

WHO/UNICEF Joint Annual Measles Report 2010

Strengthening Immunization Services through Measles Control



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Abbreviations and Acronyms

AFR	African Region
AMR	Region of the Americas
ARC	American Red Cross
Catch-up	One-time vaccination campaign generally targeting children 9 M to 15 Y
CDC	US Centers for Disease Control and Prevention
EMR	Eastern Mediterranean Region
EPI	Expanded Programme on Immunization
EUR	European Region
Follow-up	Periodic vaccination campaign generally targeting children 9 M to 3-5 Y
GAVI	Global Alliance for Vaccines and Immunisation
GIVS	Global Immunization Vision and Strategy
IFRC	International Federation of Red Cross and Red Crescent Societies
IgM	Measles-specific immunoglobulin M
IVB	Department of Immunization, Vaccines and Biologicals, WHO
MCV	Measles containing vaccine
MDG	Millennium Development Goal
OPV	Oral polio vaccine
SEAR	South-East Asian Region
SIA	Supplemental immunization activity
UNICEF	United Nations Children's Fund
UNF	United Nations Foundation
VPD	Vaccine-preventable disease
WHO	World Health Organization
WPR	Western Pacific Region

Executive Summary

The Measles Initiative continued to achieve major progress in the fight against measles: over 942 million children have been vaccinated since its inception, and 186 million in 2010 alone. India started the introduction of the 2nd measles dose, and China conducted the largest public health intervention ever, vaccinating over 102 million children, besides millions of children reached in the countries in the African, Eastern Mediterranean, South Asian and Western Pacific regions.

Increased measles vaccination has reduced overall under-five mortality by 23% between 1990 and 2008. Hence, the reduction in measles related mortality contributed significantly to progress on Millennium Development Goal 4 (MDG4); reducing deaths among children under-five by two thirds between 1990 and 2015. All countries that fully implemented the recommended measles control strategy achieved 90% measles mortality reduction since 2000.

However, the year 2010 was also a challenging year for the Measles Initiative: measles outbreaks in Africa reported over 200,000 cases and 1,400 deaths. Due to under-reporting, the true number of measles cases and deaths is estimated to be 10-20 fold higher. The underlying cause of the outbreaks is insufficient vaccination during routine immunization and campaigns, and escaped natural infection due to low transmission in recent years. The outbreaks in Africa together with the continued high numbers of measles deaths occurring in India threaten the contribution of measles mortality reduction to achievement of Millennium Development Goal #4.

In addition, there is insufficient political commitment to conduct high quality measles campaigns in several critical countries, as well as insufficient financial support to reach underserved communities.

To address the challenge of reduced quality campaigns, the Measles Initiative initiated a best practice campaign in Ethiopia, to learn which activities are critical to conduct high quality campaigns and what SIA activities can be catalysts to improving routine immunization.

The Measles Initiative engaged increasingly in advocacy activities with political leaders, with support of the Task Force for Global Health, Lions Club International and The Sabin Vaccine Institute. This comes in addition to interpersonal communication activities by volunteers and community health workers, supported from National Red Cross Red Crescent Societies, Lions Club members, and the Church of Jesus Christ of Latter-Day Saints volunteers, among other NGOs.

Routine immunization plateaued in the last two years at 82%. Routine immunization missed 23.7 million infants in 2009, and most deprived infants are more likely having missed their routine immunization. Good quality campaigns are conducted to reach the underserved populations. In addition, measles activities strengthen routine immunization systems through capacity building and Measles Initiative partners leveraged resources for routine immunization.

Measles campaigns continue to provide a platform for delivery of other child interventions. In 2010, more than 32 million doses of vitamin A, 19 million doses of de-worming medicine, and 9 million doses of polio vaccine were distributed during measles campaigns. These integrated measles activities contribute even more significantly to child mortality reduction and to the achievement of Millennium Development Goal (MDG) 4 by 2015.

The measles and Rubella Laboratory Network increased its capacity. By January 2011, genotype information from 5758 measles viruses has been submitted, comprising all 24 genotypes from 131 countries. In 2010, 1086 measles viruses representing 11 different genotypes were identified from 59 countries, enabling tracking of virus spread.

In May 2010, the WHA endorsed the following measles control targets for 2015 as milestones towards measles eradication:

- increasing measles immunization coverage to >90% nationally and >80% in every district;
- reporting an incidence of <5 cases/1 000 000 population; and
- reducing measles mortality by 95% compared with 2000 levels.

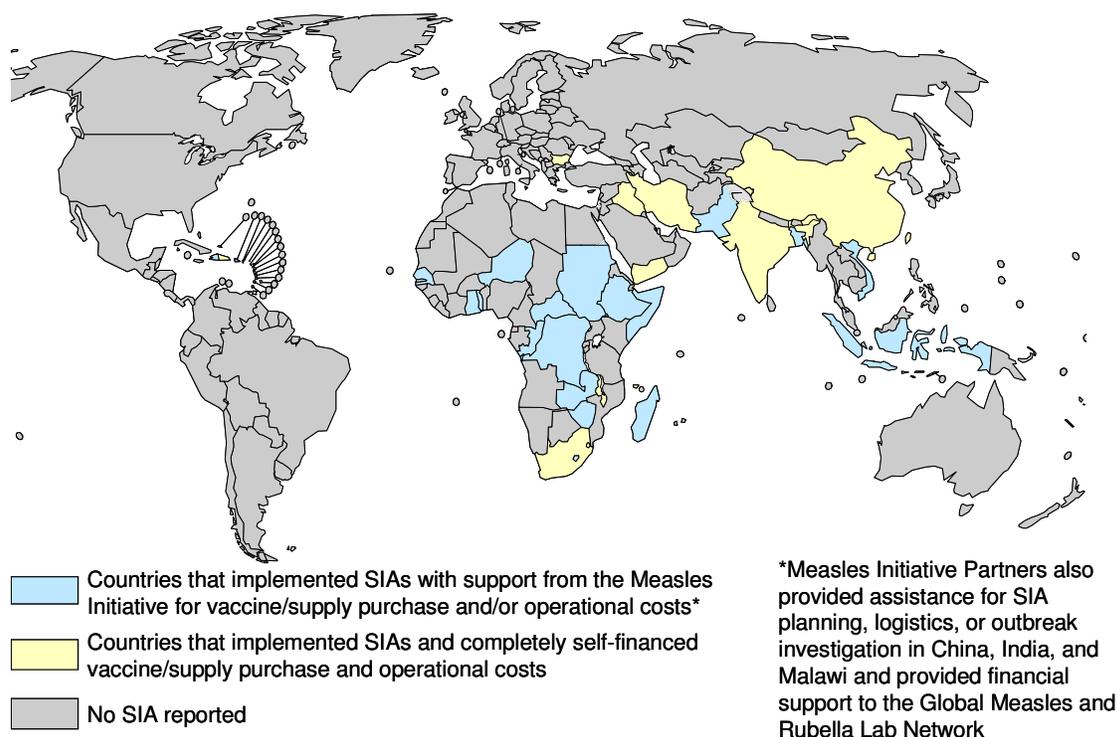
The SAGE concluded “that measles can and should be eradicated. A goal for measles eradication should be established with a proposed target date based on measurable progress made towards existing

goals and targets. The eradication of measles represents unique disease control and developmental opportunities, and should be carried out in the context of strengthening routine immunization programmes.”

Three priorities to be addressed in 2011:

1. **Reduce the risk of a global measles resurgence by mobilizing sufficient funding and political commitment.** If the funding gap for 2011 of \$59 million is not resolved, some countries may be forced to restrict measles SIAs to smaller target population or delay the campaigns altogether. This will place children from poorest communities at risk of outbreaks and increases the risk of importation for all countries worldwide.
2. **India:** Continue and expand the catch-up vaccination campaign in high burden states and introduction of a routine second dose of measles vaccine (MCV2) in all other states in India, as the last country to introduce the 2nd dose of measles vaccination nationwide. SIAs must be completed in 14 states and MCV2 in the remaining 17 states.
3. **Strengthen routine immunization:** 49 countries reached less than 80% of their infants with the first dose of measles vaccine and need to continue to improve the immunization system. 57 countries have not yet introduced a second routine dose of measles vaccine. 17 countries are currently eligible to introduce a second routine dose in 2011. High coverage of two doses of measles vaccination is the ultimate goal to control measles.

