



# Global Vaccine Action Plan

*Monitoring, Evaluation & Accountability*

*Secretariat Annual Report 2015*

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# ACRONYMS and ABBREVIATIONS

ANC1	first antenatal visit
AVAREF	African Vaccines Regulatory Forum
BCG	Bacille Calmette–Guérin (vaccine)
BMGF	Bill and Melinda Gates Foundation
CFDA	China Food and Drug Administration
CMV	cytomegalovirus
COIA	Commission on Information and Accountability for Women’s and Children’s Health
CRS	congenital rubella syndrome
CSO	civil society organization
DHS	Demographic and Health Survey
DoV	Decade of Vaccines
DTP	diphtheria–tetanus–pertussis (vaccine)
EMA	European Medicines Agency
EPI	Expanded Programme on Immunization
EQA	external quality assessment
EWEC	Every Woman Every Child
FDA	(US) Food and Drug Administration
GPEI	Global Polio Eradication Initiative
GNI	gross national income
GVAP	Global Vaccine Action Plan
GVIRF	Global Vaccine and Immunization Research Forum
HA	haemagglutinin
HepB	Hepatitis B
Hib	<i>Haemophilus influenzae</i> type b
HPV	human papillomavirus
HSS	health system strengthening
iERG	independent Expert Review Group
IAVI	International AIDS Vaccine Initiative
IB-VPD	invasive bacterial vaccine-preventable disease
ICTRP	International Clinical Trials Registry Platform
iERG	independent Expert Review Group
IFPMA	International Federation of Pharmaceutical Manufacturers and Associations
IPV	inactivated polio vaccine
iTAG	independent Technical Advisory Group
IVB	Immunization, Vaccines and Biologicals Department (WHO)
JRF	(WHO-UNICEF) joint reporting form
KANCO	Kenya AIDS NGOs Consortium
LQA–CS	lot quality assurance – cluster sampling
M&E/A	monitoring and evaluation/accountability
M&RI	Measles and Rubella Initiative
MenAfriVac	serogroup A meningococcal conjugate vaccine
MCV	measles-containing vaccine
MDG	Millennium Development Goal
MICS	Multiple Indicator Cluster Surveys
MR	measles–rubella
MMR	measles, mumps and rubella
MNT	maternal and neonatal tetanus
MNTE	maternal and neonatal tetanus elimination
Mtb	<i>Mycobacterium tuberculosis</i>
NGO	nongovernmental organization
NHP	non-human primate
NIAID	National Institute of Allergy and Infectious Diseases

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NITAG	National Immunization Technical Advisory Group
NRA	national regulatory authority
NVC	National Verification Committee
OECD	Organisation for Economic Co-operation and Development
OPV	oral polio vaccine
ORS	oral rehydration salts
PAB	protected at birth against neonatal tetanus
PAHO	Pan American Health Organization
PCV	pneumococcal conjugate vaccine
PMNCH	Partnership for Maternal, Neonatal and Child Health
PQS	performance, quality and safety
RV	rotavirus vaccine
RCV	rubella-containing vaccine
RVC	Regional Verification Commission
SAGE	Strategic Advisory Group of Experts (on immunization)
SHA	Systems of Health Accounts
SIA	supplementary immunization activity
SIV	simian immunodeficiency virus
SO	(GVAP) Strategic Objective
TAG	Technical Advisory Group
TPP	target product profile
TT	tetanus toxoid
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNICEF	United Nations Children's Fund
V3P	vaccine product, price and procurement
VFC	(United States CDC) Vaccines for Children Fund
VPD	vaccine-preventable diseases
WAP	weighted average prices
WHO	World Health Organization
WPV	wild poliovirus
WUENIC	WHO-UNICEF Estimates of National Immunization Coverage

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# Introduction

## The Global Action Plan and process for monitoring progress

The Global Vaccine Action Plan (GVAP) is a framework adopted at the Sixty-fifth World Health Assembly in May 2012 to achieve the vision of the Decade of Vaccines (DoV) 2011–2020 of “a world in which all individuals and communities enjoy lives free from vaccine-preventable diseases”<sup>1</sup>. The GVAP’s mission is to “improve health by extending by 2020 and beyond the full benefits of immunization to all people, regardless of where they are born, who they are, or where they live.”

The GVAP has articulated five goals and six strategic objectives to achieve this mission, as shown in Table 1.

The Sixty-fifth World Health Assembly requested the World Health Organization (WHO) Director General to monitor progress and report annually, using an accountability framework, in order to guide immunization discussions and future actions.<sup>2</sup> In response, the DoV partners developed a Monitoring & Evaluation/Accountability (M&E/A) Framework that identifies specific indicators to measure progress for each goal and strategic objective. The DoV partners also agreed to a process for an annual independent review of progress.

**Table 1: The GVAP Monitoring and Evaluation/Accountability Framework: goals, strategic objectives and indicators to evaluate progress**

Goal /Strategic Objective	Indicators
<b>Goals:</b>	
<b>1. Achieve a world free of poliomyelitis</b>	1.1. Interrupt wild poliovirus transmission globally
	1.2. Certification of poliomyelitis eradication
<b>2. Meet global and regional elimination targets</b>	2.1. Neonatal tetanus elimination
	2.2. Measles elimination
	2.3. Rubella/Congenital rubella syndrome (CRS) elimination
<b>3. Meet vaccination coverage targets in every region, country and community</b>	3.1. By 2015, reach 90% national coverage and 80% in every district or equivalent administrative unit with three doses of diphtheria-tetanus-pertussis-containing vaccines
	3.2. By 2020, reach 90% national coverage and 80% in every district or equivalent administrative unit for all vaccines in national programmes, unless otherwise recommended
<b>4. Develop and introduce new and improved vaccines and technologies</b>	4.1. Licensure and launch of vaccine or vaccines against one or more major currently non-vaccine preventable diseases
	4.2. Licensure and launch of at least one platform delivery technology
	4.3. Number of low-income and middle-income countries that have introduced one or more new or under-utilized vaccines
<b>5. Exceed the Millennium Development Goal 4 target for reducing child mortality and Integration indicators</b>	5.1. Reduce under-five mortality rate
	5.2. Integration of health care interventions and immunization activities

<sup>1</sup> The GVAP can be found at: [http://www.who.int/immunization/global\\_vaccine\\_action\\_plan/en/](http://www.who.int/immunization/global_vaccine_action_plan/en/).

<sup>2</sup> Resolution WHA65.17 (found at: [http://apps.who.int/gb/or/e/e\\_wha65r1.html](http://apps.who.int/gb/or/e/e_wha65r1.html)).

Goal /Strategic Objective	Indicators
<b>Strategic Objectives (SOs)</b>	
<b>1. Ensuring country ownership of immunization</b>	1.1. Increasing domestic expenditures for immunization per person targeted 1.2. Presence of an independent technical advisory group that meets the defined criteria
<b>2. Demand for immunization</b>	2.1. Percentage of countries that have assessed the level of hesitancy in vaccination at a national or subnational level. 2.2. Reasons for vaccine hesitancy
<b>3. The benefits of immunization are equitably extended to all people</b>	3.1. Percentage of districts with 80% or greater coverage with three doses of diphtheria-tetanus-pertussis-containing vaccine Note: this indicator is included in the narrative of the overall coverage indicator report (under G3.1) 3.2. Reduction in coverage gaps between wealth quintiles and other appropriate equity indicator(s)
<b>4. Strong immunization systems are an integral part of a well-functioning health system</b>	4.1. Dropout rates between first dose (DTP1) and third dose (DPT3) of diphtheria-tetanus-pertussis-containing vaccines Note: this indicator is included in the narrative of the overall coverage indicator report (under G3.1) 4.2. Sustained coverage of diphtheria-tetanus-pertussis-containing vaccines 90% or greater for three or more years Note: this indicator is included in the narrative of the overall coverage indicator report (under G3.1) 4.3. Immunization coverage data assessed as high quality by WHO and UNICEF To be revised in September 2015 4.4. Number of Member States with case-based surveillance for vaccine-preventable diseases: invasive bacterial vaccine-preventable diseases and rotavirus
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<b>6. Country, regional and global research and development innovations maximize the benefits of immunization</b>	6.1. Progress towards development of HIV, TB and malaria vaccines 6.2. Progress towards a universal influenza vaccine (protecting against drift and shift variants) 6.3. Progress towards institutional and technical capacity to carry out vaccine clinical trials 6.4. Number of vaccines that have either been re-licensed or licensed for use in a controlled-temperature chain at temperatures above the traditional 2–8°C range 6.5. Number of vaccine delivery technologies (devices and equipment) that have received WHO pre-qualification against the 2010 baseline

This report, prepared by the Secretariat for the Decade of Vaccines Global Vaccine Action Plan, serves as the basis for the independent review. As was the case in 2013 and 2014, this report reviews progress against each of the indicators in the Monitoring and Evaluation/Accountability Framework of the GVAP. In addition it contains a narrative report on trends in vaccine prices,

short updates on Tracking Resources and Commitments to Immunization, and independent voluntary submissions from various partners on the activities they conducted under the GVAP umbrella.

The readers can take notes of the following general comments for this edition:

1. The report does not strictly follow the structure of the GVAP, but rather considers linked indicators relating to specific areas together, even though they reflect different indicators, e.g. all results relating to immunization coverage are compiled into one section of the report, even though they come under separate goals or strategic objectives. Grouping in this way also met the request from the Strategic Advisory Group of Experts (SAGE) on immunization that certain original indicators be considered as part of the overall report on progress with immunization coverage, rather than as independent indicators.
2. Progress on the research and development indicators, which are meant to be reported biennially (baseline was set in last year report), are not included in this report.
3. Civil society organizations were specifically invited to submit reports focusing on their efforts to improve community participation and demand for immunization but also provided a general report in the independent submissions section.
4. The report also contains independent submissions by various technical partners, donors and the pharmaceutical industry.

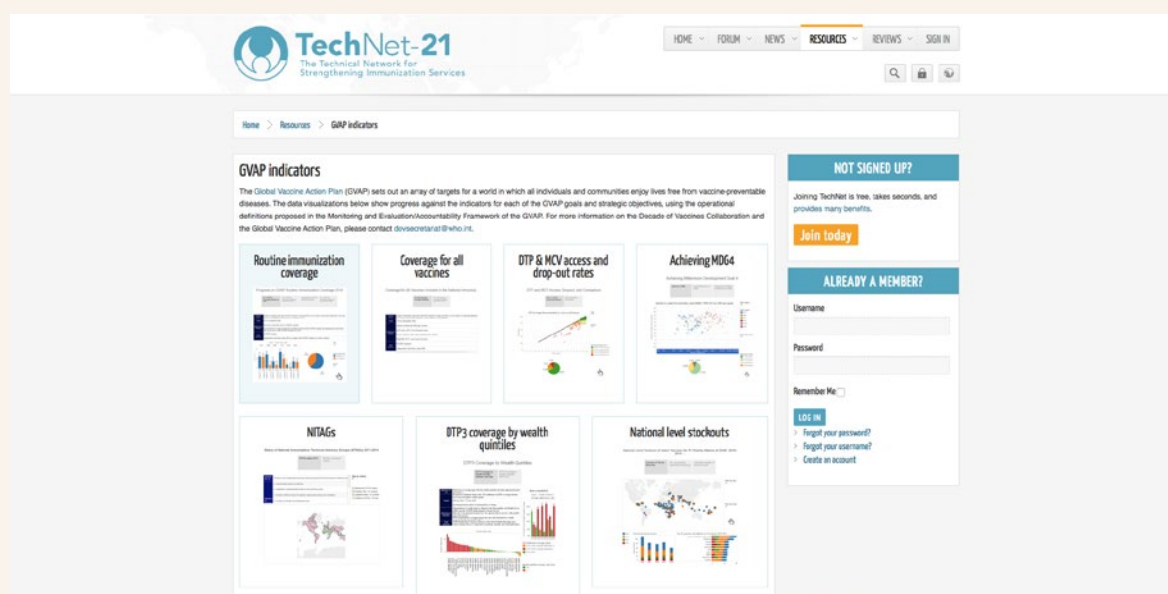
SAGE has been reviewing other indicators, which are still in the process of being developed. It is hoped that the addition of these indicators, and the revisions of others, together with further improvements to the format of the Secretariat report, will lead to a clearer picture of the progress made and challenges remaining to attain the ambitious goals and targets set forth in the Global Vaccine Action Plan.

### Data Visualization of GVAP Indicators

Please note that for several indicators, the GVAP Secretariat has provided interactive maps and graphs that will help the reader to better understand and explore of data.

To access these interactive figures/dashboard please use the Technet21 platform:

<http://www.technet-21.org/en/resources/gvap-indicators>



When looking at the data, please hover over the dots, bars and countries; change the year; use the filters; use zoom, etc. to view additional information in the background.

For example, for the graph showing the relationship between DTP1 and DTP3, by filtering by region and then hovering over the circles, one can see which country the circles represent.

# I

Monitoring results: goals, strategic objectives and indicators





# 1. DISEASE ELIMINATION

## GOAL 1:

## Achieve a world free of poliomyelitis (indicators G1.1 and G1.2)



### Highlights

- In 2014, there were 414 cases of wild poliovirus (WPV) in nine countries, with for 85% of all cases occurring in Pakistan. Pakistan currently poses the greatest epidemiological risk to achieving a polio-free world, but a robust new emergency plan aims to turn the tide in 2015.
- The second half of 2014 saw the two-year mark since the most recent case of WPV type 3 (WPV3), which was last detected in November 2012, in Nigeria. This allows for cautious optimism that this strain may have been eradicated. No WPV cases of any type have been detected on the African continent since 11 August 2014, meaning the end of all WPV transmission in Africa is a cautious possibility.
- The WHO South-East Asia Region was certified polio-free on 27 March 2014, and certification of conclusive global eradication of WPV type 2 (WPV2) is on track for 2015.
- The outbreaks in the Horn of Africa, central Africa, and the Middle East that spanned 2013 and the first half of 2014 were brought to the verge of being stopped in the second half of 2014. However, none of the outbreaks has been considered closed as there are still residual surveillance gaps which could hide undetected transmission.
- The current situation regarding international spread of the virus has been declared a Public Health Emergency of International Concern by the Director-General of WHO and temporary recommendations were issued for “states currently exporting WPVs” and “states infected with WPV but not currently exporting”.
- In October 2014, Strategic Advisory Group of Experts (SAGE) on immunization reviewed progress towards global readiness for the coordinated, phased removal of oral polio vaccines (OPVs) and concluded that preparations are on track for a switch from trivalent OPV to bivalent OPV in April 2016. All but three countries have committed to introduction of inactivated polio vaccine (IPV) by the end of 2015 as recommended by SAGE.
- Legacy planning work is being done to ensure that the investments made in the cause of polio eradication are built upon to benefit other developmental goals, through a comprehensive programme of work to document and transfer the Global Polio Eradication Initiative (GPEI)’s knowledge, lessons learnt and assets.
- In 2014 and 2015, a midterm review was conducted by the GPEI to review progress to date, recommend appropriate changes to the goals, strategies, activities, and timeline, and to align stakeholders and donors around a shared set of lessons learnt, risks, and priorities that will impact on the remainder of the eradication effort.



## G1.1: INTERRUPT WILD POLIOVIRUS TRANSMISSION GLOBALLY

TARGET: 2014

## G1.2: CERTIFICATION OF POLIOMYELITIS ERADICATION

TARGET: 2018

For the definition of each indicator, description of data sources, comments on data quality, description of results, narrative and highlights please refer to the documents listed in Box 1.

### Box 1: Descriptions of indicators, results, data sources and highlights

1. For context, see the Global Polio Eradication Initiative Status Reports 2014 (June and December), available at: <http://www.polioeradication.org/Resourcelibrary/Strategyandwork/Annualreports.aspx>
2. To review the real-time updates on polio cases worldwide, see: <http://www.polioeradication.org/Dataandmonitoring.aspx>
3. To review the May 2015 report of the Independent Monitoring Board (IMB) of the Global Polio Eradication Initiative (GPEI), please visit: <http://www.polioeradication.org/Aboutus/Governance/IndependentMonitoringBoard/Reports.aspx>

Progress towards the achievement of polio eradication goals and interim milestones is intensively monitored by several bodies, including the IMB of the GPEI, which reviews progress on a quarterly basis and issues

a report after each meeting. Below are excerpts from WHO, GPEI and IMB documents that summarize progress towards this goal and the corrective actions that are being taken, as well as recommendations for future actions.

### From the last two GPEI Status Reports (January–June 2014 and July–December 2014)

Significant progress was made in 2014 towards each of the objectives of the Global Polio Eradication Initiative (GPEI). No wild poliovirus (WPV) cases have been detected on the African continent since 11 August 2014, and the end of all WPV transmission in Africa is a cautious possibility. The WHO South-East Asia Region was certified polio-free on 27 March, and certification of the conclusive global eradication of wild poliovirus type 2 (WPV2) is on track for 2015.

There were 414 cases of WPV in nine countries, compared to 416 cases in eight countries in 2013. Pakistan accounted for 85% of all cases worldwide and, in the second half of 2014, it was the only country that continued to export the poliovirus internationally. Pakistan is currently the greatest epidemiological risk to achieving a polio-free world.

**Table 1: Acute flaccid paralysis (AFP)/polio case count for 2014, by WHO region**

WHO region	AFP cases reported	Non-polio AFP rate	AFP cases with adequate specimens (%)	Total confirmed polio cases	Wild-virus confirmed polio cases
<b>African Region</b>	22447	5.65	92	50	17 <sup>a</sup>
<b>Region of the Americas</b>	2015	0.86	77	0	0
<b>South-East Asia Region</b>	59442	11.02	87	0	0
<b>European Region</b>	1593	1.03	88	0	0
<b>Eastern Mediterranean Region</b>	12540	5.86	91	364	342 <sup>a</sup>
<b>Western Pacific Region</b>	6878	1.88	90	0	0

<sup>a</sup> The difference between total confirmed polio cases and wild-virus confirmed polio cases is because of circulating vaccine-derived poliovirus.  
Source: WHO; data from 02 June 2015.

As a result of the improved quality of immunization campaigns in Nigeria, there were only six new cases due to wild poliovirus, with none occurring during the second half of the year, compared to 53 in 2013. This is a significant decline of 88% in one year. However, the country continues to be affected by a persistent circulating vaccine-derived poliovirus type 2 (cVDPV2) outbreak. The second half of 2014 also saw the two-year mark of the most recent case of WPV type 3, which was last detected globally in November 2012, in Nigeria. This allows cautious optimism that this strain may have been eradicated.

The outbreaks in the Horn of Africa, central Africa, and the Middle East that spanned 2013 and the first half of 2014 were brought to the verge of being stopped

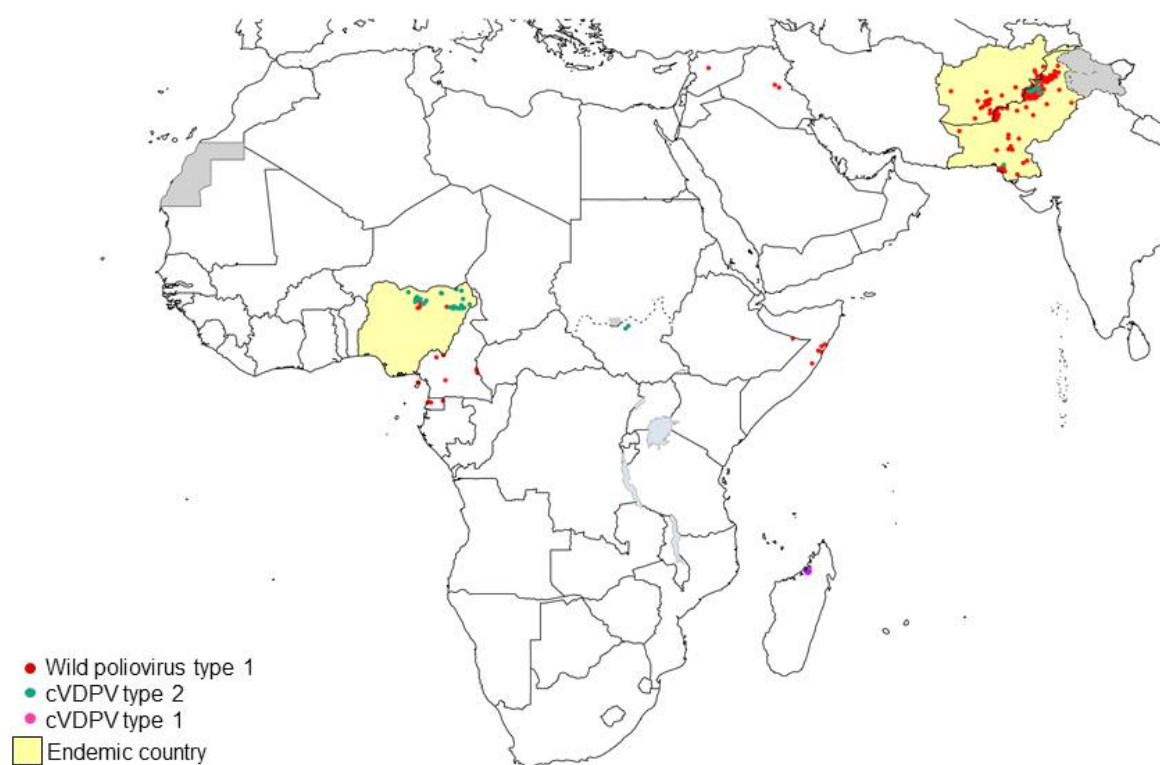
in the second half of 2014. One case was reported in Somalia on 24 August, 2014 and since then there have been no other cases reported from any of the outbreaks. However, none of the outbreaks has been considered closed as there are still residual surveillance gaps which could hide undetected transmission.

The number of cases of WPV in Pakistan more than tripled, going from 93 in 2013 to 306 in 2014. This, coupled with the further deterioration of immunization systems in the Syrian Arab Republic and Iraq due to the conflict and security situation, is putting the Middle East at high risk for reinfection. The current situation regarding international spread of the virus has been declared a Public Health Emergency of International Concern by the Director-General of the WHO.”

**Table 2: Case breakdown of confirmed wild poliovirus (WPV) cases in 2014, by country**

	WPV1	cVDPV Type 2
Afghanistan	28	0
Cameroon	5	0
Equatorial Guinea	5	0
Ethiopia	1	0
Iraq	2	0
Madagascar	0	1
Nigeria	6	30
Pakistan	306	22
Somalia	5	0
South Sudan	0	2
Syrian Arab Republic	1	0

Source: WHO; data from 2 June 2015.

**Figure 1: Wild poliovirus cases and cVDPV<sup>a</sup> cases<sup>b</sup> worldwide in 2014**

<sup>a</sup> cVDPV is associated with  $\geq 2$  AFP cases or non-household contacts. VDPV2 cases with  $\geq 6$  ( $\geq 10$  for type 1) nucleotides different from Sabin in VP1 are reported here.

<sup>b</sup> Excludes viruses detected from environmental surveillance.

Source: WHO data; May 2015.

## Endemic countries: progress and challenges

Nigeria has made major progress towards achieving polio-free status. The decrease in global cases is largely associated with progress achieved in Nigeria, which saw only one case of WPV1 in the second half of 2014, on July 24. This led to a total of 6 cases in 2014, a significant decrease from 53 in 2013. Kano has been identified as the remaining place with persistent WPV transmission in the country and strategies have been targeted to inform ward-specific plans. Although access has improved significantly in the past year, it does continue to be a problem in several areas.

There have been no cVDPV2 cases reported in Afghanistan since March 2013, but the number of WPV cases in 2014 is twice what it was in 2013. The majority of cases in Afghanistan are linked to transmission from Pakistan, leaving Afghanistan's progress towards polio eradication inextricably connected to the progress made against the virus in Pakistan.

WPV cases are on the rise in Pakistan, but a robust new emergency plan aims to turn the tide in early 2015. The government has established a national polio eradication Emergency Operations Centre (EOC) and EOCs in all provinces. In the second half of 2014, Pakistan was the only country that continued to export the virus internationally. According to polling data by Harvard in 2014, vaccine acceptance rates are at the highest levels ever recorded in Pakistan. Vaccine acceptance rates reach 99% in many areas in Pakistan, meaning that parents' desire to vaccinate their children is high, even in inaccessible and insecure areas.

Further, displacement of persons from North and South Waziristan meant that as populations from this area moved out, they received the polio vaccine for the first time since 2012. Access to both areas has also improved for the first time since 2012. In 2015, Pakistan has the opportunity to reverse the current spike in cases and, in so doing, to take the world over the finish line of eradication.

## Outbreaks

The WPV1 outbreak in the Horn of Africa which began in 2013 has significantly declined, but confirmation of a case in Somalia in June 2014 underscores the dangers of ongoing, low-level residual transmission in the region. Two cases of cVDPV2 emerged in South Sudan in September, in a refugee camp area of Unity State. A total of 130 million doses of OPV have been administered to more than 27 million children across four countries.

In central Africa, two WPV1 cases were reported in August 2014, the first in the region since February, from a refugee camp near the border between Cameroon and the Central African Republic. A total of 72 million

doses of OPV have been administered to more than 8.6 million children across four countries. In 2015, it is critical to urgently and fully stop this outbreak, in particular given the progress achieved in Nigeria. Stopping this outbreak may hold the key to achieving a polio-free Africa.

Despite major disruptions to health and transport infrastructure in the Middle East, no new cases have been detected in Iraq since April and in the Syrian Arab Republic since January. A total of more than 140 million doses of OPV have been administered to nearly 30 million children across eight countries in the region.

## Public Health Emergency of International Concern

On May 5, 2014, on the advice of the International Health Regulations (2005) emergency Committee convened at the request of the WHO Executive Board, the Director-General declared the international spread of WPV to be a Public Health Emergency of International Concern (PHEIC). The Director-General has issued Temporary Recommendations for "states currently exporting WPVs" and "states infected with WPV but not currently exporting".

On November 13, the Temporary Recommendations were supplemented with specific measures for Pakistan, because of escalating WPV transmission in that country and the ongoing cross-border exportation of the virus into Afghanistan, including recommending Pakistan restrict at the point of departure the international travel of any resident lacking documentation of appropriate polio vaccination.



## The risk of polio to West African countries: the impact of Ebola

West Africa has historically been one of the highest-risk areas for polio reinfection and outbreaks, given its geographic proximity to Nigeria and large-scale population movements across the region. The devastating Ebola outbreak affecting the region has further raised the spectre of the renewed spread of polio across the region.

In the three Ebola-affected countries, Guinea, Liberia and Sierra Leone, population immunity has declined, as has surveillance for AFP, as the Ebola outbreak has limited the ability to conduct activities. However, poliovirus transmission levels are at a historic low in Nigeria (from where the virus would spread into West

Africa) and population movements *into* the three Ebola-affected countries are limited.

The programme is prepared to immediately implement large-scale supplementary immunization activities in the three Ebola-affected countries as soon as the situation allows. Polio staff and infrastructure across the region continue to support Ebola outbreak response measures, by conducting surveillance, contact tracing, data management, logistics and supply distribution, and outbreak management. In Nigeria, the assets and experience of the dedicated polio eradication emergency operations centres and staff were instrumental in helping stop the Ebola outbreak in that country.

## IPV introduction

As part of the Polio Eradication and Endgame Strategic Plan, oral polio vaccine (OPV) use worldwide will eventually end, starting with the removal of OPV type 2 through the switch from trivalent OPV to bivalent OPV. A first step in this process is the introduction of at least one dose of inactivated polio vaccine (IPV) in all routine immunization programmes by the end of 2015. This will boost immunity against type 2 polioviruses and will also:

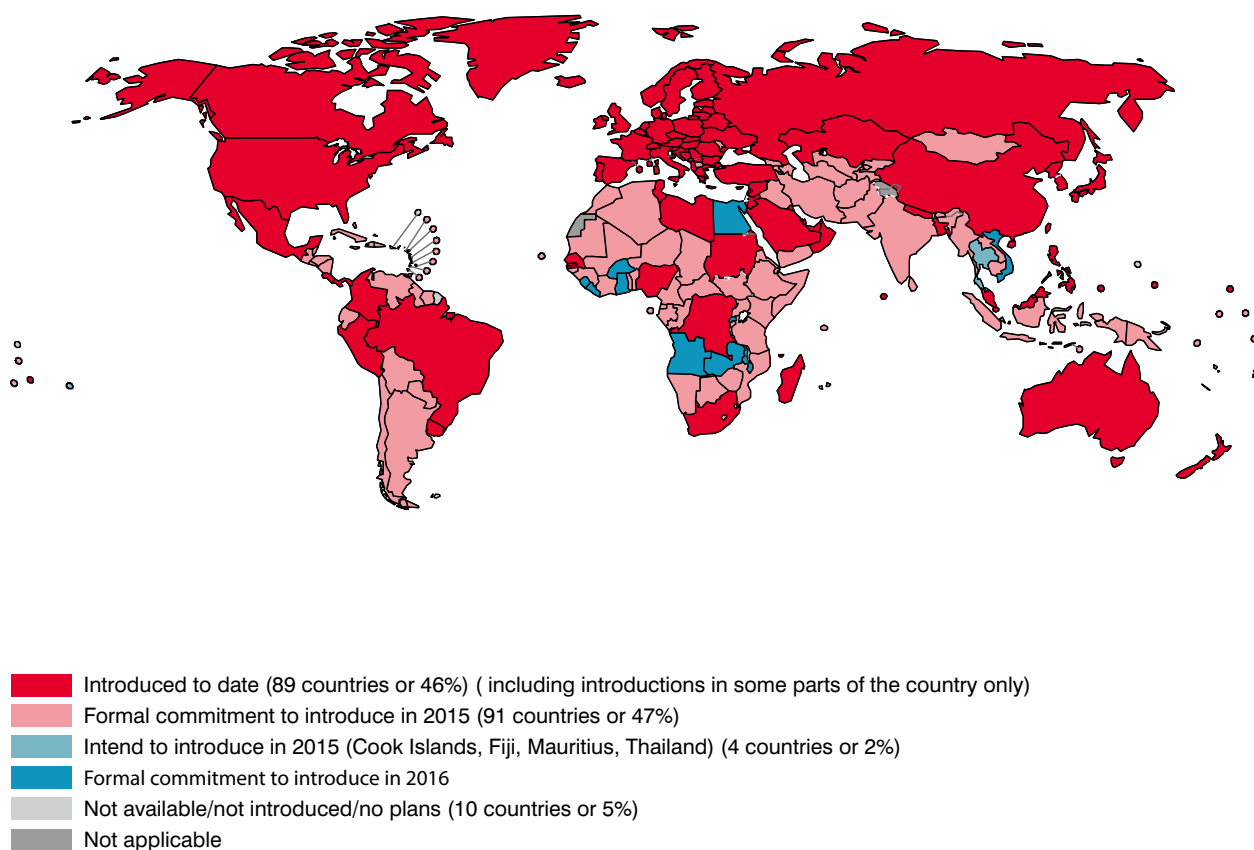
- Reduce the risk of re-emergence of WPV2 or cVDPV2
- Facilitate the containment of outbreaks
- Accelerate WPV eradication by boosting immunity against poliovirus types 1 and 3 in children who have previously received OPV

In October 2014, the SAGE reviewed progress towards global readiness for the coordinated, phased removal of OPVs and concluded that preparations are on track for a switch from trivalent OPV to bivalent OPV in

April 2016. In particular, the group noted the progress achieved with regard to IPV introduction. All but three countries have committed to IPV introduction by the end of 2015 as recommended by SAGE. In total, the three remaining countries account for less than 0.05% of the global birth cohort and are not considered to be at high risk of emergence of a cVDPV2.

Since January 2013, the following countries have introduced IPV: Kazakhstan and Peru (July 2013); Libya (March 2014); Albania (May 2014); Panama (July 2014); Nepal and Tunisia (September 2014); Philippines (October 2014); China (December 2014); Comoros, Senegal and Serbia (January 2015); Colombia and Nigeria (February 2015); Bangladesh and Maldives (March 2015); Democratic People's Republic of Korea, Democratic Republic of the Congo and Gambia (April 2015); Madagascar and Sudan (May 2015).

**Figure 2: Countries using IPV vaccine to date (as of 1 June 2015) and countries with a formal decision or intent to introduce**



## Routine immunization strengthening in focus countries

The Polio Eradication and Endgame Strategic Plan also includes efforts to strengthen routine immunization in 10 “focus” countries where there are significant polio resources and assets. A joint programme of work was initiated with Gavi, the Vaccine Alliance, to support this work. To date, six of these countries – Chad, Democratic Republic of the Congo, Ethiopia, India, Nigeria,

and Pakistan – have developed annual national immunization plans that leverage polio assets to improve broader immunization goals. In Pakistan, for example, a pilot project first evaluated in 16 districts is being expanded across all provinces, in close collaboration with the high-level political leadership, to take steps to rapidly increase vaccination coverage among children.

## Legacy planning

The principal objective of the legacy planning work is to ensure that the investments made in the cause of polio eradication are built upon to benefit other developmental goals, through a comprehensive programme of work to document and transition the GPEI’s knowledge, lessons learnt and assets.

As an example, the infrastructure used in polio eradication is helping to support the response to the Ebola outbreak in West Africa, by providing staff for surge support and by conducting disease surveillance,

contact tracing, data management, logistics and supply distribution, and outbreak management.

An evidence database continues to be compiled, definitively outlining the capabilities, functions, assets, and contributions of the GPEI to other priorities. Other programmes already benefiting from the GPEI infrastructure in particular are in the areas of disaster and crisis response, maternal and child health, sanitation and hygiene, child health days and new vaccine introductions.

It is envisioned that legacy planning will be conducted in a phased manner, beginning with an initial small group of countries. A three-stage country-level planning and implementation process is envisaged, focusing on:

1. Planning and decision-making
2. Preparation
3. Execution

## Future priorities

In 2014 and 2015, a midterm review was conducted by the GPEI to review progress to date, recommend appropriate changes to the goals, strategies, activities, and timeline, and to align stakeholders and donors around a shared set of lessons learnt, risks, and priorities that will impact the remainder of the eradication effort. Recommendations regarding activities for interruption of transmission were given top priority and include: increasing surveillance capacity and quality, improving supplementary immunization activity (SIA) quality with a focus on missed children and intensified social mobilization, increasing global and national capacity for outbreak preparation and aggressive response to cVDPV and WPV, and rapidly accelerating support for Global Action Plan (GAPIII) implementation.

Recommendations were also made regarding activities for the switch from OPV to IPV including: prioritizing strategic IPV use, and focusing on tOPV to bOPV

It is anticipated that legacy planning will be conducted on a national basis according to the Global Legacy Framework but that global priorities (e.g. emergency response capacity) will be open to discussion.

contingency planning. The review also provided a number of recommendations regarding enabling activities. These include: strengthening collaboration and joint accountability between polio and the broader routine immunization community, strengthening management capacity and accountability, increasing advocacy at the subnational level and improving communication with external and internal stakeholders, increasing data standardization, monitoring capacity and analysis, and updating resource mobilization and allocation strategy.

Since the target of interruption of WPV transmission globally was not met by the end of 2014 deadline, a number of financial scenarios have been developed regarding funding for continued elimination efforts. They will be reviewed by the Polio Oversight Board in September 2015.

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## GOAL 2:

### Achieve maternal and neonatal tetanus elimination (indicator G2.1)



#### Highlights

- The GVAP target for 2014 was not achieved.
- A total of 35<sup>3</sup> of the 59 priority Member States (60%) had achieved maternal and neonatal tetanus (MNT) elimination as of December 2014 (Figure). Madagascar was the only additional country to do so in 2014, besides 12 additional states of India.
- Since 2010, 16 of the 36 countries required to meet the GVAP milestone for 2014 have achieved elimination.
- By the end of 2014, MNT continued to be a public health problem in the following 24 Member States: Afghanistan, Angola, Cambodia, Central African Republic, Chad, Democratic Republic of the Congo, Equatorial Guinea, Ethiopia (Somali region), Guinea, Haiti, India (6 of 36 states), Indonesia (4 of 34 provinces), Kenya, Mali, Mauritania, Niger, Nigeria, Pakistan, Papua New Guinea, Philippines, Somalia, South Sudan, Sudan and Yemen.

Of these 24 Member States:

- Angola, Cambodia, Democratic Republic of the Congo, Equatorial Guinea, Guinea, Mauritania and the Philippines are very close to achieving elimination.
- Three countries have partly eliminated MNT: **Ethiopia** (eliminated everywhere except the Somali region), **India** has achieved elimination in 30 of 36 states (Andhra Pradesh, Andaman and Nicobar Islands, Arunachal Pradesh, Assam, Bihar, Chandigarh, Chhattisgarh, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Lakshadweep,

Madhya Pradesh, Maharashtra, Mizoram, Odisha, Pondicherry, Punjab, Rajasthan, Sikkim, Tripura, Tamil Nadu, Telangana, Uttar Pradesh, Uttarakhand and West Bengal), and **Indonesia** has achieved elimination in 30 of 34 provinces (i.e. all except Maluku, North Maluku, Papua and West Papua provinces).

- A significant part of Nigeria, a significant part of Pakistan, Papua New Guinea and Sudan are lagging behind in their efforts to eliminate MNT, despite their relatively stable political situation.
- Afghanistan, Central African Republic, Mali, Somalia, South Sudan and Yemen are affected by political instability – lobbying donors for funding and the use of innovative approaches to reach vulnerable populations, including the use of tetanus toxoid (TT) Uniject™ devices are pertinent. More funds are required for operations in these countries to reach the most inaccessible populations.
- Chad is one of the countries that reports a significant number of neonatal tetanus cases each year, with little progress in control efforts. However, with the marked progress towards polio eradication made in Africa in 2014, Chad has started focusing on the implementation of TT campaigns in high-risk districts, taking advantage of the polio infrastructure. More efforts are needed to utilize the windows of opportunity during the country's current efforts to improve routine immunization performance, through better planning to integrate MNT elimination (MNTE) activities.

<sup>3</sup> Bangladesh, Benin, Burkina Faso, Burundi, Cameroon, China, Comoros, Congo, Côte d'Ivoire, Egypt, Eritrea, Gabon, Ghana, Guinea Bissau, Iraq, Lao People's Democratic Republic, Liberia, Madagascar, Malawi, Mozambique, Myanmar, Namibia, Nepal, Rwanda, Senegal, Sierra Leone, South Africa, Timor Leste, Turkey, Togo, Uganda, United Republic of Tanzania, Viet Nam, Zambia and Zimbabwe.

- Even though only Madagascar was validated as attaining MNTE in 2014, it is significant that 12 additional states in India, including Uttar Pradesh and Bihar, were validated as having achieved MNTE. This was the result of successful strategies to improve access to TT vaccination and health systems strengthening, which increased access to health service delivery in general, including antenatal care (ANC) and clean delivery practices.
- The remaining countries have developed their MNTE plans of action as part of comprehensive multi-year planning. What is hampering progress, however, is the difficulty in finding a window of opportunity among competing priorities for the same resources and the availability of the resources required to support timely implementation of planned activities that are known to work. The reflection of MNTE plans in the comprehensive multi-year plan (cMYP) shows national commitments, but the execution of the plan depends on prioritization and allocation of resources by the national governments. The target date for the attainment of MNTE, thus, cannot be ascertained based on TT vaccination plans in the cMYP. However, it is envisaged that almost all of the remaining 24 countries will achieve elimination by the decade of vaccines (DOV) target of 2020 if the implementation challenges are addressed.
- Levels of coverage of ANC and skilled attendance at birth from the most recent surveys are presented in the GVAP Secretariat report 2014. These very important aspects of MNTE rely heavily on the performance of the health systems and often progress slowly unless there is a concerted effort by governments, as seen in China and India.
- In 2013 about 49 000 neonates were estimated to have died from tetanus (1). These deaths are avoidable and should not have been allowed to occur in this day and age.

