The decades-long effort to ensure equitable global access to vaccines is under threat. Between 2020 and 2021, the Covid-19 pandemic sparked the most significant decrease in immunization coverage rates in three decades. New World Health Organization (WHO)/UNICEF estimates of national immunization coverage data released in July 2023 show that while many countries have begun to close coverage gaps, recovery is uneven, and low-income or conflict-affected countries that struggled prior to the pandemic continue to see large numbers of unvaccinated people. But with rates of vaccine-preventable diseases such as measles, diphtheria, and polio rising even before the pandemic, the persistent gaps in immunization coverage point to greater global vulnerabilities to deadly and disruptive disease outbreaks. The important role vaccines have played in responding to Covid-19 also underscores the relevance of strong and equitable immunization programs rooted in resilient primary healthcare programs as critical elements of pandemic preparedness and response. With the possibility of future pandemics increasing thanks to urbanization, population growth, and climate change, ensuring health systems are prepared to effectively deliver existing and new vaccines to people of all ages is critical.

For the United States, closing global gaps in access to immunizations for children while preparing health systems to both maintain health services and reach adolescent and adult populations with new vaccines during a health crisis is increasingly defined as a matter of national security. In cooperation with bilateral
partners as well as multilateral agencies including UNICEF, the WHO, and Gavi, the Vaccine Alliance, the United States has long supported programs that build countries’ capacities to purchase vaccines and deliver them, largely in the context of maternal and child health programs. The United States has also supported countries’ efforts to strengthen their vaccine delivery services to reach the goals within the Global Health Security Agenda action package on immunizations. Further, it has provided funds to the Coalition for Epidemic Preparedness Innovations (CEPI) to support research and development of new vaccines as well as “equitable solutions for outbreak response capacity.”

However, until recently, U.S.-supported efforts have paid less attention to preparing health systems to deliver vaccines to people of all ages or to fostering a strong cadre of health workers well equipped to provide them. And there has been no overarching, whole-of-government political initiative focused on elevating the importance of equitable access to immunizations within high-level diplomatic engagement. How can the United States best help close the gaps in immunization coverage that widened during the pandemic while also preparing vaccine delivery platforms to serve as elements of pandemic response in the event of a new health crisis?

The CSIS Bipartisan Alliance for Global Health Security Working Group on Routine Immunizations and Global Health Security met several times over the course of the first part of 2023 to develop recommendations for strengthening U.S. support for immunizations within bilateral and multilateral programs, both to close gaps in access to childhood vaccines and to ensure health systems can maintain services while equitably delivering vaccines within a health emergency. The working group’s recommendations include the following actions:

• Increase funding for bilateral and multilateral immunization programs, including by investing in sustainable financing mechanisms that support immunization delivery within the context of primary healthcare services and making an increased, multiyear commitment to Gavi in its 2025 replenishment;

• Elevate the importance of immunizations as a critical tool for global health security within high-level political dialogue and U.S. diplomatic engagement;

• Support local research, communications, and outreach efforts to fortify vaccine acceptance and confront misinformation and disinformation about vaccines while building and sustaining vaccine confidence;

• Prioritize a focus on health systems strengthening, including by institutionalizing the use of immunization coverage as an indicator of health system resilience and pandemic preparedness and by assisting countries in determining how best to recruit, train, retain, and professionally advance the health workforce that delivers vaccines and information about vaccines and manages immunization programs;

• Deepen a commitment to a life-course approach to ensure adolescents and adults, as well as children, are well served by immunization systems; and

• Support the development and deployment of new vaccine delivery technologies to enhance the reach of immunization services and improve vaccine acceptance.

Through the U.S. Agency for International Development (USAID), the U.S. Centers for Disease Control and Prevention (CDC), and the U.S. Department of State, these are all activities the United States can undertake to strengthen equitable access to disease prevention and other critical services to close gaps in access to immunizations for children, prepare health systems to deliver vaccines to adolescents and adults, and prepare for distribution of new vaccines in the event of a future pandemic. Failing to do so risks further widening the gulf between those who can access one of the most effective health interventions of the last 100 years and those who cannot, deepening the vulnerability of the United States and other countries around the world to future health crises.

