

WHO/UNICEF Joint Annual Measles Report 2007

Strengthening Immunization Services Through
Measles Control, Phase IX

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Executive Summary

"We are winning the fight against measles, which has long killed, sickened and disabled our children. Our determination is stronger than ever to make measles history..."

Mr. U. Olanguena Awono, Minister of Public Health, Cameroon, January 19, 2007

2007 was a pivotal year for making history in the fight against measles. Not only was the 2005 goal of halving global measles deaths (compared to 1999 levels) exceeded by 10%, but Africa achieved the 2010 goal of reducing measles deaths by 90% (compared to 2000 levels) four years early!

Over the six year period (2000-2006) global measles mortality in all ages has been reduced by 68%, from an estimated 757,000 deaths in 2000 to 242,000 in 2006. The largest percent reduction was in Africa (where measles mortality decreased by 91%); followed by the Western Pacific region (81% reduction), and the Eastern Mediterranean region (76% reduction). The Americas region has maintained its measles-free status since 2002.

This spectacular progress has only been achieved through the firm commitment and resources of national governments, and support from the Measles Initiative and its partners.

The WHO/UNICEF strategy to reduce measles mortality, consisting of four components, has been key to ensuring the massive global decrease in measles deaths. The strategy calls for:

- the provision of one dose of measles vaccine for all infants via routine health services;
- a second opportunity for measles immunization for all children, generally through mass vaccination campaigns;
- effective surveillance for measles; and
- enhanced case management, including the provision of vitamin A supplementation for treatment.

As a result of this strategy, since 2000, more than 613 million children aged 9 months through 14 years have received measles vaccination through campaigns in 47 priority countries. In 2007 alone, 37 countries conducted measles campaigns reaching more than 135 children. Measles campaigns continue to serve as a model for promoting injection safety, including waste management, and raising standards. Social mobilization efforts by volunteers have been instrumental to the success of measles campaigns by creating demand to reach the target population, including the hard-to-reach and vulnerable.

Increasingly, the integration of other key child health interventions with measles campaigns has become the norm. The distribution of insecticide treated nets (ITNs), vitamin A, and deworming along side measles vaccination helps rapidly scale up coverage, reach the unreached, reduce costs and improve efficiency, and contribute toward the achievement of MDG#4 (reduce under 5 child mortality). In 2007, 31 countries (out of 37) included at least one other child survival intervention with their measles campaign. This resulted in the distribution of an estimated 7 million ITNs, 39 million doses of vitamin A, and 19 million deworming treatments. Through integration with other interventions, measles efforts have been a catalyst to combating other diseases, promoting greater health equity, enhancing child survival and building partnerships.

With respect to strengthening routine immunization systems, globally for the first time ever, as of 2006, measles routine vaccination coverage reached 80% (an increase of 8% in six years). The European and Americas regions maintained coverage over 90%, but overall there has been an upward trend in coverage in other regions -- but with significant variation. In the African region, routine coverage rose from 56% to 73%; in the Eastern Mediterranean region, from 73% to 83%; and in the Western Pacific region, from 86% to 93%. In Southeast Asia region routine measles coverage only rose from 60% to 65%. While routine immunization coverage for measles has improved, it is not high enough to stop campaign activities. Focus on building up the immunization system from the district level up will remain a priority.

Measles surveillance and laboratory activities continue to help build stronger health systems by integrating existing surveillance systems (particularly for polio) and expanding the lab network. Since 2000, the WHO measles and rubella lab network (MRLN) has tripled in size from 228 to 688 national and sub-national labs serving 164 countries. This surveillance system is the backbone which provides essential data on measles cases to monitor progress, improve planning, and help allocate health resources more efficiently. Integrating measles surveillance into other disease surveillance systems (e.g. Polio, Yellow Fever, Japanese Encephalitis) has resulted in improvements in infrastructure, capacity building, and provision of needed personnel and outbreak response.

The implementation of these activities has required significant financial resources. As a result of the joint resource mobilization efforts of the Measles Initiative (with funding support from the American Red Cross, United Nations Foundation, the U.S. Centers for Disease Control and Prevention, UNICEF, and others), \$488 million has been provided since 2001. In 2007, major financial support from GAVI and its innovative financing mechanism (the International Finance Facility for Immunization "IFFIm") helped provide for the expansion of measles activities during 2007-2008.

Despite the success achieved in 2007, real challenges remain to sustain the progress and achieve the 2010 measles mortality reduction goal. Globally, there are still an estimated 242,000 measles deaths (2006) and 90% of these are in children under 5 years of age. The greatest number of these deaths (74%) occur in Southeast Asia where measles activities need to be accelerated. It is estimated that more than 26 million one-year old children (2006) still do not receive a routine first dose of measles. Sixteen million of these children reside in five large countries -- India (10.5 million), Nigeria (2 million), China (1.2 million), Indonesia (1.2 million), and Ethiopia (1.1 million).

However, beyond 2008 funding for planned measles activities is not secured, and there is a large funding gap.

Through the power of partnership, the Measles Initiative, is committed to working together to confront these challenges, and achieve the 2010 measles mortality reduction goal and in doing so, make an important contribution to the MDGs by improving child survival and reducing under-five year old deaths.

1. Introduction

Measles is a leading killer of children in many developing countries where prevention and health care can be difficult to access. But with strong global support from governments, health workers and dedicated volunteers, significant progress is being made in the fight against measles.

In 2001, a global health initiative, the Measles 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— was launched to reduce measles deaths in Africa. Since 2004, the Measles Initiative has expanded to Asia and other parts of the world where children are at risk. The Initiative provides technical and financial support to governments and communities for measles vaccination campaigns.

Funding provided by the Measles Initiative is a result of joint resource mobilization efforts by partners to secure the financial resources required to implement activities in countries with high measles burden. Since 2001, the Initiative has provided \$488 million for global measles mortality activities in 47 countries, \$145 million of this in 2007 representing the highest amount of funding provided to date.

The 2007 Annual Report updates progress towards measles mortality reduction based on activities implemented with the support of the Measles Initiative and their estimated impact. The report demonstrates how technical and financial support provided by the Initiative has better than ever before positioned countries to win the fight against measles. Through developing capacity, sharing knowledge, integrating child survival interventions and working in partnerships, countries are strengthening their efforts to protect their children.

2. Global Overview of Progress towards Measles Mortality Reduction

The Problem: Leading Cause of Vaccine-Preventable Death

Measles is a highly contagious respiratory infection caused by a virus. The highest fatality rates are usually among children under five, and up to 20% in infants. Children affected by measles may suffer lifelong disabilities, including brain damage and blindness.

Since the 1960s, a safe, effective and relatively inexpensive vaccine has been available. Beginning in 1974, routine vaccination against measles was introduced in almost every country of the world. Twenty-five years later, routine measles vaccination had leveled off and many industrialized countries had introduced a second dose¹ to protect children who did not respond to the first. Yet in the year 2000, there were an estimated 757,000 measles deaths, occurring mostly in infants and young children living in developing countries due to underutilization of measles vaccine caused by inadequately supported immunization programmes and disease surveillance systems.

Global Response: Setting the Goals

Recognizing the need to tackle causes of childhood mortality and to reduce deaths due to measles, countries have recommitted themselves to achieving global measles control goals.

Goal for 2005

In May 2003, the World Health Assembly (WHA) endorsed a resolution urging member states to achieve the goal adopted by the UN General Assembly Special Session on Children (2002) to halve the number of deaths due to measles by the end of 2005, compared with 1999 estimates.

Goal for 2010

At the WHA in 2005, an even more ambitious global measles control goal was established as part of the Global Immunization Vision and Strategy (GIVS), 2006-2015 (developed by WHO and UNICEF): 90% reduction in measles mortality by 2010 compared with 2000.

Goal for 2015

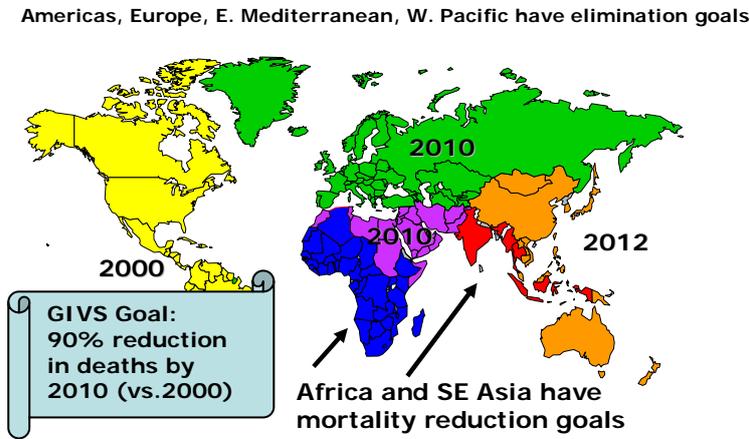
In September 2000, the UN Millennium Summit set a goal to reduce the under-five mortality rate by two-thirds, between 1990 and 2015 (Millennium Development Goal 4). Recognizing the important contribution of measles to child mortality, routine measles vaccination coverage is used as an indicator and measles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

The Way Forward: A comprehensive strategy

In 2001, WHO and UNICEF developed a comprehensive strategy to sustainably reduce measles deaths which was endorsed by the WHA in 2003. Using this strategy, measles has been eliminated from the WHO Region of the Americas. Furthermore, three other WHO regions (Europe, the Western Pacific and the Eastern Mediterranean) have also 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.

¹ In 2006, 126/193 member states included a routine measles 2nd dose in their immunization schedule.

Figure 1: Global and Regional Measles Control Goals



The components of the strategy are: (1.) achieving and maintaining high coverage (>90%) with the first dose of measles vaccine by 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)²; (3.) effective laboratory-backed surveillance and monitoring of immunization coverage; and (4.) appropriate clinical management of measles cases, including Vitamin A supplementation (Table 1). Progress in achieving the 2010 GIVS goal is dependent on implementation of the four major components of the strategy.

Table 1: Summary Comprehensive Strategy Components

	Mortality Reduction	Elimination
1 st dose coverage	≥90%	≥95%
2 nd Opportunity (routine 2 nd dose or SIAs)	All children	All children
Surveillance	Aggregate or case-based*	Case-based*
Case Management	Vitamin A Supportive Rx	Vitamin A Supportive Rx

* Supported by Global Measles/Rubella Laboratory Network

² 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.

Surpassing the 2005 goal: The Strategy Works!

In January 2007, WHO and UNICEF reported that the 2005 goal to reduce measles deaths by half worldwide had been achieved on time and exceeded.³

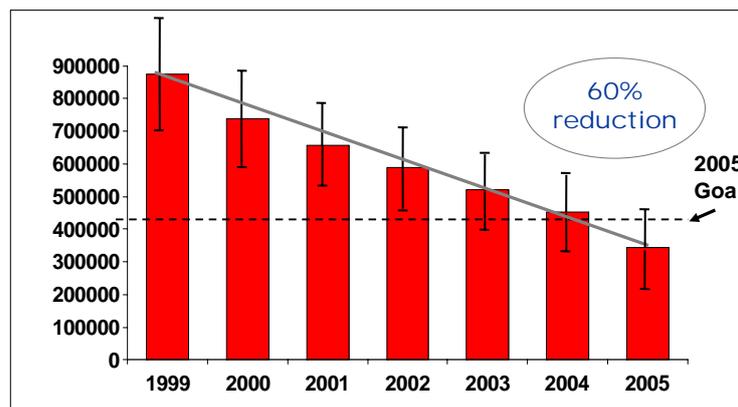
2005 Mortality Reduction Goal Achieved!!

- 60% reduction worldwide
- 75% in Africa
- 1st dose coverage increased 71% to 77%
- >360 million vaccinated in SIAs
- 2.3 million additional deaths prevented



Through the implementation of measles mortality reduction strategies, measles mortality was reduced by 60%, from an estimated 873 000 deaths in 1999 to 345 000 deaths in 2005 (Figure 2). The WHO African region accounted for 72% of the global reduction in measles mortality.

Figure 2: Estimated Global Measles Deaths, 1999-2005



High-low lines indicate uncertainty bounds
Source: Lancet 2007, L Wolfson et al

Trend Continues on Track

Global coverage and incidence data is only available in the 4th quarter of the subsequent year, due to a reporting lag. Current statistics on activities carried out in 2006 indicate continued

³ Wolfson LJ, Strebel P, Gacic-Dobo M et al. Has the 2005 measles mortality reduction goal been achieved? A natural history modelling study. Lancet 2007; 369: 191-200

measles mortality reduction is on track. The evidence provides key insight, particularly into routine coverage and Africa's progress.

▪ **Achieving Highest Global Routine Coverage, Yet Children are Being Missed**

Measles mortality reduction activities continue to reduce the overall global burden of disease relative to the new baseline of 2000. WHO/UNICEF estimates indicate that, in 2006, global routine measles vaccination coverage reached 80% for the first time, increasing from 72% in 2000. Coverage varied significantly by geographical region (Table 2). The largest improvements in routine coverage were evident in the WHO African region (from 56% to 73%) and the Eastern Mediterranean Region (73% to 83%).

Yet, children are being missed. It is estimated that in 2006, more than 26 million one-year old children did not receive a dose of measles vaccine through routine immunization services. Sixty-one percent of infants who missed their first dose of measles vaccine through routine immunization services reside in five large countries (India [10.5 million], Nigeria [2.0 million], China [1.2 million], Indonesia [1.2 million] and Ethiopia [1.1 million]), highlighting the need for these countries to continue their efforts if global and regional goals are to be achieved.

