ANNUAL REPORT 2014

MEASLES & RUBELLA INITIATIVE

American Red Cross

CDC Centers for Disease Control and Prevention

unicef

United Nations Foundation

World Health Organization

2014 AT A GLANCE

215 million
children were vaccinated against measles and rubella

260,000
measles and rubella samples were tested globally by our network of laboratories

318 million
doses of measles & measles-rubella vaccine were procured

More than **560,000**
volunteers were mobilized in 13 countries

84%
of children around the world had received one dose of measles vaccine by their second birthday

Four more countries introduced a second dose of measles-containing vaccine into their routine immunization schedule for a total of **153** countries

$7.6 million
was used from the Outbreak Response Fund in 7 countries

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The Measles & Rubella Initiative
2014
Annual Report

EXECUTIVE SUMMARY

The Measles and Rubella Initiative (M&RI) is pleased to present its 2014 annual report. This year's report highlights countries in action as they implement the strategies required to achieve measles and rubella control and elimination.

The impact of the measles vaccine on global public health continues to be tremendous. Since the M&RI was founded in 2001, measles mortality has dropped by an estimated 75 per cent, with annual deaths plummeting from 544,200 in 2000 to 145,700 in 2013. Each year, measles vaccination programs prevent the deaths of over one million children, as estimated by the World Health Organization (WHO). There has also been a steady increase in the number of countries—from ninety-nine in 2000 to 141 in 2014—introducing rubella-containing vaccines (RCVs) into their routine immunization programmes to prevent Congenital Rubella Syndrome (CRS).

Over the course of 2014, approximately 215 million children received measles-containing vaccines (MCVs) as part of Supplementary Immunization Activities (SIAs) conducted in twenty-seven countries. In more than half of these countries, other life-saving interventions—such as vitamin A supplementation and oral polio vaccines—were also delivered.

The M&RI was at the forefront of this drive, contributing funds to support the vaccination of more than 70 million children in fifteen countries. The remaining twelve countries either funded their own SIAs or received support from GAVI—the Vaccine Alliance, with the M&RI providing assistance in planning, monitoring, and evaluation.

Yet despite these intensive immunization efforts, 2014 was marked by measles and rubella outbreaks across Europe and in countries as disparate as Ethiopia, Iraq, Sudan, Syria, and the United States. These and other outbreaks demonstrated, yet again, the ability of the measles and rubella viruses to spread quickly and exploit gaps in population immunity. By the end of 2014, an estimated 400 children were dying from measles and close to 300 newborns were entering the world with the disabilities of CRS *every day.*

In 2013, the WHO's Strategic Advisory Group of Experts (SAGE) on Immunization warned that the WHO regions of Africa, the Eastern Mediterranean, and Europe

75%

Since the M&RI was founded in 2001, measles mortality has dropped by an estimated 75%

were not progressing as expected to meet their 2015 measles and rubella elimination goals. The events of 2014—that included disrupted SIAs caused by conflicts in Iraq and Syria and the Ebola crisis in Western Africa—pushed the 2015 regional elimination targets even further beyond reach.

In 2014 recommendations of the 2013 External Review of the M&RI were implemented. These included measures to strengthen the Initiative's working mechanisms, Management Team, and significantly, the establishment of seven Working Groups (Resource Mobilization and Advocacy; Strategic Communications; Implementation, Technical Assistance and Monitoring; Research and Innovation; External Financial Resource Requirements; Vaccine Supply Coordination; and Routine Immunization Strengthening). These Working Groups have tremendously enhanced the depth and scope of the Initiative as well as co-opted contributions from new partners and stakeholders in guiding the M&RI's work.

Reliable and sustainable financing is essential to reaching measles and rubella elimination goals. The M&RI forecasts that US$635 million is required to support countries to conduct needed follow-up MR campaigns and other planned activities between 2015 and 2020. To date, expected and pledged donations amount to $267 million, leaving a funding shortfall of $369 million. Other significant challenges include sub-optimal country ownership of national immunization programmes, assuring timely technical assistance, the emergence of 'vaccine hesitancy' in some communities, and sustaining immunization programs in emergencies.

To date, expected and pledged donations amount to $267 million, leaving a funding shortfall of $369 million

On a more positive front, measles and rubella vaccines continue to be one of the best buys in public health. A range of new innovations, including a 'micro-needle' patch and the expansion of regional measles-rubella laboratory networks (LabNets), promise to enhance programme performance in the years to come. Also, as the global campaign to eradicate polio draws to a conclusion, measles and rubella elimination activities are poised to build upon the platform that has made this success possible.

Our continued progress is made possible because of the commitment of national immunization programmes supported by numerous partners on the ground. Extraordinary effort is put forth at a global level by key volunteer partners including the Church of Jesus Christ of Latter-day Saints, the Lions Clubs International, and the Red Cross and Red Crescent Societies. In 2014, our advocacy work expanded through renewed partnerships with the American and International Pediatric Societies.

We must not lose sight of the fact that global measles and rubella elimination is imminently achievable. We know this because it was achieved in the WHO Region of the Americas in 2002 and we are on the cusp of the same accomplishment in the Western Pacific Region. But reaching elimination targets requires rededicated efforts by each and every stakeholder.

The M&RI will continue to work with partners and national governments to reach at least 95 per cent of the eligible target population. This will include robust advocacy to secure the resources required to close funding gaps. The M&RI will also provide technical assistance to strengthen immunization systems as elaborated in the Global Vaccine Action Plan (GVAP).

We know what needs to be done, and we have the know-how. Allowing children to die or bear lifelong consequences from measles or to be born with permanent impairment from CRS is unforgivable when all it takes is $1.50 to protect a child from both diseases.

We have committed to move faster to fight measles and rubella. Let's move faster, together.

THE MEASLES & RUBELLA INITIATIVE PARTNERS
American Red Cross
United States Centers for Disease Control and Prevention
United Nations Foundation
United Nations Children's Fund
World Health Organization

All it takes is $1.50 to protect a child from both diseases

INTRODUCTION

Globally, an estimated 100,000 children are born each year with CRS

ABOUT MEASLES AND RUBELLA

Measles remains a leading cause of childhood mortality with serious complications including pneumonia, diarrhea, and blindness, especially in infants and children under the age of five. More than 20 million people are affected by measles each year, particularly in parts of Africa and Asia. Measles outbreaks are notably devastating in emergency settings and among populations emerging from natural disasters. Outbreaks in 2014 associated with the crisis in Syria and cyclones in the Philippines demonstrated how rapidly measles can transmit—and kill—under emergency circumstances. Acute rubella infection, on the other hand, is a mild disease in children and adults. However, for pregnant women—particularly those infected with the rubella virus in the first trimester—there is a 90 per cent chance that the foetus will have CRS, which can result in heart disorders, blindness, deafness, or brain damage. Globally, an estimated 100,000 children are born each year with CRS, the majority of whom require lifelong care and expensive treatment.

MOVING FORWARD: THE MEASLES & RUBELLA INITIATIVE

Originally established as the Measles Initiative in 2001, the M&RI is a collaborative effort founded by the American Red Cross (ARC), the United States Centers for Disease Control and Prevention (CDC), the United Nations Foundation (UNF), United Nations Children's Fund (UNICEF), and the WHO. The Measles & Rubella Initiative mobilizes resources, provides technical expertise, and assists with the planning and implementation of quality supplementary campaigns. The M&RI also investigates outbreaks and provides technical and financial support for effective outbreak response. Highlighting the importance of surveillance as a cornerstone of achieving disease control and elimination, the M&RI also supports LabNets, a global measles and rubella laboratory network.

More than 20 million people are affected by measles each year

THE COMMITMENTS

The M&RI's Global Strategic Plan 2012-2020 draws on resolutions adopted by member countries of the World Health Assemblies (WHA) in 2010 and 2012. These include the 2012 establishment of the GVAP, which commits to measles elimination in four WHO regions and rubella elimination in two WHO regions by the end of 2015. It commits to the elimination of both measles and rubella in at least five WHO regions by 2020.

The goals of the M&RI Global Strategic Plan are:

BY THE END OF 2015

- To increase immunization coverage with the first dose of measles vaccine to at least 90 per cent nationally, and to 80 per cent in every district.
- To reduce global measles deaths by at least 95 per cent compared with 2000 levels.
- To achieve regional measles and rubella/CRS elimination goals.

BY THE END OF 2020

- To achieve measles and rubella elimination in at least five WHO regions.

LIST OF ACRONYMS

AEFI's:	Adverse events following immunization
AFR:	WHO African Region
AMR:	WHO Region of the Americas
ARC:	American Red Cross
CDC:	US Centers for Disease Control and Prevention
CFR:	Case fatality rate
CRS:	Congenital rubella syndrome
EPI:	Expanded programme on immunization
EMR:	WHO Eastern Mediterranean Region
EUR:	WHO European Region
GAVI:	GAVI, the Vaccine Alliance
GMRLN:	The Global Measles and Rubella Laboratory Network
GVAP:	Global Vaccine Action Plan
ICC:	Inter-agency coordinating committee
IEC:	International Expert Committee
IgM:	Immunoglobulin
IP:	Inactivated poliovirus vaccine
LabNets:	Regional measles-rubella laboratory networks
LLIN:	Long-lasting insecticide-treated bed net
M:	Measles vaccine
M&RI:	Measles and Rubella Initiative
MeaNS:	Measles Nucleotide Surveillance
MCV:	Measles-containing vaccine
MCV1:	First dose of measles-containing vaccine
MCV2:	Second dose of measles-containing vaccine
MMR:	Measles-mumps-rubella vaccine
MR:	Measles-rubella vaccine
NVC:	National Verification Committee
OPV:	Oral polio vaccine
ORF:	Outbreak response fund
ORI:	Outbreak response immunization
PoA:	Plan of Action
R&I:	Research and Innovations
RCM:	Rapid Convenience Monitoring
RCV:	Rubella-containing vaccine
RCV1:	First dose of rubella-containing vaccine
RCV2:	Second dose of rubella-containing vaccine
RIVM:	Rijksinstituut voor Volksgezondheid en Milieu (Netherlands)
RubeNS:	Rubella Nucleotide Surveillance
RVC:	Regional Verification Commission
RI:	Routine Immunization
2YL:	Second year of life
SAGE:	WHO Strategic Advisory Group of Experts on Immunization
SEAR:	WHO South-East Asia Region
SEAR-ITAG:	South-East Asia Regional Technical Group on Immunization
SIA:	Supplementary immunization activity
TT:	Tetanus toxoid
UNF:	United Nations Foundation
UNFIP:	United Nations Fund for International Partnerships
UNICEF:	United Nations Children's Fund
UNICEF SD:	UNICEF Supply Division
WHA:	World Health Assembly
WHO:	World Health Organization
WPR:	WHO Western Pacific Region

