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Executive Summary

Global measles mortality has decreased 74% from an estimated 757,000 deaths in 2000 to 197,000 in 2007. The Eastern Mediterranean region accomplished the largest percentage reduction (measles mortality decreased by 90%); followed by the African region (89% reduction), and the Western Pacific region (73% reduction). Measles has not been endemic in the Americas since 2002.

The Eastern Mediterranean region achieved the United Nations goal to reduce measles deaths by 90% by 2010 compared to 2000 levels, three years early, – reducing measles deaths from an estimated 96,000 deaths in 2000 to 10,000 deaths in 2007.

“This achievement is a tribute to the hard work and commitment of countries in the Eastern Mediterranean region to combat measles,” said Dr Margaret Chan, WHO Director-General. “With only two years until the 2010 target date, I urge all countries affected by measles to intensify their efforts to immunize all children against the disease.”

Implementation of the WHO/UNICEF strategy to reduce measles mortality has led to the remarkable decrease in measles deaths. From 2000 to 2007, an estimated 3.6 million measles deaths were averted as a result of accelerated measles control activities (increased routine immunization coverage and SIAs) at a donor cost of 184 US$/death averted.

At the 2008 World Health Assembly governments renewed their commitment to achieving a 90% reduction in measles mortality compared with 2000. The strategy includes: the provision of one dose of measles vaccine for all infants via routine health services; a second opportunity for measles immunization for all children; effective surveillance for measles; and appropriate case management, including the provision of vitamin A supplementation for treatment.

Globally, measles routine vaccination coverage reached 82%, for the first time, increasing from 72% in 2000. The European and America regions maintained coverage over 90%. There has been an upward trend in coverage in all regions — but with considerable variation. In the African region, routine coverage rose from 56% to 74%; in the Eastern Mediterranean region, from 73% to 84%; and in the Western Pacific region, from 86% to 92%. In the Southeast Asia region routine measles coverage rose from 61% to 73%. Routine immunization is improving, but supplementary immunization activities are still required to continue to rapidly decrease mortality.

In 2008, twenty six countries conducted measles campaigns reaching more than 128 million children. Measles campaigns not only protect children against disease, but also strengthen health and immunization systems. Volunteers and community health workers are an integral part of campaigns and play an important role in the success of measles campaigns by working closely with communities — often in hard to reach areas.

Measles campaigns provided the platform for effective delivery of other child health interventions. The distribution of insecticide treated nets (ITNs), vitamin A, deworming tablets and polio vaccination alongside measles vaccination helps rapidly improve coverage and save lives. Thus contributing towards the achievement of MDG#4 to reduce under 5 child mortality by 2015. In 2008 twenty two countries (out of 26) included at least one other child survival intervention with their measles campaign. This resulted in the distribution of
an estimated 5.6 million ITNs, 35 million doses of vitamin A, and 30 million deworming treatments.

Measles surveillance and laboratory confirmation continue to strengthen health systems by integrating existing surveillance activities and expanding the laboratory network. The measles and rubella laboratory network (LabNet) consists of 679 laboratories serving 164 countries. Timeliness and quality of serum testing remain high even with a 44% global increase in samples (2006 to 2007). A comprehensive validation and utility of using dried blood and oral fluid samples for measles and rubella surveillance showed that alternative techniques may enhance surveillance.

Significant progress has been made with measles mortality reduction; however, three major challenges remain to achieve the 2010 measles mortality reduction goal:

1. **India:** The only country still relying on a single dose strategy at nine months age.

2. **Outbreaks:** Persistent outbreaks are occurring in unvaccinated children indicating low coverage both through routine services and through campaigns as the primary problem.

3. **Funding:** The funding for measles activities for 2009 and beyond has not been fully secured as donors have not kept pace with country demands for support. The Measles Initiative will continue working with its partners to achieve the 2010 measles mortality reduction goal.

“The progress that has been made shows what can be achieved through measles campaigns, but much more needs to be done. It is a tragedy that measles still kills more than 500 children a day when there is a safe, effective and inexpensive vaccine to prevent the disease.” Ann Veneman, Executive Director, UNICEF
1. Introduction

Measles remains a leading cause of death among young children especially in developing countries. Measles outbreaks result in high mortality rates particularly in malnourished populations. The most recent data (2007) indicates that there were an estimated 197,000 measles related deaths globally, representing a 74 percent reduction from the estimated 750,000 deaths in 2000. Despite the remarkable progress, there are still significant challenges to further decrease measles related morbidity and mortality.

The Measles Initiative is a partnership committed to reducing measles deaths globally. Launched in 2001, the Initiative — led by the American Red Cross, UNICEF, the United Nations Foundation, the U.S. Centers for Disease Control and Prevention, and the World Health Organization — provides technical and financial support to governments and communities for measles vaccination campaigns and disease surveillance.

The Measles Initiative partners secure the financial resources required to implement activities in countries with high measles burden through joint resource mobilization efforts. Since 2001 the Initiative has provided more than $682 million for global measles mortality activities in more than 60 countries, $48 million of this in 2008.

The 2008 Annual Report reports on progress towards measles mortality reduction goal, focusing on activities implemented with the support of the Measles Initiative. (See Annex 1 for measles mortality reduction goals and WHO/UNICEF measles mortality reduction strategy).

2. Progress towards Measles Mortality Reduction

Improving Global Routine Coverage

The most recent WHO/UNICEF estimates (2007) indicate that global routine measles vaccination coverage reached 82% for the first time, increasing from 72% in 2000. Coverage varied significantly by geographical region (Table 1). The greatest gains in routine immunization coverage were realized in the WHO African region (from 56% to 74%), South East Asia region (from 61% to 73%) and Eastern Mediterranean Region (73% to 84%).

