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Global Immunization Vision and Strategy (GIVS): a mid-term analysis of progress in 50 countries

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Within the overall framework set out in the Global Immunization Vision and Strategy (GIVS) for the period 2006–2015, over 70 countries had developed comprehensive Multi-Year Plans (cMYPs) by 2008, outlining their plans for implementing the GIVS strategies and for attaining the GIVS Goals at the midpoint in 2010 or earlier. These goals are to: (1) reach ≥90% and ≥80% vaccination coverage at national and district level, respectively; and (2) reduce measles-related mortality by 90% compared with the 2000 level. Fifty cMYPs were analysed along the four strategic areas of the GIVS: (1) protecting more people in a changing world; (2) introducing new vaccines and technologies; (3) integrating immunization, other health interventions and surveillance in the health system context; and (4) immunizing in the context of global interdependence. By 2010, all 50 countries planned to have introduced hepatitis B (HepB) vaccine, 48 the Haemophilus influenzae type B (Hib) vaccine and only a few countries had firm plans to introduce pneumococcal or rotavirus vaccines. Countries seem to be inadequately prepared in terms of cold-chain requirements to deal with the expected increases in storage that will be required for vaccines, and in making provisions to establish a corresponding surveillance system for planned new vaccine introductions. Immunization contacts are used to deliver other health interventions, especially in the countries in the World Health Organization (WHO) Africa Region. The cost for the planned immunization activities will double to U$27 per infant, of which U$5 per infant is the expected shortfall. Global Alliance for Vaccines and Immunization (GAVI) funding is becoming the largest contributor to immunization programmes.

Keywords Immunization planning, immunization financing, vaccines, global vision and strategy

KEY MESSAGES

- Since the inception of the Global Immunization Vision and Strategy (GIVS) and development of comprehensive Multi-Year Plan (cMYP) guidelines in 2005, 70 countries have developed cMYPs, of which 50 are reviewed in this article.
- By 2010, all 50 countries planned to have introduced hepatitis B vaccine and 48 the Haemophilus influenzae type B (Hib) vaccine.

- Countries seem to be ill-prepared in terms of either expanding cold-chain capacity, or in establishing a corresponding surveillance system, for these new vaccines.
- The evidence suggests that resource requirements for routine immunization needed to double by the GIVS midpoint for countries to fully implement their cMYPs and reach their objectives and goals.

Introduction

In 2009, the global coverage of infants with three doses of diphtheria, tetanus and pertussis vaccine (DTP3) stood at 82%, with an estimated 107 million children vaccinated, and the number of unvaccinated infants decreased to 23.2 million compared with 27.7 million in 2005 (WHO/UNICEF 2010). Seventy per cent of these unvaccinated children live in 10 countries: Chad, China, Democratic Republic of the Congo, Ethiopia, India, Indonesia, Kenya, Nigeria, Pakistan and Uganda. Elements that have contributed to this achievement include national multi-year planning, district-level planning and monitoring, and the establishment of national budget lines funded with domestic and external resources, including those provided by the GAVI Alliance for immunization services strengthening (GAVI Alliance 2010).

Of the estimated 8.8 million deaths occurring annually among children under 5 years of age, 20% are caused by diseases that can be prevented by existing vaccines (WHO 2011). Vaccination, including against rotavirus and pneumococcal diseases, has the potential therefore to contribute significantly to achieving the fourth Millennium Development Goal (MDG4) (Veneman 2006), which calls for a reduction by two-thirds of under-5 mortality by 2015.

Recognizing the role that vaccines and immunization can play in reducing under-5 mortality, the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), in consultation with other partners, developed the Global Immunization Vision and Strategy (GIVS) as a framework for protecting children from vaccine-preventable childhood diseases (WHO/UNICEF 2005a).

To 'translate' the strategies summarized in the GIVS into practical steps, countries are encouraged to develop comprehensive Multi-Year Plans (cMYP) for immunization. In late 2005, WHO and UNICEF, together with GAVI Alliance partners, drew up guidelines for countries to develop such cMYPs for immunization for those that did not already have a strong planning process in place (WHO/UNICEF 2005b).

Between 2005 and 2008, over 70 countries had developed cMYPs for immunization using the guidelines. This paper describes the outcomes of a review of 50[1] of these national immunization programme cMYPs (Figure 1). It provides an insight into the directions countries are planning to take towards achieving the GIVS goals in terms of improving coverage with traditional vaccines, introducing new vaccines, implementing campaigns, expanding surveillance and further integrating health services with immunization.

Background

The GIVS 2006–2015 proposes a 10-year vision for immunization worldwide. Positioned around four 'strategic areas', the GIVS sees the future of immunization as:

(1) Protecting more people in a changing world;
(2) Introducing new vaccines and technologies;
(3) Integrating immunization, other health interventions and surveillance in the health system context;
(4) Immunizing in the context of global interdependence.

For each of these areas, the GIVS provides a menu of possible strategies from which countries can make selections. The following GIVS goals are set for the midpoint in 2010 or earlier: (1) reaching ≥90% and ≥80% vaccination coverage at national and district level, respectively; and (2) reducing measles-related mortality by 90% compared with the 2000 level.