**BACKGROUND**

Even prior to the WHO declaration in March 2020 that Covid-19 constituted a global pandemic, it was clear that after several years of steady progress, global immunization coverage had plateaued. Thanks to support from Gavi, UNICEF, and other multilateral and bilateral donors since the early 2000s, low-income countries had been able to access new vaccines more quickly than in the decades between the launch of the Expanded Program on Immunization (1974) and the turn of the century. But the
rapid gains seen between 2000 and 2010 had stalled, and there were decreases in coverage in some areas thanks to population growth, conflict, and challenges associated with reaching mobile populations, among others. The UN Sustainable Development Goals (SDGs), approved by UN member countries in 2015, set a target of increasing equitable access to essential medicines and vaccines, with indicators focused on increasing the “proportion of the target population covered by all vaccines included in their national program.”6

But the end of the decade saw numerous challenges to the global effort to improve equitable access to immunizations by 2030. In 2019, measles outbreaks in areas of low coverage, due in part to fears over possible adverse effects from the vaccine, led to hundreds of thousands of cases worldwide and prompted the WHO to declare vaccine hesitancy one of the top threats to global health.7

During the early months of 2020, as countries began to impose curfews and lockdowns to limit transmission of the novel coronavirus and trade and transportation routes were interrupted, immunization programs were negatively affected, with parents fearful of taking children to clinics and immunization staff diverted to outbreak response. With surveys showing that many countries had put essential health services on hold as pandemic quarantine policies went into effect, the WHO developed guidance to help countries resume immunizations as quickly as possible, and many experts were optimistic that it would be possible to close gaps easily once the pandemic stabilized.8 However, annual data for 2020 and 2021 show that the trend of decreasing coverage continued, with the number of children missing the full three doses of diphtheria, tetanus toxoid, and pertussis-containing (DTP) vaccine—a “marker for immunization coverage within and across countries”—increasing to 25 million in 2021, constituting “the
largest sustained decline in childhood vaccinations in approximately 30 years.\textsuperscript{9} The new WHO and UNICEF data points to improved DTP3 coverage in many countries, but measles coverage rates are lagging, and high risk populations in low-income and fragile settings remain vulnerable to outbreaks of infectious disease. Factors driving the slow recovery of immunization coverage include a large number of children living in conflict zones, ongoing supply chain disruptions, and the proliferation of misinformation associated with Covid-19 vaccines.\textsuperscript{10}

The United States has supported immunization programs for several decades, primarily with funds designated for maternal and child health activities at USAID, as well as through CDC initiatives funded with earmarks for polio and measles.\textsuperscript{11} Both agencies focus efforts on a set of priority regions that include low-income countries as well as a handful of middle-income countries.\textsuperscript{12} There is some overlap between the USAID priority countries for maternal and child health and countries prioritized by the CDC for immunization support. At the same time, the U.S. priority countries for global health security, supported through the Global Health Security Agenda, present a separate set of focal areas.\textsuperscript{13}

The United States has also supported Gavi since the early 2000s, providing funds to the alliance through USAID’s maternal and child health accounts. Annual U.S. contributions to Gavi have remained flat since 2018 at $290 million, although the United States committed funding in late 2020 for COVAX, the Covid-19 vaccine pillar of the ACT Accelerator, with a one-time transfer of $4 billion to Gavi occurring in 2021. USAID bilateral funds for maternal, newborn, and child health activities are managed at the country mission level, with support focused in 25 partner countries and provided through organizations working with health programs at the community level. Currently, the USAID-funded MOMENTUM Project’s Routine Immunization Transformation and Equity Project manages the bulk of bilateral initiatives focused on immunizations, including the delivery of polio vaccines, as well as the delivery of Covid-19 vaccines.\textsuperscript{14} Since the 1970s, USAID has funded
research focused on the development of new vaccines to protect against malaria, as well as for HIV/AIDS, working closely with U.S. military laboratories and the National Institutes of Health to evaluate diverse options.\textsuperscript{15}

CDC funding for global immunization activities is largely focused on polio and measles, with the agency providing training and technical assistance to ministries of health and other health personnel at the national and subnational levels. In its collaboration with other countries, the CDC emphasizes “consequential geographies”—that is, countries for which an outbreak would have significant impacts beyond its borders. Focus countries include many that

Figure 3: U.S. Direct Contributions to Gavi, 2021–2023 (millions)

The increase in the U.S. direct contribution to Gavi in 2020 reflects money allocated for the Ebola vaccine stockpile.

Note: In 2021, the U.S. government also invested $4 billion in emergency supplemental Covid-19 funding for vaccine procurement and delivery support under COVAX.

Figure 4: Global Reported Measles Cases, 2012–2022

are fragile or are affected by conflict, such as Ethiopia, the Democratic Republic of the Congo, and Nigeria. Areas of focused technical assistance also include the Philippines, Indonesia, and Brazil, where CDC staff work directly with national or regional health authorities to strengthen their capacities in the areas of vaccine delivery, supply logistics, vaccine confidence, and workforce management.