Table 2: Measles vaccine coverage, estimated number of deaths from measles by WHO region, 2000 and 2006

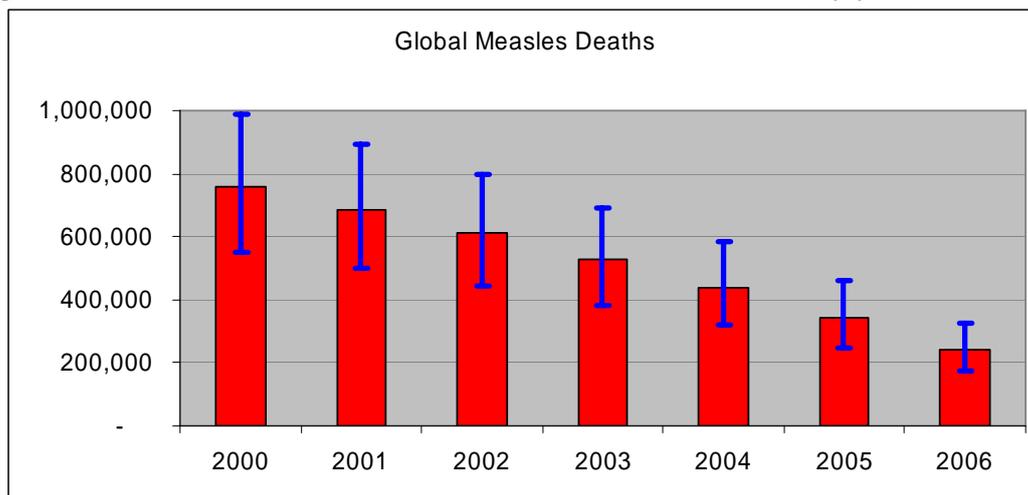
WHO region	2000		2006		Decrease in measles deaths 2000-2006		Proportion of global decrease attributable to region
	Percent first-dose measles vaccine coverage	Estimated number of measles deaths (uncertainty bounds)	Percent first-dose measles vaccine coverage	Estimated number of measles deaths (uncertainty bounds)	Number	Percent	Percent
Africa	56	396,000 (290,000 - 514,000)	73	36,000 (26,000 - 49,000)	360,000	91	70
Americas	92	< 1000	93	<1000	-	-	-
Eastern Mediterranean	73	96,000 (71,000 - 124,000)	83	23,000 (16,000 - 34,000)	73,000	76	14
European	91	<1000	94	<1000	-	-	-
Southeast Asia	60	240,000 (173,000 - 316,000)	65	178,000 (128,000 - 234,000)	62,000	26	12
Western Pacific	86	25,000 (17,000 - 35,000)	93	5,000 (3,000 - 7,000)	20,000	81	4
Total	72	757,000 (551,000 - 990,000)	80	242,000 (173,000 - 325,000)	515,000	68	100

▪ **Africa Leading the Way**

WHO/UNICEF estimates of global coverage with the first dose of measles vaccine reached their highest level ever in 2006; largely due to the increase in estimated routine immunization coverage in countries of the African region. Measles deaths in Africa fell by 91 percent

between 2000 and 2006, from an estimated 396,000 to 36,000, reaching the 2010 goal to cut measles deaths by 90 percent four years early. The spectacular gains achieved in Africa helped generate a strong decline in global measles deaths, which fell 68 percent worldwide – from an estimated 757,000 to 242,000 during this period (Figure 3). While Africa leads the way, gains in the South East Asian region were substantially smaller because certain large countries, e.g. India, have not yet begun large-scale measles SIAs and because there has been little improvement in the routine immunization coverage.

Figure 3: Estimated number of measles deaths --- worldwide, by year, 2000-2006⁴



“Cutting measles deaths in half over the last five years is one of the greatest public health successes to date. We must build upon these gains to save additional lives. Protecting children against measles will make a significant contribution to reducing child deaths - a key millennium development goal.”
Ann M. Veneman, Executive Director, UNICEF

Achieving the 2010 Goal: Sustaining Gains and Overcoming Challenges

Although the 2005 measles mortality reduction goal has been exceeded and progress continued in 2006 and 2007, major challenges need to be overcome to achieve the goal to cut global measles deaths by 90 percent in the period 2000-2010. There is much to be accomplished. Nearly 600 children under age 5 still die from measles each day, approximately 242,000 children each year.

- First, measles mortality reduction activities need to be successfully implemented in several large countries with high measles burden, particularly in South Asia (e.g., India). Currently, about 74 percent of measles deaths globally occur in South Asia.
- Second, to sustain the gains in reduced measles deaths in high measles burden countries, particularly in the Africa region, vaccination systems need to be improved to ensure that >90% of infants are vaccinated against measles through routine health services before their first birthday.

⁴ 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).

- Third, all priority countries will need to conduct regular follow-up SIAs every 2-4 years to prevent the accumulation of large numbers of susceptible children and reduce the risk of large outbreaks.
- Fourth, disease surveillance systems need to be strengthened at all levels to enable case-based surveillance with testing of clinical specimens from all suspected cases in laboratories participating in the global Measles and Rubella Laboratory Network (MRLN).
- Finally, measles case management, including appropriate vitamin A supplementation as treatment, should be strengthened

If these challenges are overcome and gains achieved to date are sustained, the 2010 goal is within reach.

Overview of Key Statistics, 2000-2007

- **Between 2000 and 2006, global measles mortality in all ages was reduced by 68%**, from an estimated 757,000 deaths in 2000 to an estimated 242,000 deaths in 2006. Ninety percent (90%) of the measles deaths in 2006 – an estimated 217,000 – were among children under age 5.
- **Estimated deaths from measles by WHO regions in 2006:**
 - Southeast Asia: 178,000
 - Africa: 36,000
 - Eastern Mediterranean: 23,000
 - Western Pacific: 5,000
 - Americas and Europe: <1,000
- **The largest percent reduction during this time period (2000-2006) was in the African region (where measles mortality decreased by 91%);** followed by the Western Pacific region (81% reduction), and the Eastern Mediterranean region (76% reduction). The Americas region has maintained its measles-free status since 2002. The African region contributed 70% of the global reduction.
- **From 2000 through 2007, more than 613 million children aged 9 months through 14 years of age received measles vaccine through mass vaccination campaigns in 47 priority countries.**
 - In 2006, 25 countries conducted campaigns reaching more than 136 million children.
 - In 2007, 37 countries conducted campaigns reaching more than 135 million children
- **Of the 25 countries conducting vaccination campaigns in 2006, 20 countries integrated the campaigns at least one other child survival intervention** – such as an insecticide-treated bed net, de-worming medicine, vitamin A, or polio vaccine – **with measles vaccination.**
 - Notably, 21 million bed nets for malaria prevention were distributed during measles vaccination campaigns in 2006.
- **Of the 37 countries conducting vaccination campaigns in 2007, 31 countries integrated the campaigns at least one other child survival intervention**
 - Notably, an estimated 7 million ITNs, 39 million doses of vitamin A, and 19 million deworming treatments.
- **Between 2000 and 2006, global routine immunization coverage increased from 72% to 80%.** Coverage varied significantly across geographical regions. In the Africa region, routine coverage rose from 56% to 73%; in the Eastern Mediterranean region, from 73% to 83%; and in the Western Pacific region, from 86% to 93%.
- **In 2006, more than 26 million one-year old children did not receive a dose of measles vaccine through routine immunization services.** An estimated 16 million of these children reside in five large countries – India (10.5 million), Nigeria (2 million), China (1.2 million), Indonesia (1.2 million), and Ethiopia (1.1 million).

3. Summary of 2007 Measles Activities

In 2007, the Measles Initiative and its partners vaccinated approximately 135 million children, during 43 immunization campaigns in 37 countries.

Highlights

■ Evidence Continues to Demonstrate Success

In 2007, new evidence became available demonstrating that the recommended strategies work. It was an exciting year for the Measles Initiative, which began with the announcement of the achievement of the 2005 measles mortality reduction goal, published in the *Lancet* in January. Later in the year, two additional milestones were announced, paving the way towards achievement of the 2010 goal: (i) measles deaths in Africa plunged by 91% during the period 2000-2006; and (ii) global routine immunization coverage reached 80% in 2006 for the first time ever.

What also became clear was the dramatic effect of a country conducting a measles campaign on reported measles cases. It has been shown in country after country that conducting measles campaigns significantly boosts measles vaccination coverage and decreases reported cases as, e.g., per Figures 4 and 5.

Figure 4

Reported measles cases and measles vaccination coverage, 1990-2006, Cambodia

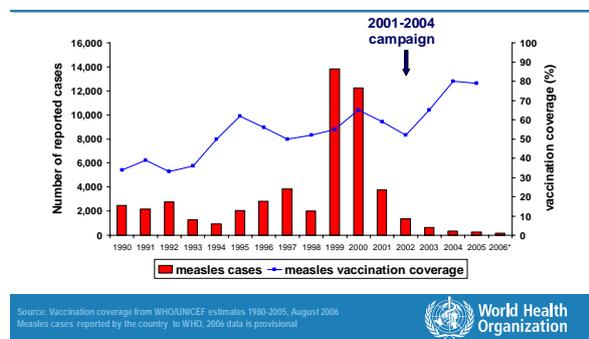
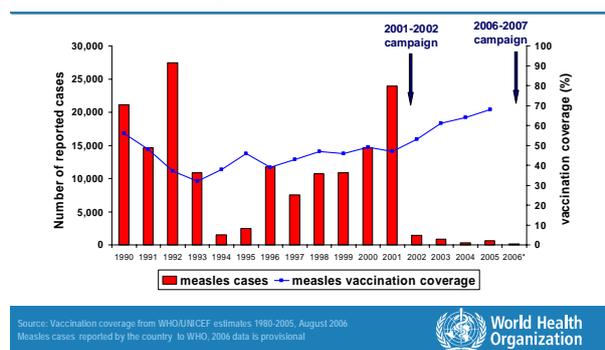


Figure 5

Reported measles cases and measles vaccination coverage, 1990-2006, Cameroon



Key Events in 2007

January – Announcement of achievement of 2005 goal in *Lancet*.

February – 7th Annual Partners for Measles Advocacy Meeting held in Washington D.C.

March – Pakistan launches first phase of largest-ever measles vaccination campaign in four districts

April - 16 million children and adults were immunized against measles in North Korea in one of the fastest responses to a major outbreak of the disease, which began in November 2006.

May – "Beating measles" is the central theme of the stand from the Department of Immunization, Vaccines and Biologicals at the 60th World Health Assembly.

June – New phase of largest-ever measles vaccination campaign begins in Pakistan with more than 600 vaccination teams comprised of nearly 3,200 trained health staff and social mobilization volunteers.

September – India held the first meeting of Indian Technical Advisory Group for Measles Control (ITAGM) and Indonesia completes multi-phased measles campaigns.

October – Government of Madagascar and coalition of global partners launch measles and malaria prevention campaign.

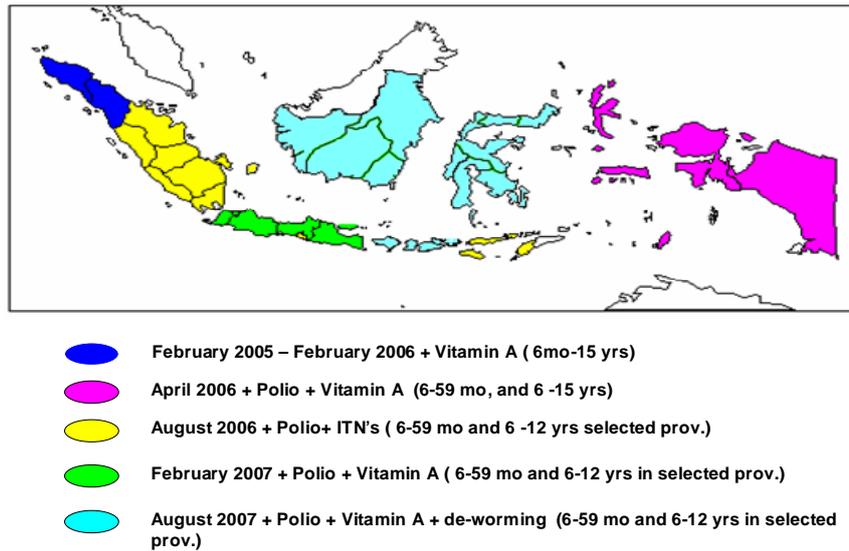
November – Announcement that measles deaths in Africa plunge by 91% and that global routine measles vaccination coverage reached 80% in 2006 for the first time ever.

December – Government of Mali and global partners launch integrated health campaign; bringing nearly 3 million children a healthier future.

▪ **High Burden Countries Implement Activities**

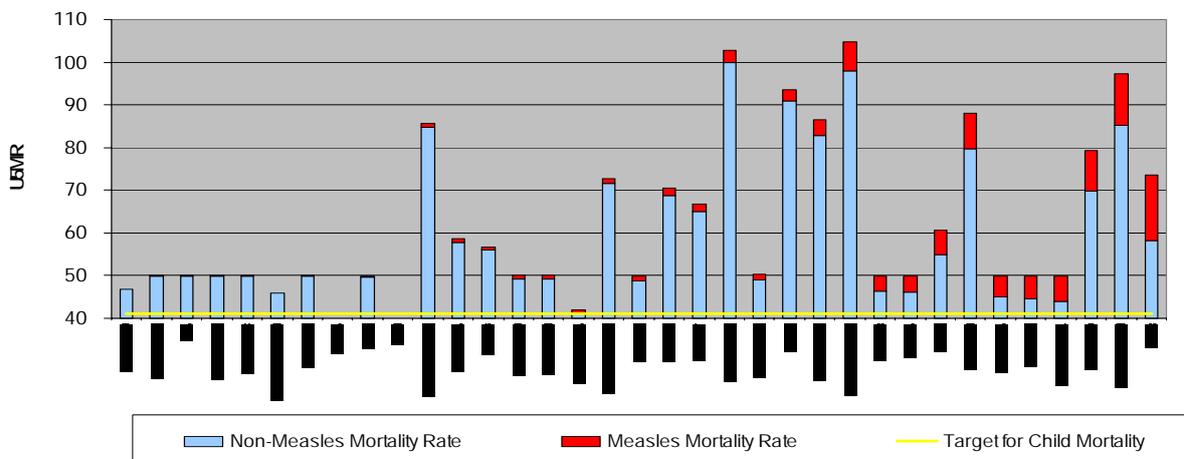
Continued success depends on large high burden countries successfully implementing measles mortality reduction activities. In March, Pakistan launched the largest multi-phased campaign targeting 63 million children. In October, Indonesia finished a multi-phased, multi-intervention campaign, which began in 2004 and reached over 31 million children (Figure 6).