REGIONAL SUMMARIES

WHO REGION OF THE AMERICAS (AMR)

HIGHLIGHTS

- All countries and territories in the region have achieved and are maintaining rubella and CRS elimination.
- The region leveraged widespread interest in the 2014 FIFA World Cup in Brazil to conduct targeted vaccination campaigns, raise public awareness using social media and other modalities, and to reinvigorate active searches for possible measles or rubella cases.
- Nineteen countries and territories administered more than 3,140,000 doses of measles-rubella vaccine (MR) during the April 2014 Vaccination Week in the Americas.
- The International Expert Committee (IEC)—the body charged with reviewing evidence documenting measles and rubella elimination—began documenting the region's elimination of rubella and CRS by examining evidence submitted by twenty-three National Commissions and the sub-regional Commission for the English-Speaking Caribbean Countries.

CHALLENGES

- A sustained measles outbreak in two northern Brazilian states threatened the region's achievement of having interrupted endemic measles transmission for more than a decade.
- Timely, accurate, and complete measles-rubella surveillance.
- The U.S experienced multi-state measles outbreaks, including one that started at Disneyland in California and another that affected the unvaccinated Amish community in Ohio.
- Avoiding a false sense of security among policy-makers and immunization managers in the face of high (>95 per cent) national rates of measles-rubella vaccination coverage. (High national average rates can mask the risk of outbreaks in local or municipal areas with low coverage rates).
- Ensuring that physicians, epidemiologists, and other health workers—many of whom have never seen a case of measles or rubella—remain vigilant and report suspected cases.
- Sustaining strong political commitment to measles-rubella elimination efforts.

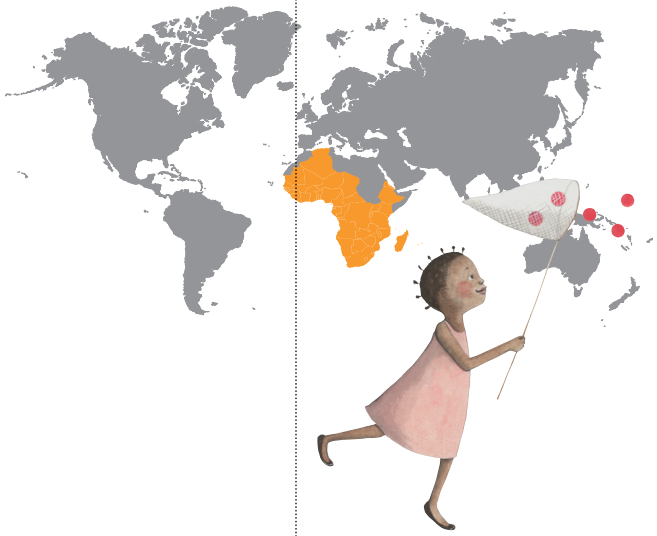
WHO EASTERN MEDITERRANEAN REGION (EMR)

HIGHLIGHTS

- Sizeable reductions in the number of reported measles cases in 2014 as compared to 2013 (8,084 vs 16,487) as well as in incidence per million population (13.66 in 2014, down from 27.47 in 2013).
- Six countries reported a very low incidence of measles. Three reported no endemic cases and are ready for the measles elimination verification process.
- In countries with lower vaccination coverage, measles and measles-rubella SIAs reached over 40.5 million people in 2014.
- The introduction of MR in Yemen through a nationwide SIA.
- Strong LabNet capacity to meet diagnostic requirements for measles/rubella case-based surveillance.

CHALLENGES

- Continued conflict in several countries, coupled with mass displacement and the resettlement of populations, complicated delivery of routine vaccination services and SIAs. This in turn led to a resurgence of measles in Iraq, Jordan, Lebanon, and Syria, all of which had reported zero or very low incidences of measles over the preceding three years.
- Challenges in completing polio eradication in Afghanistan and Pakistan, which detracted from efforts to address gaps in measles control and introduce rubella vaccines.
- Little or no visibility of measles elimination targets in some countries due to competing priorities.
- Lack of funding, particularly for follow-up SIAs.
- Ensuring adequate vaccine supply for outbreak response.



WHO AFRICAN REGION (AFR)

HIGHLIGHTS

- Eighteen countries had introduced a second dose of measles-containing vaccine (MCV2) by the end of 2014.
- SIAs in nine countries reached more than 77 million children with measles vaccine and MR.
- Burkina Faso and Tanzania introduced RCVs into SIAs.
- Forty-four countries intensified case-based surveillance and laboratory confirmation for measles and rubella.

CHALLENGES

- Ebola outbreaks in Guinea, Liberia, and Sierra Leone forced the postponement of planned measles elimination campaigns.
- Insecurity in the Central Africa Republic and South Sudan forced the delay of planned measles vaccination activities.
- Country-level resource mobilisation and leadership gaps hampered timely measles elimination activities, particularly in Gabon, Equatorial Guinea, and Togo.
- The lack of trained nurses, physicians, and epidemiologists working in immunization slowed the rollout of timely measles elimination activities.

WHO WESTERN PACIFIC REGION (WPR)

HIGHLIGHTS

- Regional Committee endorsed a region-wide rubella elimination goal (without specifying a target year) as part of a comprehensive Regional Framework to implement the GVAP.
- Australia, the Democratic People's Republic of Korea (DPRK), Macao SAR (China), and Mongolia announced they have achieved measles elimination.
- MR SIAs conducted in the Federated States of Micronesia, Laos, the Philippines, the Solomon Islands, and Viet Nam.
- Case-based surveillance initiated for reporting rubella to the WHO Regional Office.

CHALLENGES

- Measles outbreaks in Laos, the Pacific Islands, Papua New Guinea (PNG), and Viet Nam that ended long periods marked by low or zero transmission rates.
- On-going endemic transmission of measles in China, Malaysia, and the Philippines .
- Difficulty in closing immunity gaps in China and the Philippines, particularly among very young children, older adolescents, and adults.

WHO SOUTH-EAST ASIA REGION (SEAR)

HIGHLIGHTS

- MR activities scaled up across the Region. By the end of 2014, all eleven countries had introduced or were developing MR strategic plans.
- Bhutan, the DPRK, and the Maldives announced they had eliminated measles and planned to have this status validated by NVCs.
- Bangladesh, Nepal, Sri Lanka, and Thailand demonstrated relatively low levels of measles transmission.
- India and Indonesia expanded MR LabNet capacity to support case-based surveillance.
- Regional CRS surveillance guidelines were developed and presented at the South-East Asia Regional Technical Group on Immunization (SEAR-ITAG).

CHALLENGES

- Improving routine immunization and conducting high quality SIAs in the region's two largest countries, India and Indonesia.
- Increasing routine immunization coverage to achieve >95 per cent coverage for both doses of MR and measles-mumps-rubella vaccine (MMR).
- Improving laboratory supported case-based surveillance standards in all countries.
- Ensuring adequate vaccine supply.
- Ensuring adequate funding and adequately trained staff to conduct immunization and surveillance activities.

WHO EUROPEAN REGION (EUR)

HIGHLIGHTS

- The European Region reported an overall decline in the number of measles and rubella cases in 2014 as compared to the previous year.
- Twenty-two countries have interrupted the transmission of measles and twenty-four have interrupted the transmission of rubella, according to the Regional Verification Commission (RVC).
- Outbreak response campaigns tackled serious occurrences in Azerbaijan, Georgia, Turkey, and the United Kingdom (UK).
- NVC's had been established in fifty of the region's fifty-three countries by the end of 2014.

CHALLENGES

- Several countries experienced new measles outbreaks in 2014, while the transmission rate of measles intensified in others.
- Competing public health priorities resulted in insufficient political commitment to close immunity gaps.
- Addressing significant gaps in population immunity—particularly among adolescents and adults—while maintaining high routine vaccination coverage.
- Ensuring timely and adequate vaccine supply.
- Ensuring timely and adequate responses to limit the duration of outbreaks.
- Strengthening the epidemiological and laboratory components of surveillance and reporting.
- Reinforcing a pro-vaccination attitude through advocacy and messaging, the use of reliable scientific sources and experts, and by galvanizing support from public leaders and champions.

OUR STRATEGIES IN ACTION

VACCINATE MORE

STRATEGY 1

Achieve and maintain high levels of population immunity by providing high vaccination coverage with two doses of measles, or measles-rubella-containing, vaccines

Measles is highly infectious and will easily find pockets of non-immune populations. To achieve measles- and rubella- elimination goals, the WHO recommends that, if introduced, two doses of measles or MR vaccine must reach at least 95 per cent of a population, both at the national and district level.

While many countries have made tremendous progress towards increasing population immunity, global coverage with a first dose of measles containing vaccine (MCV1) has stagnated at approximately 84 per cent since 2009. However, MCV2 coverage increased from 35 per cent in 2009 to 53 per cent by the end of 2013, in part as a result of the number of countries with routine MCV2 immunization coverage increasing from 134 to 153 over the same period. Increased effort is required to accelerate progress and achieve recommended coverage at national and district levels.