Despite the improvements in coverage, many children remain unvaccinated. In 2007 an estimated 23 million one-year old children did not receive a dose of measles vaccine through routine immunization services. Sixty-five percent of infants who missed their first dose of measles vaccine through routine immunization services reside in eight populous countries (India [8.5 million], Nigeria [2.0 million], China [1.0 million], Ethiopia [1.0 million], Indonesia [0.9 million], Pakistan [0.8 million] the Democratic Republic of Congo [0.6 million]) and Bangladesh [0.5 million]). Accelerated activities are required for these countries to reach the mortality reduction goal.
Table 1: Measles vaccine coverage, estimated number of deaths from measles by WHO region, 2000 and 2007

<table>
<thead>
<tr>
<th>WHO region</th>
<th>2000</th>
<th>2007</th>
<th>Decrease in measles deaths 2000-2007</th>
<th>Proportion of global decrease attributable to region</th>
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<tr>
<td></td>
<td>Percent first-dose measles vaccine coverage</td>
<td>Estimated number of measles deaths (uncertainty bounds)</td>
<td>Percent first-dose measles vaccine coverage</td>
<td>Estimated number of measles deaths (uncertainty bounds)</td>
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<td>45,000 (32,000 - 60,000)</td>
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<tr>
<td>Americas</td>
<td>92</td>
<td>&lt;1000</td>
<td>93</td>
<td>&lt;1000</td>
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<tr>
<td>Eastern Mediterranean</td>
<td>73</td>
<td>96,000 (71,000 - 123,000)</td>
<td>84</td>
<td>10,000 (7,000 - 15,000)</td>
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<td>European</td>
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<td>&lt;1000</td>
<td>94</td>
<td>&lt;1000</td>
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<td>Southeast Asia</td>
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<td>136,000 (98,000 - 180,000)</td>
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<td>Western Pacific</td>
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<td>25,000 (17,000 - 35,000)</td>
<td>92</td>
<td>7,000 (4,000 - 11,000)</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>750,000 (543,000 - 982,000)</td>
<td>82</td>
<td>197,000 (141,000 - 267,000)</td>
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</table>

**Eastern Mediterranean Region and Africa Successes**

Increased coverage of routine measles immunization together with accelerated efforts to vaccinate children through SIAs during 2000 to 2007 has resulted in a 74% decrease in the estimated number of measles deaths globally (Figure 1). The largest percent reduction was in the Eastern Mediterranean Region, where measles deaths decreased by 90 percent between 2000 and 2007, from an estimated 96,000 to 10,000 reaching the 2010 measles mortality reduction goal three years early and accounting for sixteen percent of global reduction. An important contributor to the rapid reduction in measles mortality in this region in the past year was the intensification of SIAs with more than twice the number of children reached through SIAs in 2007 compared to 2006. In Africa measles deaths fell by 89 percent from an estimated 395,000 deaths to 45,000 accounting for sixty three percent of the global reduction. The reduction in the South East Asia Region was smaller because India, which accounts for 67% of the region’s population, has not yet begun large scale measles SIAs.
Figure 1: Estimated number of measles deaths --- worldwide, by year, 2000-2007

1 High-low bars indicate uncertainty range and are based on Monte Carlo simulations that account for uncertainty in key input variables (i.e., vaccination coverage and case-fatality ratios).

Nepal Measles campaign (Photo credit: M. Vandenent, UNICEF)
3. Summary of 2008 Measles Activities

Overview of 2008 Activities

In 2008, the Measles Initiative and its partners supported vaccinated approximately 128 million children through 33 immunization campaigns in 26 countries. More than 203 million measles vaccine doses and safe injection materials were procured through UNICEF and PAHO revolving fund mechanism for measles supplementary immunization activities. (See Annex 2 for details). Twenty two out of 26 countries added at least one other child health interventions to the measles vaccination campaigns. (See Figure 2 and Table 2).

Most countries contributed financially to operational costs in addition to providing resources in-kind. The governments of Nigeria, Tanzania, Malawi and Egypt procured vaccines and devices with their own funds. This trend is encouraging as governments are required to cover 50% of the operational costs for follow-up campaigns with the aim of ensuring long term sustainability of measles mortality reduction activities.

Lessons Learned

Measles campaigns are major events requiring good coordination, high quality planning and mobilizing many professionals and volunteers for a successful outcome. Countries implementing measles campaigns reported common lessons learned:

- the need for high level political support;
- the timely availability of sufficient funds;
- the benefits of including different sectors and partners;
- the need for adequate comprehensive planning including detailed micro-planning;
- the benefits and challenges of integrating other interventions;
- the importance of involving the community to ensure high demand; and
- timely management of adverse events following immunization (AEFI).

Key Events in 2008

March – Pakistan launches the final phase of a national measles vaccination campaign, marking the conclusion of the largest ever measles campaign providing measles vaccine to more than 66 million children in the country.

April – Global leaders in childhood immunization meet to review Measles Initiative progress and address challenges ahead.

May – ‘Don’t blow your future – get vaccinated’ is the key message of the immunization exhibit at 61st World Health Assembly where governments reaffirmed their commitment towards the 2010 GIVS goal of reducing measles deaths by 90%.

August – Measles Initiative statement on U.S. measles outbreak-advocating that all children have the right to be protected from measles through vaccination.


October – Measles Initiative announces urgent funding needed to reach 2010 measles goal. Funding for measles activities in 2009-2010 has not been fully secured, putting recent gains in measles control in danger of being lost.

November – Government of the People’s Republic of China provide measles vaccination to more than 7.3 million children, implementing additional measles control activities and strengthening the delivery of routine immunization in areas impacted by a devastating earthquake.

December – Announcement that measles deaths worldwide fell by 74% between 2000 and 2007 and the Eastern Mediterranean Region achieved the UN goal to reduce measles deaths by 2010 three years early.
Figure 2: Measles supplementary immunization activities

Measles supplementary immunization activities, January – December 2008

Other Interventions:
- Vitamin A – 14
- De-worming – 13
- Bed nets – 7
- OPV - 9

Source: WHO/IVB SIA Database, as of February 2009.

1 Countries receiving funding from UNF project grant Phase IX
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<th>Country</th>
<th>Measles coverage estimate for 2007</th>
<th>Age Group</th>
<th>Extent</th>
<th>Reached</th>
<th>Coverage</th>
<th>OPV1</th>
<th>Vit A</th>
<th>ITNs</th>
<th>De-worming</th>
<th>TT/dT</th>
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<td>Reached</td>
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<td>China (Sichuan)</td>
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<td>8M-14Y</td>
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<td>8M-6Y</td>
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<td>Papua New Guinea</td>
<td>58</td>
<td>6M-7Y</td>
<td>Sub-national</td>
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<td>Vietnam</td>
<td>83</td>
<td>7-15Y, 7-20Y</td>
<td>Sub-national</td>
<td>1,008,690</td>
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<td><strong>Regional sub-total</strong></td>
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<td><strong>14,602,287</strong></td>
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<td><strong>Global Total</strong></td>
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WHO/IVB database as of 14 December 2008

- Benin, Cote d’Ivoire, DRC – preliminary data
- CAR and Nigeria – campaigns in December – coverage data not available
- Nicaragua – SIA conducted during ‘Vaccination Week’ MMR, Polio, Rotavirus, Pentavalent administered to complete routine immunization schedule
- Ukraine – campaign suspended
- Nepal-preliminary data – Phase 2 included 46 districts. Reports received from 40 of 46 districts as per SEAM telecon 5/2/09
- China and Papua New Guinea – data not available
- Vietnam – 2 phases - 3 provinces target age: 7-20 years; and 2 provinces target age: 7-15 years
61st World Health Assembly 2008 –GIVS Measles Mortality Reduction Goal

At the World Health Assembly the Member States reaffirmed their commitment to achieving a 90% reduction in measles mortality by 2010 compared with 2000.