<b>DEFINITION OF INDICATOR</b>	<p>An incidence of &lt;1 case of neonatal tetanus per 1000 live births per year in all districts or similar administrative units of a country (please refer to GVAP Secretariat Report 2013 (2) for more information); the neonatal tetanus indicator acts as a proxy for maternal tetanus</p> <p>To monitor sustainability of elimination, the routine Expanded Programme on Immunization (EPI), reproductive health and surveillance data will be used, as the sustainability is directly linked to health system strengthening with a focus on routine delivery of immunization, ANC, clean delivery, clean cord care practices and surveillance activities</p> <p>Note that the guidelines that will provide an opportunity to periodically review and monitor the elimination status are being finalized, and will offer a menu of options for the countries to choose and adapt based on the findings from the risk analysis</p>
<b>DATA SOURCES</b>	<ul style="list-style-type: none"> <li>• WHO-UNICEF joint reporting forms (JRF)</li> <li>• Country health management information system reports</li> <li>• Country disease surveillance reports</li> <li>• Immunization coverage survey reports</li> <li>• Multiple indicator cluster sampling survey reports, demographic and health survey reports and any other reports of immunization and reproductive health programme reviews</li> <li>• Reports of MNTE validation surveys</li> </ul>
<b>MILESTONES</b>	<p>(From 2010 baseline, with 40 countries still to achieve elimination):</p> <ul style="list-style-type: none"> <li>• 10 countries eliminated neonatal tetanus (NT) by 2012</li> <li>• 22 countries eliminated NT by 2013</li> <li>• 36 countries eliminated NT by 2014</li> <li>• 40 countries eliminated NT by 2015</li> </ul>

## Background

The estimated burden of NT declined from more than 780 000 in 1988 to 49 000 in 2013. This was partly a result of the successful implementation of MNTE activities that include TT vaccination (including campaigns in high-risk districts), improvement in clean delivery and clean cord care practices and use of the ANC services to promote more visits, but also to assess women and advise them on immunization and delivery practices and other health services opportunities.

**China and India** focused on strengthening their health systems through promoting institutional delivery, including use of incentives such as maternity waiting homes, cash grants and provision of free services to the mother and newborn child within the first week of birth. **Ethiopia and Malawi** are using task-shifting innovation to place more community-based health workers who are also supporting immunization and improvement in clean delivery practices. **Democratic Republic of the Congo** is another example – where there is 89% ANC, 80% skilled attendants at birth and 82% reported TT2+ coverage, with currently only 14 of its 516 districts being at high risk for MNT.

Tetanus cannot be eradicated, as *Clostridium tetani* – the bacteria that causes the disease – is commonly found in the soil and in the intestinal tracts of animals

and humans. Therefore, even after the attainment of elimination, the efforts have to be sustained by maintaining the low MNT risk status. All efforts made by countries to improve their health systems will positively impact on the delivery of regular health services that can support the sustenance of the MNTE status. The opportunities within countries, which include enhanced outreach services, periodic intensification of routine immunization, improving access to (and utilization of) ANC services, and other initiatives to improve health facility deliveries and skilled attendance at birth, will all make it feasible to sustain MNTE. Improvement in NT surveillance through integrated vaccine-preventable-disease surveillance is expected to support efforts at monitoring the status of countries in the post-elimination era, as well as administering evidence-based corrective interventions.

At the global level, the development of guidelines for sustaining MNTE is at an advanced stage. The guidelines will provide countries with a menu of options for appropriate responses that may be required following periodic desk reviews of MNT risk indicators.

## Results

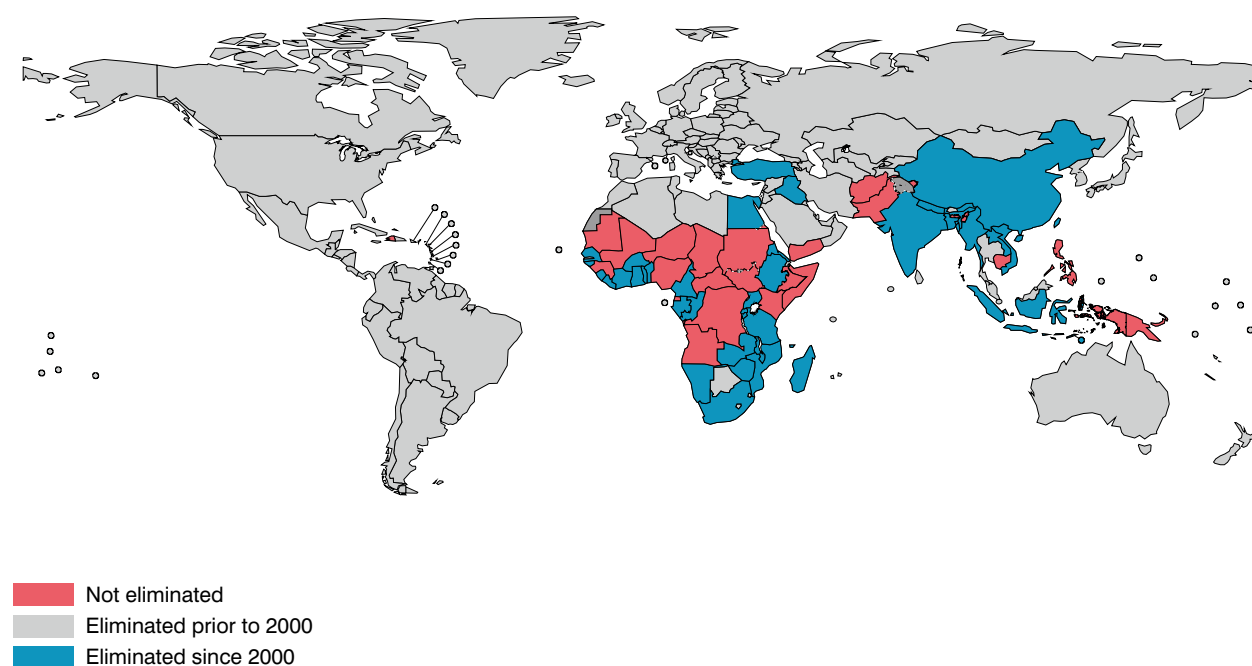
- In 2012, six Member States (Burkina Faso, Cameroon, China, Guinea Bissau, Timor Leste and the United Republic of Tanzania) were validated as having eliminated MNT. With four Member States validated in 2011 (Ghana, Liberia, Senegal and Uganda) in addition to Ethiopia (excluding Somali region) and the completion of the third of the four phases in Indonesia, the milestone for achieving elimination in 10 additional countries between 2010 and 2012 was thus met.
- In 2013 five additional Member States (Cote d'Ivoire, Gabon, Iraq, Lao People's Democratic Republic and Sierra Leone) and three additional states in India (Delhi, Mizoram and Uttarakhand) achieved elimination, bringing the total number of states that had achieved elimination in India to 18 out of 35 at that time.

- In 2014 the only Member State to attain elimination was Madagascar. However, 12 additional states of India (Andaman and Nicobar Islands; Arunachal Pradesh; Assam; Bihar; Chhattisgarh; Daman and Diu; Jharkhand; Madhya Pradesh; Odisha; Rajasthan; Tripura; and Uttar Pradesh) were also validated.

As of December 2014, 35<sup>4</sup> of the 59 priority Member States (60%) had achieved MNTE (Figure 3). Since 2010, the total number of countries that have achieved elimination is 16 of the 36 required to meet the GVAP milestone for 2014.

<sup>4</sup> Bangladesh, Benin, Burkina Faso, Burundi, Cameroon, China, Comoros, Congo, Côte d'Ivoire, Egypt, Eritrea, Gabon, Ghana, Guinea Bissau, Iraq, Lao People's Democratic Republic, Liberia, Madagascar, Malawi, Mozambique, Myanmar, Namibia, Nepal, Rwanda, Senegal, Sierra Leone, South Africa, Timor Leste, Togo, Turkey, Uganda, United Republic of Tanzania, Viet Nam, Zambia and Zimbabwe.



**Figure 3: Member States with validated elimination of neonatal tetanus (as of December 2014)<sup>a</sup>**

<sup>a</sup> This includes 30 of 36 states in India, Ethiopia (except Somali Region) and 30 of 34 provinces in Indonesia.

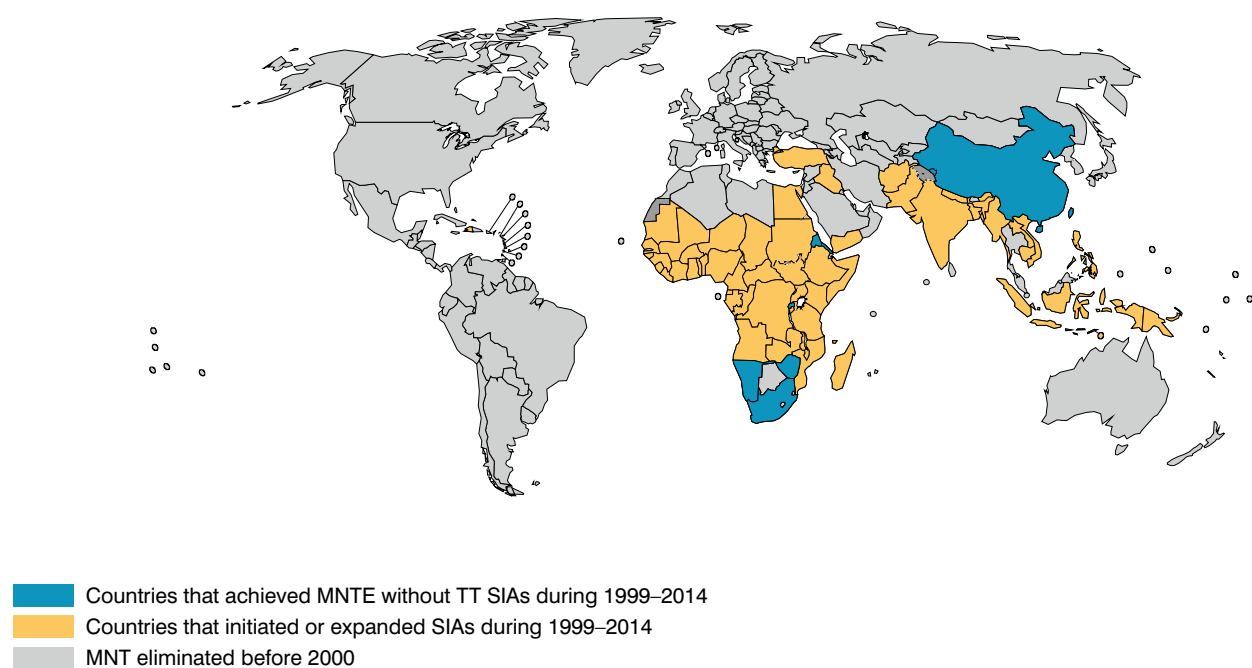
Map production: Immunization Vaccines and Biologicals (IVB), WHO.

Source: WHO-UNICEF Database.

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In addition, TT vaccination campaigns targeting women of reproductive age (15–49 years) were conducted in 12 Member States (Angola, Cambodia, Chad, Democratic Republic of the Congo, Haiti, Indonesia, Kenya, Mali,

Niger, Nigeria, Papua New Guinea and South Sudan) in 2014, taking the total number of countries that had implemented TT Supplementary Immunization Activities (SIAs) from 1999 to 2014 to 53 (Figure 4).

**Figure 4: 52 Member States that implemented TT SIAs between 1999 and 2014**

Map production: Immunization Vaccines and Biologicals (IVB), WHO.

Source: WHO-UNICEF database, February 2015.

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## Discussion

Please see the 2014 report, pages 7 to 11.

### Areas requiring focus in order to keep progress towards the attainment of “MNTE in all countries” on track

The funding gap estimated at US\$ 130 million (inclusive of Uniject™ cost of US\$ 37 million) is a serious challenge to the global goal of achieving MNTE. Ownership and contributions of national governments have proved instrumental in achieving and sustaining MNTE, and these have been expressed in the promotion of clean delivery through improving access to institutional delivery, expanding networks of midwives, capacity-building of other categories of health staff, providing community incentives (such as free stay in maternity homes and cash disbursements), assigning staff to support the implementation of elimination activities, provision of vaccines and devices, and exploring alternative funding sources. In terms of external funding, the programme is currently being supported by private sector contributions from Kiwanis International, P&G – Pampers and UNICEF national committees. It is now time for individual and collaborative fundraising efforts by all MNTE partners to tap the resources of bilateral and multilateral donors.

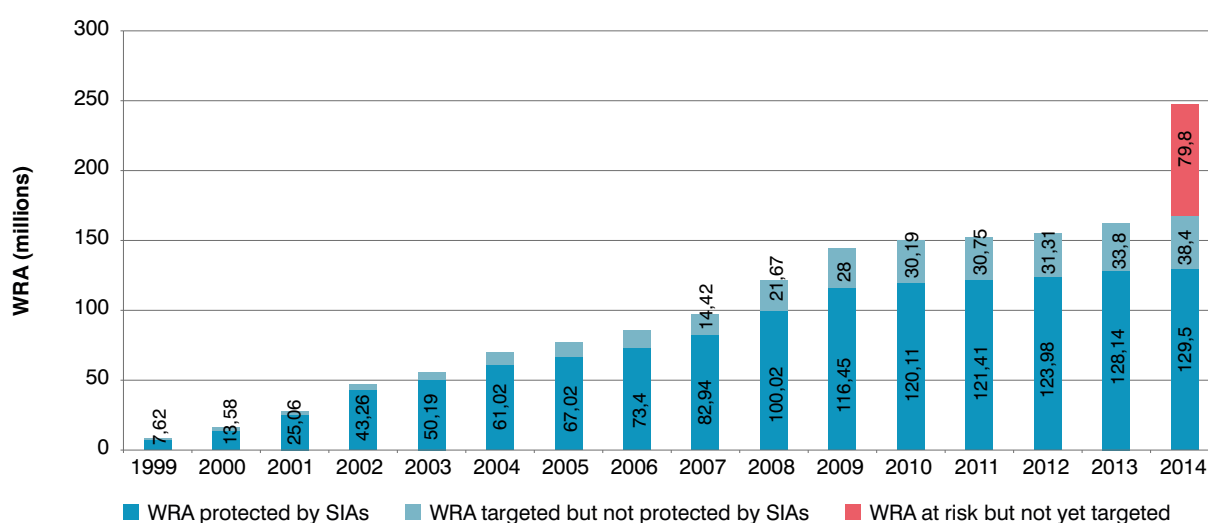
The TT Uniject™ is targeted for use especially in the nine countries where there are serious issues with accessing

high-risk populations, primarily owing to geographical obstacles and/or security challenges. These countries include Afghanistan, Central African Republic, Chad, Mali, Nigeria, Pakistan, Somalia, South Sudan, Sudan and Yemen. The use of TT Uniject™ by trained lay health workers in Afghanistan, Ghana, Mali and Somalia in the past attained coverage levels of at least 80% for TT3, and an assessment of the experiences of its use by PATH found that the vaccine was correctly administered, safe injection techniques were applied and no untoward side-effects were reported (3).

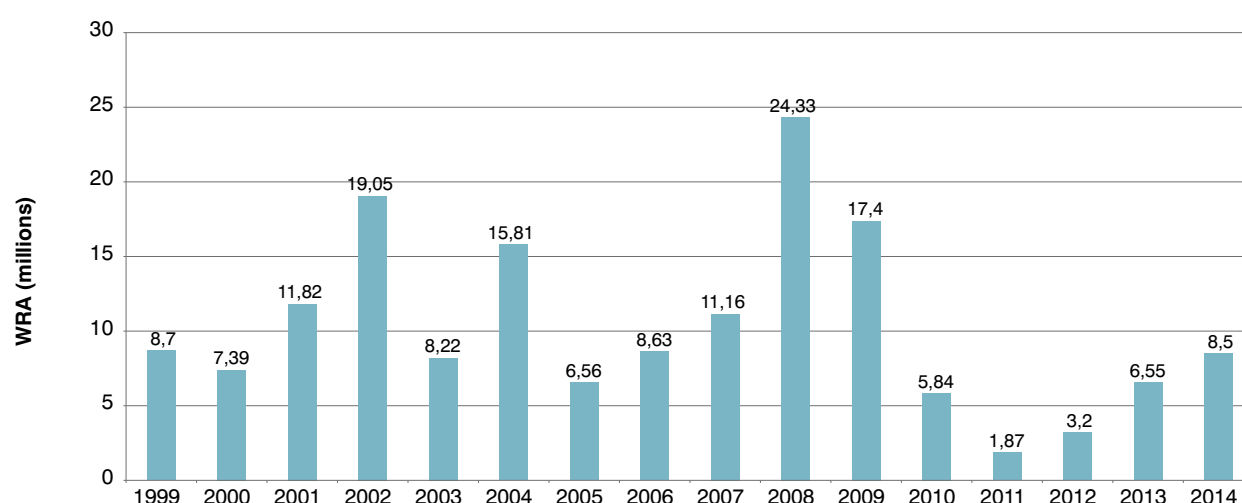
Programmatic integration with other elimination and eradication efforts would be critical for addressing inequities by enabling the most underserved to be reached with a package of high-impact interventions (campaign mode) and strengthening routine service delivery.

To minimize missed opportunities, there is a need to integrate immunization and ANC services. This is evident from gaps in diphtheria–tetanus–pertussis (DTP)3 and TT2+ coverage vis-à-vis ANC coverage in most of the target countries. There is also a significant dropout between ANC1 and ANC4 visits that warrants joint efforts to strengthen the ANC platform. Four ANC visits are recommended to provide adequate opportunity for a pregnant woman to be assessed, and to receive all her due doses of TT vaccine based on her TT vaccination status, as well as to enable delivery of other high-impact lifesaving interventions.

**Figure 5: Cumulative number of women of reproductive age (WRA) protected with at least two doses of TT during SIAs/year**



Source: WHO-UNICEF MNTE Database, as at 17 February 2015. Data for 2014 are provisional.

**Figure 6: Trend in WRA targeted with TT SIAs – extent of activities dependent on availability of funds**

Source: WHO/UNICEF MNT Database, as at 17 February 2015. For 2014, data are provisional.

## Update for 2015

1. Three additional countries, Cambodia, India and Mauritania were validated as having eliminated MNT between January and June 2015. The Philippines was partially validated in 16 of 17 regions.
2. Pre-validation assessments are being planned for Angola, Democratic Republic of Congo and Niger later in 2015.

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2. Global Vaccine Action Plan monitoring, evaluation & accountability: Secretariat annual report 2013. Geneva: World Health Organization; 2013 ([http://www.who.int/entity/immunization/global\\_vaccine\\_action\\_plan/GVAP\\_secretariat\\_report\\_2013.pdf](http://www.who.int/entity/immunization/global_vaccine_action_plan/GVAP_secretariat_report_2013.pdf), accessed 24 August 2015).
3. Introducing TT-Uniject in Maternal and Neonatal Tetanus Elimination, A guide for program planners, UNICEF & PATH, 2003; pages 21. [http://www.path.org/publications/files/TS\\_introduce\\_tt.pdf](http://www.path.org/publications/files/TS_introduce_tt.pdf), accessed 6 September 2015.

## GOAL 2:

### Achieve measles elimination (indicator G2.2)



#### Highlights

The following are highlights from the **global level**.

- Worldwide measles morbidity and mortality has been reduced by >90% since the introduction of measles vaccine and four out of every five children are receiving their first dose of measles-containing vaccine (MCV1) through routine services. In addition, each year more than 100 million children receive MCV through supplementary immunization activities (SIAs).
- Because of the highly infectious nature of measles, in order to achieve elimination, the programme target for vaccination coverage is 95% or higher, with two doses of MCV delivered through routine services and/or SIAs. To prevent measles outbreaks, this high level of coverage needs to be achieved uniformly across all districts and very high levels of immunity need to be maintained across all age groups.
- In 2014, 39% and 21% of Member States reached the MCV1 and MCV2 coverage target of at least 95%. However, the global MCV1 and MCV2 coverage levels were 85% and 56%, respectively – both short of the programme targets.
- Since 2010, global measles incidence has decreased by 19% from 50 cases per million population in 2010 to 40 in 2014, which is substantially higher than the global 2015 target of fewer than five cases per million population.
- Between 2000 and 2013, estimated measles deaths decreased by 75% (from 544 200 to 145 700); however, the rate of decline has plateaued meaning that the achievement of the 95% mortality reduction target by the end of 2015 is not possible.
- Based on current trends and programme performance, the 2015 global targets for MCV1 coverage, measles incidence and measles mortality reduction will not be achieved on time.
- In decreasing order, the following six large Member States had the highest number of susceptible infants in 2014 and accounted for over two thirds of the measles mortality burden in 2013: India, Nigeria, Pakistan, Indonesia, Ethiopia, Democratic Republic of the Congo.
  - In these six Member States, routine MCV1 coverage has either shown little progress or has declined since 2010. There is a need to strengthen health systems as a whole and ensure that immunization services are included in national budgets to achieve equitable, high coverage with measles and rubella vaccines (and all other vaccines).
  - Unless the quality of immunization services (both routine and campaign delivery of measles vaccine) can be improved in these Member States, the 2015 global measles incidence and mortality reduction targets will not be met.
  - A strategic cross-cutting approach by all immunization stakeholders is needed in these countries to address the combined challenges of lack of health infrastructure and human resources as well as civil conflict in some areas.

The following are highlights from the **regional level**.

- All six WHO regions have established measles elimination goals with target dates in or before 2020.
- Measles incidence has decreased in three of the six WHO regions in the past 12 months (the African, Eastern Mediterranean and European regions) whereas in the other three regions there has been an increase in incidence in the past year (Region of the Americas, South-East Asia Region and Western Pacific Region).
- In the **African Region**, many countries continued to experience measles outbreaks. Large outbreaks occurred in 2014 in Angola, Democratic Republic of the Congo, Ethiopia, Nigeria and South Sudan. Outbreaks are mainly the result of stagnating coverage levels, with MCV2 coverage lagging behind MCV1 coverage, and poor quality of SIAs in many countries. Funding gaps also led to countries limiting the age ranges covered by SIAs, where a wider age range is indicated, and delaying introduction of MCV2 and rubella-containing vaccine (RCV) because of uncertainty about future financial commitments.
- The **Region of the Americas** achieved measles elimination in 2002 and sustained the elimination for more than 10 years. The reestablishment of endemic measles transmission in Brazil in 2014 highlights the constant risk of spread from importations, especially in communities with low vaccination coverage. Experience in the Americas indicates that maintaining elimination may be more challenging than achieving it because of the problems of complacency, declining routine coverage, decreasing quality of surveillance and competing public health priorities.
- Despite the progress in the **Eastern Mediterranean Region** where fewer cases were reported in 2014 than in 2013, some countries including Afghanistan, Pakistan, Somalia, Sudan, Syria and

Yemen experienced several measles outbreaks from late 2010 to 2014. Egypt and Iraq also had outbreaks in 2014 with significant increases in reported numbers of cases compared to 2013. These outbreaks occurred as a result of delay in implementation of the follow-up SIAs, a deteriorating security situation, and/or inadequate funds.

- The **European Region** continued to experience outbreaks in 2014 in Bosnia and Herzegovina, Georgia, Italy, Russian Federation and Ukraine. However, with about 50% fewer measles cases reported in 2014 (n = 14 020) than in 2013 (n = 26 385), the number of cases in the Region appears to have dropped to the lowest level since 2010 (n = 30 625).
- The **Western Pacific Region** is being challenged by measles outbreaks, with most of the cases occurring in China, Papua New Guinea, the Philippines and Viet Nam. Overall, less than 20% of Member States in this region have interrupted measles transmission.
- Following the establishment of a measles elimination target of 2020 in the **South-East Asia Region** in 2013, all countries drafted, and some adopted, national plans of action to achieve these goals. By the end of 2014, regional coverage with MCV1 had increased to 84% and with MCV2 to 59%.

#### General highlights

- Much stronger country ownership and political commitment to measles elimination goals will be needed to get back on track towards elimination in the regions.

For Member States with routine measles coverage <90% nationally (72 Member States in 2014), reaching and sustaining ≥95% coverage will require substantial additional investments over a sustained period.

DEFINITION OF INDICATOR	<p>Framework for verification of measles elimination (1) lists the following.</p> <ul style="list-style-type: none"> <li>• Measles eradication: worldwide interruption of measles virus transmission in the presence of a surveillance system that meets specified performance indicators</li> <li>• Measles elimination: the absence of endemic measles transmission in a defined geographical area (e.g. region or country) for ≥12 months in the presence of a well-performing surveillance system</li> </ul> <p><i>Note:</i> Verification of measles elimination takes place after 36 months of interrupted endemic measles virus transmission</p>
DATA SOURCES	<ul style="list-style-type: none"> <li>• Joint Reporting Forms (JRFs) for disease incidence and WHO-UNICEF estimates of national immunization coverage (WUENIC) data for coverage rates</li> <li>• Progress reports of the regional verification commissions: from the Regions of the Americas, Europe and the Western Pacific for outbreak data and status of countries with regard to elimination as of 31 December 2014</li> </ul>
COMMENTS ON DATA QUALITY	<ul style="list-style-type: none"> <li>• JRFs and WUENIC data are subject to the same limitations as all other data submitted via the JRFs, as described in the 2014 GVAP Secretariat report (2)</li> <li>• Regional verification commission reports are only available from three regions: European Region, Region of the Americas and the Western Pacific Region (note that commissions will only verify elimination if data quality standards are met)</li> </ul>
MILESTONES	<ul style="list-style-type: none"> <li>• Measles elimination goals by WHO region (3) <ul style="list-style-type: none"> <li>• Americas: eliminated in 2002 (2 years after the 2000 goal)<sup>5</sup></li> <li>• Western Pacific Region: elimination by 2012</li> <li>• European Region: elimination by 2015</li> <li>• Eastern Mediterranean Region: elimination by 2015</li> <li>• African Region: elimination by 2020</li> <li>• South-East Asia Region: elimination by 2020</li> </ul> </li> </ul>

## Background and progress

The impact of the measles vaccine on global public health has been tremendous. Before 1963, most of the world's population had been infected with measles virus by their 15th birthday, resulting in an estimated 100 million cases and more than 2 million deaths annually (4). By 2000, four decades of steadily increasing use of the vaccine had led to a dramatic reduction in the number of cases to just over half a million annually. In 2002, the Region of the Americas stopped endemic transmission of measles (i.e. measles was eliminated from the region) and sustained the elimination for more than a decade.<sup>5</sup>

Since the sixty-third World Health Assembly in 2010 endorsed three global measles targets for 2015 as milestones towards global eradication of measles,<sup>6</sup> however, progress has been slow.

Between 2010 and 2014, **global routine measles vaccine coverage** stagnated at 85% – well below the 2015 target of ≥90% (Table 3). By region, three of the six WHO regions have sustained MCV1 coverage above 90% (Region of the Americas, European Region and Western Pacific Region), one region achieved coverage between

80 and 90% (South-East Asia Region) and two regions achieved coverage below 80% (African Region and Eastern Mediterranean Region). The number of Member States achieving the global MCV1 coverage target at the national level remained the same in 2014 as in 2010; 122 Member States achieved the ≥90% MCV1 national coverage target<sup>7</sup> (Table 3, Figure 7).

Since 2010, global **reported measles incidence** has decreased by 19% from 50 cases per million population in 2010 to 40 in 2014 with only one region (Region of the Americas) meeting the global 2015 target of fewer than five cases per million population (Table 3 and Figure 8). During the same period, there was a decrease in the number of Member States (95 Member States in 2014 compared to 114 Member States in 2010) meeting the global 2015 incidence target.

Between 2000 and 2013, **estimated measles deaths** decreased by 75% (from 544 200 to 145 700) and all regions reported substantial reductions in estimated measles mortality. However, the progress since 2010 has been too slow (from 69% mortality reduction in 2010 to 75% in 2013) making it highly unlikely that the target of 95% mortality reduction can be achieved by the end of 2015.

<sup>5</sup> Brazil is facing re-established measles transmission owing to an uninterrupted outbreak in two states, which started in 2013. Brazil is taking aggressive measures to interrupt measles transmission.

<sup>6</sup> The global milestones endorsed are to: 1) exceed 90% coverage with the first dose of MCV nationally and exceed 80% vaccination coverage in every district or equivalent administrative unit; 2) reduce annual measles incidence to fewer than five cases per million and maintain that level; 3) reduce measles mortality by 95% or more in comparison with 2000 estimates.

<sup>7</sup> It should be noted that the 90% MCV1 coverage target for 2015 is a milestone towards elimination. In order to achieve the regional elimination targets, vaccination coverage needs to be >95% for two doses of MCV administered through routine immunization or routine immunization and SIAs. To prevent measles outbreaks, this high level of coverage needs to be achieved uniformly across all districts and across people in all age groups born since the introduction of measles vaccine.



In 2014, 154 (79%) Member States had introduced a second dose of MCV (compared to 136 (70%) in 2010) and **MCV2 global coverage** was 56% (compared to 40% in 2010) (Figure 9).

Among those 154 countries, 53 provide MCV2 to infants less than 2 years of age *and* have reported coverage both for MCV1 and MCV2. In these 53 countries,<sup>8</sup> the difference between MCV1 and MCV2 reached 16% in 2014 (87% MCV1 compared to 71% MCV2). This highlights the missed opportunities and routine system weaknesses that contribute to suboptimal population immunity and the inability to interrupt measles virus transmission.

Many countries regularly supplement routine efforts through the use of SIAs. SIAs vaccinated approximately 197 million children in 33 Member States in 2013 and an additional 215 million children in 28 Member States in 2014. Among 34 countries that conducted SIAs between 2012 and 2014 and that conducted a coverage evaluation survey of the SIA, less than half (16 Member States) were able to reach the target of 95% national coverage.

Given these gaps in coverage and population immunity, it is not surprising that outbreaks continue to threaten elimination goals in all six WHO regions.

Many countries in the **African Region** continued to experience outbreaks, with large outbreaks in 2014 in Angola, Ethiopia, Democratic Republic of the Congo, Nigeria and South Sudan. Outbreaks are mainly the result of stagnating coverage levels, with MCV2 coverage lagging behind MCV1 coverage, and poor quality of SIAs in many countries. Funding gaps also led to countries limiting the age ranges covered by SIAs, where a wider age range is indicated, and delaying MCV2 and RCV introduction owing to uncertainty about future financial commitments.

In the **Region of the Americas**, 1152 cases were reported in 2014, mostly related to two outbreaks in Brazil and in Canada. It is noteworthy that the United States reported no measles cases through JRF in 2014; however 667 cases were reported and published.<sup>9</sup> More than 80% of reported cases in Brazil, Canada and the United States were not vaccinated and, as a whole, the region has witnessed a decline in routine MCV1 coverage since 2012 with heterogeneous coverage at the subnational level where many municipalities have less than 80% coverage.

The **Eastern Mediterranean Region** has seen a decline in reported measles cases since 2012, with total numbers of confirmed cases in 2012, 2013 and 2014 of 34 504, 20 884 and 19 099, respectively. However, continued

measles outbreaks occurred in Afghanistan, Pakistan, Somalia, Sudan and Yemen, despite implementation of several follow-up SIAs since 2010 with reported high coverage. The disruption of health services in the Syrian Arab Republic owing to ongoing conflict led to an increase in reported measles cases from 13 in 2012 to 740 in 2013, and 594 in 2014 with disruptive consequences for neighbouring countries hosting Syrian refugees. Since 2013, Iraq has been experiencing a measles outbreak which continues to spread countrywide in 2015. The majority of the reported outbreaks in the Eastern Mediterranean Region affect children under 10 years of age, indicating poor implementation of routine vaccination and poor quality of SIAs.

In the **European Region**, measles outbreaks affected primarily Bosnia and Herzegovina and Georgia as well as Italy, the Russian Federation and Ukraine in 2014. The majority of the reported cases in 2014 (78%) were either unvaccinated or had unknown vaccination status and more than half of those affected were 15 years of age or older.

In 2014, measles continued to circulate widely in most countries of the **South-East Asia Region** (except Bhutan, Democratic People's Republic of Korea and Maldives). While the completeness and quality of investigations of suspect cases varied among countries, it is clear that the main cause of continued measles cases was underutilization of measles vaccine. Of the 40 625 cases reported in the region, India continued to report the most confirmed and linked cases (24 977), followed by Indonesia (12 222), Sri Lanka (1686) and Nepal (1279) (Figure 8).

Measles incidence (per 1 million population) in the **Western Pacific Region** increased from 5.9 in 2012 to 17.2 in 2013 and 70.6 in 2014. This is largely the result of a resurgence of endemic transmission in endemic countries (China and the Philippines) and outbreaks following importation in countries with low or no documented transmission for a certain period (e.g. Papua New Guinea and Viet Nam). The region is witnessing increased infection and transmission of measles virus among people outside the target group of current immunization strategies for measles elimination (i.e. infants <8 months, adolescents and adults).

These events illustrate the need for sustained efforts to raise and maintain high levels of immunization coverage even in areas where elimination-level control has previously been attained. Every opportunity to address system bottlenecks and to increase routine immunization coverage should be seized. The introduction of a routine second dose of MCV

<sup>8</sup> Countries that had introduced MCV2 in 2014 were excluded from this comparison.

<sup>9</sup> <http://www.cdc.gov/mmwr/pdf/wk/mm6428md.pdf>

and SIAs provide such opportunities. For example, SIAs have been shown to contribute to strengthening the routine immunization programme through improving several aspects including health-worker skills and knowledge, social mobilization, cold chain and logistics, and integration of other public health interventions (5, 6).

The establishment of Regional Verification Commissions (RVCs) for measles elimination and their corresponding National Verification Committees (NVCs) has helped to refine the understanding of the barriers to elimination and build stronger national commitment to achieving elimination goals (Table 4).

The **Region of the Americas** has the longest standing RVC. As of December 2014, 98% of its Member States were verified as having achieved measles elimination (5). The International Expert Committee (IEC) for Measles and Rubella Elimination in the Americas awaits the control of the measles outbreak in Brazil and fulfilment of verification criteria by an external team, to declare the elimination of measles in the Americas.

At the **Western Pacific Region** RVC meeting in 2014 (Table 6), Australia, Macao (China), Mongolia and Republic of Korea were verified as having achieved measles elimination based on a verification-standard epidemiological surveillance system supported by accredited laboratories. Three additional countries were included in 2015: Brunei Darussalam, Cambodia and Japan.

In the **European Region** (Table 7), 50 of 53 Member States have established NVCs and at the RVC meeting in November 2014, 22 (41%) of the Member States were documented to have interrupted endemic measles transmission.

In the **Eastern Mediterranean Region**, a regional verification guide was drafted but no RVC has yet

been established. However, NVCs were established in 9 of 21 Member States. Three countries in the region (Bahrain, Oman and Palestine) are ready for verification, as they have reported zero cases for the past three years in the presence of a nationwide measles case-based surveillance and high coverage for both MCV1 and MCV2.

There is no measles RVC in the African or South-East Asian regions yet; however, the South-East Asian Region is likely to establish the RVC in 2015. Compared to 2013, there has been no progress in terms of the number of regions with RVCs or the number of Member States that have established NVCs.

In decreasing order, the following six large Member States had the highest number of susceptible infants in 2014 and accounted for more than two-thirds of the measles mortality burden in 2013: India, Nigeria, Pakistan, Indonesia, Ethiopia and Democratic Republic of the Congo (Figure).

For these countries, one could highlight the importance of strengthening health systems to achieve higher immunization coverage. Routine MCV1 coverage in these countries has either shown little progress or has declined since 2010, and the reported measles incidence remains high. All six countries had low density of nursing and midwifery personnel per 10 000 population, well below the global average (Table 8). Such a shortage of health-care workers is a contributor to missed opportunities for immunization and the inability to reach global targets. In addition, discrepancies between administrative data on immunization coverage and survey data, particularly for SIAs, remains an issue. Immunization coverage reported from administrative sources is often much higher than the coverage reported from surveys (e.g. in 2013, Nigeria reported 94% coverage rate for SIA in the administrative data, whereas 75% coverage was reported through the SIA coverage evaluation survey).

## Conclusion

Although in 2014 some improvement was seen in MCV2 immunization coverage and a small reduction was reported in measles incidence (compared to 2010), based on current trends and programme performance, the 2015 global targets as well as regional elimination targets, in the five WHO regions where measles is still endemic, will not be achieved.

Measles is a highly infectious disease, and its elimination requires very high and homogeneous population

immunity and a high-quality surveillance system. Without a robust routine programme, elimination is very difficult to achieve and cannot be sustained. For Member States that are now at <90% coverage nationally, reaching ≥95% coverage will require substantial additional investments over a sustained period. The gap between MCV1 and MCV2 coverage highlights the missed opportunities and routine system weaknesses that contribute to suboptimal population immunity and the inability to interrupt measles virus

transmission. In 2013, the Strategic Advisory Group of Experts (SAGE) on Immunization urged Member States and partners to raise the visibility of measles and rubella elimination activities and make the necessary investments of financial and human resources required to strengthen health systems and achieve more equitable

access to immunization services. SAGE stressed the importance of building on the work with the polio programme to integrate measles and rubella and other critical services in a way that helps to strengthen the health system and achieve universal health care.





## Background data

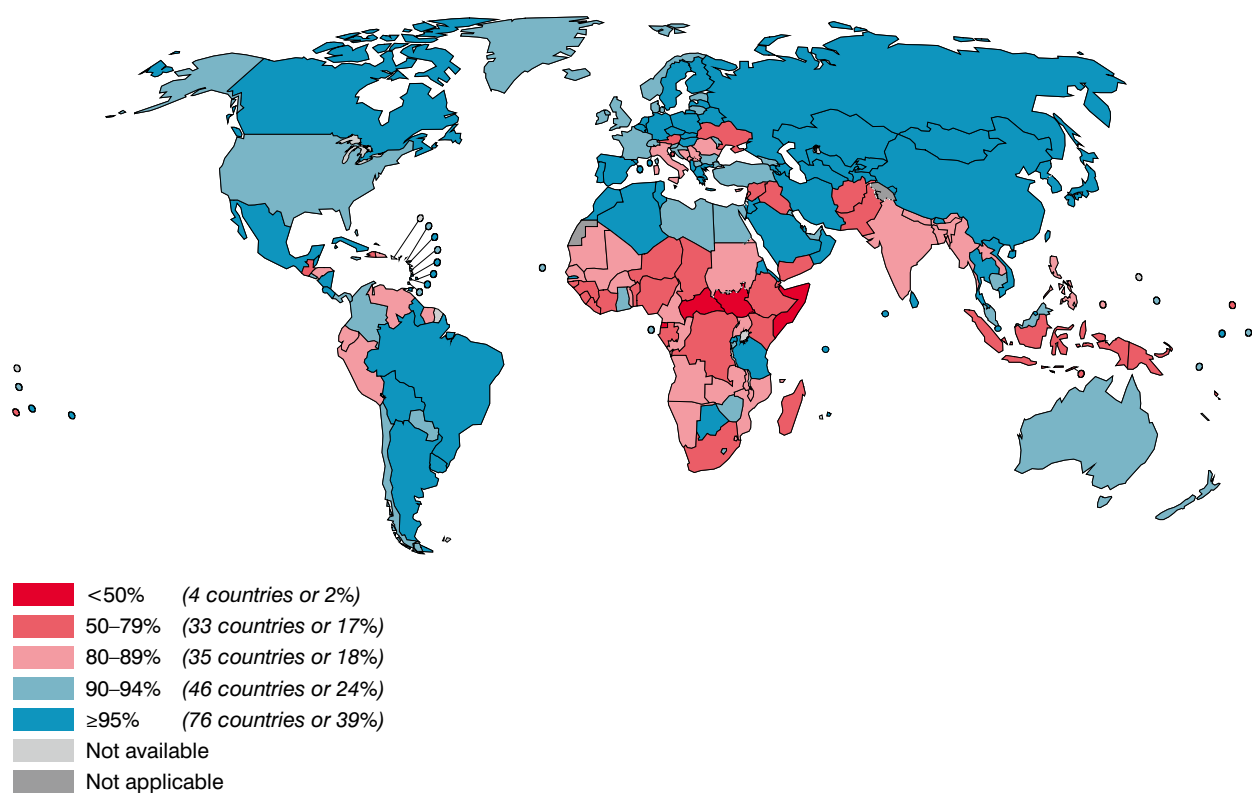
Table 3: Number of measles cases and incidence by WHO region, 2010–2014

WHO region	MCV1 national coverage					% of Member States reporting measles in their JRF <sup>a</sup>					Measles incidence per million population					Number of countries with incidence less than 5 per million population				
	2014	2013	2012	2010	% change 2010–2014	2014	2013	2012	2010	% change 2010–2014	2014	2013	2012	2010	% change 2010–2014	2014	2013	2012	2010	% change 2010–2014
African Region	73	73	73	74	–1.4	100	100	98	100	–67	235.1	184.6	125.6	235.1	–67	24	25	18	14	68
Region of the Americas	92	91	94	93	–1.1	94	97	100	100	358	0.3	0.5	0.1	0.3	358	32	34	35	35	–3
Eastern Mediterranean Region	77	78	77	81	–4.9	90	86	100	95	76	17.6	35.1	57.4	17.6	76	4	5	9	8	–47
European Region	94	95	95	93	1.1	74	85	92	98	–44	34.1	33.7	34.0	34.1	–44	24	31	35	36	–11
South-East Asia Region	84	84	84	83	1.2	91	100	100	100	–26	30.3	16.2	25.6	30.3	–26	5	5	4	4	38
Western Pacific Region	97	97	97	96	1.0	63	70	100	93	159	27.3	17.2	5.9	27.3	159	6	13	19	17	–48
Total	85	85	85	85	0	85	90	97	98	–19	50.1	40.3	33.0	50.1	–19	95	113	120	114	–5

<sup>a</sup> List of Member States not reporting JRF measles data: Albania, Andorra, Austria, Chile, Cook Islands, Costa Rica, Croatia, Djibouti, Fiji, Finland, Ireland, Israel, Italy, Luxembourg, Marshall Islands, Monaco, Montenegro, Nauru, Niue, Oman, Poland, Samoa, San Marino, Singapore, Solomon Islands, Thailand, Tonga, Tuvalu, Ukraine.