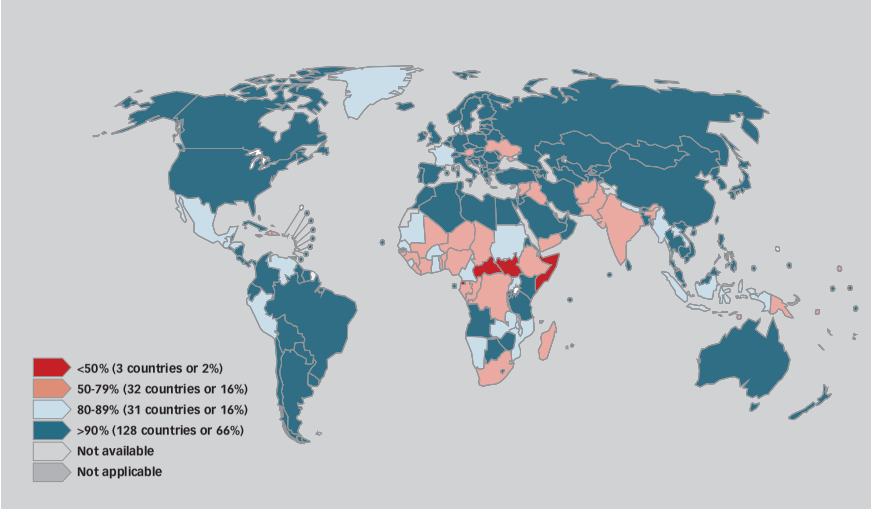
Over the course of 2014, approximately 215 million children received MCV's during SIAs conducted in twenty-seven countries (Table 1). Other life-saving interventions—such as vitamin A supplementation and oral polio vaccines—were integrated with SIAs in fourteen of these countries.

The M&RI contributed funding to fifteen of these countries that supported the vaccination of 70.4 million children. The remaining 12 countries either financed their own SIAs or received support from GAVI – the Vaccine Alliance. In 2014, GAVI funded measles SIAs that reached approximately 48 million children in Chad, the DRC, and Pakistan, and 108 million children through measles-rubella SIA's in Bangladesh, Burkina Faso, the Solomon Islands, Tanzania, Viet Nam, and Yemen. The M&RI provided technical assistance for the planning, monitoring, and evaluation of these GAVI-supported campaigns.

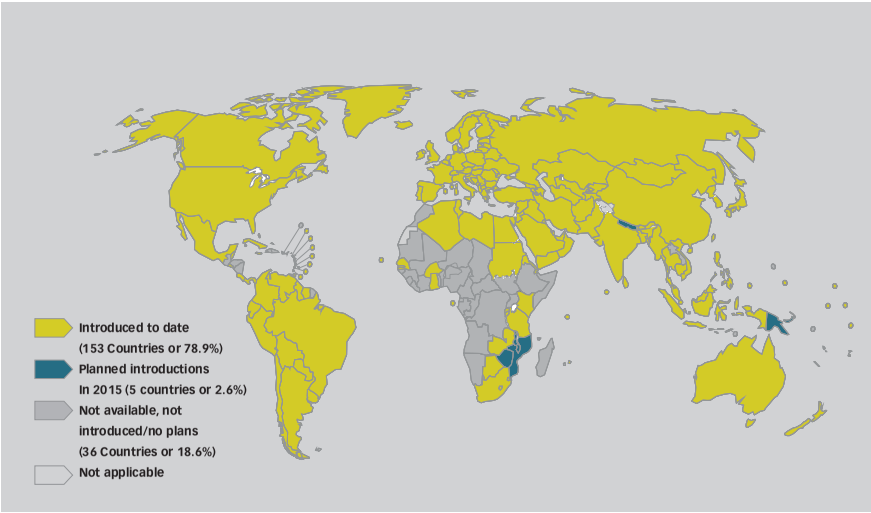
The M&RI also topped-up GAVI support following measles outbreaks in order to widen the target age for vaccination and close previously identified immunity gaps. Children up to nine years were included in measles vaccination campaigns in the DRC and Pakistan, while children and adults up to twenty-nine years received vaccinations in the Solomon Islands' measles-rubella vaccination campaign.

Over the course of 2014, approximately 215 million children received MCVs during SIAs conducted in twenty-seven countries

IMMUNIZATION COVERAGE WITH MEASLES CONTAINING VACCINES IN INFANTS, 2013



COUNTRIES USING MEASLES SECOND DOSE VACCINE IN 2014, AND PLANNED INTRODUCTIONS IN 2015. DATA AS OF 31ST DECEMBER 2014

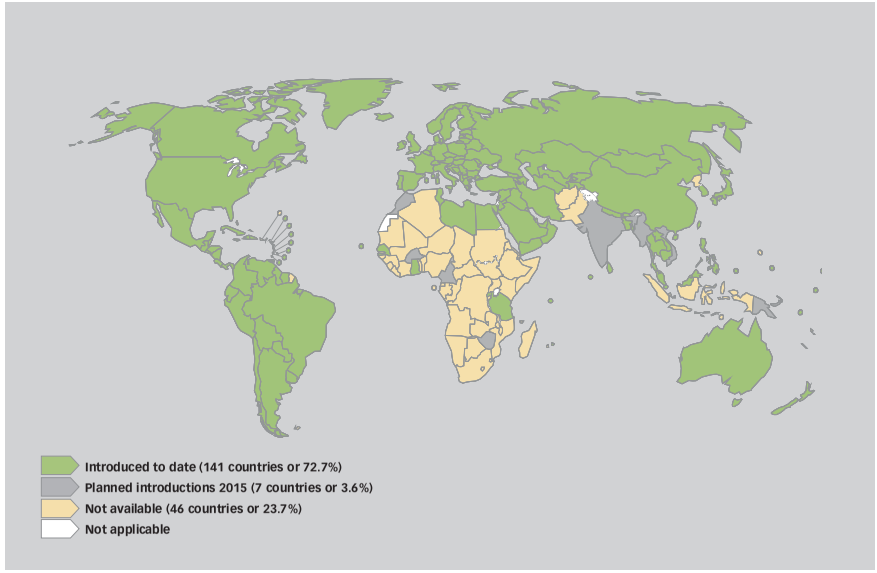


BANGLADESH

Bangladesh introduced the MR vaccine into its national immunization programme in 2012 and has established 2018 as its target year to eliminate measles and control rubella. To achieve and maintain high population immunity against these two diseases, a three-week nationwide MR campaign was conducted in early 2014 that targeted 53 million children aged nine months to fifteen years.

The first week focused on delivering the vaccine within educational institutes. During the second and third weeks, MR vaccines were delivered through the routine immunization network as well as at the community level. Community groups and clinics, along with teachers and schools, were instrumental in reaching the target population. A total of 53,644,603 children were vaccinated, representing coverage of more than 100 per cent.

COUNTRIES WITH RUBELLA VACCINE IN THE NATIONAL IMMUNIZATION PROGRAMME AND PLANNED INTRODUCTIONS IN 2015-2016



RUBELLA VACCINE INTRODUCTION

Morocco, Rwanda, and Tanzania introduced RCV's into their routine programmes in 2014. This brought the number of countries providing RCVs through their routine immunization programmes to 141, a 41 per cent increase compared to the 2000 figure of ninety-nine countries. Over the course of 2014, the M&RI continued to provide expert technical support to countries introducing RCV and to monitor RCV progress in follow-up campaigns in countries that have already introduced rubella vaccines.

Over the next four years, M&RI partners will support an increasing number of countries in introducing RCV, while GAVI has committed to support eight additional countries doing so in 2015: Burkina Faso, Cameroon, Gambia, Myanmar, PNG, Viet Nam, Yemen, and Zimbabwe.

YEMEN

For the past three years, civil unrest in Yemen has disrupted vaccination programs and contributed to declines in immunization coverage. This has resulted in the re-emergence of measles in epidemic proportions. With GAVI support, in 2014 Yemen carried out a nationwide SIA that targeted children under fifteen years of age. With a goal of reaching 11.6 million children, the campaign used a combination of fixed, temporary, and mobile sites—coupled with social mobilization efforts—that resulted in 97 per cent coverage of the targeted population.

Thousands of vaccinators, health educators, and volunteers in the southern Aden governorate combined forces to explain the benefits of immunization, especially to communities consisting of vulnerable, high-risk groups.

Treacherous mountain roads were travelled to get to barely accessible areas and reach every child. "I feel that I'm working for my children," said a health educator in Aden. "Vaccinating other children helps to protect my own children from falling victim to one of these deadly diseases."

TABLE 1: MEASLES SUPPLEMENTARY IMMUNIZATION ACTIVITIES (SIAS) AND THE DELIVERY OF OTHER CHILD HEALTH INTERVENTIONS BY COUNTRY AND WORLD HEALTH ORGANIZATION (WHO) REGION, 2014

