



Review

Applying an equity lens in the Decade of Vaccines

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ABSTRACT

Addressing inequities in immunisation must be the main priority for the Decade of Vaccines. Children who remain unreached are those who need vaccination – and other health services – most. Reaching these children and other underserved target groups will require a reorientation of current approaches and resource allocation. At the country level, evidence-based and context-specific strategies must be developed to promote equity in ways that strengthen the system that facilitates vaccination, are sustainable and extend benefits across the life cycle. At the global level, more attention must go on ensuring sustainable and affordable supply for low- and middle-income countries to vaccine products that are appropriate for the contexts where needs are greatest. Finally, data must be disaggregated and used at all levels to monitor and guide progress to reach the unreached.

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1. Introduction

The Global Vaccine Action Plan (GVAP) [1], developed as a framework to guide immunisation programmes in the “Decade of Vaccines” calls for more people having access to more vaccines to achieve several ambitious goals. A guiding principle of the GVAP¹

is that equitable access to immunisation is a core component to the right to health. Equitable access will also ensure that the benefits of immunisation extend to each individual and to society as a whole.

Despite impressive progress, the current trajectory remains insufficient to achieve the goal of all children enjoying the full benefits of immunisation. Inequalities in immunisation coverage between and within countries persist and in some cases are widening. Although 83% of children worldwide received three doses of a diphtheria-, tetanus- and pertussis-containing vaccine (DTP3)² in 2011, 22.4 million children are estimated to have been missed [2]. Household wealth, education, access to healthcare and location are all contributing factors to this inequity [3]. Further, those who are

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¹ The six guiding principles of the GVAP are: (1) Country ownership of immunization services, (2) Immunization is a shared individual, community and governmental responsibility that transcends borders and sectors, (3) equitable access to immunization, (4) strong immunization systems as part of broader health systems, (5) ensured sustainability of immunization programmes, and (6) continued innovation and quality improvement across all aspects of immunization.

² DTP3 is used as the main indicator of immunisation coverage as it captures the ability of the system to identify and routinely administer three doses of vaccine to the same children.

un- or underimmunised³ are those most in need and for whom vaccines could have the greatest impact. This is unacceptable.

To seize the opportunity of the GVAP, addressing inequalities in immunisation coverage must be a prime focus for the next decade, pursued in ways that are sustainable and have wider benefits across the continuum of care, so that children and their families have access to more health interventions they need. For this purpose, as governments, global actors, regional bodies, civil society and the private sector move into the GVAP's implementation phase, existing imbalances will need to be addressed. Reaching the unreached will require a reorientation of funding, programming approaches, and research and development, so that the needs of the most vulnerable and underserved are prioritised. This must involve greater emphasis on *vaccination*, moving beyond the current focus on the vaccines themselves, for any vaccine is only as effective as the health system that will deliver it. As such, we are in the “Decade of Vaccines and Vaccination”.

In this article we make the case for focusing on equity in the coming decade. This is by no means a comprehensive or systematic analysis of how to reach the unreached, but it presents some key areas of the GVAP that warrant additional attention at country and/or global level in order that all children enjoy the full benefits of immunisation. While we focus here on supply-side constraints, efforts to reduce inequities in immunisation coverage should of course consider demand- and supply-side issues, as well as the enabling environment.

2. Setting the scene

Progress in immunisation coverage has been impressive. The Expanded Programme on Immunisation (EPI) was founded in 1974 [4] and in low-resource countries catalysed immunisation programming. This, combined with a very focused approach under “Universal Child Immunisation (UCI)”, resulted in coverage rapidly increasing through the 1980s. This was followed in the 1990s by a phase of consolidation of gains in many countries, but by stagnation and even decline in many countries with weaker health systems. Accelerated access to new vaccines for low-income countries has become the focus over the past decade since the Global Alliance for Vaccines and Immunisation (GAVI Alliance) was established (Fig. 1). Against this background, intensified and mostly campaign driven efforts reduced poliomyelitis incidence by 99% [5], neonatal tetanus incidence by over 90% [6–8], and measles mortality by close to 90% over the past 20 years [9].

To further improve coverage, the challenge that shapes the decade ahead is to reach the final fifth of children who are currently not being fully vaccinated. Inadequate data limits our ability to monitor progress and develop evidence-based strategies. However, we know that the unreached and undervaccinated are not randomly distributed: a child's poor immunisation status corresponds to inequalities that characterise his/her community and sub-community. This trend is true for most vaccines and in most countries. Average DTP3 coverage in low-income countries (LICs) falls 15 percentage points behind that of high-income countries (HICs) [10,11].⁴ Further, the underimmunised are heavily concentrated with 80% of children without DTP3 living in Africa and south-east Asia [12]. Within countries, inequalities in immunisation coverage can be widespread and are associated with household wealth, education and geographic location [13]. For instance in Nigeria, children from the poorest households were nine times less

³ In other words, children who have not received all vaccines as prescribed in the national schedules.