The cMYP guidelines use the GIVS as a reference in the immunization programme planning process, and try to address some of the shortcomings of past immunization plans, including limited strategic focus, having to develop separate plans for each initiative or target disease, and having to develop plans to fit particular donor requirements. The cMYP guidelines also ensure compatibility and synchronization with other national planning processes and health sector planning by aligning planning timeframes and inclusion of key immunization indicators. The approach is intended to steer countries away from traditional vertical planning for immunizations, to more harmonized planning in line with the 'Paris Declaration' (High Level Forum 2005). The cMYPs based on the guidelines are intended to:

- Provide national goals, objectives and strategies for 3 to 5 years based upon a situational analysis;
- Address all components of the immunization system relevant to the country;
- Make synergies between various immunization initiatives;
- Integrate in one plan those activities common to accelerated disease control and other initiatives to avoid duplication;
- Include costing and financing of the immunization programme and strategies for financial sustainability;
- Encourage links with other programmes.

The decision to develop a cMYP should be made by each country, and countries can choose to what extent their cMYPs are built along the cMYP guidelines. Developing a cMYP therefore presents an opportunity for countries to consolidate and address global, national and sub-national immunization objectives and strategies, and to evaluate costs and financing of immunization programmes for the planning period, in line with the GIVS framework.

The cMYPs are typically developed by the immunization programmes within Ministries of Health, and in most cases with involvement and support of regional and national immunization and health partners through inter-agency coordinating committees.

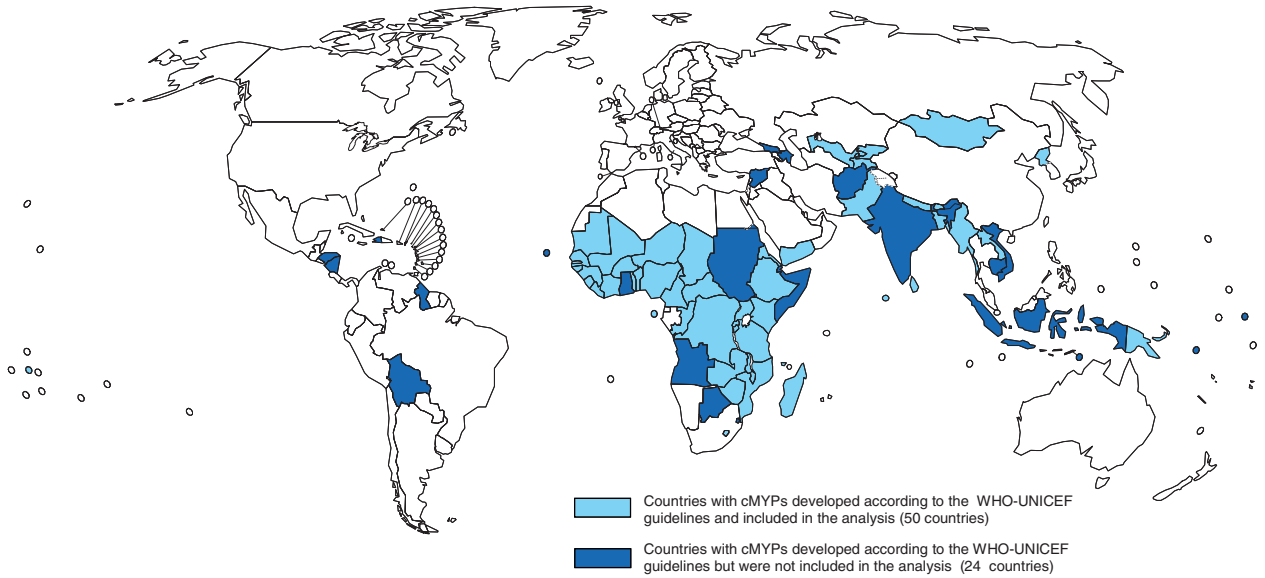

Figure 1 Global map of comprehensive Multi-Year Plans (cMYPs) developed and reviewed

Methods

Out of the 70 available cMYPs, the information from 50 was analysed. The choice of the sample was determined by the ability to make cross-country comparisons based on the completeness of the information, common planning time frames, the application of the cMYP guidelines, and the quality of the costing information. Although the analysis is presented for a wide set of countries, these mostly represent the African continent; therefore it is not possible to derive meaningful regional trends and conclusions. The programmatic sections were reviewed for the period 2007–2010 (costing and financing sections for 2008–2010), with 2006 as the baseline year. These 50 cMYPs were reviewed in order to identify general trends in immunization programmes. The review specifically focused on directions countries are planning to take towards achieving the GIVS goals along the four GIVS strategic areas mentioned above.

Programmatic information was extracted manually after a careful review of each of the cMYPs, and information on key indicators was entered in a comparison table. The indicators reviewed were related to the presence of goals and objectives, use of integrated approaches, details on strategies, cold-chain plans, surveillance, booster doses, second routine measles dose, waste management and operational research. To assess country plans against actual achievement by 2010, the plans were compared with actual coverage (see Figure 2) and new vaccine introductions (see Figure 3).