			CHILDREN REACHED IN TARGETED AGE GROUP		OTHER INTERVENTIONS DELIVERED
WHO REGION/ COUNTRY	AGE GROUP TARGETED	EXTENT OF SIA	NO.	(%)	
AFRICA					
Angola	6 M - 9 Y	National	9,169,335	(117)	oral polio / vaccine vitamin A
Benin	9 M - 9 Y	National	2,621,634	(100)	
Burkina Faso	9 M - 14 Y	National	8,481,625	(106)	rubella vaccination
Chad	9 M - 9 Y	National	4,886,532	(103)	
Cote d'Ivoire	6 M - 9 Y	National	9,640,512	(92)	vitamin A / deworming medication
Dem Rep Congo	6 M - 9 Y	Rollover-national	18,539,883	(101)	oral polio vaccine / vitamin A / deworming medication
Mauritania	9 M - 14 Y	National	1,489,563	(105)	
South Sudan	6 - 59 M 6 M - 15 Y	National	2,172,737	(66)	oral polio vaccine / vitamin A
United Republic of Tanzania	9 M - 14 Y	Rollover-national	20,529,629	(97)	oral polio vaccine / vitamin A / deworming medication / rubella vaccination
AMERICAS					
Argentina	1 - 4 Y	National	2,347,019	(82)	oral polio vaccine / rubella vaccination / mumps vaccination
Brazil	1 - 4 Y	National	9,800,047	(89)	oral polio vaccine / rubella vaccination / mumps vaccination
Paraguay	1 - 4 Y	National	533,889	(72)	oral polio vaccine / rubella vaccination / mumps vaccination
Venezuela	1 - 4 Y	National	2,479,348	(101)	oral polio vaccine / rubella vaccination / mumps vaccination
EASTERN MEDITERRANEAN					
Afghanistan	9 - 59 M 6 M - 10 Y	Sub-national	842,134	(94)	
Lebanon	9 M - 18 Y	National	1,170,182	(80)	rubella vaccination
Pakistan	9 m - 9 Y	Sindh and KP Provinces	25,112,595	(104)	oral polio vaccine
Somalia	9 - 59 M	Sub-national child health days and SIAs in newly-accessible areas	1,251,090	(67)	oral polio and TT vaccines / vitamin A / deworming medication
Syria	7 M - 5 Y, up to 15 Y in high-risk areas	Sub-national	769,408	(74)	rubella vaccination / mumps vaccination
Yemen	9 M - 14 Y	National	11,368,968	(93)	oral polio vaccine / rubella vaccination
EUROPEAN					
Azerbaijan	10 - 14 Y	National	164,560	(96)	rubella vaccination / mumps vaccination
Georgia	14 Y +	National	28,718	(106)	rubella vaccination / mumps vaccination
SOUTH EAST ASIA					
Bangladesh	9 M-14 Y	National	53,644,603	(102)	oral polio vaccine / rubella vaccination
WESTERN PACIFIC					
Lao People's Democratic Republic	9 M - 9 Y	National	1,569,224	(101)	oral polio vaccine / deworming medication / rubella vaccination
Micronesia	12 M - 49 Y 12 M - 57 Y	National	66,485	(85)	rubella vaccination / mumps vaccination
Philippines	6 - 36 M 9 - 59 M	Outbreak response National	12,098,419	(89)	National campaign: oral polio and rubella vaccination
Solomon Islands	6 M - 29 Y	National	398,286	(106)	rubella vaccination
Viet Nam	12 - 59 M	National	13,734,988	(94)	rubella vaccination
TOTAL			**214,911,413**		

PROCUREMENT OF VACCINES AND INJECTION DEVICES AND VACCINE SECURITY

In 2014, the UNICEF Supply Division (SD) procured more than 318 million doses of measles monovalent (M), MR and MMR vaccines for use in more than seventy countries. Approximately 186 million doses were delivered for SIAs, 125 million doses for routine immunization, and more than 7 million doses for outbreak response and emergency campaigns. And, as a result of GAVI support for MR vaccine introductions, significant quantities were also delivered for use in large-scale campaigns in Bangladesh, Burkina Faso, Myanmar, Tanzania, Viet Nam, and Yemen.

Although supply met overall demand, a high proportion of orders were requested for delivery within a short timeframe in quarters three and four, posing challenges for both manufacturers and freight forwarders. The MCV market currently does not allow sourcing from a number of manufacturers, which added to the complexity of distributing evenly and facilitating effortless operations. In contrast, there is only a single manufacturer producing a WHO pre-qualified MR vaccine. This same manufacturer is also the largest supplier of M vaccine. The current environment of high demand and a limited number of products is anticipated to change after 2017, when new entrants to the market are expected to offer a greater range of WHO pre-qualified products. Until then, maintaining effective cooperation between UNICEF SD and the manufacturer is critical to safeguarding supply and availability.

Although the weighted average price of supplies in 2014 was 10 per cent lower compared to 2013, increased demand required concomitant increases in supplies. The supply base, while healthy, faced the same challenges as in 2013, including un-forecasted SIA activities and the late release of funds relative to shipment lead-times.

Despite these challenges, large campaigns were successfully undertaken in Tanzania, Yemen, and Viet Nam, and Myanmar's distribution supply chain was improved.

The M&RI's Supply Coordination Working Group played a key role in measles and rubella elimination and control in 2014. The group, led by UNICEF SD and comprised of representatives from ARC, the Bill & Melinda Gates Foundation, CDC, GAVI, UNICEF, UNF, and WHO, regularly monitors, coordinates, and prioritizes global demand and the availability of MCV vaccines for planned SIAs and outbreak response.

Approximately 186 million doses were delivered for SIAs, 125 million doses for routine immunization, and more than 7 million doses for outbreak response and emergency campaigns

MEASLES AND RUBELLA CONTROL AND ROUTINE IMMUNIZATION

The GVAP calls for measles elimination in at least five WHO regions by 2020. To reach this goal, timely vaccination of 95 per cent of children with two doses of measles vaccine in every segment of society—including the poor, marginalized, and hard-to-reach—is necessary.

Because the measles vaccine is often the last to be provided in the infant immunization schedules of most developing countries, achieving high rates of measles vaccination coverage can be a yardstick for national immunization programs. For this reason, many countries have included measles vaccination coverage as a marker for system development. As such, measles outbreaks often serve as early signals of faltering program performance, and addressing them can help guide improvements to the system as a whole.

Measles SIAs can help improve routine immunization in micro planning, create demand and awareness of immunizations, enhance skills among health care workers, improve management of adverse events following immunization (AEFI's), and foster the relationships with community leaders that are vital for success. In 2014, continued emphasis was placed on maximizing opportunities to strengthen the interplay of routine immunization (RI) as part of measles elimination and rubella control.

One of the key actions in 2014 was the formation of the M&RI Routine Immunization Working Group. This group supports the measles elimination strategy of reaching high levels of population immunity through high coverage with two doses of MCV. Bringing RI, measles, and rubella expertise together will help identify opportunities that benefit increasing immunity through routine measles vaccinations and will have a broader impact on routine immunization service delivery. For example, the RI Working Group is overseeing a project to assess if reducing the number of doses in a measles vaccine vial will decrease missed opportunities, reduce vaccine wastage, and lead to increased MCV coverage.

Building or strengthening platforms for vaccination and other health interventions in the second year of life offers another potential approach to improve MCV1 and MCV2 coverage.

Promoting the provision of a second measles dose at eighteen months of age opens the door to the introduction of further lifesaving interventions, such as a booster (4th) dose of DTP vaccine, a second dose of meningococcal conjugate vaccine in the African meningitis belt, inactivated poliovirus vaccine (IP), tetanus toxoid, and vitamin A supplementation.

This second year of life gateway provides an invaluable touch point with infants and young children to catch up on missed immunizations as well as promote additional life-saving measures that would otherwise be unavailable. The M&RI will continue to work closely with routine immunization programmes to make vaccinations and other health interventions in the second year of life an integral part of a child's routine health regimen.

TANZANIA

Tanzania introduced the MR vaccine through SIAs in 2014, and is planning to introduce the vaccine into its routine immunization schedule in 2015. The nationwide MR SIAs, conducted in October 2014, targeted 21,159,629 children aged nine months to fifteen years. The SIAs were integrated with Vitamin A supplementation and Mebendazole, while Albendazole and Ivermectin mass treatment was provided in the provinces with the highest risk of neglected tropical diseases.

A total of 12,824 teams and 47,189 volunteers were deployed to support the SIAs, with the country adapting the SIA readiness assessment tool to improve advance preparation. In addition, a review of each day's results helped to identify missed areas for vaccination. Post-SIA coverage surveys were conducted to assess the MR SIAs as well as the routine immunization program. These showed that the SIA administrative coverage was 97 per cent for MR and 100 per cent for Vitamin A and Mebendazole. Surveys also indicated that 89 per cent of the target population was reached with MR vaccines.

The M&RI worked closely with each Ebola-affected country and our partners to restart routine immunization programs, conduct measles vaccination campaigns, and strengthen case-based surveillance

GUINEA, LIBERIA & SIERRA LEONE

The 2014 Ebola outbreak in Guinea, Liberia, and Sierra Leone interrupted a wide range of regular health services, including immunization. This interruption threatened to trigger an upsurge in measles cases, as measles is far more contagious than Ebola. (On average, a case of Ebola results in two new infections, whereas a person infected with measles can generate up to eighteen new cases among susceptible persons). In the 4th quarter of 2014 the M&RI worked closely with each Ebola-affected country and our partners to restart routine immunization programs, conduct measles vaccination campaigns, strengthen case-based surveillance, and provide the necessary financial and technical assistance to ensure communities can regularly access essential vaccines to protect their children in a post-Ebola era.

WATCH CLOSELY

STRATEGY 2

Monitor disease using effective surveillance and evaluate programmatic efforts to ensure progress

Effective program monitoring requires case-based surveillance with laboratory confirmation of suspected measles cases. Between 2004 and 2013, the number of member states using case-based surveillance increased from 120 (62 per cent) to 187 (96 per cent).

Over the 2000–2013 period, annual reporting by countries demonstrated a 67 per cent decrease in the total number of measles cases worldwide, from 853,479 to 279,776, and a 72 per cent decrease in measles incidence, from 146 to 40 cases per million population (Table 2).