Source: JRF (as of 26 June 2015) and WHO-UNICEF estimates, 1980–2014, revision July 2015.

**Figure 7: Immunization coverage (%) with first dose of measles-containing vaccines (MCV1) in infants per country, 2014**

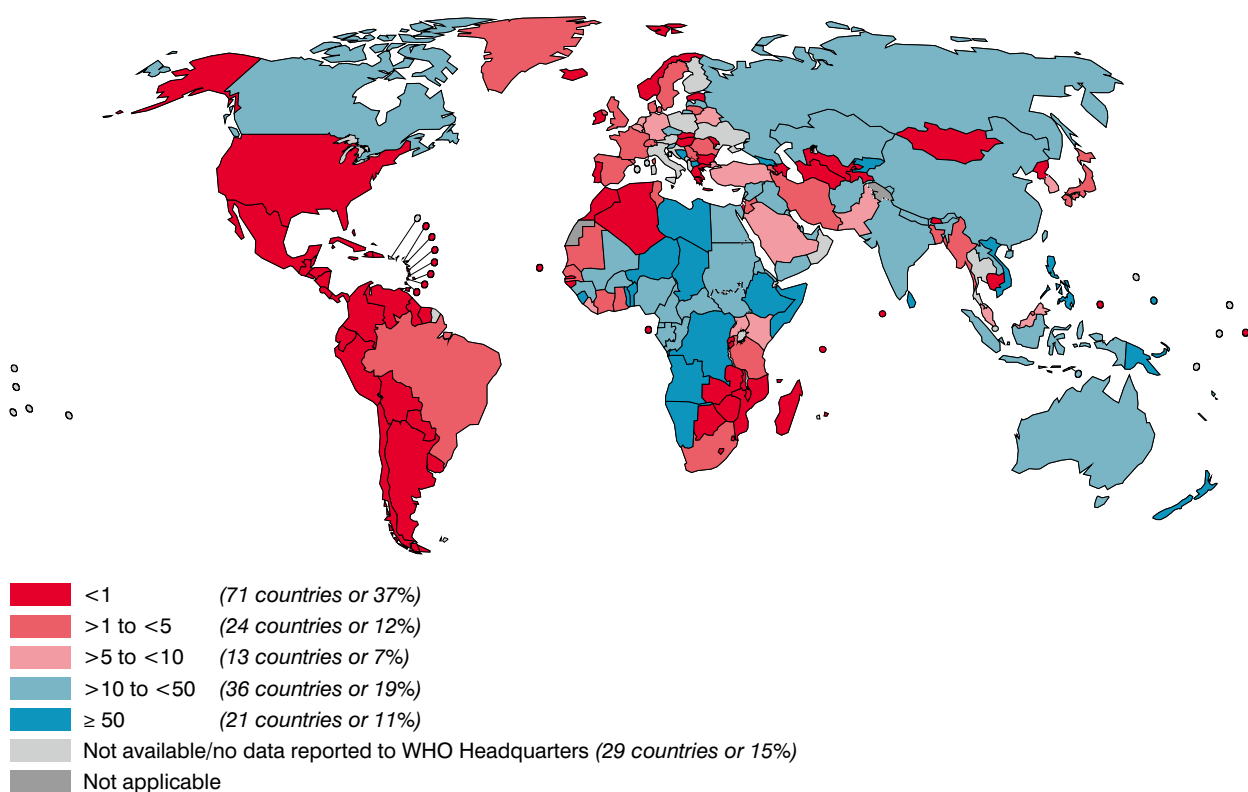


Map production: Immunization Vaccines and Biologicals (IVB). WHO

Date of slide: 16 July 2015

Source: WHO–UNICEF coverage estimates, 2015 revision.

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**Figure 8: Reported measles incidence rate<sup>a</sup> per country, 2014**

<sup>a</sup> Per million population

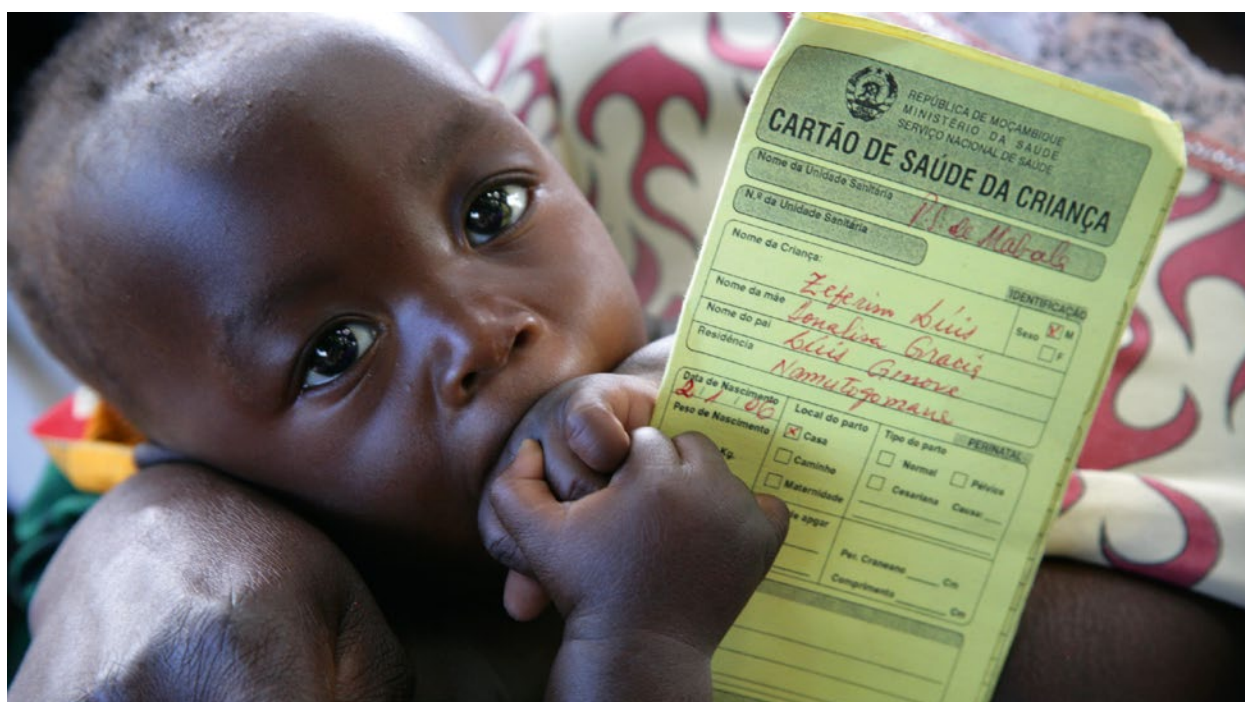
Source: Joint Reporting Form as at 26 June 2015: 194 WHO Member States.

Map production: Immunization Vaccines and Biologicals (IVB), WHO.

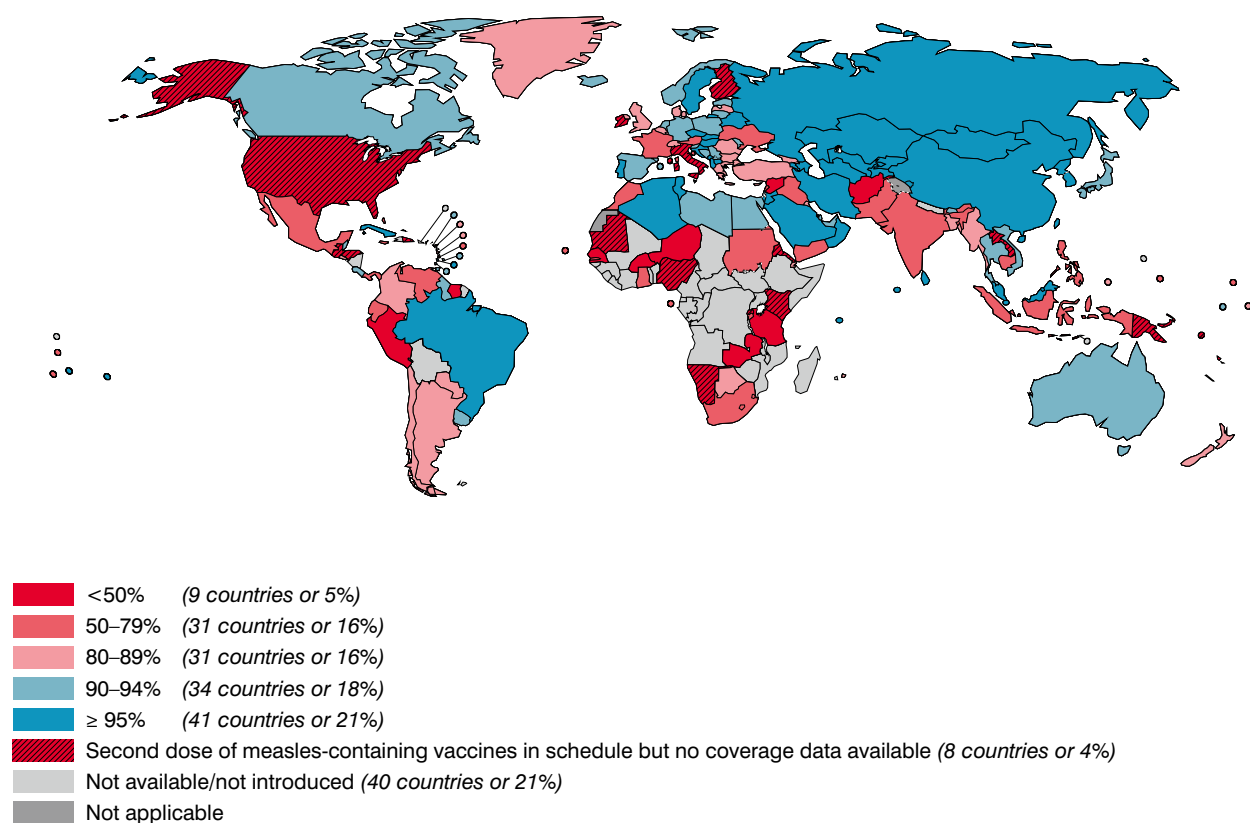
Date of slide: 16 July 2015.

Source: Joint Reporting Form as at 26 June 2015: 194 WHO Member States.

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**Figure 9: Immunization coverage with routine MCV2 by national schedule for infants, 2014**

Map production: Immunization Vaccines and Biologicals (IVB), WHO

Date of slide: 16 July 2015

Source: WHO-UNICEF coverage estimates, 2015 revision.

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**Table 4: Progress towards measles elimination, by WHO region (as of 31 December 2014)**

WHO region	Target year for measles/ rubella elimination in region	RVC established	Regional measles elimination verification report provided in 2015 by RVC for 2013/ 2014 data	Member States that have established an NVC n (% of total)	Established NVCs that submitted annual status reports <sup>a</sup> n (% of total)	Member States that were verified free of endemic measles based on 2013 reporting n (% of total) <sup>b</sup>
African Region	2020	No	No	Unknown	Not applicable	Not applicable
Region of the Americas	2000	Yes	Verification reports sent in 2013. No need to send updates in 2014	24 (100)	Reports not submitted on annual basis	43/44 (98)
Eastern Mediterranean Region	2015	Yes	No	9	Not applicable	Not applicable
European Region	2015	Yes	Yes (for 2013)	50 (94)	46 (87%)	22 (41) <sup>c</sup>
South-East Asia Region	2020	No	No	Unknown	Not applicable	Not applicable
Western Pacific Region	2012	Yes	Yes (for 2014)	17 <sup>d</sup> (100)	17 (100) <sup>d</sup>	3 (11%)

<sup>a</sup> Percentage is out of the total number of established NVCs, not the total number of Member States. Note that a total of 46 reports were submitted to the European RVC. Percentage is based on Member States submitting reports in time for RVC review in October 2013.

<sup>b</sup> Percentage is out of the total number of Member States, and not the total number of established NVCs.

<sup>c</sup> These 22 countries were not verified as having been free of endemic measles for 36 months or longer, but were documented to have interrupted endemic measles transmission in 2013 (see Table 5).

<sup>d</sup> 13 Pacific island countries formed one Joint Subregional Verification Committee (they are: Cook Islands, Fiji, Kiribati, Marshall Islands, Micronesia (Federated States of), Nauru, Niue, Palau, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu). China, Hong Kong SAR and China, Macao SAR established their own Committees in addition to the Chinese NVC. So there are a total of 17 NVCs for 27 Member States in the Western Pacific Region.

**Table 5: Progress towards measles elimination in the Region of the Americas (as of 31 December 2014)**

Status according to Pan American Health Organization (PAHO) Region definitions	Number of countries n (% of total)	Countries
Measles elimination verified <sup>a</sup>	43 (98)	34 countries + 6 UKOTS + 3 Dutch autonomous
Re-establishment of endemic measles transmission <sup>b</sup>	1 (2)	Brazil

UKOTS, United Kingdom's own Overseas Territories.

<sup>a</sup> Verify interruption of endemic measles, rubella and congenital rubella syndrome cases in all countries of the Americas for a period of at least 3 years from the last known endemic case, in the presence of high-quality surveillance.

<sup>b</sup> Occurs when epidemiological and laboratory evidence indicates the presence of a chain of transmission of a virus strain that continues uninterrupted for > 12 months in a defined geographical area.

**Table 6: Progress towards measles elimination in the Western Pacific Region (as of 31 December 2014)**

Status according to Western Pacific Region definitions <sup>a</sup>	Number of countries n (% of total)	Countries
<b>Elimination verified</b>	3 (11)	Australia, Mongolia, Republic of Korea
<b>Possibly ready for verification, but additional data required</b>	3 (11)	Brunei Darussalam, Japan, Singapore
<b>Interrupted transmission, &lt;36 months</b>	2 (7)	Cambodia, New Zealand
<b>Period of no or very low transmission followed by outbreak</b>	16 (59)	Cook Islands, Fiji, Kiribati, Lao People's Democratic Republic, Marshall Islands, Micronesia (Federated States of), Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu, Viet Nam
<b>Endemic transmission</b>	3 (11)	China, <sup>b</sup> Malaysia, the Philippines

<sup>a</sup> Western Pacific Region definitions:

- **Elimination verified:** The interruption of endemic measles virus transmission for  $\geq 36$  months in the presence of verification-standard surveillance and genotyping evidence that supports the interruption of endemic measles virus transmission.
- **Possibly ready for verification, additional data required:** After reviewing the first reports prepared by the NVCs, the RVC determined that interruption may have been achieved, but more detailed epidemiological data were needed to verify measles elimination.
- **Interrupted transmission, <36 months:** Measles transmission has been interrupted for less than 36 months. There is no endemic transmission, but verification must occur after 36 months. Cambodia reached 36 months in 2014; New Zealand in 2015.
- **Period of no or very low transmission followed by outbreak:** After periods of no or very low transmission in the country, there are outbreaks that are currently being monitored. An outbreak is defined as a single laboratory-confirmed measles case, whether endemic or imported.
- **Endemic transmission:** The existence of continuous transmission of indigenous or imported measles virus that persists for  $\geq 12$  months in the nation.

<sup>b</sup> Data apply to all parts of China excluding China, Hong Kong SAR and China, Macao SAR. Elimination has been verified for China, Macao SAR. China, Hong Kong SAR may be ready for verification of elimination, but additional data are needed.

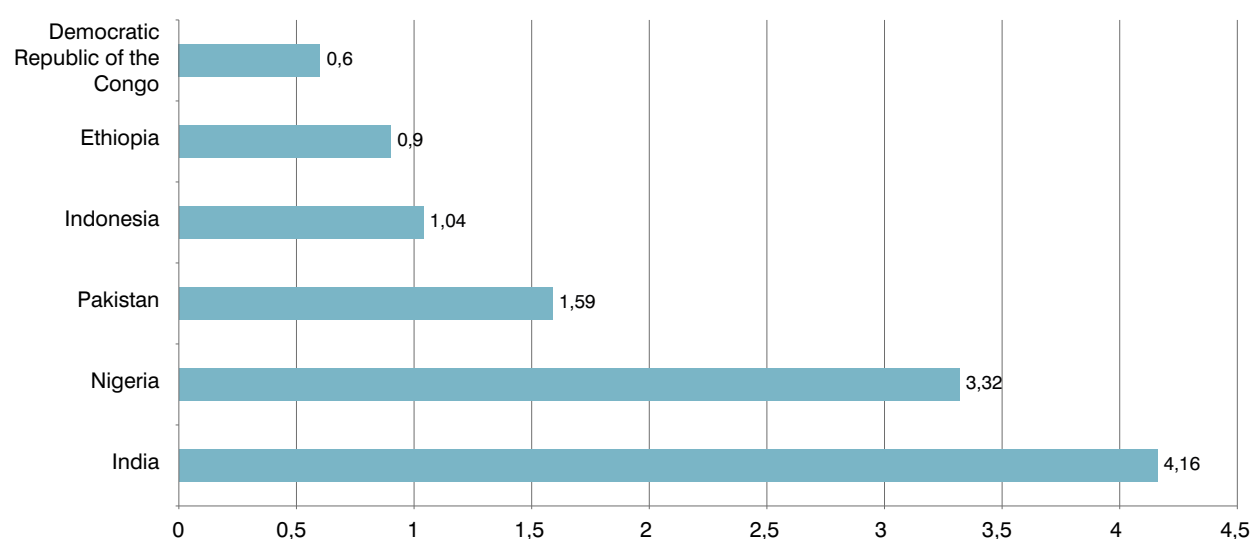


**Table 7: Progress towards measles elimination in the European Region (as of 31 December 2014)**

Status using European Region definitions <sup>a</sup>	Number and percentage of Member States n (% of total)	Member States
<b>Interrupted transmission</b>	22 (41)	Andorra, Armenia, Belarus, Czech Republic, Estonia, Finland, Hungary, Israel, Malta, Portugal, Slovakia, Slovenia, Sweden, Tajikistan, Turkmenistan
		At risk of re-establishment: Azerbaijan, Bulgaria, Cyprus, Latvia, Luxembourg, Norway, Republic of Moldova
<b>Inconclusive (incomplete data)</b>	9 (17)	Austria, Croatia, Denmark, Greece, Iceland, Montenegro, Netherlands, Spain, Uzbekistan
<b>Endemic transmission</b>	13 (24)	Belgium, France, Georgia, Germany, Ireland, Kazakhstan, Lithuania, Poland, Romania, Russian Federation, Switzerland, Turkey, United Kingdom of Great Britain and Northern Ireland
<b>Not reviewed</b>	9 (17)	Late submission: Bosnia and Herzegovina, Italy, Ukraine
		To resubmit report: Kyrgyzstan, Serbia, the former Yugoslav Republic of Macedonia
		No report submitted: Albania, Monaco, San Marino

<sup>a</sup> European Region definitions:

- Interrupted transmission: Absence of endemic measles transmission in 2013 in the presence of a well-performing surveillance system. (Note: This definition differs from that stated in the WHO Weekly Epidemiological Record, which requires absence of transmission for 36 months or longer.)
- Interrupted transmission, but at risk of re-establishment: Member States that have "interrupted transmission" for 2013 (as defined above), but have  $\leq 95\%$  vaccination coverage among infants and young children. (Note: this definition differs from that stated in the WHO Weekly Epidemiological Record (7)).
- Inconclusive (incomplete data): Data provided by the NVC for 2013 are not comprehensive enough to determine the status of measles elimination in the country.
- Endemic transmission: Continuous transmission of indigenous or imported measles virus that has persisted for a period of 12 months or more in the Member State. (Note: this definition differs from that stated in the WHO Weekly Epidemiological Record.)
- Not reviewed: The Annual status report for 2013 was not reviewed because it was not submitted, submitted late or because the RVC requested that it is revised and resubmitted.
- Endemic transmission (no NVC report): The existence of continuous transmission of indigenous or imported measles virus that has persisted in 2013 according to a national public health institution that is not an NVC (different from WHO Weekly Epidemiological Record definition).
- Inconclusive (incomplete data) (NVC report): Data provided by the NVC are not comprehensive enough to classify the country's status on measles elimination conclusively.
- No data (no NVC report): Not available because the country failed to submit the Annual status report.

**Figure 10: Countries with the largest numbers of infants unvaccinated with MCV1, in millions, 2014**

Immunization Vaccines and Biologicals (IVB), WHO.

194 WHO Member States.

Source: WHO-UNICEF coverage estimates 2014, revision. July 2015.

**Table 8: Measles incidence, national MCV1 coverage and health system indicators for the six Member States with largest numbers of unimmunized children in 2014**

	MCV1 national coverage rate				Measles incidence per million population				Density of nursing and midwifery personnel per 10 000 population by country (year) <sup>a</sup>
	2014	2013	2012	2010	2014	2013	2012	2010	
<b>Democratic Republic of the Congo</b>	77	76	72	74	486.0	1309.1	1096.2	86.9	5.29 (2004)
<b>Ethiopia</b>	70	62	65	64	132.0	55.8	47.4	48.6	2.53 (2009)
<b>Indonesia</b>	77	84	85	78	48.3	33.7	62.7	78.4	13.83 (2012)
<b>India</b>	83	83	83	82	19.7	11.0	15.1	26.1	17.11 (2011)
<b>Nigeria</b>	51	53	42	56	38.4	304.4	38.2	53.2	16.05 (2008)
<b>Pakistan</b>	63	63	61	69	7.4	48.0	44.9	25.0	5.73 (2010)

<sup>a</sup>As a comparator, global densities of nursing and midwifery personnel as of 2013 were 28.6 per 10 000 population.

Sources:

- JRF (as of 26 June 2015) for incidence rate and WHO-UNICEF estimates for national coverage, 1980–2014, revision July 2015.
- WHO Global Health Workforce statistics database as of July 2015 based on administrative reporting systems, household surveys and population census for density of nursing and midwifery personnel (per 1000 population).



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## GOAL 2:

### Achieve rubella and CRS elimination (indicator G2.2)



#### Highlights

- As of December 2014, 140 Member States had introduced rubella vaccines; coverage, however, varies from 12% to 94% depending on region.
  - As of the end of 2014, 54 Member States had not introduced rubella-containing vaccine (RCV) into their routine immunization programme. Of those, 42 (78%) are eligible for GAVI Alliance support to introduce RCV.
  - Between January 2010 and December 2014, 12 low and middle-income countries (LMIC)<sup>10</sup> introduced an RCV into their national immunization programme. Of these countries, nine (75%) are eligible for GAVI Alliance support.
  - The WHO Region of the Americas and the European Region established rubella elimination goals of 2010 and 2015, respectively. The Member States in the Region of the Americas achieved their goal in 2009, one year ahead of the target date. In April 2015, the International Expert Committee (IEC) for Measles and Rubella Elimination in the Americas verified that the Region had eliminated the endemic transmission of rubella and congenital rubella syndrome (CRS).
  - In 2014, the European Region reported its lowest ever incidence of rubella (1.0 case per million).
- While this suggests progress towards the regional elimination goal, it is hard to interpret because the proportion of Member States reporting rubella cases is declining (only 68% of Member States reported rubella cases in 2014). In 2014, the Region was still experiencing a large rubella outbreak in Poland which had started in 2010, putting the 2015 elimination goal at stake.
- The Western Pacific Region has endorsed regional rubella elimination but has not yet set a target date.
  - The South-East Asia Region has established a rubella and CRS control goal, linked with its goal to eliminate measles by 2020.
  - Two WHO regions (the African Region and the Eastern Mediterranean Region) do not have rubella elimination or control targets.
  - Rubella and CRS surveillance systems are weak and cases remain underreported, particularly in Member States that have not yet introduced RCV and/or do not have rubella control or elimination goals. Hence, global rubella and CRS surveillance data do not reflect the true burden of these diseases.
  - Failure to fully integrate prevention of rubella and CRS with measles elimination activities represents a major missed opportunity for immunization.

<sup>10</sup> Bangladesh, Cambodia, Cape Verde, Ghana, Lao People's Democratic Republic, Nepal, Philippines, Senegal, Solomon Islands, Morocco, Rwanda, and the United Republic of Tanzania.

DEFINITION OF INDICATOR (1)	<ul style="list-style-type: none"> <li>Rubella and CRS elimination: The absence of endemic rubella virus transmission in a defined geographical area (e.g. region or country) for <math>\geq 12</math> months and the absence of CRS cases associated with endemic transmission in the presence of a well-performing surveillance system</li> </ul> <p><i>Note 1:</i> There may be a time lag (up to 9 months) in occurrence of CRS cases after interruption of rubella virus transmission has occurred. Evidence of the absence of continuing rubella transmission from CRS cases is needed because CRS cases excrete rubella virus for up to 12 months after birth</p> <p><i>Note 2:</i> Verification of rubella elimination takes place after 36 months of interrupted rubella virus transmission</p>
DATA SOURCES	<ul style="list-style-type: none"> <li>WHO-UNICEF joint reporting forms (JRFs) for disease incidence and WHO-UNICEF Estimates of National Immunization Coverage (WUENIC) data for coverage rates are subject to the same limitations as all other data submitted via the JRFs, as described in the 2014 report of the GVAP Secretariat (2)</li> <li>There are no WHO-UNICEF estimates for rubella coverage. The first dose of measles-containing vaccine (MCV1) is used as a proxy in the Member States that have introduced rubella vaccine (as all the Member States use combined vaccines for first dose of rubella except for the Russian Federation).</li> </ul>
COMMENTS ON DATA QUALITY	<ul style="list-style-type: none"> <li>None</li> </ul>
MILESTONES	<ul style="list-style-type: none"> <li>Americas: Rubella eliminated in 2009 and the International Expert Committee verified the Region as rubella and CRS free in April 2015</li> <li>European: Rubella elimination by 2015</li> <li>Western Pacific: Rubella elimination but no target date</li> <li>South-East Asia: Rubella control by 2020</li> <li>African: No target</li> <li>Eastern Mediterranean: No target</li> </ul>

## Background and progress

As of December 2014, 140 (72%) Member States had introduced RCV, a 49% (46 countries) increase from 2000 (Figure 11 and Figure 12). Average coverage globally has gradually increased from 41% in 2010 to 46% in 2014. However, it varies from 12% in the South-East Asia Region to 94% in the European Region (Table 9). In 2014, an additional three Member States introduced rubella vaccine in their routine programme (Morocco, Rwanda and the United Republic of Tanzania). Introduction of rubella vaccine is ongoing in six Member States (Burkina Faso, Cameroon, Myanmar, Viet Nam, Yemen, Zimbabwe), and two Member States (Ethiopia and Papua New Guinea) plan to introduce the vaccine in 2016.

In 2014, the global incidence of rubella was estimated to be 4.6 per million population (reported by 158 Member States, Table 9 and Figure 13). Note that the total number of Member States reporting rubella incidence to WHO has diminished dramatically in recent years, from 176 (91%) in 2012 to 158 (81%) Member States in 2014, which explains the appearance that rubella incidence is diminishing.

The same trend can be seen with CRS reporting. In total 111 (57%) Member States reported CRS figures in 2014 compared with 130 (67%) in 2012 (Table 10). The very low reported incidence is probably more a sign of the almost non-existent CRS surveillance systems outside the Americas and a few other Member States than a reflection of true disease burden.

The **Region of the Americas** achieved its 2010 elimination goal in 2009 and very few cases of rubella and CRS have been reported in the region since then. Between 2010 and 2014, 56 imported rubella cases were reported in eight countries: Argentina (4), Brazil (1), Canada (19), Chile (1), Colombia (2), Mexico (2) and the United States (27). Regarding CRS, five imported cases were reported in Canada (1 in 2011) and the United States (3 in 2012 and 1 in 2013). In 2015, the region was verified as having eliminated rubella and CRS.

All 53 Member States in the **European Region** use the combined measles, mumps and rubella (MMR) vaccine in a two-dose schedule. Based on JRF data, the number

of rubella cases reported in the region dropped by 98% between 2013 (n = 39614) and 2014 (n = 640). However, only 19 countries in the Region reported rubella cases in the 2015 JRF. Most of the cases occurred in Poland even though no cases were reported in JRF. Regional sources<sup>11</sup> reported around 5899 rubella cases in Poland in 2014. Countries that reported cases in JRF include Kazakhstan (n = 152), Germany (n = 151), and Georgia (n = 149).

The large decrease in cases reported in 2014 is primarily the result of a decrease in cases reported by Poland, despite lack of a response measure to control the outbreak. The outbreak in Poland started in 2010 and was caused by aggregation of susceptible cohorts in the context of gender-specific immunization in the past, and late introduction of the two-dose MMR schedule. The outbreak mostly affected adolescent/young adult men, with 37% of those affected by rubella being 15 years of age and older.

In 2014, the **Regional Committee for the Western Pacific** endorsed the Regional Framework for Implementation of the Global Vaccine Action Plan in the Western Pacific and its specified immunization goals, including the regional rubella elimination goal (target date to be determined). At the regional meeting of the Technical Advisory Group (TAG) in June 2015, a recommendation was made to establish 2020 as the target date for elimination of rubella in the region; this recommendation will be discussed by Member States at the next Regional Committee Meeting. The number of reported rubella cases has been declining in the Western Pacific Region since 2011 (from 76 022 in 2011 to 12 814 in 2014) with the majority of cases being reported from China and Japan. Reported CRS cases have also declined in the region (44 in 2013 and 12 in 2014) with most cases being reported from China. CRS surveillance is either weak or is not carried out by many countries in the region.

Six of the 11 countries in the **South-East Asia Region** had introduced RCV by the end of 2014; the remaining five countries are home to approximately 33 million (87%) of the 38 million children under 1 year of age. However, all five of these countries have committed to introducing the vaccine in the next few years. In 2014, 9263 confirmed cases of rubella were reported. India continued to report the most confirmed cases (4870), followed by Indonesia (3267) and Nepal (704). Surveillance for CRS only started as a WHO-supported activity after the September 2013 Regional Committee resolution and all countries in the region have agreed in principle to establish sentinel surveillance for CRS.

Although the **Eastern Mediterranean Region** has not yet set a rubella elimination goal, 13 countries

(60%) have set a national target for rubella/CRS elimination and 10 countries are now implementing CRS surveillance. In 2014, 2945 confirmed cases of rubella were reported by the countries of the Eastern Mediterranean Region, the majority of these (95%) were reported from four countries (Afghanistan, Pakistan, Sudan and Yemen) which had not yet introduced RCV.<sup>12</sup> So far, only one of the six GAVI-eligible countries (i.e. Yemen) has benefited from GAVI support to conduct supplementary immunization activities (SIAs) of RCV with introduction planned in 2015.

**The African Region** does not have a rubella control or elimination target and, in 2014, reported the highest incidence of rubella of all WHO regions. This is not surprising given the low uptake of RCV in the region. By the end of 2014, seven (15%) of the countries had introduced RCV. Of these, four countries are GAVI eligible.

A new phase of accelerated rubella control and CRS prevention has begun, marked by the 2011 WHO Position Paper, which recommended a strategy consistent with rubella and CRS elimination (3), the inclusion of rubella elimination in five WHO regions by 2020 as a disease control target in the Global Vaccine Action Plan (2012), and GAVI support for the introduction of rubella vaccine in countries meeting the eligibility criteria.

The key challenges are:

- a. building support for additional regions to adopt elimination goals. This includes ensuring that all Member States can achieve and maintain the minimum coverage ( $\geq 80\%$ ) through routine services and/or in SIAs required for introduction of RCV;
- b. advocating for resources and a secure vaccine supply needed to meet the European Region's elimination goal;
- c. ensuring high routine coverage of RCV (because of the use of combined measles and rubella-containing vaccines (MR) or measles, mumps and rubella-containing (MMR) vaccines, the programmatic target for RCV1 and RCV2 coverage is  $\geq 95\%$ );
- d. ensuring high-quality MR SIAs that reach at least 95% of targeted children, as verified through surveys; and
- e. strengthening synergies between rubella and measles surveillance and expanding CRS surveillance – commitment at all levels of government as well as involvement of the private sector is needed to address these challenges.

<sup>11</sup> These data are available at [http://www.euro.who.int/\\_data/assets/pdf\\_file/0004/276115/EpiData-No12-2014.pdf?ua=1](http://www.euro.who.int/_data/assets/pdf_file/0004/276115/EpiData-No12-2014.pdf?ua=1)

<sup>12</sup> Yemen, with GAVI support, conducted a nationwide MR campaign for children aged from 9 months to 14 years in November 2014 and subsequently introduced RCV in February 2015.

For GAVI-eligible countries, the challenge is in capitalizing on the available resources for RCV introduction while ensuring sufficient political and financial commitment to assure the sustainability of the programme.

Financial support from the GAVI Alliance together with the leadership, coordination and technical expertise from the Measles & Rubella Initiative (M&RI), provide an opportunity for Member States and regions to accelerate progress in rubella control and CRS

prevention. However, except for the Americas, the WHO regions are not on track to achieve elimination. Substantially greater commitment and investment by Member States and the global immunization community will be required to complete the task of rubella elimination in the European Region by 2015 and to reach the GVAP target of rubella elimination in five regions by 2020.

Table 9 and Table 10 and Figure 11-13 provide data on cases of rubella and CRS.

**Table 9: Rubella cases and incidence by WHO region, 2012–2014**

WHO region	National rubella coverage (%)			Member States reporting rubella cases (%)			Rubella incidence per million population		
	2014	2013	2012	2014	2013	2012	2014	2013	2012
African Region	10.3	3.5	0.1	94	91	87	7.9	15.3	13.0
Region of the Americas	91.9	91.3	94	94	97	100	0	0	0
Eastern Mediterranean Region	41.7	37.7	37.9	90	86	90	4.8	6.7	3.0
European Region	94.2	94.8	94.6	68	79	89	1.0	63.4	42.3
South-East Asia Region	12.1	12.2	10.8	91	100	100	5.1	5.6	3.8
Western Pacific Region	91.3	91.3	89.3	59	63	85	6.9	18.3	24.1
Total	45.7	43.8	42.3	81	85	91	4.9	14.2	13.4

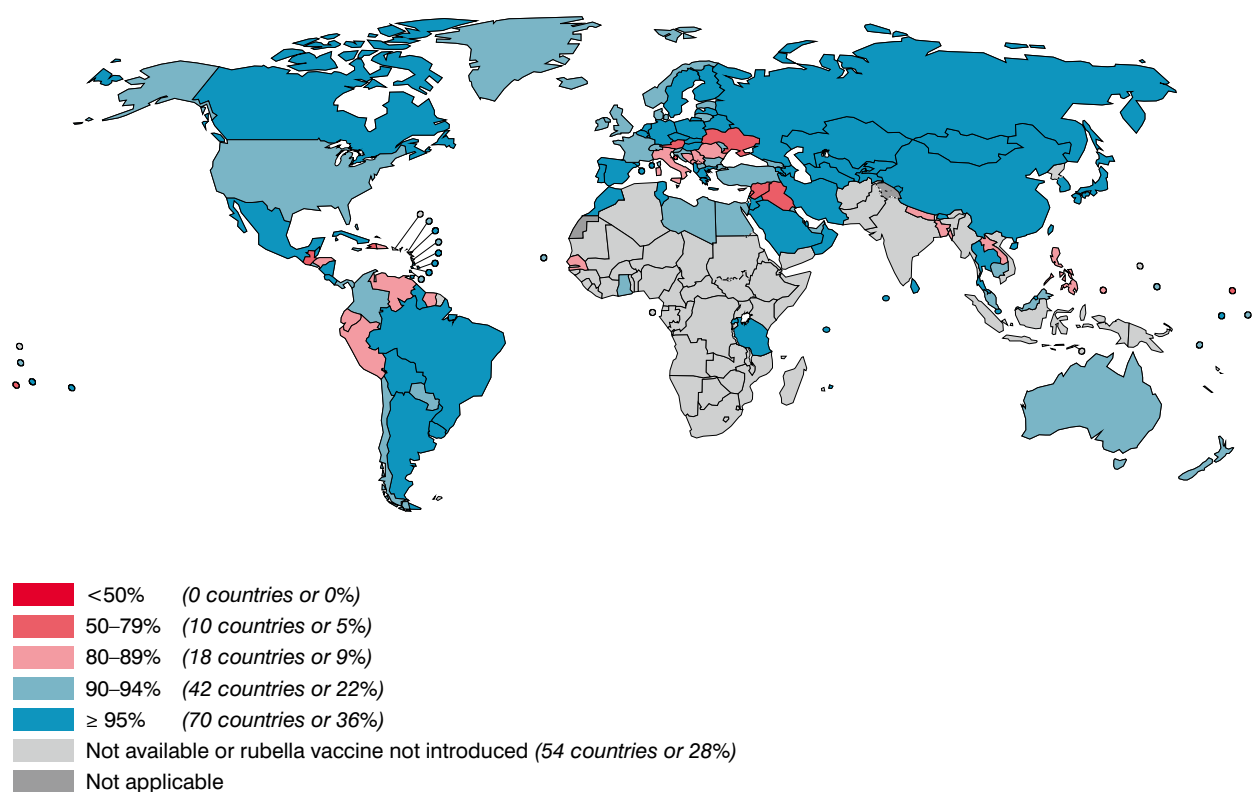
Note: MCV1 was used as a proxy in the Member States that have introduced rubella vaccine.

Source: JRF (as of 26 June 2015) and WHO-UNICEF estimates, 1980–2014, revision July 2015.

**Table 10: CRS cases and incidence by region, 2010–2014**

WHO region	CRS incidence per million population			Member States reporting CRS cases (%)		
	2014	2013	2012	2014	2013	2012
African Region	0.08	0.03	0.34	36	34	43
Region of the Americas	0	0	0	94	97	100
Eastern Mediterranean Region	0.01	0.06	0.15	38	52	43
European Region	0.04	0.07	0.09	64	81	81
South-East Asia Region	0.37	0.08	0.12	64	55	55
Western Pacific Region	0.04	0.13	0.39	44	48	63
Total	0.06	0.02	0.04	57	63	67

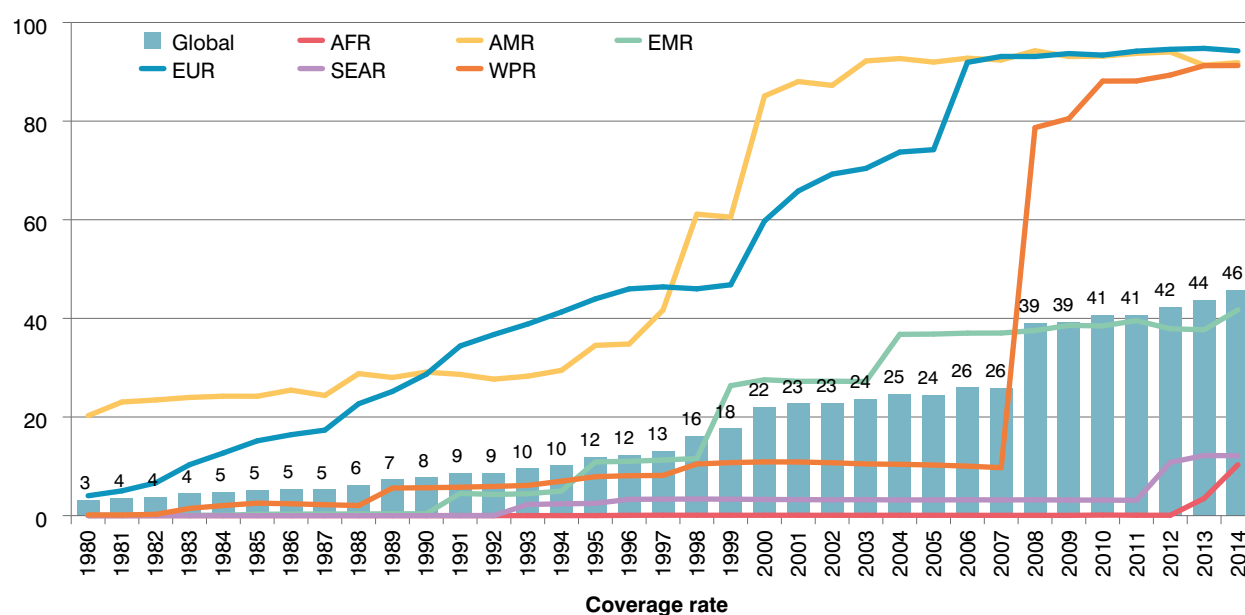
Source: JRF (data as of 26 June 2015).