The economic information was extracted from the data provided in the cMYP costing and financing tool, and transferred into the immunization financing database available from a WHO website.[2]

The indicators of choice in the costing and financing analysis are immunization expenditures and financing per infant using the number of children under 1 year of age as the common denominator (Lydon *et al*. 2008a). Such indicators should be interpreted as based on infants in the birth cohort, rather than infants fully immunized. The findings are presented using the WHO regional classification.[3]

Findings

The results of the review are grouped in accordance with the GIVS strategic areas. For each strategic area, the findings are summarized to describe whether the country plans as presented in the cMYPs are in line with the expected scaling up of activities required to achieve the GIVS goals for 2010. The findings below reflect countries' plans for the period 2007–2010 (2008–2010 for costing and financing) as outlined in the cMYPs, compared with 2006.

Protecting more people in a changing world

Using DTP3 coverage as a benchmark for programme performance, countries are ambitious in their plans to increase coverage in order to achieve the GIVS goal of 90% coverage by 2010. Of the 24 countries with less than 80% coverage in 2006,[4] 20 countries aim at achieving 90% coverage by 2010, and four at over 80% (Figure 2). Of the 12 countries with 80–89.9% coverage in 2006, 11 aim at obtaining coverage of ≥90% by 2010. In total, of the 50 countries, 45 aim at achieving the GIVS goal of 90% DTP3 coverage by 2010. Countries in the WHO Africa Region (AFR) will have the biggest challenge in scaling up coverage to meet their coverage goal: 14 of the 33 countries plan on 20 percentage point coverage improvements between 2006 and 2010 or more. The two countries with coverage in 2006 below 50% both aim at a coverage above 90% by 2010.

All 50 countries have included in their cMYPs the strategies they plan to use to achieve the stated coverage targets and to protect more people. The Reaching Every District strategy (RED) (Vandelaer *et al*. 2008) is most prominent, with 42 countries including this strategy for improving coverage performance. The eight remaining countries include the provision

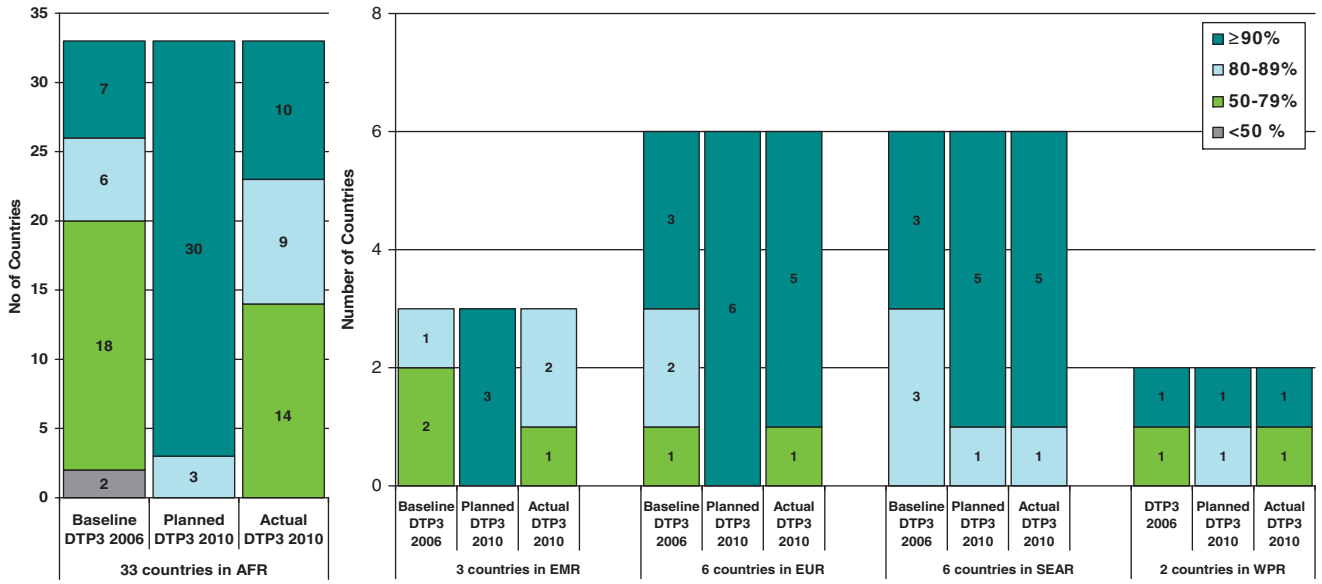

Figure 2 WHO regional DTP3 coverage: planned vs actual 2006–2010
Notes: AFR=Africa Region; EMR=Eastern Mediterranean Region; EUR=European Region; SEAR=South-East Asia Region; WPR=Western Pacific Region.