TABLE 2. ESTIMATES OF COVERAGE WITH THE FIRST DOSE OF MEASLES-CONTAINING VACCINE ADMINISTERED THROUGH ROUTINE IMMUNIZATION SERVICES, REPORTED MEASLES CASES AND INCIDENCE, AND ESTIMATED MEASLES MORTALITY BY WORLD HEALTH ORGANIZATION REGION: 2000 AND 2013

	2000						2013/2014								
WHO REGION	% COVERAGE WITH THE FIRST DOSE OF MEASLES-CONTAINING VACCINE *	% MEMBER STATES WITH COVERAGE ≥90%	NUMBER OF REPORTED MEASLES CASES **	MEASLES INCIDENCE (CASES PER MILLION POPULATION) †,‡	ESTIMATED MEASLES DEATHS (95% CI)		% COVERAGE WITH THE FIRST DOSE OF MEASLES-CONTAINING VACCINE IN 2013 *	% MEMBER STATES WITH COVERAGE ≥90%	NUMBER OF REPORTED MEASLES CASES IN 2013 **	% DECLINE FROM 2000	MEASLES INCIDENCE (CASES PER MILLION POPULATION) †, ‡	% DECLINE FROM 2000	ESTIMATED MEASLES DEATHS IN 2013 (95% CI)	% MORTALITY REDUCTION 2000 TO 2012	% TOTAL MEASLES DEATHS IN 2012
African	53	9	520,102	841	342,300 (224,600-570,600)		74	32	171,905	67	185	78	74,200 (41,600-165,000)	84	51
Americas	93	63	1,754	2.1	<100		92	80	490	76	0.5	76	<100	-	0
Eastern Mediterranean	72	57	38,592	90	54,100 (32,900-87,600)		78	57	20,885	46	35	61	32,500 (18,600-61,900)	49	22
European	91	60	37,421	50	300 (100-1,500)		95	87	24,689	31	32	37	100 (0-1,200)	65	0
South-East Asia	65	30	78,558	51	137,100 (101,000-184,100)		78	55	30,101	62	16	68	37,500 (20,800-67,100)	63	26
South-East Asia (excluding India)	78	33	39,723	80	52,300 (32,700-80,300)		89	60	16,279	59	27	66	10,000 (3,300-27,300)	74	7
India	59	-	38,835	37	84,700 (68,200-103,700)		74	-	13,822	64	11	70	27,500 (17,500-39,800)	57	19
Western Pacific	85	41	177,052	105	10,400 (5,800-47,700)		97	81	31,706	82	17	84	1,500 (100-40,100)	88	1
TOTAL	**73**	**44**	853,479	**146**	544,200 (364,300-891,500)		**84**	**66**	279,776	**67**	**40**	**72**	145,700 (81,100-335,400)	**75**	**100**

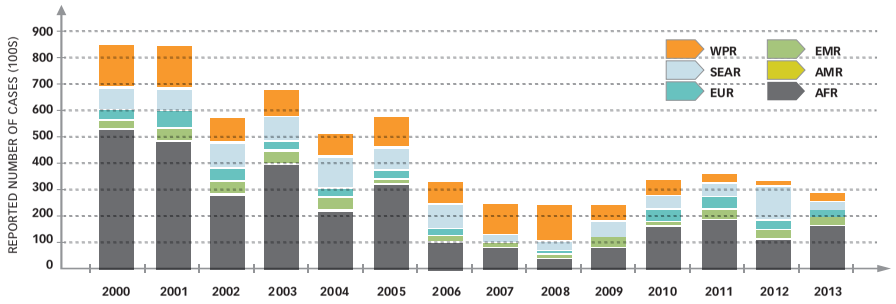
* Coverage data:WHO/UNICEF estimates of national immunization coverage. Geneva, World Health Organization, 2013 (update of 15 July 2014). (Available at http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragemcv.html, accessed 30 September 2014)

** Reported case data: Measles reported cases. Geneva, World Health Oranization, 2013 (update of 15 July 2014) (http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tsincidencemeasles.html, accessed 30 September 2014). Americas data for 2013 from Immunization in the Americas, 2014 Summary. (http://www.paho.org/hq/index.php?option=com_docman&task=doc_view&Itemid=270&gid=27446&lang=en, accessed 14 October 2014)"

† Population data: United Nations, Department of Economic and Social Affairs, Population Division (2013). World Population Prospects: The 2012 Revision, CD-ROM Edition

‡ Any country not reporting data on measles cases for that year were removed from both the numerator and denominator

REPORTED MEASLES CASES BY WHO REGION, 2000-2013



VENEZUELA

During the April 2014 Vaccination Week in the Americas, Venezuela launched an MR follow-up campaign targeting children aged one to five years and added oral polio vaccine (OPV) for children aged eight months to five years. Strategies to ensure a quality campaign included institution-based vaccination with extended hours, school vaccination, community outreach, vaccination of indigenous communities in pre-determined areas, and engagement with local organizations and leaders to help direct children, especially those not in school, to the nearest health clinic.

The country administered 3,021,690 OPV doses and 2,511,076 MMR doses, achieving a coverage rate of 99.8 per cent for measles. Rapid Convenience Monitoring (RCM) was employed to assess the campaign's reach and to adjust strategies where needed. A total of 4,446 RCM activities were implemented in sixteen of Venezuela's twenty-three states.

An expanding network of 723 laboratories serves nearly all of the WHO's 191 Member States

MEASLES AND RUBELLA LABORATORY NETWORK AND PRELIMINARY SURVEILLANCE DATA FOR 2014

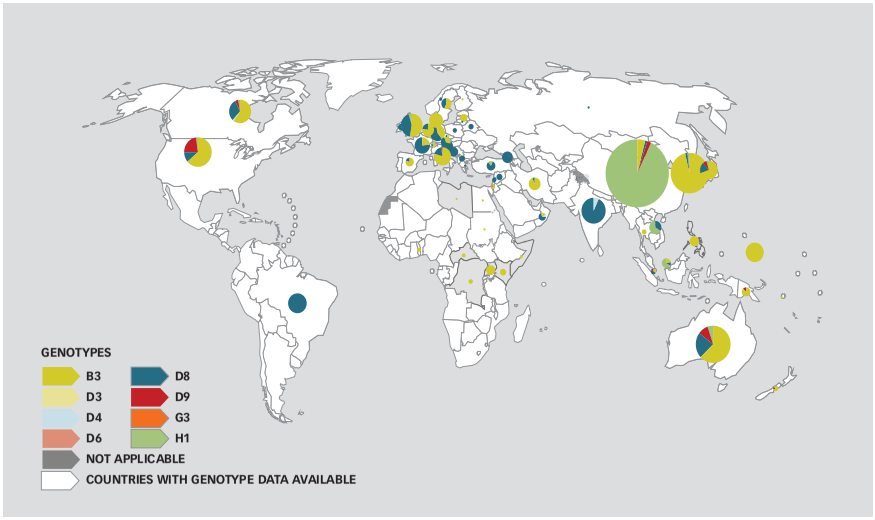
The WHO coordinates a global laboratory network to support the elimination of measles and rubella through the high quality laboratory testing of suspected measles and rubella cases. An expanding network of 723 laboratories serves nearly all of the WHO's 191 Member States. Following SEAR's adoption of a Regional Measles Elimination and Rubella Control target in 2013, all WHO Regions now have a measles elimination goal and those without laboratory facilities need to establish centers for case-based confirmation of all incidences and outbreaks.

Of the 350,000 suspected measles cases in 2014, almost 96,000 were laboratory confirmed, an increase of 20,000 as compared to 2013. Overall in 2014, network laboratories reported testing almost 160,000 clinical specimens for measles and more than 100,000 for rubella. Preliminary reports from 179 countries suggest that the global number of cases in 2014 is likely to be similar to the 2013 total. However, several countries, including India, have yet to report.

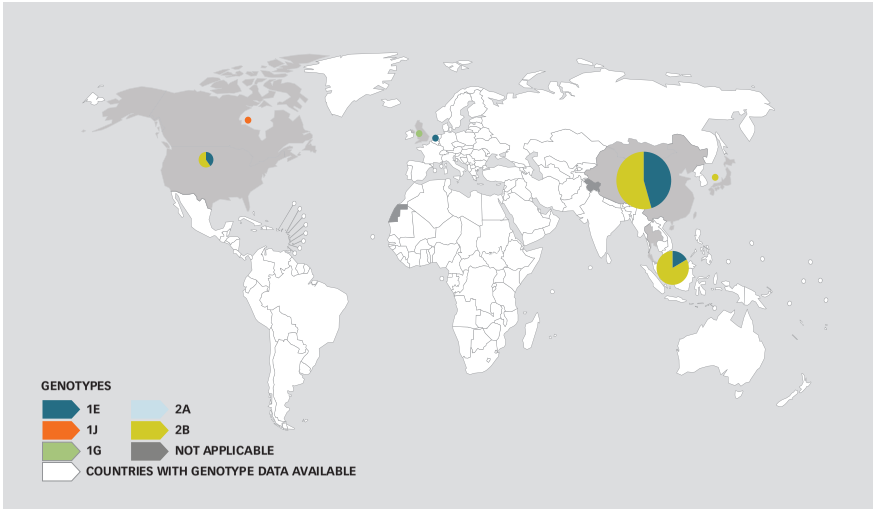
Genomic sequence analysis of measles and rubella viruses can help track their spread and monitor progress towards elimination. Such analyses have become an important tool in disease control and elimination programs. The WHO has developed databases to assist laboratories in analysing sequence data. These databases—the Measles Nucleotide Surveillance (MeaNS) for measles and the Rubella Nucleotide Surveillance (RubeNS) for rubella—are hosted by Public Health England. To date, a total of 22,226 and 1,116 viral sequences have been submitted to MeaNS and RubeNS, respectively.

Analysis of viral sequences submitted to these databases offers a fascinating glimpse into how well travelled these viruses can be. As the number of countries contributing to the databases has increased, a more complete global picture of circulating viruses has emerged. For example, a particular strain of measles virus which contributed to an outbreak in the Philippines was found to have subsequently spread to at least thirty-one different countries including Australia, Austria, Canada, China, the DPRK, Denmark, Finland, Germany, Ireland, New Zealand, Oman, the UK, and the US. Importations of the same virus from countries other than the Philippines were also observed. Another virus strain partly responsible for the outbreak in the Philippines was found to be directly linked to a 377-case outbreak among the unvaccinated Amish community in the US state of Ohio.

DISTRIBUTION OF MEASLES GENOTYPES FROM JAN TO DEC 2014



DISTRIBUTION OF RUBELLA GENOTYPES FROM JAN TO DEC 2014



BE READY

STRATEGY 3:
Develop and maintain outbreak preparedness, respond rapidly to outbreaks, and manage cases

MEASLES OUTBREAKS

In 2014, large measles outbreaks occurred in four of the six WHO regions, placing elimination goals at risk. By the end of 2014, large outbreaks had been reported in the Philippines (53,803 reported cases), China (52,482), the DRC (35,835), Ethiopia (14,100), Angola (12,036), PNG (11,798), Somalia (9,965), and Indonesia (7,928).