In 2021, the United States launched the $1.6 billion “whole-of-government” Initiative for Global Vaccine Access (Global Vax) to help countries access and deliver Covid-19 vaccines, with a priority focus on supporting countries in sub-Saharan Africa with assistance managing cold chain and supply chain logistics, promoting vaccine demand and acceptance, and analyzing data to monitor for equity and quality of service. In contributing to the initiative, the CDC has established the Covid-19 International Vaccine Implementation and Evaluation Program to support low- and middle-income countries, including those receiving support from COVAX, in delivering vaccines and building sustainable programs that can serve adolescent and adult populations. The Global VAX initiative has focused on providing support to a set of “surge” countries, including Angola, Cote d’Ivoire, Eswatini, Ghana, Lesotho, Nigeria, Senegal, South Africa, Tanzania, Uganda, and Zambia, while also managing the donation of half a billion Covid-19 vaccines to 115 countries.

In 2022, the United States also supported the Covid-19 Vaccine Delivery Partnership, which was established by the WHO, UNICEF, and Gavi to remedy global inequities in access to vaccines, including by promoting greater vaccine acceptance and demand. In alignment with the activities encompassed by Global VAX, the United States has more recently supported efforts to build the global health work force and strengthen countries’ capacities to deliver health services, including immunizations. In May 2022, the Biden administration announced the Global Health Worker Initiative to help low- and middle-income countries recruit and train health workers, for which there will be an estimated deficit of 10 million worldwide

Figure 5: Top 10 Countries with Highest Measles Cases per Million, 2022

by 2030. In September 2022, the U.S. government and the Pan-American Health Organization signed an agreement to form the Americas Health Corps to train half a million public health professionals in the Latin America and Caribbean region, where there is an estimated “deficit of between 600,000 and 2 million healthcare workers.” In the recent G7 Leaders’ Communiqué, the United States joined other countries in committing to strengthen the health workforce in low- and middle-income countries to improve the delivery of primary healthcare services, including services for mothers and children.

RECOMMENDATIONS

To ensure that U.S. support for immunization services serves both to close gaps in equitable access to immunizations, with a particular emphasis on reaching missed children with essential vaccine doses, while also readying health systems to respond to pandemic threats, including by distributing vaccines once available, the CSIS Working Group on Routine Immunizations and Global Health Security recommends the following steps:

1. Increase funding for bilateral and multilateral programs that support immunization activities, including financing mechanisms that support primary healthcare and health systems strengthening, as well as Gavi.

The stresses of Covid-19 have negatively affected the economies of lower- and lower-middle income countries, which are not expected to recover to pre-pandemic levels in the short term. The United States has supported such pandemic-era assistance and financing initiatives as COVAX and the ACT Accelerator, but as these programs phase out, it will be important to support financing mechanisms that can enable countries to strengthen health systems, including immunization services, recognizing the essential role they play in helping to prepare for responding to future health threats. One promising development is that the United States has supported the formation of the Pandemic Fund at the World Bank, announcing at the recent G7 meetings in Hiroshima, Japan, a pledge to commit $250 million to the fund, subject to congressional approval, with an FY 2024 request of an additional $500 million.

Beyond the Pandemic Fund, the United States should commit funding to Gavi for the remaining two years of its current work plan (2021-2025) as well as make an increased, multiyear commitment to Gavi during the 2025 replenishment. In the run-up to the 2020 Gavi replenishment, the United States made an unprecedented four-year commitment of $290 million per year, sending an important signal that the country is a committed partner when it comes to global immunization programs. As Gavi builds on lessons learned during Covid-19 and prepares to support countries in introducing or scaling up vaccines during its next phase of work, the United States should make a new multiyear commitment to Gavi, increasing its annual contribution if it can do so without reducing funding for bilateral maternal and child health programs. Given the importance of U.S. commitments to Gavi, USAID and CDC staff at the mission level can coordinate with other bilateral and multilateral health partners to share information on immunization activities that are being supported to enhance contributions and impact.

2. Elevate the importance of immunizations as a critical tool for global health security within high-level political dialogue and diplomatic engagement.

While the United States, through USAID and the CDC, provides funding and technical assistance to bilateral and multilateral partners to help reach global immunization goals, there is an opportunity to place a higher priority on immunizations as critical global health security tools through high-level political dialogue and engagement. Beyond encouraging other countries to contribute to Gavi during its next replenishment, U.S. diplomats can strengthen vaccine confidence by sharing evidence about the effectiveness of vaccines in preventing disease and by voicing support for immunization programs in speeches and interactions with their counterparts. In particular, in their engagement with host-country officials, U.S. diplomats can emphasize the importance of ensuring the delivery of vaccines to often-overlooked populations, such as refugees, displaced communities, and
mobile or nomadic groups, as well as the general population. U.S. officials can also work with their counterparts to compare experiences and share advice on the most effective ways to prepare health systems to better reach adolescents and adults with immunization services.