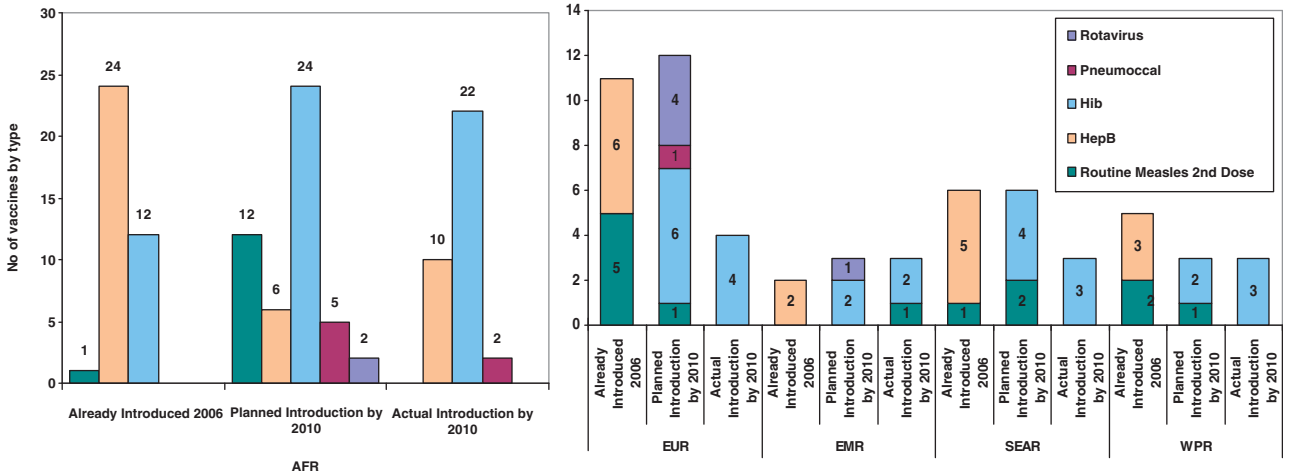

Figure 3 Vaccine introductions by region: planned vs actual 2006–2010
Notes: AFR=Africa Region; EMR=Eastern Mediterranean Region; EUR=European Region; SEAR=South-East Asia Region; WPR=Western Pacific Region.

of enhanced outreach services, immunization plus days and child health days/weeks as preferred strategies.

Furthermore, to protect more people against vaccine preventable diseases, the introduction or expansion of school-based immunization with tetanus toxoid-containing vaccine (nine countries), measles (two countries) and rubella (one country) are being planned.

Mass immunization campaigns for accelerated disease control feature in national immunization programme plans of 40 countries. Overall, 25 countries are planning to conduct polio campaigns, 25 to conduct maternal and neonatal tetanus campaigns, 39 measles or measles/rubella campaigns, and 9 yellow fever campaigns. The AFR region is most active with 29/33 countries planning to conduct one or multiple campaigns between 2007 and 2010.

Introducing new vaccines

There is evidence from the review that countries are planning to scale up the introduction of new vaccines for the period 2007–2010. A total of 73 new vaccine introductions are planned by 2010, of which 38 are for Hib, 6 for HepB, 6 for pneumococcal, 7 for rotavirus and 16 for measles second dose (Figure 3). None of the 50 countries had pneumococcal or rotavirus vaccination in their schedule in 2006 and only six and seven countries, respectively, are planning the introduction of these two vaccines by 2010. The majority of the countries introducing new vaccines in this period are located in the AFR and Eastern Mediterranean (EMR) regions. In addition, 16 countries plan to introduce a second routine measles dose in their national immunization schedule by 2010; in comparison no countries had

Table 1 Planned surveillance in relation to vaccine introduction plans, by WHO Region (number of countries)

Regions	Hib introduction planned	Hib surveillance planned	Pneumococcal introduction planned	Pneumococcal surveillance planned	Rotavirus introduction planned	Rotavirus surveillance planned
AFR (33)	24	15	5	2 (1)	4	(3)
EMR (3)	2	2	0	(1)	1	0
EUR (6)	6	6	1	(1)	4	3
SEAR (6)	4	4 (2)	0	(1)	0	0
WPR (2)	2	2	0	(1)	0	0
Total	38	29 (2)	6	2 (5)	9	3 (3)

Notes: AFR = Africa Region; EMR = Eastern Mediterranean Region; EUR = European Region; SEAR = South-East Asia Region; WPR = Western Pacific Region.

introduced a second dose of routine measles vaccine in the baseline year of 2006.

When introducing new vaccines and/or additional doses, countries will need to make significant investments to ensure adequate cold-chain capacities to accommodate the additional vaccines. Whereas 45 of the 50 countries have plans to introduce new vaccines and/or a second measles dose, only six countries included in their cMYP that they had conducted a detailed analysis of anticipated vaccine volumes. Although all countries mention a need to replace an ageing cold chain, and 41 countries note that an expansion of the cold chain is needed, only six countries include a detailed analysis of actual vaccine storage needs across all levels of the national health system.