Figure 1: 31 countries reported implementing an SIA in 2010. Of these, 18 received support from the Measles Initiative for bundled vaccine and supply purchase and/or operational costs; 3 additional countries* were assisted by Partners for SIA planning, logistics and monitoring or outbreak investigation



1. Introduction

Increased measles vaccination has reduced overall under-five mortality by 23% between 1990 and 2008 (M Vandenen et al, 2011, JID in press). Hence, the reduction in measles related mortality contributed significantly to progress on Millennium Development Goal 4 (MDG4); reducing deaths among children under-five by two thirds between 1990 and 2015. Measles is one of the most contagious human diseases. In 1980, before widespread use of measles vaccination, an estimated 2.6 million deaths were caused by measles. Measles continues to put children at risk of severe health complications (such as encephalitis, pneumonia and blindness) and deaths, especially in the world's poorest communities.

The Measles Initiative, launched in 2001, has been the driving force behind efforts to accelerate measles mortality reduction worldwide to date. Formed by the American Red Cross, UNICEF, the United Nations Foundation, the U.S. Centers for Disease Control and Prevention, and the World Health Organization, the Measles Initiative provides technical and financial support to governments and communities for measles activities.

The technical and financial resources provided by the Measles Initiative partners have been particularly pivotal in the 47 priority countries that had the highest burden of measles in 2000. The Initiative secures the financial resources required to implement activities through joint resource mobilization efforts. In 2010, the Initiative provided more than US\$ 50 million for measles campaigns and surveillance in 21 countries. Since its inception, over US\$ 780m million has been devoted to measles control through the Initiative.

The 2010 Annual Report outlines the activities that have been implemented during the period January to December 2010 with the support of the Measles Initiative in the context of overall progress towards the 2010 global goal to reduce measles mortality by 90% between 2000 and 2010.

2. Progress towards measles mortality reduction challenged by resurgence

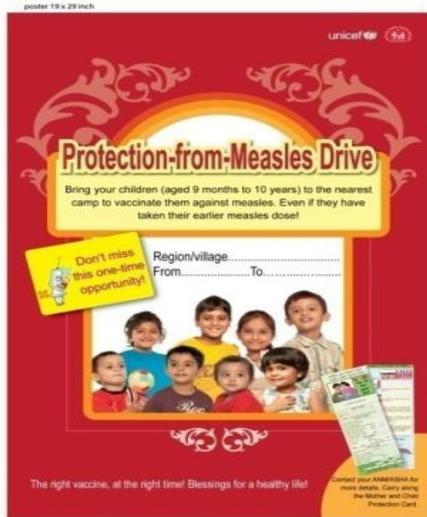
The WHO–UNICEF accelerated strategy for reducing measles mortality focuses on countries where the burden of measles is highest. The strategy aims to (i) achieve and maintain high coverage ($\geq 90\%$ nationally and $\geq 80\%$ in each district) of 2 doses of measles-containing vaccine (MCV) delivered through routine immunization services and supplemental immunization activities (SIAs), (ii) implement effective laboratory-supported disease surveillance, and (iii) provide appropriate clinical management for measles cases.

Global measles mortality declined by an impressive 78% from an estimated 733,000 deaths in 2000 to 164,000 in 2008, according to the natural history model for projecting disease incidence and deaths (WHO (2009), Global reductions in measles mortality 2000–2008 and the risk of measles resurgence, WER; 49:441-8.). This decline in measles mortality has accounted for approximately a quarter of the overall decline in childhood mortality over this time period. All WHO regions have achieved the 2010 global goal of reducing measles mortality by 90% ahead of the 2010 target year, with the exception of the South East Asia Region. In South East Asia all countries except India have achieved the target.

This achievement illustrates that if countries fully implement the measles strategy, measles mortality can be reduced by 90% or greater. India, home to 77% of the global measles burden in 2008, started providing the 2nd dose of measles through mass campaigns in 13 out of the 14 states with MCV1 coverage under 80% in 2010. [See text box India]

Cumulatively, approximately 12.7 million measles deaths were averted during 2000-2008 as a result of immunization activities; maintaining routine immunization coverage at the 2000 level averted an estimated 8.4 million (66%) of these deaths and accelerating immunization activities by increasing routine coverage and implementing measles SIAs averted an additional 4.3 million (33%) estimated deaths.

Figure 2: Invitation card for measles vaccination in India



134 million Indian children targeted in "Protection-from-Measles Drive"

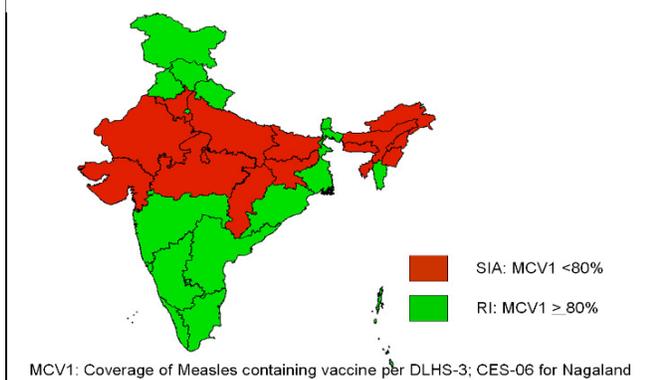
The Government of India began a phased introduction of a second dose of measles vaccine through campaigns and the routine immunization program in accordance with new recommendations. The measles campaigns started in the states of Assam (Morigaon district) and Arunachal Pradesh (East Siang district) on 8th November 2010. The drive is the first in a year long public health initiative, targeting 134 million children in 14 high risk states to prevent an estimated 60,000 to 100,000 child deaths annually.

Worldwide three out of the four children, who died from measles in 2008, were from India. As part of the Indian national immunization strategy, fourteen states were identified by the National Technical Advisory Group on Immunization (NTAGI) as having less than eighty per cent coverage and were thus advised to introduce a measles catch-up campaign for children between the

ages of nine months to ten years. In the rest of the country, the second dose of measles vaccination will be given as part of the routine immunization programme.

The measles catch up campaigns will be carried out in phases over one year targeting 134 million children between the ages of 9 month to 10 years. Detailed operational guidelines, training manuals, communication strategies and AEFI management protocols have been developed and are being implemented in campaign districts. In 2010, over 9 million children received measles vaccine during the campaigns. In the remaining 17 states, measles 2nd dose is being introduced into the routine immunization program to immunize children between the ages of 16-24 months

Figure 3: 2nd Measles Dose: State Specific Delivery Strategies



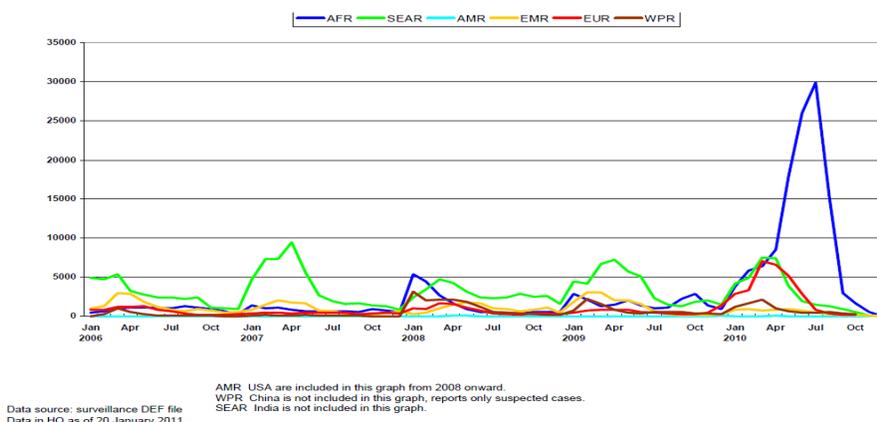
Resurgence of Measles in Africa

However, starting in mid-2009, there has been a widespread resurgence of measles affecting 28 countries in Sub-Saharan Africa that has resulted in over 200,000 reported measles cases and more than 1,400 reported measles deaths. Due to under-reporting, the true number of measles cases and deaths is estimated to be 10-20 fold higher. The highest incidence was reported in Southern African Countries (South Africa, Namibia, Botswana, Lesotho, Swaziland, Zimbabwe Zambia and Malawi) and Mauritania. Measles surveillance data reported an incidence 16.5 measles cases per 100,000 population in the African Region. The outbreaks in Africa together with the continued high numbers of measles deaths occurring in India threaten the contribution of measles mortality reduction to achievement of Millennium Development Goal #4.