**Figure 11: Immunization coverage with rubella-containing vaccines<sup>a</sup> in infants, 2014**

<sup>a</sup> MCV1 was used as a proxy in the Member States that have introduced rubella vaccine.  
 Map production: Immunization Vaccines and Biologicals (IVB), World Health Organization.  
 Date of slide: 17 July 2015.

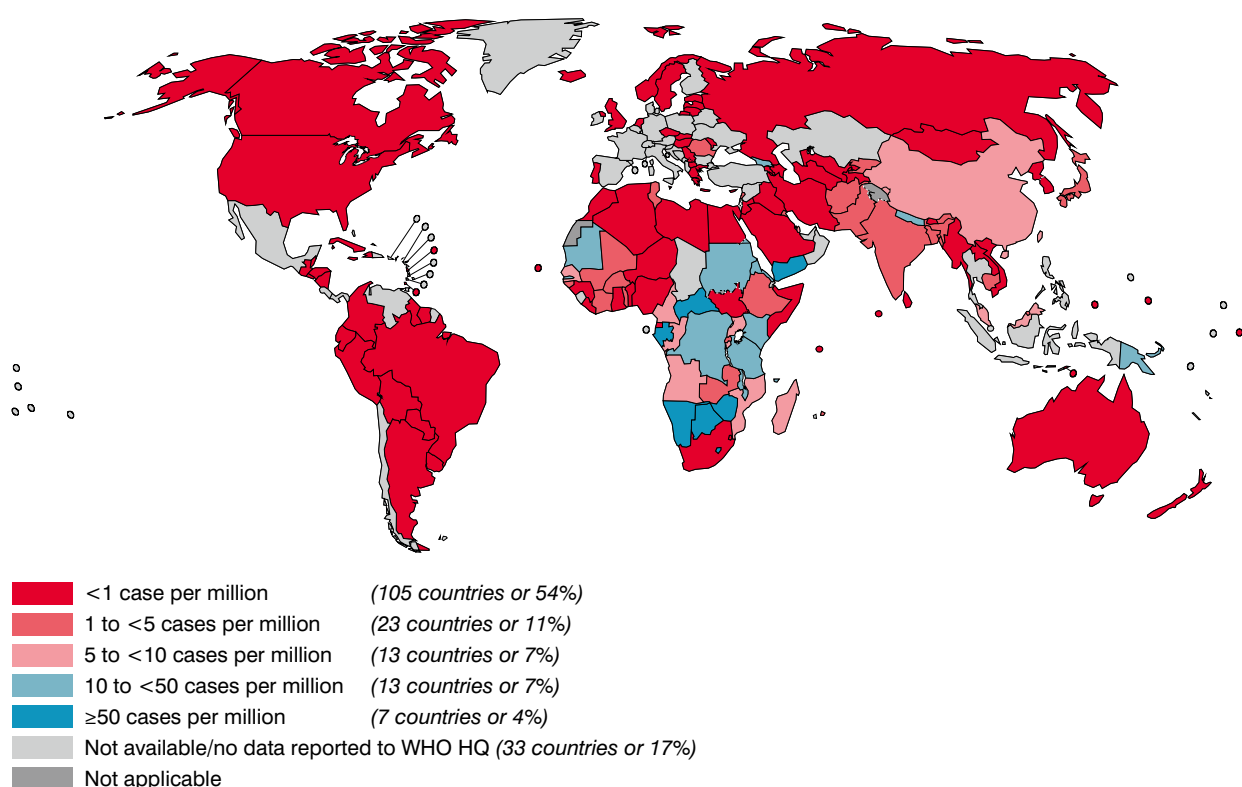
Source: WHO, UNICEF coverage estimates 2015 revision, July 2015.

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**Figure 12: Rubella-containing vaccine coverage<sup>a</sup> by WHO region, 1980–2014**

<sup>a</sup> MCV1 was used as a proxy in the Member States that have introduced rubella vaccine.  
 Immunization Vaccines and Biologicals (IVB), WHO. 194 WHO Member States.  
 Date of slide: 16 July 2015.

Source: WHO-UNICEF coverage estimates 2015 revision, July 2015.

**Figure 13: Reported rubella incidence rate per country for 2014<sup>a</sup>**

<sup>a</sup> Per million population.

Map production: Immunization Vaccines and Biologicals (IVB), WHO.

Source: Joint Reporting Form as at 26 June 2015: 194 WHO Member States. Map production: Immunization Vaccines and Biologicals (IVB), WHO.

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## 2. IMMUNIZATION COVERAGE RELATED INDICATORS

### Note to the reader

Progress towards the GVAP goals and strategic objectives related to immunization coverage has been consolidated into a single report, as for the previous report, on the recommendation of the SAGE GVAP Working Group.

As in the previous report, and as per the SAGE Working Group recommendation, the data for the following indicators are no longer reported separately, but included in the overall progress with coverage:

- Indicator SO3.1: percentage of districts (or equivalent administrative units) with 80% or greater coverage with three doses of diphtheria–tetanus–pertussis-containing vaccine (DTP3)
- Indicator SO4.1: DTP1–DTP3 dropout rate for national coverage
- Indicator SO4.2: 3 years sustainability of DTP3 national coverage > 80%

The two major sources of data for this report are:

- the WHO-UNICEF Joint Reporting Form on Immunization (JRF), which collects national-level data from countries on reported cases of selected vaccine-preventable diseases; recommended immunization schedules; immunization coverage; vaccine supply; and other information on the structure, policies and performance of national immunization systems;
- the WHO-UNICEF estimates of national infant immunization coverage (WUENIC), which are derived from various data sources, including coverage data from the JRFs; and
- the WHO Health Equity Monitor Database of the Global Health Data repository (data from Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS)).

The estimates are based on data and information available to WHO or UNICEF as of 7 July 2015.

The data are available from both WHO and UNICEF websites.<sup>13</sup> An explanation of how to interpret the country profiles is also available.<sup>14</sup>

The GVAP assessment compares progress against indicators over time using different country classifications. However, it should be noted that the list of WHO Member states,<sup>15</sup> the World Bank country classification<sup>16</sup> and the list of Gavi-eligible countries<sup>17</sup> have evolved during the time periods under consideration affecting, to different degrees, comparisons of progress against indicators, according to region, income group and Gavi eligibility. Thus, in the present GVAP report, comparisons over the years have been reduced to the most relevant ones that are not strongly impacted by these differences in classification.

Readers need also to be aware that the entire time-series of coverage estimates may be updated for certain countries, based on the availability of new data that affect the coverage estimates over a period of time, for example a new coverage survey, an update sent by the Member States or data submitted later last year.

As an example, estimates for India were revised based on a comprehensive subnational data review by the Government of India in 2015, which led to a revision of the coverage estimates time-series (increase).

For Côte d'Ivoire, the estimates were revised based on new survey results and, consequently, some estimates diminished. Thus, the estimates of coverage for 2013 in this report may not be the same as those provided in the previous report. The coverage estimates for 2014 must, therefore, be compared with the 2013 estimates in the updated time series (1–3).

For more information about the JRF and WUENIC coverage data, please refer to Annex 1 of the GVAP Secretariat Report 2013.<sup>18</sup>

<sup>13</sup> [http://www.who.int/immunization/monitoring\\_surveillance/routine/coverage/en/index4.html](http://www.who.int/immunization/monitoring_surveillance/routine/coverage/en/index4.html) and <http://www.data.unicef.org/child-health/immunization>.

<sup>14</sup> [http://www.who.int/entity/immunization/monitoring\\_surveillance/routine/coverage/User\\_Ref\\_Country\\_Reports.pdf](http://www.who.int/entity/immunization/monitoring_surveillance/routine/coverage/User_Ref_Country_Reports.pdf) and [http://www.childinfo.org/files/Immunization\\_WUENIC\\_guide\\_and\\_mark-up.pdf](http://www.childinfo.org/files/Immunization_WUENIC_guide_and_mark-up.pdf)

<sup>15</sup> The list of WHO Member States is available at: <http://www.who.int/countries/en/>

<sup>16</sup> World Bank country classification is available at: <http://data.worldbank.org/about/country-and-lending-groups>

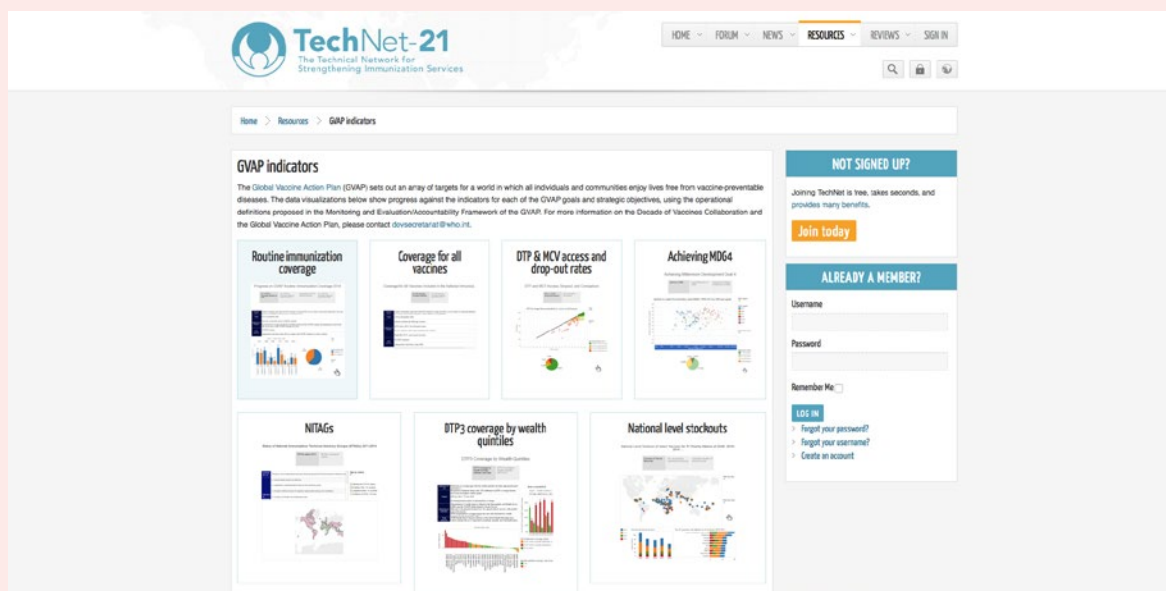
<sup>17</sup> The list of Gavi-eligible countries is available at: <http://www.gavi.org/support/apply/countries-eligible-for-support/>

<sup>18</sup> Annex 1 of the GVAP Secretariat Report 2013, "Understanding immunization coverage data: WHO-UNICEF JRF and WUENIC" ([http://www.who.int/entity/immunization/global\\_vaccine\\_action\\_plan/GVAP\\_secretariat\\_report\\_2013.pdf?ua=1](http://www.who.int/entity/immunization/global_vaccine_action_plan/GVAP_secretariat_report_2013.pdf?ua=1)).

## Data visualization of GVAP indicators

Please note that for all the coverage indicators, the GVAP Secretariat has provided interactive maps and graphs that will help the reader to better understand and explore of data.

To access these interactive figures/dashboard please use the Technet21 platform:  
<http://www.technet-21.org/en/resources/gvap-indicators>



When looking at the data, please hover over the dots, bars and countries; change the year; use the filters; use zoom, etc. to view additional information in the background.

For example, for the graph showing the relationship between DTP1 and DTP3, by filtering by region and then hovering over the circles, one can see which country the circles represent.



## GVAP COVERAGE INDICATORS

Goal/Strategic Objective	Indicators
<b>Goals</b>	
<b>G3</b> <b>Meet vaccination coverage targets in every region, country and community</b>	<b>G3.1</b> Reach 90% national coverage and 80% in every district or equivalent administrative unit with three doses of diphtheria–tetanus–pertussis-containing vaccines
	<b>G3.2</b> Reach 90% national coverage and 80% in every district or equivalent administrative unit for all vaccines in national programmes, unless otherwise recommended
<b>Strategic Objectives (SOs)</b>	
<b>SO3</b> <b>The benefits of immunization are equitably extended to all people</b>	<b>SO3.1</b> Percentage of districts with 80% or greater coverage with three doses of diphtheria–tetanus–pertussis-containing vaccine <b>Included in the G3.1 overall coverage indicator report</b>
<b>SO4</b> <b>Strong immunization systems are an integral part of a well-functioning health system</b>	<b>SO3.2</b> Reduction in coverage gaps between wealth quintiles and other appropriate equity indicator(s)
	<b>SO4.1</b> Dropout rates between first dose (DTP1) and third dose (DPT3) of diphtheria–tetanus–pertussis-containing vaccines <b>Included in the G3.1 overall coverage indicator report</b>
	<b>SO4.2</b> Sustained coverage of diphtheria–tetanus–pertussis-containing vaccines 90% or greater for three or more years <b>Included in the overall G3.1 coverage indicator report</b>
	<b>SO4.3</b> Immunization coverage data assessed as high quality by WHO and UNICEF <b>Indicator's definition to be discussed at SAGE GVAP Working Group meeting in 2015</b>

## GOAL 3:

### Meet vaccination coverage targets in every region, country and community

#### Indicator G3.1: Number of Member States that reach 90% national coverage and 80% in every district or equivalent administrative unit with three doses of diphtheria–tetanus–pertussis-containing vaccines



#### Highlights

- 129 (66%) of WHO Member States reached national DTP3 coverage of  $\geq 90\%$  in 2014. The number of countries that have achieved and sustained coverage  $\geq 90\%$  has steadily increased since 2010 (109) but has remained relatively stable over the past 4 years (130 in 2013).
- 119 countries have sustained coverage of  $\geq 90\%$  for at least 3 years.
- 65 countries that have yet to achieve the target will require game-changing strategies in order to meet the GVAP goal. Among them are seven countries with less than 50% coverage with DTP3: Central African Republic, Chad, Equatorial Guinea, Haiti, Somalia, South Sudan and Syrian Arab Republic.
- Worldwide, DTP3 immunization coverage showed a stable trend between 2013 and 2014, of 86% for all three doses.
- In 2014, 91% of infants received at least one dose of DTP.
- The estimated number of unvaccinated and under-vaccinated infants in 2014 was 18.7 million. While this is significantly lower than the estimate reported in the previous report (21.8 million in 2013), the updated time-series indicates that the decline is marginal compared to 2013, when there were 18.8 million unvaccinated or under-vaccinated infants. The revised coverage estimates in India largely explain the lower estimates in this report compared to the last report.
- 121 (62%) of Member States had available and valid district data for DTP3 coverage in 2014, compared to 101 (52%) in 2013, showing an improvement in data availability and quality over the year.
- Only 54 Member States (28%) reached national DTP3 coverage of  $\geq 90\%$  as well as coverage in all districts of 80% or more. This figure is relatively stable compared to previous years (55 in 2013, 62 in 2012 and 50 in 2011).
- 37 (19%) countries did not provide district coverage data and 36 (19%) provided data that were considered invalid.
- In 2014, 22 (11%) countries with validated district-level coverage rates had achieved DTP3 coverage of  $\geq 80\%$  in between 50% and 79% of their districts, while 15 (8%) countries had coverage of  $\geq 80\%$  in  $< 50\%$  of districts.

TARGET	2015 in all Member States
DEFINITION OF INDICATOR	National coverage data based on WUENIC estimates For district-level coverage, the data are considered valid only if the WUENIC estimates and administrative data from the JRF are the same or if the WUENIC estimates are $\geq 90\%$
DATA SOURCES <sup>19</sup>	WUENIC estimates Administrative data from country JRFs (to compare with WUENIC estimates as a check of validity)

## Data availability and quality

By the end of 2014 most countries were using combination vaccines, either DTP-*Haemophilus influenzae* type B (Hib)-hepatitis B (HepB) (DTP-Hib-HepB) or DTP-Hib-inactivated polio vaccine (IPV) or DTP-Hib-HepB-IPV, so the generic DTP3 term is used in the report to refer to DTP3 alone or to any of the above-mentioned DTP3-containing vaccines.

Although WUENIC data are available every year and can be used to monitor progress towards achievement of target coverage at the national level, the full assessment of progress in national DTP3 coverage is limited by the availability of valid district-level coverage data. In this assessment, district-level coverage data were considered valid if WUENIC estimates were the same as the administrative coverage data reported by national

authorities on the JRF, or if the WUENIC estimates of national coverage were 90% or greater.

Using this definition, 121 Member States (62%) had valid district-level coverage estimates for DTP3 in 2014 (Table 11). Of the remaining 73 Member States, 36 had WUENIC estimates that differed from the JRF administrative data and had national coverage  $< 90\%$ , and are therefore not considered valid, and 37 did not report district-level coverage. Relative to the previous year, when 101 countries had valid data, there was a considerable increase in the number of Member States that had valid district-level coverage estimates for DTP3 in 2014. The number of countries that did not report district-level coverage decreased from 40 in 2013 to 37 in 2014. The number of countries with invalid district-level coverage data decreased from 61 to 36.

## Results

### National DTP3 immunization coverage

Of the 194 Member States, 129 (66%) achieved a national DTP3 coverage rate of  $\geq 90\%$  in 2014 (Table 11). The distribution was uneven between regions and the distribution patterns are almost identical to those of 2013. Six additional countries (Burkina Faso, Congo, Dominican Republic, Malawi, Nauru and Viet Nam) achieved DTP3  $\geq 90\%$  in 2014.

One hundred and nineteen countries had sustained DTP3 coverage  $\geq 90\%$  for 3 years in 2014, which was better than in 2013 when 115 countries had been able to sustain this level of coverage (Figure 14).

Global coverage for DTP3 was 86% in 2014 (Figure 14). While this is higher than the coverage reported in the last report, as per the updated time-series, coverage has stagnated for the past 5 years. The regional coverage

rates are also stagnating in almost all the regions, with some, such as the Region of the Americas, showing decreasing trends (Figure 15).

The total number of unvaccinated children diminished globally from 18.8 million in 2013 to 18.7 in 2014 (Figure 16), mainly reflecting the considerable reduction in the number of unvaccinated children in Nigeria (2.5 Million in 2013 and 2.3 Million in 2014, Figure 17 and Figure 18). While the numbers are lower than those reported in the last report, as per the updated time-series, there has not been any significant downward trend.

It is proposed to classify countries where DTP3 is less than 90% into four groups based on their DTP1 and DTP3 coverage (dropout) to allow recommendations adapted to their specific situation, as shown in Table 12 and Figure 19.

<sup>19</sup> For more information about the JRF and WUENIC coverage data, please refer to GVAP Secretariat Report 2013, Annex 1 "Understanding immunization coverage data: WHO-UNICEF JRF and WUENIC", pp. 133–37. ([http://www.who.int/entity/immunization/global\\_vaccine\\_action\\_plan/GVAP\\_secretariat\\_report\\_2013.pdf?ua=1](http://www.who.int/entity/immunization/global_vaccine_action_plan/GVAP_secretariat_report_2013.pdf?ua=1)).



## District-level DTP3 coverage

Among the 121 Member States with valid district-level coverage estimates in 2014, only 54 (28%) had achieved national-level coverage of  $\geq 90\%$  and coverage of  $\geq 80\%$  in every district (or equivalent administrative level) (ex-GVAP Indicator G3.1). This was fewer than in the previous year when 57 Member States (29%) reached this goal. As mentioned above, 37 countries (19%) did not provide district coverage data and 36 (19%) provided data that were considered invalid.

Distribution of Member States by percentage of districts achieving the target  $\geq 80\%$  coverage for DTP3 in all districts in 2014 (ex-GVAP Indicator SO3.1), by WHO region is shown in Figure 20 and Table 13b. Fifty-four Member States achieved coverage of 80% or more for DTP3 in all districts, compared to 55 in 2013.

Twenty-two (11%) Member States with validated district-level coverage rates had achieved DTP3 coverage of  $\geq 80\%$  in between 50% and 79% of their districts in 2013. Thirty (15%) countries had DTP3  $\geq 80\%$  in 80–99% of their districts, whereas 15 (8%) had coverage of  $\geq 80\%$  in  $< 50\%$  of their districts.

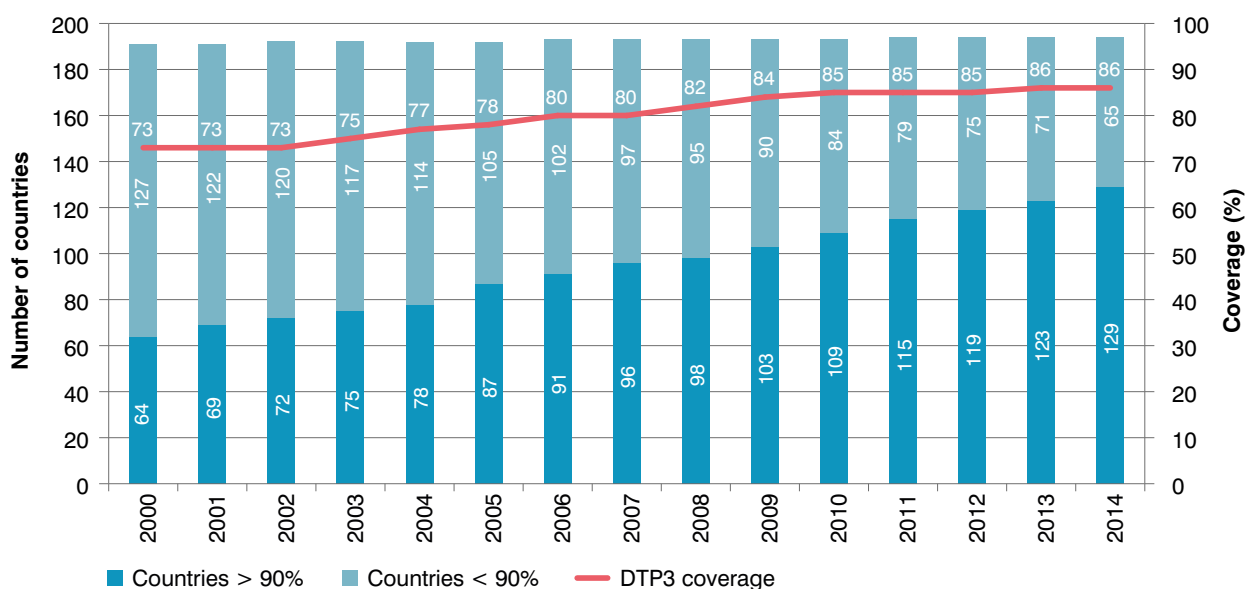
**Table 11: Distribution of all 194 Member States by level of national DTP3 coverage rate and region, based on WUENIC estimates for 2014**

WHO region	DTP3 $\geq 90\%$ in 2013		DTP3 $\geq 90\%$		DTP3 of 70–89%		DTP3 of 50–69%		DTP3 $< 50\%$		Total
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	
African Region	18	38	18	38	20	43	5	11	4	9	47
Region of the Americas	24	69	25	71	9	26	0	0	1	3	35
Eastern Mediterranean Region	13	62	13	62	5	24	1	5	2	10	21
European Region	49	92	48	91	5	9	0	0	0	0	53
South-East Asia Region	7	64	7	64	4	36	0	0	0	0	11
Western Pacific Region	19	70	18	67	7	26	2	7	0	0	27
Global	130	70	129	66	50	26	8	4	7	4	194

Immunization Vaccines and Biologicals, (IVB), WHO.

Source: WHO-UNICEF coverage estimates, 2014 revision, July 2015.

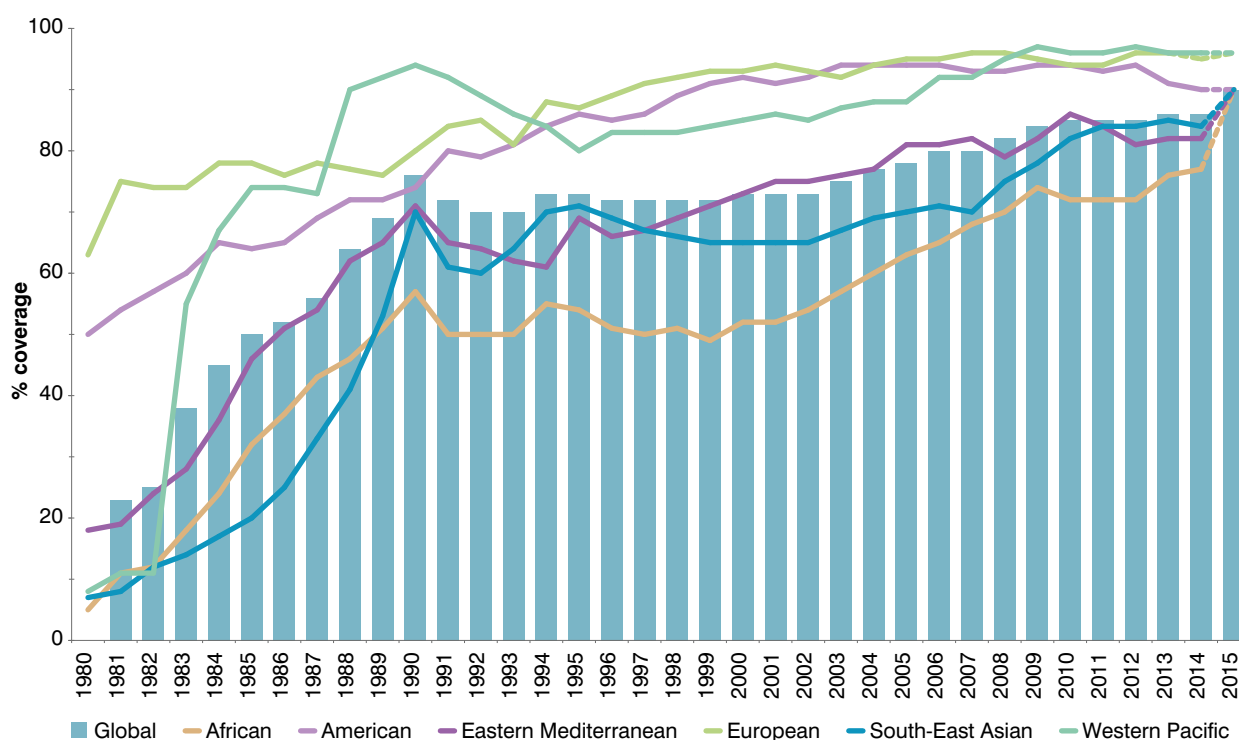
**Figure 14: Number of countries that have reached and sustained  $\geq 90\%$  DTP3 coverage since 2000 and global DTP3 coverage in 2014**



Note: Data in this table should be read as follows: In 2014 (last column), 129 countries reached and sustained DTP3  $\geq 90\%$  for 1 year; 119 countries have reached and sustained DTP3  $\geq 90\%$  for the past 3 years and 64 have reached and sustained it for 15 years. Immunization Vaccines and Biologicals, (IVB), WHO.

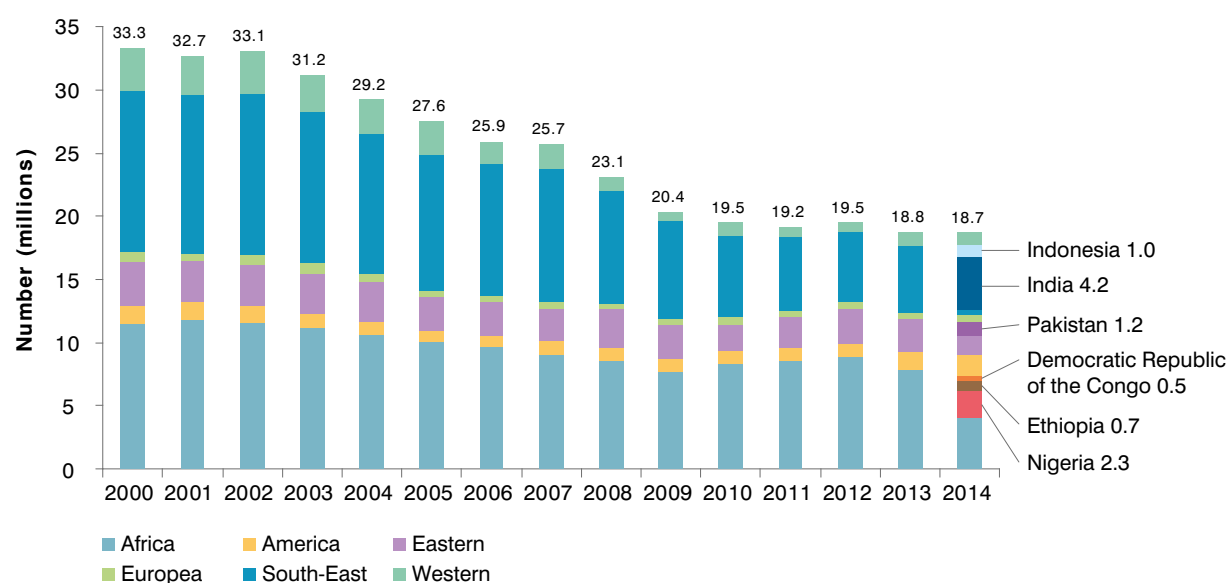
Source: WHO-UNICEF coverage estimates, 2014 revision, July 2015.

**Figure 15: Global immunization 1980–2014 and projections to reach 90% global coverage goals in 2015 for DTP3**



Immunization Vaccines and Biologicals (IVB), WHO.

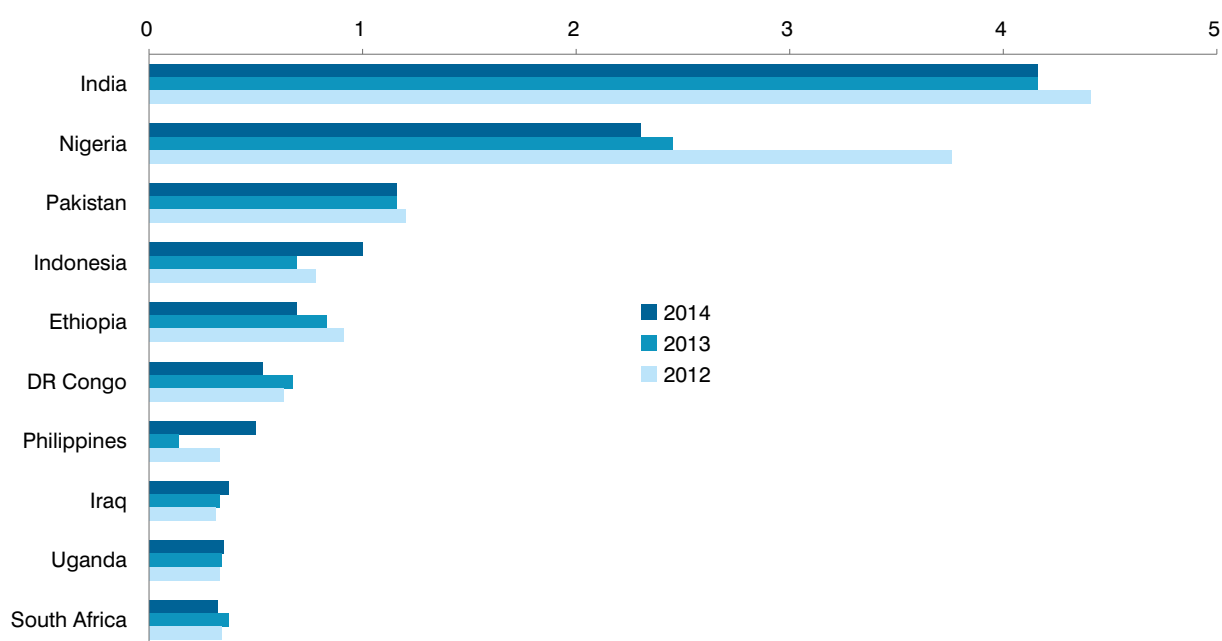
Source: WHO-UNICEF coverage estimates 2014 revision, July 2015.

**Figure 16: Number of unvaccinated children (DTP3) by year and WHO region, 2000–2014**

Immunization Vaccines and Biologicals (IVB), WHO.

194 WHO Member States

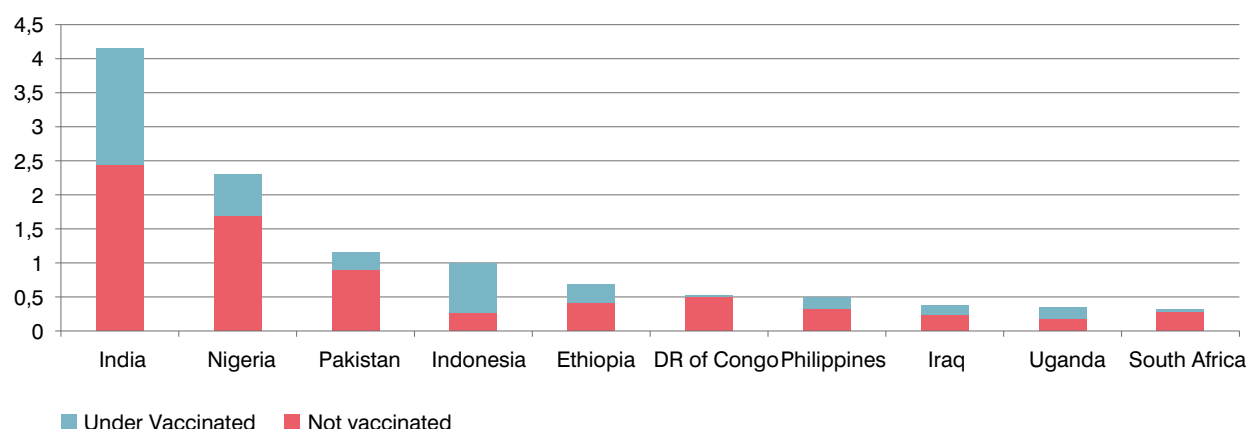
Source: WHO-UNICEF coverage estimates, 2014 revision, July 2015 and United Nations Population Division, The world population prospects: the 2012 revision. New York: United Nations; 2013.

**Figure 17: Countries with most unvaccinated infants DTP3, 2011–2014 (in millions)**

Immunization Vaccines and Biologicals (IVB), WHO.

Source: WHO-UNICEF coverage estimates, 2014 revision, July 2015.

**Figure 18: The ten countries with most under-vaccinated and unvaccinated children (in millions) with DTP3**



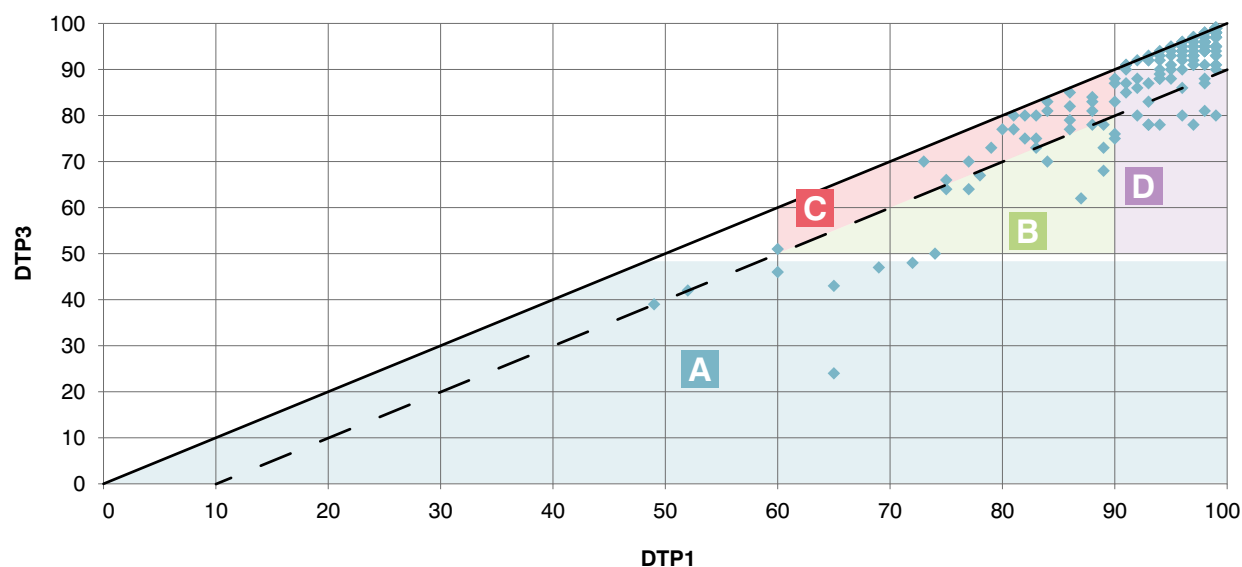
Immunization Vaccines and Biologicals (IVB), WHO.

Source: WHO-UNICEF coverage estimates 2014, revision July 2015.

**Table 12: Classification of Member States for which DTP3 national coverage is less than 90% into four groups based on their DTP1 and DTP3 coverage (and recommendations adapted to their specific situation), 2014**

Group	Definition	Countries	Proposed strategies to increase DTP3 coverage
A	DTP3 < 50%	Central African Republic, Chad, Equatorial Guinea, Haiti, Somalia, South Sudan, Syrian Arab Republic	Overall system strengthening
B	DTP1 < 90% and dropout ≥ 10%	Benin, Central African Republic, Chad, Côte d'Ivoire, Equatorial Guinea, Ethiopia, Guatemala, Guinea, Haiti, Iraq, Kiribati, Liberia, Madagascar, Niger, Nigeria, Papua New Guinea, Somalia, South Sudan, Syrian Arab Republic, Uganda, Vanuatu, Venezuela (Bolivarian Republic of)	Improve access: <ul style="list-style-type: none"> <li>• Social mobilization and demand generation</li> <li>• Target hard-to-reach populations</li> </ul> Address dropout: <ul style="list-style-type: none"> <li>• Improve quality and predictability of service delivery</li> <li>• Reduce missed opportunities</li> </ul>
C	DTP1 < 90% but dropout < 10%	Afghanistan, Comoros, Democratic Republic of the Congo, Ecuador, Gabon, Honduras, Kenya, Lebanon, Mali, Mauritania, Pakistan, Philippines, San Marino, Sierra Leone, South Africa, Timor-Leste, Tonga	Improve access
D	DTP1 ≥ 90% and DTP3 < 90%	Angola, Austria, Bosnia and Herzegovina, Bulgaria, Cameroon, Djibouti, Guinea-Bissau, India, Indonesia, Lao People's Democratic Republic, Marshall Islands, Mexico, Micronesia (Federated States of), Mozambique, Myanmar, Namibia, Panama, Paraguay, Peru, Senegal, Solomon Islands, Suriname, Togo, Ukraine, Yemen, Zambia	Address dropout

**Figure 19: Classification of Member States for which DTP3 national coverage is less than 90% into four groups based on their DTP1 and DTP3 coverage (and recommendations adapted to their specific situation)**



Note: Data in this table should be read as follows:

- A: Countries with DTP3 coverage <50%
- B: Countries with DTP1 coverage <90% & drop-out ≥10%
- C: Countries with DTP1 coverage <90% but drop-out <10%
- D: Countries DTP1 coverage ≥90% and DTP3 coverage <90%.

