

# The Economics and Value of Immunizing Zero-Dose Children

AN ADVOCACY BRIEF



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## Introduction

Vaccines are a powerful tool for saving lives, improving lifelong health, and promoting gender- and wealth-related equity. By preventing illnesses, deaths, and long-term disability, vaccines increase a person's likelihood for better health outcomes and indiscriminately provide a fair chance to survive, thrive, and reach one's full potential. In 2021, about 81% of infants worldwide received three doses of diphtheria-tetanus-pertussis vaccine (DTP3)<sup>1</sup>. However, too many children—particularly those in hard-to-reach and conflict-affected settings—still miss out on life-saving vaccines. WHO and UNICEF data (2021) show that 25 million children have missed out on one or more doses of life-saving vaccines.<sup>2</sup> Eighteen million of these children have never received a single dose of vaccines – these are the zero-dose children.

### KEY DEFINITIONS

**Zero-dose children** are those who have not received any routine vaccine. For operational purposes, Gavi measures zero-dose children as those who have not received their first dose of diphtheria-tetanus-pertussis containing vaccine (DTP1). Tracking the complete lack of DTP3 helps to identify children with limited access to PHC, as this vaccine is offered almost exclusively through routine immunization touchpoints with the health system.<sup>6</sup>

**Return on investment (ROI)** reflects the average economic benefit realized per dollar invested in immunization programs and provides important evidence that supports vaccine introduction decisions.<sup>7</sup>

The **Sustainable Development Goals (SDGs)** are 17 goals set by the United Nations that aim to address global challenges including poverty, inequality, climate change, environmental degradation, peace, and justice. Although not legally binding, countries are expected to take ownership and establish a national framework for achieving these goals by 2030.<sup>8</sup>

The **Immunization Agenda 2030 (IA2030)** is a global framework to guide immunization strategy for the decade from 2021–2030. In this strategy, immunization is positioned as a critical part of the fundamental right to the highest attainable physical mental and health, as well as an investment in the future.<sup>9</sup>

Extending vaccine coverage to hard-to-reach populations is estimated to cost two to three times more per vaccine dose.<sup>3-5</sup> In an increasingly resource-constrained world, leveraging health interventions that can co-deliver primary health care (PHC) services cost-effectively and sustainably in these communities will be critical. Given the potentially greater cost of reaching hard-to-reach communities, it is all the more important to understand the true economic benefits of reaching missed communities with routine immunization.

The following brief discusses these relationships, highlights the economic considerations due to the inequities these communities often face, and provides recommendations for what is needed to better understand the costs and benefits associated with immunizing zero-dose children. Finally, recommendations are provided for mobilizing core resources to inform budgeting and planning to reach the most vulnerable and underserved communities.

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## Immunization is an Investment in Equity

Despite advances in vaccine coverage in recent decades, many children remain in zero-dose or under-immunized status in low- and middle-income countries (LMICs) and are

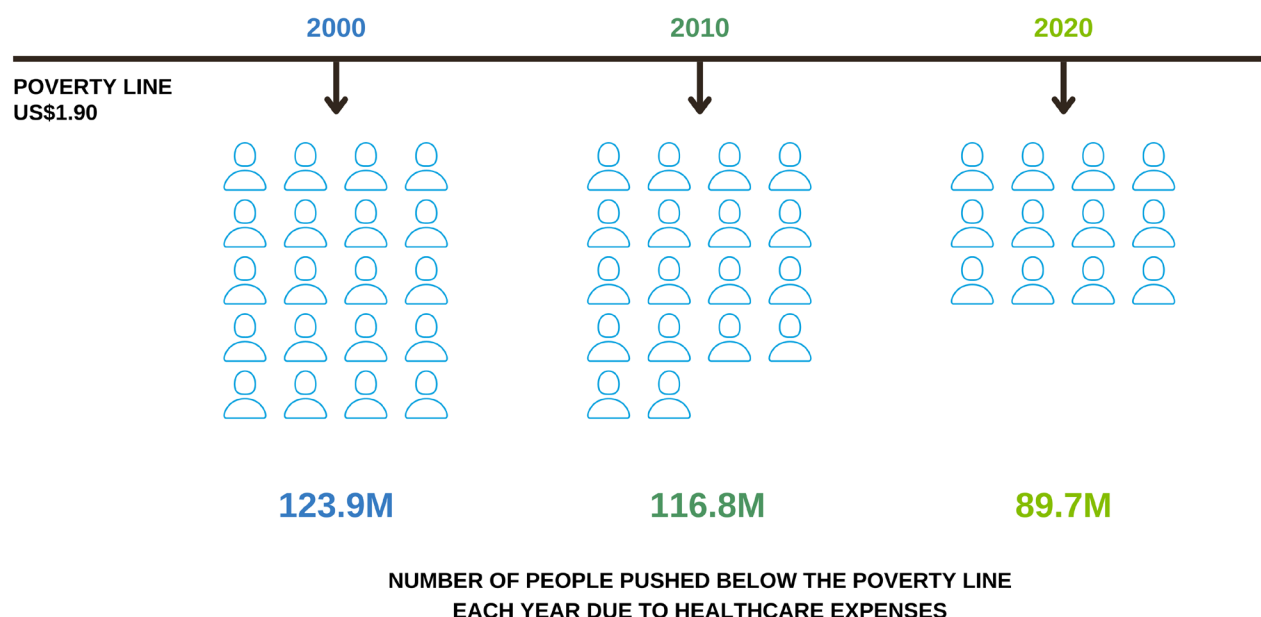
experiencing widespread economic-related inequalities.<sup>10</sup> In the majority of LMICs, immunization coverage is typically higher among those grouped in a higher wealth quintile. Research suggests that this could be linked to greater access to antenatal care services by wealthier mothers.<sup>11</sup> The overlap between zero-dose status and gaps in delivery of other essential health services demonstrates the need to close the gap in access to the health care system across all income levels to improve a population’s health outcomes.

