Childhood immunisation in South Asia – overcoming the hurdles to progress

In South Asia, as many as one in four children remain under-immunised. In this article Andreas Hasman and Douglas Noble describe the many hurdles to progress that still exist and the variety of strategies that can reduce vaccine-preventable child mortality.

IMMUNISATION IN SOUTH ASIA

The countries of South Asia[i] have made impressive progress in reducing child mortality. Between 1990 and 2015, the number of under-five deaths per 1,000 live births fell from 129 to 53.[1] Despite this progress, almost two million children under five years of age will die in South Asia in 2016. Many (51.8%) of the under-five deaths worldwide (6.3 million) in 2013 were from infectious diseases, many that could be preventable through vaccination.[2,3]

Immunisation is a core intervention to reduce child mortality. It is highly cost-effective[4] and globally averts an estimated 2.5 million child deaths every year.[5] Most South Asian countries started routinely immunising children in the 1980s with the introduction of the standardised schedule for the Expanded Program on Immunization (EPI).[6] In 1980, no country in South Asia other than Sri Lanka was reaching more than 10% of surviving children with a third dose of the diphtheria–tetanus–pertussis (DTP3) vaccine. It is a remarkable achievement that all countries had coverage above 60% by 2007 (Figure 1). However, in 2012, 8 million of the world's 23 million under-immunised[ii] children lived in South Asia,[7] most of them in India, Pakistan, and Afghanistan. The region as a whole is still faring relatively poorly with 76% coverage of DTP3 in 2012 (Figure 2).[8] Progress is also starting to show a trend towards stagnation, indicating that increased focus on immunisation and new approaches are needed.

In 2012, the Global Vaccine Action Plan (GVAP) 2011–2020 was adopted by the World Health Assembly. GVAP acknowledged that in order to maximise the benefits of vaccination, immunisation programmes should aim to extend DTP3 coverage to 90% in every country by 2015, with each district having at least 80% coverage, and targeting children from the most disadvantaged communities.[9] South Asia lags behind both this coverage and equity goal. For example, in Afghanistan's Farah Province, immunisation coverage is less than 3%,[10] whereas in Rajshahi district in Bangladesh it is 99%.[11]

Human resource capacity for effective vaccine delivery is insufficient in many areas, particularly at community level

BARRIERS PREVENTING PROGRESS

Many of the challenges for improving immunisation coverage are common to the countries of South Asia. Global funding for immunisation has been extensive with *Gavi, The Vaccine Alliance* committing almost US$10 billion worth of funding between 2000 and 2020.[12] Yet, countries in South Asia have not followed this lead to prioritise their own resources for health. Spending on health is low in many countries of the region,[13] and spending priorities affect vaccination programmes. Scarce or poorly maintained refrigeration infrastructure is an issue, as it is globally.[14,15] Human resource capacity for effective vaccine delivery is insufficient in many areas, particularly at community level.

Other hurdles include difficulties in accurately forecasting demand for vaccination as population data are often of poor quality or outdated. High-quality data are critical to identifying children who have not been vaccinated, reaching those who have 'dropped out' between doses and getting the right number of vaccines to the right place at the right time.[16] The completeness of information systems for immunisation is affected by various factors such as increased mobility of individuals, fragmentation of vaccine delivery systems, and outdated recording and reporting formats. In Pakistan, for example, the last national census was in 1993.[17]

Low demand for vaccination among caregivers is another bottleneck. Traditionally, the focus of immunisation programmes has been on raising caregiver awareness and preventing refusal of vaccination. However, it has been suggested that outright opposition to vaccination is becoming a marginal phenomenon and is being replaced by 'vaccination hesitancy', in which caregivers rationally balance arguments for and against vaccination.[18] This is consistent with the experience in South Asia. In India, the reasons that caregivers most often give for non-participation in routine immunisation is that the need is not obvious and that they do not know enough about the vaccines.[19] Accurate planning with a focus on equity is also a challenge. Our experience from Nepal, Bhutan, and Bangladesh suggests that good micro-planning can contribute to higher immunisation coverage, but some