European countries experiencing outbreaks included the Russian Federation (3,248 cases), Georgia (3,190), Bosnia and Herzegovina (2,204), and Italy (1,687). The 2012 outbreak in Ukraine continued into 2014, though cases during the year dropped to 2,326 compared with 2013 (3,308 cases) and 2012 (12,746 cases). Vaccine hesitancy continued to affect coverage in many countries in the region in 2014, including France, Georgia, Germany, and the UK.

In the Eastern Mediterranean Region, the continued insurgency in Somalia kept many areas inaccessible to vaccination teams and contributed to a large outbreak affecting at least 9,965 children in 2014. On-going conflict also disrupted the immunization programme in Syria, where the measles vaccination rate is estimated to have fallen from pre-conflict coverage of over 90 per cent to around 61 per cent at the end of 2013. In Pakistan, an outbreak originally reported in 2012 continued into 2014. All of Pakistan's provinces were affected, with more than 10,000 cases reported through the country's case-based system. Outbreak response immunization activities were carried out in Sindh and Punjab Provinces, and nationwide SIAs—originally scheduled for 2013—were implemented in Sindh and Khyber Pakhtunkhwa provinces in 2014.

In the South-East Asia Region, a large outbreak in Sri Lanka that began in 2013 continued into 2014. After several years with few or no cases, the outbreak comprised 3,440 cases in 2013 and 2,554 cases in 2014. The outbreaks involved mostly children under one year of age and young adults in age groups not included in the country's 2001 catch-up campaign. India has not yet reported for 2014.

In the Western Pacific Region, China's 2014 outbreaks primarily affected very young children born since the 2010 SIAs and young adults who missed routine immunization but were too old for the campaign. A review conducted in June 2013 concluded that many young children, particularly those from recent unregistered migrants, tend to miss routine vaccinations because they are not registered with the public health system. Another contributing factor is false

In 2014, large measles outbreaks occurred in four of the six WHO regions, placing elimination goals at risk

contra-indications that delay or permanently prevent significant numbers of children from being vaccinated. Transmission in health care delivery institutions might also play a part.

In the Africa Region, the number of reported cases declined sharply in the DRC but increased sharply in Ethiopia, where 14,100 cases were reported in 2014. Cases in Ethiopia are increasingly being reported from age groups too old to have been targeted by the last two campaigns, as well as among younger children in regions with persisting gaps in routine and SIA coverage. Other African countries reporting large outbreaks in 2014 included Angola (12,036 reported cases) and Nigeria (7,055).

Outbreak investigations frequently indicate that the overwhelming majority of cases occur among unvaccinated children, revealing that country programmes continue to miss children both in routine service delivery and during campaigns.

AZERBAIJAN

In 2014, Azerbaijan implemented a national measles and rubella follow-up campaign in response to a 2013 measles outbreak. The initial campaign targeted 27,083 children under ten years of age who received the combined MMR vaccine.

For the follow-up campaign, the Ministry of Health procured 200,000 doses of MR vaccine for a campaign targeting 171,565 children and adolescents in the eleven to fifteen-year-old range. Outreach vaccination was organized in every school in coordination with the Ministry of Education. In total, 164,560 children and adolescents (96 per cent of the target group) were vaccinated.

In 2014, the M&RI provided $7.65 million for outbreak responses in seven countries

THE MEASLES OUTBREAK RESPONSE FUND

The M&RI Outbreak Response Fund (ORF) was operationalized in 2013. Funded by GAVI and managed by the M&RI, the ORF is designed to prevent measles deaths and enable rapid response during an outbreak. During its first year, the ORF provided outbreak response funds to four countries, and in 2014 funded outbreak responses totalling $7.65 million in Chad, the DRC, Kenya, Pakistan, the Solomon Islands, Togo, and Uganda.

In 2014, the ORF's Standard Operating Procedures for supporting operational costs were amended. Rather than provide a flat $0.33 per child for operations costs, countries can now receive funds equal to 50 per cent of the outbreak response operational budget. This change will allow for better financing of response operations in countries where operational costs are higher.

An outbreak in Pakistan in late 2012 and early 2013 led to a nationwide response targeting children nine months to ten years of age. The ORF provided $2.64 million for the procurement of injection devices for the campaign. In the face of substantial challenges, Pakistan was able to conduct measles campaigns in three provinces (38 per cent of the total population) by the end of 2014.

In the DRC, a large measles outbreak that began in Katanga and South Kivu in 2011 spread across the country over the next two-and-a-half years. In 2014, the ORF provided $4 million for a campaign that targeted seven provinces in addition to the four covered in 2013. The campaign targeted children between six months and ten years of age.

In the Solomon Islands, an outbreak affecting children and adults resulted in a campaign in late 2014 targeting those between nine months and twenty-nine years. GAVI funded the portion of the campaign targeting those aged nine months to fourteen years, while the ORF provided $439,455 to cover the fifteen to twenty-nine-year-old age group.

Two of the six regions in Togo that had been unable to participate in a 2013 nationwide campaign and which subsequently experienced outbreaks in 2014 were reached thanks to a $307,000 ORF-funded measles campaign.

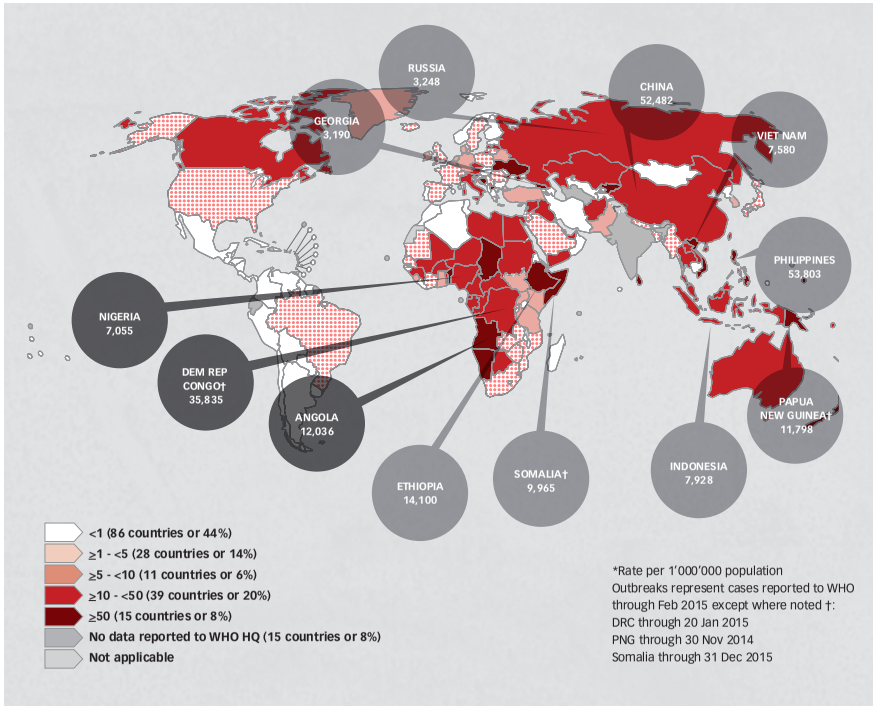
In 2014, $114,663 in funds were also provided to contain an outbreak in and around a refugee camp in Kenya and $317,000 to provide measles and other vaccines in twenty high-risk Ugandan districts.

However, one shortcoming of the ORF was its inability to fund responses in non-GAVI eligible countries. As such, outbreaks in Georgia, the Philippines, and Syria that would have benefited immensely from timely responses if funds were available were not aided.

RUBELLA OUTBREAKS

In 2013, several rubella outbreaks occurred in Japan, Poland, and Romania, all countries that had previously introduced rubella vaccines using a strategy that focused primarily on preventing CRS by vaccinating adolescent girls. This strategy had left a large number of males susceptible to rubella infection, and a series of new outbreaks in 2014 primarily affected adolescents, young adult males, and also susceptible pregnant women. From these outbreaks, a sizeable number of susceptible pregnant women were infected, which resulted in the birth of infants with CRS. In 2012 and 2013 in Romania, fifty-five and forty-five infants with CRS were born, respectively. In Japan, thirty-one infants with CRS were born in 2013. In 2014, several rubella outbreaks were identified and investigated in the African Region. These outbreaks highlight the importance of not only rubella surveillance but also CRS surveillance.

REPORTED MEASLES INCIDENCE RATE* (JAN TO DEC 2014). REPORTED MEASLES CASES IN 12 LARGE OUTBREAKS SINCE JANUARY 2014



BE HEARD

STRATEGY 4:
Communicate and engage to build public confidence and demand for immunization

Communications and social mobilization play a critical role in conducting measles or measles-rubella SIAs. Engaging with communities, parents, and caregivers to stimulate demand for vaccination requires tremendous effort and coordination. Achieving targeted coverage results depends upon plans and strategies to reach various segments of society including policy and decision makers, media, religious groups, community leaders, families, and individuals.

Increasingly, countries use data from surveillance, rapid coverage assessments, and independent surveys to identify and understand reasons for missed vaccinations. This data subsequently helps address the causes of missed vaccinations.

Mobilizing community resources, the distribution of tailored information to different audiences and generating local support are an integral part of the process. The M&RI relies heavily on the efforts of partners like the Latter-day Saints, Lions Clubs, and the Red Cross to carry out communications and social mobilization efforts. Their combined resources and local networks saw 556,000 volunteers mobilize millions of families in sixteen countries in 2014.

The American Red Cross supported a measles vaccination campaign in Benin in November 2014. Josephine, pictured left, is the mother of five children between the ages of two and thirteen. Francoise, also pictured, is part of the 1,000-member corps of Benin Red Cross volunteers who went door-to-door telling people like Josephine about the measles vaccination campaign. When she learned about the measles campaign, Josephine decided to get her family vaccinated. The day after her initial visit, Francoise returned to Josephine's home to accompany her and her children to a health clinic. Volunteers checked Josephine's daughter's immunization card and delivered the vaccine, which now protects her for life. Josephine's children are just a few of the 3.1 million children vaccinated during this lifesaving campaign.

