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### **Technical paper**

## **Scaling up the Expanded Programme on Immunization to meet global and regional targets**

Immunization is one of the most effective, cost-effective and safe public health interventions and one of the main tools for achieving Millennium Development Goal 4 on reducing under-five mortality. The past few years have witnessed remarkable improvement in routine vaccination coverage in several countries of the Region. However, more than 20% of child deaths in the Region are still attributed to diseases for which effective vaccines are currently available. The paper draws attention to the challenges facing immunization programmes and to the urgent need for scaling up the national immunization programmes in order to sustain gains and achieve the targets of disease control, eradication and elimination.

A draft resolution is attached for consideration by the Regional Committee.

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## Executive summary

An estimated 1.239 million children under five years of age died in 2008 in the Eastern Mediterranean Region, more than 20% of these deaths are attributed to diseases for which potent vaccines are currently available.

Immunization is one of the most efficacious, cost-effective and safe public health interventions and one of the main tools for achieving Millennium Development Goal 4 (MDG 4). Recent years have witnessed remarkable improvement in the routine vaccination coverage in several countries of the Eastern Mediterranean Region, and the average coverage with three doses of DTP in the Region, based on reported national data, reached 91% in 2010. In addition, the Region achieved 93% reduction in measles mortality between 2000 and 2008. As well, the introduction of new life-saving vaccines gained momentum in recent years with introduction of Hib vaccine in 18 countries, pneumococcal vaccine in 8 countries and rotavirus vaccine in 4 countries.

Despite this progress, around 1.5 million infants did not receive their third dose of DTP in 2010 and the number of children who were not fully vaccinated in line with the national schedule is higher. The target of measles elimination by 2010 was not achieved and the gains in measles mortality reduction might be lost unless measles control and elimination efforts are sustained. Introduction of new vaccines constitutes the major challenge facing middle-income countries, especially the low middle-income countries. Hib vaccine is not offered to 31% of the annual birth cohort. Moreover, 88% of the infants in the Region are born in countries that offer neither pneumococcal nor rotavirus vaccines in the national immunization programme.

There are several challenges facing efforts to scale up immunization programmes in the Region. The structure and managerial capacity of immunization programmes are inadequate, and there is need for stronger programme capacity at the central and peripheral levels. In addition, the relatively low government allocations for immunization programmes and the increasing financial resources needed to meet the evolving demands of EPI, including new vaccines introduction and disease eradication and elimination requirements, threaten the gains of the immunization programmes. As well, the current vaccine procurement and regulation system in several countries is inadequate, and there is a need for stronger mechanisms that ensure vaccine quality and security.

The aim of this paper is to highlight the role that vaccination plays in reducing morbidity and mortality due to communicable diseases among children and, hence, achieving the target of MDG 4 in countries of the Region. It also aims at raising awareness with regard to the missed opportunities to save more lives, due to the delay in introduction of the new highly effective life-saving vaccines in many countries. It underlines the necessity of sustaining measles elimination activities in order to maintain the gains in measles mortality reduction and to achieve the target of measles elimination. Finally, the paper draws attention to the constraints and challenges facing immunization programmes in the Region and the action needed to reach the targets set and achieve MDG 4. The paper does not specifically address the issue of poliomyelitis eradication because this is addressed through the annual progress report submitted to the Regional Committee. Nor does it address the hepatitis B control target as a specific resolution on this subject was endorsed by the Regional Committee in 2009 (EM/RC56/R.5).

## 1. Introduction

Immunization is one of the most efficacious, cost-effective and safe public health interventions. Vaccines continue to have a tremendous impact on public health, saving millions of lives each year. Smallpox eradication, the great progress towards poliomyelitis eradication, the significant reduction in measles morbidity and mortality and the drastic reduction of *Haemophilus influenzae* type B (Hib) disease in countries that have introduced the vaccine provide clear evidence of this.

Recent years have witnessed remarkable improvement in the routine vaccination coverage in several countries of the Eastern Mediterranean Region, and hence, in control and prevention of several vaccine-preventable diseases. Based on reported national data, the average coverage with three doses of DTP (DTP3) in the Region reached 91% in 2010 and 400 million people received measles vaccine through supplementary immunization activities between 1994 and 2010. The Region achieved 93% reduction in measles mortality between 2000 and 2008, maternal and neonatal tetanus has been eliminated from 16 countries and diphtheria and pertussis are no longer a public health problem in many countries.

Despite this considerable progress, around 1.5 million infants did not receive their third dose of DTP in 2010 and the number of children who were not fully vaccinated in line with the national schedule is higher. The target of measles elimination by 2010 was not achieved and the gains in measles mortality reduction might be lost unless measles control efforts are sustained. Introduction of new vaccines into the national immunization programme constitutes a major challenge facing the middle-income countries in particular, mainly because of the relatively high prices of these vaccines. Hib vaccine is not offered to 31% of the annual birth cohort. Moreover, 88% of infants in the Region are born in countries that offer neither pneumococcal nor rotavirus vaccines in the national immunization programme.

The aim of this paper is to highlight the role that vaccination plays in reducing morbidity and mortality of communicable diseases among children and, hence, achieving the target of Millennium Development Goal 4 (MDG 4) in countries of the Region. It also aims at raising awareness with regard to the missed opportunities to save more lives, due to the delay in introduction of the new highly effective life-saving vaccines in many countries. It underlines the necessity of sustaining measles elimination activities in order to maintain the gains in measles mortality reduction and to achieve the target of measles elimination. Finally, the paper draws the attention to the constraints and challenges facing immunization programmes in the region and the action needed to reach the targets set and achieve MDG 4. The paper does not specifically address the issue of poliomyelitis eradication because this is addressed through the annual progress report submitted to the Regional Committee. Nor does it address the hepatitis B control target as a specific resolution on this subject was endorsed by the Regional Committee in 2009 (EM/RC56/R.5).