The underlying cause of these outbreaks is insufficient vaccination, both low first dose coverage and reduced quality or delayed SIAs. The result is a build-up of susceptible children and adolescents who both missed immunization ("hard to reach") and escaped natural infection during the years of reduced transmission. As the disease disappeared over the past few years, health workers have reported that awareness and demand for measles vaccination was reduced. In addition, there is insufficient political commitment to conduct high quality measles campaigns in several critical countries, due in part to

competing public health priorities, as well as insufficient financial support to conduct high quality campaigns and to reach underserved communities. Some priority countries suspended activities that are critical to reach the unreached (e.g. outreach vaccinations, real time monitoring, supervision) due to inadequate funding. All of these elements demonstrate the challenges facing the Measles Initiative and need urgent further attention to sustain the gains in the global fight against measles.

Figure 4: Reported measles case distribution by Month and WHO Regions, 2006 - 2010



Improving activities through Best Practice documentation

To respond to this challenge, the Measles Initiative supported a best practice measles campaign in Ethiopia to map out critical elements for conducting high quality campaigns. [See text box of Ethiopia best practices] The aim is to implement these best practices in all future SIAs in the African Region.

Examples of Best Practices Being Evaluated:

- Establishment of **coordination structures at all levels** to contribute to proper planning, monitoring and implementation of the SIA
- Engagement of **political leadership at all levels**
- **Accurate estimate of the target population** conversion factor for under-five children as well as emphasis on screening mechanisms to avoid stock outs in future SIAs
- Development of **communication messages** based on an analysis of information gaps and concerns of the community
- Diverse **methods of communication** to achieve high turn out e.g., house to house canvassing
- **Sufficient lead time** for translation of forms, IEC materials and guides to allow for timely printing and distribution
- **Logistic capacity to ensure timely distribution of supplies at all levels** including involvement of the zonal level to confirm logistic needs and technical capacity for maintenance of the cold chain during distribution
- Place emphasis on **post organization and screening** during **training and supervision**
- **Timely disbursements of funds** to avoid late implementation of crucial activities and compromise quality
- **Cold chain maintenance** before the SIA
- Establish mechanisms for **daily reporting** of achievements during the SIA and timely submission and use of coverage data during daily meetings
- **Maximize and sustain mechanisms created or strengthened through the SIA for routine EPI and future SIAs**, e.g. National and Regional Task Forces, supervision, review meetings, focus on high risk areas

Best Practices Supplementary Immunization Activities (SIAs) in Ethiopia

The government of Ethiopia launched a nation-wide "best practices" follow-up measles campaign in two phases: October 2010 (in 7 regions) and February 2011 (in remaining 4 regions), targeting over 8 million children. This activity was spearheaded by the Measles Initiative to identify and document the most effective practices related to improving the quality of measles immunization activities. The exercise will also document measles campaigns activities that can serve as catalysts to improve routine immunization. Lessons learned from Ethiopia will inform the implementation of future SIAs and routine immunization programme in Ethiopia and the region.

A National Task Force was established by the Federal Ministry of Health to provide technical oversight and coordination for the campaign. Under the National Task Force, sub-committees were established for planning, coordination, monitoring and evaluation; logistics; social mobilization and communication; resource mobilization; and documentation. A National Best Practice Workshop and Advocacy Meeting was conducted in March 2010 to identify best practices to incorporate into the planning and implementation of the SIAs.

A number of best practices and indicators were identified in the areas of coordination, micro planning, training, advocacy, social mobilization and communication, logistics management, resource mobilization and partnerships, implementation, enhancing routine immunization, and supervision, monitoring and evaluation.

Campaign monitoring was systematically conducted by centrally trained facilitators, trained regional, zonal and woreda level coordinators, as well as team supervisors. High risk areas (identified by poor performance in previous campaign, low EPI coverage, etc.) were also monitored by independent monitors

Administrative reports from the October 2010 campaign indicate that 8,171,534 children (107%) were reached with measles vaccines, 11,706,217 (98%) children received OPV, 6,084,903 (96%) received Vitamin A, 4,386,939 (102%) children received deworming, 1,674,335.00 (96%) children and 335,809 pregnant and lactating women (78%) had nutrition screening.

An evaluation of the best practices SIAs is being conducted and preliminary data will be available during the first semester of 2011. This evaluation includes post-campaign household coverage surveys in all regions, best practices surveys at national, regional, woreda and health post levels, and a census of households with children under 5 in select kebeles and woredas, mainly facilitated by UNICEF. It also includes an assessment of the impact of SIAs on routine immunization, mainly facilitated by WHO.

The best practices SIAs were led by the government of Ethiopia, with financial and technical support from the Measles Initiative, the Lions Club, the Polio Eradication Initiative and the nutrition partners. Financial and technical support for the evaluation has been provided by the Bill and Melinda Gates Foundation through the Measles Initiative as well as the Federal Ministry of Health

Figure 5: Measles vaccination session Ethiopia, 2010



Photo: H Dao, 2010

3. Summary of 2010 measles activities

Measles campaigns supported by the Measles Initiative were conducted in 21 countries in 2010, reaching over 186 million children and adolescents were reached across the world. In 13 of 21 countries reporting data by February 2011, children were also offered vaccinations against polio or tetanus or other interventions such as vitamin A and deworming medication when they received measles vaccine. The measles and rubella laboratory network continued to support optimal measles control and increased capacity in 2010 through regional and country-level training workshops, technical support in five regions, and expansion of the number of laboratories participating in the network.

Table 1: 2010 measles SIAs and integrated interventions supported by the Measles Initiative for vaccine/supply purchase and operational costs (N=18), outbreak investigation* (N=1) or SIA planning and logistics (N=2)**

Country	Routine measles vaccination coverage estimate for 2009	Target age group	Extent	Number of children reached	Coverage	OPV	Vitamin A	Deworming	TT/dT	Other*
WHO African Region										
Congo	76%	9-59 M	National	575,940	82%		√	√		
D. R. Congo	76%	6-59 M	Sub-Nat'l	1,259,363	103%		√	√	√	
Ethiopia	75%	6-59 M	Sub-Nat'l	961,798	91%				√	
Ethiopia	75%	9-47 M	Sub-Nat'l	8,171,534	107%	√	√	√		
Ghana	93%	6-59 M	National	3,983,610	92%		√			
Lesotho	85%	6 M-14 Y	National	558,335	91%	√	√	√		
Madagascar	64%	9-47 M	National	2,415,792	93%		√	√		
Malawi*	92%	9 M-14 Y	National	6,785,428	107%					
Niger	73%	9-47 M	National	2,661,324	102%					
Senegal	79%	9-59 M	National	NA	NA					
Togo	84%	9-47 M	National	858,592	97%		√	√		
Zambia	85%	9-47 M	National	1,961,316	114%	√	√	√		
Zimbabwe	76%	6 M-14 Y	National	5,140,000	97%		√			
Regional sub-total				35,333,032						
WHO Eastern Mediterranean Region										
Pakistan	80%	6-59 M	Sub-Nat'l	7,998,260	96%				√	√
Somalia	24%	9-59 M	Sub-Nat'l	1,241,159	86%	√	√	√	√	√
Sudan	82%	9-59 M	Sub-Nat'l	1,763,398	95%					
Regional sub-total				11,002,817						
WHO Region of the Americas										
Haiti	59%	9 M-7 Y	Sub-Nat'l	186,682	80%					
Regional sub-total				186,682						
WHO South-East Asia Region										
Bangladesh	89%	9-59 M	National	18,085,685	93%	√	√			
India**	71%	9 M-10 Y	Sub-Nat'l	9,367,741	91%					
Indonesia	82%	9-59 M	Sub-Nat'l	3,294,315	91%					
Regional sub-total				30,747,741						
WHO Western Pacific Region										
China**	94%	8 M-14Y	National	102,000,000	95%					
Viet Nam	97%	12-59 M	National	6,982,749	95%					
Regional sub-total				108,982,749						
GLOBAL TOTAL				186,253,021						
Source: SIA technical reports and other data submitted to WHO as of 13 April 2011										
*Support for outbreak investigation provided in Malawi										
**Support for SIA planning and logistics provided in China and India										

China spearheaded largest vaccination campaign as part of the measles elimination plan

From September 11 – 20, 2010, China conducted a nationwide measles SIA. The target age group varied by province: 20 provinces targeted children aged 8 months - 4 years; 5 targeted those aged 8 months - 6 years; and the remaining 6 targeted children aged 8 months - 14 years. All children were targeted regardless of resident status, and vaccination or disease history.

Prior to and during the SIA, mobile phone messages, television, radio, newspapers and loudspeakers were used to mobilize the Chinese population. A workshop to educate journalists about immunizations was held by the Ministry of Health (MOH). In addition, in anticipation of possible adverse events following immunization (AEFI), a workshop focusing on risk communication for AEFI was held for national and provincial staff. Press conferences, interviews with experts, and opportunities for the public to ask questions online were organized by MOH and China Centers for Disease Control in close collaboration with the World Health Organization (WHO).