Integrating immunization and other health interventions and surveillance

The analysis shows that in accordance with the GIVS, many countries have planned to adopt the strategy of linking immunization with the delivery of other health interventions. For the purposes of this analysis, linking with Vitamin A was excluded because this has already been adopted widely for many years. In total, 29 out of 50 countries (23 of them in the 33 AFR country group) have planned to provide other interventions (excluding Vitamin A) with routine immunization, and 17 countries to do so with various vaccination campaigns for polio, or measles, or maternal and neonatal tetanus (all 17 are in AFR). For routine immunization, the list of linked interventions includes malaria bed nets, anti-helminthics and for some countries Integrated Management of Childhood Illness (IMCI), the latter to be delivered through Child Health Days. The list of interventions planned to be linked with campaigns is almost exclusively malaria bed nets and anti-helminthics. In contrast, in regions other than AFR no countries plan links with campaigns, and only six countries plan to deliver other interventions, again mostly bed nets and anti-helminthics, in combination with routine immunization.

Of the 24 countries in AFR that plan to introduce Hib vaccination, only 15 also plan to conduct Hib surveillance (Table 1). Similarly, out of the five AFR countries that plan to introduce pneumococcal vaccine, only two are planning pneumococcal disease surveillance, and none of the four planning to introduce rotavirus vaccine is also planning rotavirus surveillance. Six countries in the other regions plan to introduce pneumococcal or rotavirus vaccine (of which five are in the European region, EUR), of which three also plan to start the corresponding surveillance activities. On the other hand, there are 10 countries that plan to establish surveillance for Hib, pneumococcal or rotavirus diseases, but do not yet plan to introduce the corresponding vaccines. These countries are shown in brackets in Table 1. WHO recommends countries to have national surveillance systems in place.[5]

Immunization in the context of global interdependence

Immunization in the context of global interdependence builds on the recognition that equity in access to vaccines and related financing, and equal availability of information, are in every country's interest. Strategies aim to increase awareness of the reality that every country is vulnerable to the impact of global issues and events on vaccine supply, financing, collaboration of partners, communications and epidemic preparedness.

Adequate financing for immunization is critical for countries to be able to implement their 5-year cMYP. The findings highlight that the financing of immunization would need to be scaled up significantly, given the rise in expenditures, in order to protect more people and for new vaccine introductions.

In 2006, expenditures to sustain existing coverage gains averaged US$14 per infant in the 50 countries. The findings suggest that expenditures need to double to average US$27 per infant over the 2008–2010 period if the immunization objectives are to be achieved by the midpoint of the GIVS (2010). The extra financial requirements are a function of existing and targeted immunization coverage levels and schedules, differences in wage bills, human resource constraints and levels of integration of immunization in the health system. The main driver is to cover for increasing costs of vaccine supply and logistics. The relative share of these costs in overall expenditure rose from 45% in 2006 to 62% between 2008 and 2010. Expenditure requirements for service delivery are the second largest cost item. Important regional differences are also noteworthy (Figure 4).

Since 2000 the trend in immunization financing is one characterized by increases in both national and external financing for routine immunization, the total rising from US$6.0 in 2001 to US$9.0 per infant in 2003 (Lydon *et al*. 2008b). Based on the analysis, this trend is continuing: by 2006 total immunization financing reached US$14.0 per infant and is expected to rise even more during the 2008–2010 period to US$22.0 (Figure 5).

The cMYPs anticipate that national government financing for immunization will continue to increase to an average US$8.0 per infant over the 2008–2010 period, while financing from multilateral, bilateral and other sources is expected to remain