3. **Support local research, communications, and outreach efforts to fortify vaccine acceptance and demand to confront misinformation and disinformation about vaccines while building and sustaining vaccine confidence.**

One of the greatest potential threats to global health security is declining trust in vaccines. While research has shown that the development or loss of vaccine confidence is highly context-specific, vaccine hesitancy is driven in part by eroding confidence in government institutions, science, and the pharmaceutical industry as well as the circulation of mis- and disinformation through mainstream channels and social media. To counter the challenges posed by low trust in vaccines, the United States can support research to better understand the complexities of vaccine acceptance in diverse global contexts and engage in regional coordination programs to counter misinformation. Addressing the challenge of vaccine hesitancy among mobile populations or those affected by conflict will require supporting community organizations to deliver messages and health services in relevant languages and with respect for local customs and practices. Special attention will also need to be paid to building the vaccine confidence of all health workers, who, as trusted members of the communities they serve, also play an important role in delivering information about vaccines to patients and their families.

4. **Prioritize a focus on health systems strengthening and the development of the health workforce that delivers immunizations.**

While immunization coverage for DTP and measles had stalled prior to the pandemic, the disruptions of the Covid-19 outbreak and the erosion of public trust in science and vaccines have widened gaps in access to several important vaccines for children in countries around the world. Trends in immunization coverage should be recognized as an early indicator of the health system’s potential to “withstand health shocks while maintaining routine functions.”

In its efforts to strengthen the health workforce, the United States can also assist countries in determining how best to recruit, train, retain, and professionally advance the health work force that delivers vaccines and information about vaccines and manages immunization programs. The importance of recruiting and retaining health workers has become clear over the course of the pandemic and points to the importance of cultivating and sustaining the workforce that delivers immunizations, from pre-service training to mentorship programs to preparation for executive leadership.

To slow this revolving door of expertise, the United States can help countries build competency levels in the subnational context through pre-service and on-the-job trainings and by supporting countries in empowering the immunization workforce to contribute more directly to decisionmaking regarding resources and planning. In closing gaps in immunization coverage and preparing for future health threats, it will be important to ensure decent work, recruit a new generation of health workers, and ensure that the entire health workforce, not just the immunization sector, is trained on the importance of immunizations and how to deliver them.

5. **Deepen a commitment to a life-course approach to ensure adolescents and adults, as well as children, are well served by immunization systems.**

Historically, the bulk of U.S. funding for immunization programs has come from foreign assistance accounts dedicated to maternal and child health. While sustaining progress toward meeting global goals related to maternal and child health should remain paramount, it is also important to secure additional funding to reach adolescents and adults, both because there is an increasing number
of vaccines available to protect their health and because they may be especially vulnerable to a future pandemic pathogen. To reach all key and vulnerable populations, including adolescents, adults, and older children who may have missed immunizations during the pandemic, programs should continue to evolve to encompass a whole-of-family, life-course approach.

Expanding U.S. government support for programs that deliver the vaccine to prevent infection with the human papillomavirus (HPV) can accelerate progress toward this goal. First available in the early 2000s, HPV vaccines, which are typically administered in two doses to adolescents, have proven to be effective in decreasing the prevalence of HPV and associated cancers, particularly cervical cancer. By the end of 2022, more than 120 countries had introduced the HPV vaccine into their national immunization programs, targeting girls in outreach initiatives.24 However, progress in scaling up access to the HPV vaccine for girls has been slow, and just 12 percent of eligible girls and women had been vaccinated by the end of 2021.25

To address this challenge and work toward the global goal of eliminating cervical cancer as a public health problem, in December 2022, the WHO published updated recommendations regarding the HPV vaccine. The position paper recommends including HPV vaccines in all national immunization programs, with a goal of reaching 90 percent of girls by age 15 with HPV vaccine by 2030. It recommends a two-dose schedule but also offers an alternative, single-dose schedule as an off-label option.26

Responding to the decline in HPV vaccination rates throughout the Covid-19 pandemic, Gavi announced a commitment to reach 86 million adolescent girls with the HPV vaccine from 2022 to 2025.27 Through the funding it provides to Gavi, the United States can help health officials determine the best ways to reach adolescents with immunization services and, as HPV vaccine supplies increase, prepare countries to move from a focus on vaccinating girls to a universal approach to HPV vaccination and provide adolescent boys with cancer-preventing vaccines and health services as well.