During the SIA, experts from WHO headquarters, the Western Pacific Regional Office of WHO, the Pan American Health Organization and the WHO country office as well as the US Centers for Disease Control and Prevention and UNICEF participated in a three-province monitoring exercise. Monitors noted well organized vaccination sites, high quality service delivery by trained health workers, rapid responses to AEFI, and extensive education of public and the media. According to tallied doses, in total 102 million children were vaccinated through the SIA; the largest in history.

In 2006, China set the goal of reaching measles elimination by 2012 and developed a strategic plan to do so. Major components of the country's elimination plan are 1) a two dose routine measles immunization schedule administered at 8 and 18 months of age; 2) school entry immunization checks; 3) SIAs, including the 2010 nationwide SIA; and 4) case-based surveillance supported by a strong laboratory network. Following the nationwide SIA, China will focus on strengthening surveillance and the routine immunization system to reach the measles elimination goal.

Figure 6: Two of the 102 million vaccinated Chinese children



Key Events in 2010

April: Over 100 countries participate in immunization week

In April 2010 — for the first time — 112 countries in the WHO regions of the Americas, Eastern Mediterranean and Europe hosted simultaneous immunization weeks. This unprecedented collaborative effort provided further momentum towards a worldwide immunization week. Various regional launches took place during the week and a variety of activities were carried out including workshops, training sessions, social mobilization, round-table discussions, exhibitions and media events addressing a wide range of vaccine-related issues. In addition, large-scale vaccination campaigns, tracking of unvaccinated people and the delivery of an integrated package of life-saving health interventions during Child Health Days took place.

http://www.who.int/immunization/newsroom/advocacy_events_immunization_weeks_2010/en/index.html

May: World Health Assembly discussed measles eradication

Nineteen countries and partners took the floor during the World Health Assembly discussion and endorsement of the following targets to be achieved by 2015: measles vaccination coverage of at least 90% at national level and at least 80% in every district; a reported annual incidence of measles of less than 5 cases per million population; and at least 95% reduction in global measles mortality compared with 2000 estimates. These targets should be viewed as milestones towards the eventual global eradication of measles. Member States were encouraged by the efforts and progress made in controlling measles but also highlighted the formidable challenges that need to be addressed to achieve the 2015 targets. These include: competing public health priorities, weak immunization systems, sustaining high routine vaccination

coverage, addressing the US\$ 271 million funding gap (2011-2015), vaccinating the hard-to-reach population and addressing an increasing number of measles outbreaks particularly in cross border areas. Success in achieving the measles 2015 targets is essential if the Millennium Development Goal 4 to reduce child mortality is to be reached. http://apps.who.int/gb/ebwha/pdf_files/WHA63/A63_18-en.pdf
http://www.who.int/immunization/newsroom/measles_press_note_21may2010.pdf
<http://www.ifrc.org/docs/news/speech10/cm200510.asp>

June: Growing measles outbreak in Eastern and Southern Africa

A steep increase in cases of measles in Eastern and Southern Africa put recent gains in reducing measles mortality at risk of being reversed. As of mid-June 2010, the outbreaks have affected more than 47,907 children in 14 countries, resulting in 731 deaths, mounting up to over 200,000 reported cases and 1,400 measles deaths in 28 countries by the end of December 2010. The current wave of measles outbreaks comes as a result of incomplete or low-quality implementation of the control strategies linked to inadequate financial commitments from governments and partners. Moreover, in some countries (Malawi, Mozambique, South Africa, Swaziland and Zimbabwe) certain population groups of the population refuse to immunize their children. In 2009, more than 2.4 million children in the Eastern and Southern Africa sub-region (20% of all children younger than one year) were not reached by routine immunization.

http://www.who.int/immunization/newsroom/WHO_UNICEF_press_release_measles_outbreaks_18jun10.pdf

July: Global Technical Consultation on feasibility of measles eradication

The Ad-Hoc Global Measles Advisory Group reviewed the available evidence and concluded that measles eradication is biologically and technically feasible. An operational model has been demonstrated to be effective in the entire American Region and a number of countries in each remaining WHO Region. In addition, measles eradication has been shown to be cost-effective. Thus, the ad hoc advisory committee concludes that measles can and should be eradicated. The committee also concluded that measles eradication presents an unprecedented developmental opportunity to strengthen and sustain the overall immunization program. The success of measles eradication will depend on strong management, accountability, communication, advocacy and resource mobilization at all levels.

November: SAGE advises measles should be eradicated in the context of strengthening routine immunization

WHO's Strategic Advisory Group of Experts (SAGE) recommended at its November 2010 meeting concluded that measles can and should be eradicated. A goal for measles eradication should be established with a proposed target date based on measurable progress made towards existing goals and targets. The eradication of measles represents unique disease control and developmental opportunities, and should be carried out in the context of strengthening routine immunization programmes.

http://www.who.int/wer/2011/wer8601_02.pdf

3.1 Reaching high coverage with advocacy, communication and social mobilization by volunteers

Adequate demand for measles vaccination is an important factor in achieving high vaccination coverage. The Measles Initiative partners focus on improving demand through the implementation of a scope of activities, including advocacy, communication, and social mobilization.

The Measles Initiative has increasingly engaged in advocacy activities with political leaders, with critical support of the Task Force for Global Health, Lions Club International and The Sabin Vaccine Institute. Through the Task Force for Global Health the Measles Initiative had support from two high level personalities. President Carter conducted high-level outreach to leadership in sub-Saharan Africa and the international community expressing his support of measles immunization programs. President Carter and former UN Secretary General Kofi Annan published an op-ed entitled "Why Is the World's Most Successful Child Health Intervention Going Begging". This editorial appealed to national governments and the international community to increase contributions to immunizations. The editorial was widely published, particularly in African nations during the week of the 2010 African Union Assembly (see annex 5).

Lions Club International held meetings to engage leaders in Ethiopia, Madagascar, Mali and Nigeria, and provided additional financial support for social mobilization activities. Adequate support of political leaders will enable countries to prioritize measles activities for resources in the health, including government funding of the measles activities.

Mass communication through media, e.g. television, national, community radios, print media, was used to inform the population on immunization activities in their communities. Community radios in particular are potent information channels for immunization activities. Ministries of Health and partners in countries engaged with traditional and religious leaders to propagate measles messages to their community.

Most importantly, community health workers and volunteers educate their community about upcoming immunization campaigns and the importance of vaccinations through interpersonal communication. At the community level, this requires large numbers of people. The National Red Cross Red Crescent Societies (supported with additional funding from the American Red Cross and others), Lions Club members, and the Church of Jesus Christ of Latter-Day Saints volunteers, among other NGOs complemented the community health workers that are engaged by the ministry of health for community mobilization. The volunteers raised awareness of the campaign through house-to-house visits, communicate the importance of vaccination at schools and gatherings, in addition to identifying vulnerable and hard-to-reach populations in their areas. In 2010, volunteers made up over a third of the work force for measles vaccination campaigns among the 7 countries that reported on volunteer and health worker involvement (*Table 2.*)

In addition to engaging and involving the community in measles vaccination and pre-registering children for the campaigns, volunteers are essential on vaccination days to manage crowds, screen vaccination cards, record immunizations and other interventions, e.g. administration of vitamin A, de-worming tablets, oral polio vaccine or hand out of LLINs. Volunteers sometimes also conduct rapid coverage assessments to identify un- or under-immunized groups that can then be targeted with mop-up vaccination activities.

Without these efforts to bring all eligible children to vaccination posts, SIAs could not achieve the high levels of coverage, particularly among marginalized communities, and, consequently, the equitable distribution of resources that mark the success of this vaccination strategy. Volunteers may be teachers, routine community health program volunteers, or members of the numerous organizations that support vaccination campaigns.

In addition, funds for the volunteers' social mobilization activities come from their respective organizations and represent a cost savings to the government. For example, in 2009 and 2010 the American Red Cross committed technical support and financial support to national societies for social mobilization programs and provided technical support for social mobilization programs.