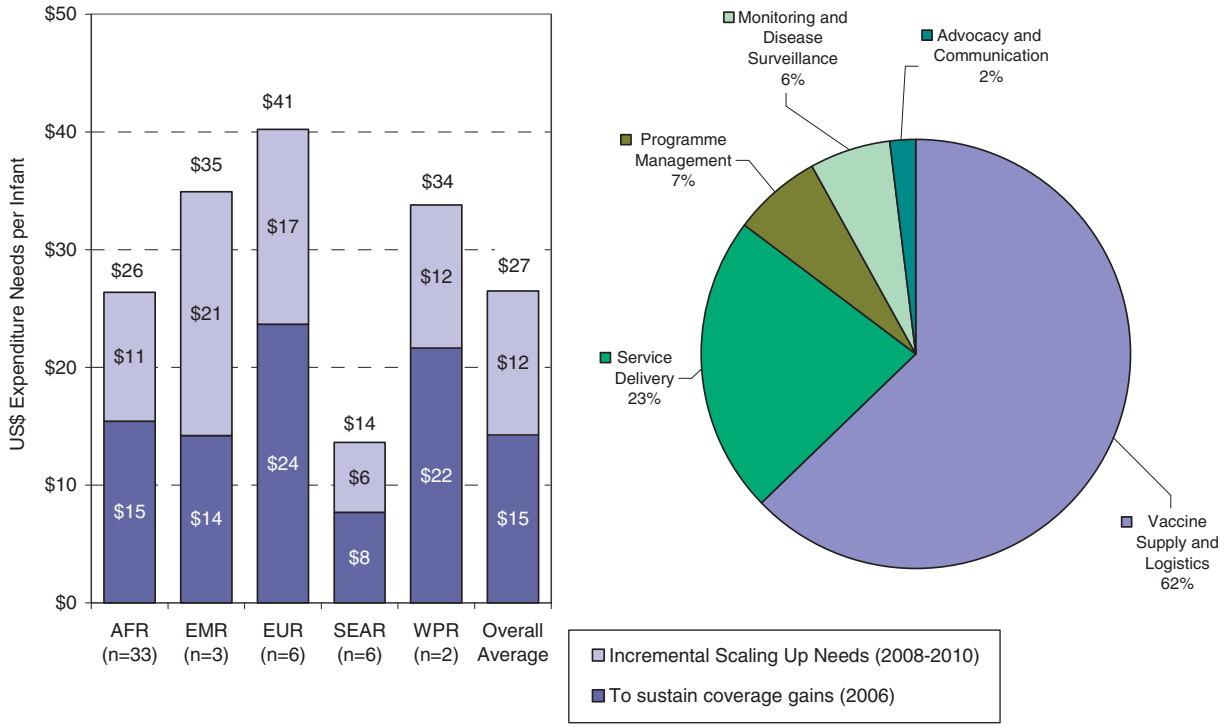

Figure 4 Immunization expenditures per infant by WHO region and overall breakdown

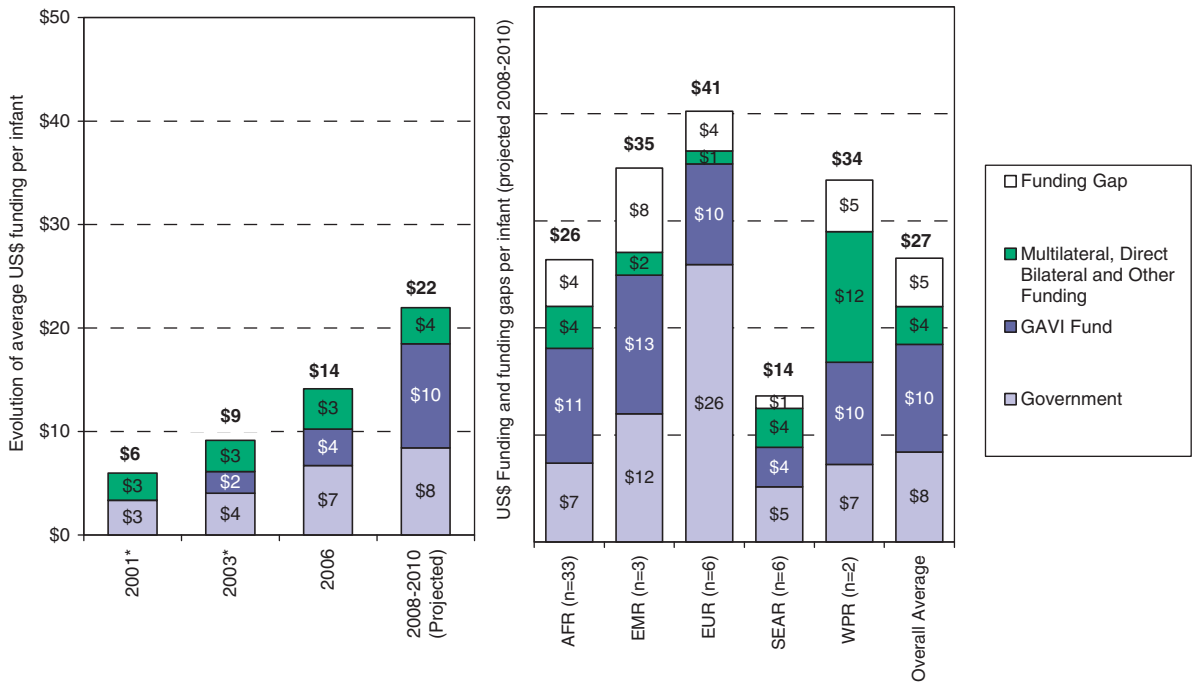

Figure 5 Immunization financing per infant through time and by WHO region
Notes: *= Baseline years

stagnant at an average of US$4.0 per infant, a level it has been at since 2000 (Figure 5).[6]

The most important change in immunization financing is the anticipated contribution from the GAVI Alliance. On average, GAVI Fund commitments in 2006 were US$4.0 per infant. Countries expect that during 2008–2010 this average funding per infant will more than double to reach US$10 (Figure 5). Of the overall needs for immunization during 2008–2010, half will be met by external sources of financing and 30% by government finance.

Important variability in the needs across regions is due to differences in immunization coverage and schedules as well as varying cost of different inputs (salaries). On the financing side, differences in the ability of national governments to raise domestic resources for immunization and differences in the level of reliance on external support explain the variability. One region stands out from the rest in terms of needs and financing. In the South-East Asia region, the needs are significantly less. This is due to both the composition of the countries in the sample (which includes very highly populated nations where economies of scale significantly lower the unit needs and financing per infant) and the fact that few of the countries in the region made plans at the time to introduce Hib vaccine.