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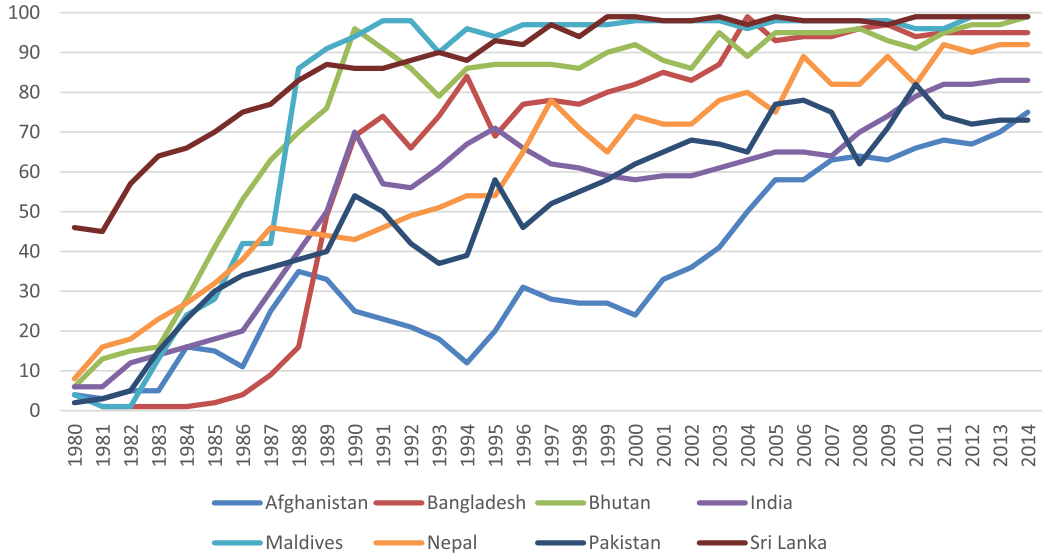
Figure 1

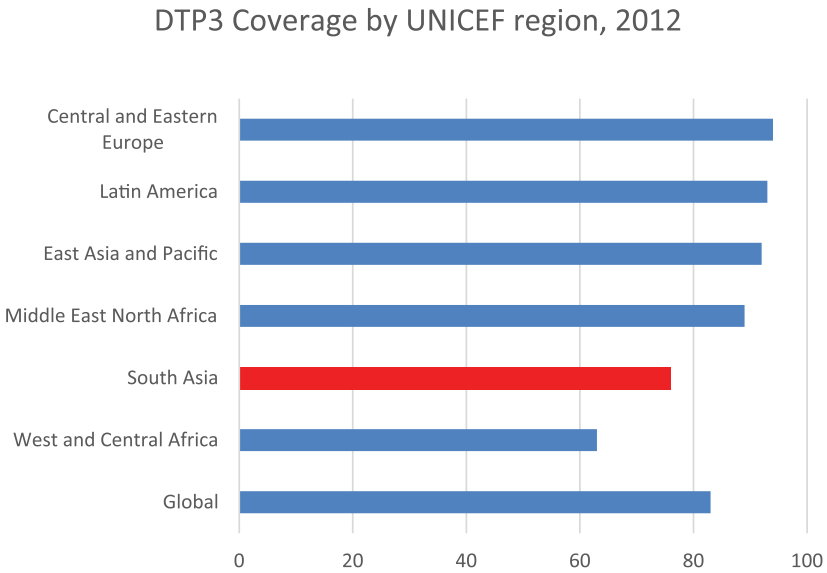
DTP3 coverage in South Asia from 1980 to 2014



Source: WHO/UNICEF coverage estimates for 1980–2014, as of 10 July 2015, http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragedtp3.html

Figure 2

DTP3 coverage by UNICEF region



Source: UNICEF Immunization Summary (2014 version): http://www.childinfo.org/files/immunization_summary_2012_en.pdf

other countries have not fared so well. Essential to planning is a focus on the 'reaching every community' (REC) approach. REC puts the focus on health centres and communities working together to improve immunisation services in the most disadvantaged communities and develops systems to ensure access, quality, capacity building of staff, and accurate recording of data.[20]

Countries in the region have also generally been slow to utilise the opportunity that new vaccine introductions present. Vaccine introductions can in theory lead to coverage improvements because the process brings additional resources, focus, and awareness that can be used to reach more children. However, global assessments of vaccine introductions suggest that this is not happening, partly because of insufficient

political support and consensus at national and subnational levels.[21] Additionally, it takes too long to introduce new vaccines. Whereas developed countries started introducing the vaccine for *Haemophilus influenzae* type b (Hib) in 1991,[22] it was not until 2009 that the vaccine was introduced in Afghanistan, Bangladesh, and Pakistan.[23] Sri Lanka, Nepal, Bhutan, India, and the Maldives only introduced Hib vaccine between 2010 and 2013 – more than 20 years after it first became available.[24]

EXAMPLES OF SUCCESS

Bangladesh, Bhutan, Maldives, Nepal, and Sri Lanka have succeeded in improving routine immunisation coverage to higher levels. From the mid-1980s, Bangladesh reinvented its EPI and invested heavily in infrastructure and training.[25] In addition, a new system for systematic outreach was introduced, in which community health workers (health assistants) provided almost all vaccinations, significantly improving access to routine immunisation.[26] Communities were mobilised and awareness and demand generated locally, through partnerships between government, non-governmental organisations (NGOs), and the private sector.[27] In Bangladesh, DTP3 immunisation coverage increased from 69% in 1990 to above 90% from 2005 onwards.[28] This provides learning for the whole region that investment in immunisation and cultivation of multi-sectoral partnerships produces results.