Note: The recommendations for the different groups are as follows:

- A: Countries need better overall health system strengthening (DTP3 < 50%).
- B: Countries need to improve both access and dropout (DTP1 < 90% and dropout ≥ 10%).
- C: Improve access
- D: Address drop-out

Immunization, Vaccines and Biologicals (IVB), WHO.

Source: WHO-UNICEF coverage estimates, 2014 revision. July 2015.





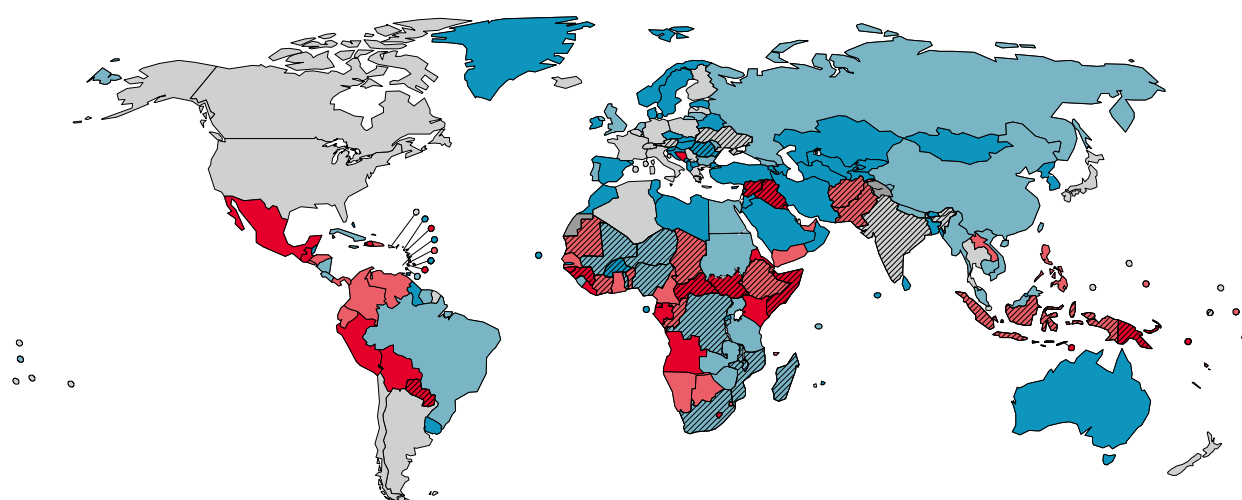
**Table 13:** Distribution of Member States by national and district-level DTP3 coverage achievements and by WHO region in 2014

WHO region	Countries with DTP3 district coverage data available and valid								DTP3 district coverage data not available		DTP3 district coverage data available but not valid		Total
	DTP3 coverage national ≥ 90% and all districts ≥ 80%		DTP3 coverage national ≥ 90% but not all districts ≥ 80%		DTP3 national coverage < 90%		Total						
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	
African Region	5	11%	9	19	10	21	24	51	1	2	22	47	47
Region of the Americas	7	20	13	37	8	23	28	80	4	11	3	9	35
Eastern Mediterranean Region	8	38	4	19	2	10	14	67	1	5	6	29	21
European Region	24	45	7	13	2	4	33	62	19	36	1	2	53
South-East Asia Region	5	45	1	9	2	18	8	73	2	18	1	9	11
Western Pacific Region	5	19	5	19	4	15	14	52	10	37	3	11	27
Global	54	28	39	20	28	14	121	62	37	19	36	19	194

Immunization, Vaccines and Biologicals (IVB), WHO.

Source: WHO-UNICEF coverage estimates, 2014 revision, July 2015.



**Figure 20: Member States by the percentage of districts with DTP3 coverage of  $\geq 80\%$  for 2014**

- < 50% (27 Member States or 14%, for 12 of which administrative coverage DTP3 data considered not valid)
- 50–79% (32 Member States or 16%, for 10 of which administrative coverage DTP3 data considered not valid)
- 80–99% (40 Member States or 21%, for 10 of which administrative coverage DTP3 data considered not valid)
- All districts (58 Member States or 30%, for 4 of which administrative coverage DTP3 data considered not valid)
- Not available (37 Member States or 19%, with 4 Member States having administrative coverage DTP3 data that are not valid)
- Not applicable
- WHO-UNICEF (WUENIC) estimate is < 90% or differs from country's administrative coverage reported on the JFR and therefore district data are not considered valid (40 Member States or 21%)

Map production: Immunization Vaccines and Biologicals (IVB), WHO.

Source: WHO-UNICEF coverage estimates, 2015 revision.

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**Table 13b: Distribution of Member States by percentage of districts achieving ≥ 80% coverage for DTP3 in 2014, by WHO region**

WHO region	Countries with DTP3 district coverage data available and valid										Total	
	100% districts with DTP3 ≥ 80%		80–99% districts with DTP3 ≥ 80%		50–79% districts with DTP3 ≥ 80%		0–49% districts with DTP3 ≥ 80%		Total			
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)		
African Region	5	11	6	13	7	15	6	13	24	51	22	47
Region of the Americas	7	20	7	20	8	23	6	17	28	80	3	35
Eastern Mediterranean Region	8	38	2	10	3	14	1	5	14	67	1	21
European Region	24	45	8	15	0	0	1	2	33	62	19	53
South-East Asia Region	5	45	2	18	0	0	1	9	8	73	2	11
Western Pacific Region	5	19	5	19	4	15	0	0	14	52	10	27
Global	54	28	30	15	22	11	15	8	121	62	37	194
											36	19

Immunization Vaccines and Biologicals (IVB), WHO.

Source: WHO-UNICEF coverage estimates, 2014 revision, July 2015.

## Indicator G3.2: Number of Member States that reach 90% national coverage and 80% in every district or equivalent administrative unit for all vaccines in national programmes, unless otherwise recommended



### Highlights

- District-level coverage is currently only monitored for DTP3 and not for other vaccines. Hence, the results in this chapter mainly relate to national-level coverage.
- 83 countries (43%) reached this target for all vaccines, while 111 (57%) did not; this is equal to the number achieving the target in 2013.
- 46 Member States (24% of all Member States) met DTP3 national coverage goals but failed to meet the  $\geq 90\%$  coverage targets for all vaccines in national programmes, while 65 Member States (33.5%) failed to meet both targets.

TARGET	2020 in all Member States
DEFINITION OF INDICATOR	<p>Indicator includes the following vaccines:</p> <p>Three doses of DTP, polio and the first dose of measles-containing vaccine (MCV) for all Member States</p> <p>Bacille Calmette–Guérin (BCG) for Member States where included in the schedule (i.e. not limited to high risk populations)</p> <p>Three doses of HepB, Hib, PCV and rotavirus last dose (second or third dose, depending on the vaccine) when part of the national immunization schedule</p> <p>National coverage data are included only for vaccines that have been introduced into the immunization schedule for at least one year before the JRF reporting year (e.g. coverage reported for the calendar year 2012 for a vaccine introduced in 2010) and in countries that have reported these data</p>
DATA SOURCES <sup>20</sup>	<p>WUENIC estimates</p> <p>Administrative data from country JRFs</p>

### Data availability and quality

It is possible to measure progress towards the target only for national-level coverage at this point, since district-level administrative data are currently available only for DTP3 and measles-containing vaccines (MCV). For the purposes of this analysis, it should be noted

that the lowest coverage rate for any particular vaccine that is part of the national immunization programme is used to determine whether the country has met the indicator target.

<sup>20</sup> For more information about the JRF and WUENIC coverage data, please refer to GVAP Secretariat Report 2013, Annex 1 "Understanding immunization coverage data: WHO-UNICEF JRF and WUENIC", pp. 133–37 ([http://www.who.int/entity/immunization/global\\_vaccine\\_action\\_plan/GVAP\\_secretariat\\_report\\_2013.pdf?ua=1](http://www.who.int/entity/immunization/global_vaccine_action_plan/GVAP_secretariat_report_2013.pdf?ua=1)).

## Results

Countries achieving national coverage of 90% or greater for all vaccines in their immunization schedule in 2014 are shown in Figure 21. Eighty-three countries (43%) reached this target for all vaccines, while 111 (57%) did not; this is equal to the number that achieved the target in 2013 (Table 14).

Whereas the number of Member States achieving  $\geq 90\%$  with all vaccines in their national immunization schedule stagnated from 2013 to 2014, 11 countries that had not achieved the goal in 2013 achieved it in 2014 and 11 Member States that had achieved it in 2013 did not achieve it in 2014. There could be a number of reasons for this. For example the change may have resulted from the recent introduction of a new vaccine into the national programme, which would have a lower coverage than the vaccines that have been in the programme for a longer period. In some cases the Member States have only one antigen that falls under the 90% threshold (these countries usually also report stockouts of that antigen).

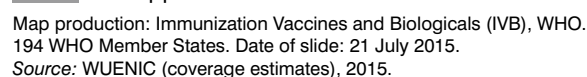
Among the 129 countries that had achieved DTP3  $\geq 90\%$ ; 83 also achieved coverage  $\geq 90\%$  with all other vaccines in their national programmes. By contrast, 46 Member States (24% of all Member States) met DTP3 national coverage goals but failed to meet the  $\geq 90\%$  coverage targets for all vaccines in national programmes, while 65 nations (33.5%) failed to meet both targets. A variety of causes could account for coverage of some vaccines being lower than that of DTP3, but these causes are not identifiable by examining data available at the global level. Countries in this category need to examine their own data carefully to understand the underlying causes for lower coverage with one or more vaccines and take the necessary corrective actions.

Global coverage of individual vaccines varies from one vaccine to another. If BCG, DTP1, DTP3, HepB, MCV and neonates protected at birth against neonatal tetanus (PAB) are all above 80% of global coverage, new vaccines like rotavirus vaccine, PCV and Hib remain low (Figure 22) since many countries have yet to introduce these vaccines into their national programmes.

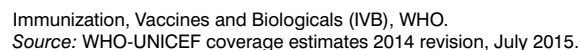
**Table 14: Number of Member States that achieved  $\geq 90\%$  national coverage for all the vaccines included in their national immunization schedule by WHO region, 2012–2014**

WHO region	2012		2013		2014	
	n	(%)	n	(%)	n	(%)
African Region	13	28	11	23	12	26
Region of the Americas	16	46	15	43	16	46
Eastern Mediterranean Region	11	52	11	52	10	48
European Region	32	60	29	55	28	53
South-East Asia Region	5	45	5	45	5	45
Western Pacific Region	14	52	12	44	12	44
Global	91	47	83	43	83	43





**Figure 22: Global coverage estimates, 1980–2014, BCG, DTP 1st and 3rd, measles 1st and 2nd, HepB birth and 3rd, Hib3, PCV3 and rotavirus vaccine (last dose)**



# REDUCTION IN COVERAGE GAPS BETWEEN WEALTH QUINTILES AND OTHER APPROPRIATE EQUITY INDICATOR(S) (Indicator SO3.2)



## Highlights

- Baseline data from Demographic and Health Survey (DHS) or Multiple Indicator Cluster Sampling (MICS) surveys conducted between 2008 and 2013 on national diphtheria–tetanus–pertussis (DTP3) coverage rates by wealth quintiles were available for 61 Member States (31%) compared to 54 Member States in the previous year's report; 133 nations still need to conduct surveys to provide a baseline estimate for the decade.
- Coverage was higher in the wealthiest quintile than in the poorest quintile in most Member States with 10 exceptions.
- Of the 61 countries with available data, 40 (66%) have met the target of <20% difference in immunization coverage between the highest and lowest wealth quintiles. However, this figure needs to be considered with caution as 10 countries (16%) still had a quintile differential <20% but ≥10% and only 25 (41%) Member States have DTP3 coverage ≥90%.
- Twenty-one countries (34%) had a quintile differential ≥20% and have thus failed to meet the target. Of those, only one country had DTP3 coverage ≥90%, meaning that 20 countries have failed to meet both targets.

TARGETS	Increasing trend in equity in immunization coverage
	Proportion of Member States with <20% difference in DTP3 coverage between the lowest and highest wealth quintile:
	60% by 2015
	75% by 2020
DEFINITION OF INDICATOR	<ul style="list-style-type: none"> <li>• DTP3 immunization coverage among 1-year-olds distributed by wealth quintiles for the period 2007–2012</li> <li>• Determination of wealth index as defined in DHS and the United Nations Children's Fund (UNICEF) MICS</li> <li>• Data are to be measured at least twice (by special study or survey), with an early and late measure</li> </ul>
DATA SOURCES	WHO Health Equity Monitor Database of the Global Health Data repository, <sup>21</sup> which contains data on more than 30 reproductive maternal, neonatal and child health indicators disaggregated by child's sex, place of residence (rural versus urban), wealth quintile and educational level. The data come from DHS and MICS surveys conducted in 94 Member States, of which 93 are low- or middle-income countries

## Data availability and quality

Data for this analysis were derived from a re-analysis of DHS and MICS microdata, which are publicly available,<sup>22</sup> using the standard indicator definitions

for estimating household wealth as published in DHS and UNICEF documents. Health inequality data must be interpreted with caution because they have several

<sup>21</sup> The database can be found at: <http://apps.who.int/gho/data/node.main.HE-1540?lang=en>.

<sup>22</sup> Immunization: full, bacille Calmette-Guérin (BCG), DTP3, measles, polio: wealth quintile, data by country (<http://apps.who.int/gho/data/node.main.HE-1590?lang=en>). DTP3 coverage: WHO-UNICEF review of national immunization coverage, 1980-2013 ([http://apps.who.int/immunization\\_monitoring/globalsummary/wucoveragecountrylist.html#P](http://apps.who.int/immunization_monitoring/globalsummary/wucoveragecountrylist.html#P)).

limitations. Since estimates of household wealth and immunization coverage are only available through DHS and MICS surveys, which are conducted periodically, these data cannot be generated for each country on an annual basis.

In a few cases there may be minor differences between the data reported here and in previous DHS or MICS country reports, owing to small discrepancies in the definition and calculation of some indicators. As new information is acquired every year, the coverage estimates are updated annually, which can result in changes in the estimates from one year to the next. Detailed information about the indicator criteria is available in the WHO Indicator and Measurement Registry ([www.who.int/gho/indicator\\_registry/en/](http://www.who.int/gho/indicator_registry/en/)).

At least two measures are required to identify trends. Baseline data were defined as data from DHS or MICS surveys that took place in 2008 or later, as was the case in the previous year's report. The DHS and MICS surveys provide data on children aged 12 to 23 months, meaning the birth year of the cohort is the year before the surveys were conducted. Because the data relate to infant immunizations, DTP3 coverage data used for each country correspond to the birth year of the cohort and not the year the national surveys were conducted.

## Results

Baseline data on DTP3 coverage rates for the highest and lowest wealth quintile from DHS and MICS surveys conducted from 2008 to 2013 in 61 Member States was used to calculate the quintile differential defined as the lowest wealth quintile's coverage rate subtracted from the highest wealth quintile's coverage rate (absolute difference). The quintile differentials for various countries are displayed in Figure 23.

Of the 61 countries with data, 40<sup>23</sup> (66%) have met the target of <20% difference in immunization coverage between the highest and lowest wealth quintiles.

Among those 40 countries, 10 Member States<sup>24</sup> (16%) had higher coverage in the poorest quintile than in the wealthiest quintile; 10 countries (16%) had a quintile differential <20% but ≥10% and 20 had a quintile differential <10% but ≥0.

Although 10 countries (16%) with a quintile differential <20% but ≥10% have met the goal, additional efforts to lower the quintile differential to below 10% are needed.

When surveys were available for multiple years within the relevant time period, data from the most recent survey were chosen for inclusion in the analysis. For example, surveys were conducted in Nigeria in 2011 and in 2013, but only the data from the survey conducted in 2013 were included in this analysis. When survey data were not available for national DTP3 coverage rate, WHO and UNICEF Estimates of National Immunization Coverage (WUENIC) data were used.

At the time of this report, 61 countries had data on DTP3 coverage rates by wealth quintiles. The Eastern Mediterranean, European and Western Pacific Regions are in particular need of these data, since at least 80% of the countries in these regions lack such data. Although data availability has improved since last year, with seven more countries providing data, 133 Member States still need to conduct nationwide surveys.

For those Member States that have not conducted a survey since 2008, the baseline will need to be established once a survey takes place. The United Nations (UN) Secretary-General's Global Strategy for Women's and Children's Health recommends household surveys every three years for the 75 "Countdown" Member States (countries with the highest child mortality). Hence, it is expected that at least this subset of Member States will collect three sets of data during the decade, to monitor reduction in coverage inequities.

These should include efforts to meet the DTP3 national coverage target of ≥90% as only three – Cambodia, Nepal, and Senegal – of those 10 countries have coverage of ≥90%.

The remaining 21 countries (34%) had a quintile differential ≥20% and only one, Liberia, reached the target for DTP3 coverage of ≥90%. The remaining 20 countries have not met either DTP3 national coverage or wealth quintile coverage gap reduction targets. For these nations, a strategy to increase the overall national coverage – but with a targeted focus on the lower wealth quintiles – will be essential in making progress towards both goals. The results for each Member State are shown in Table 15 and Table 16.

In general, Member States with high national coverage were likely to have smaller differences in coverage between wealth quintiles. Only one of the Member States with national DTP3 coverage rates of ≥90% had a quintile differential ≥20%, and three others had a differential ≥10%.

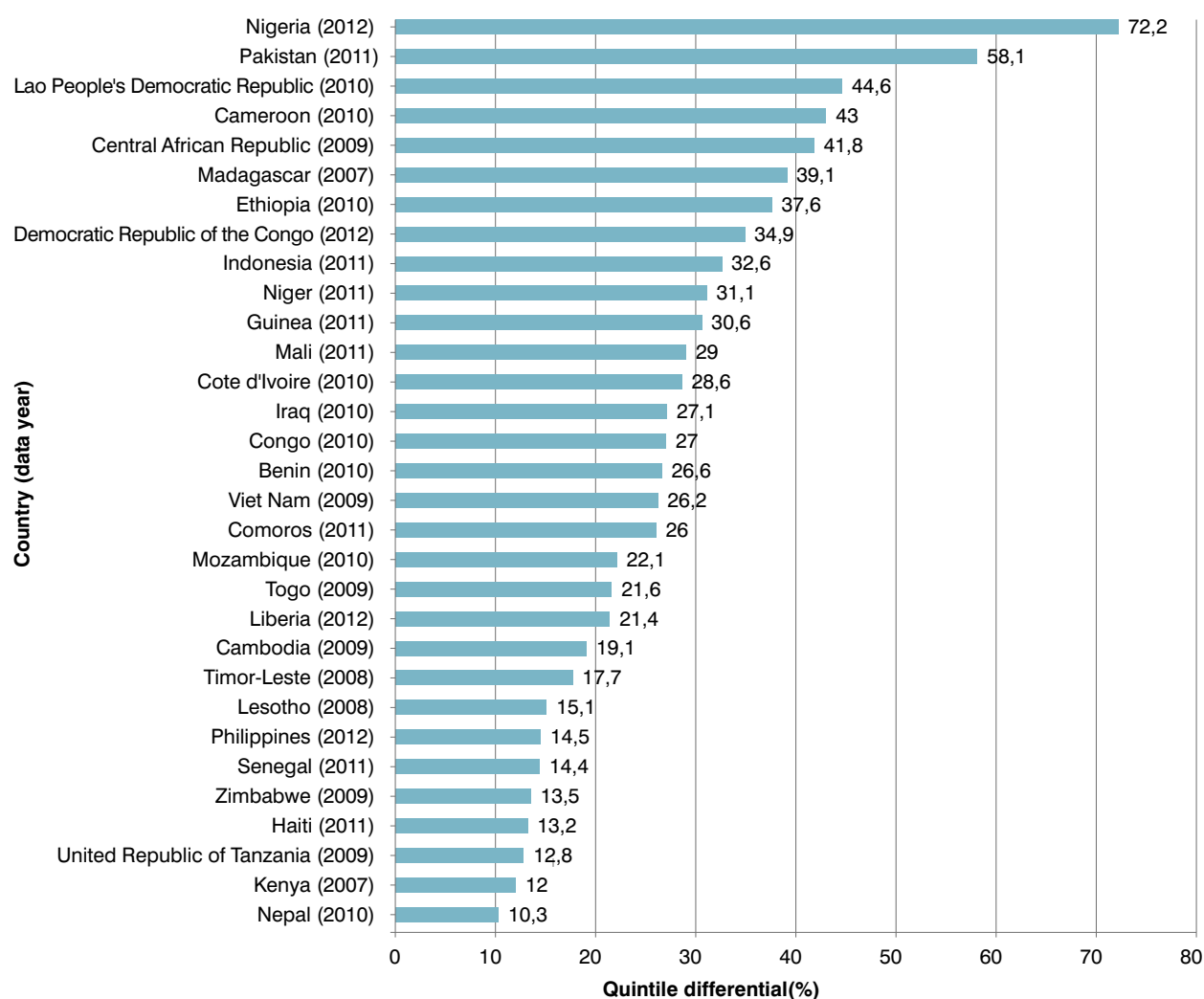
<sup>23</sup> Albania, Armenia, Bangladesh, Belize, Bolivia (Plurinational State of), Bosnia and Herzegovina, Burkina Faso, Burundi, Cambodia, Colombia, Costa Rica, Egypt, Gabon, Ghana, Guyana, Haiti, Honduras, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Lesotho, Malawi, Maldives, Mongolia, Nepal, Peru, Philippines, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Suriname, Swaziland, Tajikistan, the former Yugoslav Republic of Macedonia, Timor-Leste, Uganda, United Republic of Tanzania and Zimbabwe.

<sup>24</sup> Albania, Belize, Burundi, Kazakhstan, Kyrgyzstan, Maldives, Sierra Leone, Suriname, Swaziland and Tajikistan.

It should be noted that this indicator cannot be properly assessed globally until all countries conduct DHS or MICS surveys. As it stands, the underlying target for all countries to have baseline data by 2015 is unlikely to be met. However, preliminary results indicate that countries

with DTP3 coverage below 90% have a tendency to have greater wealth quintile differentials, and it is important for those countries with lower national coverage to conduct a national survey to assess equity in immunization coverage.

**Figure 23: DTP3 quintile differential for 31 Member States having a quintile differential of  $\geq 10\%$ <sup>a</sup>**



<sup>a</sup> Source: Data from DHS or MICS surveys conducted between 2008 and 2013.

**Table 15: DTP3 national coverage, DTP3 coverage by wealth quintile, and quintile differential for 31 Member States having a quintile differential of  $\geq 10\%$ <sup>a</sup>**

Category	Country (data year)	DTP3 coverage <sup>b</sup>	Quintile 1 (poorest)	Quintile 5 (richest)	Quintile differential
<b>Quintile differential <math>\geq 20\%</math> and DTP3 <math>\geq 90\%</math> n = 1 (1.6%)</b>	Liberia (2012)	93 <sup>a</sup>	58	79.4	21.4
	Nigeria (2012)	25	7.4	79.6	72.2
	Pakistan (2011)	74 <sup>a</sup>	29.9	88	58.1
	Lao People's Democratic Republic (2010)	56	36.8	81.4	44.6
	Cameroon (2010)	84 <sup>a</sup>	44.6	87.6	43
	Central African Republic (2009)	32	17.8	59.6	41.8
	Madagascar (2007)	82	53.6	92.7	39.1
	Ethiopia (2010)	36	26	63.6	37.6
<b>Quintile differential <math>\geq 20\%</math> and DTP3 <math>&lt; 90\%</math> n = 20 (33%)</b>	Democratic Republic of the Congo (2012)	72 <sup>a</sup>	48.1	83	34.9
	Indonesia (2011)	72	52.5	85.1	32.6
	Niger (2011)	68	53.3	84.4	31.1
	Guinea (2011)	50	32.4	63	30.6
	Mali (2011)	72 <sup>a</sup>	48.6	77.6	29
	Côte d'Ivoire (2010)	85 <sup>a</sup>	52.1	80.7	28.6
	Iraq (2010)	70	55.2	82.3	27.1
	Congo (2010)	72	54.6	81.6	27
	Benin (2010)	76 <sup>a</sup>	59	85.6	26.6
	Viet Nam (2009)	74	59.3	85.5	26.2
	Comoros (2011)	73	57.5	83.5	26
	Mozambique (2010)	76	65.4	87.5	22.1
	Togo (2009)	72	62.8	84.4	21.6
	Cambodia (2009)	94 <sup>a</sup>	73.5	92.6	19.1
	Senegal (2011)	92	80.2	94.6	14.4
	Nepal (2010)	92	88.1	98.4	10.3
<b>Quintile differential <math>&lt; 20\%</math> but <math>\geq 10\%</math> and DTP3 <math>\geq 90\%</math> n = 3 (5%)</b>	Timor-Leste (2008)	66	54.8	72.5	17.7
	Lesotho (2008)	84	73.2	88.3	15.1
<b>Quintile differential <math>&lt; 20\%</math> but <math>\geq 10\%</math> and DTP3 <math>&lt; 90\%</math> n = 7 (11.5%)</b>	Philippines (2012)	86 <sup>a</sup>	78.5	93	14.5
	Zimbabwe (2009)	73 <sup>a</sup>	67.4	80.9	13.5
	Haiti (2011)	62	54.7	67.9	13.2
	United Republic of Tanzania (2009)	88	84.1	96.9	12.8
	Kenya (2007)	86	77.6	89.6	12

<sup>a</sup> Based on WUENIC coverage estimates.<sup>b</sup> Coverage data from [http://apps.who.int/immunization\\_monitoring/globalsummary/wucoveragecountrylist.html#P](http://apps.who.int/immunization_monitoring/globalsummary/wucoveragecountrylist.html#P) Source: Data from DHS or MICS surveys conducted between 2008 and 2013.



**Table 16: DTP3 national coverage, DTP3 coverage by wealth quintile, and quintile differential for 20 Member States having a quintile differential of <10%<sup>a</sup>**

Category	Country (data year)	DTP3 coverage <sup>b</sup>	Quintile 1 (poorest)	Quintile 5 (richest)	Quintile differential
<b>Quintile differential &lt;10% but &gt;0 and DTP3 ≥90%</b> <b>n = 15 (25%)</b>	Guyana (2008)	93 <sup>a</sup>	76.5	86.2	9.7
	Burkina Faso (2009)	90	83.4	92.9	9.5
	Armenia (2009)	95	88.3	96.9	8.6
	Costa Rica (2010)	94	89.3	97.2	7.9
	Columbia (2009)	90	84.9	92.5	7.6
	Bangladesh (2010)	93	90.3	97.8	7.5
	Mongolia (2009)	92	91.2	96.1	4.9
	Jordan (2011)	98	96.2	99.1	2.9
	Malawi (2009)	93	91.4	94.3	2.9
	Rwanda (2009)	97	96.1	98.7	2.6
	Bosnia and Herzegovina (2010)	92	91.4	93.8	2.4
	Egypt (2007)	98	97.1	98.9	1.8
	Honduras (2010)	95	96.4	98.1	1.7
	Ghana (2010)	93	93	94.4	1.4
	The former Yugoslav Republic of Macedonia (2010)	95 <sup>a</sup>	92.7	94	1.3
<b>Quintile differential &lt;10% but &gt;0 and DTP3 &lt;90%</b> <b>n = 5 (8%)</b>	Gabon (2011)	75 <sup>a</sup>	62.2	71.8	9.6
	Peru (2011)	83	83.4	88.6	5.2
	Sao Tome and Principe (2007)	87.4	86.5	91	4.5
	Bolivia (Plurinational State of) (2007)	84 <sup>a</sup>	85.7	86.1	0.4
	Uganda (2010)	72	74.5	74.8	0.3

<sup>a</sup> Based on WUENIC coverage estimates.<sup>b</sup> Coverage data from [http://apps.who.int/immunization\\_monitoring/globalsummary/wucoveragecountrylist.html#P](http://apps.who.int/immunization_monitoring/globalsummary/wucoveragecountrylist.html#P)

Source: Data from DHS or MICS surveys conducted between 2008 and 2013.

## STRATEGIC OBJECTIVE 4: STRONG IMMUNIZATION SYSTEMS ARE AN INTEGRAL PART OF A WELL-FUNCTIONING HEALTH SYSTEM

### Indicator SO4.3: Immunization coverage data assessed as high quality by WHO and UNICEF

As discussed by the members of the SAGE GVAP Working Group in April 2015, it has been recommended that the indicator on data quality should apply to focusing on the grade of confidence in the estimates of coverage using national administrative data rather than WHO-UNICEF estimates of national infant immunization coverage (WUENIC).

There was consensus that data quality implied that data of sufficient accuracy, completeness and granularity at all

levels to monitor programmes and inform programme planning and corrective actions were desired. However, the limitations of currently available data, particularly at the subnational levels were also recognized.

The Decade of Vaccines Secretariat will propose possible new indicators to the SAGE GVAP Working Group in September 2015.

### References

1. Burton A, Monasch R, Lautenbach B, Gacic-Dobo M, Neill M, Karimov R, et al. WHO and UNICEF estimates of national infant immunization coverage: methods and processes. *Bull World Health Organ.* 2009;87(7):535–41 (<http://www.who.int/bulletin/volumes/87/7/08-053819/en/>, accessed 7 September 2015).
2. Burton A, Kowalski R, Gacic-Dobo M, Karimov R, Brown D. A formal representation of the WHO and UNICEF estimates of national immunization coverage: A computational logic approach. *PLoS ONE.* 2012;7(10): e47806. doi:10.1371/journal.pone.0047806 (<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3485034/pdf/pone.0047806.pdf>, accessed 7 September 2015).
3. Brown D, Burton A, Gacic-Dobo M, Karimov R. An introduction to the grade of confidence in the WHO and UNICEF estimates of national immunization coverage. *The Open Public Health Journal.* 2013;6: 73–76 (<http://www.benthamscience.com/open/tophj/articles/V006/73TOPHJ.pdf>, accessed 7 September 2015).

# NUMBER OF LOW-INCOME AND MIDDLE-INCOME COUNTRIES THAT HAVE INTRODUCED ONE OR MORE NEW AND UNDER-UTILIZED VACCINES (indicator G4.3)



## Highlights

- From January 2010 to December 2013, 86 low- and middle-income countries added at least one new and under-utilized vaccine to their national immunization programme and sustained vaccine use for at least 12 months, i.e. until December 2014.
- These 86 low- and middle-income Member States, representing more than half (56%) of the world's population living in low- and middle-income countries, introduced a total of 128 vaccines from January 2010 to 31 December 2013 (32 introduced more than one vaccine during this period).
- Overall, it shows an increasing trend in sustainably introducing one or more new and under-utilized vaccines. In comparison, 68 low- and middle-income countries were reported to have introduced at least one such vaccine in the 2014 GVAP Secretariat Report.

<b>TARGET</b>	2015: At least 90 low- and middle-income Member States 2020: All low- and middle-income Member States
<b>DEFINITION OF INDICATOR</b>	A vaccine is added to the national immunization schedule and used for a sustained period of at least 12 months. New and under-utilized vaccines are all vaccines that were not previously included in the national immunization schedule.  Introduction of a single dose of IPV as part of the polio eradication end-game strategy is not considered as an inclusion criterion for this indicator. Only countries that replace OPV with IPV or introduce IPV as part of a sequential schedule are included.
<b>DATA SOURCES</b>	WHO-UNICEF joint reporting forms (JRFs)
<b>DATA AVAILABILITY AND QUALITY</b>	The limitations of JRF and WUENIC coverage data were discussed in the GVAP Secretariat report 2013 <sup>25</sup> .

## Results

In the first four years of the Decade of Vaccines – January 2010 to December 2013 – 86 low- and middle-income countries added at least one new and

under-utilized vaccine to their national immunization programme and sustained vaccine use for at least 12 months, i.e. until December 2014 (Table 17).

<sup>25</sup> Global Vaccine Action Plan monitoring, evaluation & accountability: Secretariat annual report 2014. Geneva: World Health Organization; 2014 ([http://www.who.int/immunization/global\\_vaccine\\_action\\_plan/gvap\\_secretariat\\_report\\_2014.pdf](http://www.who.int/immunization/global_vaccine_action_plan/gvap_secretariat_report_2014.pdf)).

**Table 17: Number of low- and middle-income Member States that introduced a new and under-utilized vaccine between January 2010 and December 2013 and sustained its use for at least 12 months, by vaccine, GAVI Alliance eligibility and World Bank income group**

Country classification	Total No. of countries by category	Member States that have introduced at least 1 vaccine	Hib	PCV	Rota	HPV	Rubella	JE
GAVI-eligible	56	40 (71%)	8	26	10	2	7	1
GAVI-graduating	17	12 (71%)	4	7	4	1	0	1
Non-GAVI-eligible lower-middle income	11	7 (64%)	3	3	3	1	2	0
Non-GAVI-eligible upper-middle income	51	27 (53%)	8	12	6	10	0	0
<b>Total</b>	<b>135</b>	<b>86 (64%)</b>	<b>23</b>	<b>48</b>	<b>23</b>	<b>14</b>	<b>9</b>	<b>2</b>

These vaccines include: Hib-containing vaccine, pneumococcal conjugate vaccine (PCV), rotavirus vaccine, human papillomavirus vaccine, rubella and inactivated polio vaccine.<sup>26</sup> These 86 countries represent more than half (56%) of the world's population that live in low- and middle-income countries.

Fifty-four of these low- and middle-income countries introduced one vaccine during this four-year period (Table 18), while 32 introduced more than one vaccine. A total of 128 vaccine introductions took place in these 86 low- and middle-income countries during this period.

All but two countries<sup>27</sup> had introduced and sustainably used Hib-containing vaccine by the end of 2014.

A major increase in new and under-utilized vaccine introductions during recent years was seen with pneumococcal-, HPV- and Hib- containing vaccines in middle-income countries.

Regarding IPV vaccine, as of December 2013, 22 low- and middle-countries had introduced it sustainably by 2013 (13 of which had introduced before 2010). There remain 113 countries that have until early 2016 to include IPV into their national immunization schedule.

Among the 32 Member States which introduced and sustained more than one vaccine during the period, 12 are upper-middle income countries, 14 are lower-middle income countries and 12 are GAVI-eligible countries.

**Table 18: Number of Member States that have added one or more new and under-utilized vaccines to their national immunization schedule, by year and WHO region**

WHO region	No. of low- and middle- income countries <sup>a</sup> / total Member States in region 2013	Number of low- and middle- income countries having introduced at least one vaccine			
		2010	2011	2012	2013
African	45/47	3 (7%)	11 (24%)	11 (24%)	16 (36%)
Americas	24/35	9 (38%)	5 (21%)	7 (29%)	4 (17%)
Eastern Mediterranean	15/21	2 (13%)	3 (20%)	5 (33%)	6 (40%)
European	19/53	5 (26%)	3 (16%)	2 (11%)	6 (32%)
South-East Asia	11/11	0 (0%)	3 (18%)	4 (36%)	2 (18%)
Western Pacific	21 <sup>b</sup> /27	6 (29%)	2 (10%)	5 (24%)	8 (38%)
<b>Total</b>	<b>135/194</b>	<b>25 (19%)</b>	<b>27 (20%)</b>	<b>34 (25%)</b>	<b>42 (31%)</b>

<sup>a</sup> World Bank classification. It is proposed to keep this reference year for future reports to ensure comparability of data.

<sup>b</sup> Cook Islands, Niue and Nauru were not classified by the World Bank, but were considered as upper-middle -income countries for this report.

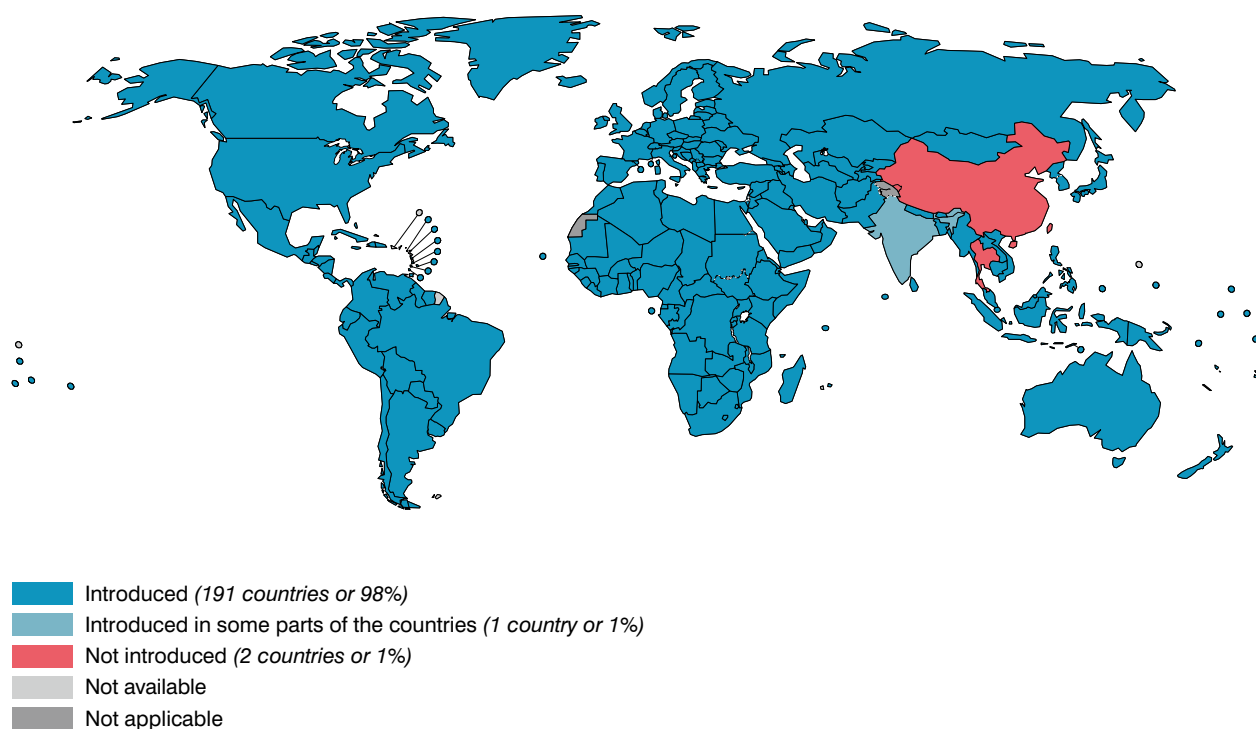
Figure 24 to Figure 28 show the status of the use of Hib-containing, pneumococcal conjugate, rotavirus,

human papillomavirus, and inactivated Polio vaccines in national immunization programmes worldwide.

<sup>26</sup> For more information about the JRF and WUENIC coverage data, please refer to the GVAP Secretariat report 2013, Annex 1. [http://www.who.int/entity/immunization/global\\_vaccine\\_action\\_plan/GVAP\\_secretariat\\_report\\_2013.pdf?ua=1](http://www.who.int/entity/immunization/global_vaccine_action_plan/GVAP_secretariat_report_2013.pdf?ua=1)

<sup>27</sup> China and Thailand do not plan to introduce Hib-containing vaccine. India only introduced it partially.