The Executive Board recommended the adoption of a resolution urging Member states:

- To implement fully the strategy for reducing measles mortality in order to achieve the goal set in the Global Immunization and Vision Strategy 2006-2015 of a 90% reduction in the global measles mortality rate between 2000 and 2010;

- To enhance efforts to improve delivery of high-quality immunization services to achieve the target of equitable coverage of at least 80% in all districts by 2010 set in the Global Immunization Vision and Strategy 2006-2015;

- To further expand access to, and coverage of, available and cost-effective new life-saving vaccines of assured quality, in accordance with national priorities, for all target populations in order to accelerate the achievement of Millennium Development Goal 4; and

- To develop, strengthen and/or maintain surveillance systems for vaccine-related adverse events.

This resolution is important to sustain the strong political commitment that has been critical to gains already made since 2000 and also to strengthen commitment in the few countries where progress towards measles mortality reduction has been limited and activities need to be accelerated quickly to meet the 2010 goal.

SAGE Recommendations – Two dose measles routine immunization schedule

In November 2008, the Strategic Advisory Group of Experts (SAGE), the principal advisory group to WHO for vaccines and immunization concluded that:

- Reaching all children with two doses of measles vaccine should be the standard for all national immunization programmes

- The delivery of the second dose can be either on a continuous basis (e.g. through routine services) or given periodically (e.g. through campaigns) depending on which method achieves the higher coverage.

- Reaching every child with two doses of measles vaccine will require greater investment in systems to record and monitor administration of each dose.

- Because achievement of population immunity of greater than 93 to 95% homogenously in all geographical areas is required to prevent measles epidemics reaching and maintaining very high immunization coverage remains the basis of measles control.

- Currently 61 countries do not have a two dose routine measles immunization schedule. The measles working group is to address the question of when countries should introduce a second dose if they have not already done so.

- The WHO measles vaccine position paper (2004) should be updated to reflect new information and policy developments.
Measles Elimination Goal

With four WHO regions with a measles elimination goal, it is critical that clear indicators and criteria are set to validate that the countries and regions have eliminated measles. At the global level, a number of technical consultations with experts and partners have taken place to define the criteria for monitoring progress towards measles elimination and to achieve standardized definitions and indicators for measles elimination. A set of indicators and targets have been agreed upon, however, these criteria will be reassessed in 2009 based on country and regional experience. At the Regional level, the PAHO region, having eliminated endemic measles transmission, has taken the lead in putting together a process, protocols and criteria for countries to use in validating measles elimination. In addition, EMRO, EURO and WPRO have also started this process.

At the May Meeting of the Executive Board (EB) of the World Health Assembly (WHA) the EB accepted a request that WHO examine the feasibility of global measles elimination. The process for assessing the feasibility and appropriateness of measles eradication (global measles elimination) has started and will be completed in 2010. The programme of work will result in an interim report to the EB in 2010. In 2011, a full report on the feasibility of measles eradication will be provided to the EB. This report will be presented with a progress report of the 2010 measles mortality reduction goal along with recommendations for setting a new measles global goal. The programme of work has many facets including assessing the programmatic and biological feasibilities, assessing the economic aspects and cost effectiveness analysis, assessing the impact of measles eradication activities on health systems and carrying out a market analysis of measles containing vaccine. This programme of work was presented to the SAGE and received general support the SAGE Working group on measles.

Pakistan National Measles Campaign – Making history

Pakistan implemented the largest measles vaccination campaign in history in five phases between March 2007 and April 2008. More than 66 million children aged 9 months to 13 years received measles vaccination. Prior to the campaign there were more than 1 million cases and 20,000 deaths each year from measles and its complications. (Source – Measles Initiative)

The government of Pakistan led the process with financial and technical support from the Measles Initiative. Preparations began in 2006, with detailed planning and development of guidelines and communication strategy to ensure the campaign’s success. Along with high political commitment, support from religious leaders, community organizers, health workers and teachers contributed to a successful campaign. Challenges included shortages of skilled human resources; difficulties in planning for vaccination of nomadic and high risk populations; cold chain maintenance; and supervision and monitoring of immunization activities.

An independent evaluation of the fifth phase of the campaign showed coverage of 96%. As well as achieving high coverage with measles vaccination, the campaign has contributed to strengthening the health care system through training of health staff and provision of cold chain equipment.

More than 200,000 children received OPV along with measles vaccine in remote areas along the Pakistan-Afghanistan border. In Punjab, OPV was administered along with measles vaccination resulting in an increased vaccination of previously unimmunized children. The Global Polio Eradication Initiative field staff supported the planning and implementation of the measles vaccination campaign and disease surveillance in Pakistan.

Current challenges are to sustain high vaccination coverage through strengthening routine immunization services to reach 90% coverage in all districts, to offer a second opportunity for measles vaccination in a follow-up campaign or through routine and to introduce case based measles surveillance.
**India – A call to action**

India accounts for approximately two-thirds of global measles mortality. Of the 47 priority countries for measles mortality reduction, all except India have conducted mass immunization campaigns. India does not provide a second opportunity for measles immunization either through SIAs or routine immunization.

India has made progress in increasing routine immunization coverage to infants. In 2007, 67% of children were vaccinated against measles (Immunization summary, estimates for 2007 WHO/UNICEF). However, an estimated 8.5 million infants still do not receive measles vaccine. Ten states account for ninety percent of the estimated measles deaths. To reach the global goal of measles mortality reduction, 204 million children between 9 months and 10 years in these states need to receive measles immunization through mass immunization campaigns by 2010.