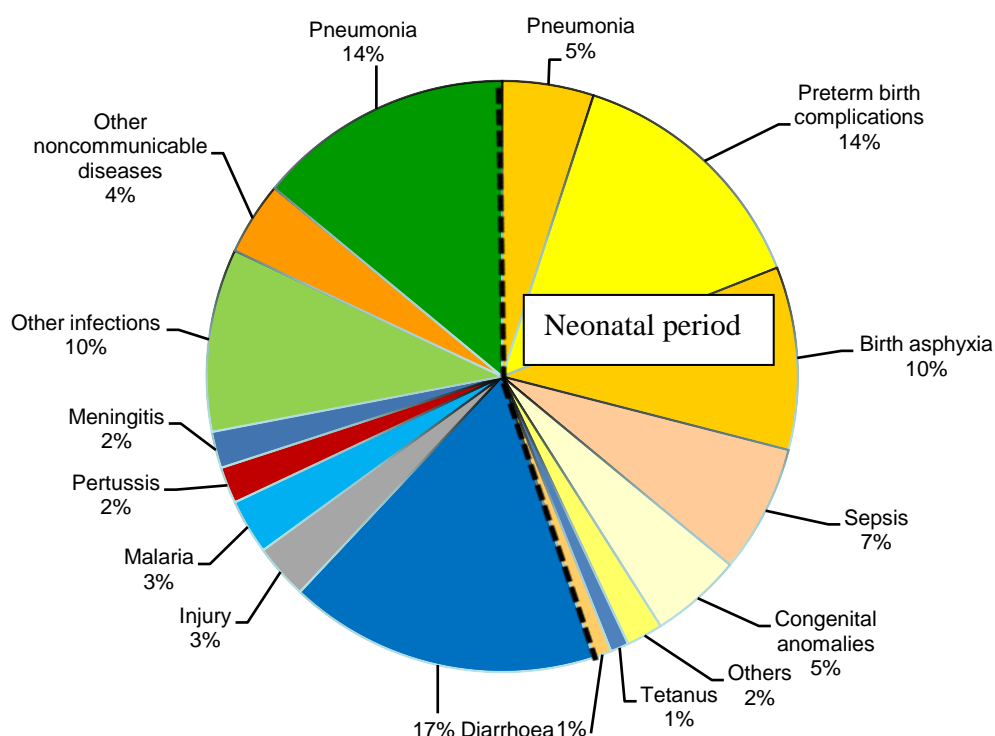
## 2. Burden of vaccine-preventable diseases

An estimated 1.239 million children under five years of age died in 2008 in the Eastern Mediterranean Region. More than 20% of these deaths are attributed to diseases for which potent vaccines are available. A large proportion of these deaths is due to pneumonia and diarrhoeal diseases caused by *Streptococcus pneumoniae*, *Haemophilus influenzae* type B (Hib), and *rotavirus*, despite the existence and availability of potent and safe vaccines (Figure 1)<sup>1</sup>.

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<sup>1</sup> Black RE et al. Global, regional and national causes of child mortality in 2008: a systematic analysis. *The Lancet*. Published online May 12, 2010 DOI:10.1016/S0140-6736(10)60549-1

Measles is still an important cause of child deaths. Even after the successful reduction in measles mortality globally, in 2008, there were still an estimated 164 000 measles deaths globally – nearly 450 deaths every day or 18 deaths every hour. During the same year, WHO estimated that 7000 measles deaths, or 20 deaths per day, occurred in the Eastern Mediterranean Region. Measles is a disease of poverty. Malnourished children are especially at risk of infection and more than 95% of measles deaths occur in low-income countries with weak health infrastructure. Many deaths from the measles virus are directly related to complications, including pneumonia, diarrhoea and malnutrition.



**Figure 1. Causes of 1.239 million deaths among children under 5 years in the Region, 2008**

Diarrhoea and pneumonia account for around 37% of the deaths among children under 5 years of age in the Region (Figure 1). Pneumococcal, Hib and rotavirus diseases are responsible for a substantial proportion of these deaths.

Tackling under-5 mortality with classic vaccines only is not enough if the target of MDG 4 is to be achieved. The possible impact that different immunization interventions may have had on vaccine-preventable diseases related to under-5 mortality and relevant to achieving the target of MDG 4 was studied by WHO and UNICEF in 2005. It was determined that if the current trend in terms of routine immunization coverage and vaccines in use continues, the impact of immunization on under-5 mortality reduction between 2000 and 2015 would be minor. However, if routine vaccination coverage was scaled up to 90% and Hib, rotavirus and pneumococcal vaccines were widely used, a 60% to 70% reduction in under-5 mortality attributable to vaccine-preventable diseases could be reached by 2015. Therefore, scaling up routine immunization and introduction of new vaccines, especially Hib, pneumococcal and rotavirus vaccines, were identified by WHO and UNICEF in the Global Immunization Vision and Strategies (GIVS)

**Table 1. WHO estimate of burden of diseases preventable by new vaccines<sup>a</sup>**

Country	Hib deaths as % of <5 deaths	Pneumococcal deaths as % of <5 deaths	Rotavirus deaths as % of <5 deaths	Proportion of Hib, pneumococcal and rotavirus deaths
Afghanistan	4.1	9.0	7.3	20.5
Bahrain	0.0	0.0	0	0.0
Djibouti	4.5	8.9	4.1	17.5
Egypt	3.7	7.6	1.2	12.5
Iran, Islamic Republic of	2.3	4.7	4.2	11.1
Iraq	3.2	6.4	1.9	11.5
Jordan	3.9	6.4	1.9	12.2
Kuwait	0.0	2.5	0.2	2.7
Lebanon	3.8	6.1	0.4	10.2
Libyan Arab Jamahiriya	2.9	5.0	1.5	9.4
Morocco	4.3	7.8	4.4	16.5
Oman	3.8	6.9	0.9	11.6
Pakistan	2.9	5.7	8.3	16.9
Qatar	0.0	0.6	0.6	1.3
Saudi Arabia	0.2	4.7	1.4	6.3
Somalia	4.2	8.7	6.4	19.4
Sudan	3.9	8.0	8.2	20.0
Syrian Arab Republic	5.4	8.0	2.0	15.5
Tunisia	5.2	9.2	1.6	16.1
United Arab Emirates	0.0	2.3	0.4	2.7
Yemen	3.8	7.2	5.7	16.6
Region	3.5	7.1	6.5	17.1

<sup>a</sup> Rotavirus estimates for 2008; Hib and pneumococcal estimates for 2000, revised 2008; All estimates are before vaccine introduction except Hib disease estimates for Bahrain, Qatar, Kuwait, Saudi Arabia and United Arab Emirates which are adjusted for Hib vaccine introduction

document<sup>2</sup>, endorsed by resolution WHA58.15, as a cornerstone for achieving MDG 4. The estimated burden of these diseases in countries of the Region is shown in Table 1<sup>3</sup>.

