- Latest Strategy: [The END TB Strategy](#)

**Yellow fever.** CDC works to help yellow fever-endemic countries in Africa and South America develop and implement strategies to vaccinate populations at higher risk of disease, prevent international spread, and detect and contain outbreaks rapidly.

- Latest Strategy: [Eliminate Yellow Fever Epidemics Strategy](#)

### **Diseases without established control targets, with vaccines recommended in all country immunization schedules**

**Diphtheria.** CDC works to help countries achieve high infant vaccination coverage with diphtheria-containing vaccines and introduce childhood and adolescent booster doses. CDC also works to perform disease burden assessments, establish and improve surveillance, and respond to diphtheria outbreaks.

**H. influenzae type b disease.** CDC provides technical assistance to countries to collate and assess evidence for Hib vaccine introduction decisions and vaccine implementation. CDC also supports the monitoring and evaluation of vaccine introduction impacts, including through invasive bacterial disease surveillance networks. CDC supports capacity building for invasive bacterial disease surveillance sentinel site and laboratory networks to measure disease burden before and after vaccine introduction.

**Pertussis.** CDC works to help countries achieve high infant vaccination coverage with pertussis-containing vaccines and introduce childhood, adolescent, and maternal booster doses, including generating evidence to evaluate the impact of different vaccine products and booster dose delivery strategies. CDC also works to perform disease burden assessments, establish and improve surveillance, and respond to pertussis outbreaks.

***Pneumococcal disease.*** CDC provides technical assistance to countries to collate and assess evidence for pneumococcal vaccine introduction decisions and vaccine implementation. CDC also supports the monitoring and evaluation of vaccine introduction impacts, including through invasive bacterial disease surveillance networks. CDC supports capacity building for invasive bacterial disease surveillance sentinel site and laboratory networks to measure disease burden before and after vaccine introduction.

***Rotavirus gastroenteritis.*** CDC provides technical assistance to countries to collate and assess evidence for rotavirus vaccine introduction decisions and vaccine implementation. CDC also supports the monitoring and evaluation of vaccine introduction impacts, including through rotavirus surveillance networks. CDC supports capacity building for rotavirus surveillance sentinel sites and laboratory networks to measure disease burden before and after vaccine introduction. CDC has supported the WHO SAGE Working Group in evidence review and recommendations for policy making around the use of rotavirus vaccines.

***Tetanus (non-neonatal).*** CDC works to help countries achieve high infant vaccination coverage with tetanus toxoid-containing vaccines (TTCV) and introduce childhood and adolescent TTCV booster doses. CDC also works to establish and improve non-neonatal tetanus surveillance, perform disease burden assessments, and respond to tetanus outbreaks. Together, these activities help achieve broader tetanus control throughout the life course and reduce tetanus-related morbidity and mortality.

***Diseases without established control targets, with vaccines considered in countries based on disease burden***

***Coronavirus disease 2019 (COVID-19).*** CDC provides support to global partners to review evidence and develop guidance and recommendations related to the use of potential COVID-19 vaccines and appropriate vaccination strategies. CDC provides technical assistance and funding to support COVID-19 vaccine introduction preparations in over twenty countries.

***Dengue.*** CDC's Division of Vector-Borne Diseases' Dengue Branch in San Juan, Puerto Rico, is one of the world's largest research units dedicated to improving dengue prevention and control. CDC has supported estimation of the health and economic impacts of dengue and has provided subject matter expertise on dengue vaccines and potential vaccination strategy recommendations to partners and through participation in the ACIP Working Group.

***Ebola virus disease.*** CDC assists with Ebola outbreak response and global, regional, and national surveillance for Ebola through supporting surveillance systems and laboratory capacity. CDC also provides expert technical guidance on the epidemiology, clinical manifestations, and virology of Ebola to WHO, NIH, CEPI, and ministries of health. CDC has also worked with ACIP on Ervebo, the recently approved Ebola vaccine, and is spearheading work to administer this vaccine in the U.S. CDC also performs research on Ebola, including efforts to identify the animal reservoir in Africa.

***Hepatitis A.*** CDC has supported the WHO SAGE Working Group in evidence review and recommendations for policy making around the use of Hepatitis A vaccines.

***Hepatitis E.*** CDC has supported the WHO SAGE Working Group in evidence review and recommendations for policy making around the use of Hepatitis E vaccines.