In 2007, India established and held its first meeting of the Indian Technical Advisory Group for Measles Control (ITAGM) to identify and prioritize appropriate plans for measles control. Recommendations from ITAGM were endorsed by the National Technical Advisory Group on Immunization (NTAGI) in June 2008. The NTAGI recommended that a second opportunity for measles immunization be introduced either through routine services (where coverage is >80%) or through supplementary immunization activities; however, the recommendations have not yet been implemented. NTAGI has also recommended measles catch-up campaigns for states where MCV1 coverage is less than 80%

Recently, the Measles Initiative has intensified the dialogue with the federal Ministry of Health and Family Welfare to accelerate the implementation of measles control activities, in particular in the highest burden states. The Ministry re-iterated their interest and requested assistance from the Measles Initiative partners to assist in setting up measles surveillance in four high priority states (Utter Pradesh, Bihar, Rajasthan, and Madhya Pradesh). The WHO/Government of India National Polio Surveillance Project (NPSP) has an extensive network of surveillance medical officers for polio eradication activities and is currently supporting measles surveillance in six states. The Government of India has requested NPSP to assist the governments of Bihar

**Africa: sustaining the gains remains critical**

Progress towards the measles mortality reduction goal continues in Africa. All priority countries have conducted or plan to conduct follow-up campaigns to provide the second opportunity for measles vaccination. Large countries in Africa – Nigeria, Ethiopia and Democratic Republic of the Congo conducted measles follow-up campaigns in 2008.

However, early in 2008 more than 12,000 children in Nigeria contracted measles due to a large cohort of unvaccinated children who were born after the previous campaign and had not received vaccination through routine immunization, or were missed in the catch-up campaign in 2005-06. (Source: WHO/MoH Nigeria). This demonstrates the need for regular follow-up campaigns; especially in countries where routine immunization coverage remains low. In Niger outbreaks were reported
following the measles campaign conducted in 2008 highlighting the importance of high quality campaigns. Countries must monitor the accumulation of susceptible children by carefully evaluating data on routine MCV1 coverage and SIA coverage by birth cohort and planning timely vaccination campaigns.

**Measles Mortality Reduction in Emergencies – China and India**

In emergencies, immunizing children against measles is among the most cost-effective preventive public health measures, especially for displaced populations in camps.¹

WHO/UNICEF recommend measles immunization together with vitamin A supplementation during and after emergencies. The primary reason for high measles morbidity and mortality during complex emergencies is that many children are not immunized against measles. Many measles deaths can be prevented by implementing immunization campaigns quickly.

In November, the Measles Initiative supported the government of the People’s Republic of China in providing measles vaccines to more than 7.3 million children, implementing additional measles control activities and strengthening the delivery of routine immunization services in Chongqing, Gansu, Shaanxi and Sichuan provinces which were severely impacted by an 8.0 magnitude earthquake. The Measles Initiative support helped to repair immunization facilities and the cold chain; conduct trainings, strengthen school-age vaccinations, expand outreach to unimmunized children and conduct disease surveillance and outbreak investigations. A vaccination campaign was implemented in Chongqing province, where there was a high incidence of measles, to protect the children of Chongqing and minimize the risk of introducing measles in Sichuan province, hardest hit by the earthquake. Shaanxi and Sichuan provinces had already completed vaccination campaigns in 2007-2008 which prevented outbreaks following the disaster.

In September 2008 floods affected almost 2.7 million people in northern India, forcing many to leave their homes and live in temporary shelters in camps. The government of Bihar organized mass immunization campaigns in displaced camps. WHO and UNICEF supported an integrated campaign to vaccinate 112,000 children against measles and polio and provide vitamin A supplementation. Building on this experience, UNICEF initiated discussion with the state of Bihar to expand the measles control activities to the entire state and supported the government in drafting a plan of action and developing a budget for the vaccination of all children in the state between 9 months and 10 years.

**Measles outbreaks**

*Europe*

From November 2006 to April 2008, an outbreak of measles cases spread across Switzerland totalling 2,250 cases; mostly affecting school aged populations (5-14 years) with 98% of cases unvaccinated or only partly vaccinated.² The outbreak extended to neighbouring European countries and to the United States, among populations with low vaccination coverage.

The response by national and local public health authorities in Switzerland, Austria, Germany and Norway included immunization of unvaccinated children in affected schools, day care centres and other institutions. To minimize the risk of transmission and further international spread, especially during the European Football Championships, hosted in Austria and Switzerland in June 2008, national public health authorities issued a recommendation for any person visiting these countries to check their measles vaccination status and if needed, be vaccinated against measles.

¹ WHO/UNICEF Joint Statement – Reducing Measles Mortality in Emergencies
In the Region of the Americas, there have been sporadic importations of measles since the disease was declared eliminated in 2002 (See Figure 3 below). The country most affected by measles in the Americas has been the United States because of the high volume of international visitors. From January to July 2008, 131 measles cases were reported, more cases than had been reported since 1996.\(^1\) Of the 131 cases, 13% were imported from other countries particularly European countries, and also from China, Pakistan, and the Philippines. Ninety one percent of the (123) resident cases were unvaccinated or had unknown vaccination status. The importation associated cases occurred in school age children whose parents chose not to have them vaccinated. The outbreaks demonstrate that measles remains a risk for unvaccinated persons and those who come in contact with them.

**Figure 3: Measles virus importations**

*Measles Elimination, The Americas, 2001-2008*

<table>
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<th>Genotype</th>
<th>2001</th>
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Source: Country reports to FCH/IM, Global Measles Laboratory.
* Provisional data as of 27 March 2008.
** Canada cases from 2007 (D4 genotype) linked to a case or transmission chain where the source of index case is unknown.

\(^1\) MMWR Weekly, August 22, 2008/57(33):893-896
### 3.1 Social Mobilization by Volunteers: Part of the Success Story

Social mobilization involves activities to reach and involve all relevant sectors of society from the national to the community level, to create an enabling environment and effect positive behaviour and social change. Engaging the community and increasing awareness about vaccination and health issues is essential to achieving high vaccination coverage.

Country-level social mobilization efforts have increased community demand for measles vaccination and other health interventions. Community level social mobilization efforts ensure that all eligible members of the target population are involved, including the highest risk groups. This has resulted in improved service utilization by the target population, including the most vulnerable and hard to reach children.

