

Summary of Key Evidence Related to Zero Dose and Health Resilience

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Key Points

- Health resilience helps individuals, communities, and health systems to withstand, adapt to, and recover from health emergencies.
- Immunization is one of the most effective ways to strengthen individual-level health resilience for zero-dose children by protecting them from the long-term impacts of vaccine-preventable diseases.
- Outbreaks like the COVID-19 pandemic can disrupt delivery of and access to critical primary health care interventions like routine immunization programs at a time when they are needed the most, particularly by vulnerable and marginalized communities. This highlights the importance of continuity of health services in building a resilient health system, which can mitigate the effects of falling immunization coverage and prevent zero-dose children and their communities from becoming even more vulnerable to disease outbreaks.
- Health systems can adopt resilience-building strategies (centered around population awareness, diversity of service provision points, flexible sub-national health services that can self-regulate, integrated multi-sectoral and public-private service provisions, and adaptive health services) ahead of a crisis to improve their ability to maintain routine services like immunization programs during an emergency.

As part of Gavi 5.1's ambitious agenda to "leave no one behind" on the path to achieving the Sustainable Development Goals (SDGs), Gavi has commissioned the International Vaccine Access Center (IVAC) to produce evidence-based and policy-relevant knowledge products relevant to Gavi's equity approach in wider political and policy spaces. **This knowledge summary is the fifth in a series of six (6) documents which aim to provide a snapshot of recent key evidence related to a specific topic or area of interest. This document focuses on the importance of building health resilience through equitable immunization access for zero-dose communities.** This knowledge summary draws upon peer-reviewed literature linking health resilience concepts to zero-dose evidence and aims to provide a basic understanding about how health resilience can further the immunization equity agenda at the individual, community, and health systems levels. Presented here are the results of a search conducted through November 2022. Key findings are briefly described below in the form of an annotated bibliography while the related advocacy brief provides more information and context.

Introduction

Health resilience as a concept refers to “the capacity of health actors, institutions, and populations to prepare for and effectively respond to crises; maintain core functions when a crisis hits; and, informed by lessons learnt during the crisis, reorganize if conditions require it”¹. Health resilience is multidimensional and mutually reinforcing, as individuals, communities, and health systems must all be resilient to adequately protect children and communities, especially those that are vulnerable and marginalized, from shocks and threats to their health. This is especially critical for zero-dose children, who are operationally defined as those who have not received a single dose of diphtheria, tetanus, and pertussis-containing vaccine (DTP)². These children often come from households living below the international poverty line and are clustered in marginalized communities which are systematically excluded from essential services and resources such as primary health care (PHC) and sanitation. Identifying these communities, increasing equitable access to routine immunization, and reducing the number of zero-dose children are important steps to build and strengthen the health resilience of those left furthest behind.

The COVID-19 pandemic has highlighted the interdependencies of health system, community, and individual resilience, as well as the social inequalities that disproportionately impact people and communities from low socioeconomic backgrounds. Lock-downs and other pandemic measures disrupted and reduced access to routine immunization and other PHC services, and already-limited public health resources and capacities were diverted to respond to the pandemic. As a result, the number of zero-dose children globally increased by 37% between 2019

DEFINING HEALTH RESILIENCE

Individual health resilience: A person’s capacity to cope with, adapt to, and recover from a threat to their health⁴

Community health resilience: A community’s capacity to strengthen health care systems and thus improve the health and health resilience of its members⁵

Health system resilience: A health system’s capacity to prepare for, withstand, and learn from unexpected crises, as well as its ability to maintain its core functions during times of stress⁶

and 2021, reaching 18 million³. To reach the Immunization Agenda 2030’s (IA2030) and Gavi’s goals of reducing the number of zero-dose children by 25% by 2025 and by 50% by 2030², it will be critical to examine strategies to strengthen health resilience in order to prevent further backsliding of routine immunization, catching-up missed children, and restore and maintain immunization coverage in vulnerable communities.

Immunization Strengthens Individual-level Health Resilience

Reducing susceptibility to health threats and strengthening the ability to cope and recover from these threats are key factors that contribute to the health resilience of a zero-dose child. Immunization reduces the risks of catching vaccine-preventable diseases (VPDs) in the first place, and is therefore one of the most effective ways to

strengthen individual-level health resilience, especially for zero-dose children.