Table 2: Examples of volunteer and health worker involvement in measles SIAs in 2010*			Table 3: LDS volunteers in 2010 measles SIAs		
Country	# Volunteers	# Health workers	Country	# Volunteers	Volunteer Hours
Bangladesh	65,000	550,000	Zambia	1,250	5,200
Comoros	n/a	230	Congo	459	2,713
Congo	674	2018	Ghana	2,100	8,400
Ethiopia	58,680	45,000	Ethiopia	49	980
Ghana	8,334	24,865	Madagascar	929	4,891
Indonesia	288,144	192,092	Total	4,787	22,184
Lesotho	1230	5677			
Madagascar	31945	6869			
Malawi	18075	9318			
Namibia	4832	4161			
Pakistan	10,800	10,800			
Swaziland	1701	280			
Zambia	3650	1978			
Zimbabwe	6,200	9,802			
TOTAL	499,265	863,090			

n/a: not available
 *Note: This data only represents a small sample of volunteer participation. Source: SIA technical reports.

3.2 Strengthening health systems

Measles campaigns support health systems by improving staff skills for service delivery and programme management, information on target populations, management and reporting of adverse events following immunization, laboratory equipment and improved surveillance, cold-chain and logistics system. In addition, enhanced coordination with other sectors (i.e. community service organizations and Ministries of Education) and within health (i.e. environmental health) is reported, as measles campaigns integrate the delivery of other health interventions during the campaigns and seek new ways to vaccinate unreached children.

A recent study by the LSHTM concluded that measles elimination activities have a net positive effect on strengthening immunization systems. Even in countries with very weak health infrastructure, the negative effects were outweighed by the following observed positive benefits (Measles eradication and health systems impacts: Evidence from six countries, Summary Report, 20th July 2010, Hanvoravongchai P et al, LSHTM).

Micro-planning determines population access to immunization, develops strategies on how to provide services to hard-to-reach populations, enhances health worker understanding of access to health facilities in their catchment area, and often serves as the basis for micro-planning for routine services. The micro-planning process enhances access to health services through health worker mapping of the community locations, identification of underserved and hard-to-reach groups, and estimation of the number of children within the age ranges targeted for vaccination. A work schedule is developed for every team so that the entire target population can be reached within the campaign days or weeks and the maximum immunization coverage can be achieved. In addition to this training on logistics, the health workers are provided with training on injection safety and vaccine supply management during the SIA planning period.

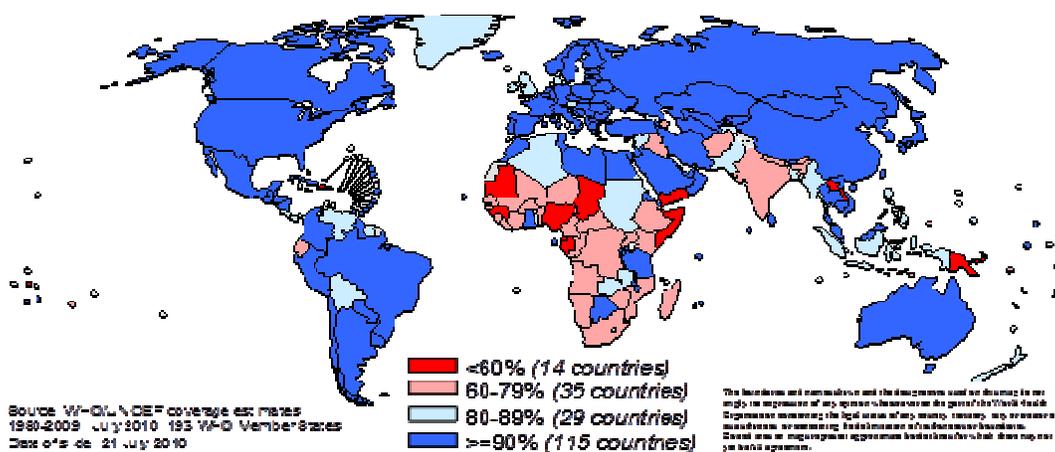
Poorly functioning cold-chain systems (e.g. cold rooms and refrigerators for vaccine storage, cold boxes and vaccine carriers) are a major constraint in many countries. Measles campaigns provide the opportunity to expand, replace, and repair cold-chain equipment. Furthermore, the waste management system is reviewed during preparations for the campaign and incinerators are built to expand waste management capacity when resources allow.

3.4 Strengthening routine immunization

Immunization programs have made an impressive contribution to reducing deaths among children less than five years of age. Routine immunization is the foundation of the measles control strategy, as it delivers the first dose of measles vaccine to infants. Since 2000, global coverage of the first dose of measles-containing vaccine (MCV1) has increased from 71% to 82% (WHO/UNICEF immunization estimates for 2009); that is, over 15 million additional children are reached each year. In the 47 priority countries for measles mortality reduction, MCV1 coverage through routine immunization has increased even more significantly, from 56% to 73% (WHO/UNICEF immunization estimates for 2009). Countries achieved these improvements over the past 10 years with funding support from GAVI, USAID and the Measles Initiative (10% of all funding went to routine immunization), among other donors, and the contributions by national governments. Measles Initiative and partners advocate or inclusion of immunization budget in Sector Wide Approaches and other health sector financing mechanisms.

Over two-thirds of the measles deaths prevented over the past decade were avoided by maintaining routine immunization coverage at 2000 levels.

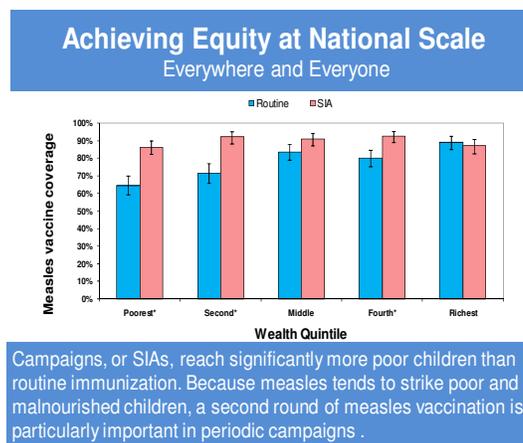
Figure 7: Immunization coverage with measles containing vaccines in infants, 2009



Because sustainable measles mortality reduction depends on strong routine immunization programmes, reaching high coverage with routine services in every district has been a central strategy for effective measles control. Moreover, measles is the most critical vaccine-preventable disease for understanding immunization system performance because measles outbreaks quickly identify where routine services need to be strengthened. For instance, one phenomenon that has repeatedly been identified by measles outbreaks is a deficit of routine immunization in peri-urban areas and routine strengthening in these locations has become a priority.

Despite these improvements, 23.7 million infants did not receive the first measles dose before their first birthday in 2009. 60% of these children reside in large countries: India (7.4 million), Nigeria (3.2 million), China (1.1 million), Pakistan (0.7 million), Indonesia (0.7 million), and Ethiopia (0.6 million). According to Demographic Health Surveys and Multi Indicator Cluster Surveys, children from the poorest wealth quintiles are less likely to have received vaccinations before their first birthday. To address these inequities, Measles campaigns are conducted to deliver a second dose of measles vaccination in countries with weak health systems, (see chart below) (Vijayaraghavan M, et al. (2007) Measles SIAs improve measles coverage and equity: Evidence from Kenya. Health Policy **83**: 27-36.)

Figure 8: Campaigns reaches poorest children



Measles Initiative partners continue to support the introduction of the 2nd dose of measles in the routine immunization. 136 countries provide a 2nd dose in the routine system and 17 additional countries are eligible for the introduction of a second dose in the routine¹. Ghana and Zambia expressed interest in the introduction of a 2nd routine dose through applications to GAVI for financial support. However, GAVI froze new support in 2010. While countries can introduce a 2nd measles dose in the routine immunization system, they need to continue SIAs until immunization coverage reaches at least 90% at the national level and at least 80% in each district if they aim to reduce mortality from measles and, if they aim to eliminate measles, at least 95% coverage with both doses in every district (WER **35**, (2009), 84, 349–360).

¹ MCV2 may be added to the routine immunization schedule in countries that have achieved ≥80% coverage of MCV1 at the national level for 3 consecutive years as determined by the most accurate means available (for example, a well conducted population-based survey or WHO/UNICEF estimates).

3.3 Integration with other child survival interventions

Measles campaigns provide a platform to deliver other life-saving interventions. Two-thirds of the Measles Initiative supported SIAs in 2010 offered at least one additional intervention. More than 32 million doses of vitamin A, 19 million doses of de-worming medicine, and 9 million doses of polio vaccine were distributed during measles campaigns in 2010. These integrated measles activities contribute even more significantly to child mortality reduction and to the achievement of Millennium Development Goal (MDG) 4 by 2015.