In October 2014, Tanzania carried out one of the largest public health interventions in the country's history. More than 20 million children were immunized in a measles and rubella vaccination campaign. Members of Tanzania's Lions Club were active in the national and municipal social mobilization planning process to ensure that high coverage would be achieved. During the campaign, Lions worked to educate parents on the dangers of measles and rubella and to encourage them to bring their children to vaccination sites. Activities included the production and distribution of more than 20,000 posters and banners, road shows to raise awareness in urban areas, the hosting of mini-campaign launch events to raise awareness and engage communities at the municipal level, and using radio, television, and print media to amplify awareness of the campaign.

TABLE 3. VOLUNTEER AND HEALTHCARE WORKER NUMBERS FOR 2014 SIAS

REGION	COUNTRY	VOLUNTEERS	HEALTH WORKERS
AFR	Angola	10,131	18,732
AFR	Benin	1,992	2,184
AFR	Burkina Faso	9,428	ND
AFR	Chad	1,772	1,772
AFR	Chad	3,030	3,030
AFR	Cote d'Ivoire	10,295	ND
AFR	Dem Rep Congo	18,734	37,236
AFR	Dem Rep Congo	25,282	21,714
AFR	Dem Rep Congo	12,092	9,069
AFR	Dem Rep Congo	278	8,468
AFR	Dem Rep Congo	481	24,196
AFR	Mauritania	1,900	1,804
AFR	South Sudan	ND	2,121
AFR	Tanzania	47,189	63,369
EMR	Afghanistan	ND	2,826
SEAR	Bangladesh	388,000	67,256
WPR	Lao PDR	35,500	4,668
WPR	Solomon Islands	120	514
	TOTAL	566,224	268,959

ND = no data

In 2014, there were a number of notable advances in research on strategic fronts, including diagnostics, vaccine delivery, and cost effectiveness studies

INNOVATE

STRATEGY 5:
Perform the research and development needed to support cost-effective operations and improve vaccination and diagnostic tools

Despite major advances in MR vaccination coverage, a recent GVAP assessment report noted that measles and rubella elimination efforts are behind schedule. Increasing vaccination coverage will require further investments to address barriers to measles vaccination and to support innovations for increasing vaccination coverage. In 2014, significant steps were taken to increase the M&RI's capacity for full implementation of its 2012-2020 Strategic Plan.

At the direction of the M&RI management team, CDC took the lead in forming the M&RI Research and Innovations (R&I) Working Group. The R&I Working Group will prioritize, monitor, and coordinate measles and rubella research and innovations as well as establish a funding mechanism for prioritized research to help meet the measles and rubella elimination targets outlined in the M&RI's Global Strategic Plan 2012-2020 . The Working Group will also help coordinate the periodic updating of the measles and mumps research agenda that was established in 2011, as a number of M&RI partners—as well as other agencies and academic institutions—have come together to fund and/or conduct measles and rubella research.

In 2014, there were a number of notable advances in research on strategic fronts, including diagnostics, vaccine delivery, and cost effectiveness studies. The currently available MR vaccine presents a number of challenges: it must be reconstituted and maintained in the cold chain; skilled health professionals are required for safe hypodermic injection and vaccine handling; injection pain can be a deterrent for vaccination acceptance; and vaccinators are sometimes hesitant to open a multi-dose vial as unused doses must be discarded. These complex logistics make house-to-house vaccination campaigns—a critical strategy for current polio eradication efforts and past smallpox campaigns—extremely difficult. However, the Georgia Institute of Technology in the US and the CDC are working on an alternative approach to develop a dissolving "microneedle" patch to administer the MR vaccine. The patch is designed to cause little or no pain, generate no sharps waste, maintain stability outside the cold chain, and be administered by minimally trained personnel. The manufacturing cost of this microneedle is expected to be similar to that of currently available MR vaccines. This innovation offers a potentially major advance in measles and rubella elimination efforts, similar to the profound impact that the introduction of the bifurcated needle played in achieving smallpox eradication.

Other advances in 2014 centered on the development of faster, more efficient and cost effective methods for estimating population immunity. Understanding the prevalence of measles and rubella antibodies in a population can help verify vaccination coverage rates and identify subpopulations that may be at risk of measles or rubella virus transmission and outbreaks. Throughout 2014, the Global Measles and Rubella Laboratory Network (GMRLN) routinely conducted serologic testing for measles and rubella antibodies to assess population immunity. Also in 2014, the CDC and colleagues at the Rijksinstituut voor Volksgezondheid en Milieu (RIVM) in the Netherlands demonstrated that a new assay—one allowing simultaneous testing for measles, mumps, rubella, and varicella—correlated well with the standard enzyme immunoassays currently being used in GMRLN laboratories. This promising new method for conducting serosurveys will be further developed and established through the M&RI partnership.

Meeting GVAP's elimination targets and establishing a goal for eradication will require substantial investments in developing innovative approaches to overcome persistent barriers against increasing MR vaccination coverage, particularly in resource limited settings.

PHILIPPINES

The Philippines experienced on-going measles outbreaks in 2013 and early 2014. In September 2014, a nation-wide SIA campaign targeted 11.5 million children and reached 10.4 million. The Church of Jesus Christ of Latter-day Saints has a large membership in the Philippines so was able to leverage local church leadership and groups of church members to volunteer and support the campaign. Volunteers went door-to-door to identify children five years of age and younger who had not yet received measles vaccine and directed parents to a local clinic where their children could be immunized. The Church also opened up several of its meeting houses to serve as makeshift clinics and provided funding for various aspects of the campaign. Having church volunteers go door-to-door to talk with families not only helped spread the word, but also helped health workers accurately record the number of children who were being immunized throughout the country.

OUR PARTNERS, FINANCIALS & MANAGEMENT TEAM

THE MEASLES & RUBELLA INITIATIVE PARTNERS

Key supporters of the Measles & Rubella Initiative include countries and governments affected by measles, rubella and CRS, and the following:

American Academy of Pediatrics
Anne Ray Charitable Trust
BD
Bill and Melinda Gates Foundation
Canadian International Development Agency (CIDA)
Church of Jesus Christ of Latter-day Saints
GAVI - The Vaccine Alliance
Global Payments, Inc.
Herman and Katherine Peters Foundation
International Federation of Pharmaceutical Manufacturers Association
International Federation of Red Cross and Red Crescent Societies
International Pediatric Association
Izumi Foundation
Jeppesen
Lions Clubs International Foundation
Japanese Agency for Development Cooperation (JICA)
Merck Co. Foundation
Norwegian Ministry of Foreign Affairs
ONE Campaign
Red Cross and chapters
Rockefeller Foundation
Sabin Vaccine Institute
Task Force for Global Health
United Kingdom Department for International Development
Vodafone Foundation
World Bank
Women's National Basketball Association

The Measles & Rubella Initiative is also grateful to its many individual private donors.

OUR FINANCIALS

MEASLES & RUBELLA INITIATIVE FUNDING MECHANISM

To increase coordination and transparency while minimizing transaction costs for UNICEF and WHO, a unique funding mechanism was implemented in 2001. Grants from various donors made to the UN Foundation specifically for the M&RI are pooled together with contributions from the UN Foundation. Initially, the UN Foundation matched donor funds and then moved to a straight contribution when donor contributions became too large to match.

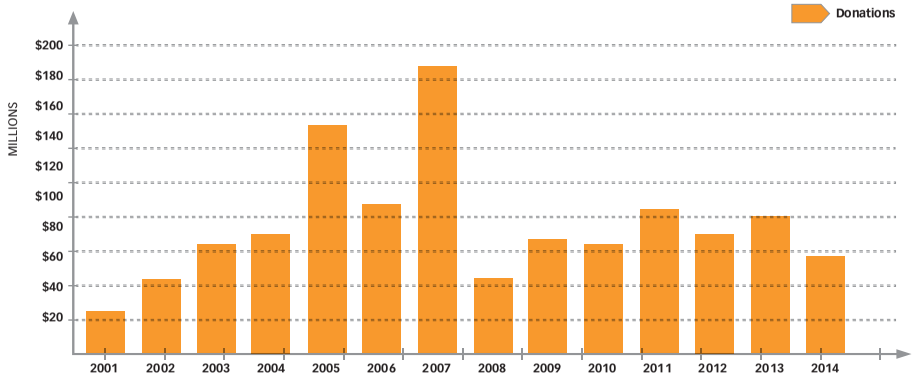
A schedule of SIAs is projected over several years based on routine coverage and the quality and coverage of previous SIAs. Countries planning to conduct SIAs are requested to submit a Plan of Action (PoA), approved by each country's Interagency Coordinating Committee (ICC), which includes target populations and budgets. The WHO and UNICEF develop an annual global budget for measles and rubella activities based upon these PoAs.

Each year, UNICEF and WHO submit one joint proposal to the UN Foundation for measles mortality reduction/elimination activities to be conducted in each of the six WHO regions. Based upon the budgets for these activities, the UN Foundation disburses funding to WHO and UNICEF according to the proposal request. Funds then flow from the UN Foundation to the UN Fund for International Partnerships (UNFIP) within the United Nations Secretary General's office and then to the UNICEF and WHO headquarter offices.