**The Church of Jesus Christ Of Latter-Day Saints (since 2003)**

**No. of Volunteers:** approx. 11,500 in 2007 and 1,100 in 2008

**Countries where participated:**
- **2007:** Armenia, Bolivia, DR Congo, Guatemala, Haiti, Lesotho, Madagascar, Mongolia, Philippines, Togo, & Zambia
- **2008:** Benin, Côte d’Ivoire, Egypt, Malawi, Mozambique, Papua New Guinea

**Activities:** Social mobilization (training, community outreach) assistance at vaccination sites (vaccination, record keeping and, crowd control)

**Overall Challenges:** Improvements in social mobilization, training and expanding partnerships with other faith based organizations

**International Red Cross & Red Crescent Societies (since 2001)**

**No. of Volunteers:** approximately 20,000 in 2007 and 15,000 in 2008

**Countries where participated:**
- **2007:** Cameroon, Congo, DPRK, Ethiopia, Gabon, Gambia, Indonesia, Lesotho, Madagascar, Mali, Myanmar, and Pakistan
- **2008:** Benin, Cameroon (emergency), Central Africa Republic, Cote d'Ivoire, Georgia, Lebanon, Malawi, Morocco, Mozambique, Nepal, Nigeria, Pakistan, Tanzania

**Activities:** Social mobilization, community education, registration and crowd control

**Overall Challenges:** Strong integrated planning with partners, monitoring and evaluation of volunteer impact

UNICEF, American Red Cross, LDS and other NGOs play an important role in working with communities to increase awareness, provide key messages, identify the most vulnerable, and dispel myths. During the campaign, they bring eligible children for vaccination and assist with logistics and site management. They are also involved in monitoring and evaluation and surveillance activities. Volunteers have additional roles and are even more critical to the success of campaigns when other child survival interventions are integrated, (Summary of LDS and IFRC activities above).
Hope in Ghana

Today Ghana rarely sees a child with measles, but not that long ago it was a major killer of children. In contrast, in 1985, an outbreak triggered more than 64,000 cases of the disease. The country was in desperate need of widespread immunization against measles; but launching a successful vaccination campaign requires hundreds of helping hands and tremendous coordination.

In 2001, in partnership with the Measles Initiative, the country implemented a pilot campaign. It was so successful that it was expanded nationwide and in 2002, the Ghana Red Cross mobilized 14,350 volunteers to help with the program. The volunteers went house to house and educated families, pre-registered children, assisted at vaccination sites and helped with post campaign evaluation.

In 2006, with the help of the Ghana Red Cross, a follow up campaign vaccinated 4 million children against the disease, and today measles is no longer killing thousands of Ghanaian children.

“This series of vaccination campaigns that were held in 2001, 2002, and 2006, with the help of the Measles Initiative really helped bring down the measles cases and deaths in Ghana” says Theresa Nobiya of the Ghana Red Cross Society.

But the success in Ghana and other countries in Africa remain fragile. While this generation of children is protected, without resources to continue vaccinations, the disease could once again threaten future generations.
3.2 Strengthening routine immunization

**Highest routine coverage to date, and SIAs continue**

Reaching the goal of sustainable measles mortality reduction by 2010 is dependent on strong routine immunization programmes. One goal of the WHO/UNICEF GIVS and measles mortality reduction strategy is to achieve and maintain greater than 90% coverage of the first dose of measles containing vaccine by 9-12 months of age in every district delivered through routine services. Global routine measles vaccination coverage continues to increase; reaching 82% in 2007; a significant increase from 72% in 2000 (Figure 4).

**Figure 4: First Dose Measles Coverage in 47 Priority Countries**

Coverage has increased in all regions, but there is great variation among countries and still much work to be done with 40% of countries with estimated national coverage below 90%. Two thirds of the unvaccinated children reside in 8 countries with India, Nigeria, China and Ethiopia each having more than 1 million infants who did not receive their first dose of vaccine through routine immunization before their first birthday. (Figure 5)
Strengthening health systems

Measles campaigns support the strengthening of health systems through micro-planning, training of health workers, reinforcement of the cold chain, improvement of the waste management system, increased injection safety standards, strengthening disease surveillance systems and promoting the use of surveillance data for program management.

Micro-planning determines population access to immunization services, and develops strategies on how to reach the hard to reach population. Micro-planning is one of the key elements of the reaching every district (RED) approach, and is thoroughly reviewed while planning for campaigns. Measles campaigns present an opportunity for district level capacity building, primarily through training and support in micro-planning. The focus is on increasing immunization coverage, especially in the underserved and hard-to-reach target groups. Measles campaign micro-planning is often used as the basis for micro-planning for routine services, thus strengthening health systems and improving access to vaccination services.

Poorly functioning cold chain systems are a major constraint in many countries. Measles campaigns provide the opportunity to improve the cold chain: expansion, replacement and repair of cold chain equipment. In Pakistan, 20,000 vaccine carriers, 90,000 ice packs, 400 cold boxes, 1,000 ice lined refrigerators and 500 freezers procured prior to the measles vaccination campaign will be utilized by the health system.

Furthermore, the waste management system is reviewed during campaign planning and improvements made to accommodate the waste produced during the campaign. In Togo, 32 incinerators were repaired prior to the measles campaign which will improve overall waste management in those health facilities.
3.3 Building Stronger Measles Surveillance Systems & Laboratory Network

Measles Surveillance Systems and Laboratory Network

Effective surveillance for measles entails establishing case based surveillance that includes investigation and laboratory testing of samples from all suspected cases. By 2007, 173 (90%) of 193 member states had implemented case based surveillance compared with 120 countries in 2004. (Data are not available prior to 2004)

Globally, the number of reported cases of measles declined from 852,937 in 2000 to 279,006 in 2007, a 67% decrease. All regions showed a decrease in reported cases of measles; the highest percentage reduction occurred in the Region of the Americas (93%) and the African Region (85%); the smallest decrease occurred in the South-East Asia Region (12%).

As an indicator of the sensitivity of measles surveillance systems, the WHO established a minimal reporting rate of two non-measles febrile rash illness per 100,000 population nationally. Among the 159 countries doing case-based surveillance and reporting sufficient data to calculate this indicator, 56 countries (35%) met this sensitivity target.

Laboratory Network

The measles and rubella laboratory network (LabNet) consists of 679 laboratories serving 164 countries (Figure 6). The primary focus of these laboratories is to confirm measles and rubella cases by identifying the presence of measles virus-specific or rubella virus-specific immunoglobulin M (IgM) antibodies. Many also test for polio and yellow fever.

Figure 6: Global Vaccine Preventable Diseases Laboratory Network
In 2007, almost 250,000 serum samples were tested globally for measles IgM, an increase of 44% from 2006. Approximately 80% of the 250,000 samples were also tested for rubella, resulting in an estimated 400,000 measles and rubella assays being tested in the LabNet for 2007. (Figure 7) Timeliness and quality of the testing is high with more than 80% of laboratories reporting at least 80% of their results within 7 days. Of the 164 laboratories that received the global annual proficiency-testing panel in 2007, 98.8% passed the measles component and 97% passed the rubella component. Most of the remaining sub-national laboratories participated in national proficiency testing programmes with a similar high level of performance.