Despite positive trends, expected future funds will not be enough to match the expenditures needed to sustain the gains or to scale up immunization as envisioned in country cMYPs. Of the US$27.0 per infant needed annually during 2008–2010, the cMYPs estimate the average funding gap at US$5.0 per infant if both committed and non-committed funds are considered. In this optimistic funding scenario, some 20% of the expenditure needs to reach the objectives remain largely unmet. The size of the gaps varies widely by country and reflects their different capacities and opportunities to mobilize the needed resources for their programme.

Discussion

Since the inception of the GIVS and the development of the cMYP guidelines in 2005, 70 countries have developed comprehensive immunization plans, of which 50 were reviewed in this paper. This demonstrates that countries consider multi-year planning as an essential component of immunization programmes. Of the 50 countries included in this analysis, all are developing countries with the majority concentrated in AFR. Therefore, it is difficult to provide meaningful conclusions by region despite the interesting findings.

The analysis shows that 45 of the 50 countries aim at achieving the GIVS goal of 90% coverage by 2010 or earlier. While significant progress has been achieved by 2010 (Figure 2), questions remain for some countries about how in reality they will be able to reach this goal, given low existing coverage levels. The RED strategy is the overriding strategy in 41 countries to achieve the coverage targets and to address current disparities in district coverage. In addition, 40 countries plan to use or continue to use vaccination campaigns, mainly to achieve accelerated disease control goals such as those for polio, measles, maternal and neonatal tetanus, and yellow fever.

During 2009 and 2010 alone, a total of 36 of the 50 countries included in this analysis conducted supplementary immunization activities (SIAs) against measles, which provide a platform for delivery of other child interventions. In 2010, 32 million doses of vitamin A and 19 million doses of deworming medicine were distributed through such means. Dedicated funding and support are required for accelerated disease control and eradication initiatives.

Altogether 39 countries are planning 73 new vaccine introductions (HepB, Hib, pneumococcal, rotavirus, measles second dose) between 2007 and 2010. By 2010, 47 of these planned introductions had been achieved (64%). This is a significant achievement for Hib and HepB with 34 and 10 additional introductions, respectively. This is a great advance on 2006 when 44 countries had HepB, and only 10 had included Hib vaccine. This can be explained by a combination of factors including specific recommendations in 2006 from the WHO Strategic Advisory Group of Experts (SAGE)[7] on the use of Hib vaccine, and the availability of funding though GAVI. In contrast, only six countries are planning to introduce the pneumococcal vaccine and eight countries the rotavirus vaccine by 2010.[8] In contrast, by 2010, two countries had introduced the pneumococcal vaccine and one the measles second dose into their routine immunization programmes. This slower progress is consistent with the incomplete availability of country-specific disease burden data and lack of any global recommendations for these vaccines at the time of writing these plans, the limited availability of suitable presentations and in adequate supply, the limited availability of clear pricing information for countries at the time of decision making and planning, and in addition, GAVI having a pause in calls for applications from countries between 2009 and 2010. Work is ongoing to resolve these constraints to accelerate the introduction of these new vaccines as a contribution to reach MDG4.

In parallel, the underlying problem of low coverage, particularly in some of the AFR countries must be resolved through improved management of the immunization system and investment in adequate human resources if new vaccine introductions are to realize their full potential.

Given the ambitious new vaccine introduction agenda, with 73 planned vaccine introductions by 2010, there is little evidence of countries having a good grasp of their current cold-chain capacities in the baseline year and related scaling up needs to accommodate the accelerated introduction of new vaccines. Several countries have no plans to commence surveillance for Hib, pneumococcal and rotavirus diseases, despite planning to introduce vaccines to prevent them. In the absence of such surveillance, countries may not be able to measure impact and justify continued financial commitment for sustaining these vaccines in their programmes.[9] However, it is encouraging to note that the plans of some countries express a desire to establish surveillance in advance of making a decision on introducing a new vaccine.

The strategy of linking other health interventions with immunization has been widely adopted in the countries in AFR, both through routine immunization delivery and/or immunization campaigns. In other regions, only a few countries plan to use the routine immunization contacts to deliver other interventions, while none plan to use campaigns. It can be concluded that opportunities to deliver packages of interventions are being missed.

The evidence gathered from the 50 countries suggests that resource requirements for routine immunization needed to double by the GIVS midpoint for countries to fully implement their cMYPs and reach their objectives and goals. Because few countries have planned for the introduction of the next generation of vaccines (pneumococcal and rotavirus) and corresponding logistics and surveillance needs, the requirements presented in the analysis are likely to be underestimated

and should be considered as the minimum requirements for immunization.

While in an optimistic scenario, the cMYPs expect financial flows for immunization to rise, mainly from government sources and funding by the GAVI Alliance, there is little additional funding expected from other sources to support routine immunization. In most cases, the GAVI Alliance has become the single largest source of financing in the poorest countries (almost 50%). Yet their support base is primarily limited to new vaccine introduction. The corresponding needs for logistics, service delivery and surveillance are largely unfunded. In this optimistic scenario, a funding gap of US$5 per infant remains for the 2010 GIVS objectives to be met. If we consider only funding that has been secured, the funding gap is closer to US$12 per infant.