Figure 6: PHASES of MEASLES CAMPAIGN in INDONESIA 2005 -2007



India remains the key country in terms of remaining disease burden. In 2007, India established and held its first meeting of the Indian Technical Advisory Group for Measles Control (ITAGM) to identify and prioritize appropriate next steps for measles control. The introduction of 2nd measles opportunity in India will significantly contribute to achieving MDG4 (Figure 7).

Figure 7: Potential Contribution of Accelerated Measles Control to Achieving MDG4 in India, 2006



Pakistan Largest Multi-Phased Campaign

In 2007, the Government of Pakistan launched a massive measles campaign, which ran in phases from March 2007 to March 2008, and with a target of more than 63 million children between 9 months and less than 13 years. Measles is still endemic in Pakistan and is a major cause of childhood illness and death. Every day, 58 children die from measles in Pakistan and an estimated 21,000 children die every year from measles and its complications. The measles campaign represents a significant milestone in Pakistan's efforts to ensure all children are protected against vaccine-preventable diseases.

This campaign is led by the government of Pakistan, with financial (\$30 million) and technical support from the Measles Initiative. Measles mortality reduction activities in Pakistan have also benefited from financial assistance provided by the Global Alliance for Vaccines and Immunization for strengthening their routine immunization system. In addition, the field staff from the Global Polio Eradication Initiative have played a major role in supporting the planning and implementation of vaccination campaigns and disease surveillance in Pakistan.

India Begins Preparations for Measles Control

India is the only country in the Region that does not provide a second opportunity for measles immunization either through large-scale SIAs or a routine 2nd dose (where coverage is $\geq 90\%$). As the country with the highest measles disease burden, there is an urgent need to begin accelerating measles mortality reduction activities. Thus far, the focus has been on strengthening routine immunization and surveillance.

Based on the National Strategic Plan for Measles Control (2005-2010) and the recommendations of the ITAGM, preparations are underway for phased activities in 10 high burden states with strong political commitment. Given the very low coverage levels, routine immunization will need to be strengthened further in priority states. There remain numerous challenges to successful implementation of phased activities: finishing polio eradication; huge target population requiring significant resources; lack of surveillance resources; and an anti-vaccination movement. Coordinated support from partners will be critical, especially for planning, implementation and resource mobilization.

During the floods in August 2007, measles activities with assistance from UNICEF were carried out in flood-affected areas to protect vulnerable populations from the risk of a measles epidemic.

■ Countries Integrate Measles Campaigns with National Immunization Plans

In 2007, WHO conducted a review of 31 comprehensive Multi-Year Plans for immunization (cMYPs). The review highlighted the strategic consideration being given to campaigns. As measles campaigns are generally being planned well in advance and resources need to be secured, campaigns are increasingly being included in cMYPs. Of the 31 cMYPs reviewed, 25 had included planned measles campaigns. This is an important "best practice" to ensure both government commitment and integration of measles campaign activities with the overall national immunization program. This demonstrates the move away from externally driven campaign planning, and is crucial to the long term success of measles mortality reduction and to strengthening routine immunization.

Challenges

Achieving progress in 2007 has not been without obstacles, notably (i) insufficient human resources, and (ii) remaining polio endemic countries.

▪ **Insufficient Human Resources**

The global shortage of human resources for health has become one of the most serious and critical constraints to scaling up priority health programs, including measles control activities. This shortage is compounded by an ever increasing demand for human resources, brain drain and a dwindling supply. Efforts among major health initiatives, including the Measles Initiative, to increase and make better use of existing human and financial resources are ongoing in order overcome the human resource barrier. For example, volunteers and community members are increasingly used for activities that do not need medically trained personnel. Additionally, integrated campaigns enhance efficiency in the health system, including the use of available human resources, as more interventions are delivered together and preparatory activities are combined.

▪ **Remaining Polio Endemic Countries**

Despite tremendous global progress in the effort to eradicate polio, there remain four polio endemic countries in 2007 - Afghanistan, India, Nigeria and Pakistan. These countries are also high measles burden countries, where measles activities need to be accelerated. The challenges to eradicating polio and reducing measles mortality in these countries are shared, e.g. security, large populations, hard-to-reach populations and low routine coverage. In 2007, the Measles Initiative continued to join forces with the Global Polio Eradication Initiative to maximize efforts and resources to reach all children with both polio and measles vaccines.

Overview of 2007 Activities

In 2007, the Measles Initiative and its partners vaccinated approximately 135 million children through 43 immunization campaigns in 37 countries. The vaccine and injection safety supplies procured by UNICEF for measles SIAs in 2007 is provided in Annex 1. Figure 8 and Table 4 provide a detailed summary of activities conducted, including the addition of other interventions. With the exception of a few, most countries contributed financially to operational costs, in addition to providing resources in-kind. This trend is encouraging as governments will be 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. Additionally, the majority of countries achieved greater than 90% coverage in 80-100% of districts, reinforcing the importance of “reaching every district” (RED) (see pages 36-37 for more detail).

What is a comprehensive multi-year immunization plan (cMYP)?

A comprehensive multi-year plan for immunization:

- provides national goals, objectives and strategies for three to five years based upon a situational analysis;
- addresses all components of the immunization system relevant to the country;
- makes synergies between various immunization initiatives—polio, measles, maternal and neonatal tetanus (MNT), injection safety etc.—to avoid the need for separate plans;
- integrates in one plan those activities common to accelerated disease control and other initiatives and routine immunization, to avoid duplication;
- includes costing and financing assessments to be linked to the relevant planning cycle;
- encourages links with other programs; and
- includes scenarios and strategies for financial sustainability.

It is usually support by a detailed annual workplan for the period covered by the cMYP.

▪ **Lessons Learned**

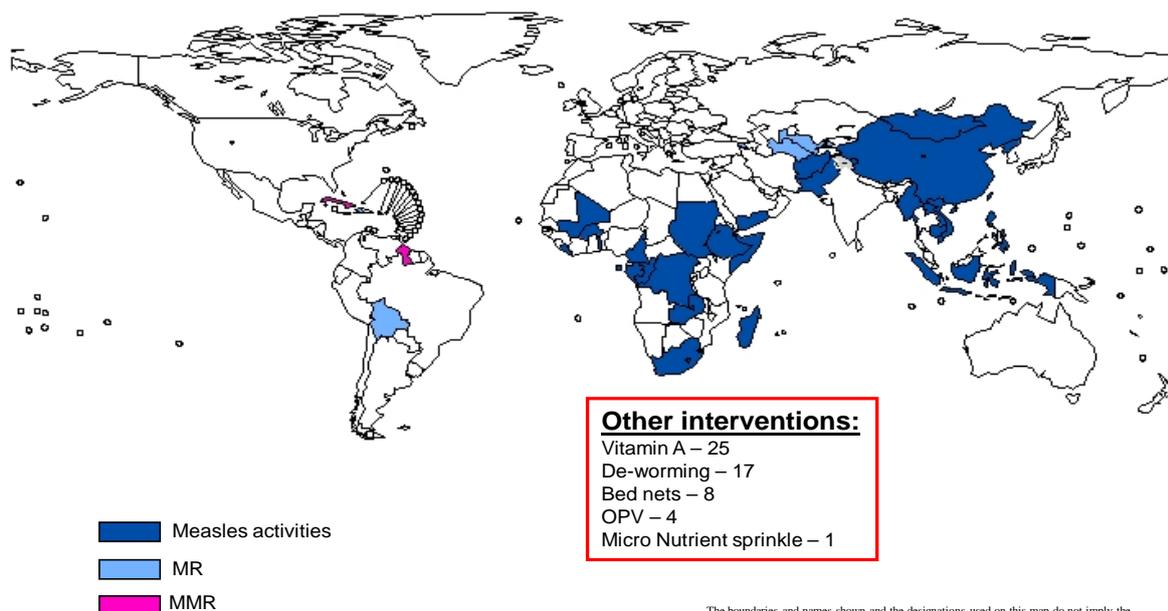
In addition to country-specific lessons, particular lessons emerged with general relevance for all countries. Main areas included political engagement, benefits and difficulties with integrated campaigns (primarily for ITN distribution), cold chain planning and infrastructure maintenance, timely micro-planning and involvement of all players (established and new). Table 3 highlights some country specific lessons as well as overall lessons.

Table 3: Highlights of Lessons Learned

Country-Specific Lessons	Overall Lessons
Adequate time between phases to ensure quality preparations and building on lessons learned (Pakistan and Lesotho)	Engagement of political (& religious) leadership at all levels, including political commitment
Importance of using polio infrastructure, especially in conflict and resource poor areas (Somalia)	Advanced and inter-sectoral planning, especially for integrated campaigns
Integrated campaigns – source of motivation and attraction (Cameroon, Congo, Sudan)	Critical role of mass media in communication
Adequate information on usage of ITNs and on how to handle supply issues (Mali)	Strong and coordinated mobilization of international, national and local partners, including participation during micro-planning
Proper conservation and administration of the vaccine to avoid adverse events (Burkina Faso)	Adequate monitoring and supervision of campaigns at all levels for optimal team performance
Establishment of coordinating mechanism to facilitate better planning (Lesotho)	Maintenance of cold chain and adequate supplies of cold chain equipment, including timely delivery

Figure 8⁵:

Measles supplementary immunization activities, January –December 2007



WHO/IVB SIA Database, as of 7 February 2008

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.
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⁵ Only those measles campaigns receiving funding via the UNF project grant Phase IX.

Table 4: Measles supplementary immunization activities, including other interventions, 2007

Country	Measles coverage estimate for 2006	Age Group	Extent	Reached	Coverage	OPV1	Vit A	ITNs	De-worming	TT	Rubella
WHO African Region											
Burkina Faso	88	9-59 M	National	3'041'413	98		X				
Cameroon	73	9-59 M	Sub-National	1'763'167	94		X	X			
Comoros	66	9 M-15 Y	National	243'398	89		X		X		
Congo	66	9-59 M	National	677'390	95		X	X	X		
Democratic Republic of the Congo	73	6-59 M	National	3'732'935	100		X	X	X		
Ethiopia	63	6-59 M	National	1'063'379	97		X				
Gabon	55	9-59 M	National	190'035	83		X	X	X		
Gambia	95	9-59 M	National		96		X		X		
Lesotho	85	9-59 M	National	196'416	92		X		X		
Liberia	94	9-59 M	National	629'676	97		X	X	X		
Madagascar	59	9-59 M	National	3'185'626	100		X	X	X		
Mali	86	9-59 M	National			X	X	X	X		
Sao Tome and Principe	85	9 M-15 Y	National				X				
South Africa	85	9-59 M	National	3'653'942	84						
Togo	83	9-59 M	National				X		X		
Zambia	84	9-59 M	National	2'204'553	108		X	X	X		
<i>Regional sub-total</i>		<i>20'581'930</i>									
WHO Region of the Americas											
Bolivia	81	2-15 Y	Rollover-Nat	3'075'963	96						X
Cuba	96	12-24 Y	National	1'991'513	97						X
Guyana	90	0-59 M	National	5'860	95						X
Haiti	58	1-19 Y	Rollover-Nat	1'319'342	80	X	X		X		
<i>Regional sub-total</i>		<i>6'392'678</i>									
WHO Eastern Mediterranean Region											
Afghanistan	68	9-59 M	Rollover-Nat (Phase1)	1'809'823	105						
Afghanistan	68	9-59 M	Rollover-Nat (Phase2)	2'085'479	106					X	
Pakistan	80	9 M-15 Y	Rollover-Nat (Phase 1)	2'511'837	98		X			X	
Pakistan	80	9 M-13 Y	Rollover-Nat (Phase 2)	1'282'232	105		X			X	
Pakistan	80	9 M-13 Y	Rollover-Nat (Phase 3)	6'906'376	100		X			X	
Pakistan	80	9 M-13 Y	Rollover-Nat (Phase 4)	20'566'497	97		X			X	

Country	Measles coverage estimate for 2006	Age Group	Extent	Reached	Coverage	OPV1	Vit A	ITNs	De-worming	TT	Rubella
Somalia	35	9 M-15 Y	Rollover-Nat	450'508	108		X				
Sudan (South)	73	6 M-15 Y	Sub-National	1'698'058	72						
Sudan (North)	73	9 M-5 Y	Rollover-Nat	1'490'822	96				X		
Yemen	80	9 M-15 Y	Sub-National	1'291'206	91		X				
Regional sub-total				40'092'838							
WHO European Region											
Armenia	92	6-27 Y	National	912'510	96.8						
Turkmenistan	99	7-40 Y	National	2'112'704	93.5						
Uzbekistan	95	1-29 Y	Rollover-Nat	8'129'804	99.8						
Regional sub-total				11'155'018							
WHO Southeast Asia Region											
Democratic People's Republic of Korea	96	6 M-45 Y	National	16'109'432	100						
Indonesia	72	6 M-12Y	Rollover-Nat (Phase 1)	13'139'214	93	X	X				
Indonesia	72	6 M-5 Y	Rollover-Nat (Phase 2)	6'075'628	97	X	X				
Myanmar	78	9 M-5 Y	National	5'706'351	94						
Regional sub-total				41'030'625							
WHO Western Pacific Region											
Cambodia	78	9-59 M	National	1'526'530	105	X	X		X		
China	93	8 M-14 Y	Sub-National	3'980'978	99						
Lao People's Democratic Republic	48	9 M-14 Y	National	2'086'190	96		X		X		
Mongolia	99	2-10 Y	National	401'575	97		X				
Philippines	92	9-48 M	National	8'197'860	95		X		X		
Viet Nam*	93	6-20 Y	Sub-National	-			X		X		
Regional sub-total				16'193'133							
Global Total				135'446'222							
<p>Source for the Measles coverage estimates for 2006: WHO/UNICEF Coverage Estimates as of August 2007 WHO/IVB database as of 06 February 2008</p> <ul style="list-style-type: none"> For Vietnam, No data yet available - the campaign started 01 November 2007 and will be completed in February 2008 Zambia ITN activity was re-treatment of nets Indonesia included micronutrient sprinkles in one of its campaigns 											

3 (i) Integration of other child survival interventions

Making Measles Efforts a Catalyst to Combat Other Diseases

Linking additional interventions to immunization contacts can rapidly scale up the coverage of key child survival interventions, while at the same time boost quality and coverage of immunization activities. Integration is one of the four strategic areas of GIVS, as such, various child survival interventions [e.g., distribution of insecticide treated nets (ITNs), vitamin A, and de-worming] are increasingly being added to measles campaigns. The delivery of more than one intervention enhances considerably the coverage of high impact interventions, by reducing missed opportunities, and accelerates efforts towards the achievement of MDG4. The integration of multiple interventions with measles campaigns has increased as more funding for other health interventions, e.g. from the Global Fund for Aids, TB and Malaria (GFATM) for ITNs, has become available and as countries transition from catch-up to follow-up measles vaccination campaigns.