Integration of critical health interventions is one of the four strategic areas of the Global Immunization and Vision Strategy. Studies have concluded that integrated campaign packages save more lives and that adequate planning can address the logistical challenges. However, the integration of multiple interventions with measles campaigns may, in some instances, cause additional stress on transportation systems and health workers' time. Integrated activities are now common practice and in several regions, Child Health Days and periodic intensification of routine immunization are increasingly being utilized to combine the effects of broad social mobilization, like that used for SIAs, with a spectrum of health interventions in order to bolster the reach of the routine health system.

3.5 Building stronger surveillance systems & a global laboratory network

Measles Surveillance Systems

Effective surveillance for measles entails establishing case-based surveillance that includes investigation and laboratory testing of samples from all suspected case, with the exception that during large outbreaks testing is only recommended for the first 10 cases. By 2010, 181 (94%) of 193 member states had implemented case-based surveillance compared with 120 countries in 2004, when data collection on global case-based surveillance began.

From 2000 to 2009, the number of reported cases of measles declined globally by 74%, from 852,937 to 222,318. All regions except Africa and the Eastern Mediterranean reported a decrease in measles cases in 2009 compared to 2008. In the Eastern Mediterranean, reported cases tripled, from 12,120 in 2008 to 36,605 in 2009 and in the African region, reported measles cases doubled from 37,010 in 2008 to 83,464 in 2009. Reported cases are expected to double again in 2010 in Africa due the resurgence of measles in the south.

Surveillance data quality is improving. By the end of 2010, 151 countries were reporting monthly surveillance data to WHO. As an indicator of the sensitivity of measles surveillance systems, 53 countries using the monthly data reporting system met the minimal reporting rate of two discarded suspected measles cases per 100,000 population nationally between January and December 2010 (data as of February 2011.)

Measles Surveillance Systems and Laboratory Network

The Measles and Rubella Laboratory Network (LabNet) includes 679 national and subnational WHO-certified laboratories in 2010 serving 183 countries compared with fewer than 40 laboratories and 71 countries served by the LabNet in 1998. 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. National laboratories used for polio, yellow fever and Japanese Encephalitis surveillance are frequently the same laboratories or are at least in the same institute, as those used for measles and rubella surveillance allowing for synergies between different vaccine preventable disease surveillance programmes.

Over 300,000 serum samples were tested for measles and rubella immunoglobulin M (IgM) antibody in 2010 and more than 80% of results were reported within 7 days after receipt of specimens in the laboratory. Virological surveillance for measles has been used for identifying the source of measles outbreaks and tracking virus transmission within and between the regions with more than 1000 measles viruses sequenced and data shared with the LabNet in 2010. Of the 220 laboratories that participated in the 2009 laboratory network proficiency testing programme, 218 (98%) laboratories met the minimum required score of 90%

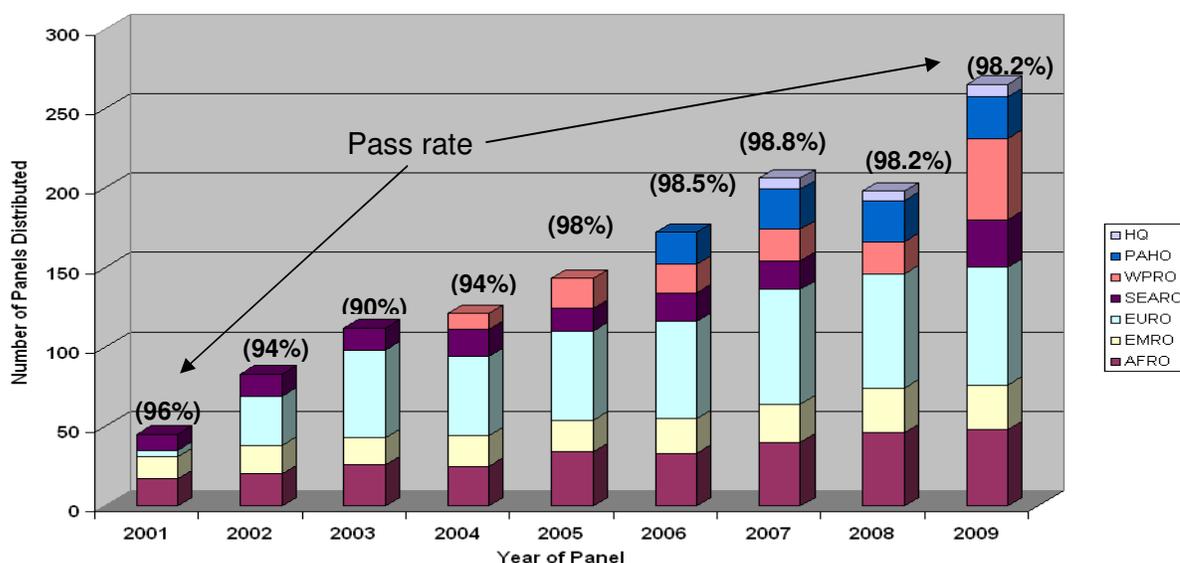
and 155 (70.5%) achieved 100% (figure 9). Most of the remaining sub-national laboratories participated in national proficiency testing programmes with a similar high level of performance.

Training

Strengthening the capacity of laboratories for virus detection is essential for improving molecular surveillance. Workshops were held in the Western Pacific, European, South East Asian, African and Eastern Mediterranean regions in 2009-10 to provide skills for virus detection and sequencing and to meet the need of new staff. More than 200 participants were trained from 98 laboratories in 55 countries for measles and rubella, yellow fever and Japanese encephalitis over this period.

Five countries in the African Region; Benin, Botswana, Cote d'Ivoire, Kenya and Zimbabwe are testing the use of oral fluid samples to enhance surveillance. Training workshops were held in Cote d'Ivoire and Uganda for surveillance officers and laboratory technicians to collect and test oral fluid samples. Preliminary field data from Zimbabwe showed almost equivalent IgM results in oral fluid to that from serum collected from the same cases, with the added benefit of sequence data being available from the oral fluid samples.

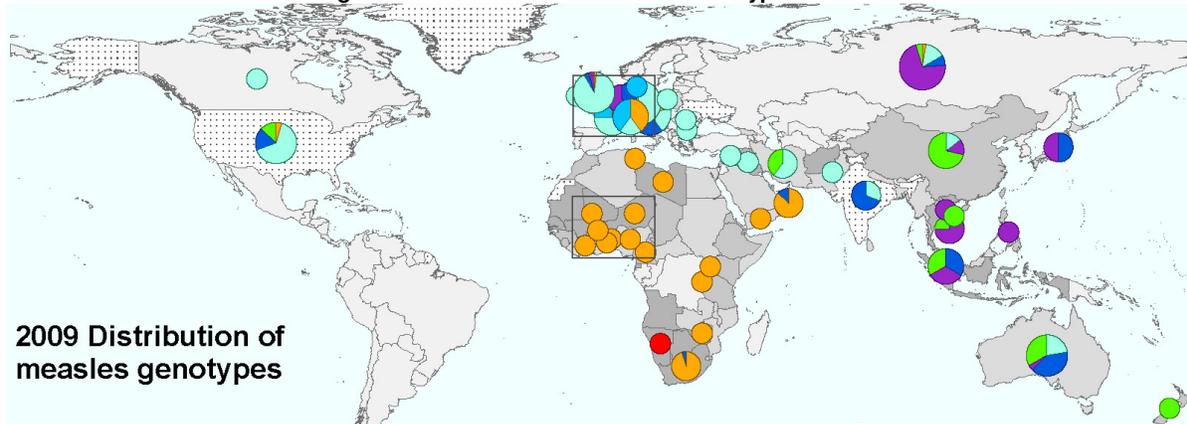
Figure 9: WHO LabNet Quality- Global Proficiency IgM Test Panel distribution and results: 2001-2009



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. There has been a marked increase in the collection and sharing of measles molecular epidemiological data since 2003 as more laboratories develop capacity for molecular techniques and the programmatic value in tracking viruses is recognized. In 2006 a WHO genotype database was established to track measles viruses detected by the LabNet. By January 2011, genotype information from 8758 measles viruses had been submitted to the database comprising all of the 24 genotypes from 131 countries. In 2010, 1086 viruses representing 11 different genotypes were identified from 59 countries and were submitted to the database (figure 10). Gaps in molecular surveillance still occur, but these are gradually being filled.