***Mumps.*** No current CDC activities related to global immunization have been identified for this disease.

***Typhoid.*** CDC assists with typhoid outbreak response, including studies of risk factors for typhoid prevention and global, regional, national, and local estimates of the burden of disease through surveillance studies and investigations. CDC also supports laboratory training for the isolation and identification of Salmonella Typhi from clinical and environmental specimens, conducts surveillance for typhoid fever in the U.S. to look for evidence of vaccine failures, and promotes typhoid vaccination for travelers to typhoid endemic or epidemic areas.



**Varicella.** No current CDC activities related to global immunization have been identified for this disease.

## ADVANCE DEVELOPMENT

### High disease burden

**Enterotoxigenic *E. coli*.** CDC has supported WHO to establish surveillance networks for *E. coli* and other pediatric diarrheal diseases.

**Group B *Streptococcus (GBS)*.** CDC conducts research on disease burden and provides subject matter expertise to global partners to review evidence and identify evidence gaps where further research is needed to inform vaccine development and the investment case for GBS vaccination.

**HIV/AIDS.** No current CDC activities related to global immunization have been identified for this disease.

**Malaria.** Currently, there are more than twenty malaria vaccine candidates targeting pre-erythrocytic, erythrocytic (blood), and sexual (transmission blocking) stages of the malaria parasite life cycle. Mosquirix [RTS,S/AS01] remains the only malaria vaccine that went through Phase III clinical trials to date. CDC has played a vital role in evaluating malaria vaccines. In collaboration with the Kenya Medical Research Institute (KEMRI) in western Kenya, CDC led a site for the phase III RTS,S/AS01 vaccine trials and is leading the WHO-sponsored evaluation of the RTS,S/AS01 implementation by the Kenya Ministry of Health, the first ever routine roll-out of a malaria vaccine. CDC currently leads a consortium that includes KEMRI, the U.S. Army Medical Research Directorate-Africa (USAMRD-A), and KEMRI-Wellcome Trust Research Program (KWTRP) to evaluate the routine implementation of the RTS,S Malaria Vaccine by the Kenya Ministry of Health. The primary objectives of the evaluation are to assess the impact of the vaccine on childhood mortality, evaluate rare safety signals at a population level, and evaluate the feasibility of delivering the four vaccine doses through routine programs. Results of the evaluation will be used to inform WHO recommendations for the use of RTS,S Malaria Vaccine in highly endemic settings. Additionally, CDC led a Phase II trial to

evaluate the safety, tolerability, immunogenicity, and efficacy of Sanaria's PfSPZ vaccine in western Kenya, the largest pediatric trial of this vaccine to date.

**Respiratory Syncytial Virus (RSV) disease.** CDC provides subject matter expertise to global partners to review evidence and identify evidence gaps where further research is needed to inform vaccine development and the investment case for RSV vaccination.

**Shigellosis.** CDC has conducted studies to understand the disease burden of *Shigella* in some countries, including those measuring the incidence, severity, and morbidity and mortality attributable to Shigellosis. In addition, CDC studied the risk factors for the disease to understand which populations are vulnerable to infection and determine which prevention methods are most effective. This work can help vaccine policy makers identify high priority vaccines and population priorities. CDC has completed many studies of *Shigella* disease burden in western Kenya and are part of a proposal submitted to the Gates Foundation in May 2020 for a new round of such studies.

### Epidemic potential

**Chikungunya.** CDC assists with chikungunya outbreak response and with global, regional, national surveillance for chikungunya through supporting surveillance systems and laboratory capacity. CDC also provides expert technical guidance on the epidemiology, clinical manifestations, and virology of chikungunya to WHO, NIH, Coalition for Epidemic Preparedness Innovations (CEPI), ministries of health, and manufacturers to guide further development and potential use of chikungunya vaccines.

**Crimean-Congo Hemorrhagic Fever (CCHF).** CDC assists with CCHF outbreak response and global, regional, national surveillance for CCHF through supporting surveillance systems and laboratory capacity. CDC also provides expert technical guidance on the epidemiology, clinical manifestations, and virology of CCHF to WHO, NIH, CEPI, and ministries of health. Furthermore, CDC performs research on the CCHF virus (CCHFV)

including the recent development of an early-stage CCHFV-vaccine candidate. Another research focus is on the development and study of animal models for CCHFV infection, through which vaccine candidates can be tested under BSL-4 containment.