"Measles vaccination campaigns are an example of initiatives that can deliver a package of health-promoting interventions, including insecticide-treated bednets, de-worming tablets, vitamin A supplements, and polio vaccine in addition to measles immunization...."

Dr Margaret Chan, Director-General, WHO, as quoted in her first address as WHO Director-General. 4 January 2007.

Since 2001, the Measles Initiative with other partners has supported the distribution of more than 29 million ITNs for malaria prevention, (21 million alone in 2006), 30 million doses of de-worming medicine, and more than 87 million doses of vitamin A. Of the 37 countries conducting measles SIAs in 2007, 31 integrated at least one other child survival intervention with measles vaccination. Approximately (as of data available February 2008), 7 million ITNs were distributed (Africa only), 39 million doses of vitamin A (largely Indonesia and the Philippines) and 19 million doses of de-worming medication (mainly African and Western Pacific Regions) (Table 5). This continues to be an incredible achievement considering the logistics involved in planning and implementing integrated campaigns.

Table 5: Summary of Number of Other Interventions Provided, 2001-2006 & 2007

Other Interventions	2001 -2006	2007 (estimated) ⁶
ITNs	29 million	7 million
Doses of Vitamin A	87 million	39 million
Doses of De-worming medicine	30 million	19 million

Promoting Greater Health Equity

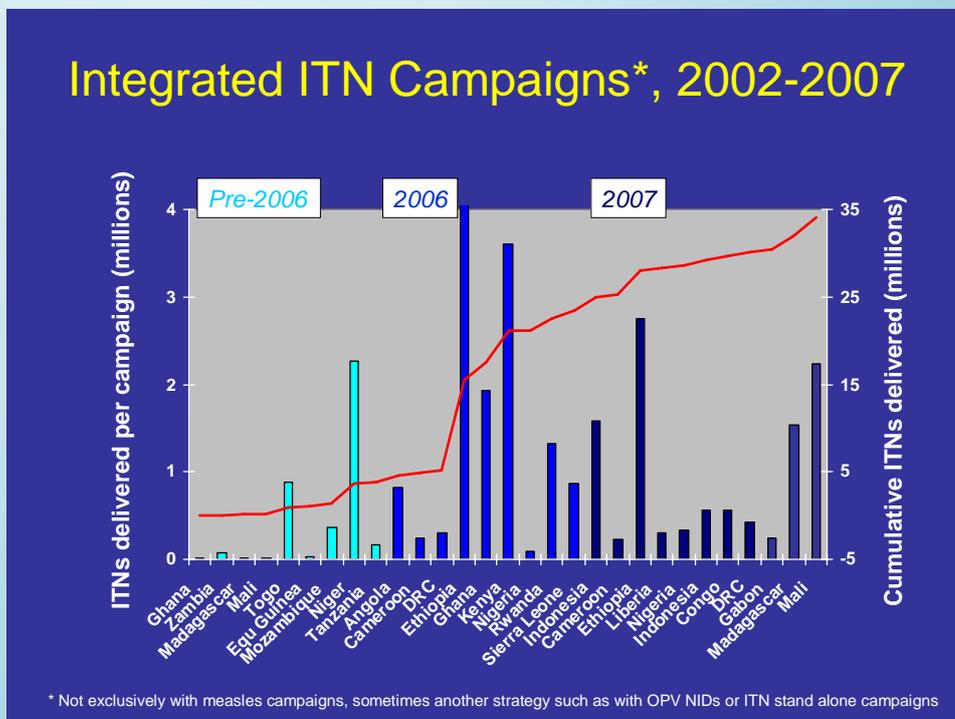
Immunization campaigns help address health inequities as they make extra efforts to reach the poorest of the poor, both boys and girls. Coupled with other child survival interventions, measles vaccination campaigns promote greater health equity by providing access to more than one health intervention and improving health outcomes. As mass campaigns do not discriminate, poor vulnerable populations are served as well as wealthy ones, achieving higher equity.

⁶ WHO/IVB database as of 06 February 2008.

Mass, free distribution of ITNs during measles vaccination campaigns achieves immediate, high and equitable coverage for both ITNs and measles vaccine. Maintaining high and equitable coverage over time requires long-term, routine access to new nets. Country experience has shown that high equity achieved via campaigns can be maintained with the transition to routine service delivery.

Measles and Malaria

In most high-burden measles and malaria countries, ITN use is still below agreed targets. The best opportunity for rapidly scaling-up malaria prevention is free or highly subsidized ITN distribution through existing public health services (both routine and campaigns). Mass distribution through measles campaigns have helped achieve high ITN coverage quickly.



ITN Distribution: Experience in Kenya Ends the Debate – New Guidance Issued

Experience in Kenya overwhelmingly showed that free mass distribution of long-lasting insecticidal nets is a powerful way to quickly and dramatically increase coverage, particularly among the poorest people. Consequently, in August 2007, WHO issued new global guidance for the use of ITNs:

- ITNs are to be long-lasting and made available at no cost or at highly subsidized prices; should have broad population coverage; and
- Campaign-like mass distribution strategies (e.g. via measles campaigns) should be complemented by delivery through routine health services to achieve and maintain high levels of coverage.

Reaching the Under-Fives: Enhancing Child Survival

According to the Black et al⁷, approximately 10 million children under 5 years of age die each year in developing countries. Measles, malaria, pneumonia, diarrhea and malnutrition are the primary causes of these deaths. Recent efforts to augment measles vaccination coverage through SIAs have proven an effective platform for reaching more of the under-fives with high impact interventions such as ITN distribution, and vitamin A supplementation and de-worming tablets, further enhancing child survival. While integrated measles campaigns continue to serve as a model for improving child survival, there is a need for continued operational research to maximize the outcomes.

Intervention	Impact
Measles Immunization	Measles immunization provides protection against measles, reducing child mortality.
ITNs	Young children sleeping under ITNs avert deaths due to malaria.
Vitamin A	Vitamin A reduces risk of Vitamin A deficiency, which contributes to measles-related mortality as well as blindness and malnutrition.
De-worming Tablets	De-worming tablets improve physical and cognitive child development by avoiding malnutrition due to worms.

Building Strong Partnerships

Multi-intervention measles campaigns bring together partners at the global, country and sub-national levels. Creating strong partnerships at the country level is arguably the most difficult process and one of the factors most likely to determine the outcome of the campaign. The need to form strong and transparent working relationships between government agencies responsible for immunizations and other disease control programs is crucial. The value of partnerships created should not be seen as being limited to the life of the measles campaign, but should continue to support campaign evaluation efforts and future child survival activities. (See Box page 22 on Partnerships and Integrated Health Campaigns.)

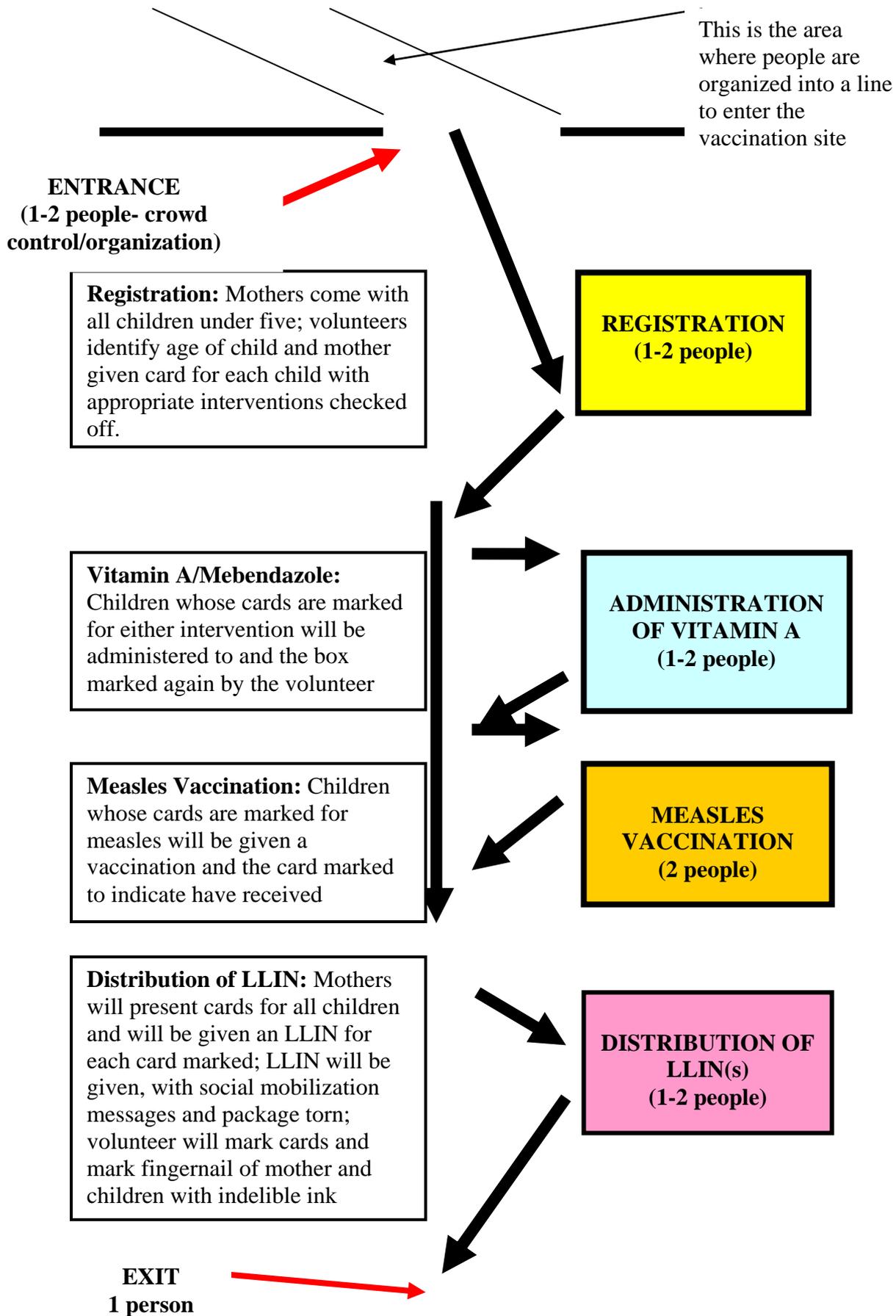
Lessons for Improvement

Over the course of implementing multi-intervention campaigns during the last seven years, many lessons have been learned. Combining high-demand health interventions with measles vaccination campaigns attracts high-level political support, allows for resources to be pooled, and increases community participation⁸. In addition, integrated immunization campaigns offer opportunities to reach a significant proportion of the population with health promoting interventions. However, integration activities need to be carefully planned in advance to avoid delays in the implementation of timely SIAs. Additionally, documentation of countries experiences should continue to be improved, specifically the undertaking of operations research to help formulate best practices (Figure 9).

⁷ Black, R.E., Morris, S.S., Bryce, J. Where and why are 10 million children dying every year. *Lancet* 2003; 361: 226-34.

⁸ Progress in measles control: Kenya, 2002–2007. *Weekly epidemiological record*, 2007, 82, 329–336

Figure 9: Example of an Integrated Delivery Post from campaigns in Kenya



Source: KEPI Training Field Guide Integrated Measles Follow-up, 2006

Partnerships and Integrated Health Campaigns

Madagascar

On 22 October, 2007 the government of Madagascar, in collaboration with international partners, launched a national integrated health campaign to vaccinate more than 2.8 million children against measles and distributed more than 1.5 million insecticide treated mosquito nets. From October 22-30, all children between 9-59 months were targeted to receive a measles vaccine. Mosquito nets were distributed to children in 59 districts, where malaria is most prevalent. In addition, all children in the target group received Vitamin A and de-worming medicine.

Prior to the campaign, health workers and trained volunteers informed families about the importance of vaccinations and proper health care. UNICEF, WHO and other agencies provided technical support to the government, including logistics, social mobilization, training, and monitoring and evaluation. Trained volunteers follow-up the campaign by educating families about how to properly use and care for mosquito nets.

Led by the Madagascar Ministry of Health and Family Planning, the integrated health campaign was a collaborative effort among the American Red Cross; the Canadian International Development Agency; the Canadian Red Cross; GAVI, the Global Fund to Fight AIDS, Tuberculosis and Malaria; Global Health Advocates, the International Federation of Red Cross and Red Crescent Societies; the Malagasy Red Cross; Malaria No More; the Measles Initiative; Population Services International; the President's Malaria Initiative; Roll Back Malaria Partnership; Sumitomo Chemical; UNICEF; United Nations Foundation; USAID; U.S. Centers for Disease Control and Prevention; Vestergaard Frandsen; World Health Organization; and others.

Indonesia

In September 2007, the government of Indonesia successfully completed a massive integrated health campaign, which began in 2004.

Responding to an urgent and specific need in numerous provinces throughout Indonesia, the Ministry of Health began its campaign in an effort to stop the spread of measles and strengthen the immunization system in areas affected by the 2004 tsunami.

More than 31 million children were successfully protected against measles. In addition, over two million insecticide-treated nets were distributed in 27 high malaria endemic districts in eight provinces. Before the campaign, only 1.9 percent of children slept under the anti-malaria nets. Now, an estimated 80 percent of children are sleeping under the protective nets in these districts. More than 21 million children were vaccinated against polio. Since February 2006, no confirmed wild polio virus cases have been detected. Many children also received vitamin A supplements, micronutrient sprinkles, and de-worming medicine.