In LMICs, the cost to manage pediatric infectious illness can rapidly escalate and can potentially cost up to 75% of a household’s monthly income. Seeking treatment for vaccine-preventable diseases (VPDs), therefore, places a huge financial burden on a family. A study in Bangladesh reported that 78% of the poorest caregivers experienced catastrophic health expenditures due to out-of-pocket expenses paid to treat measles in children under-five.<sup>12</sup> Reaching children, especially zero-dose children and their communities, with not only vaccines but also other preventive health services can reduce their

risk of contracting VPDs and thus will be beneficial to reduce inequities by protecting vulnerable individuals and families from catastrophic medical expenses.

Childhood vaccines represent a path to achieving health equity—a guiding principle of the Sustainable Development Goals (SDGs)—through averting deaths, reducing the risk of medical impoverishment, and enhancing opportunities for higher educational attainment.<sup>13-16</sup> The cross-sectoral benefits of routine immunization were also highlighted in the Immunization Agenda 2030 (IA2030), which states, “Immunization plays a key role in eliminating poverty, by reducing treatment costs and increasing longer-term productivity by averting losses due to disability and death.”<sup>9</sup>

Today, immunization coverage remains inequitably distributed across wealth and socioeconomic levels and policymakers are encouraged to view vaccination policies as an important tool to target health equity and poverty.<sup>11,13</sup> Shrinking government resources mean that governments and partners need to ensure



Adapted from Gavi, Value of Vaccination

health financing is utilized efficiently by prioritizing equitable access to PHC, including routine immunization. Often, national programs are faced with competing mandates between improving immunization coverage or improving immunization equity, which can influence how resources are deployed. Cost analyses from Pakistan showed that when resources are limited, allocating those resources to maximize equity can still achieve close to maximum immunization coverage, but the converse is not necessarily true.<sup>17</sup> Thus, delivery models that are designed to maximize equity through reaching hard-to-reach communities, including zero-dose communities, should be prioritized.

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## Immunization is a Smart Investment in Health and Non-Health Sectors

The knowledge summaries and advocacy briefs in this collaborative series have highlighted how prioritizing zero-dose children in routine immunization programs can provide an enabling platform to build PHC, gender equity, and health resilience through service integration as well as pooling and efficient use of resources. Although the cost of scaling up vaccines to reach zero-dose populations may be higher than routine costs, the potential spillover economic benefits of reaching the communities left furthest behind could be substantial for these children's future health outcomes, development, educational attainment, and economic productivity. Routine immunization further creates opportunities to increase cost-effectiveness of PHC interventions through better coordination, service integration, and cost sharing.<sup>3,18</sup> In LMICs, where morbidity and mortality due to VPDs is high and public resources are often constrained,

## IMPACT ON PRODUCTIVITY AND FUTURE EARNINGS

In addition to directly reducing morbidity and mortality, childhood immunization is now recognized to include other advantages such as improvements in cognitive capacity and school attainment.<sup>15-16</sup> This positive influence on child development during a critical period means that immunization may have a profound domino effect to enhance long-term trajectories and later lifetime outcomes. Reaching zero-dose children now becomes paramount as higher levels of school attainment—due to lower risk of illness and/or more time in school—may lead to greater productivity and higher potential earnings as adults. Eliminating zero-dose may therefore lead to economic benefits for individuals and potentially also for society as a whole.



implementing thoughtful and informed strategies to reach zero-dose children can be especially warranted.<sup>3,18</sup>

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## Recommendations

The value proposition of delivering vaccines is consistently supported by the existing and emerging evidence base. In Gavi-supported countries, for example,

*“Countries and partners should apply appropriate insights, data, and lessons gained through campaigns and other outreach approaches to strengthen strategies to reach zero-dose children and communities – resulting in greater resource efficiencies.”*

— IA2030’s Working Group on Sustainable Financing

every US\$1 invested in immunization is estimated to return up to US\$54.<sup>7</sup> The COVID-19 pandemic has further exposed and exacerbated underlying inequities in access to healthcare services, which disproportionately impacts the vulnerable and marginalized communities where many zero-dose children live. Reaching these communities where children who have not received even a single dose of vaccine due to geographic, social, or economic barriers is therefore imperative as the world transitions post-pandemic.

Further work involving shared successes and lessons learned from implementing collaborative national policies, developing innovative models for service delivery, and delving further to examine subnational differences will be a key step toward reducing the prevalence of zero-dose status in LMIC settings. Context-specific data will be important to not only shape national immunization program recovery but also to guide the specific budgeting, fundraising, and planning considerations required to effectively scale up immunizations to address zero-dose children. Data related to economic, demographic, and health parameters are all vital to better understand and improve health in the local context. Other important considerations include factors such as the current distribution of zero-dose populations (e.g., rural communities versus urban slums), rates of migration or displaced populations, and the proportion of persons people affected by conflict, political instability, and natural disasters. As explored in previous briefs from this series, opportunities for integration and cost-sharing have promising potential to be advantageous for programs aiming to

strengthen PHC, gender equity, and health resilience in LMICs.

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