### 3. Regional immunization situation

#### 3.1 Immunization targets

The national immunization programmes provide vaccines against at least six diseases as part of the national Expanded Programme on Immunization (EPI) in all countries of the Region. These vaccines include antigens against childhood tuberculosis using one dose of the bacille Calmette-Guérin (BCG) vaccine, at least three doses of diphtheria, pertussis and tetanus vaccine (DPT), poliovaccine and measles vaccine. Various new vaccines are also provided by different countries, in addition to immunization of pregnant women and women of childbearing age to prevent maternal and neonatal tetanus.

Immunization programmes in the Region aim at control, elimination or eradication of all vaccine-preventable diseases through the wide-scale use of quality-assured effective vaccines and

<sup>2</sup> The component strategies. World Health Organization, Geneva, 2006. Accessed on 27 June 2011. [http://www.who.int/immunization/givs/GIVS\\_strategies.pdf](http://www.who.int/immunization/givs/GIVS_strategies.pdf)

<sup>3</sup> Rotavirus disease: WHO unpublished estimates for 2008. Hib and pneumococcal disease: [http://www.who.int/immunization\\_monitoring/burden/Pneumo\\_hib\\_estimates/en/index1.html](http://www.who.int/immunization_monitoring/burden/Pneumo_hib_estimates/en/index1.html)

technologies, as well as safe immunization practices. The global and regional targets of immunization programmes are to:

- achieve at least 90% DPT3 coverage at national level and at least 80% in every district by 2010 (global goal, resolution WHA58.15);
- reduce measles mortality by at least 90% compared to the 2000 level by 2010 (global goal, resolution WHA58.15);
- eliminate measles from all countries of the Region by 2010 (regional target, resolution EM/RC44/R.6);
- eradicate poliomyelitis by 2012 (global target);
- reduce hepatitis B surface antigen prevalence to less than 1% among children aged less than 5 years in all countries of the Region by 2015 (regional target, resolution EM/RC56/R.5);
- eliminate maternal and neonatal tetanus as soon as possible (target date was 2007);
- achieve, by 2015, a two-thirds reduction of morbidity and mortality due to vaccine-preventable diseases compared to 2000 levels (global goal, resolution WHA58.15). This is one of the goals of the GIVS which addresses the contribution of immunization programmes to achieving MDG 4. New vaccines introduction is a major tool for reaching this target and, hence, achieving MDG 4.

### **3.2 Current situation of routine immunization**

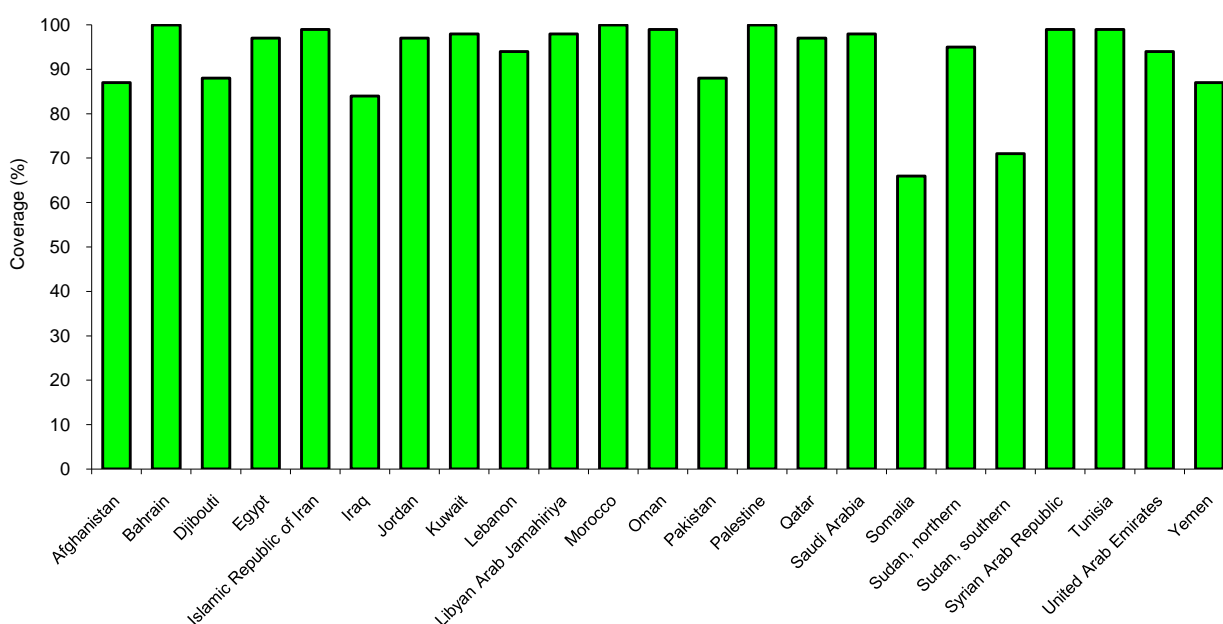
Routine immunization is the most cost-effective vaccination delivery strategy. It is the back-bone of all vaccination activities and the basis for achieving and sustaining all immunization targets. High routine vaccination coverage is the cornerstone for achieving and sustaining poliomyelitis eradication and measles elimination and the successful introduction of and access to new vaccines. In several parts of the world, including the Eastern Mediterranean Region, countries that have high routine vaccination coverage against poliomyelitis were able to sustain interruption of wild polio transmission after re-introduction of the wild poliovirus. Whereas countries with low routine vaccination coverage were exposed to polio outbreaks after this re-introduction.