To support the measles vaccination campaign, training was provided to mid-level managers and health workers, cold chain equipment in resource-poor health centers was improved and the monitoring system for management of adverse events following immunization was strengthened. External monitors present during the vaccination campaigns revealed that the safety and quality of immunization practices have improved over the multi-phased campaign. Considerable efforts are underway to strengthen measles surveillance with other vaccine-preventable diseases to monitor the impact of the multi-phased campaign.

This campaign was led by the government of Indonesia, with financial and technical support from the Measles Initiative.

3 (ii) Building Stronger Measles Surveillance Systems & Laboratory Network

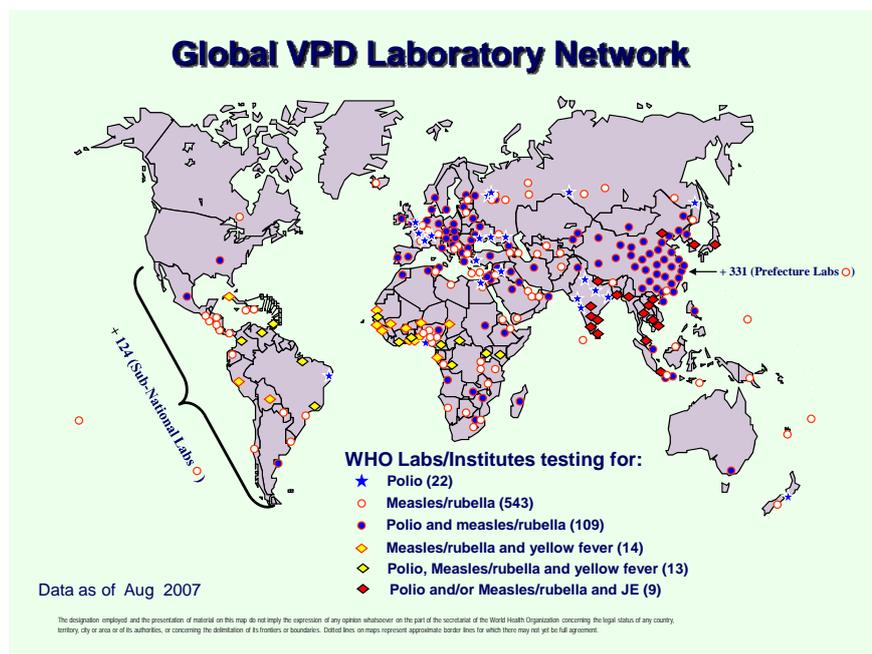
Integrating Surveillance Systems: Sharing Resources & Improving Efficiency

The global framework for immunization monitoring and surveillance (GFIMS) was developed by WHO, CDC, and other immunization partners as an extension of GIVS. One of the key messages and guiding principles is to link, whenever feasible, with existing surveillance and monitoring systems. Integration can reduce duplication, time and cost while increasing the efficient use of the often limited human and financial resources and physical structures.

Global Vaccine Preventable Disease (VPD) Laboratory Network

The WHO measles and rubella laboratory network (LabNet) has been established to provide a standardized testing and reporting and a global quality assurance program. The LabNet currently includes 688 laboratories serving 164 countries and has been developed using the successful model of the Polio Laboratory Network. This model consists of a tiered structure of labs with the following functions:

- National labs which perform primary testing of suspected cases
- Regional reference labs which support national labs through confirming their primary testing results and perform more technical testing, such as virus detection. Quality and performance of national labs are monitored regularly.
- Global specialized labs set the technical standards for laboratory diagnosis. They also support training and assure quality in national and regional labs and develop and validate new techniques.



All labs in the measles and rubella LabNet have the equipment and technical skills to perform serological testing for IgM. This capacity has been utilized for the development of other lab-based surveillance networks, such as Yellow Fever in the African region, and Japanese Encephalitis in the South East Asian and Western Pacific regions. Though these other VPD networks may utilize the measles and rubella LabNet infrastructure, additional financial and/or human resources, for their coordination, supplies and maintenance, are often limited. WHO supports lab coordinators in all regions, but in SEARO, WPRO and AMRO only one coordinator is responsible for all VPD LabNets in their region, including polio. Further resources are essential if new VPD lab-based surveillance is planned and if the quality of the current LabNets is to be maintained.

Measles surveillance and laboratory activities continue to help build stronger surveillance systems and laboratory networks, especially when those activities are part of a country's integrated system. Substantial fixed costs are involved in building and maintaining national surveillance and response systems and a limited number of countries can afford the cost of duplicative systems.

Where appropriate, the measles surveillance and laboratory network serve as part of the platform for an integrated disease surveillance and response (ISDR) system. Both AFRO and SEARO have developed regional integrated disease surveillance strategies, and surveillance activities using an integrated approach are under way in EMRO and EURO. Initially, many of these countries used the polio surveillance system as a platform for strengthening measles and rubella surveillance. Overall 131 countries have integrated measles surveillance into their AFP surveillance. In turn, the measles lab and surveillance system has helped to support surveillance for other VPDs, particularly the strengthening of Japanese Encephalitis and Yellow Fever labs. Integrating measles surveillance systems into other disease surveillance systems has resulted in improvements in infrastructure, capacity building, provision of needed personnel and outbreak response.

Laboratory-backed surveillance: Continued Improvements

Measles surveillance is an important tool for measuring the disease burden, studying morbidity and mortality trends and early detection of outbreaks for instituting effective control measures in a timely manner. It also provides essential data to monitor progress, improve planning and help allocate health resources more efficiently. Surveillance and the laboratory network play a critical role in directing program activities. This role is becoming more crucial as measles incidence decreases.

Given the overlap of the clinical presentations of measles and other rash fever illnesses (e.g. rubella, Parvovirus B19, HHV-6, dengue, and others), it is critical that laboratory investigation is carried out to confirm suspected cases as measles. This entails establishing case-based surveillance with investigation and laboratory testing of all suspected measles cases. The establishment and maintenance of a countrywide, active, case-based, laboratory-supported fever and rash surveillance system is one of the GFIMS goals to be achieved by 2010.

Considerable improvement has been made with global molecular surveillance of measles viruses. In the year 2000 five countries reported 74 viruses with genotype information to WHO compared with 40 countries reporting 970 viruses in 2006. Countries are encouraged to collect samples for measles virus detection from all outbreaks and many are reporting real-time sequence information to WHO which can help confirm transmission pathways and monitor success of immunization activities.

▪ Case-based surveillance continues to climb

In 2007, of 193 WHO member states, 146 (76%) have implemented case based measles surveillance compared to 120 (62%) countries in 2004 (data prior to 2004 not available). Annual reporting of measles surveillance data to WHO increased from 88% of countries in 2000 to 93% in 2006.

There was a 56% decrease in the global number of reported measles cases in 2006 (373,421) compared with 2000 (852,937). However, the number of reported cases in the European region increased from 37,421 in 2000 to 53,344 in 2006, primarily due to large measles

outbreaks in Ukraine and Romania. In addition, the number of reported cases in the South East Asian region increased from 78,574 in 2000 to 94,562 in 2006, primarily due to improvement in measles surveillance in India and Indonesia.

As an indicator of the sensitivity of measles surveillance systems, WHO established a minimal reporting rate of two non-measles febrile rash illness per 100,000 population nationally. Among the 146 countries doing case-based surveillance in 2007, 46 (32%) countries have met this surveillance performance indicator.

▪ **Lab Network: More Labs, Greater Workload, Improved Quality**

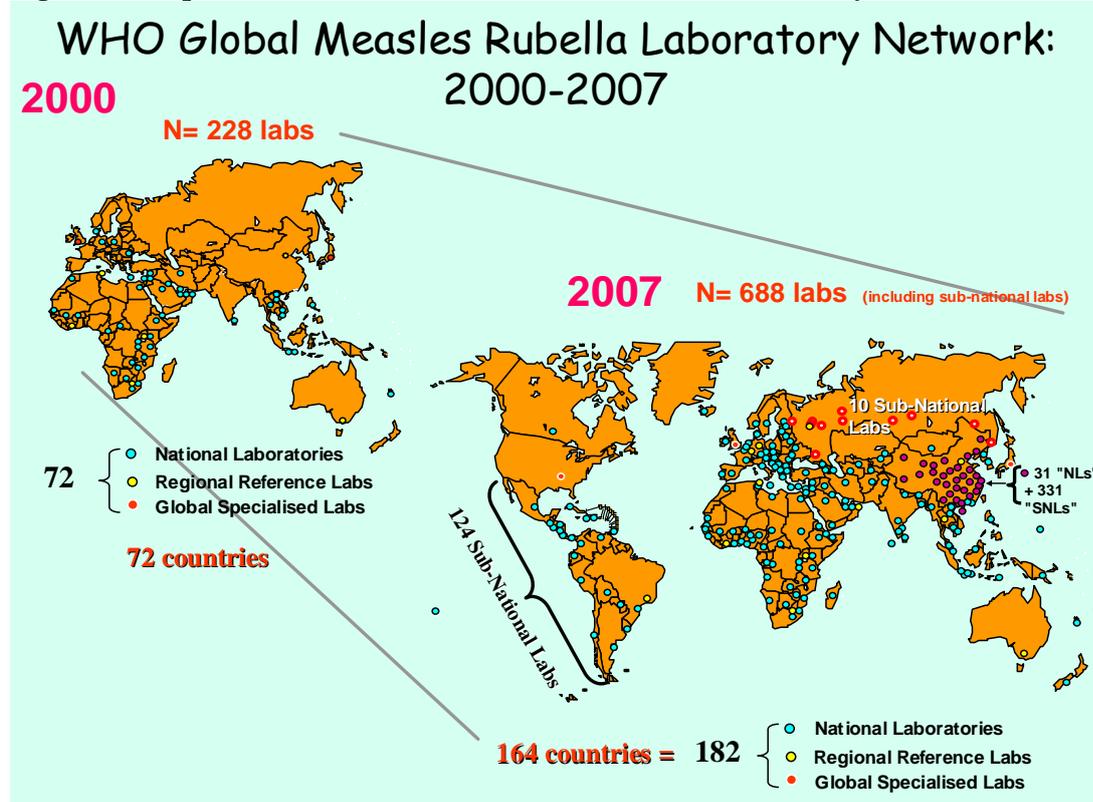
In 2000, the WHO measles and rubella laboratory network (MRLN) consisted of 228 measles laboratories, up from fewer than 40 measles laboratories in 1998. By 2007 this network had further expanded to 688 national and sub-national laboratories serving 164 countries (Table 6 and Figure 10).

Table 6: Comparison of Number of Laboratories, 2000 and 2007

Lab Numbers:
2000 and 2007

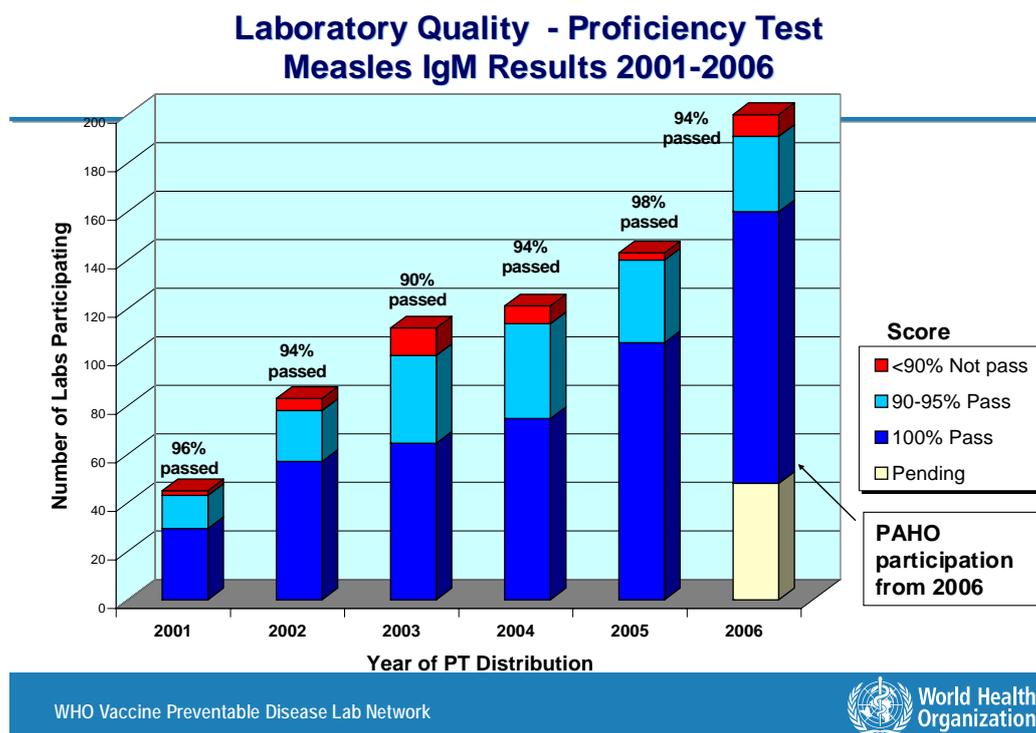
	2000	2007
Countries	72	164
Sub-National Labs	125	475
National Labs	55	160
Regional Reference Labs	14	19
Global Specialized Labs	3	3
China Provincial Labs	31	31
TOTAL	228	688

Figure 10: Expansion of Laboratories in Global Measles Laboratory Network, 2001-2007



National or sub-national laboratories perform ELISA tests for measles IgM antibody on serum samples collected from persons with suspected cases at first contact with a health facility. Testing of specimens for rubella IgM antibody is also performed in many countries on specimens testing negative for measles IgM antibody. More than 180,000 serum samples were tested globally in 2006, an increase from 119,000 tested in 2005. More than 80% of laboratories met the timeliness performance target of reporting at least 80% of results within 7 days of receipt of the sample. Annual MRLN proficiency testing has been conducted since 2001 (Figure 11). Of the 163 national laboratories which participated in the 2006 assessment, 160 (97.5%) met the proficiency requirement. A similar proficiency testing program has been established for sub-national laboratories.