**Figure 7: LabNet Workload: Measles Serology Samples Tested in 2007**

![Diagram showing LabNet workload for measles serology samples tested in 2007.](image)

**Alternative sampling techniques**

A comprehensive summary of the use of dried blood and oral fluid samples for measles and rubella surveillance was reported in a joint WER and MMWR article in June 2008. This article showed that alternative sampling techniques may enhance surveillance through easier and non invasive collection methods and considerably reduce shipping costs as reverse cold chain is not essential. The use of oral fluid samples provides a much greater opportunity for collecting measles virus sequence information. The period is extended from within 5 days after rash onset for conventional virus culture, to 2-3 weeks post onset for molecular detection from oral fluid samples.

**Tracking measles viruses**

The tracking of virus globally can help determine whether outbreaks are caused by endemic or imported virus strains and can monitor progress of measles control goals (See figure 8). There has been a marked increase in the collection of measles molecular epidemiological data since 2003 as more laboratories develop capacity for molecular techniques and the programmatic value in tracking viruses has been recognized. In 2006 a WHO genotype database was established to track measles viruses detected by the LabNet. By November 2008, genotype information from 3425 measles viruses had been submitted to the database comprising 18 of the 23 genotypes from 77 countries. Surveillance gaps in molecular surveillance still occur, but these are gradually being filled.
Training

In 2007-08 training workshops were held in 5 WHO regions to meet the need of labs experiencing staff turnover. Since 2007, training workshops have also involved strengthening the capacity of laboratories for virus detection. Workshops in the Americas, South East Asian, African and Eastern Mediterranean regions were held to provide skills for virus detection and sequencing. The workshop held in the Eastern Mediterranean region in 2007 provided the impetus for 13 countries to gather measles genotype data from outbreaks in the 12 month period following completion of the workshop. In 2006 only 6 countries were able to provide this data.

3.4 Integration of other child survival interventions

Integrated Campaigns: Enhancing Child Survival

Nearly ten million children under the age of five die each year. From one month to five years of age the main causes of death include measles, malaria, pneumonia, diarrhea and HIV. Malnutrition is an underlying cause of about half of child deaths. Measles vaccination campaigns provide an effective platform for reaching more children, including the hard to reach and poorest of the poor, with proven interventions including insecticide treated nets (ITN) distribution, vitamin A supplementation and de-worming treatment. Integration of critical health interventions is one of the four strategic areas of the Global Immunization and Vision Strategy.

The integration of multiple interventions with measles campaigns is now common practice in Africa and beyond, as evaluations have provided evidence of success. Studies from Ghana (2002), Zambia (2003), Togo (2004), Madagascar (2007), and other analyses concluded that integrated campaign packages of high-impact interventions helped save lives and demonstrated that formidable logistic challenges could be addressed with adequate planning.

Based on this evidence additional funding has been made available through partners such as the Global Fund for AIDS, TB and malaria for ITNs. Vitamin A supplementation is the most frequently added intervention, and deworming medication is increasingly added to campaigns. Although these interventions are not as visible as ITNs, they provide significant benefits to child health and development. Parents and caregivers appreciate the opportunity to receive multiple interventions, particularly in areas with limited health services.

**Promoting Greater Health Equity**

The GIVS promotes equal access to immunization for every child, adolescent and adult. Immunization campaigns reach more children, across all wealth quintiles, thereby addressing health inequities. Campaigns reach children that are repeatedly missed by routine services, as health systems fail to fully address the equity challenges.

Mass, free distribution of ITNs during measles vaccination campaigns achieves immediate, high and equitable coverage for both ITNs and measles vaccine. Maintaining high coverage over time requires ongoing availability of new nets. Country experience has shown that high equity achieved via campaigns can be maintained with the transition to routine service delivery including periodic outreach services to hard to reach populations.

In 2008, the Measles Initiative with other partners has supported the distribution of more than 5.6 million ITNs for malaria prevention, 30 million doses of de-worming medicine, and more than 35 million doses of vitamin A. This is a remarkable achievement considering the logistics involved in planning and implementing integrated campaigns.
Building Strong Partnerships

Integrated measles campaigns bring together partners at international, national and sub-national levels. Creating strong partnerships at the country level is essential. Effective working relationships between government agencies responsible for immunizations and other disease control programs as well as non-government organizations is critical for success. Partnerships have important roles in campaign evaluation efforts and future child survival activities.
Partnerships and Integrated Health Campaigns

**Côte d'Ivoire**

In November 2008 the government of Côte d'Ivoire, in collaboration with international partners, launched a national integrated campaign to vaccinate more than 3 million children. All children aged 9 to 59 months were targeted to receive measles vaccination, vitamin A supplementation and deworming medicine. In addition, 779,285 insecticide treated nets were distributed in 18 districts of the country.

Measles is now well controlled; since the measles catch-up campaign in 2005 few measles cases have been reported. However, it is estimated that only 67% of children receive routine measles vaccination before their first birthday (2007), resulting in a large cohort of unvaccinated infants susceptible to measles. Hence mass vaccination is needed to protect children from measles.

Malaria is a major childhood killer, yet a survey found that only 3% of children under the age of 5 years slept under an ITN (MICS 2005). The government of Côte d’ Ivoire used this opportunity to distribute nets alongside measles vaccination.

The integrated delivery of four interventions was perceived as a success by the Ivorian population. The ITNs attracted caregivers to the immunization posts and contributed to attaining high coverage with measles vaccination even when there are few measles cases seen.

The EPI programme led the campaign planning, implementation and evaluation. The national Nutrition program and the National Malaria Control programme benefitted from the experience of the EPI programme to improve coverage.

Funding was made available through the Measles Initiative, the Global Fund to fight AIDS, TB and Malaria and UNF for additional funds for ITN distribution.

**Nepal**

The Government of Nepal successfully implemented a two phase national integrated campaign targeting 3.9 million children between 9 months and 5 years of age to receive measles vaccination and all children less than 5 years of age to receive oral polio vaccine.

The government of Nepal reported six cases of poliomyelitis in 2008. Nepal remains at risk for importation of wild poliovirus from India. Oral polio vaccine was added to both phases of the measles campaign, providing an important opportunity to protect Nepali children against this disease.

Female Community Health Volunteers are the backbone of the Nepali health system, linking the health services with the community. These volunteers are trained in basic health care and refer children to health services as appropriate. They are trusted members of the community and know the local children. During the measles campaign, they mobilized the population for measles immunization and ensured that children were vaccinated.