This is reinforced by estimates prepared by the Vaccine Impact Modeling Consortium (VIMC)⁷, which calculated the number of deaths and disability adjusted life years (DALYs) averted by immunization programs to quantify the impact of vaccination for a birth cohort. They examined immunizations against 10 pathogens (*Haemophilus influenzae type b* (Hib), hepatitis B, human papillomavirus (HPV), Japanese encephalitis, measles, *Neisseria meningitidis* serogroup A, rotavirus, rubella, *Streptococcus pneumoniae*, and yellow fever) in 112 countries between 2000–2030. Researchers estimated that in this time period, immunization activities would avert 97 million deaths and 5,100 million DALYs. When the data were aggregated by birth cohort, it was estimated that 54 million deaths and 3,400 DALYs would be averted in children under 5, who carry a disproportionate disease burden for several of the pathogens included in analysis.

In addition to averting a significant number of deaths, vaccines can also protect zero-dose children from the cascading health effects related to these VPDs, such as undernutrition and stunting that can result from diarrheal diseases⁸. By preventing infections in the first place, vaccines can also curtail the use or misuse of antibiotic drugs to treat VPDs and secondary bacterial infections, thus contributing to the fight against antimicrobial resistance (AMR)⁹.

Disease Outbreaks Indirectly Impact Immunization Coverage

The COVID-19 pandemic has shown how crises like disease outbreaks can impact the delivery of routine health services.

A 2021 study analyzed data from 170 countries and territories to determine the impact of the COVID-19 pandemic on routine immunization services¹⁰. Data was collected about the status of routine immunization during the pandemic (i.e., partial or complete suspension of services) as well as the number of vaccine doses administered in 2019 and in 2020, with a focus on the third dose of DTP and the first dose of measles-containing vaccine (MCV). These data were aggregated at the national level for each month between January 2019 and December 2020.

Nearly half of responding countries reported that their routine immunization services were disrupted or completely suspended. In the first half of 2020, there was a significant decline in the number of DTP3 and MCV1 doses administered. For example, in April 2020, 33% fewer doses of DTP3 were administered globally compared to April 2019; this number increased to 57% when considering just the WHO South-East Asia region. By June 2020, immunization services in many of the countries included in the study had begun to return to normal, though researchers emphasize that immunization coverage in the most vulnerable communities will most likely take longer to rebound.

This study illustrates the importance of building resilient health systems ahead of any future pandemics to ensure continued and equitable access to, and delivery of, public health services, especially routine immunization, which is key to pandemic prevention, preparedness and response (PPPR). Reaching zero-dose children with essential services such as routine immunization will play a crucial role in identifying and addressing the systemic inequities that were exposed and exacerbated by the COVID-19 pandemic's disruption of health services.

Resilient Health Systems Can Maintain Immunization Services During Crises

A critical aspect of health system resilience is the ability to maintain the continuity of the health system's core functions during a crisis or disease outbreak. Maintaining routine immunization is one such core function because it provides the opportunity for children to remain in contact with the health system and access additional primary health care services¹¹. Additionally, reaching zero-dose children with an initial immunization supports raising levels of co-coverage, as children reached with one vaccine are significantly more likely to receive other vaccines.

A 2022 systematic review¹² examined the five elements of a resilient health system needed to maintain delivery of routine immunization services during health crises, using the COVID-19 pandemic as an example.

Awareness: At a population level, awareness about the onset and magnitude of an interruption and insight about operational status and factors such as supply chain or staffing issues is critical. The value of sustaining or rapidly restoring coverage may be emphasized to key audiences through mass and digital media platforms.

Diversity of resources available for routine immunization programmes: Rather than relying solely on immunization-specific facilities, vaccines should be available in a range of health care settings, such as hospitals, pharmacies, and mobile outreach clinics.

Self-regulation at sub-national levels: When necessary, decision makers should be able to appropriately adapt immunization



A framework for resilient health systems, adapted from Kruk et al., 2017⁶

guidelines, such as prioritizing certain populations (e.g., pregnant women), at the sub-national level for health systems to continue to operate during crises and pandemics.

Integration: Agencies and organizations from both the private and public sectors must collaborate to maintain immunization services and enhance communication efforts to promote immunization.

Adaptation: Programs must be able to adapt to unexpected challenges (e.g., changing clinic hours, allowing a wider range of health workers to administer vaccines) to make it easier and safer for individuals to access immunization services.

These lessons learned from the COVID-19 pandemic can inform strategies to strengthen the resilience of health systems and, in turn, the resilience of zero-dose children by ensuring continued access to critical health services—including routine immunization—when the next crisis occurs.

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