Figure 11: Laboratory Network Proficiency Testing, 2001-2006



The Measles Strategic Planning Tool: Improving Estimates of Global Measles Burden

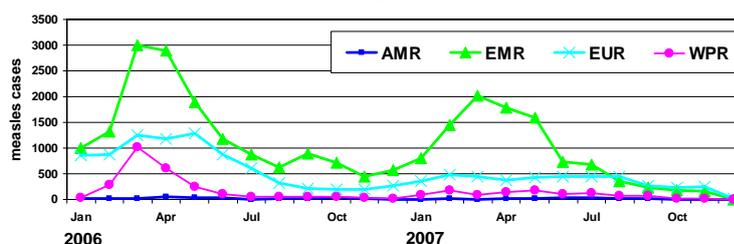
Because surveillance data do not allow direct measurement of global measles mortality, models continue to be used for this purpose. An expert panel in 2005 noted that a natural history approach using a static model would become less robust as measles incidence decreased further. To improve the estimation of measles disease burden as measles incidence declines and to allow country-specific evaluations, WHO has developed a quasi-dynamic model. This tool, the measles strategic planning (MSP) tool, allows the estimation of measles deaths based on immunization coverage. The MSP tool was reviewed in September 2007 by the Quantitative Immunization and Vaccine Related Research (QUIVER) Advisory Group and considered superior to the previous static model for estimating trends in measles mortality. After appropriate validation and adjustments have been made, the MSP tool can be used to generate annual estimates of global measles burden beginning in 2008. Additionally, the MSP tool can also be used by national immunization programs to assess the impact of different strategic options and to help inform decision making.

Global Measles Monthly Reporting System

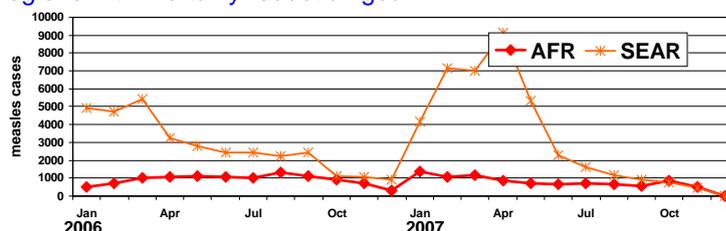
- Starting in 2003, regional offices began reporting surveillance and laboratory data to WHO Headquarters, with all regions reporting as of the 4th quarter 2006.
- As of 4th quarter 2007, 157/192 (82%) countries provide data to WHO regional offices on a weekly or monthly basis.
- A monthly global summary is prepared by HQ for distribution to measles focal points and partners (as of September 2007) for improved program decision making (e.g. see graph below on monthly case distribution).
- Additionally, regional surveillance bulletins are produced by the Regions.
- While there has been improvement in data collection and sharing, there remain weaknesses: (1) data only represents 58% of total population as India and China are not reporting; and (2) there are discrepancies between the data from field surveillance and data from the laboratory as well as differences in case counts in the monthly versus annual data. Continued improvements in laboratory and field surveillance will help target measles control activities.

Measles Case Distribution by Month and WHO Regions, 2006-2007

Regions with measles elimination goal



Regions with mortality reduction goal



SEAR data only represents 33% of total SEAR population;
WPR data only represents 15% of total WPR population;

Note: Number of reported cases in last three months is likely to increase as data will be updated

Data source: surveillance DEF file
Data in HQ as of 24 January 2008



Links to regional bulletins

- AFR monthly feedback tables <http://afro.who.int/measles/monitoring.html>
- AMR: (weekly bulletin published every Friday)
<http://www.paho.org/English/AD/FCH/IM/MeaslesWeeklyBulletin.htm>
- EMR: <http://www.emro.who.int/vpi/measles/Bulletin.htm>
- EUR :
periodical bulletin: http://www.euro.who.int/vaccine/publications/20050603_2
monthly data: <http://data.euro.who.int/cisid/?TabID=96712>
- SEAR: (monthly bulletin)
<http://www.searo.who.int/en/Section1226/showafpmonth.asp>
- WPR: (periodical newsletter)
<http://www.wpro.who.int/sites/epi/documents/MeaslesBulletin.htm>

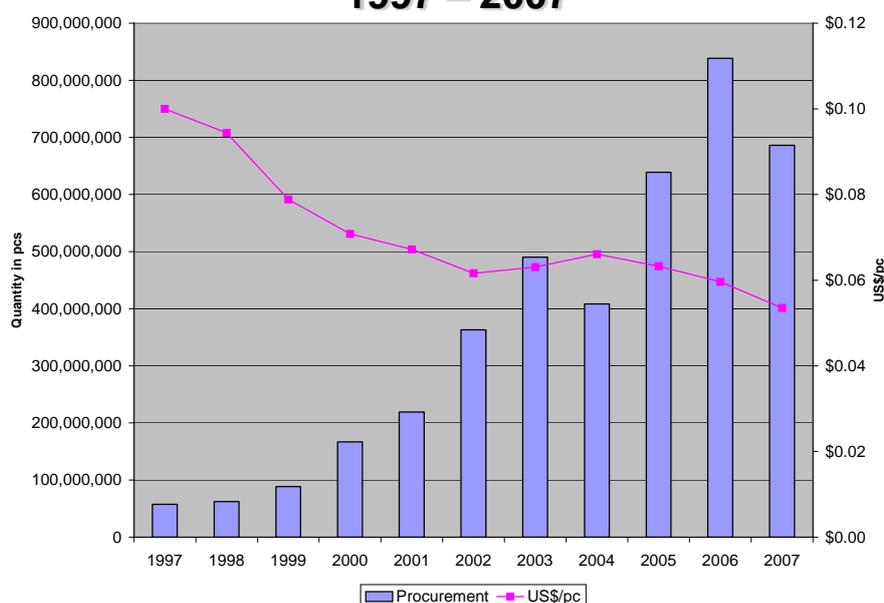
3 (iii) Promoting Injection Safety and Raising the Standards

Measles vaccination campaigns pose specific 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 of the most notable challenges are injection safety, including waste management, and appropriate management of adverse events following immunization (AEFI).

Catalyzing the Use of Autodisable (AD) Syringes: Improving Injection Safety

To reduce the risk of spreading bloodborne diseases through reuse of needles and syringes, (thus improving injection safety) WHO and UNICEF recommended that autodisable (AD) syringes be used for all immunizations. Since their introduction in the mid-1990s, AD syringes have been widely accepted and are now used for approximately half the immunizations given globally. First wide-spread use began with measles campaigns and since 2000, no Measles Initiative funded campaigns have been conducted without AD syringes and safety boxes. Measles campaigns became the driving force to improve the training and use of AD syringes and to lower the price, catalyzing the introduction of AD syringes into many countries. There are currently over 138 countries using only AD syringes and safety boxes for their immunization services. In 1997, UNICEF purchased 50 million AD syringes, increasing to almost 700 million in 2007 (Figure 12).

Figure 12: **UNICEF Procurement of 0.5 ml AD syringes 1997 – 2007**



Closing a Gap in Injection Safety

AD syringes for injections have significantly improved injection safety, but efforts to further reduce risks continue. In 2007, a field evaluation of the introduction of WHO pre-qualified reuse prevention feature (RPF) reconstitution (“mixing”) syringes in measles campaigns was conducted. The evaluation provided key data on performance, acceptability and training requirements. Use of RPF reconstitution syringes in conjunction with AD syringes will eliminate all possibility of reuse of reconstitution syringes during immunization campaigns, closing a current injection safety gap. The results of this research have been crucial as

UNICEF prepares to supply RPF reconstitution syringes to immunization programs in 2008 with the objective to only provide RPF reconstitution syringes after 2010.

Contributing to Sustainable Waste Management Solutions

There is more to injection safety than just AD syringes and safety boxes. While their use during measles immunization campaigns has greatly reduced the risk of bloodborne diseases, their use has increased the amount of waste generated. The safe disposal of such waste has raised the need for safe waste management for all immunization waste, addressing both health and environmental risks. Waste management is often a neglected and/or underfunded component of both curative and preventive health services (including immunizations). Increased efforts are being made to include waste management activities and costs in measles SIA plans. In the high burden countries, cold chain and waste management represent 2% of the cost of planned activities for 2006-2010⁹. Additionally, by the end of 2008, 90% of countries receiving funding from GAVI will have adopted policies and plans on safe health care waste management. These efforts are contributing to development of more sustainable waste management solutions for other parts of the health system.

Despite better waste management planning and funding, there is currently no ideal solution for immunization waste. The three methods commonly used in developing countries for the safe disposal of used injection equipment are burying, burning, and incineration. Until countries have access to health-care waste management options that are safer to the environment and health, incineration may be an acceptable response when applied appropriately. Key elements of appropriate operation of incinerators include effective waste reduction and waste segregation, placing incinerators away from populated areas, satisfactory engineered design, construction following appropriate dimensional plans, proper operation, periodic maintenance, and staff training and management.

As per the new WHO guidelines on waste disposal, measles campaigns are moving away from burning to high grade incineration. The strategies being employed for the measles campaigns help strengthen waste management practices for not only routine vaccinations, but all injections (e.g. curative, therapeutic, etc.) given at health centers. Measles campaigns have served as a model for promoting injection safety, including improved waste management, and raising the standards. For 2007, all countries implementing measles campaigns, with a few exceptions in Africa, have a national strategy or plan for injection waste management.

Facilitating AEFI Surveillance via Campaigns

Another area of injection safety particularly important to measles campaigns is adverse events following immunization (AEFI) surveillance and the prevention and management of these events. An AEFI is any adverse event that follows immunization that is believed to be caused by the immunization.

To prevent and properly manage AEFI, some form of adverse event monitoring is essential. Measles campaigns provide a unique opportunity to 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 launch AEFI surveillance activities, which can be maintained and later expanded into the routine immunization system. (The establishment and maintenance of AEFI surveillance is a WHO priority).

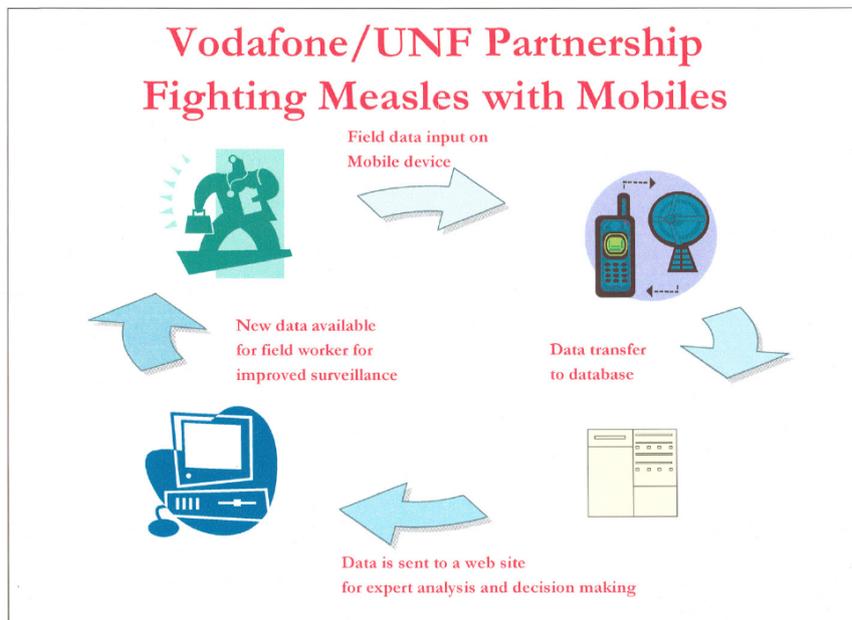
⁹ Measles Investment Case II, 2005

For 2007, all countries implemented satisfactory AEFI surveillance during measles campaigns. This increases the overall quality and outcomes of campaigns and reduces the risk of negative publicity and public resistance against immunization in general. This is particularly important as improperly managed AEFI after measles campaigns has the potential to impact the entire immunization system, if public and donor confidence is impaired. The implementation of safety surveillance for measles campaigns offers countries the opportunity to avoid crisis situations and to begin vaccine safety monitoring in routine immunization programs

Bringing Hand-held Technology to the Field Fighting Measles with Mobiles in Africa

The United Nations Foundation working in partnership with the Vodafone Group Foundation launched a major program in June 2006 to fund training, software, and personal digital assistants (PDAs) for health data officers in Kenya and Zambia to support the fight against measles, through the NGO DataDyne.

The results from the two-country pilots were impressive: increased speed, collection, reporting, analyzing and use of data; increased completion and accuracy of data; and decreased costs. WHO and Ministries of Health see the use of digital health data systems powered by PDA as a way to further improve the effectiveness and efficiency of measles control efforts in Africa. In 2007, the program was rolled out in 10 measles-affected countries in Africa, with another 10 expected in 2008. This technology will also be made available to health workers fighting other diseases, such as malaria, and to integrate additional applications, such as health mapping.



3. (iv) Capacity Building – Assuring Quality and Sustainability

Capacity building is a core requirement to efficiently meet measles mortality reduction goals in a sustainable way. Capacity building is much more than training. It covers a broad spectrum of approaches and targets to strengthen knowledge, abilities, skills and behaviors of individuals and improve institutional structures and processes.

- **Human Resources Capacity Building**

One of the main components of measles capacity building activities is human resource development – equipping individuals with the understanding, skills and access to information, knowledge and training that enables them to perform effectively. This is mainly achieved by providing technical assistance (TA), including consultants, to regions and priority countries in areas such as disease surveillance, laboratory diagnosis, micro-planning, logistics, measles case management, training health workers, monitoring and evaluation, communications and social mobilization. In addition to technical assistance, health workers are trained for the campaign using the standard EPI training modules. Where possible, measles TA is pooled with broader immunization TA efforts, including the Polio Eradication Initiative.

- **Laboratory Capacity Building**

Laboratory capacity building is carried out through training lab staff in standardized testing and reporting procedures, and in the implementation of QA methods. Training opportunities are supported by Global Specialized labs and are held on a regular basis to accommodate new techniques, staff turnover and to strengthen deficiencies detected through the QA program. For logistical and financial purposes, training is usually held as a regional workshop, with multiple national labs attending, but it may also involve individual national lab staff being trained at reference or specialized labs, or through specialized trainers visiting individual national labs.