Health workers were trained prior to the measles campaign, and additional cold chain equipment was secured. Operational research was carried out in two districts during the campaign with re-use prevention (RUP) syringes.

External monitors present during the campaign reported good injection practice and documentation and noted the valuable contribution of female health volunteers and Red Cross volunteers. Current challenges are to strengthen routine immunization and case based measles surveillance.

The government of Nepal led this campaign with technical financial support from the Measles Initiative.
3.5 Promoting Injection Safety and AEFI Surveillance

Measles vaccination campaigns pose particular safety challenges due to their objective of immunizing large populations over a short period of time and often being conducted outside the normal healthcare setting. Two important challenges are injection safety, and appropriate management of adverse events following immunization (AEFI).

Improving Injection Safety

WHO and UNICEF recommend the use of autodisable (AD) syringes for all immunizations to prevent the risk of spreading bloodborne diseases through reuse of needles and syringes. In all Measles Initiative supported campaigns AD syringes are used for vaccination and safety boxes for safe disposal. However, reconstitution syringes are sometimes reused. One of the three WHO pre-qualified Re-Use Prevention (RUP) syringes was evaluated in two districts of Nepal during the 2008 measles follow up campaign. The RUP syringe improved injection safety, was easy to use and was well received by managers and vaccinators. UNICEF and WHO now recommend use of RUP reconstitution syringes. UNICEF supply division will gradually phase out the conventional disposable syringe and replace those with RUP syringes for reconstitution to improve safety.

Measles campaigns provide the opportunity to provide training in use of AD syringes and injection safety, improving knowledge of health staff and promoting best practices for campaign and routine immunizations. The recent evaluation of RUP syringes in Nepal is just one example of promoting best practice.

Strengthening AEFI Surveillance through Campaigns

Prevention and management of AEFI is an important part of injection safety during measles campaigns. An AEFI is any adverse event that follows immunization that is believed to be caused by the immunization. In 2008, all countries reported implementing AEFI surveillance during measles campaigns.

Adverse event monitoring is essential to prevent and properly manage AEFI. Measles campaigns provide the opportunity to review current practice and establish a surveillance system for adverse events or to strengthen an existing system and to increase awareness about vaccine safety. Countries that do not have a national functioning AEFI surveillance system have used campaigns to introduce AEFI surveillance activities, which then are extended to the routine immunization system.
4. Working in Partnership: The Key to Continued Success

The Measles Initiative comprises five core partners: the American Red Cross, UNICEF, UNF, the CDC, and the WHO. The Initiative provides technical and financial support to governments and communities for measles vaccination campaigns, routine immunization, and surveillance. The Initiative also strengthens political and social commitment, and communicates the positive impact and success of measles mortality reduction activities. The partners work closely with the countries and local communities and are coordinated at the national level through the Inter-agency Coordinating Committee (ICC).

The remarkable progress towards reducing measles deaths is the result of the hard work and commitment of national governments and all partners working to reduce measles mortality. Current partners will need to continue to work together while developing new associations to secure the necessary support and financial resources to further reduce global measles deaths.

The success of the Measles Initiative in supporting countries to reduce measles mortality is dependent on strong partnerships. Additional partners include: Becton, Dickinson and Company; the Bill and Melinda Gates Foundation; the Canadian International Development Agency (CIDA); the Church of Jesus Christ of Latter-day Saints; the GAVI Alliance; Global Payments, Inc.; International Federation of Red Cross and Red Crescent Societies; the Izumi Foundation; the Japanese Agency for Development Cooperation (JICA); the Kessler Family Foundation; Merck Co.; Herman and Katherine Peters Foundation, the Vodafone Foundation; and countries and governments affected by measles.

WHO plays a leading role in strategy development, consensus building and partner coordination. It provides technical leadership and strategic planning for the management and coordination of global measles control activities and is responsible for ensuring that all components of the WHO/UNICEF strategy are technically sound and successfully implemented.

UNICEF uses its logistical and procurement capacity to support purchasing as well as delivery of syringes, vaccine and other commodities to vaccination sites. The agency also supports program implementation by providing cold-chain logistics and maintenance and social mobilization.

CDC provides technical assistance for epidemiological and laboratory surveillance. The agency also provides funds for purchasing bundled measles vaccine and supporting safe immunization practices.

The American Red Cross leads the global partnership coordination with UNF, provides funding and communication support, and works with national Red Cross/Red Crescent Societies to mobilize parents and caretakers to immunize their children during campaigns and through routine immunization.

The UNF manages the funds of the Measles Initiative through an agreement with the United Nations. Under this agreement, the UNF manages and coordinates proposals for donor and implementing partners; provides matching funds for other donor funds, and disburses and accounts for these funds through the UN financial system, and provides communication and fundraising resources.
5. Looking Forward… Can we reach the 2010 goal?

Significant progress has been made towards achieving the 2010 goal for measles mortality reduction. The Eastern Mediterranean region reached the goal of 90% measles mortality reduction in 2007 and measles related deaths have decreased by 89% in the African region between 2000 and 2007. Large scale measles campaigns and strengthening of routine immunization services has protected children and saved lives. However major challenges remain and must be addressed to reach the goal of reducing global measles deaths by 90 percent in the period 2000-2010. With just two years to 2010, more than 500 children still die from measles each day.

Recent estimates demonstrate that it is possible to reach the 2010 measles mortality reduction goal. Figure 10 shows three possible scenarios. In the ‘status quo’ scenario, with routine immunization coverage remaining constant and no SIAs, measles deaths would increase rapidly and the remarkable gains made through intensification of measles mortality reduction activities since 2000 would be lost. Improving routine immunization and implementing follow up campaigns in countries that have already started accelerated measles activities (all countries except India) would result in modest mortality reductions each year, but would not achieve a 90% reduction in deaths.

![Figure 10: Estimated measles deaths projections](image)

**What will it take to achieve the goal?**

- Accelerated activities, both SIAs and further efforts to improve MCV1 coverage need to be successfully implemented in India since it is the greatest contributor to the global burden of measles.
- Sustaining the gains in reduced measles deaths, especially in Africa, by strengthening immunization programs to ensure that more than 90% of infants are vaccinated against measles through routine health services before their first birthday as well as conducting timely, high quality follow up campaigns.
- Securing sufficient funding for measles-control activities both globally and nationally. The Measles Initiative faces a funding shortfall of US $176 million dollars for 2009-2010. Implementation of timely follow up campaigns is increasingly dependent upon countries...
funding these activities locally. The decrease in donor funds available at global level to support activities to reduce measles mortality makes increased political commitment and country ownership of the activities critical for achieving and sustaining the goal of reducing measles mortality by 90%.