⁴ Authors' calculation as non-weighted average, estimated from WHO/UNICEF coverage estimates by country for DTP3 (1980–2011).

likely to receive DTP3 than those from the richest in 2008 [14].⁵ Where disaggregated data is available to track changes in DTP3 coverage over time, few countries have achieved substantial reductions in disparities [15]. In many contexts, evidence suggests that the “inverse equity hypothesis” – coined by Victora and others⁶ – is correct, where progress in immunisation benefits the least vulnerable first [16].

3. The rationale for focusing on equity

The importance to achieve not only high coverage, but also to do so in equitable ways was reflected in the Global Immunisation Vision and Strategy (GIVS), which was established in 2005 and called for 90% coverage in every country and 80% coverage in every district [17]. Both targets are retained in the GVAP. The message is that countries should not strive towards high national coverage by addressing access and utilization in more easily accessed and more densely populated areas only. On the contrary: a recent analysis found that increasing coverage among the poorest households is a major driver of aggregate increases in coverage at the national level [18].

Access to the full benefits of immunisation, as a proven cost-effective intervention, is indeed part of the human right to health. As such, any inequity in immunisation coverage is to be seen as unfair and avoidable, creating an ethical prerogative to address such inequalities, and requiring both resources and political will and attention to do so.

There is also an economic case for reaching the unreached. Often the poorest who are underimmunised are likely to also be exposed to increased risks such as inadequate water, sanitation and nutritional intake, as well as to lack access to other essential preventive interventions, making them more susceptible to disease. When sick, poor children are less likely to have timely access to quality care, their chance of survival from preventable illness is reduced. Due to the disproportionate vulnerability and disease burden, vaccinating the unreached is most cost-effective [19,20] and has huge life-saving potential, arguably greater than any future technology [21]. This is also true for the new vaccines: maximizing their impact means prioritising the underserved. Equitable immunisation coverage at high levels of rotavirus infection would increase the impact of the vaccine by 35% overall, and by 60–400% for the most poor [19].

Improving equity in immunisation also opens the door to better coverage in other health interventions: despite existing inequities in coverage, immunisation is often the intervention with the widest reach, able to act as vehicle of delivery for other preventative measures. Improving that reach, while integrating other interventions with immunisation, can bring broader health benefits to those most in need [41].

4. What must be done?

As the structural determinants that characterise immunisation coverage – such as household wealth – are the same as those that deprive millions from access to other essential interventions, the root causes of such inequalities must be addressed. At the same time, the health system – and immunisation programmes specifically – can help to mitigate some of the drivers of health inequity [21].

Two comprehensive literature reviews [23,24] used four main categories to classify the reasons why children are not fully

⁵ Authors' calculation using the Nigerian Demographic and Health Survey 2008.

⁶ The inverse care law was first stated by Julian Tudor Hard in the *Lancet* in 1971.

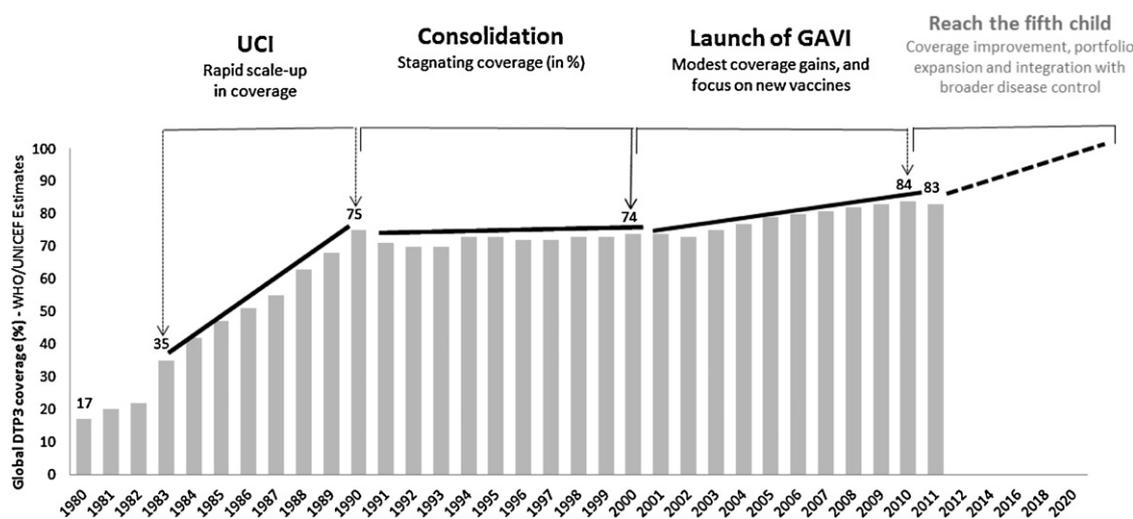


Fig. 1. Global DTP3 coverage since 1980.