**Influenza (pandemic).** See “*CONTROL: Diseases with established control targets: Influenza (seasonal)*”.

**Lassa fever.** CDC assists with Lassa outbreak response and global, regional, and national surveillance for Lassa through supporting surveillance systems and laboratory capacity. CDC also provides expert technical guidance on the epidemiology, clinical manifestations, and virology of Lassa to WHO, NIH, CEPI, and ministries of health. CDC also performs research on Lassa virus, including the development of vaccine candidates and animal models of infection in which to test them. A replicon particle vaccine candidate was recently shown to protect against lethal Lassa virus infection in the guinea pig and is the subject of ongoing development efforts.

**Marburg hemorrhagic fever.** CDC assists with Marburg outbreak responses and global, regional, and national surveillance for Marburg through supporting surveillance systems and laboratory capacity. CDC also provides expert technical guidance on the epidemiology, clinical manifestations, and virology of Marburg to WHO, NIH, CEPI, and ministries of health. CDC scientists discovered that the Egyptian fruit bat is a host of Marburg virus, and they continue to study viral pathogenesis in a colony of these bats that is now maintained at CDC.

**Middle East respiratory syndrome (MERS).** CDC collaborates with partners to better understand the source and spread of this MERS coronavirus and how to prevent infections.

**Nipah virus disease.** CDC assists with Nipah outbreak response and global, regional, and national surveillance for Nipah through supporting surveillance systems and laboratory capacity. CDC also provides expert technical guidance on the epidemiology, clinical manifestations, and virology

of Nipah to WHO, NIH, CEPI, and ministries of health. CDC performs research on early-stage vaccine candidates for Nipah virus, recently showing that a messenger RNA vaccine encoding the Nipah glycoprotein protected hamsters from lethal challenge.

**Rift Valley fever.** CDC assists with Rift Valley fever (RVF) outbreak response and global, regional, and national surveillance for RVF through supporting surveillance systems and laboratory capacity. CDC also provides expert technical guidance on the epidemiology, clinical manifestations, and virology of RVF to WHO, NIH, CEPI, and ministries of health. Research performed by the CDC’s scientists has led to the development of several vaccine candidates for RVF virus. A live-attenuated vaccine candidate was demonstrated to protect sheep from challenge and was subsequently licensed to Boehringer Ingelheim for further development as an animal vaccine. More recently, CEPI has invested several million dollars in further development of this vaccine for human use.

**Zika virus disease.** CDC assists with Zika outbreak response and global, regional, and national surveillance for Zika, including through supporting surveillance systems and laboratory capacity. CDC also provides expert technical guidance on the epidemiology, clinical manifestations, and virology of Zika to global partners such as WHO, NIH, and ministries of health to guide the development and potential use of Zika vaccines. CDC has provided significant technical support for U.S. government efforts to develop a Zika virus vaccine, including providing reference testing for vaccine efficacy studies and partnering with manufacturers for the development and evaluation of multiple vaccine candidates.

# Annex G

## CDC Global Immunization Strategic Framework Development Process

### **DRAFT 0**

Draft 0 of the CDC GISF was created using input gathered from CDC divisions, offices, and programs with subject matter and disease-specific areas of expertise related to global immunization. In June 2019, CDC leadership provided input in individual 30–60-minute interviews. During the same period, CDC divisions that advance global immunization were invited to complete questionnaires describing their global immunization work, priorities for the future, experience using the previous framework, and external trends that may impact their global immunization work. In June–July 2019, GID staff members provided input via retreat breakout sessions and an online survey tool on two areas: 1) the previous framework’s effectiveness and relevancy, and 2) their views of CDC’s comparative advantage in focus areas identified in *IA2030*.

### **DRAFT 1**

In April and May 2020, feedback for Draft 0 received from GID staff was consolidated and adjudicated by the GID Framework Team. A clean Draft 1 was then developed and circulated in June–July 2020 to representatives of CDC divisions, offices, and programs; USG partners; and external partners for feedback via an online feedback form. In late July 2020, select external partners were asked to provide feedback via two virtual facilitated discussions. In August 2020, all feedback was consolidated and adjudicated to create Draft 2.

### **DRAFT 2**

During September–December 2020, Draft 2 was reviewed by GID staff and CDC divisions, offices, and programs through CDC scientific and policy clearance, and was cleared for dissemination in December 2020.