Interventions and approaches to ensure strong routine immunization programmes include:

- strengthening routine vaccination delivery services: maximizing access to sustainable vaccination services and devising innovative strategies to increase routine immunization coverage in hard-to-reach areas;
- improving the logistic support system to ensure a sustainable and reliable supply of affordable vaccines of assured quality and other related logistic needs through:
  - ensuring an adequate vaccine procurement system;
  - ensuring an adequate cold chain and vaccine management system;
  - establishing an adequate vaccine transportation and distribution system;
- reinforcing the managerial capacity of the immunization staff at the central and peripheral levels, through establishing and fulfilling a suitable EPI staff organigram;
- strengthening surveillance of vaccine-preventable diseases, including laboratory surveillance and using data for action;
- strengthening the EPI monitoring and evaluation system and ensuring high EPI data quality and using data for action;

- achieving financial sustainability of the immunization programme through development and implementation of comprehensive multi-year plans (cMYP) and mobilization of adequate resources;
- strengthening the national decision-making process through the establishment of a well-functioning national immunization technical advisory group (NITAG);
- enhancing advocacy, communication and social mobilization through developing and implementing suitable strategies;
- re-establishing immunization as a key component of primary health care through increasing emphasis on disease burden reduction, with vaccines as an entry point to other health interventions.

Vaccination coverage for the third dose for DPT (DPT3-containing vaccines) among children below 1 year of age is the main indicator of successful routine immunization services. The global and regional target of routine immunization programmes is to achieve at least 90% DPT3 coverage at national level and 80% in every district or equivalent administrative level in all countries by 2010 (global goal, resolution WHA58.15).



Source: WHO/UNICEF joint reporting forms

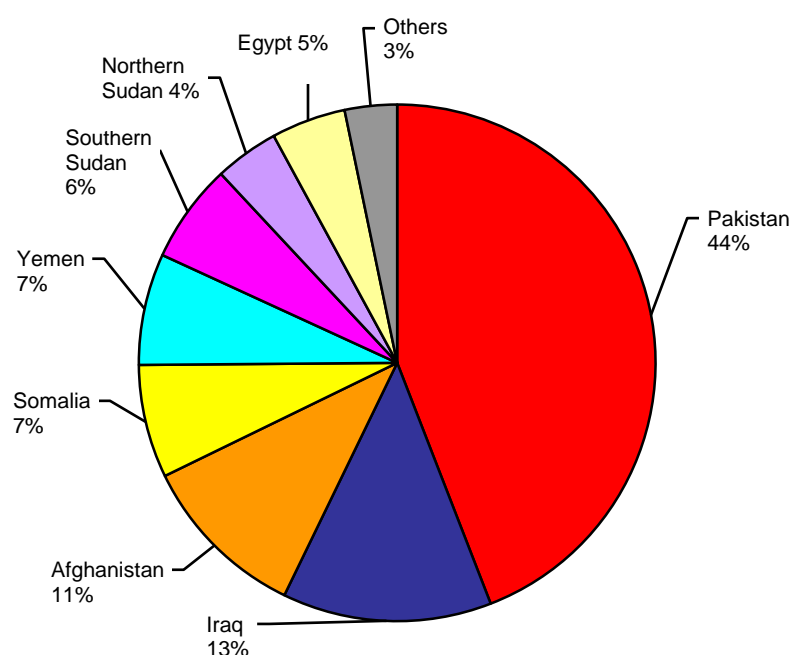
**Figure 2. Reported DPT3 coverage in countries of the Eastern Mediterranean Region, 2010**

The main strategy to ensure achievement of the routine immunization coverage target is the “Reach Every District” (RED) approach. It uses a mix of fixed, outreach and mobile vaccine delivery strategies, aiming at reaching all targeted children, including those in the most remote areas. The RED approach calls for simple and achievable strategies within a decentralized EPI management structure. RED has been successfully implemented in several countries with a large number of low coverage districts, mainly Afghanistan, Djibouti, Iraq, Somalia, Sudan and Yemen. It needs to be expanded and implemented in all countries with any number of low coverage districts.

Substantial improvement in routine immunization services was achieved over the past few years. Sixteen countries have achieved the target of 90% coverage, while Afghanistan, Djibouti, Iraq, Pakistan and Yemen are close to this target (Figure 2), and the regional average for DPT3 reached 91% in 2010. The remarkable achievement experienced during the past two years is due mainly to the widespread adoption of the RED approach, implementation of the integrated child survival interventions such as child health days in Somalia and accelerating immunization activities in Afghanistan, Sudan and Yemen.

In response to the remarkable opportunities and daunting challenges, in 2010 the WHO Regional Office for the Eastern Mediterranean and partners initiated Vaccination Week in the Eastern Mediterranean during the week of 24–30 April. This is an annual Region-wide initiative celebrating and promoting immunization through advocacy, education and communication activities, and utilizing the opportunity for raising vaccination coverage through additional vaccination activities. Successful Vaccination Week activities require collaboration among multiple private, nongovernmental and government sectors.

Despite this, around 1.5 million infants did not receive their third dose of DPT vaccine in 2010; around 92% of these children are from 6 countries (Figure 3). Even in the countries that report high routine coverage, there are issues of inequity, with a considerable proportion of the districts not achieving the 80% target by 2010. Moreover, these coverage figures are based on national reporting systems that are considered to be unreliable and which need strengthening in several countries.



**Figure 3. Distribution of 1.5 million unvaccinated children in the Region in 2010 (reported data)**

Among the major weaknesses of the immunization programmes in several countries are the monitoring and evaluation systems and the quality of vaccination coverage data. These weaknesses stem, mainly, from the unreliability of the target population figures, due to dependence on outdated censuses, inadequate vital registration systems or inaccurate estimates. Weak reporting systems and a tendency to inflate coverage figures at the periphery due to application of performance-based reward systems without adequate monitoring and supervision are additional problems. Therefore, the actual vaccination coverage figures might be significantly lower in some countries and this is indicated by the occurrence of outbreaks of measles, diphtheria and pertussis in countries reporting high vaccination coverage. In addition, with the exception of AFP surveillance and the improving measles surveillance, vaccine-preventable disease surveillance is not receiving the attention it deserves. It is weak in most of the countries, and where data are available; they are not adequately used as an indicator of immunization programme performance. Strengthening surveillance for vaccine-preventable diseases is highly needed to monitor programme performance and monitor progress towards achieving the set targets.