Assessments, analysis, and technology transfers are also key factors in driving coverage and equity improvements. For example, since 2001 Gavi has awarded grants worth almost US$350 million for health and immunisation system strengthening in the region, based on a thorough review and analysis of existing immunisation systems.[29] Effective Vaccine Management (EVM) assessments, in which the effectiveness of supply chains are assessed and analysed by governments, with the technical assistance of United Nations Children's Fund (UNICEF) and the World Health Organization (WHO), have been increasingly important for planning improvements in the supply chain.

Supplementary immunisation activities (SIAs) are often used in areas where routine coverage is insufficient to achieve herd immunity. In Afghanistan, polio SIAs have achieved coverage that is much higher than for polio vaccination in the routine programme. SIAs are focused campaigns which deliver specific antigens to a specified population within a defined period of time.[30] SIAs can strengthen management, build capacity for addressing vaccine hesitancy and dropouts, and increase confidence in the health system.[31]

Several national immunisation programmes in the region have also systematically used communication and advocacy activities to change parental behaviour, counter vaccine hesitancy, and increase demand for vaccines. In Nepal, district public health offices have in recent years used female community health volunteers to initiate discussion about the benefits of immunisation at village and community levels.[32] Awareness-raising campaigns aim to declare the district 'fully immunised' with over 90% coverage. Since 2014, around 1,500 villages have been declared fully immunised, with all remaining villages in the country to follow by 2017. Demand generation activities such as this can foster dialogue about vaccines at policy and community levels, increase social approval and political support for immunisation, and improve knowledge of the risks of infectious disease and the means of prevention.

Finally, the REC approach has been used in South Asia as a strategy to strengthen immunisation systems and improve coverage. In some states of India and in Pakistan, several districts have developed micro-plans to identify local problems and adopt corrective solutions.[33] Those planning immunisations have worked with local stakeholders to identity underserved communities and to revise service delivery to overcome barriers and increase access to immunisation.

SPECIFIC ACTIONS FOR COUNTRIES AND PARTNERS

Despite recent progress in immunisation coverage and several successful initiatives to extend the reach of immunisation programmes, as many as a quarter of children in South Asia remain under-immunised. Barriers are well known, and although the GVAP provides a roadmap to progress, it is not fully implemented in South Asia. There are a range of actions that governments and development partners in the region can take to ensure maximum protection from vaccine-preventable diseases (Table 1).

Table 1

Specific actions for countries and partners

Barrier	Mitigating factors
Low spending on health	Improved investment case approach across government
Poor data quality	Independent data validation mechanisms
Lack of behaviour change strategies	Prioritisation of communication for development in immunisation programmes
Project based approach to planning	Incorporating immunisation planning in overall health planning and budgetary allocation cycles
Persistent gaps in equitable coverage	Taking the approach of 'proportionate universalism' in health programmes to ensure the poorest benefit proportionately more

Low fiscal allocation for health is widespread in South Asia. There is a disconnect between the advocacy efforts of development partners and increases in health budgets. Part of the problem is that public health professionals omit to develop an understanding of political economy for health in countries and strategies for strengthening the interface between Ministries of Health, Ministries of Finance and the Office of the Head of State. The ball lies in the court of public health professionals to make stronger investment cases.

While the REC approach has offered a systematic approach to planning in some settings, there is a tendency for equity-promoting initiatives to become detached from overall planning systems and national policy. Pilot projects in hard-to-reach districts need to be connected to government mechanisms for annual health planning and budgetary allocation.

In order to achieve equity in immunisation, governments and development partners also need to operationalise the concept of 'proportionate universalism',[34] which means public health interventions being applied across the whole population with a disproportionate focus on the poorest.

The quality of immunisation data means that health management information systems can be unreliable. Countries should be supported to develop high-quality administrative data sets. More data validation is needed, and countries should consider setting up public bodies to audit, quality assure, and improve administrative data.

The value of inter-personal and social communication to change behaviours is frequently undervalued in immunisation. This is a problem because it contributes to a lack of awareness in caregivers and leads to an absence of community accountability. Only when the benefits of immunisation are widely acknowledged can communities hold local officials to account and harness the real meaning of demand generation. Community engagement relies not just on information sharing and awareness raising but also on a dialogue that enables public health professionals to understand the needs and concerns of caregivers and community leaders. Immunisation programmes need to factor that dialogue into systems for delivery of vaccines.

Given that increasing vaccination coverage offers significant benefits in terms of reducing morbidity and mortality and may have wider positive effects on society as a whole, acceleration of progress is urgently needed.

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The opinions expressed in this paper are solely those of the authors and do not necessarily represent the official position of UNICEF.

Notes

i. Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.
ii. Surviving infants who have not had a third dose of diphtheria–tetanus–pertussis vaccine (DTP3) in their first year of life.

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