- **Health Systems Capacity Building**

In order for health systems to function properly, i.e. the ability to respond to the needs of the population, there must be strong surveillance systems and laboratory capacity. Surveillance systems continually measure the level of health of the population. Measles activities to strengthen surveillance and increase lab capacity, along with integrating surveillance of other diseases, contribute directly to the overall improvement of the health systems. (See Section 4 for Strengthening Routine Immunization.)

3. (v) Social Mobilization by Volunteers: Setting the Stage for Success

Social mobilization is a strategic activity before, during and after measles campaigns, primarily aimed at creating demand. Engaging the community has been shown as being essential to achieving high vaccination coverage. It involves planned actions and processes to reach, influence, and involve all relevant segments of society across all sectors from the national to the community level, in order to create an enabling environment and effect positive behavior and social change.



Red Cross volunteer gathering children (Photo Credit: Marko Kokic, IFRC)

*Mobilizing the power of humanity...
Reaching the 'hard to reach'...
Finding the most vulnerable.....
---- at the volunteer level.*

Quote Source: Kate Elder Presentation, September 2007



LDS volunteer helping with record keeping during campaign
(Photo Credit: Blair Packard, Mozambique Measles Campaign)

Country-level social mobilization efforts have contributed to strong community-demand for measles vaccination and other health interventions as the number of integrated campaigns conducted increase. This has resulted in improved use of the service 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. 17,000 in 2006 and 11,500 in 2007

Countries where participated:
2006: Angola, Ghana, Kenya, Lesotho, Namibia, Sierra Leone, Swaziland, Uganda & Zimbabwe
2007: Armenia, Congo, DR Congo, Lesotho, Madagascar, Mongolia, Philippines, Togo, & Zambia

Activities: Social mobilization (including training and community outreach) & assistance at vaccination sites (e.g. crowd control, vaccinations & record keeping)

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 15,000 in 2006 and 21,000 in 2007

Countries where participated:
2006: Angola, Bangladesh, Burundi, Cameroon, CAR, Chad, DR Congo, Ethiopia, Ghana, Indonesia, Kenya, Nigeria & Uganda
2007: Cameroon, Cambodia, Congo, DPRK, Ethiopia, Gabon, Gambia, Indonesia, Lesotho, Liberia, Madagascar, Mali, Myanmar, and Pakistan

Activities: Responding to governments requests, social mobilization (community outreach and education, finding 'hard to reach', increasing demand, etc.), assistance at vaccination site (logistics and site management & bringing eligibles to site) & monitoring and surveillance

Overall Challenges: Continued strong planning & preparation with support of Federation and expanding number of volunteers

The increased demand is due in part to the social mobilization efforts by UNICEF and the NGO community (notably IFRC and the LDS, see Boxes above) and its volunteers. NGOs and community-based organizations are partners in planning, coordination, implementation and follow-up of campaigns. They play an extremely important role in providing volunteer assistance, which has been instrumental to the success of measles campaigns, especially in Africa. Volunteers provide assistance: for social mobilization (raising awareness, community education, spreading key messages, finding the 'hard to reach'/most vulnerable, dispelling myths and increasing demand for vaccinations and responding to those demands), at vaccination sites (logistics and site management as well as bringing eligibles for vaccination); and for monitoring and evaluation, especially surveillance activities. Volunteers are becoming even more crucial to the success of campaigns as other child survival interventions are integrated, e.g. ITNs, which require additional manpower and community education. Not to be overlooked is the economic contribution of volunteer time, which is estimated to total about 6% of overall costs for the period 2005-2010¹⁰.

¹⁰ Measles Investment Case II, 2005

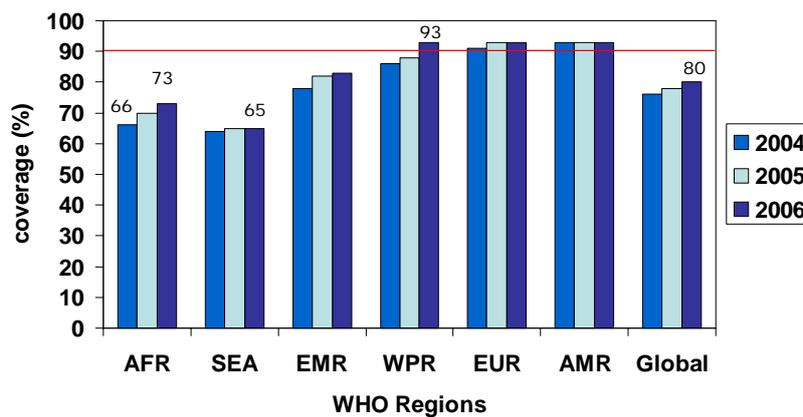
4. Strengthening routine immunization: Moving forward, but not there yet

Highest routine coverage to date, but still need SIAs

Strong routine immunization is one of the key requirements for reaching the goal of sustainable measles mortality reduction by 2010. Without strong routine immunization services, it will not be possible to reach >90% coverage with the first dose of measles vaccine

Figure 13: Routine Measles Vaccination

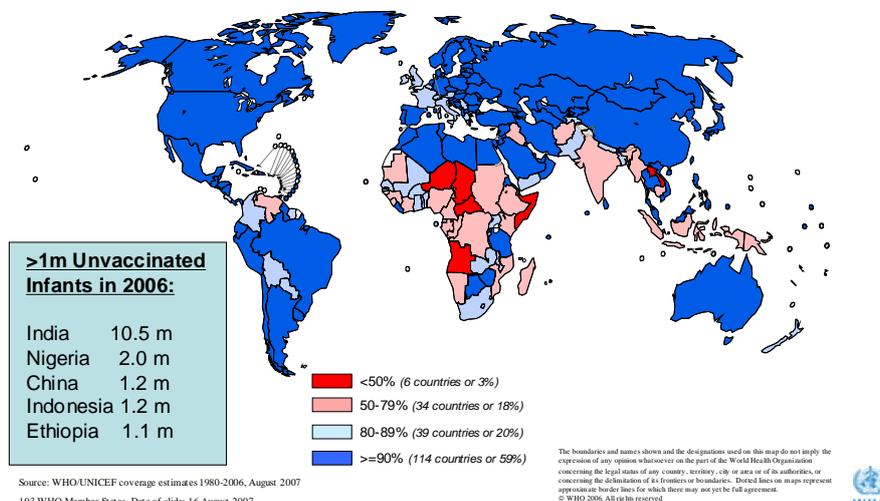
First Dose Measles Vaccination Coverage, by WHO Region and Global, 2004, 2005, 2006



Source: WHO/UNICEF Estimates of National Immunization Coverage as of August 2007

by 12 months of age in every district delivered through routine services. For the first time, global routine measles vaccination coverage reached 80% in 2006, increasing from 72% in 2000 (Figure 13). Despite the improvement in all regions, particularly the African region, routine coverage is still not high enough to stop SIAs. Large countries like China, India, Nigeria, Indonesia and Ethiopia still have large numbers of infants who missed their first dose of vaccine through routine immunization (Figure 14).

Figure 14: Immunization coverage with measles containing vaccines in infants, 2006



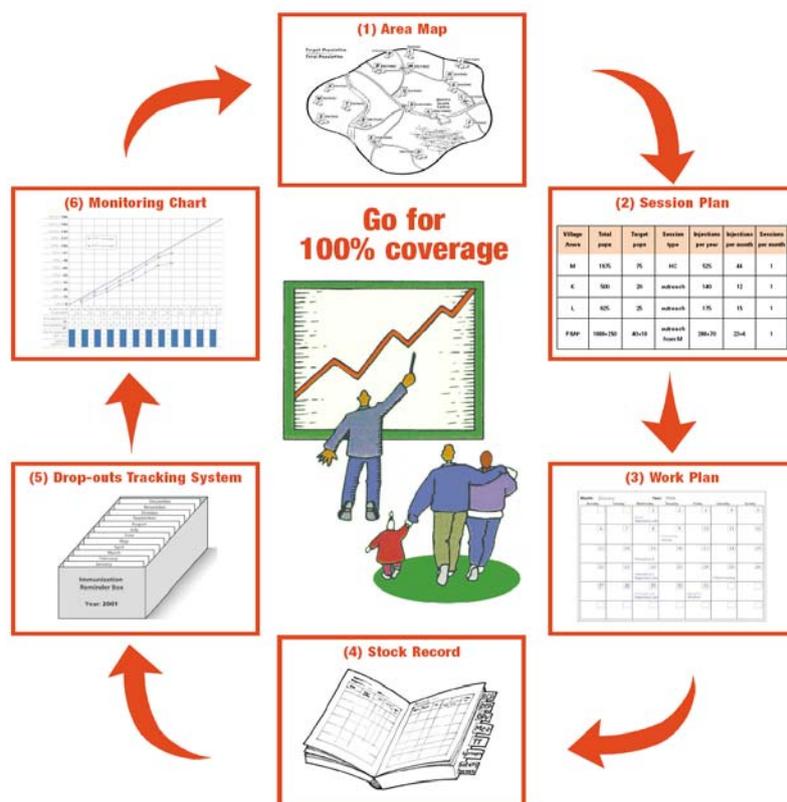
Infrastructure Improvements

Planning and implementation of measles SIA activities play an important role in the strengthening of routine immunization by improving key components of the immunization (and health) infrastructure. This includes forging and strengthening local partnerships, tackling cold chain logistics, promoting and building capacity for injection safety and waste management, strengthening disease surveillance systems and promoting the use of surveillance data for program management. Funding from measles campaigns have been used for cold chain equipment (carriers, ice packs), training (national and local), injection safety (assessments and AD syringe introduction), waste management (incinerators), surveillance (staff, data managers and equipment), and lab network (equipment and kits). This has helped strengthen the backbone of the routine infrastructure.

▪ Building up the system at district level through micro-planning

A key tool being used in many regions is the “Reaching Every District” (RED) approach, which seeks to increase overall access to immunization services and utilization of those services, particularly through micro-planning, outreach and monitoring at district level (see box next page). Since 2002, 56 countries have started implementing RED strategies. Country evaluations in 2005 and 2007 have shown that implementation of the RED strategy results in significantly more infants being reached. By increasing immunization coverage in every district, the RED strategy is a valuable tool to achieve both the 2010 measles & 2015 MDG goals.

RED Planning Elements Poster: 6 Tools¹¹



The planning and monitoring of measles campaigns presents opportunities for district level capacity building, primarily through training and support in micro-planning. The focus is on addressing common obstacles to increasing immunization coverage, especially in the underserved and hard-to-reach target groups. Measles campaign micro-planning has served as basis for micro-planning for routine services, thus strengthening health systems and improving access to vaccination services.

¹¹ Source: http://www.who.int/immunization_delivery/systems_policy/Final-RED%20poster.pdf, accessed 20 Nov 2007

The “Reaching Every District” Strategy

"Reaching every district" (RED) is a strategy to achieve the 2010 GIVS goal of 80% immunization coverage in all districts and 90% nationally in the WHO member states. RED aims to fully immunize every infant with all vaccines included in the national immunization schedule of countries. In order to achieve this goal, the strategy focuses on building national capacity from district level upward to maximize access to all vaccines, old and new.

RED addresses common obstacles to increasing immunization coverage such as poor quality district planning, low quality and unreliable service, inadequate monitoring and supervision of health workers.

The five RED operational components

1. Re-establishing outreach vaccination services

In many countries, a large proportion of the population only has access to immunization through outreach services. Outreach sessions, particularly mobile immunization teams, present opportunities to provide other interventions such as administering vitamin A and de-worming tablets with immunization.

2. Supportive supervision

Supportive supervision includes providing regular on-site training and assistance by supervisors to health workers in the district. It should be held during supervisory visits or at regular district meetings. It also offers the opportunity to integrate supervision of other health interventions, for example Integrated Management of Childhood Illness (IMCI).

3. Linking services with communities

Immunization services need to be integrated better into community structures. This can be achieved by involving the community in the planning and delivery of health services, including immunization, such as identifying community volunteers and designating responsibilities such as identifying newborns in the district and performing regular follow-up on mothers whose children are not fully immunized as well as organizing regular meetings with the community.

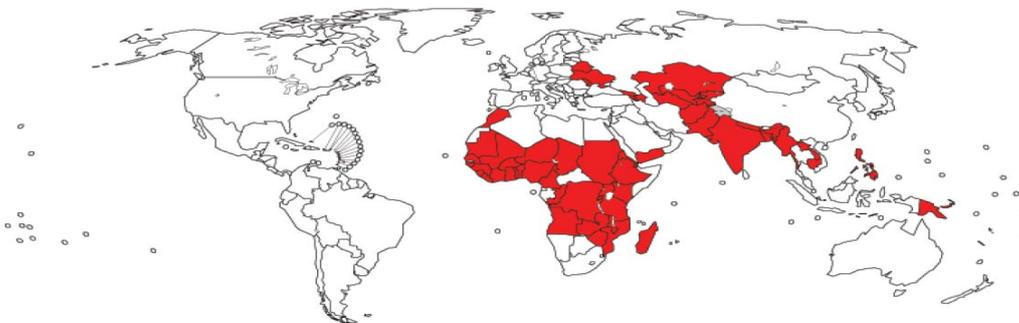
4. Monitoring and use of data for action

Monitoring of immunization activities and using the data for action is critical in strengthening the immunization system. Some simple monitoring tools such as wall charts of vaccination coverage can be used to track monthly progress. In addition, information on logistics, vaccine supply and surveillance which is collected every month should be analyzed together with the coverage data to improve the immunization system.

5. Planning and management of resources

A micro plan is the key to the RED strategy. At each level, micro plans should contain details of the financial and human resources required to reach every district in a sustainable manner.