### 3.3 Measles elimination

In 2005, the World Health Assembly adopted the GIVS goal of achieving a 90% reduction in global measles mortality by 2010, compared to the level of 2000 (WHA58.15). Eight years earlier, in 1997, the Forty-fourth Session of the Regional Committee for the Eastern Mediterranean adopted a resolution to eliminate measles from all countries of the Region by 2010 (EM/RC44/R.6)<sup>4</sup>. MDG 4 aims to reduce the under-5 mortality rate by two thirds between 1990 and 2015. Recognizing the potential impact of measles vaccination on reducing child mortality, measles vaccination coverage among children under 1 year of age has been selected as an indicator of progress towards achieving MDG 4.

#### *Regional strategies to reach measles control and elimination targets*

1. Achieving high population immunity through implementing nationwide measles catch-up vaccination campaigns targeting wide age cohorts and achieving homogenous high coverage;
2. Maintaining high population immunity through achieving high vaccination coverage (95% coverage in all districts) among all cohorts born after the nationwide measles catch up campaign, with two doses of measles-containing vaccine by:
  - a) routine vaccination for the first dose of measles-containing vaccine (MCV1);
  - b) implementation of the second dose of measles vaccination through, either
    - i) routine second dose; and/or
    - ii) follow-up supplementary immunization activities, to be timely conducted until the routine second dose reaches the required high coverage (95% in all districts);
3. Strong case-based laboratory-based surveillance for measles;
4. Optimal measles case management.

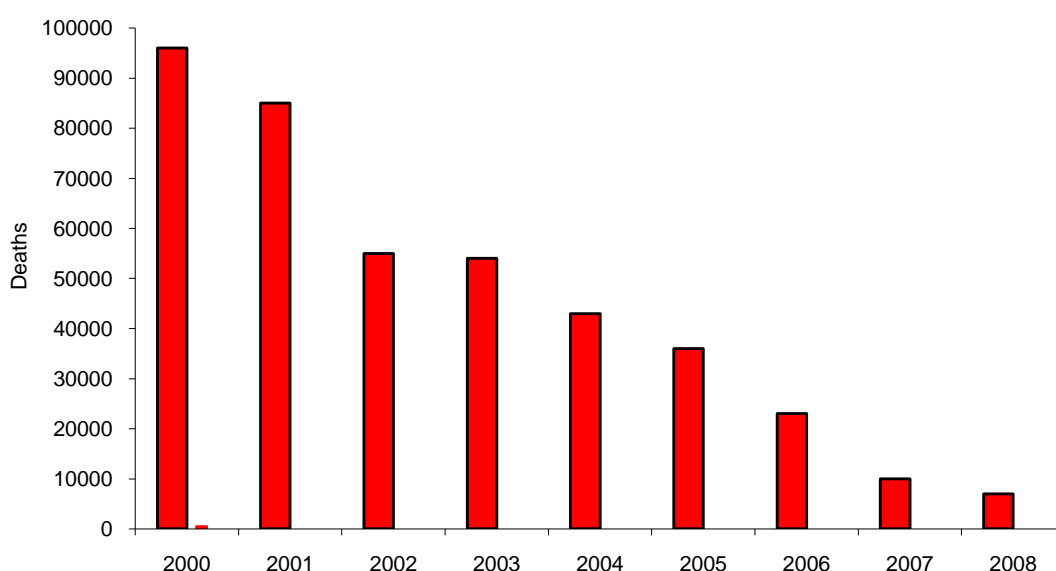
The Region has made substantial progress towards achieving the target of measles mortality reduction and elimination. All countries have implemented the nationwide catch up campaign. Approximately 400 million people in the Region were vaccinated through supplementary immunization activities (catch up and/or follow-up campaigns) between 1994 and 2010 and the regional average of MCV1 coverage reached 88% in 2010 (based on country reports,

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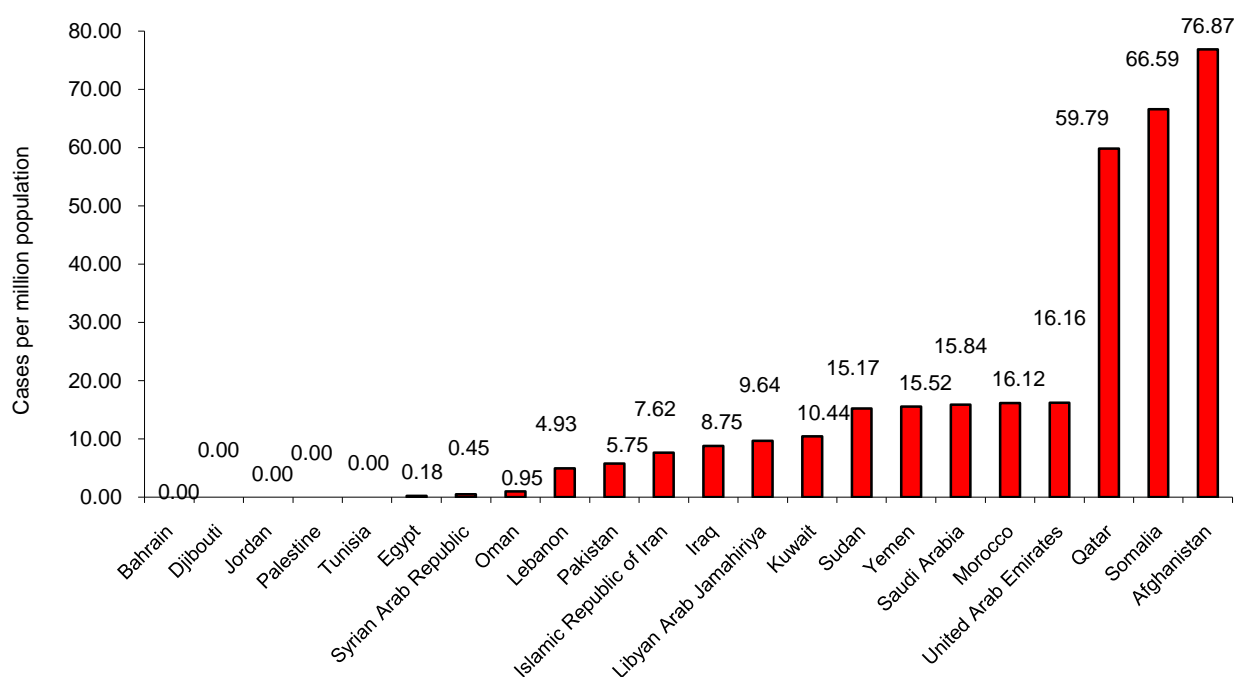
<sup>4</sup> Measles elimination: The absence of endemic measles transmission in a defined geographical area (e.g. region) for a period of at least 12 months or more, in the presence of a well-performing surveillance system.