It is possible to reach the 2010 goal of 90% reduction in measles mortality compared to 2000 levels. The measles mortality reduction strategy has resulted in a 74% reduction in measles deaths between 2000 and 2007. The remaining challenges to reach the 90% reduction goal have been identified. There are proven strategies to address the technical challenges and an urgent need to secure funds to protect these remarkable gains.

“Progress also depends on addressing the considerable funding gap: The shortfall stands at US $176 million for 2009-2010, of which US $35 million is urgently needed for 2009. With continued funding and increasing ownership and commitment of the countries, we can sustain our progress and achieve our goal by 2010. We ask our supporters to stay with us and strongly encourage new supporters to join us in our efforts to save lives.”

Kathy Calvin, Executive Vice President and Chief Operating Officer for the UN Foundation as quoted in news release “Global measles deaths drop by 74%”, 4 December 2008

1 Urgent funding needed to reach the 2010 measles goal (http://www.measlesinitiative.org/docs/mi-funding-statement.pdf)
Annex 1: Measles Mortality Reduction Goals and WHO/UNICEF Strategy

In 2003, the World Health Assembly (WHA) adopted a resolution to halve the number of deaths due to measles by the end of 2005, compared with 1999 estimates. This goal was surpassed with a 60% reduction in measles mortality, and new goals have been set.

**Goal for 2010**

A goal of 90% reduction in measles mortality by 2010 compared with 2000 was established as part of the WHO/UNICEF Global Immunization Vision and Strategy (GIVS), 2006-2015. At the WHA in 2008, all Member States reaffirmed their commitment to achieving this goal.

**Goal for 2015**

In September 2000, the UN Millennium Summit set a goal to reduce the under-five mortality rate by two-thirds, between 1990 and 2015 (Millennium Development Goal 4). Routine measles vaccination coverage is used as an indicator. Measles mortality reduction is an important milestone towards achieving this goal.

**WHO/UNICEF comprehensive strategy**

In 2003, the WHA endorsed the WHO/UNICEF comprehensive strategy to reduce measles deaths. Measles has already been eliminated from the WHO Region of the Americas. Three other WHO regions: Europe, the Western Pacific and the Eastern Mediterranean, have set regional measles elimination goals (Figure 1). The joint WHO/UNICEF Global Plan for Reducing Measles Mortality Reduction 2006-2010 focuses the implementation of the comprehensive strategy on countries with high measles burden.

**Figure 1: Global and Regional Measles Control Goals**

Americas, Europe, E. Mediterranean, W. Pacific have elimination goals

Africa and SE Asia have mortality reduction goals
The strategies to achieve the goals include:

1. achieving and maintaining high coverage (>90%) with the first dose of measles vaccine by 9-12 months of age in every district delivered through routine services;

2. ensuring that all children receive a second opportunity for measles immunization (through periodic supplementary immunization activities [SIAs] or routine services);

3. implementing effective laboratory-supported disease surveillance; and

4. providing appropriate clinical management of measles cases, including Vitamin A supplementation.

Experience from America, Africa and the Eastern Mediterranean regions indicate that achieving 90 percent global measles reduction and reaching the 2010 GIVS goal are possible with successful implementation of these strategies.

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1 SIAs are generally carried out in two approaches. An initial, nationwide catch-up SIA targets all children aged 9 months–14 years; it has the goal of eliminating susceptibility to measles in the general population. Periodic follow-up SIAs then target all children born since the last SIA. Follow-up SIAs are generally conducted nationwide every 2–4 years and target children aged 9–59 months; their goal is to eliminate any measles susceptibility that has developed in recent birth cohorts and to protect children who did not respond to the first measles vaccination.
### Annex 2: Table of Measles, Rubella and Mumps Bundled Vaccine Supplies for SIAs, 2008: Supplies Procured through UNICEF Supply Division

<table>
<thead>
<tr>
<th>#</th>
<th>Country</th>
<th>Vaccine</th>
<th>Quantity (ds)</th>
<th>Cost of vaccines</th>
<th>Cost of AD Syringes</th>
<th>Cost of Reconstitution Syringes</th>
<th>Cost of Safety Boxes</th>
<th>Total Cost</th>
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2) Originally Scheduled for 2007, delayed to 2008
3) Procured through Government Funds
### Overview of Key Statistics, 2000-2008

- **Between 2000 and 2007, global measles mortality in all ages was reduced by 74%,** from an estimated 757,000 deaths in 2000 to an estimated 197,000 deaths in 2007.

- **Estimated deaths from measles by WHO region in 2007:**
  - Southeast Asia: 136,000
  - Africa: 45,000
  - Eastern Mediterranean: 10,000
  - Western Pacific: 7,000
  - Americas and Europe: <1,000

- The largest percent reduction during this time period (2000-2007) was in the Eastern Mediterranean and African regions (where measles mortality decreased by 90% and 89% respectively); followed by Western Pacific region (73% reduction) and the South East Asia region (42% reduction). In the Americas region, measles has not been endemic since 2002.

- From 2000 to 2007, approximately 3.6 million deaths were averted as a result of accelerated activities (increases in routine coverage and implementation of measles vaccination campaigns), at an estimated donor cost of $184 USD/death averted.

- Since 2001, the Measles Initiative has supported the vaccination of more than 600 million children, mostly in Africa and Asia.

- Of the 6 countries conducting vaccination campaigns in 2008, 22 (85%) countries integrated the measles campaigns with at least one other child survival intervention – such as an insecticide-treated bed net, de-worming medicine, vitamin A, or polio vaccine.

- Between 2000 and 2007, global routine immunization coverage increased from 72% to 82%. Coverage varied significantly across geographical regions. In the Africa region, routine coverage rose from 56% to 74%; in the South East Asia region, from 61% to 73%; in the Eastern Mediterranean region, from 73% to 84%, and in the Western Pacific region from 86% to 92%.

- In 2007, more than 23 million one-year old children did not receive a dose of measles vaccine through routine immunization services. An estimated 15.2 million of these children reside in eight populous countries – India (8.5 million), Nigeria (2 million), China (1.0 million), Ethiopia (1.0 million), Indonesia (0.9 million), Pakistan (0.8 million), Democratic Republic of Congo (0.6 million) and Bangladesh (0.5 million).

An estimated 540 children die from measles each day, 90% of these children are less than 5 years of age.

Source: Adapted from Key Statistics, The Measles Initiative, [http://www.measlesinitiative.org](http://www.measlesinitiative.org)