Figure 10 Distribution of Measles Genotypes in 2009



3.6 Promoting injection safety and AEFI surveillance

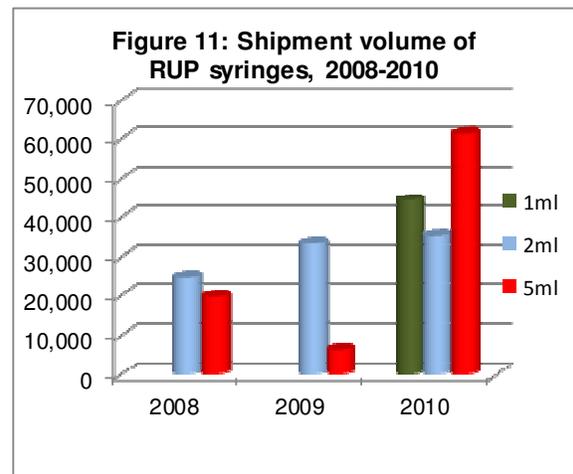
Measles vaccination campaigns pose particular safety challenges due to their objective of immunizing large populations over a short period of time, often at locations outside the normal healthcare setting. Two important measures to maintain an excellent safety record are safe injection supplies and training, and appropriate management of adverse events following immunization (AEFI).

Improving Injection Safety

WHO and UNICEF recommend the use of auto-disable (AD) syringes for all immunizations to prevent the risk of spreading blood borne diseases through reuse of needles and syringes. In all campaigns supported by the Measles Initiative, AD syringes are used for vaccination and safety boxes for safe disposal. 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.

UNICEF issued a Program Instruction in November 2006 to gradually supply all immunization programs with Re-Use Prevention (RUP) featured syringes for vaccine reconstitution from 2010 onwards, as previously regular disposable reconstitution syringes have been used for the reconstitution of vaccines and the risk of re-use of this syringe. This will prevent the possibility of re-use of a syringe to reconstitute multiple vials of vaccine or re-use for multiple injections into patients thus causing contamination of the vaccine and spread of blood-borne diseases, e.g. HIV/AIDS, Hep B & C.

Measles campaigns are a major driver for the introduction of 5ml RUP syringes. In the period of 2008-2010, UNICEF procured about 8,727,500 units of 5ml, 9,369,000 units of 2ml RUP syringes and 4,442,400 units of 1ml RUP syringes. Demand for 5ml syringes increased in 2010 as a result of their use in the upcoming measles campaigns scheduled to take place in Nigeria and Burkina Faso in 2011.



Strengthening AEFI Surveillance through Campaigns

Prevention and management of AEFI is an important part of immunization safety during measles campaigns. An AEFI is any adverse event that occurs after vaccination, whether it is caused by the immunization or not. In 2010, all countries reported implementing AEFI surveillance during measles campaigns, ranging from zero AEFI reported in Indonesia and Haiti to 175 AEFI reported and investigated

in Ghana. No country reported a severe AEFI linked to vaccination that was potentially debilitating or life-threatening.

Active monitoring of health events among vaccinated children is essential to provide treatment and prevent further cases, as well as to mitigate the spread of misperceptions of vaccine safety when AEFI are determined to have occurred independently of vaccination. 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 are then extended to the routine immunization system.

4. Looking forward: No child dies from measles by 2020

New measles mortality reduction goal

In May 2010, the WHA endorsed the following measles control targets for 2015 as milestones towards measles eradication:

- increasing measles immunization coverage to >90% nationally and >80% in every district;
- reporting an incidence of <5 cases/1 000 000 population; and
- reducing measles mortality by 95% compared with 2000 levels.

WHO's Strategic Advisory Group of Experts on Immunization (SAGE) reviewed the report and recommendations from the July 2010 Global Technical Consultation to Assess the Feasibility of Measles Eradication. Measles has been eliminated in the Region of the Americas since 2002, and 4 of the remaining 5 Regions have established a target date for the elimination of measles: it is to be eliminated in the Eastern Mediterranean Region by 2015, in the Western Pacific Region by 2012, in the European Region by 2015 and in the African Region by 2020. In 2009, the Regional Committee for South-East Asia passed a resolution urging Member States to move towards eliminating measles. SAGE concluded "that measles can and should be eradicated. A goal for measles eradication should be established with a proposed target date based on measurable progress made towards existing goals and targets. The eradication of measles represents unique disease control and developmental opportunities, and should be carried out in the context of strengthening routine immunization programmes." (WHO 2011, WER, **86**, No. 1-2, pp 1-16)

Expanding the programme

India started introducing the second dose of measles vaccination in 2010 and is planning to fully implement the strategy nationwide by 2013. This effort will potentially prevent 60,000 to 100,000 measles deaths every year, if all Indian children are protected by the measles vaccine.

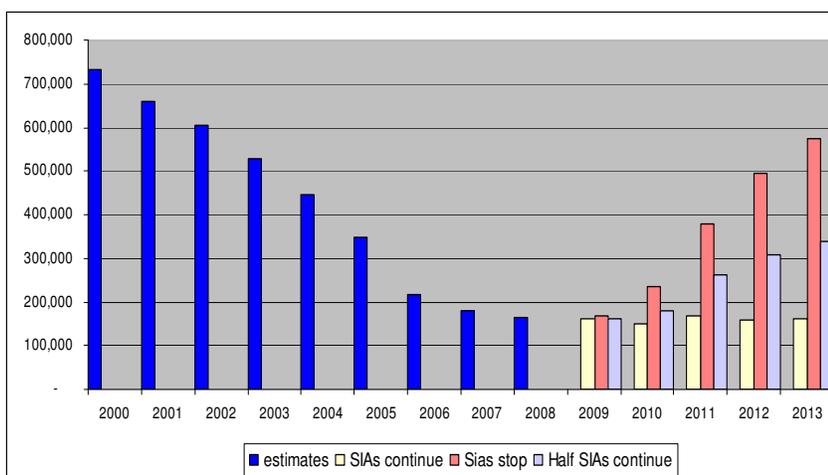
Sustaining the programme

Beginning in 2009 and throughout 2010, Africa has witnessed an increased number of measles outbreaks. Although the number of children affected is much lower than before the Measles Initiative started, the resurgence of measles has again put children at risk for this preventable disease. The underlying cause of these outbreaks is insufficient vaccination, both low first dose coverage and reduced

quality or delayed SIA, resulting in a build-up of susceptible children and adolescents who have missed immunization and escaped natural infection during the years of reduced transmission. Due to funding gaps and low political commitment, countries have suspended critical activities to reach the unreached (e.g. outreach vaccinations, real time monitoring, and supervision) during campaigns and routine immunization.

To avoid a resurgence in measles cases and deaths a comprehensive measles control strategy needs to be maintained by each country. To enable this, a long term commitment by the donor community is essential, along with political commitment and increasing financial contributions from countries affected by measles. Only this combination of support will sustain the achievements made in measles mortality reduction and secure its contribution to achieving Millennium Development Goal (MDG) 4.

Figure 12: Risk of measles resurgence



Annex 1: Measles and Measles-Rubella Bundled Vaccine Supplies Procured through UNICEF Supply Division

Measles-containing vaccine and supplies procured through UNICEF Supply Division for SIAs in 2010								
#	Country	Vaccine	Doses Vaccine	USD Value Vaccine	Cost of AD Syringes	Cost of Reconstitution Syringes	Cost of Safety Boxes	Total
1	Bangladesh	Measles	18,700,000	\$3,964,400	0	0	0	\$3,964,400
2	Burkina Faso	Measles	294,170	\$0	137,115	16,777	19,764	\$173,656
3	Central African Rep.	Measles	710,900	\$213,270	35,185	356	935	\$249,746
4	Comoros	Measles	100,600	\$21,327	4,949	0	496	\$26,772
5	Congo Brazzaville	Measles	755,400	\$160,145	37,422	2,612	4,129	\$204,308
6	DR Congo	Measles	3,571,600	\$757,179	173,092	12,108	19,059	\$961,437
7	Ethiopia	Measles	11,622,000	\$2,463,864	578,120	42,933	67,059	\$3,151,976
8	Ghana	Measles	5,090,000	\$1,079,080	0	0	0	\$1,079,080
9	Guinea-Conakry	Measles	6,700	\$1,420	0	0	0	\$1,420
10	Haiti	Measles Rubella	649,000	\$314,116	0	0	0	\$314,116
11	Kyrgyzstan	Measles Rubella	200,000	\$96,800	0	0	0	\$96,800
12	Lesotho	Measles	789,100	\$167,289	48,016	2,910	470,126	\$688,342
13	Liberia	Measles	640,000	\$123,520	30,195	2,841	4,001	\$160,557
14	Madagascar	Measles	2,890,000	\$612,680	0	0	0	\$612,680
15	Mali	Measles	5,163,600	\$1,094,683	278,164	19,421	59,924	\$1,452,192
16	Mauritania	Measles	300,000	\$63,600	30,690	2,231	4,478	\$101,000
17	Myanmar	Measles	12,000	\$2,544	0	0	0	\$2,544
18	Niger	Measles	2,919,000	\$618,828	73,358	5,250	9,045	\$706,482
19	Nigeria	Measles	22,000,000	\$4,664,000	1,640,587	255,029	206,259	\$6,765,875
20	Pakistan	Measles	15,300,000	\$3,704,040	462,091	34,651	77,216	\$4,277,999
21	Philippines	Measles	675,000	\$143,100	0	0	0	\$143,100
22	Senegal	Measles	2,512,250	\$532,597	98,611	8,071	11,247	\$650,526
23	Somalia	Measles	1,810,500	\$383,826	0	0	0	\$383,826