Careful monitoring will be required to determine to what extent the cMYPs will be implemented. Successful implementation may be hindered by overambitious coverage goals and limited availability of financial resources, not only for new vaccines but for cold chain, logistics and surveillance. The analysis shows that countries are planning to implement the GIVS strategies to achieve the GIVS Goals, despite some obvious gaps. Successful and timely implementation of these plans hinges not only on the political and financial investments by countries themselves, but also on an equal resolve of immunization partners to continue to provide technical and financial support.

The GIVS was the first-ever 10-year framework for fully realizing the potential of immunization in controlling morbidity and mortality from vaccine-preventable diseases. By 2010, the strategy had successfully become the global rallying point and had been adopted by many countries as an overarching strategic framework for immunization. As such, it has been used for the creation of regional immunization strategies and by many countries to draw up comprehensive multi-year national plans for immunization. Some of the successful outcomes of the strategy include: the development of new recommendations for routine immunization, including administration of new vaccines; increased use of new vaccines in the developing countries, particularly with support from the GAVI Alliance; and the establishment of networks of sentinel-site surveillance of invasive bacterial diseases and rotaviral diarrhoea that could serve as a platform for surveillance of diseases targeted by new vaccines.

As we approach the 2015 GIVS and MDG timelines and in progressing into the next decade of vaccines and immunizations, the experience gained from the first 5 years of putting the GIVS into place can be applied to build on the achievements to date, to remedy the limitations of the framework, to overcome obstacles to its implementation and to develop an even more ambitious vision for the coming decade. The centrality of demand-driven, country-led approaches and action, based on equity, responsibility and accountability and a spirit of national self-reliance and gradual self-sufficiency to achieve commonly-shared global immunization goals, will be critical for the next decade.

There is renewed confidence in immunization as demonstrated by the successful GAVI pledging conference in June 2011 that raised a record US$4.3 billion for immunization and health systems support for the next 5 years; expectations around the 'Decade of Vaccines' collaboration and global vaccine action plan to be unveiled in 2012; national governments increasingly co-financing new vaccines; civil society organizations stepping up in delivering services in the hardest to reach areas; and manufacturers being challenged to continue to bring down the prices of vaccines (GAVI Alliance 2011; Decade of Vaccines Collaboration 2011). Whether all these efforts will result in the achievement of national, regional and global immunization goals over the next decade remains to be seen.

Funding

None received.

Conflict of interest

None declared.

Endnotes

[1] The 50 countries are: Afghanistan, Armenia, Azerbaijan, Bangladesh, Benin, Bhutan, Burkina Faso, Burundi, Cameroon, Central African Republic (the), Chad, Comoros (the), Congo (the), Democratic Republic of the Congo (the), Côte D'Ivoire, Democratic People's Republic of Korea (the), Eritrea, Ethiopia, Gambia (the), Ghana, Guinea, Guinea Bissau, Kenya, Kyrgyzstan, Lao People's Democratic Republic (the), Lesotho, Liberia, Malawi, Mali, Mauritania, Mongolia, Mozambique, Myanmar, Nepal, Niger (the), Nigeria, Pakistan, Rwanda, Republic of Moldova (the), Sao Tome and Principe, Senegal, Sierra Leone, Sri Lanka, Tajikistan, United Republic of Tanzania (the), Togo, Uganda, Uzbekistan, Zambia, Zimbabwe.

[2] WHO immunization financing, online at: http://www.who.int/immunization_financing/en/

[3] WHO regions are classified as follows: Africa (AFR), Americas (AMR), Eastern Mediterranean (EMR), Europe (EUR), South-East Asia (SEAR), Western Pacific (WPR).

[4] According to the WHO-UNICEF Joint Report Form Data 2006.

[5] Extract from WHO Position Paper on Rotavirus Vaccine: Rotavirus disease surveillance is essential to assess both the disease burden and the need for vaccination. WHO recommends that before full-scale vaccine introduction is implemented, sufficient sentinel surveillance sites are organized at national or regional levels, as appropriate, in order to provide representative data on the incidence of severe rotavirus disease. Such surveillance programmes are currently operating in over 40 low-income countries in various parts of the world.

[6] Given the difficulties in tracking the exact sources of financing, transfers of bilateral donor agency resources to multilateral agencies, or to a health fund or the national treasuries (through pooled funding), are not attributed to the donor countries. Likewise some bilateral agencies provide significant funding for immunization by contributing directly to GAVI. In this case, the end source of financing is attributed to the GAVI Fund and not the bilateral agency. In addition, because of the focus on programme-specific costs, the often significant contributions of the national government to the shared health systems costs that are critical to a well-functioning immunization programme are not taken into account.

[7] Online at: http://www.who.int/immunization/sage/en/

[8] In November 2007, the WHO Strategic Group of Experts (SAGE) issued its recommendations for the introduction of pneumococcal conjugate vaccines (PCV) in developing countries, and

subsequently in April 2009 recommended that rotavirus vaccination be included in all national immunization programmes.

[9] In some cases, surveillance activities are externally funded, as in the case of the GAVI-supported Hib Initiative and the Accelerated Development and Introduction Plans (ADIPs) for pneumococcal and rotavirus vaccines, and as such not included in cMYPs.

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