Source: WHO/UNICEF estimates [10].

immunised: supply of and access to services, parental knowledge and attitudes, family characteristics and communications, which are often interrelated. In every context, a complex mix of such factors will be at play, differing markedly between the group of reasons why children remained completely unvaccinated and the group of reasons why children were not completing their vaccination schedule (undervaccinated).

As Rheingans and colleagues have demonstrated for rotavirus and diarrhoeal disease [19], and Mulholland et al. for pneumococcal infection [25], existing programmes are likely to miss the children who are most at risk. An alternative approach will be necessary to reach the unreached, that *starts* with the populations who are currently missed, reorienting programmes from their perspectives [26]. Only then will the full potential benefit of vaccines be realized.

In every context, efforts must be made to systematically map where the unreached are and to identify what factors are hindering coverage. Based on this analysis, strategies should be developed to address the bottlenecks identified and integrated into the existing immunisation and health strategies for implementation. Campaigns are able to reach further and can achieve more equitable coverage, however they can also be costly and unsustainable [27,28]. In addition to the immunisation strategies, alternative approaches should be investigated beyond the immunisation programme within the broader health system that would contribute to reaching the unreached.

Political will is an essential element to make progress on equity in immunisation and in health more broadly. Now is the moment for this to be expressed. The momentum of the GVAP as an approved plan at the 65th World Health Assembly must translate into action at country level.

The “Reaching Every District (RED)” strategy helps to target spatial inequalities in immunisation coverage [29], by encouraging the revitalisation of outreach services and community partnership in immunisation service delivery. Not only should this strategy be implemented wherever coverage is lagging, but as the GVAP asserts, and as is being proposed in Cambodia [30], we need to consolidate the gains of RED and move forward to reaching every community (REC) with a set of strategies that are currently being developed. Further, with the momentum of the GVAP, additional dimensions of equity must guide immunisation programme design and implementation.

Tailoring strategies to the local context is imperative and requires a mixture of drawing on the evidence available while allowing space for local problem-solving. This article does not

intend to provide a comprehensive analysis of how countries can reach the unreached, but it highlights a few areas that warrant additional attention for their potential to leverage sustainable progress on equity in immunisation and health more broadly.

A large proportion of domestic and donor funding for immunisation is spent on the vaccines themselves, for example about 85 per cent of GAVI resources are spent on vaccine procurement [32]. Yet without sufficiently strong systems, new vaccines will continue to miss those most in need and exacerbate inequities.

Almost all routine immunisations are delivered through the existing health system [25] including outreach services, and should be integrated into comprehensive preventive health and disease control plans, as the GVAP encourages. Achieving the global goals of elimination or eradication of polio or measles will be helped by immunisation campaigns but can only be achieved and sustained if they are integrated with effective health systems that deliver high quality routine immunisation on an on-going basis to every child irrespective of where he or she is born or lives [33]. Strengthening routine immunisation can also promote equity in coverage of other interventions across the continuum of care. But the current distribution of resources, and higher cost of new vaccines, creates an imbalance between the vaccines themselves and the system for vaccination. Any investment by countries and donors in new vaccines should carefully assure that sufficient investments in the immunisation programme are made [32].

System weaknesses and bottlenecks for immunisation are often common to those of other primary health care services – such as insufficient public resource allocation to health and too few health workers, who are poorly distributed with inadequate skills, equipment, support and incentives to meet the needs of the community, or a weak supply chain and unreliable transport systems – thus strategies to address inequities in immunisation coverage should consider both immunisation-specific and broader health system investments [33].

Increasingly, we know how to do this. Based on the framework established by Gilson and colleagues, four factors were identified to promote equity in health systems: leadership that facilitates inter-sectorial action for health promotion; organizational practices that are inclusive of civil society and population groups; health financing aimed at universal coverage; and revitalisation of primary health care [22]. Typically provided free at the point of use, financial barriers tend to be less prominent in immunisation programmes than for other essential interventions. Yet immunisation programmes often fare less well on the other criteria. By taking an

assets-based approach to identify and understand what is working, recent research in Africa by the Africa Routine Immunisation System Essentials (ARISE) Project has increased understanding of the drivers of increased routine immunisation performance [33]. A few tactics emerge as pivotal for reaching the unreached.