Measles-containing vaccine and supplies procured through UNICEF Supply Division for SIAs in 2010								
#	Country	Vaccine	Doses Vaccine	USD Value Vaccine	Cost of AD Syringes	Cost of Reconstitution Syringes	Cost of Safety Boxes	Total
24	Southern Sudan	Measles	469,200	\$90,556	13,260	0	0	\$103,816
25	Sudan	Measles	2,566,500	\$544,098	103,297	12,722	8,869	\$668,986
26	Tajikistan	Measles Rubella	964,000	\$511,816	26,664	1,459	2,631	\$542,571
27	Togo	Measles	1,169,400	\$247,913	49,896	6,222	5,679	\$309,710
28	Uzbekistan	Measles Rubella	110,000	\$53,240	83,000	6,771	9,925	\$152,936
29	Viet Nam	Measles	8,100,000	\$2,430,000	388,800	30,299	44,194	\$2,893,292
30	Zambia	Measles	1,800,000	\$381,600	0	0	0	\$381,600
31	Zimbabwe	Measles	6,309,800	\$1,337,678	317,890	23,858	34,724	\$1,714,150
	Grand Total		118,847,550	\$26,779,209				\$32,935,895

Annex 2: Key Measles Statistics, 2000-2010

- Global **routine measles vaccination coverage** reached 82% in 2009, up from 71% in 2000.
- A resurgence in measles occurred in Africa in 2010. While complete data is not yet available, it is clear that measles mortality increased in 2010 compared to previous years.
- Approximately **942 million children aged 9 months up to 14 years* were vaccinated through SIAs supported by the Measles Initiative** by the end of 2010.
- Of 21 countries conducting SIAs in 2010 supported by the Measles Initiative, 13 (62%) used this opportunity to deliver additional interventions.
- The Measles and Rubella Laboratory Network (LabNet) included 679 national and subnational proficient laboratories in 2010 compared with the 71 countries served by the LabNet in 2000.
- By 2010, 131 countries had contributed to the global measles genotype database.
- Over 23.7 **million infants missed receiving measles vaccination** through routine services in 2009.
- 17 countries were eligible to introduce a second dose of measles vaccine in 2010. 136 of 193 countries already administer two routine doses.

*some catch-up SIA age ranges extended up to 18 years

Annex 3: Core Partners and Contributing Organizations

The Measles Initiative comprises five core partners: the American Red Cross, UNICEF, UNF, CDC, and 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: BD ; 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); Merck & Co.; Herman and Katherine Peters Foundation, , the Vodafone Foundation, the Women's National Basketball Association Cares; and countries and governments affected by measles.

Role of Core Partners

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 promoting safe immunization practices and to support staff and operational costs for the implementing agencies.

The American Red Cross coordinates the global partnership with UNF, provides funding and advocacy 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 joint 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.

Annex 4: Why Is the World's Most Successful Child Health Intervention Going Begging?

Vaccines have saved the lives of millions of children around the world, and have the potential to save millions more in the future as newer vaccines are developed and introduced. Vaccines have resulted in global eradication of smallpox, we are on the brink of attaining global eradication of polio, and measles deaths have decreased by 78 percent since 2000. Newly developed vaccines will prevent hundreds of thousands of child deaths each year from rotavirus diarrhea and pneumococcal pneumonia when countries can gain access to these vaccines. Immunization is one of the most cost-effective investments in child health. Yet in 2009 in low-income countries, two out of five deaths in children under five-years old were due to pneumonia or diarrhea. New vaccines can prevent a large proportion of these deaths but the global community has not committed the resources necessary to bring the full range of vaccines to all children. Polio eradication is not yet assured, and we are at great risk of losing the dramatic progress made against measles as donor funding has dropped precipitously despite rapid movement toward elimination. The reduction in measles deaths alone accounts for nearly 25 percent of the overall reduction in child deaths since 1990. Achieving Millennium Development Goal 4 -- to reduce under-five child mortality by two-thirds by 2015 -- will not be possible without additional support for immunization. It would be a crime if this goal were missed simply for lack of adequate financial support.

Society has long recognized the value of vaccines. Since 1974, the World Health Organization (WHO) has coordinated a global Expanded Program on Immunization (EPI). Major support came from bilateral development agencies and UNICEF negotiated a significantly reduced price for vaccines in developing countries. However, vaccines don't give themselves. It takes organized structures and trained personnel to deliver vaccines safely to those who need them. In 2008, more than twenty-two million infants were missed by routine immunization services and remain unprotected.

Recognizing that developing countries need assistance to enjoy the full benefits of immunization, important global partnerships were developed. The Measles Initiative has provided more than \$700 million in support of campaigns and disease surveillance that strengthen the components of routine immunization systems, delivering nearly 700 million doses of measles vaccine since 2000 and preventing an additional 4.3 million childhood deaths. The result is measurable success in improving routine vaccination coverage and in reducing child deaths at an incredibly low cost. However funding for measles control has dropped 75 percent since 2007, resulting in delayed campaigns, outbreaks and deaths.

For the Polio Eradication Initiative, Rotary International has played an exemplary role in raising more than \$1 billion over the past 25 years, working closely with partners. The GAVI Alliance was formed to ensure that children in the poorest countries of the world have access to the life-saving potential of new vaccines. The GAVI Alliance currently provides more than \$1 billion per year.

The Measles Initiative and the Polio Eradication Initiative maximize the impact of vaccines. Country-wide immunization campaigns ensure all children are vaccinated, even in hard to reach areas where many children cannot access routine immunization services. During campaigns, thousands of health care workers move out across a country to immunize millions of children under five-years old over a few days. Campaigns are complex undertakings that also deliver other preventive interventions such as deworming medicine, insecticide-treated bed nets for malaria control, and vitamin A to prevent blindness often associated with measles disease.

Yet, with all of this cooperation, innovation and collaboration, we are at risk of losing many of the gains that have been made and forgoing the additional benefits that are within reach.

Since June 2009, more than 30 African countries have experienced measles outbreaks resulting in more than 89,000 cases and 1400 deaths. The World Health Organization estimates that the combined effect of decreased financial and political commitment may result in a return to over 500,000 measles deaths a year by 2013, erasing progress achieved over the past 18 years. Why is this?

First, prevention is invisible. When immunization is successful, nothing happens. In contrast, disease or injury is highly visible and demands attention. Those who are sick with malaria, TB, or HIV are in immediate need of treatment and can be passionate advocates. In contrast, there are not the same kinds of passionate advocates for prevention as there are for treatment. Furthermore, children do not vote and cannot influence social priorities. So, immunization often receives lower priority.

Second, the global economy and many individual developing country economies are in deep distress. This lessens the likelihood they will invest in low visibility activities despite very high returns.

Third, there is both donor and recipient fatigue. Donors are tired of being asked to give more even though gains are measurable by decreases in child deaths. Recipients often get tired of having to ask for more, especially when they are having difficulty sustaining the costs of new vaccines.

What needs to be done to save more children? We need a balanced immunization investment strategy that reinforces routine immunization, achieves existing initiatives to eradicate polio and reduce measles deaths by 95 percent, and enables introduction of new vaccines. At the global level, developed countries and philanthropies need to recognize that developing country needs are increasing as new life-saving public health measures become available, and adjust their support accordingly. National governments must review budgetary priorities and increase their support of their own programs -- for example, many countries are not currently providing the 50 percent of operational costs for follow-up measles campaigns requested by the Measles Initiative. At the local level, people must demand that vaccines and immunization services be made available without barriers. Only by concerted actions at local, national, and global levels can we fully realize the massive potential benefits of vaccines.

Kofi Annan served as 7th Secretary-General of the United Nations from 1997 to 2006. Jimmy Carter served as 39th President of the United States from 1977 to 1981.