WHO/UNICEF joint reporting forms 2010). All countries have moved to case-based measles surveillance with laboratory confirmation; 20 countries are implementing nationwide surveillance and Pakistan, Somalia and southern Sudan are implementing sentinel surveillance. As result, measles mortality was reduced by 93% between 2000 and 2008 (Figure 4) and the reported number of confirmed measles cases decreased from about 88 000 in 1998 to 10 517 in 2010. Eight countries are moving towards measles elimination.

However, the Region did not achieve the target of measles elimination by 2010 (Figure 5), primarily because countries did not achieve the required high sustained and consistent measles vaccination coverage (95%) with 2 doses of measles-containing vaccine (MCV) in all districts (Figure 6). Some countries are still experiencing measles outbreaks, such as Afghanistan, Iraq, Morocco, Pakistan, Somalia, Sudan and Yemen, and the gains in measles mortality reduction may be lost unless timely action is taken. In view of this situation, the EPI managers, in their annual meeting in July 2010, agreed to postpone the target of measles elimination to 2015.

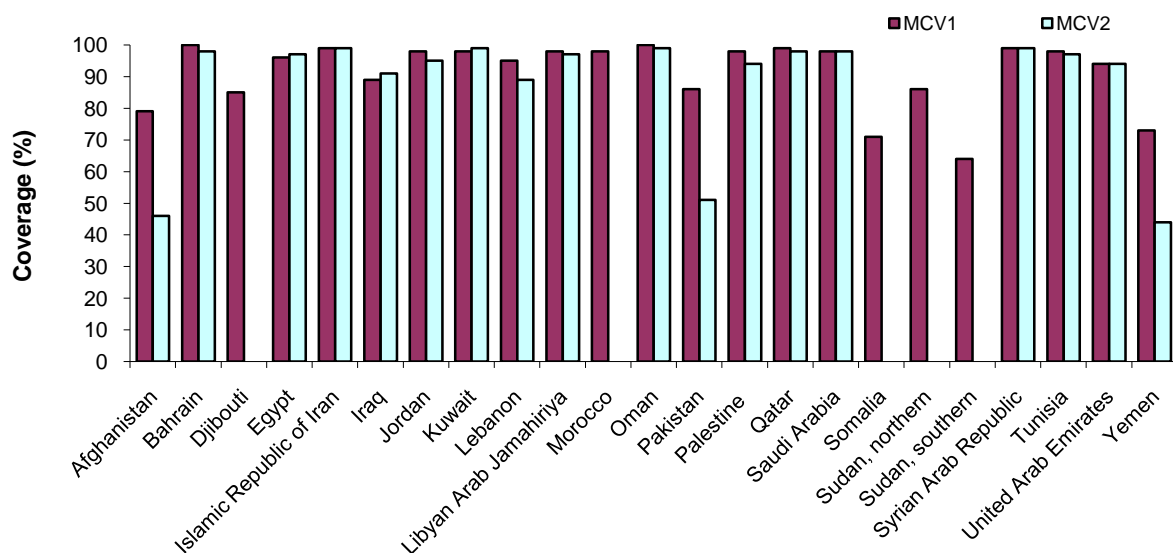


**Figure 4. Measles mortality reduction in the Region, 2000–2008**



Source: WHO/UNICEF joint reporting forms

**Figure 5. Measles minimum incidence rate per million population, 2010**



Source: WHO/UNICEF joint reporting forms

**Figure 6. Reported national coverage of measles-containing vaccine, 2010**

**Table 2. Planned measles supplementary immunization activities, 2011–2015**

Country	Year of campaign	Age group (months)	Total number of children to be targeted
Afghanistan	2011	9–59	340 000
	2013	9–59	3 000 777
Djibouti	2011	9–59	70 713
Iraq	2012	9–59	4 443 281
	2015	9–59	4 443 281
Lebanon	2012	9–59	275 000
Morocco	2012	9–59	2 600 000
Somalia	2011–2015	9–59	3.2–3.6 million
Sudan,	2011	9–59	3 380 600
northern	2014	9–59	4 000 000
Sudan,	2011	6–59	2 376 030
southern	2013	6–59	2 400 030
	2014	6–59	2 400 030
Pakistan	2011	9–59	28 000 000
	2015	9–59	30 000 000
Yemen	2013	9–59	4 015 154

**Table 3. Estimated budget (US\$) for SIAs for control/elimination of measles, Eastern Mediterranean Region, 2012–2015**

Activity	2011 <sup>a</sup>	2012	2013	2014	2015	Total
Vaccine cost	8 594 489	2 442 205	2 924 671	2 277 007	8 749 955	24 988 326
Operational cost for supplementary immunization activities	28 025 507	7 963 711	9 536 971	7 425 023	28 532 461	81 483 672
Total (US\$)	36 619 996	10 405 915	12 461 642	9 702 029	37 282 415	106 471 998

<sup>a</sup>Planned supplementary immunization activities for 2011 were partially implemented so far