**Figure 24: Member States with Hib-containing vaccine in their national immunization programme (as of 31 December, 2014)**

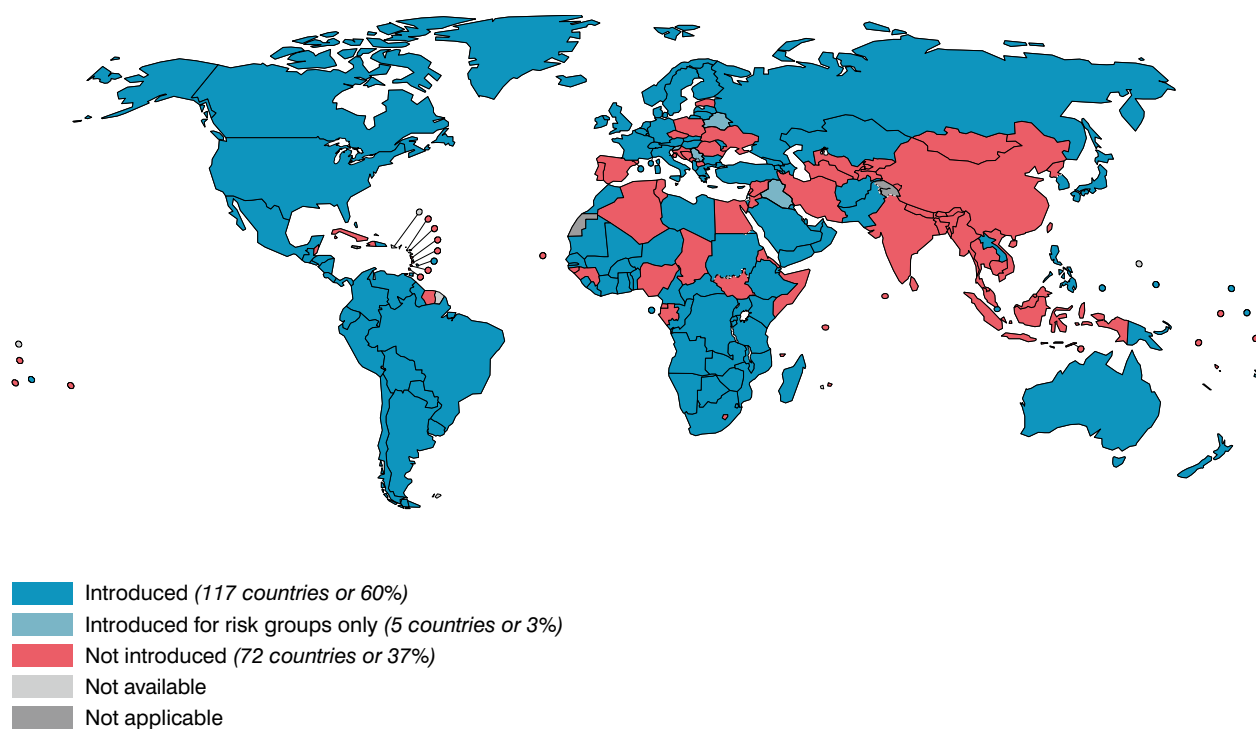


Data source: WHO/IVB Database, as of 15 July 2015

Map production Immunization Vaccines and Biologicals (IVB), WHO. Date of slide: 16 July 2015

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**Figure 25: Member States with pneumococcal conjugate vaccine in their national immunization programme (as of 31 December, 2014)**



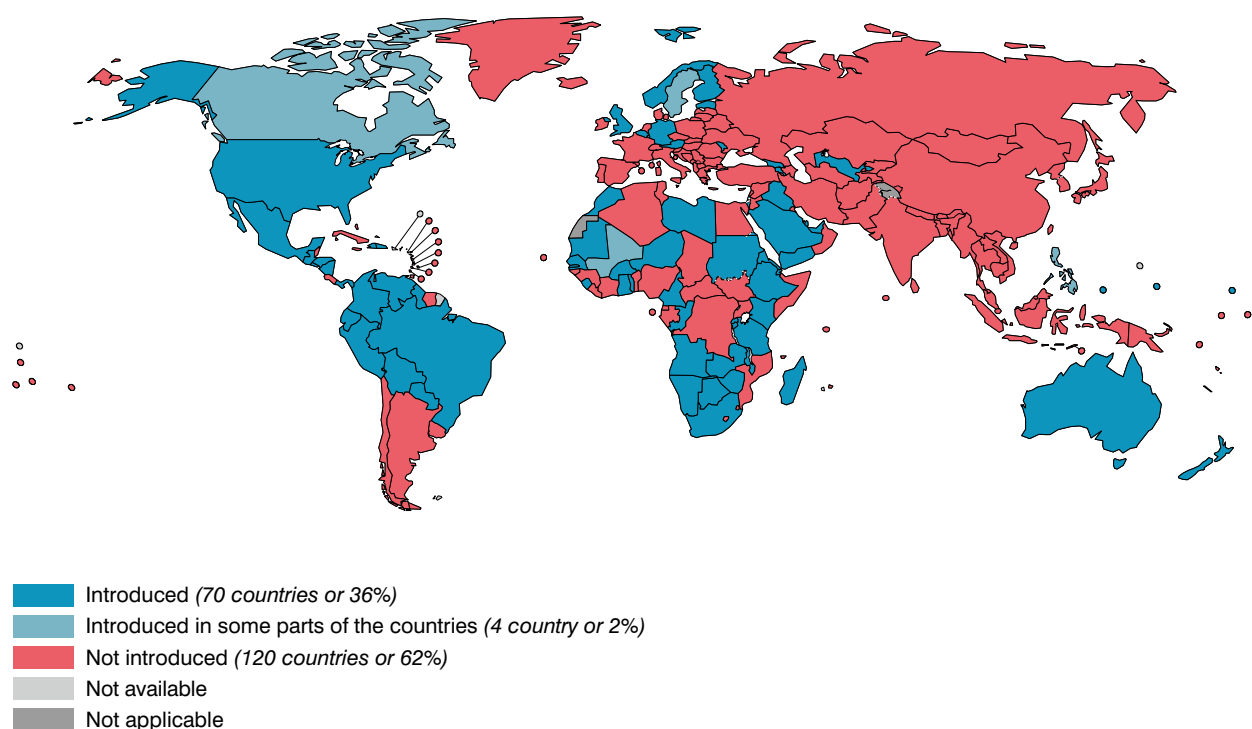
Data source: WHO/IVB Database, as of 15 July 2015

Map production Immunization Vaccines and Biologicals (IVB), WHO. Date of slide: 16 July 2015

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**Figure 26: Member States with rotavirus vaccine in their national immunization programme (as of 31 December 2014)**

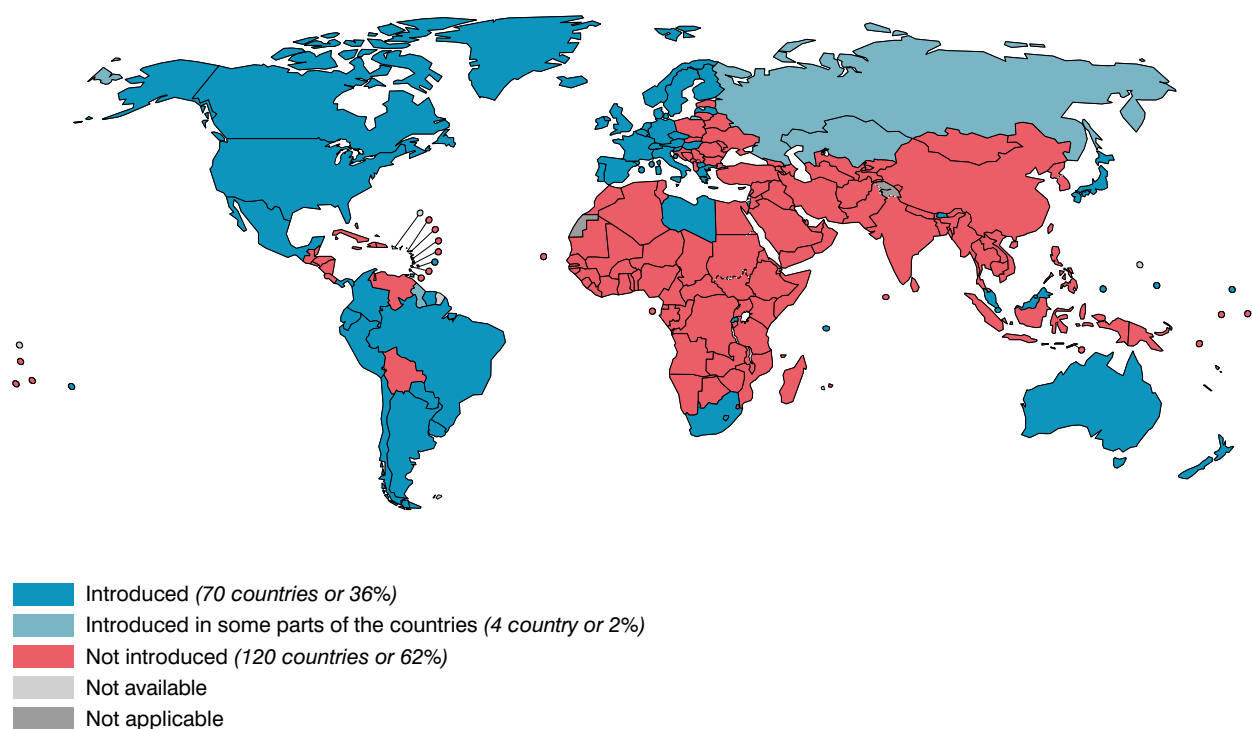


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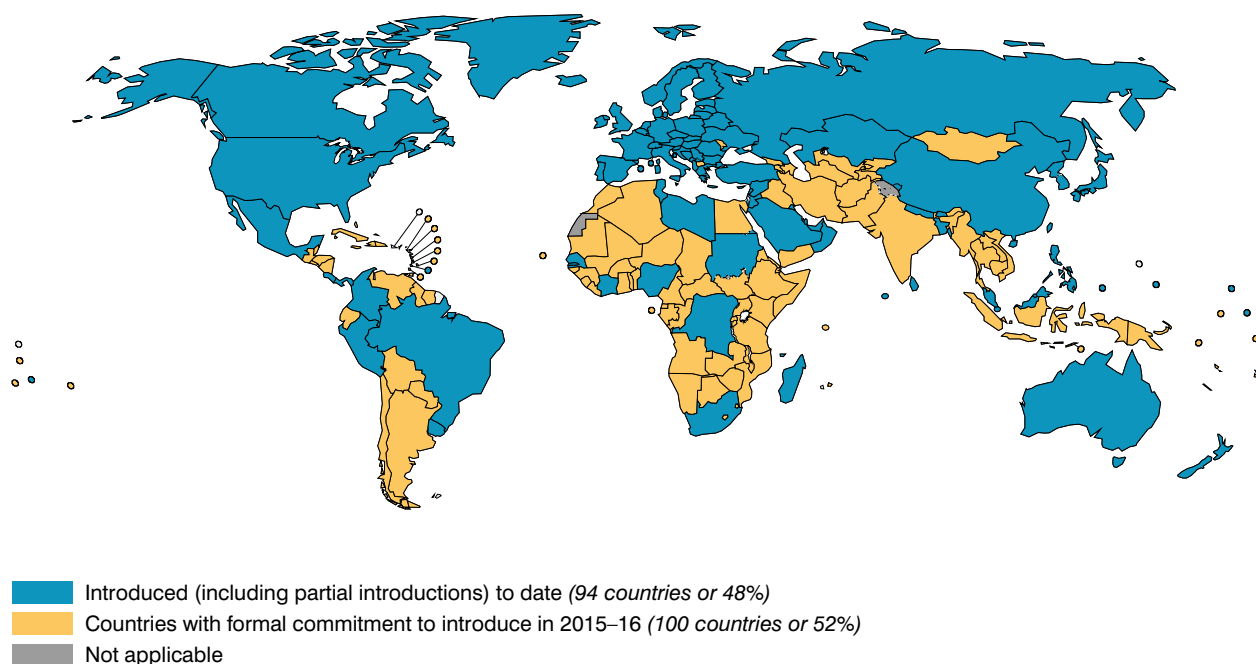
**Figure 27: Member States with HPV vaccine in the national immunization programme (as of 31 December 2014)**



Data source: WHO/IVB Database, as of 15 July 2015

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**Figure 28: Countries using IPV vaccine to date and formal decision to introduce in 2015–2016**

Since January 2013, the following countries have introduced IPV: Kazakhstan and Peru (July 2013); Libya (March 2014); Albania (May 2014); Panama (July 2014); Nepal and Tunisia (September 2014); Philippines (October 2014); China (December 2014); Comoros, Senegal and Serbia (January 2015); Colombia and Nigeria (February 2015); Bangladesh and Maldives (March 2015); Democratic People's Republic of Korea, Democratic Republic of the Congo and Gambia (April 2015); Madagascar and Sudan (May 2015); Côte d'Ivoire, Kiribati, St Vincent and the Grenadines (June 2015); Bhutan and Sri Lanka (July 2015)

Data source: WHO/IVB Database, as of 15 July 2015.

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# 3. MILLENNIUM DEVELOPMENT GOAL 4 AND INTEGRATION INDICATORS

## REDUCE UNDER-FIVE MORTALITY RATE (Indicator G5.1)



### Highlights

- Substantial progress has been made towards achieving Millennium Development Goal (MDG) 4. The number of deaths of children aged under 5 years worldwide has nearly halved, from 12.7 (12.5–12.9) million in 1990 to 6.3 (6.1–6.7) million in 2013.<sup>28</sup>
- This translates into around 17 000 fewer children dying every day in 2013 than in 1990, but it still implies the deaths of about 17 000 children under the age of 5 years every day in 2013.<sup>28</sup>
- Since 1990, the global under-five mortality rate has dropped 49% – from 90 (89–92) deaths per 1000 live births in 1990 to 46 (44–48) in 2013. All regions, except sub-Saharan Africa and Oceania, have reduced their under-five mortality rate by 52% or more.

TARGET	2015: two thirds reduction compared to 1990 2020: exceed 2015 target
DEFINITION OF INDICATOR	Under-five mortality rate per 1000 live births
DATA SOURCES	United Nations Inter-agency Group for Child Mortality Estimation

Progress towards the achievement of the MDG 4 goal to reduce child mortality is monitored as part of the Countdown 2015 initiative. Progress is measured by the independent Expert Review Group, based on the recommendations of the Commission on Information and Accountability of the Global Strategy for Women's and Children's Health. The salient findings of the Countdown 2015 report and other reports are summarized below (1, 2, 3).

- Overall, substantial progress has been made towards achieving MDG 4. The number of deaths of children aged under 5 years worldwide has nearly halved, from 12.7 (12.5–12.9) million in 1990 to 6.3 (6.1–6.7) million in 2013.<sup>1</sup> While this translates into around 17 000 fewer children dying every day in 2013 than in

1990, it still implies the deaths of about 17 000 children under the age of 5 years every day in 2013.

- Since 1990, the global under-five mortality rate has dropped by 49% – from 90 (89–92) deaths per 1000 live births in 1990 to 46 (44–48) in 2013. All regions, except for sub-Saharan Africa and Oceania, have reduced their under-five mortality rate by 52% or more.
- The average annual rate of reduction in under-five mortality has accelerated – from 1.2% a year from 1990 to 1995 to 4.0% from 2005 to 2013. Despite these gains, progress remains insufficient to reach MDG 4, particularly in Oceania, sub-Saharan Africa, Caucasus and Central Asia, and Southern Asia.
- Between 1990 and 2013, 223 million children worldwide died before their fifth birthday – more than the current population of Brazil, the world's fifth most populous country (4).

<sup>28</sup> Note that this report was prepared before the release of WHO's 2014 mortality estimates.



- Conflicts and political fragility contribute to higher rates of mortality in the under-fives. One fifth of all deaths of children under 5 years old in 2013 occurred in countries currently classified as fragile and conflict-affected.
- Accelerating progress in child survival urgently requires greater attention to ending preventable child deaths in sub-Saharan Africa and Southern Asia. Deaths of children aged under 5 years are increasingly concentrated in these areas, while the percentage in the rest of the world dropped from 32% in 1990 to 18% in 2013.
- Although sub-Saharan Africa has seen the decline in the under-five mortality rate accelerate – the average annual rate of reduction increased from 0.8% in 1990–1995 to 4.2% in 2005–2013, the region still has the highest child mortality rate. This rate of 92 deaths per 1000 live birth is more than 15 times the average for developed regions. By 2050 almost 40% of all births will take place in sub-Saharan Africa, and 37% of children aged under 5 years will live there, so the number of deaths in this age group could stagnate or even increase if there is not more progress in this region.
- About half of the deaths of children under 5 years old occur in only five countries: India, Nigeria, Pakistan, Democratic Republic of the Congo and China. India (21%) and Nigeria (13%) account for more than a third of all under-five deaths.
- The global neonatal mortality rate declined by 40% from 33 deaths per 1000 live births in 1990 to 20 in 2013. Despite falling rates of neonatal mortality, the proportion of under-five deaths that occur within the first month of life (the neonatal period) increased from 37% in 1990 to 44% in 2013, because the declines in the neonatal mortality rate are slower than those in the mortality rate for older children.
- Around two thirds of neonatal deaths occur in just 10 countries, with more than a quarter of them occurring in India and about a tenth in Nigeria.
- Eight countries with historically high child mortality rates (Bangladesh, Eritrea, Ethiopia, Liberia, Malawi, Niger, Timor-Leste, and United Republic of Tanzania) have reduced their under-five mortality rates by two thirds or more since 1990; seven<sup>29</sup> of these countries are low-income, proving that low national income is not a barrier to making gains in child survival. A further 18 countries with historically high child mortality rates have also managed to at least halve their under-five mortality rates over the same period.
- The leading causes of death among children aged under 5 years include preterm birth complications (17% of under-five deaths), pneumonia (15%), intrapartum-related complications (complications during labour and delivery, 11%), diarrhoea (9%), and malaria (7%). Globally, undernutrition contributes to nearly half of under-five deaths (5).
- A large proportion of under-five deaths globally are attributable to vaccine-preventable infectious diseases. For example, in 2013, more than 100 000 children under 5 years of age died from measles, more than 63 000 died from pertussis, and more than 50 000 died from tetanus. In the same year, diarrhoeal disease accounted for more than 577 000 deaths in children under 5 years of age and acute lower respiratory infections accounted for more than 935 000. Many cases of these illnesses are caused by infections with pathogens that are vaccine-preventable such as, *rotavirus*, *Vibrio cholerae*, *Streptococcus pneumoniae*, *Haemophilus influenzae* type B, and influenza.
- Roughly 30% of all deaths as a result of diarrhoeal disease in children under 5 years of age are caused by infections with the rotavirus or *Vibrio cholerae* pathogens, while nearly 60% of deaths from pneumonia are caused by infections with *Streptococcus pneumoniae*, *Haemophilus influenzae*, and influenza pathogens which can be prevented by vaccines.
- Widespread immunization programmes that include vaccines for measles, pertussis, tetanus, rotavirus, cholera, pneumococcus, influenza, and *Haemophilus influenzae* type B, among others, could have a significant impact in reducing the global under-five mortality rate.

<sup>29</sup> Classified by the World Bank [http://data.worldbank.org/about/country-and-lending-groups#Low\\_income](http://data.worldbank.org/about/country-and-lending-groups#Low_income)



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2. Child Mortality Estimates, 2014. Interactive maps and child mortality estimates developed by the UN Inter-agency Group for Child Mortality Estimation (<http://www.childmortality.org/index.php?r=site/map&language=>, accessed 27 August 2015).
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# INTEGRATION OF HEALTH CARE INTERVENTIONS AND IMMUNIZATION ACTIVITIES (Indicator G5.2)

TARGET	No target set
DEFINITION OF INDICATOR	<p>The proposed integration indicator is composed of two sub-indicators:</p> <ul style="list-style-type: none"> <li>provision of vitamin A<sup>30</sup> with routine or supplementary immunization activities</li> <li>comparative coverage of the first antenatal visit (ANC1), protected at birth against neonatal tetanus (PAB), third dose of diphtheria, tetanus and pertussis (DTP3) and first dose of measles-containing vaccine (MCV1)</li> </ul>
DATA SOURCES	<ul style="list-style-type: none"> <li>WHO-UNICEF joint reporting forms (JRFs) for vitamin A coverage</li> <li>WHO-UNICEF estimates of national immunization coverage (WUENIC) estimates for DTP3, MCV1, and PAB coverage</li> <li>UNICEF global databases 2015, based on data from household surveys including Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS) and other nationally representative surveys for ANC1<sup>31</sup></li> </ul>

## Background

During their review of progress in 2013, the Strategic Advisory Group of Experts on immunization (SAGE) highlighted that the integration of immunization and child health services needed more efficient coordination to enable faster progress in the reduction of child mortality, especially in the regions and countries that are lagging behind (1). SAGE requested the Secretariat to develop one or more indicators to track progress with integrated (or more coordinated) service delivery of interventions to reduce child mortality. In response the Secretariat explored the availability of data to develop indicators to track countries' progress on integration of services for reducing child mortality.

In defining indicators, the Secretariat considered two aspects of integration:

1. delivery of other health interventions along with immunization, for example delivery of vitamin A, antihelminthic medicines or insecticide-treated bed-nets during immunization contact;

2. more coordinated delivery of health interventions by different programmes directed at improving maternal and child health, such as delivery of immunizations during antenatal care (ANC) visits.

To minimize the reporting burden on Member States, the Secretariat explored existing sources of data, including the JRFs, the WUENIC estimates, UNICEF Childinfo databases and data from household surveys (DHS and MICS).

In its last progress report<sup>32</sup> the Secretariat provided data on two proposed indicators:

1. provision of vitamin A with routine or supplementary immunization;
2. comparative rates of coverage with last dose of rotavirus vaccine, oral rehydration salts (ORS) use during diarrhoea and exclusive breastfeeding for 6 months.

<sup>30</sup> Data on vitamin A coverage can be found at: <http://data.unicef.org/nutrition/vitamin-a>

<sup>31</sup> ANC1 data can be found at: <http://data.unicef.org/maternal-health/antenatal-care>

<sup>32</sup> [http://www.who.int/entity/immunization/global\\_vaccine\\_action\\_plan/gvap\\_secretariat\\_report\\_2014.pdf?ua=1](http://www.who.int/entity/immunization/global_vaccine_action_plan/gvap_secretariat_report_2014.pdf?ua=1)

The working group was not satisfied with the second indicator as it felt that it did not provide useful information and requested the Secretariat to explore alternatives.

The Secretariat proposes to replace this indicator with the following one:

- comparative coverage of the first antenatal visit (ANC1), protected at birth against neonatal tetanus (PAB), third dose of DTP (DTP3) and first dose of measles-containing vaccine (MCV1).

## Rationale for proposing the revised indicator

At the last review of progress, SAGE linked the failure of integration with missed opportunities for vaccination. The basis of this observation was the data reviewed by the Working Group and SAGE on this issue. These data came from studies on missed opportunities conducted in a number of countries. However, these studies are not consistently available from the same populations over time. Hence, the intention is to explore the use of the proposed indicator as a proxy for missed opportunity studies as well as to reflect the linkages and coordination between immunization and the broader delivery of maternal and child health services (using ANC1 as a marker).

The indicator compares the coverage of ANC1 with that of PAB, DTP3 and MCV1, the rationale being that ANC visits should be used as an opportunity to provide the required doses of tetanus toxoid-(TT)-containing vaccines and also counsel mothers about the need for DTP and measles vaccines for their infants once they are born. Similarly, childhood immunization visits could also be used to check and provide vaccines to mothers to ensure that they are fully protected during future pregnancies and childbirth. The choice of PAB over coverage with two doses of tetanus toxoid is explained in the following section.

## Data availability and quality

The JRFs and Childinfo by UNICEF<sup>33</sup> included quality data on several questions that could be used to assess progress in the 75 "Countdown" nations<sup>34</sup> with historically high child mortality rates. Member States report whether they provide vitamin A or other interventions together with routine immunization or supplementary immunization activities (SIAs). These data were used to determine the number of countries among the 75 Countdown nations that provided vitamin A with routine immunization or with SIAs; they were also used to estimate the ratio of vitamin A to MCV1 coverage for those nations that provide vitamin A with routine immunization.

The JRFs and Childinfo also included data from Member States regarding the percentage of women aged 15–49 years who attended at least one ANC visit during pregnancy to skilled health personnel such as a doctor, nurse, or midwife (ANC1). For this indicator, data were collected not only for the Countdown nations, but for all Member States from which such information was available.

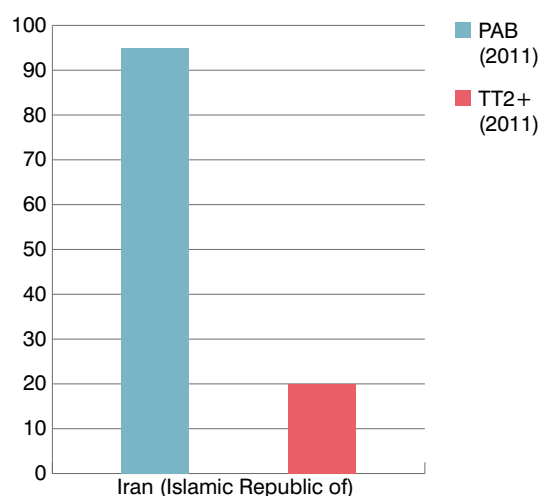
The WUENIC estimates were used in this analysis to determine the proportion of children who are PAB against neonatal tetanus by their mother's TT status; this information is collected during the DTP1 visit – a child is deemed protected if the mother has received two doses of TT in the last pregnancy or at least three doses of TT in previous years. The same source was used for estimates of DTP3 and MCV1.

PAB was chosen over TT2+ (the proportion of pregnant women who received at least two doses of TT in the last pregnancy) as it was felt to provide a more accurate representation of integration of health services. In some countries coverage with TT, as part of DTP-containing vaccines provided as primary and booster immunization, or other combinations delivered through school-based or other delivery mechanisms (e.g. SIAs) is high enough for two additional vaccinations with TT during pregnancy to be deemed unnecessary. In such countries, the PAB coverage can be quite high even when the TT2+ coverage is quite low. Figure 29 and Figure 30 provide some examples of countries in which this is the case.

<sup>33</sup> Childinfo statistics can be found here: <http://www.unicef.org/statistics/>

<sup>34</sup> The list of Countdown nations can be found here: <http://www.countdown2015mnch.org/country-profiles>

**Figure 29:** The percentage of live births protected through maternal immunization with at least two doses of TT (PAB) versus the proportion of pregnant women who received at least two doses of TT in the last pregnancy (TT2+) in the Islamic Republic of Iran in 2011

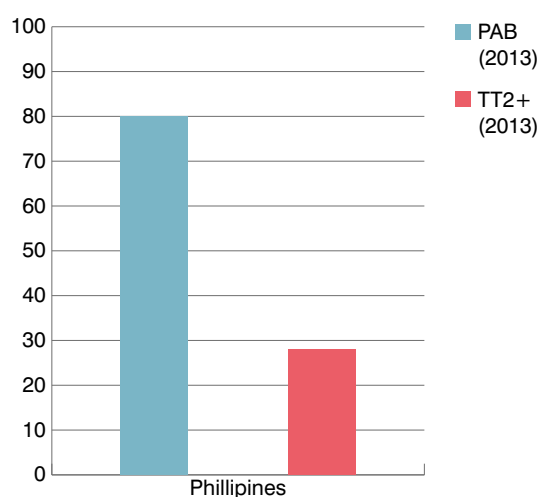


Sources: PAB, 2014 WUENIC; TT2+, 2014 JRF.

In 2011, in the Islamic Republic of Iran, only 20% of pregnant women received at least two doses of TT in their last pregnancy. However, more than 90% of infants were deemed PAB from tetanus based on their mothers'

previous immunizations. A similar phenomenon can be seen in Figure 30, which depicts the same indicators for the Philippines in 2013.

**Figure 30:** The percentage of live births protected through maternal immunization with at least two doses of TT (PAB) versus the proportion of pregnant women who received at least two doses of TT in the last pregnancy (TT2+) in the Philippines in 2013



Sources: PAB, 2014 WUENIC; TT2+, 2014 JRF.

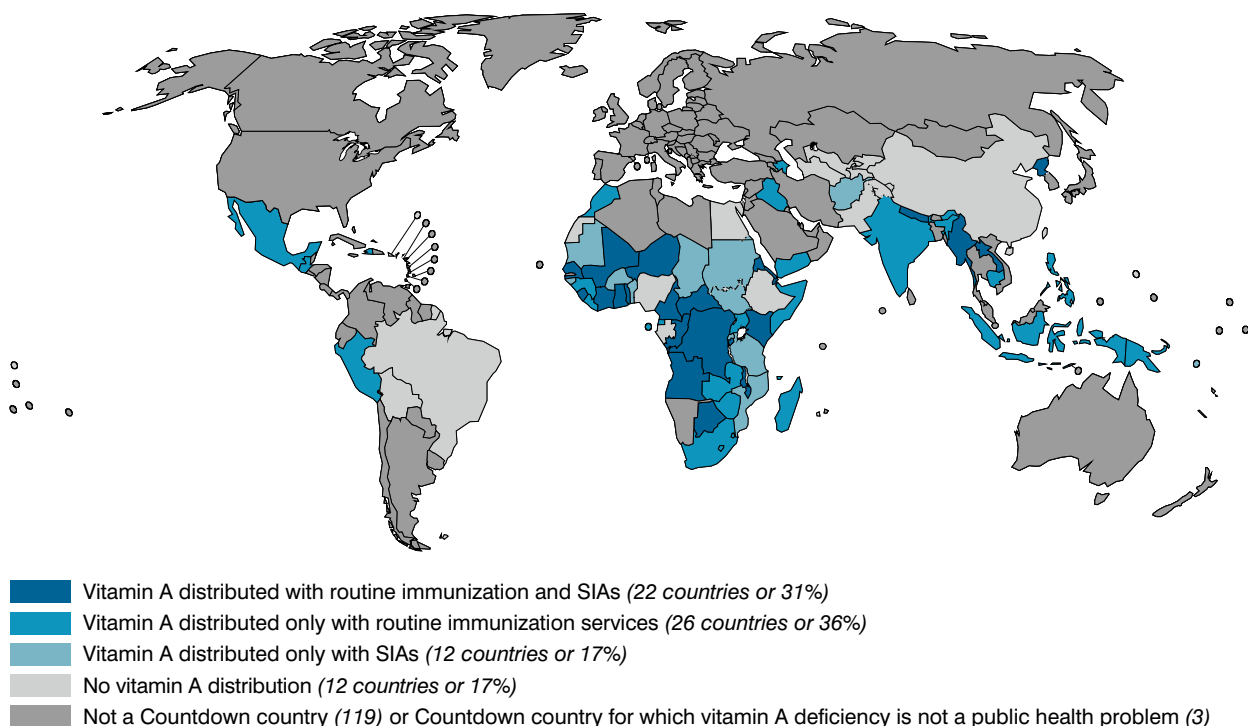
## Results

### Vitamin A provision with immunization

Among the 75 Countdown countries, 22 (31%) provided vitamin A with both routine and SIAs (Figure 31); 26 countries (36%) provided vitamin A only with

routine immunization activities, while 12 countries (17%) provided vitamin A only with SIAs. In 12 countries (17%) vitamin A was not distributed at all, while in three countries (4%) vitamin A deficiency was not considered a public health problem.

**Figure 31: Countries providing vitamin A supplementation with routine immunization and/or SIAs, 2014**



Source: WHO/UNICEF coverage estimates 2015 revision. Map production: Immunization Vaccines and Biologicals, (IVB), WHO.

Date of slide: 16 July 2015.

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### Vitamin A and MCV1

Of 48 nations that provided vitamin A with routine immunizations, vitamin A coverage data from Childinfo were available for only 37 (Table 19). For these 37

countries, the ratio of vitamin A to MCV1 coverage was computed. Nineteen countries (51%) had a vitamin A to MCV1 ratio  $\geq 1$ . Eighteen countries (49%) had a ratio of  $< 1$ , 10 of which (27%) had a ratio  $\geq 0.5$ , and eight (22%) had a ratio  $< 0.5$ .



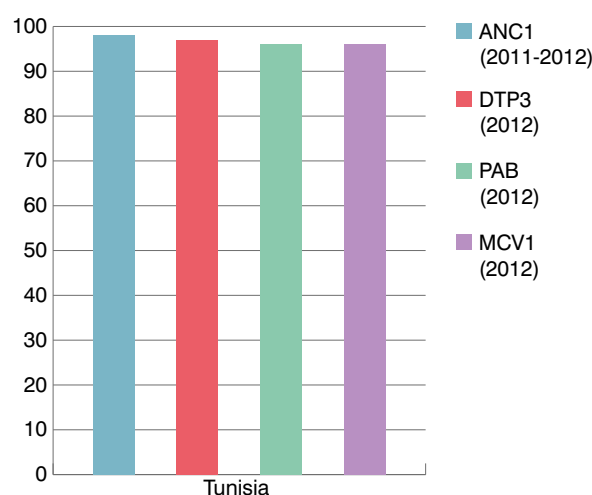
**Table 19: Ratio of vitamin A to MCV1 coverage for nations that provide vitamin A with routine immunization, 2013**

Vitamin A/MCV1 coverage	Countries
≥ 1	Cambodia, Cameroon, Central African Republic, Côte d'Ivoire, Democratic Republic of the Congo, Ghana, Lao People's Democratic Republic, Lesotho, Liberia, Malawi, Mali, Mozambique, Nepal, Niger, Senegal, Sierra Leone, Tajikistan, Yemen, Zambia
1.0 to 0.5	Angola Azerbaijan, Botswana, Burundi, Djibouti, India, Philippines, Sao Tome and Principe, Togo, Uganda
≥0.5	Bolivia (Plurinational State of), Eritrea, Guatemala, Haiti, Kenya, South Africa, Swaziland, Zimbabwe

### ANC1 and PAB

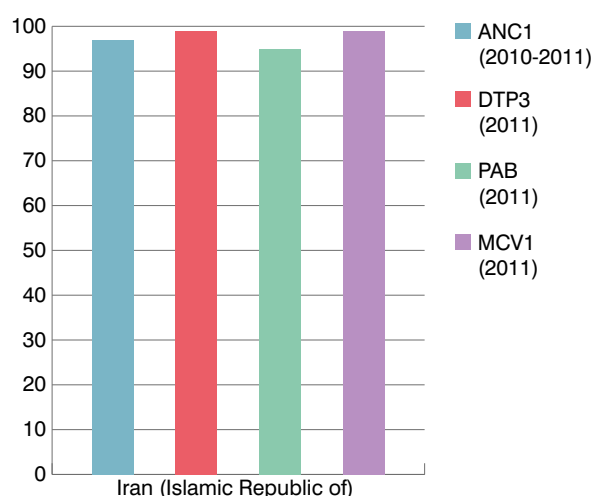
Coverage data for ANC, PAB, DTP3 and MCV1 for 2010 to 2015 were available from 54 of the 75 Countdown countries as well as 18 other Member States. The coverage estimates for DTP3, MCV1 and PAB were matched to the same year for which ANC1 coverage data (which are not available annually) are available.

Ideally, PAB and ANC1 coverage should be close to that for DTP3 and MCV1 for which the target in the GVAP is ≥90%. Reaching the coverage target for all of these interventions and immunizations is an indication that the country has a strong and well-integrated health system that is doing well in its efforts to provide necessary care to every one of its citizens. Figures 32, 33 and 34 show some examples of Member States that are achieving these coverage targets.

**Figure 32: Percentage of women who attended at least ANC1, coverage rates for DTP3, and percentage of live births protected through maternal immunization with at least two doses of TT (PAB) in Tunisia between 2011 and 2012**

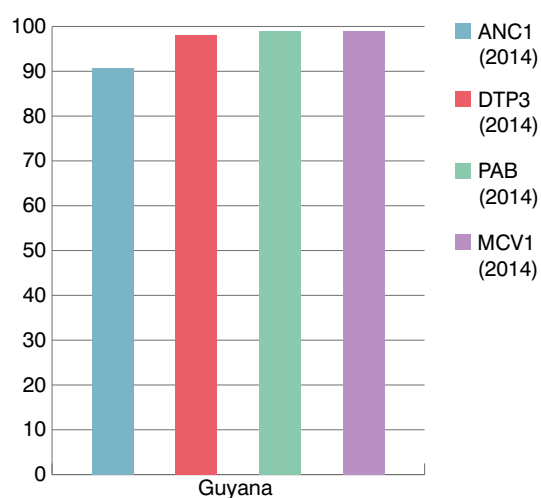
Sources: ANC1, UNICEF global databases 2015 based on DHS, MICS and other nationally representative surveys; DTP3, 2014 WUENIC; PAB, 2014 WUENIC; MCV1, 2014 WUENIC.

**Figure 33:** Percentage of women who attended at least ANC1, coverage rates for DTP3 and percentage of live births protected through maternal immunization with at least 2 doses of TT (PAB) in the Islamic Republic of Iran between 2010 and 2011



Sources: ANC1, UNICEF global databases 2015 based on DHS, MICS and other nationally representative surveys; DTP3, 2014 WUENIC; PAB, 2014 WUENIC; MCV1, 2014 WUENIC.

**Figure 34:** Percentage of women who attended at least ANC1, coverage rates for DTP3 and percentage of live births protected through maternal immunization with at least 2 doses of TT (PAB) in Guyana in 2014

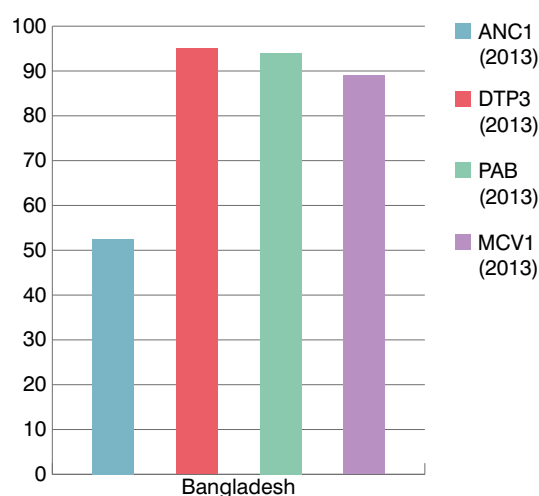


Sources: ANC1, UNICEF global databases 2015 based on DHS, MICS and other nationally representative surveys; DTP3, 2014 WUENIC; PAB, 2014 WUENIC; MCV1, 2014 WUENIC.

In countries where the PAB coverage is much higher than the ANC1 coverage (see Figure 35 and Figure 36), efforts need to be made to understand why women are not attending ANC clinics, whether or not the messages

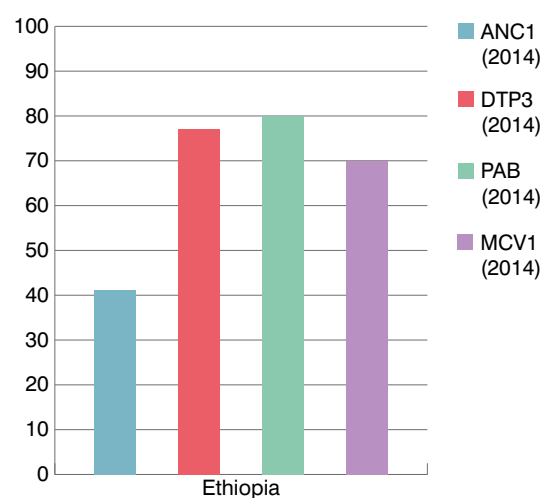
on ANC are being provided during immunization visits and whether both immunization and ANC are part of an integrated maternal and child health package.

**Figure 35:** Percentage of women who attended at least ANC1 during pregnancy, coverage rates for DTP3, and percentage of live births protected through maternal immunization with at least 2 doses of TT (PAB) in Bangladesh in 2013



Sources: ANC1, UNICEF global databases 2015 based on DHS, MICS and other nationally representative surveys; DTP3, 2014 WUENIC; PAB, 2014 WUENIC; MCV1, 2014 WUENIC.

**Figure 36:** The percentage of women who attended at least ANC1 during pregnancy, coverage rates for complete immunization against DTP3, and percentage of live births protected through maternal immunization with at least 2 doses of TT (PAB) in Ethiopia in 2014

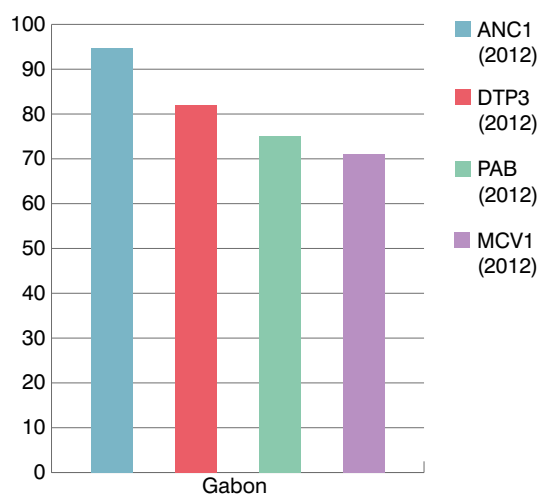


Sources: ANC1, UNICEF global databases 2015 based on DHS, MICS and other nationally representative surveys; DTP3, 2014 WUENIC; PAB, 2014 WUENIC; MCV1, 2014 WUENIC.