A crucial condition for progress is through empowerment of district health management teams, which enables programmes to be tailored to address local barriers and promote equitable coverage [21,33]. Conducting regular programme reviews to track progress, adjust strategies and promote accountability; and building sufficient technical and managerial capacity for the delivery of routine immunisation services are also recommended.

Equally important, and an often neglected component of the Reaching Every District strategy, is fostering partnership between the health system, specific health programmes such as the vaccination programme and communities. In higher-performing districts where coverage had earlier stagnated at around 70–80 per cent including in Ethiopia, Ghana and Cameroon, engaging communities in planning and implementing immunisation programmes and customizing approaches to the community's needs helped to build social commitment to immunisation and catalyse progress in coverage [33]. The GVAP also recognizes the importance of partnering with communities, and civil society can play an important role in facilitating this.

Community engagement is a component of creating a community-focused primary health care system, for which developing a paid cadre of community-focused health workers is instrumental [34]. In Madagascar, for instance, community mobilisation was associated with increased immunisation coverage [35]. As first points of contact with the health system, and trusted members of the community, community health workers can help to overcome barriers to vaccination supply and uptake, prompting a rise in coverage of essential interventions [33,36]. Community-based interventions also tend to be more equitably distributed than those delivered in health facilities [37]. Extending vaccination services to the community has been identified as a major factor in reducing inequalities in immunisation coverage in Bangladesh [38].

Where immunisation coverage is higher and more equitable than coverage of other health services across the continuum of care [37], opportunities to use immunisation as a platform to improve equity of other interventions should be seized. Integrating immunisation within a package of essential interventions is recommended as a priority in the GIVS. It stems from growing awareness of the limitations of vertical and competitive approaches, of the efficiency and equity gains of building an integrated, people-centred health system, and of the need to sustain gains made across the life-cycle [39,40]. Understandably, the threat of restricting immunisation to the capacities of the broader health system often discourages immunisation proponents from embracing integration, which is reflected in the GVAP's call for 'coordination' rather than integration. For sustainable gains to be made across the continuum of care, and inequalities in intervention coverage to be reduced, opportunities for better integration must be further explored while maintaining high coverage where it has been achieved. Further research is encouraged to estimate the potential impact of seizing this opportunity, while of course addressing the possible risks associated with integration to ensure that strategies are mutually beneficial [40,41].

Various factors at the global level affect equity in immunisation *between* countries. A country will only be able to address inequalities in coverage if sufficient supply of appropriate products are consistently available and affordable. This has taken on added significance as countries "graduate" from GAVI financed new vaccines must increase funding for these vaccines. The GVAP placed emphasis on research and development for new vaccines. This is no doubt important, but such investments must be balanced with efforts to

expand existing technologies to reach the unreached. So far we have focused on what can happen at the country level to do this, but industry also has a key role to play in fostering vaccination as a global public good. The products developed should be determined by the epidemiology of those who bear the biggest burden of mortality and morbidity. Furthermore, the products should be formulated, presented and packaged in ways that will increase the likelihood of their effective use in developing countries. Given the contextual realities that inhibit progress where the under-immunised are found – such as weak cold chains – altering the profiles and presentations of vaccines offers huge potential for their successful introduction [42]. Certain initiatives are currently promoting this agenda – for instance the Vaccine Presentation and Packaging Advisory Group. With its new supply and procurement strategy, GAVI is well positioned to use its purchasing power to stimulate the development of more appropriate vaccine presentations, formulations and new technologies.

As the underimmunised increasingly reside in middle income countries which are not eligible for GAVI support, the global aid architecture must adapt to help meet the needs of these populations [43,31]. To secure sustainable access to vaccines for the poor and unreached in these countries, vaccine prices must fall further and better efforts must be made to build the capacities of vaccine production in developing countries [44]. Meanwhile, mechanisms such as pooled procurement and price ceilings should be considered for their potential to increase countries' negotiation power to bring vaccine prices down.

As we know, what gets measured gets done, and this decade must be guided by ambitious disaggregated goals to direct attention to and monitor inequalities in immunisation coverage. The GVAP is just one of the many concurrent initiatives in maternal and child health that calls attention to the inadequacy of existing data, and should be used to prompt investments in strengthening health management information systems. More regular and disaggregated data of better quality at each level of the health system can be used to inform programme design and implementation, monitor progress by socioeconomic strata, and facilitate closer accountability.

Pervasive inequalities in immunisation and health more broadly are unfair, unacceptable and unnecessary. We have only just touched on how these can be addressed. No doubt much progress has been made, but much more is needed – as the GVAP makes clear. This will require a strengthened commitment to addressing inequalities in the coming "decade of vaccines and vaccination".

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Conflict of interest

None declared.

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