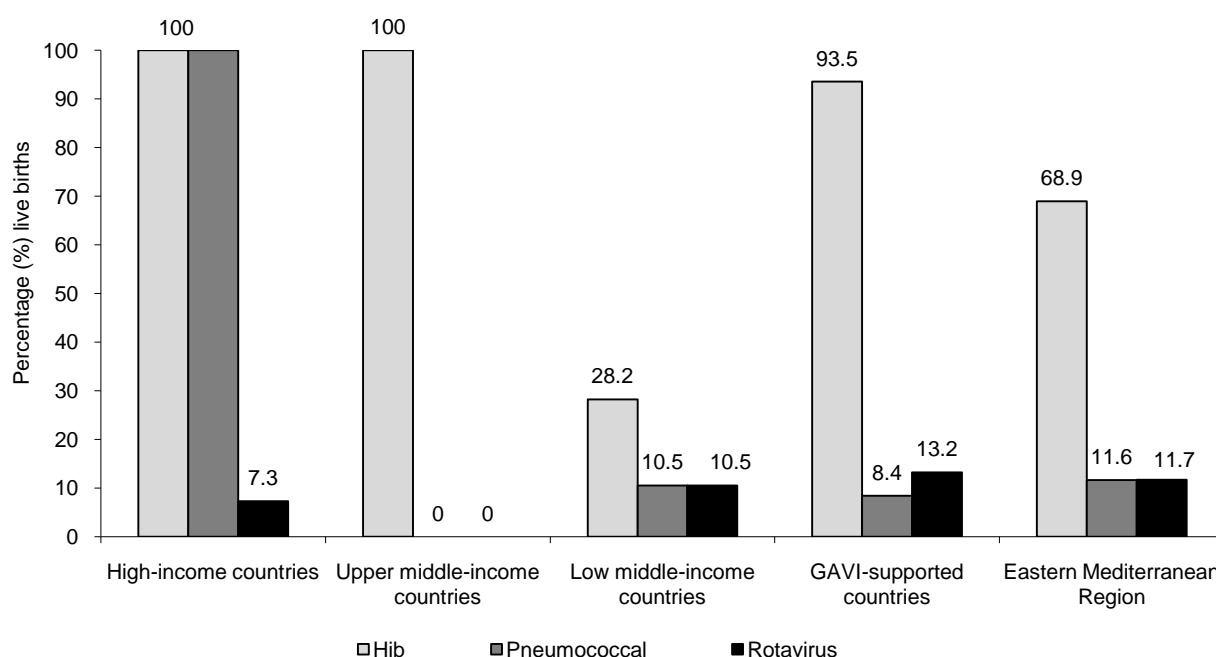
Achieving measles elimination requires reaching a very high and sustained level of measles population immunity through high routine vaccination coverage (95%) and timely implementation of the follow-up campaigns where needed, in addition to improvement in measles surveillance. National ownership and allocation of necessary government resources, together with the continuous support of the international partners is essential. Tables 2 and 3 show the planned measles supplementary immunization activities and necessary funds through 2015, respectively.

### 3.4 Introduction of new vaccines

#### *Current situation*

Pneumococcal, Hib and rotavirus diseases together cause up to 20% of the deaths among children under five years in the Region in absence of vaccination (Table 1). Thanks to GAVI support to the low-income countries, new vaccine introduction in the Region gained momentum during the past few years. So far, Hib vaccine has been introduced in 18 countries. Pneumococcal conjugate vaccine (PCV) has been introduced in 8 countries (6 Gulf Cooperation Council (GCC) countries in addition to Morocco and Yemen) while rotavirus vaccine has been introduced in 4 countries (Bahrain, Qatar, Morocco and Sudan). The percentages of children born in countries that offer Hib, PCV and rotavirus vaccine in 2011 are shown in Figure 7.

Despite this recent increase in the number of countries that introduced these new life-saving vaccines, uptake of these vaccines in the Region is considered generally slow, especially in the middle-income countries. After 20 years of availability of Hib vaccine, 31% of the infants in the



Source: WHO/UNICEF joint reporting forms

**Figure 7. Proportion of live births in countries offering new vaccines, 2011**

Region are born in countries that do not offer Hib vaccine. Moreover, 88% of infants are born in countries that offer neither PCV nor rotavirus vaccines in the national immunization programme. The slow uptake of the new vaccines is attributed mainly to the high prices of these vaccines, along with inadequate allocation of the necessary resources, inadequate decision-making capacity and lack of awareness of disease burden, which could convince the decision-makers of the necessity of introducing these vaccines. Children living in high-income countries are able to access these vaccines, as are children in low-income countries, thanks to GAVI support. However, infants in middle-income countries, especially the low middle-income countries, seem less likely to have this chance in the near future.

#### *Regional efforts to enhance introduction of new vaccines*

##### 1) Strengthening decision-making capacity

- Regional surveillance networks to support new vaccines introduction. The Regional Office has supported countries in establishing laboratory-based surveillance networks for rotavirus gastroenteritis and invasive bacterial diseases, namely Hib, pneumococcal and meningococcal diseases. These surveillance networks aim at documenting disease occurrence and serotype, serogroup, and genotype distribution in order to support evidence-informed decision-making on introduction of new vaccines. This is also crucial for studying the impact of the new vaccine on disease occurrence after introduction, which might have direct effect on continuing allocation of funds for these vaccines. So far, data generated from these networks were the basis for decision-making on introduction of rotavirus

vaccine and PCV in several countries. Nevertheless, countries' ownership and strengthening of this surveillance programme is highly needed to ensure sustainability.

- National immunization technical advisory group (NITAG). NITAGs are technical advisory groups that provide guidance to policy makers and programme managers to help them make evidence-informed policies and programme decisions. Significant progress occurred in the past 2 years in establishing and strengthening these groups. Currently, 20 countries in addition to northeast Somalia have established NITAGs of varying degrees of functionality. However, NITAGs in only two have met all seven criteria for a functioning NITAG and NITAGs in five countries are close to achieving all the required criteria. NITAGs have been instrumental in the decision-making process, especially for new vaccines introduction. This was clear in regard to the decision-making on rotavirus vaccine introduction in Sudan, pneumococcal vaccine introduction in Pakistan, Hib and rotavirus vaccine introduction in Iraq and pneumococcal and rotavirus vaccine introduction in Afghanistan. Nevertheless, greater efforts are required to ensure well functioning NITAGs in all countries.
- 2) Establishing a pooled vaccine procurement system in the Region. Pooled vaccine procurement mechanisms have been instrumental in enabling the supply of high quality competitively priced vaccines to countries which are part of the system. The two most successful examples of this have been the PAHO Revolving Fund for Vaccines and Syringes, which has been instrumental in the success of vaccine introduction and disease elimination programmes in the Americas for the past 30 years, and the GCC Group Purchasing Programme (GPP), which has extended the purchasing power of its member countries by issuing joint tenders for a wide range of medical products including vaccines since 1976.