In countries where the ANC1 coverage is significantly higher than the PAB coverage or coverage with DTP and MCV (Figure 37 and Figure 38), efforts need to be made

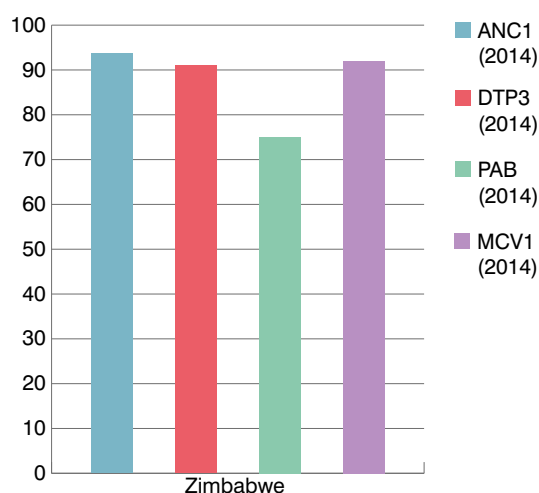
to understand why women who are going for ANC visits are not being vaccinated with TT and why women are not seeking to immunize their infants.

**Figure 37:** Percentage of women who attended at least ANC1 during pregnancy, coverage rates for DTP3 and percentage of live births protected through maternal immunization with at least 2 doses of TT (PAB) in Gabon in 2012



Sources: ANC1, UNICEF global databases 2015 based on DHS, MICS and other nationally representative surveys; DTP3, 2014 WUENIC; PAB, 2014 WUENIC; MCV1, 2014 WUENIC.

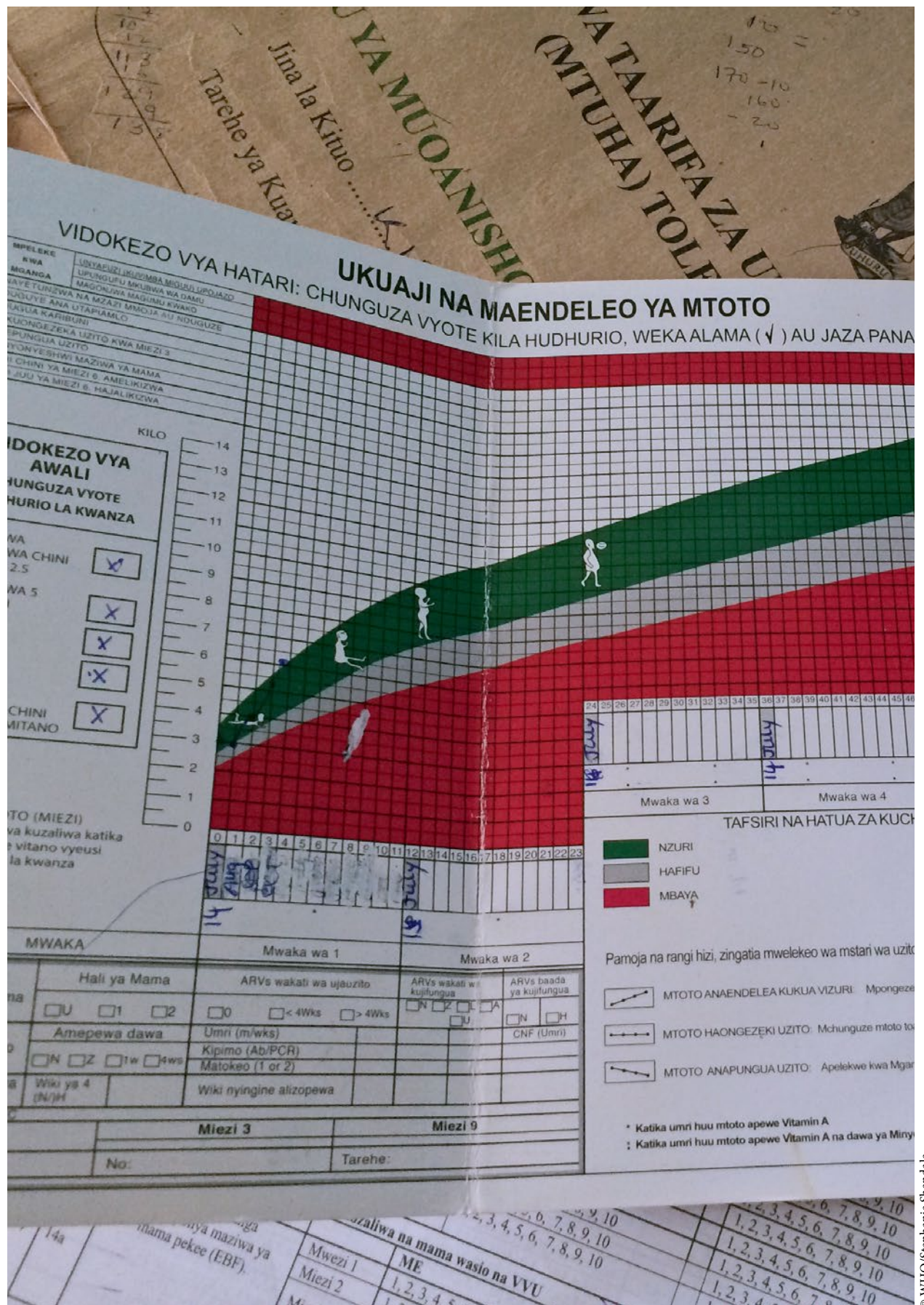
**Figure 38:** Percentage of women who attended at least ANC1, coverage rates for DTP3 and percentage of live births protected through maternal immunization with at least 2 doses of TT (PAB) in Zimbabwe in 2014



Sources: ANC1, UNICEF global databases 2015 based on DHS, MICS and other nationally representative surveys; DTP3, 2014 WUENIC; PAB, 2014 WUENIC; MCV1, 2014 WUENIC.

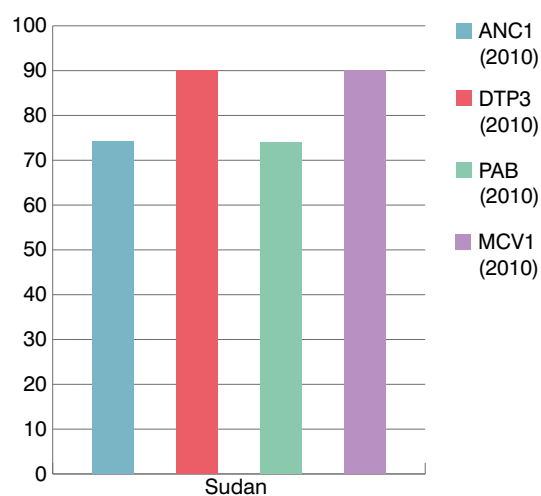
In countries where the ANC1 and PAB targets are not equal, and especially those where ANC1 and PAB are well below the DTP3 and MCV1 targets (see Figure 39), policies and practices in terms of immunization should be examined and possibly changed.

The data presented above are intended to illustrate different coverage patterns. The coverage levels for each of the 75 countdown countries are provided in Annex 1.





**Figure 39:** Percentage of women who attended at least ANC1, coverage rates for DTP3 and percentage of live births protected through maternal immunization with at least 2 doses of TT (PAB) in Sudan in 2010



Sources: ANC1, UNICEF global databases 2015 based on DHS, MICS and other nationally representative surveys; DTP3, 2014 WUENIC; PAB, 2014 WUENIC; MCV1, 2014 WUENIC.

## References

1. Meeting of the Strategic Advisory Group of Experts on immunization, April 2014 – conclusions and recommendations. Wkly Epidemiol Rec. 2014;89(1):221–36 (<http://www.who.int/wer/2014/wer8921.pdf>, accessed 16 December 2014).

# ANNEX 1

## Integration indicator for the 75 countdown countries

Percentage of women who attended at least one antenatal care visit during pregnancy (ANC1), coverage rates for complete immunization against diphtheria, tetanus and pertussis (DTP3), proportion of live births protected

through maternal immunization with at least 2 doses of tetanus toxoid (PAB), and percentage of children receiving at least one dose of measles-containing vaccine (MCV1) for the 75 countdown countries Member States.

### Data availability and quality

ANC1 data were collected from UNICEF's Childinfo database and based on Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS) and other nationally representative surveys. PAB, DTP3 and MCV1 data were collected from the 2014 WUENIC estimates.

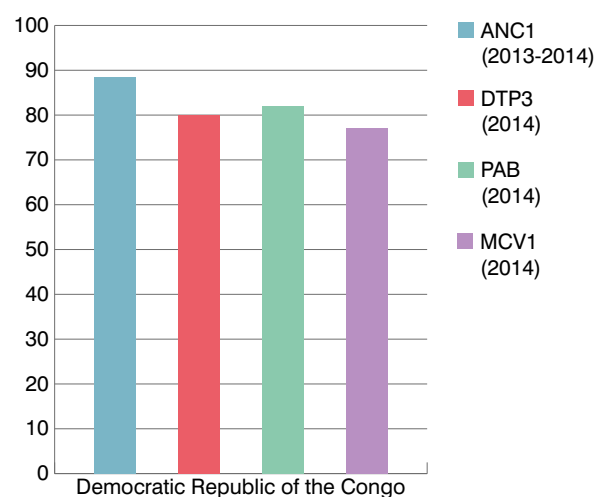
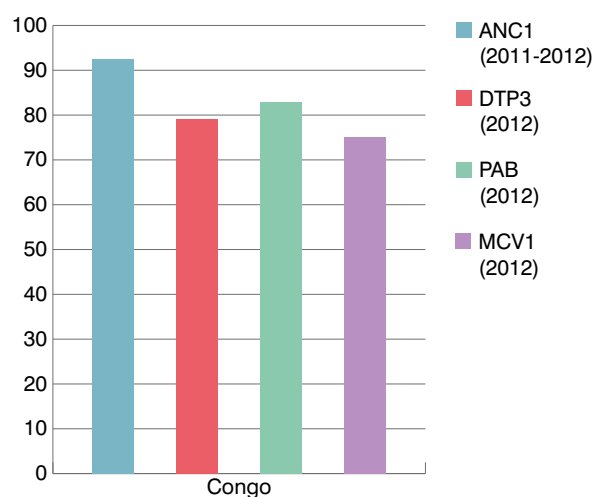
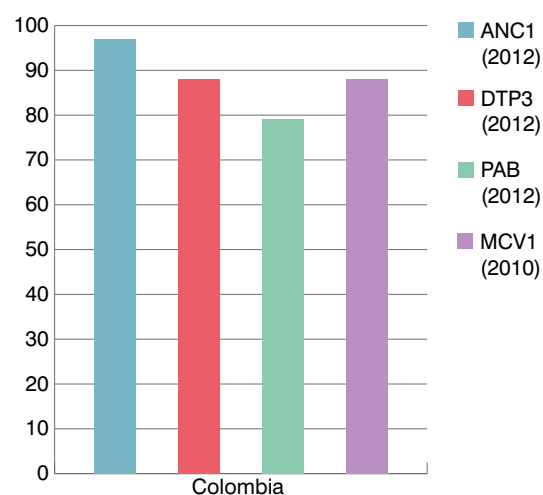
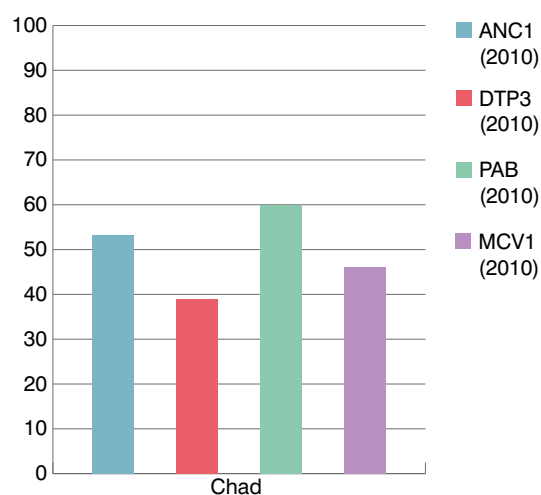
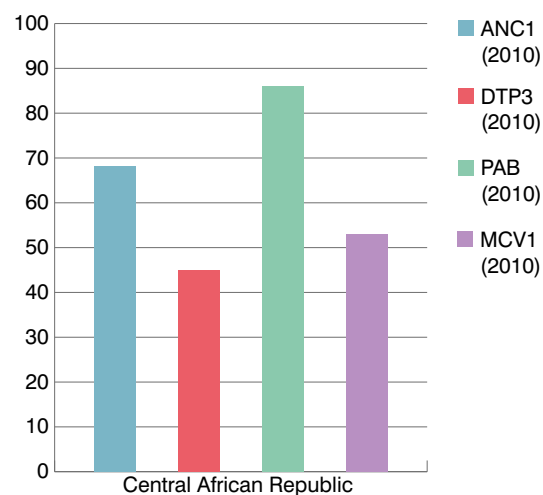
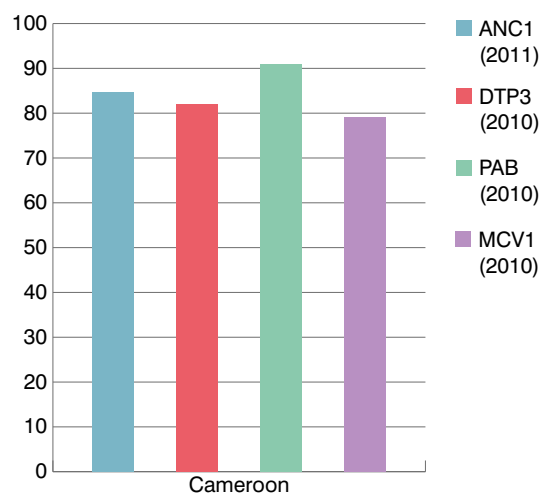
For countries for which the ANC1 survey data span more than 2 years, the PAB, DTP3 and MCV1 data were chosen for the midpoint year. For countries for which the ANC1 survey data span two years, the PAB, DTP3 and MCV1 data for the more recent of the two years were chosen.

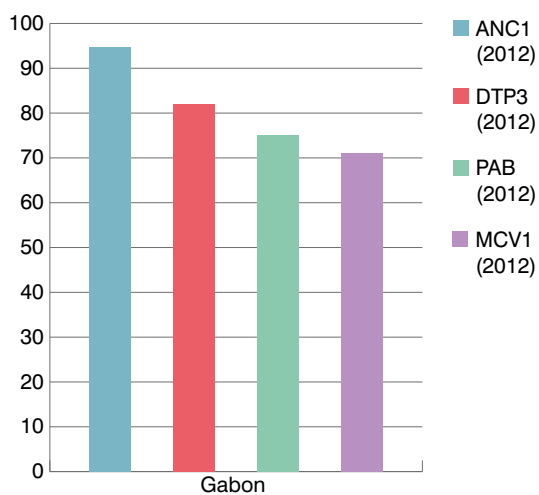
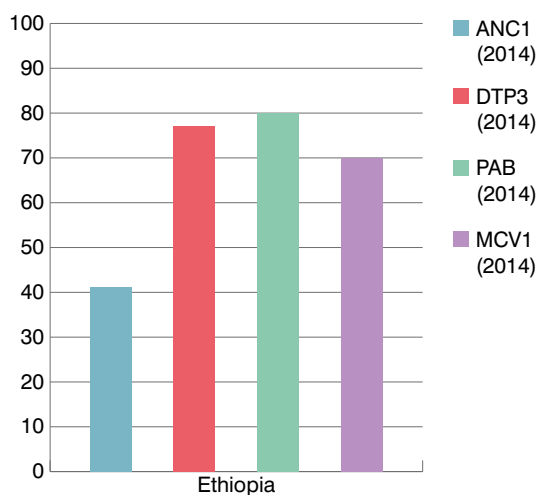
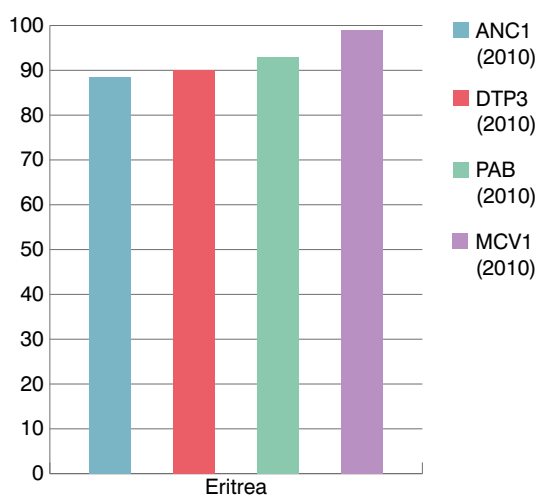
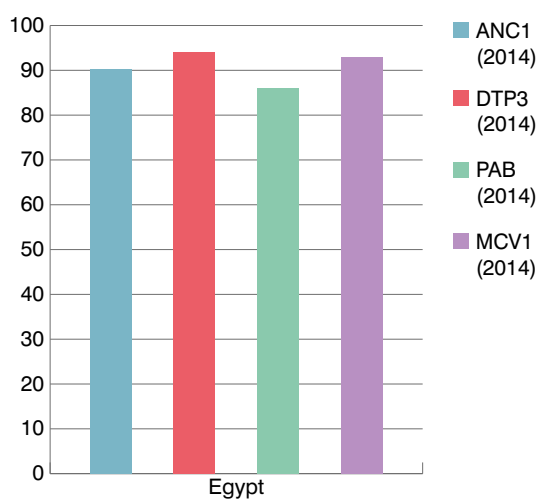
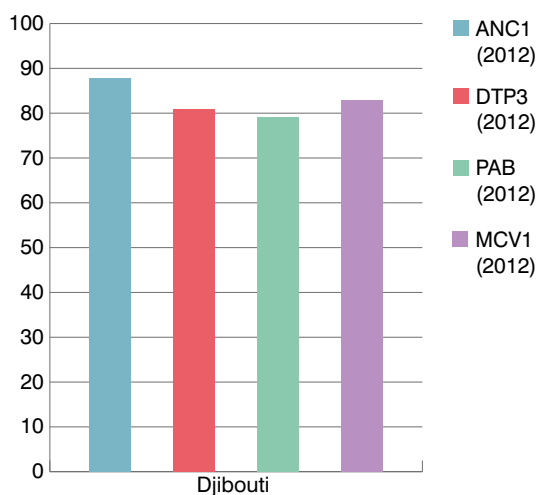
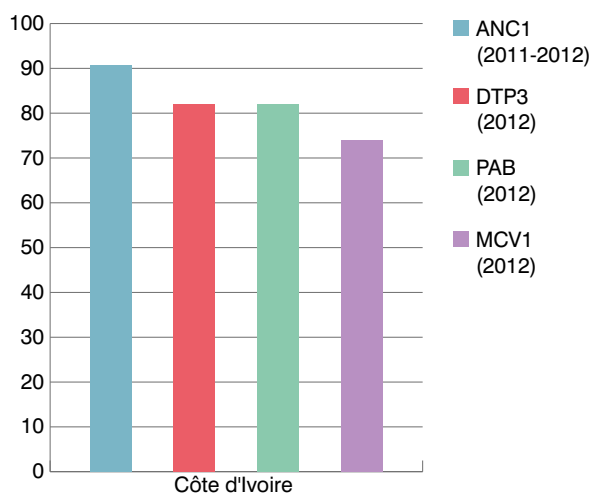


## Countdown countries

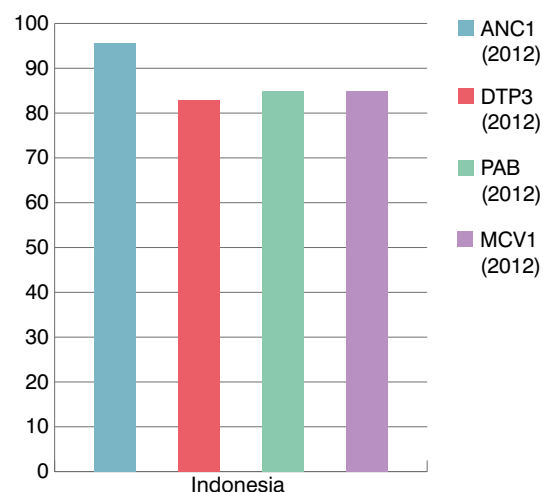
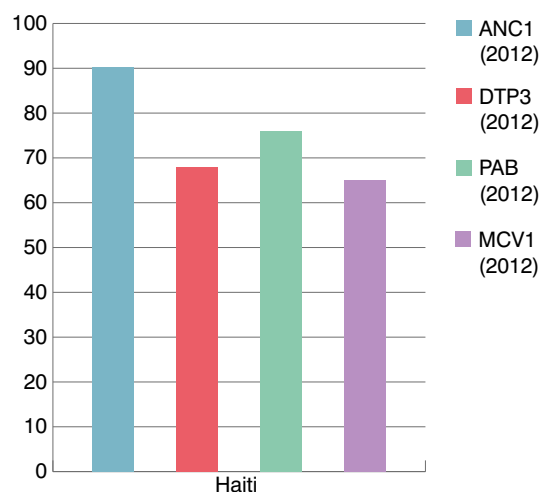
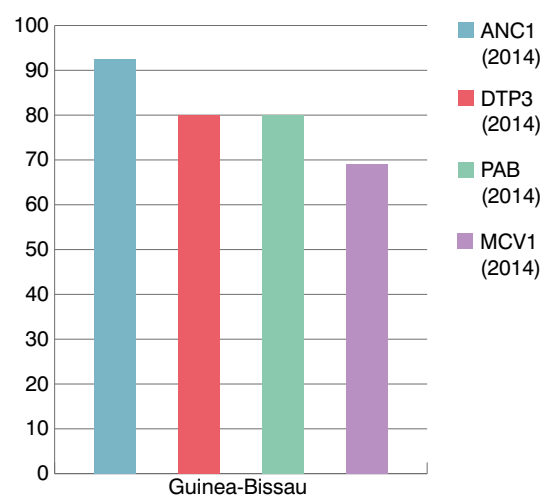
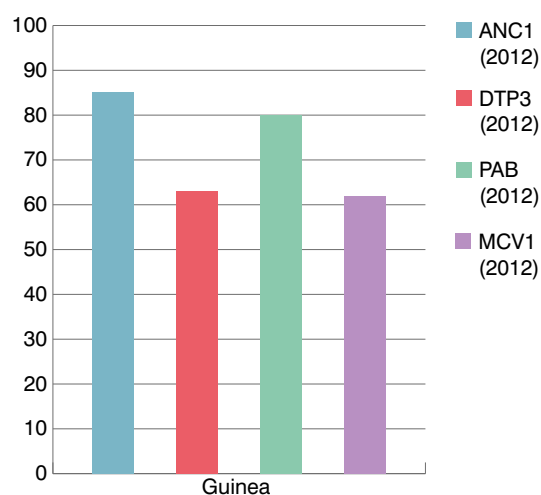
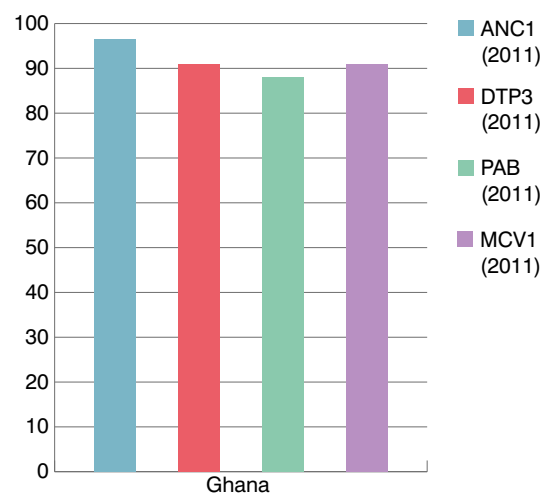
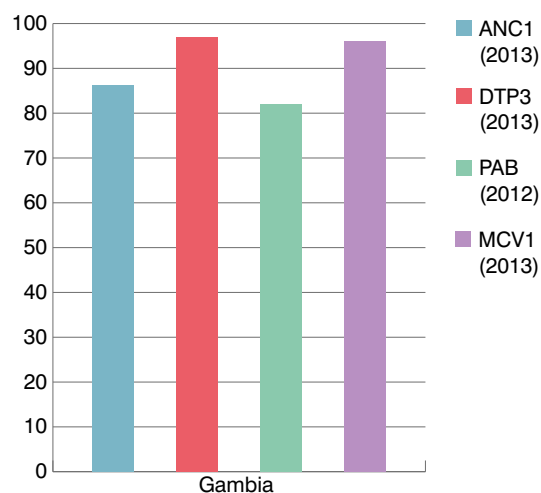
**Figure 39b:** Percentage of women who attended at least ANC1, coverage rates for DTP3 and percentage of live births protected through maternal immunization with at least 2 doses of TT (PAB) in 2010 for all Countdown countries.

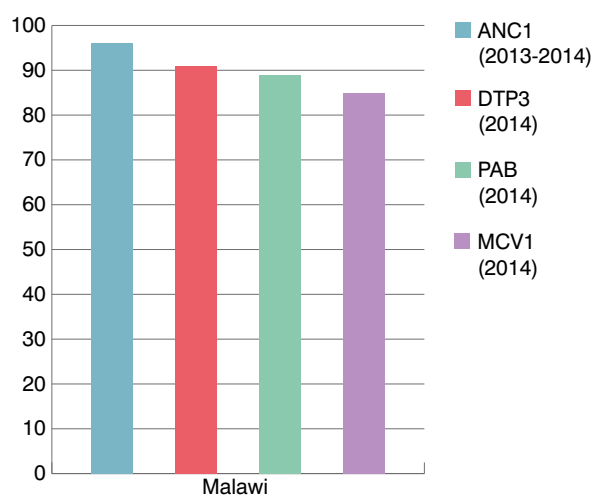
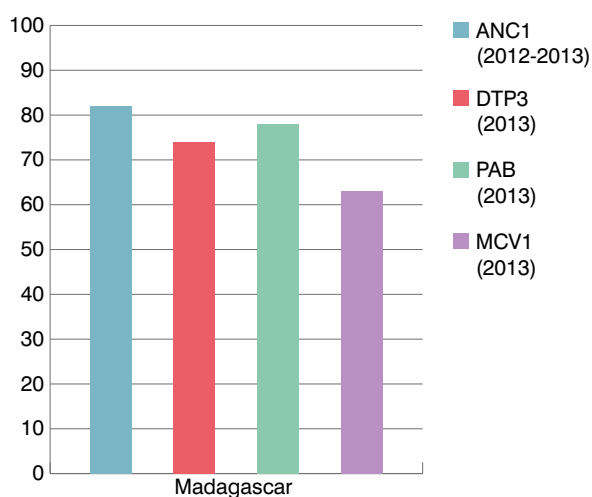
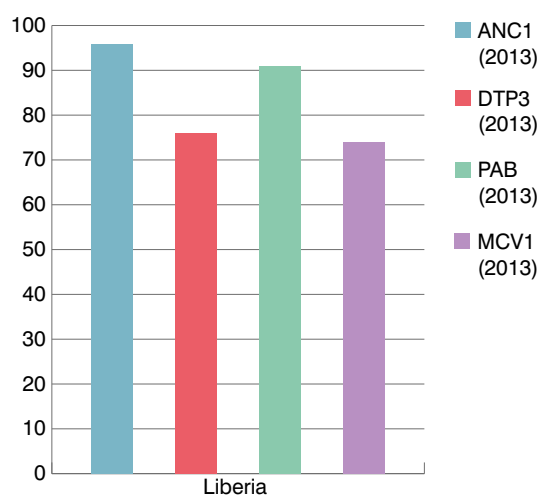
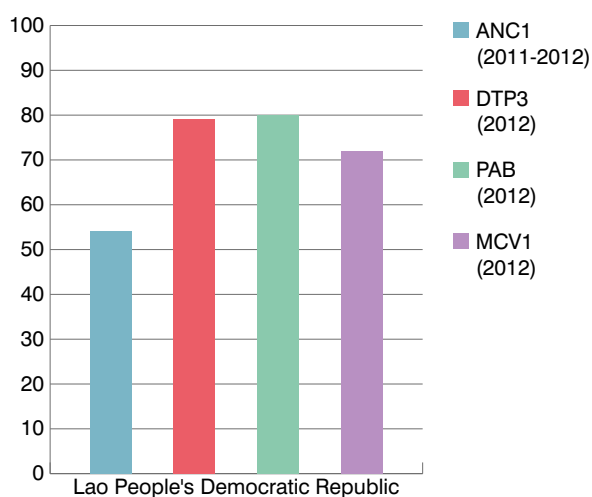
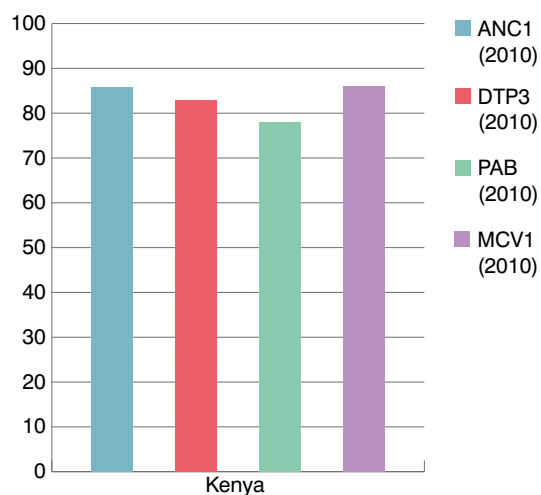
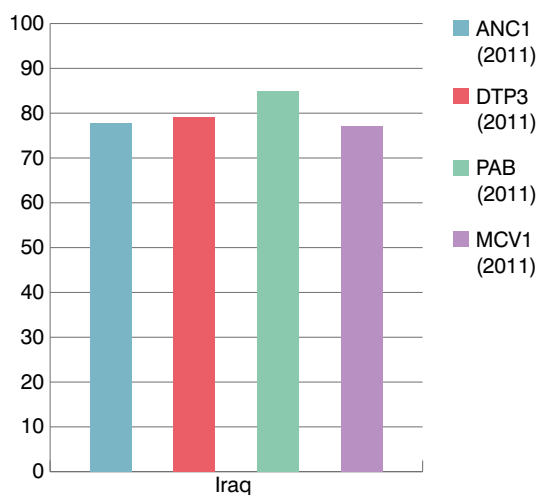


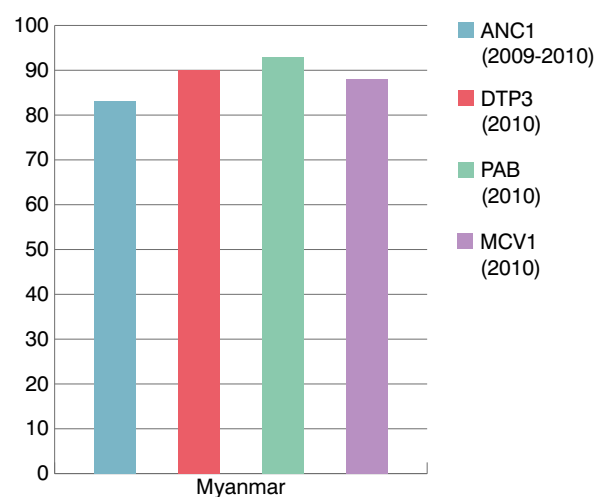
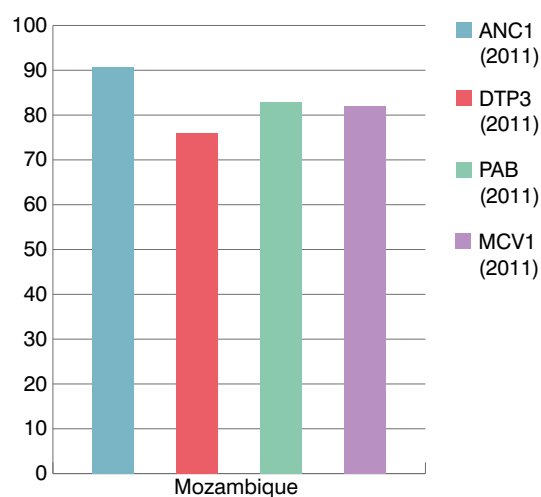
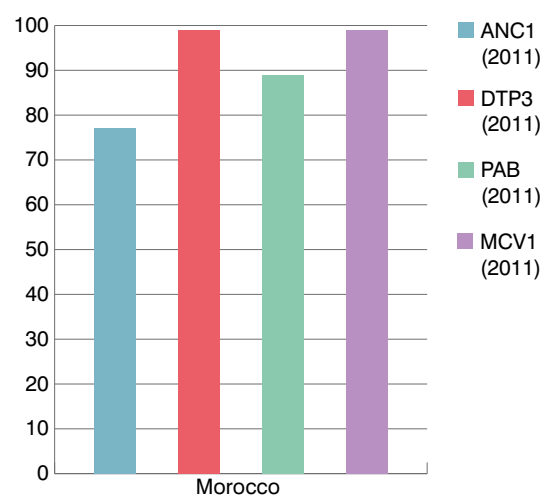
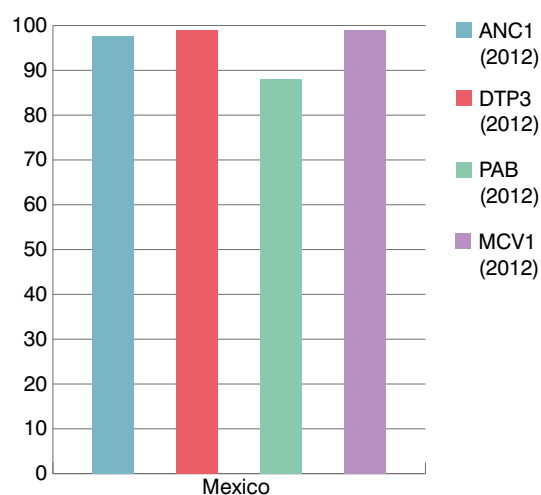
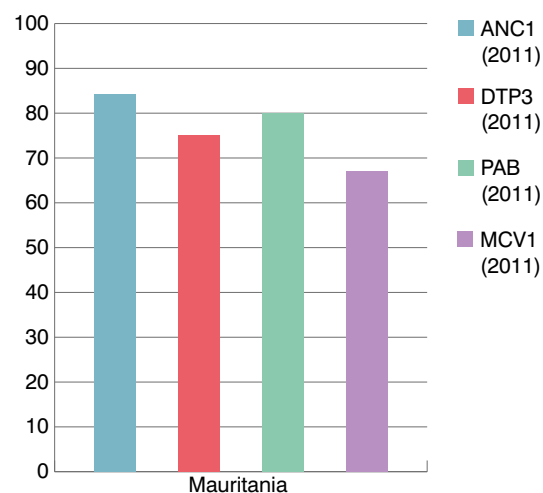
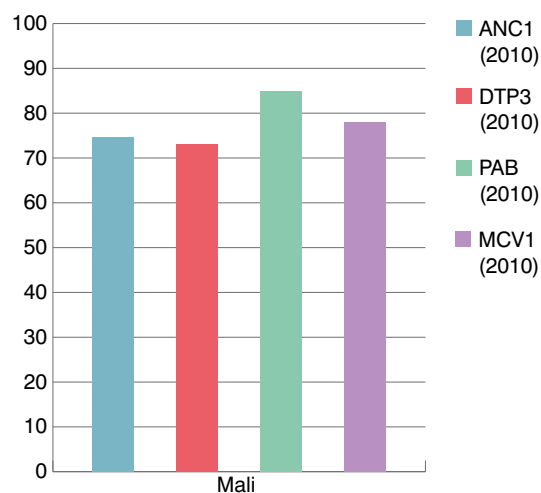


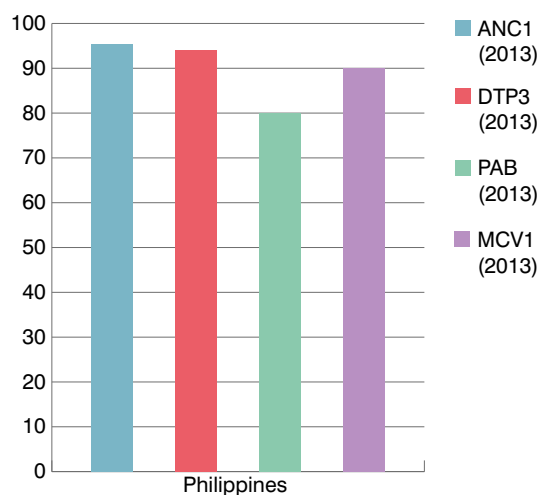
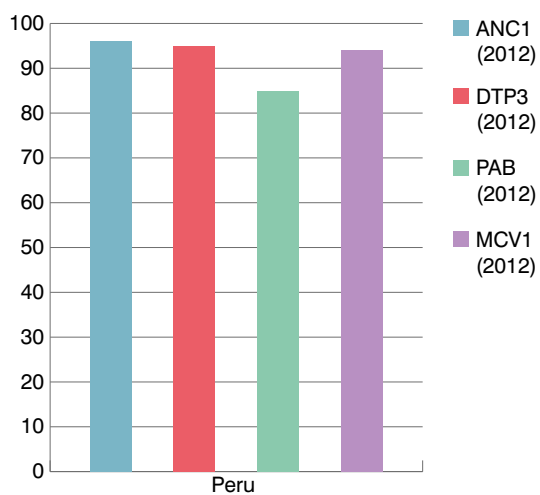
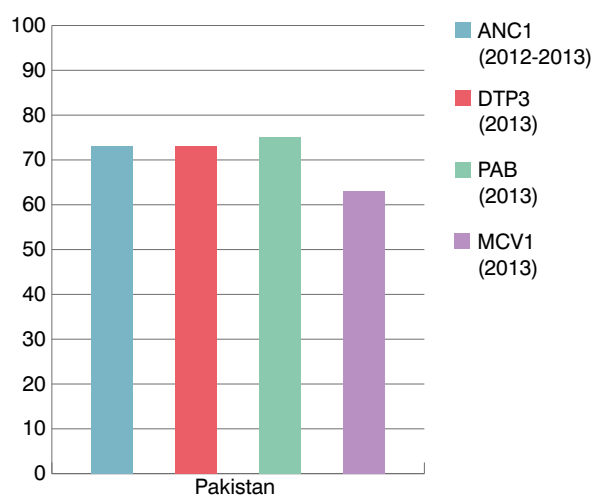
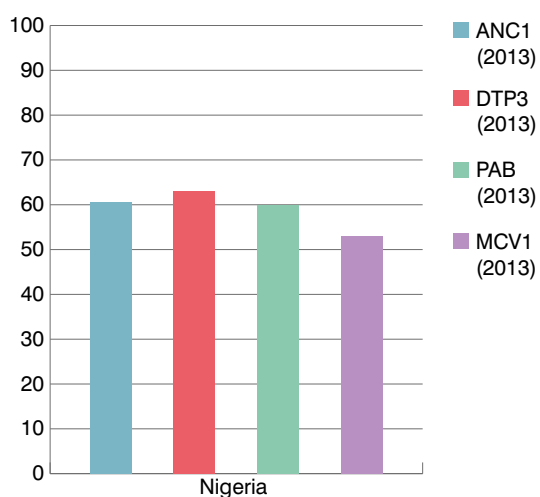
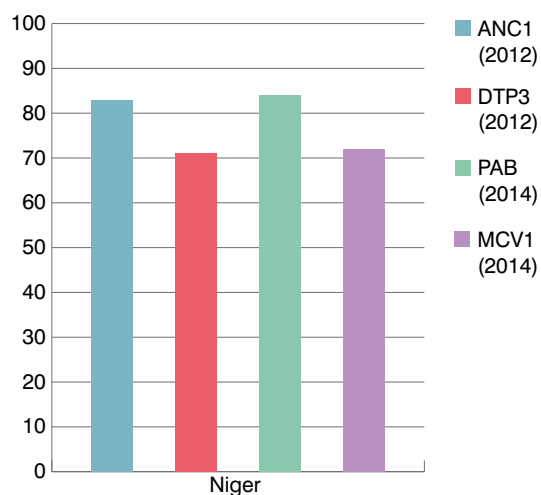
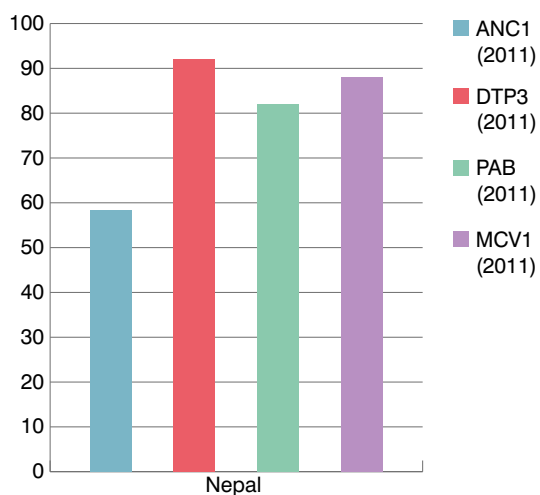