6. Support the development and deployment of new technologies to enhance immunization services outreach.

One challenge with the current vaccine delivery model is that many vaccines must be stored at cool or, in the case of the recent mRNA Covid-19 vaccines, ultra-cold temperatures. This constraint limits the ability of health workers to take some vaccines to remote communities, where many of the children not reached with immunizations are frequently found. The emphasis on intramuscular, needle-based delivery also requires specialized training and the availability of skilled health workers to deliver immunization services. However, research into thermostable and needle-free methods for delivering vaccines has begun to pay off, with a variety of options including intranasal vaccines, oral tablets, or microarray patches currently under development and testing.28 The United States, through USAID and the Biomedical Advanced Research and Development Authority, can support additional research and development of these and other new vaccine delivery technologies to finalize testing, boost production, and improve the possibilities for distributing products to a wide variety of communities in diverse contexts.29 Sustaining and, if possible, increasing commitments to CEPI can support innovative approaches to vaccine delivery as well.

In many ways, routine immunizations are anything but routine. Cost-effective and lifesaving, vaccines connect the people who receive them to other important services, making immunization programs a linchpin of effective healthcare and a critical platform for health security. But the decades-long effort to ensure equitable global access to vaccines is under threat. After years of strong progress in increasing coverage thanks to bilateral
and multilateral commitments, that momentum has slowed, and rates during Covid-19 decreased thanks to pandemic-era disruptions to health services, as well as increasing mistrust in vaccines fueled by misinformation, disinformation, and the politicization of vaccine programs. For the United States, closing global gaps in access to immunizations for children while preparing health systems to both maintain health services and reach adolescent and adult populations with new vaccines during a health crisis is a matter of national security. Increasing bilateral and multilateral funding for immunization activities, elevating the importance of immunizations as a critical tool for global health security within political dialogue and diplomatic engagement, addressing the challenges of vaccine confidence and demand, prioritizing a focus on health systems strengthening and the professional development of the health workforce that delivers immunizations across the life course, and supporting the development of innovative vaccine delivery options to increase uptake and expand coverage are all steps the United States can take to make protecting health security globally a routine matter.

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ABOUT THE CSIS BIPARTISAN ALLIANCE FOR GLOBAL HEALTH SECURITY

The CSIS Bipartisan Alliance for Global Health Security convenes an esteemed group of members of Congress, senior leaders, and subject matter experts to advance a concrete, forward-leaning agenda for U.S. global health security strategy. It prioritizes coherent, sustained U.S. leadership, ensuring success in the major institutional reforms under way across the executive branch, integration of effort with strong accountability measures, enhanced global coordination, and building new partnerships and alliances through strengthened U.S. diplomacy that systematically advances U.S. national interests, amid intensifying geopolitical competition. Equally critical is building the correct institutional arrangements, including adequate private sector incentives, to bring forward the next generation of technological innovation. The alliance is developing concrete options to strengthen core pandemic preparedness and response capabilities, while exploring the untapped opportunities to better align capabilities across traditional infectious disease programming.
including on HIV/AIDS, routine immunization, and antimicrobial resistance, among other priorities. Building on the record of prior CSIS initiatives, the alliance delivers recommendations on global health security policy and programs to key decisionmakers in the U.S. Congress, the executive branch, and nongovernmental organizations.

The two-year effort, running from spring 2023 through the end of 2024, is cochaired by Senator Richard Burr, principal policy advisor and chair of the Health Policy Strategic Consulting Practice at DLA Piper and former senator from North Carolina, and Julie Gerberding, MD, MPH, CEO of the Foundation for the National Institutes of Health and former director of the CDC. J. Stephen Morrison, PhD, senior vice president and founder/director of the CSIS Global Health Policy Center, sets the alliance’s strategic direction and directs its work on pandemic preparedness and response. Katherine E. Bliss, PhD, senior fellow and director of immunizations and health systems resilience with the CSIS Global Health Policy Center, directs its work on HIV and routine immunization. Michaela Simoneau, associate fellow, leads the alliance’s secretariat. More information on the alliance can be found on its website at https://www.csis.org/programs/global-health-policy-center/csis-bipartisan-alliance-global-health-security.

SIGNATORIES
This report conveys a majority consensus of the signatories who are participating in their individual capacity, not as representatives of their respective organizations. No expert is expected to endorse every single point contained in the report. In becoming a signatory to the report, experts affirm their broad agreement with its findings and recommendations. Language included in this brief does not imply institutional endorsement by the organizations that working group members represent.

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