Countries with implementation of 'RED' activities in 2002–2006



Source: WHO RED Fact Sheet, October 2006

Maintaining all the Links in the “Cold Chain”

The measles vaccine must be kept cold to remain effective. This requires what is known as the “cold chain” – the system of preservation and distribution of vaccines from the manufacturer to the field. Establishing and maintaining the cold chain infrastructure is complex and challenging, but on which every vaccination program (campaign or routine) is dependent. Any gaps in the cold chain infrastructure must be closed by ensuring the soundness and continuity of “all the links in the chain”. During planning and implementation of measles campaigns, gaps are identified and addressed, e.g. through purchasing of much-needed cold chain equipment or the training of health workers. Measles activities continue to contribute to the overall strengthening of the cold chain infrastructure. In 2007, for example, 8 generators for Sudan, almost 500 refrigerators for Cuba, 114 voltage stabilizers for Armenia and 1500 thermometers for Uzbekistan were purchased to expand cold chain capacity. Support will continue to concentrate on systems (policies), equipment, storage, transport and capacity building (training and technical assistance). This is especially important as increased burdens are placed on the cold chain infrastructure with the introduction of new vaccines.

Creating Partnerships to Close Links in the Cold Chain

Maintenance of the cold-chain infrastructure is a challenge in many parts of Central and Eastern Europe and the Commonwealth of Independent States region. Outdated equipment, a lack of spare parts, the unclear designation of responsibilities and a shortage of funds are to blame.

In 2006, Turkmenistan’s Ministry of Health took important steps to improve the management of the cold-chain system. Training was provided to health workers in partnership with UNICEF. The maintenance functions were outsourced to specialized professionals, and the ministry reached an agreement with the Turkmen company ‘Turkmentorgremont’ for the service and the maintenance of the immunization refrigeration equipment in Ashgabat. Additionally, all provincial cold rooms were urged to engage in similar service arrangements, with the cost of repairs covered by the Ministry of Health.

For the measles-rubella immunization campaign, the Ministry of Health concluded an agreement with the Turkmenistan meat and dairy products industry for the temporary storage of vaccines. This partnership was extended to include the temporary storage of vaccines when needed – such as during other mass immunization campaigns or in case of power cuts.



© UNICEF Turkmenistan/2006/Popovic

A toddler in Turkmenistan receives the measles vaccine from nurse Gulaylek Perdzikova at the polyclinic in Abadan.

Measles Initiative Catalyzes Regional Rubella Elimination

Based on success with measles and rubella elimination in the Americas, the WHO Regional Office for Europe (EURO) launched in 2005 a strategic plan to strengthen immunizations systems through measles and rubella elimination and the prevention of congenital rubella infection by 2010.

All Member States in the Region now have a two dose schedule. The use of rubella-containing vaccine for routine immunization by Member States has increased from 38 in 2001 to 50 in 2006 (see map).

SIAs are identified in the WHO European Regional strategy as an effective and efficient method to rapidly develop the level of population immunity required to meet Regional objectives for these diseases. Since 2001, 1 to 3 countries per year have conducted large age-group (including women of child-bearing age) measles-rubella catch-up campaigns to introduce rubella into the routine immunization program.

To assist countries, the Measles Initiative expanded its support to include 4 countries in the Region (Armenia, Georgia, Ukraine and Uzbekistan) during 2007-2008. Given the Regional rubella elimination goals and the high age group of measles susceptibles, all four countries will immunize women of child-bearing age with rubella-containing vaccine during measles SIAs.

The Measles Initiative has not only stimulated the introduction of rubella vaccine into countries of the former Soviet Union, but also provided needed funding for measles-rubella SIAs. Each of the countries supported by the Initiative has agreed to introduce MMR in their routine immunization. By 2008, all countries in the Region, except Tajikistan, will continue to include and finance rubella vaccination in routine immunization services.

Armenia

The Government of Armenia endorsed a measles and rubella elimination national strategy for 2007-2010 to be achieved through continuous implementation of the national immunization schedule, coupled with mass measles-rubella vaccination campaigns. From 1-13 October 2007, Armenia conducted the first campaign during which 1,200,000 people aged 6-27 were vaccinated against measles and rubella.

UNICEF and other partners delivered over 1.5 million doses of Measles and Rubella combined vaccine, 1.5 million auto-disable syringes to ensure safe injections, a cold room, 97 refrigerators, and 3,500 vaccine carriers with icepacks to ensure proper storage and transportation of vaccines and 1,800 first aid kits.

5. Working in Partnership: The Key to Continued Success

The tremendous progress towards reducing measles deaths is the result of the hard work and dedication of the national governments and all partners to achieve a common goal – reducing measles mortality. From community members, health workers and nongovernmental organizations to international bodies and foundations, partnerships have been the key to success. They have proven invaluable, especially for integrated campaigns, in providing financial contributions, strengthening advocacy, political and social commitment, and in communicating the positive impact and success of measles mortality reduction activities. Current partners will need to continue working closely while making efforts to forge new relationships with others to secure the necessary support and financial resources to further reduce global measles deaths.

There are more than 25 partners participating in the Measles Initiative. In addition to the core partners, key players include: GAVI, Global Payments, Inc., International Federation of Red Cross and Red Crescent Societies, the Canadian International Development Agency (CIDA), the Japanese Agency for Development Cooperation (JICA), the Bill and Melinda Gates Foundation, Becton, Dickinson and Company, the Izumi Foundation, the Vodafone Group Foundation, the Church of Jesus Christ of Latter-day Saints and high burden disease countries.

Partnership for Innovative Financing

In February 2007, GAVI facilitated a US\$139 million contribution to the Measles Initiative. This contribution was made possible by an innovative new initiative known as the International Finance Facility for Immunization (IFFIm), support by 7 donor governments (France, Italy, Norway, South Africa, Spain, Sweden and the UK). The aim of the IFFIm is to accelerate the availability of funds to be used for health and immunization programs through GAVI in the world's poorest countries to support the achievement of the MDGs. By investing the majority of resources up front—"frontloading"—this innovative funding program will increase significantly the flow of aid to ensure reliable and predictable funding flows for immunization programs and health system development during the years up to and including 2015. An anticipated IFFIm investment of US\$4 billion is expected to help prevent five million child deaths between 2006 and 2015. The Measles Initiative was one of the first programs to benefit from IFFIm funding in 2007, which will help expand the Initiative's global efforts over the next four years.

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 supporting safe immunization practices.

The American Red Cross leads the U.S.-based partnership. It coordinates with partners, provides funding and works with national Red Cross/Red Crescent Societies to mobilize parents and caretakers to immunize their children.

The UNF manages the funds of the Measles Initiative through an agreement with the United Nations. Under this agreement, the UNF: manages and coordinates all 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.

6. Looking Forward...Setting the Stage for the MDG 2015 Goal

Substantial progress has been made towards achieving the 2010 goal for measles mortality reduction. Measles campaigns alone have dramatically reduced prevalence of this disease, yet much remains to be done. The measles mortality reduction strategy has shown to be an appropriate platform for delivery of other high impact interventions to children under five, enhancing significantly the reduction in child mortality and achievement of MDG4. Governments must continue to make efforts to increase coverage of measles vaccination in SIAs and fully integrate measles activities into routine immunization programs and ensure adequate and sustainable financing for those programs. While international partners are committed to help fill financing gaps, governments will need to secure the majority of resources for measles activities. This will particularly be the case for follow-up campaigns as governments will be required to cover 50% of the operational costs. Additionally, countries, particularly India, will need to complete catch-up campaigns. The RED approach should be further implemented to increase 1st dose coverage in every district through strengthened routine services. To maximize the benefits of integrating child health interventions, continued and improved planning and coordination with other child health programs is crucial, especially with polio eradication, malaria prevention and nutrition. Ultimately, the primary responsibility for reducing measles deaths lies with national governments. Continued ownership and commitment lies at the heart of success.

“We reaffirm our commitment made the G8 and the EU to provide the financing needed to meet our health commitments through the established institutions and mechanisms.....We will also explore innovative mechanisms to meet these commitments.”

German Chancellor Andrea Merkel and UK Prime Minister Gordon Brown, on the launch of the International Health Partnership to move forward the MDGs, 24 August 2007.

“We are winning the fight against measles, which has long killed, sickened and disabled our children. Our determination is stronger than ever to make measles history by further strengthening our measles control activities, working in concert with our international partners and setting aside resources.....”

Mr U Olanguena Awono, Minister of Public Health, Cameroon, as quoted in news release “Global goal to reduce measles deaths in children surpassed”, 19 January 2007.

Annex 1

Measles, Rubella and Mumps Bundled Vaccine Supplies for SIAs in 2007 ¹² Supplies Procured through UNICEF Supply Division								
#	Country	Vaccine	Quantity (ds)	Cost of vaccine	Cost of AD syringes	Cost of Reconstitution syringes	Cost of Safety Boxes	Total cost
1	Afghanistan	Mea-10	3'150'000	\$567'000	\$189'000	\$10'080	\$32'918	\$798'998
2	Armenia	MR-10	1'492'000	\$692'288	\$89'520	\$4'774	\$15'591	\$802'174
3	Bolivia	MMR-1	145'000	217'500.00	144'210	\$140'694	\$41'612	\$2'412'326
		MR-10	4'026'530	1'868'309.92				
			4'171'530	2'085'809.92				
4	Burkina Faso	Mea-10	4'049'900	\$1'052'974	\$242'994	\$12'960	\$42'321	\$1'351'249
5	Comoros	Mea-10	321'000	\$57'780	\$19'260	\$1'027	\$3'354	\$81'422
6	Congo Braz	Mea-10	892'800	\$160'704	\$53'568	\$2'857	\$9'330	\$226'459
7	Cuba	MMR-1	99'960	249'900.00			\$21'903	1'830'283
		MMR-10	1'113'200	1'558'480.00				
			1'213'160	1'808'380.00				
8	DR Congo	Mea-10	5'163'100	\$929'358	\$309'786	\$16'522	\$53'954	\$1'309'620
9	Ethiopia	Mea-10	1'300'000	\$234'000	\$78'000	\$4'160	\$13'585	\$329'745
10	Gabon	Mea-10	268'500	\$48'330	\$16'110	\$859	\$2'806	\$68'105
11	Gambia	Mea-10	444'000	\$79'920	\$26'640	\$1'421	\$4'640	\$112'621
12	Guyana	MMR-1	32'300	70'550.00	\$1'426	\$192	\$5'578	\$83'345
		MMR-10	5'000	5'600.00				
			37'300	76'150.00				
13	Haiti	MR-10	5'214'000	\$2'419'296	\$312'840	\$16'685	\$54'486	\$2'803'307
14	Indonesia	Mea-20	15'765'400	\$2'207'156	\$945'924	\$25'225	\$164'748	\$3'343'053
15	Iran	MR-10	500'000	\$232'000	\$30'000	\$1'600	\$5'225	\$268'825
16	Korea DPR	Mea-10	17'010'000	\$3'061'800	\$1'020'600	\$54'432	\$177'755	\$4'314'587
17	Lao PDR	Mea-10	2'506'000	\$451'080	\$150'360	\$8'019	\$26'188	\$635'647
18	Lesotho	Mea-10	250'000	\$45'000	\$15'000	\$800	\$2'613	\$63'413
19	Madagascar	Mea-10	3'940'370	\$709'267	\$236'422	\$12'609	\$41'177	\$999'475
20	Mali	Mea-10	3'104'200	\$558'756	\$186'252	\$9'933	\$32'439	\$787'380
21	Mauritania	Mea-10	527'000	\$94'860	\$31'620	\$1'686	\$5'507	\$133'674
22	Mongolia	Mea-10	484'200	\$125'892	\$29'052	\$1'549	\$5'060	\$161'553
23	Morocco	MR-10	3'599'900	\$1'670'354	\$215'994	\$11'520	\$37'619	\$1'935'486
24	Niger	Mea-10	3'448'000	\$620'640	\$206'880	\$11'034	\$36'032	\$874'585
25	Pakistan	Mea-10	33'942'490	\$6'109'648	\$2'036'549	\$108'616	\$354'699	\$8'609'513

¹² Countries in Table 4 and Annex 1 might differ due to the fact that UNICEF did not procure vaccines for all countries. Moreover, some vaccines were procured in 2007 and will be used in 2008. Similarly some vaccine purchased in 2006 may have been used in 2007 (hence not reflected in this Annex) if the campaign was delayed.

Measles, Rubella and Mumps Bundled Vaccine Supplies for SIAs in 2007¹²
Supplies Procured through UNICEF Supply Division

#	Country	Vaccine	Quantity (ds)	Cost of vaccine	Cost of AD syringes	Cost of Reconstitution syringes	Cost of Safety Boxes	Total cost
26	Philippines	Mea-10	11'000'000	\$1'980'000	\$660'000	\$35'200	\$114'950	\$2'790'150
27	Sao Tome & Principe	Mea-10	90'000	\$16'200	\$5'400	\$288	\$941	\$22'829
28	Solomon Islands	Mea-10	36'000	\$6'480	\$2'160	\$115	\$376	\$9'131
29	Sudan (Northern)	Mea-10	2'423'150	\$436'167	\$145'389	\$7'754	\$25'322	\$614'632
30	Sudan (Southern)	Mea-10	1'800'000	\$324'000	\$108'000	\$5'760	\$18'810	\$456'570
31	Togo	Mea-10	1'094'000	\$196'920	\$65'640	\$3'501	\$11'432	\$277'493
32	Turkmenistan	MR-10	2'859'000	\$1'343'576	\$171'540	\$9'149	\$29'877	\$1'554'141
33	Ukraine	MR-10	8'000'000	\$3'712'000	\$480'000	\$25'600	\$83'600	\$4'301'200
34	Uzbekistan	MR-10	7'742'030	\$3'592'302	\$464'522	\$24'774	\$80'904	\$4'162'502
35	Viet Nam	Mea-10	3'734'600	\$970'996	\$224'076	\$11'951	\$39'027	\$1'246'049
36	Zambia	Mea-10	2'375'800	\$427'644	\$142'548	\$7'603	\$24'827	\$602'622

Notes:

Mea-10: measles vaccine in vial of 10 doses

Mea-20: measles vaccine in vial of 20 doses

MR-10: measles-Rubella vaccine in vial of 10 doses

MMR-1: measles mumps rubella vaccine in single dose vial

Source: UNICEF, as of 5 February 2008