Considering the constraints middle-income countries have been facing in introducing new life-saving vaccines, the ministers of health of the Region, during the side meetings of the World Health Assembly in 2008 and 2009, asked the Regional Office to undertake a feasibility study on establishing a regional mechanism for pooled vaccine procurement. The proposed implementation strategy of the Pooled Vaccine Procurement Initiative will involve adoption of a regional procurement system in a stepwise approach. The final operational mechanism of the initiative is the establishment of a central procurement unit with a financial support system. This procurement unit will support countries to acquire quality vaccines and injection equipment at competitive prices while ensuring financial sustainability. To reach this goal, the following procurement stages could be implemented to reflect the development of the operational and financial capacity of the system and the capacity of the countries to utilize the system.

*Stage 1: Partnering with UNICEF Supply Division as a procurement agent for Member countries*

This stage might take 2–3 years during which the Regional Office will be partnering with countries and UNICEF supply division which will act as a procurement agent for the participating countries (mostly the interested middle-income countries for this stage). The Regional Office will be responsible for coordinating and conducting the harmonization of procurement processes and procured products of the interested countries. It will also guide countries in the legislation and the regulation aspects of their procurement mechanism. In addition, the Regional Office and UNICEF will provide technical support to countries to improve their forecasting procedures and align them with the UNICEF operations and timing. UNICEF will be responsible for all the remaining procurement activities which will be executed in accordance with the terms of a memorandum of understanding between the interested countries and UNICEF.

*Stage 2: Procurement through a central procurement unit at the Regional Office with a financial mechanism*

At this stage of the system, a central procurement unit, which could be established within the Regional Office, will be responsible for all the necessary procurement activities and financial flows of the pooled procurement system according to the terms and conditions of a memorandum of understanding to be signed between interested countries and the Regional Office.

#### **4. Challenges and constraints facing immunization programmes**

- Emergency and security situations in an increasing number of countries.
- Competing priorities in the presence of weak health systems and inability to respond to the increasing requirement of immunization programmes to meet the set target of vaccine-preventable disease control, elimination and eradication as well as introduction of new vaccines.
- Inadequate structure, technical and managerial capacity of the immunization programmes in some countries, in terms of both number and qualification of EPI staff at central and peripheral levels.
- Inadequate decision-making capacity.
- Increasing financial demands of the immunization programmes with inadequate government financial allocation, threatening the gains of the immunization programmes.
- Perception by decision-makers that, having achieved high routine vaccination coverage, EPI is a “finished agenda”, without regard to the increasing needs of the immunization programmes to sustain the success and address competing priorities, which include introduction of new vaccines, meeting the requirements of disease eradication and elimination, and expansion of immunization to older age groups
- Weak surveillance systems for vaccine-preventable diseases, including diseases preventable by new vaccines, and weak EPI monitoring and evaluation systems.
- Inadequate social mobilization and failure in creating adequate community demand for vaccination in low coverage countries.

#### **5. Recommendations to Member States**

1. Strengthen national immunization programme capacity to be able to address the needs of the expanding programme and achieve the set targets through:
  - establishing an optimal programme structure and appointing an adequate number of qualified personnel for an adequate period of time;
  - strengthening the national immunization technical advisory group (NITAG);
  - ensuring implementation of a suitable routine vaccination delivery strategy based on adequate district micro-planning;
  - optimizing the vaccine procurement and logistics management system.
  - strengthening surveillance of vaccine-preventable diseases, including laboratory surveillance and using data for action; and
  - strengthening the EPI monitoring and evaluation system and ensuring high EPI data quality and using data for action;

2. Allocate adequate government financial resources to address the increasing demands of the immunization programmes and sustain the gains including:
  - funding to meet the requirements for introduction of new vaccines and measles elimination, particularly follow-up campaigns, and exploration of innovative ways to increase national contribution to all EPI activities, including new vaccines introduction and the requirements for achieving the targets of disease control, eradication and elimination activities;
  - ensuring adequate allocation to meet the co-financing requirements for GAVI support and adequate planning to ensure sustainability of the immunization programme, especially for new vaccines, after phasing out of GAVI support;
  - development of a comprehensive multi-year plan (cMYP) with a costing component that indicates the funding situation and funding gaps, to be used for mobilizing the necessary resources.
3. Achieve measles elimination in line with the revised regional target of 2015, including:
  - validation of measles elimination by countries reporting zero measles cases;
  - adequate monitoring of the accumulation of susceptible population and timely implementation of follow-up campaigns for countries that have not achieved high routine vaccination coverage (95%) with 2 doses of measles vaccine in all districts;
  - strengthening of measles laboratory case-based surveillance to meet the criteria needed for validating measles elimination.
4. Introduce Hib, pneumococcal and rotavirus vaccines as a high priority in all countries, identify the necessary resources for introducing these vaccines, and establish and strengthen surveillance of diseases preventable by new vaccines, as part of the national surveillance system, in order to generate reliable data that will help informed decision-making on introduction of the new vaccines.
5. Strengthen advocacy, communication and social mobilization by:
  - continuing to support the annual Vaccination Week in the Eastern Mediterranean and using this opportunity to tackle the specific problems and gaps of the immunization programme and mobilize more resources to fill the gaps;
  - establishing a strong communication and social mobilization strategy to create demands for vaccination, placing emphasis on building strong relationships with the community at all levels to mobilize its active participation in planning and implementation of vaccination activities at the community level;
  - building strong relationships with all relevant partners, including academic institutions and nongovernmental organizations, and mobilizing their active support for resource mobilization, social mobilization and field implementation of immunization activities.
6. Participate in the regional pooled vaccine procurement system proposed.