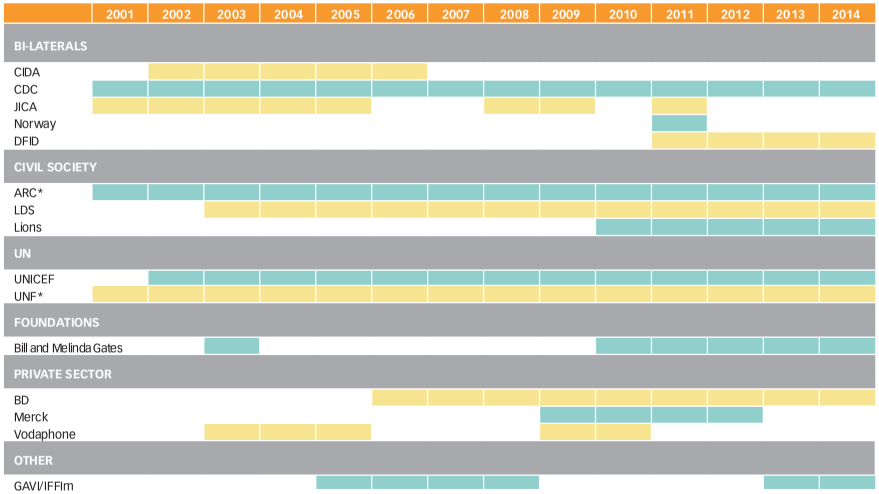
UNICEF HQ disburses funds to country offices to cover operational activities and technical assistance and directly to the UNICEF SD for approved orders of bundled vaccines and devices. WHO HQ disburses funds to WHO Regional offices for disbursement to country offices, from which campaign activities are scheduled. UNICEF and WHO submit one joint progress report to the UN Foundation on a yearly basis, which is made available to all M&RI donors and partners.

MEASLES & RUBELLA INITIATIVE ANNUAL EXPENDITURE, 2001-2014

CUMULATIVE DONATIONS 2001-2014 = US$ 1.1 BILLION
TOTAL CONTRIBUTIONS TO M&RI BY YEAR

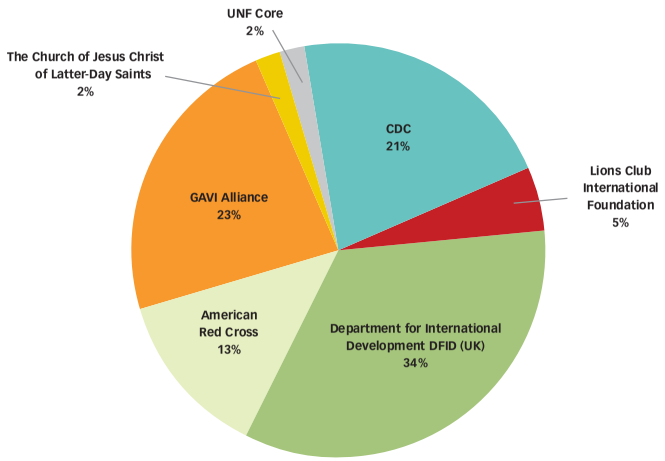


THE MEASLES & RUBELLA INITIATIVE DONORS, 2001-2014*

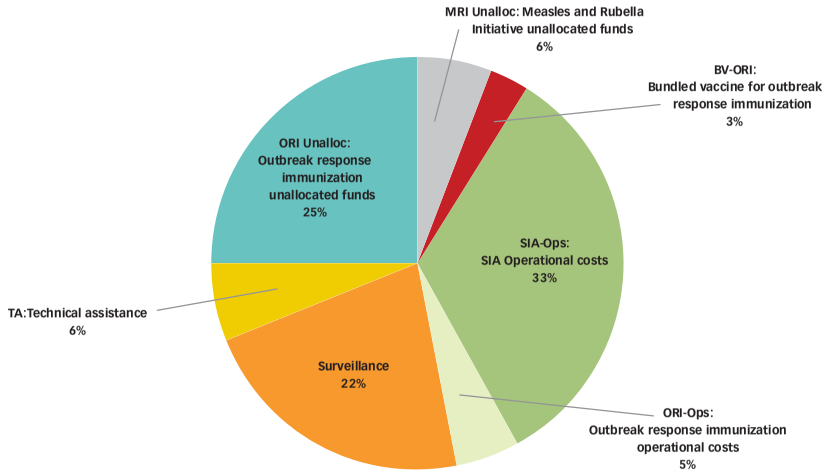


*Includes ARC/UNF and other partners

MEASLES & RUBELLA INITIATIVE DONORS 2014: USD $43 MILLION TRANSMITTED THROUGH UNF/UNFIP



USE OF 2014 FUNDS TRANSMITTED THROUGH UNF/UNFIP:



OUR MANAGEMENT TEAM

MYRNA CHARLES is Senior Technical Advisor for the Measles & Rubella Initiative at the American Red Cross working within the international services division. From September 2007 until March 2013, she served as medical advisor and Chief of Epidemiology with Peace Corps. Dr. Charles received her medical degree from the New York College of Osteopathic Medicine and earned an MPH from Columbia University and an MBA from the University of Maryland, College Park. She trained with the Centers for Disease Control and Prevention Epidemic Intelligence Service (EIS '02) and completed a Preventive Medicine Residency (PMR '05) working with the New York City Department of Health and Mental Hygiene.

STEPHEN L. COCHI is the Senior Advisor to the Director of the Centers for Disease Control and Prevention's (CDC) Global Immunization Division (GID). He holds a B.S. from MIT, an M.D. from Duke University, and an M.P.H. from Emory University. Dr. Cochi completed residency training in pediatrics at the Massachusetts General Hospital and in preventive medicine at the CDC. In addition, he completed CDC's two-year Epidemic Intelligence Service (EIS) training program in 1984. Dr. Cochi has served for 32 years at CDC in various roles in the field of immunization including leading and managing the U.S. immunization program and its international activities. From 1993-2003, he led CDC's global immunization activities as Director of GID, which is a major partner in the Global Polio Eradication Initiative (GPEI), the Measles & Rubella Initiative (M&RI), the Global Alliance for Vaccines and Immunization (GAVI Alliance), and other priority global immunization activities. Dr. Cochi served as Deputy Director of the U.S. National Immunization Program in 2003 and as Acting Director for two years from January 2004-December 2005.

ROBB LINKINS is Chief of the Accelerated Disease Control and Surveillance Branch at the Centers for Disease Control and Prevention (CDC). After completing his PhD in epidemiology at Johns Hopkins, he joined CDC's Epidemic Intelligence Service and was posted to the state health department in New Mexico. After EIS, he returned to Atlanta and began working in the National Immunization Program, firstly as an epidemiologist in the Polio Eradication Activity, next as chief of the Immunization Registry Branch, and then as Director of the Data Management Division. He was then head of the Thailand – U.S. CDC Collaboration's HIV Research Program in Bangkok for five years.

SUE REEF is the rubella team lead in the Global Immunization Division at the Centers for Disease Control and Prevention (CDC). She graduated from Indiana University School of Medicine in 1983, completed a pediatric internship and residency at Case Western Reserve University in 1986 and a fellowship in Pediatric Infectious Diseases at Emory University in 1990. In 1992, she joined the CDC in the Epidemic Intelligence Service (EIS) program; after which, Dr. Reef joined the National Immunization Program in 1994. Between 1996-2007, Dr. Reef was the technical lead for rubella and CRS in the U.S. Under her leadership elimination of endemic rubella was achieved and maintained in the United States.

ANDREA GAY is the Executive Director of Children's Health at the United Nations Foundation. As Executive Director of Children's Health, Ms. Gay oversees the largest program at the United Nations Foundation, accounting for over 65 per cent of the Foundation's grant-making. Prior to joining the Foundation in 1998, Ms. Gay worked with Managed Care Options, a professional health care firm established to advance principles, programs and practices of managed care. Ms. Gay was the founder and Executive Director of the China Education Fund, an advised fund under the Community Foundation of Greater Washington, founded to promote graduate faculty development for Chinese agriculture universities. Before living in China, Ms. Gay worked for the US Public Health Service with various community health care and financing programs. She holds both a masters in Biology and in City Planning from the University of Pennsylvania.

ROBERT KEZAALA is Senior Health Advisor – Immunisation, in the Programme Division at UNICEF headquarters. His academic qualifications include a medical degree (MBChB) from Makerere University Kampala and an MPH from the Royal Tropical Institute (KIT) in Amsterdam. He has worked for 15 years in immunization systems including 13 years with the World Health Organization – first as epidemiologist and Team Lead for WHO-EPI in Ethiopia, then heading the measles programme in WHO AFRO from 2001-2005 and with the Polio Eradication Initiative in Geneva until 2012. He currently heads the measles, rubella, epidemic meningitis and yellow fever control team at UNICEF in New York.

PETER STREBEL is the Priority Area Leader for Accelerated Disease Control in the Expanded Programme on Immunization at the World Health Organization. His academic qualifications include a BSc and medical degree from the University of Cape Town and an MPH from Johns Hopkins University. He was trained in the Centers for Disease Control and Prevention Epidemic Intelligence Service (EIS '89), and completed his residency in Preventive Medicine at the Georgia State Health Department. He worked for 16 years in the U.S. National Immunization Program where from 2000 to 2005 he was Chief of the Global Measles Branch. His current work focuses on global prevention and control of measles, rubella, and congenital rubella syndrome.

POSTER DESIGNS FOR THE IVY + BEAN VERSUS THE MEASLES CAMPAIGN WITH THE AMERICAN ACADEMY OF PEDIATRICS

The Ivy + Bean illustrations in this Annual Report were created by acclaimed artist Sophie Blackall as part of her ongoing collaboration with the M&RI. *Ivy + Bean*, written by Annie Barrows and illustrated by Ms. Blackall, is a *New York Times* bestselling series of books for children ages 6 to 9 published by Chronicle Books, with more than 15 million copies sold worldwide. The Ivy + Bean artwork produced for M&RI has been used in a wide range of advocacy and awareness products, including a successful Ivy + Bean versus The Measles campaign launched with the American Academy of Pediatrics in 2014.

ALL DOCUMENT DATA IS CURRENT AS OF DECEMBER, 2014.

ARTWORK, DESIGN AND PHOTOGRAPHY
The illustrations were produced by acclaimed illustrator Sophie Blackall for the Measles & Rubella Initiative. This annual report was designed by Sara Gillingham Studio.

PHOTOGRAPHY
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