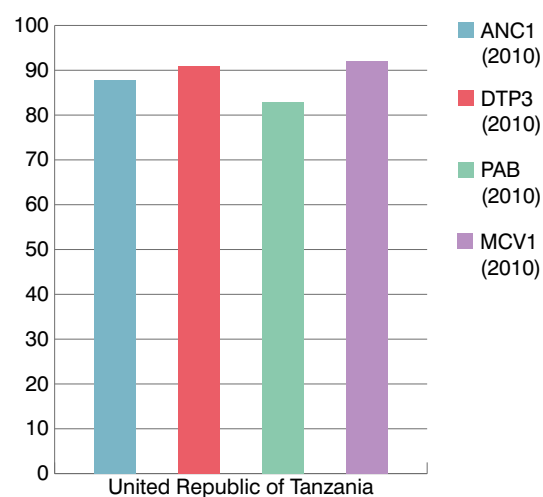
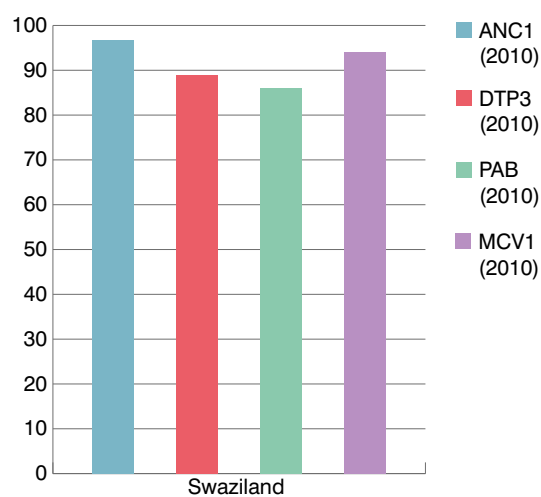
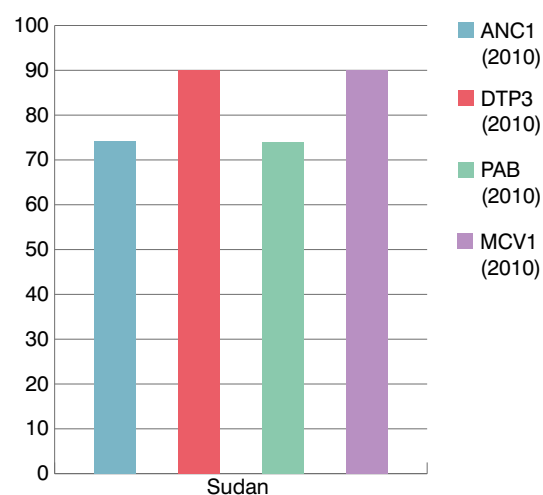
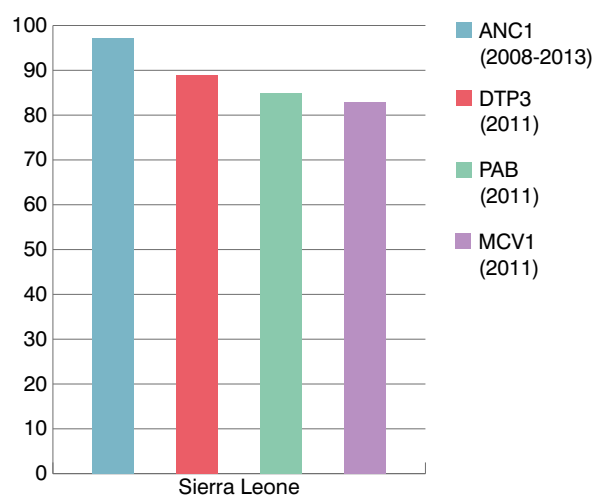
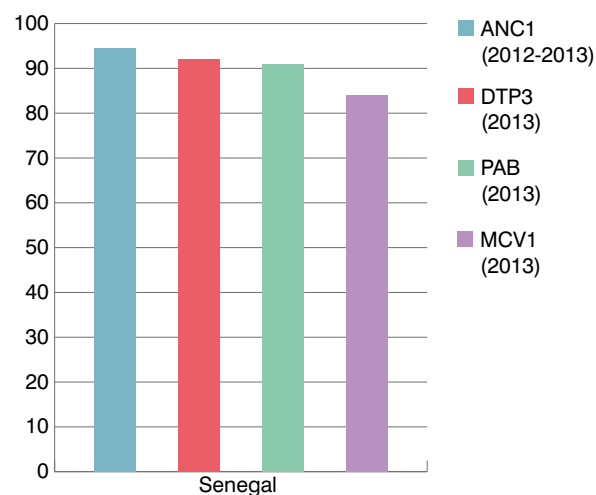
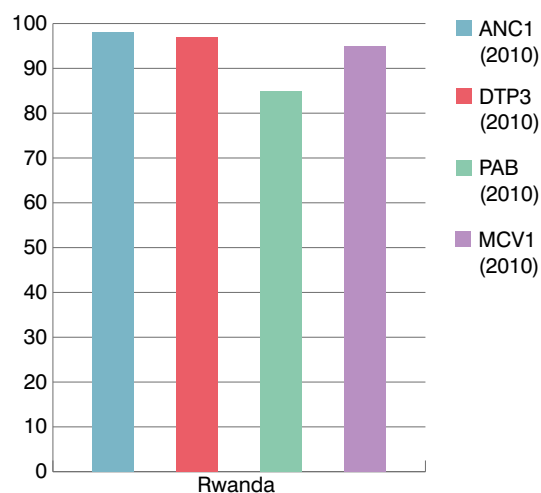




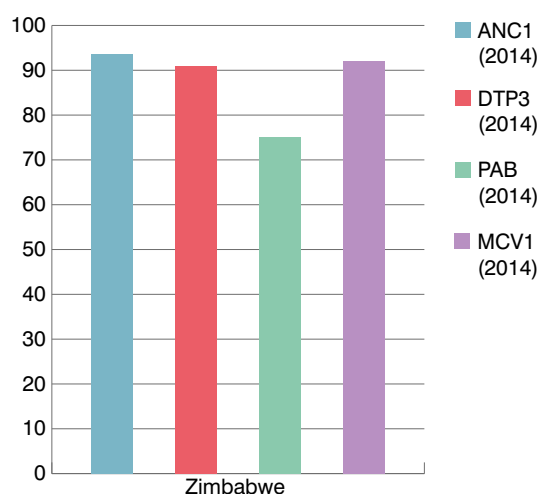
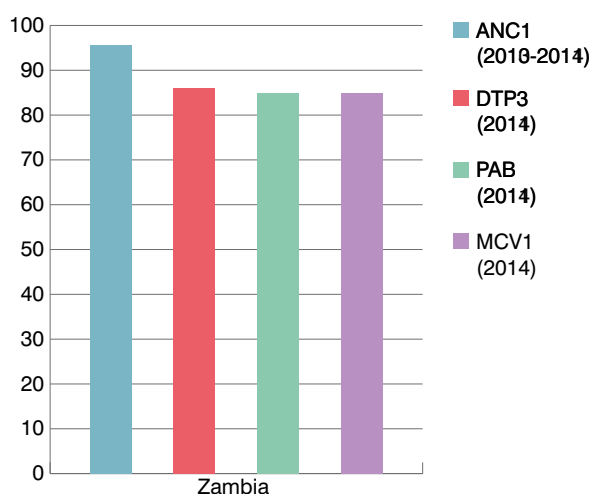
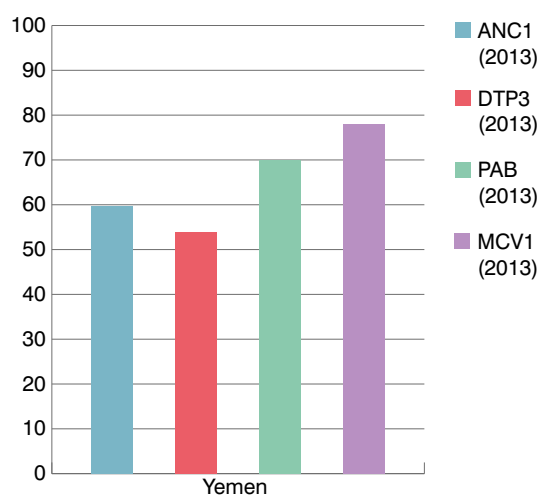
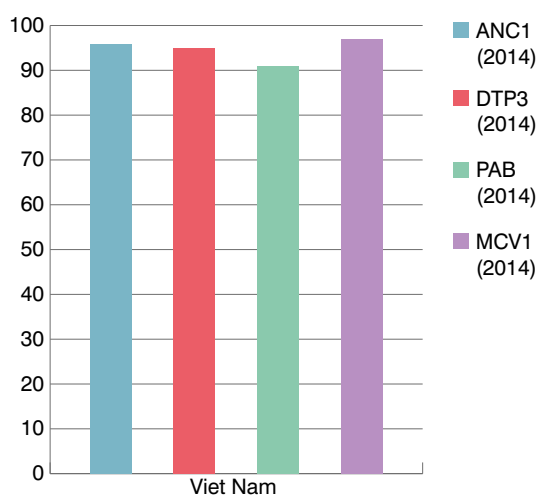
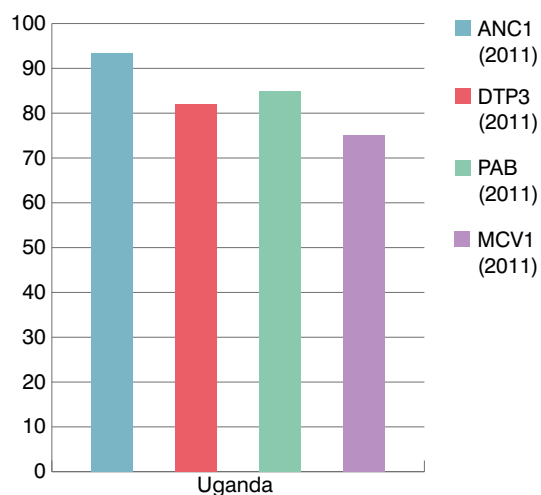
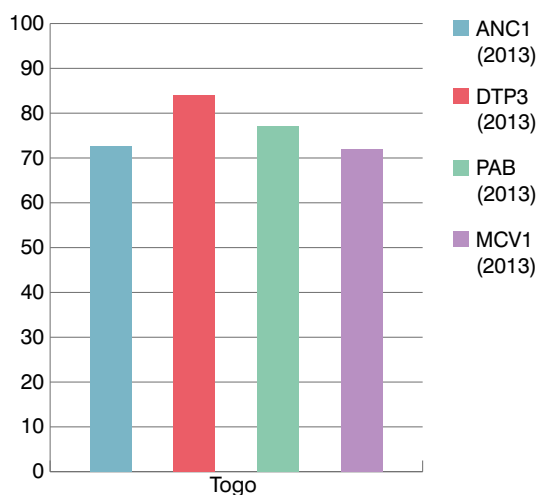




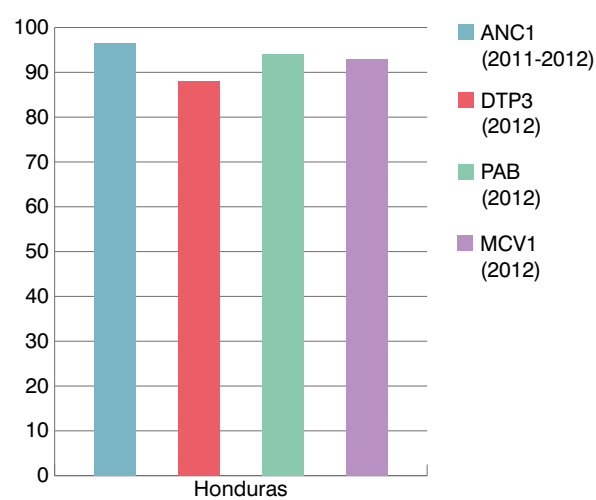
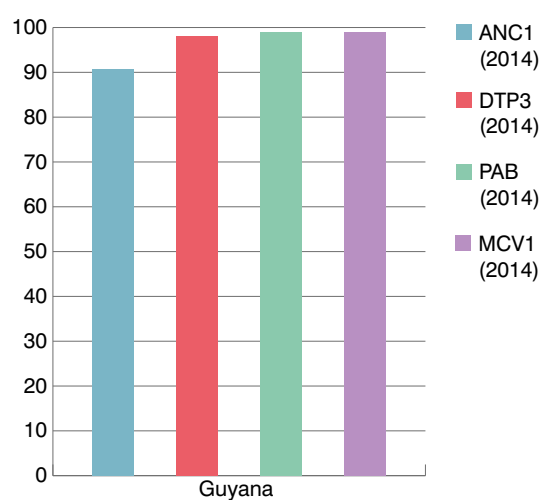
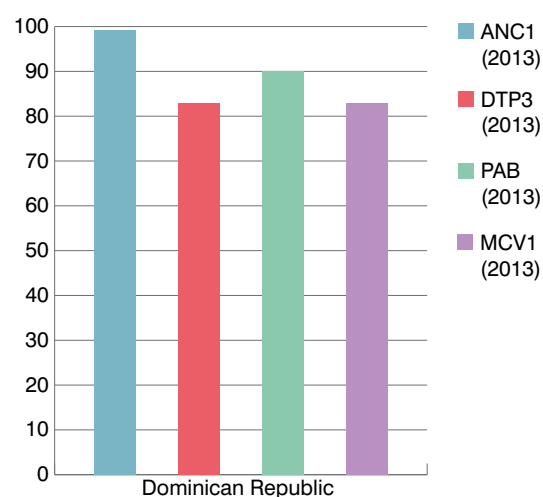
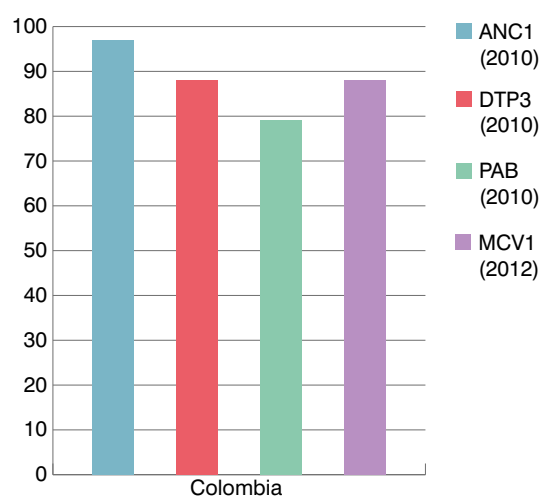
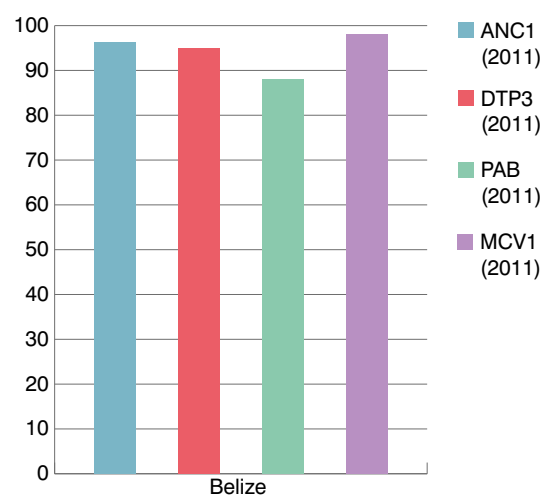
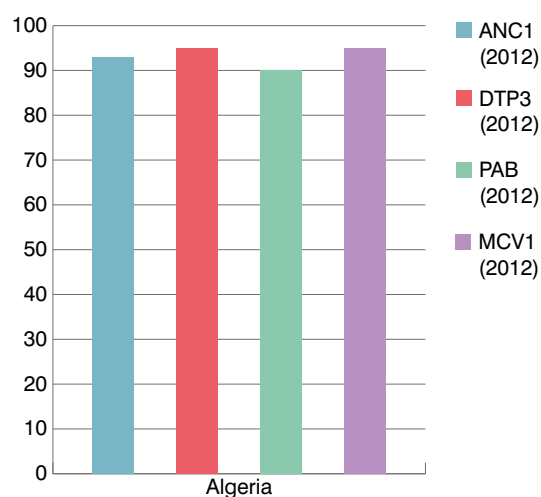


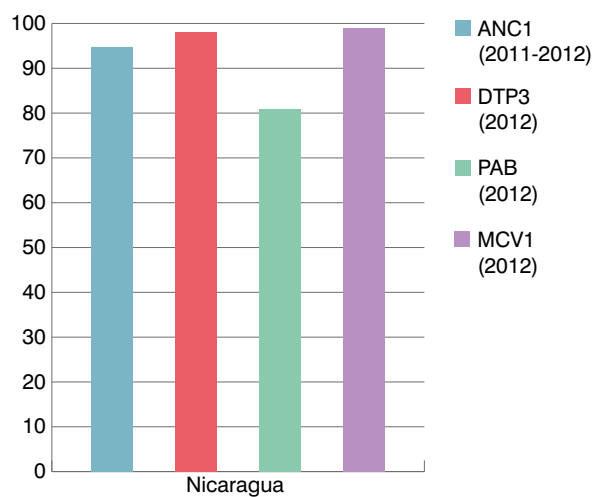
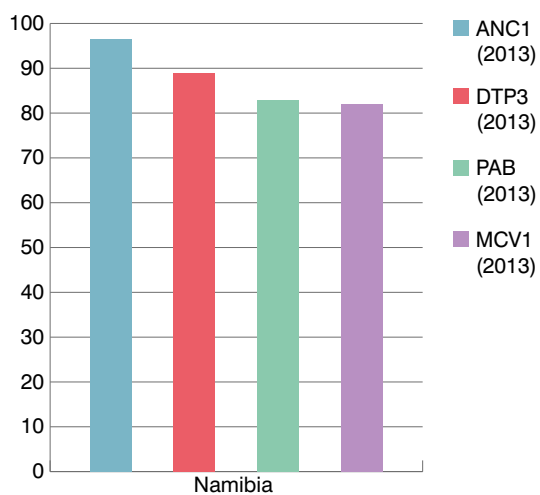
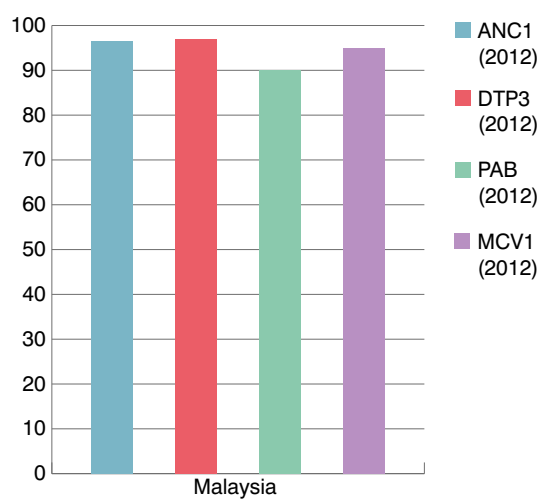
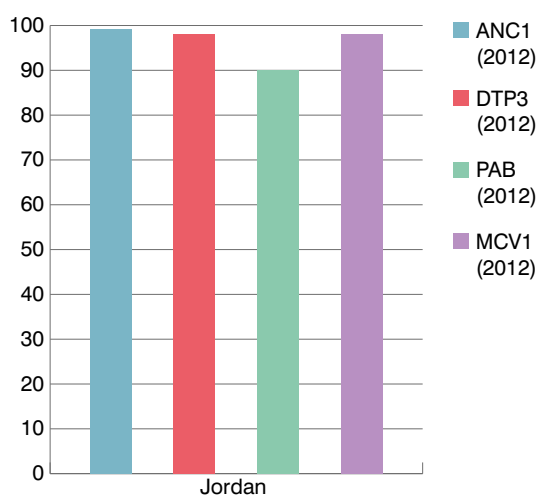
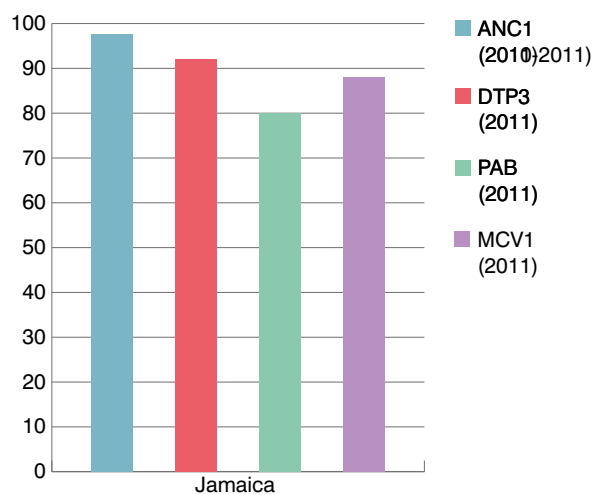
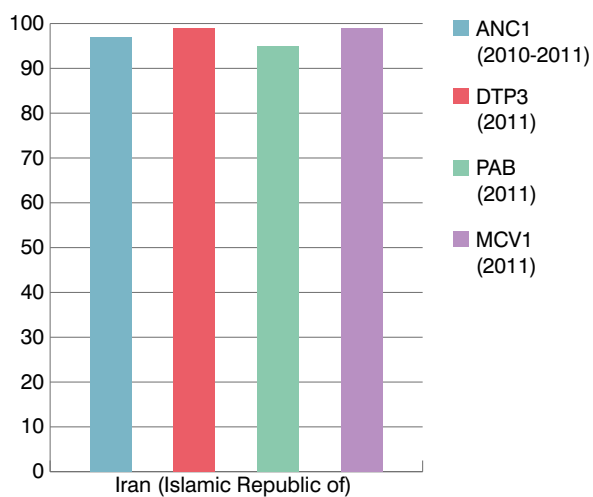


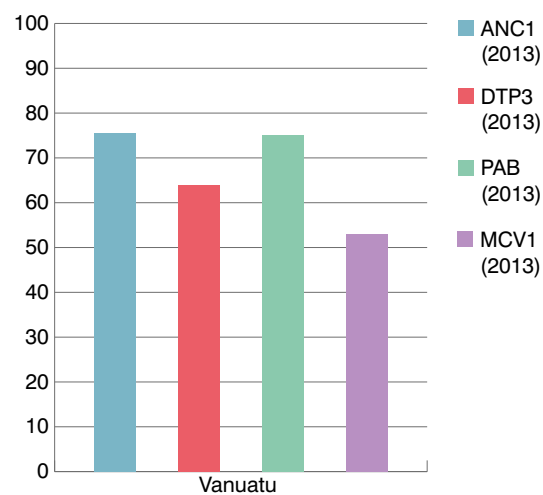
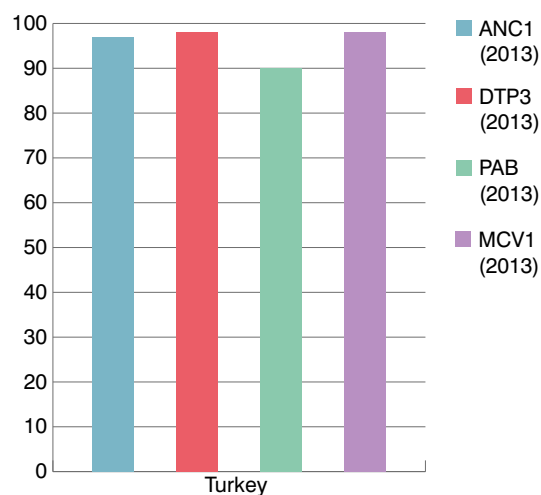
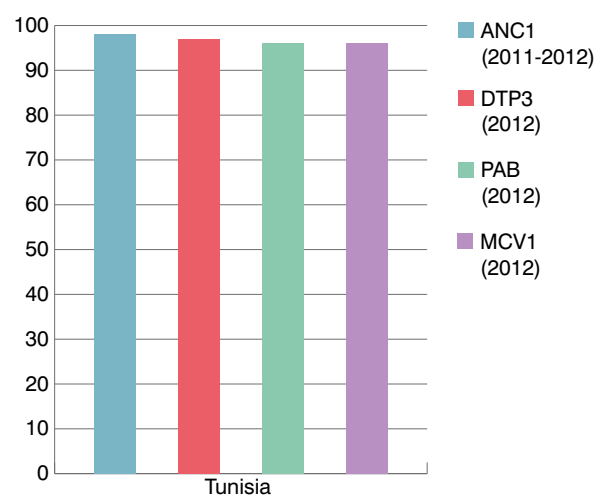
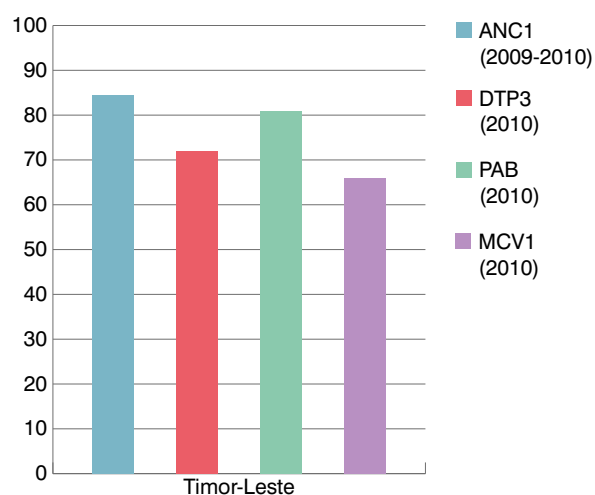
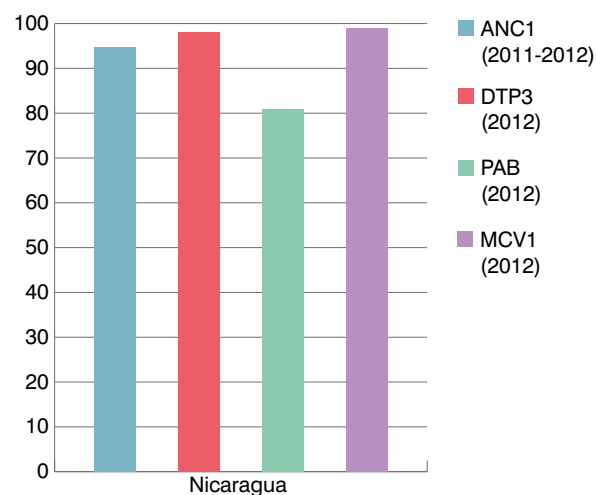
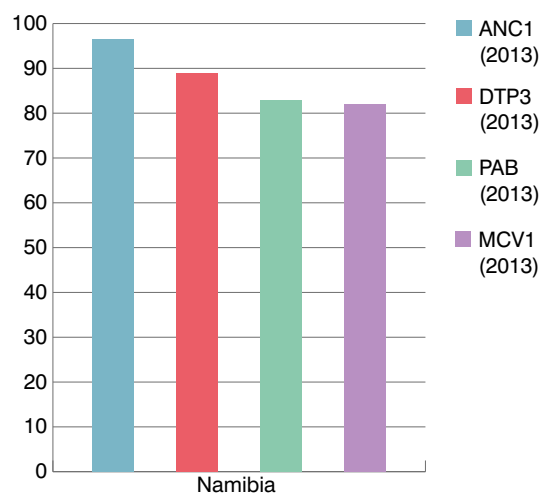




## Other member states









## 4. ENSURING COUNTRY OWNERSHIP OF IMMUNIZATION

### STRATEGIC OBJECTIVE 1: ALL MEMBER STATES COMMIT TO IMMUNIZATION AS A PRIORITY

#### DOMESTIC EXPENDITURES FOR IMMUNIZATION PER PERSON TARGETED (Indicator SO 1.1)



#### Highlights

- 92 countries provided sufficient data to analyse the trend over the period 2010–2014.
- 58 (63%) Member States reported an increasing trend against the baseline (2010), while 34 (37%) reported a decreasing trend.
- The response rate is increasing and the quality of data is progressively improving.
- Initiatives to strengthen economics and financing expertise within countries' immunization programmes need further support.

Target	Increasing trend in country allocation to national immunization programmes
Definition of indicator	<p>Domestic expenditures for immunization are considered all recurrent expenditures financed by domestic resources (from national and subnational government budgets) for immunization-specific activities carried out for both vaccine procurement and immunization delivery. Supplemental immunization activities are excluded, as are extra-budgetary expenditures from development partners, capital expenditure, out-of-pocket and private expenditures.</p> <p>For persons targeted, the number of live births from United Nations (UN) population data is used as a proxy for standard denominator available for all countries.</p>
Description of data sources	<p>The joint reporting form (JRF) template includes the following immunization financing indicators:</p> <ol style="list-style-type: none"> <li>1. Government expenditure on routine immunization</li> <li>2. Total expenditure (from all sources) on routine immunization</li> <li>3. Estimated percentage of total expenditure on routine immunization financed by government</li> <li>4. Government expenditure on vaccines used in routine immunization</li> <li>5. Total expenditure (from all sources) on vaccines used in routine immunization</li> <li>6. Estimated percentage of total expenditure on vaccines financed by government</li> </ol>



In 2014, instructions for the financing indicators in the JRF template were revised, in order to provide Member States with greater clarity on which expenditure data should be reported. Countries were also given additional guidance on sources of information and methods for estimation.

Indicator 1, Government expenditure on routine immunization includes all recurrent, immunization-specific expenditure on routine immunization financed by domestic resources. Recurrent inputs include expenditures for routine vaccines (traditional, new and underused) and vaccine co-financing payments using government funds, associated injection supplies, salaries and per diems

of health staff working full-time on immunization, transport specific for immunization, vehicles and cold-chain maintenance, immunization-specific training, social mobilization, monitoring and surveillance, and programme management.

By definition, indicator 4, Government expenditure on vaccines used in routine immunization, comes under indicator 1, detailing the expenditures on vaccines that are used exclusively in routine immunization.

The target population is the number of live births in each Member State, with the source of this information being the UN population database.<sup>35</sup> These data are readily available for all countries.

## Data quality

The quality of financing data reported through the JRF remains a major concern, although progressive improvements have been seen in recent years.

Several steps have been taken to address the deficiencies of the JRF financing data. Firstly, a survey was conducted in a sample of 36 Gavi-eligible countries in 2013 and 2014, to learn about problems faced by countries during the reporting process and to better gauge the reliability of the reported data by learning what sources of information are used by the countries. Feedback from the survey suggested that countries required greater guidance on how to collect immunization expenditure data, with particular focus needed on how to disaggregate data when expenditures are not immunization-specific.<sup>36</sup> In response to this need, JRF instructions were revised and included in the JRF template 2014–15. In March 2015 the Gavi Alliance Immunization Financing and Sustainability Task Team (IF&S) prepared and disseminated a guidance note aimed specifically at strengthening country reporting on immunization and vaccine expenditures in the JRF.<sup>37</sup> Furthermore, WHO and UNICEF regional offices have intensified efforts to provide feedback and support to countries during peer-review workshops and follow-up in order to address potential inconsistencies and missing data.

WHO annually cross-checks the financing data to find potential inconsistencies; these are identified by:

- i. analysing the time-series of financing indicators for individual countries (e.g. identifying extremely divergent values reported from one year to another);

- ii. assessing whether rules of internal consistency are adhered to i.e. government expenditure on routine immunization should be greater than and should include government expenditure on vaccines, while government expenditure on routine immunization must not exceed total expenditure on routine immunization.

Apparent mistakes such as wrong currency or typing errors are also frequent and are subsequently corrected by WHO. Records of these inconsistencies are shared with Member States, through WHO regional offices, as part of the feedback and revision mechanism that is in place.

Consistent reported values which form a time-series are used to fill gaps in data, by assuming continuation of previous/subsequent trends or by averaging available values; however these techniques are used with caution. For Member States with available comprehensive multi-year plans (cMYP), data available from the costing and financing tool are used as an additional source of information to cross-check data and produce estimates.

During the cross-check and revision process, some Member States have revised data reported in previous years or filled in missing information. Therefore the figures used in previous years' analysis of the GVAP financing indicator could be subject to change.

Response rates have improved since last year's report: 87 Member States (45%) reported the financing indicator data for at least 4 years, compared to 67 Member States (35%) last year; 107 Member States (55%) reported at least 3 years of data, an increase in comparison to 85 Member States (44%) that did so last year. This year,

<sup>35</sup> UN, Department of Economic and Social Affairs, Population Division. World population prospects: The 2012 revision [CD-ROM]. New York: United Nations; 2013.

<sup>36</sup> The report of the survey is available on the WHO website ([http://www.who.int/immunization/programmes\\_systems/financing/data\\_indicators/report\\_jrf\\_survey\\_2014\\_draft.pdf?ua=1](http://www.who.int/immunization/programmes_systems/financing/data_indicators/report_jrf_survey_2014_draft.pdf?ua=1)).

<sup>37</sup> The guidance note is available on the WHO website ([http://www.who.int/immunization/programmes\\_systems/financing/data\\_indicators/JRF\\_guidance\\_note.pdf?ua=1](http://www.who.int/immunization/programmes_systems/financing/data_indicators/JRF_guidance_note.pdf?ua=1)).

60 Member States (31%) reported a full time-series of

5 years data (2010–2014), while 57 Member States (27%) still reported no data for this period.

## Results

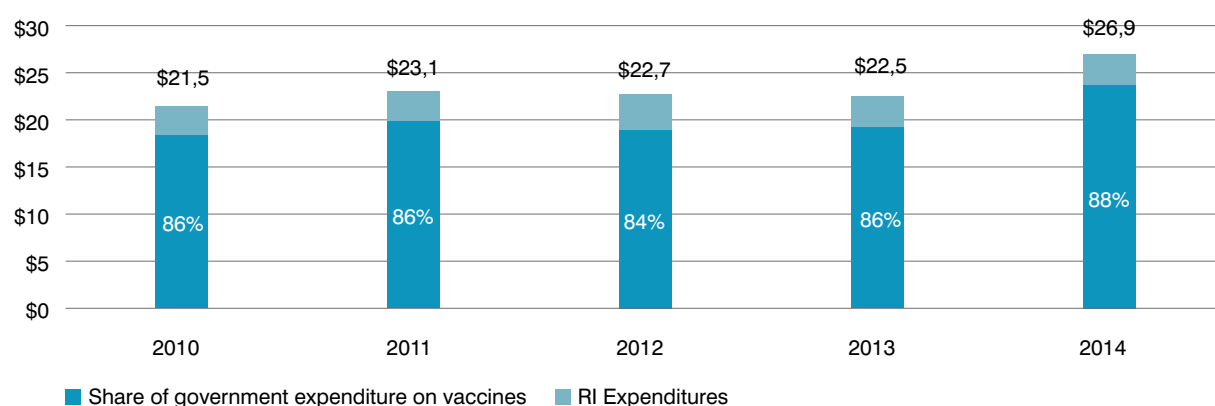
To monitor countries' progress towards the GVAP target of an increasing trend in country allocation to national immunization programmes the following analysis compares the most recent data, either 2014 or 2013 data, against the GVAP baseline year (2010) – and reports whether an increasing, decreasing or constant trend emerges.

Overall, 92 Member States have sufficient data to be included in the analysis:<sup>38</sup> 29 of these are from the African Region, 23 from the Region of the Americas, 9 from the Eastern Mediterranean Region, 11 from the European Region, 8 from the South-East Asia Region and 12 from the Western Pacific Region.

In total 58 Member States reported an increasing trend against the baseline, while 34 reported a decreasing trend.

Globally, the government expenditures on routine immunization increased on average from US\$ 21.4 in 2010 to US\$ 26.9 in 2014, after a fluctuation in 2012 and 2013 (US\$ 22.6 and US\$ 22.5 respectively). The percentage of government expenditures on routine immunization allocated to vaccines remained stable at around 86%, before rising in 2014 to 88% (Figure 40).

**Figure 40: Government expenditure on routine immunization per live birth (population weighted averages, 61 countries)**



In the following section, figures for each WHO region are presented, and tables of country data are provided in the Annex (Table 20 to 25). Figures 41 to 46 present the population weighted average of government expenditures on routine immunization per live birth for each region for the period 2010–2014, as well as the proportion of this figure that was allocated to purchasing vaccines (calculated by JRF indicator 4). To ensure comparability of time trends, the regional weighted averages are calculated using only countries which had a full time-series of data; the countries not included in the calculation of averages are highlighted with an asterisk (\*) in the regional tables below. Fourteen Member States reported a full-time series in the African Region, 17 in the Region of the Americas, 7 in the Eastern Mediterranean Region, 11 in the European Region,

5 in the South-East Asia Region and 6 in the Western Pacific Region.

## African Region

Figure 41 shows the population weighted average expenditures for the African Region calculated 14 countries which exhibited a full time-series for the 2010–2014 period. The government expenditures on routine immunization broadly increased over the 5 years, a 17% increase between 2010 and 2014. The percentage spent on vaccine varied between 47% and 62%. The trend reported by countries of the African Region is promising as there are signs of good progress being made in terms of meeting the targets set out by the

<sup>38</sup> Member States that reported the GVAP financing indicator for the baseline year 2010 and at least for 2013 or 2014 are included in the analysis.

GVAP on increasing domestic allocation of resources for immunization.

### Region of the Americas

Figure 42 displays the population weighted average expenditures for the Region of the Americas, using data from the 17 countries which reported a full time-series. The trend in expenditures is inconsistent, following a similar pattern to that of the global averages (Figure 1). However, the region does show a sizeable increase in expenditures, of 43%, between 2010 and 2014. Figure 3 also displays the percentage of expenditures going towards vaccines, which stayed close to 94% for the entire period. This can be considered a high proportion, which seems to suggest that the countries in this region direct greater funding towards vaccine costs or under-reported the programmatic costs of immunization.

### Eastern Mediterranean Region

Figure 43 displays a consistently increasing trend in expenditures over the period 2010–2014 for the Eastern Mediterranean Region, which reflects the large proportion of countries reporting an increasing

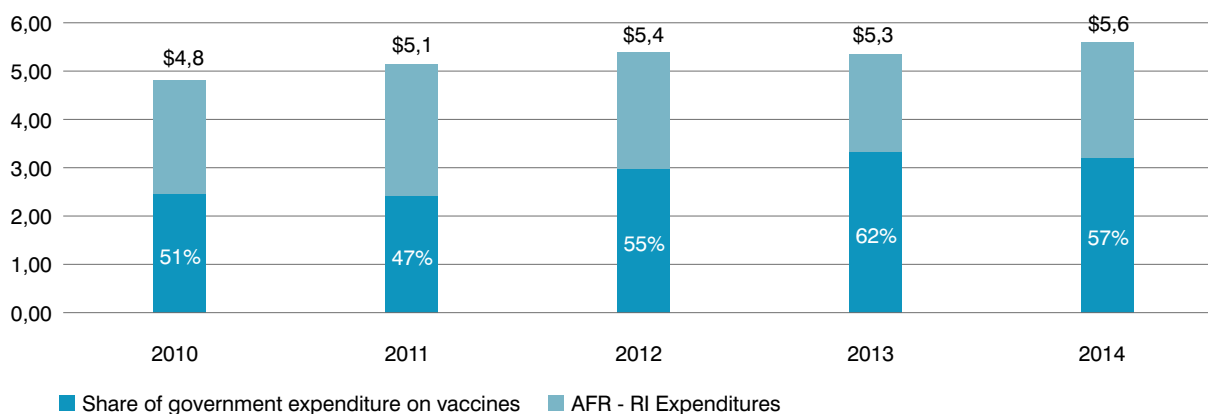
trend. The average was calculated using the data from seven countries in the region, which reported a full time-series. The results show that not only are the government expenditures on routine immunization increasing year-upon-year, but the overall increase 2010–2014 is extremely sizeable at 88%. In contrast to the increases in expenditure on routine immunization, the percentage expenditure on vaccines has remained relatively constant at around 80%.

These increasing trends show great progress being made by these countries towards meeting the GVAP objective of increasing domestic allocation of resources for immunization.

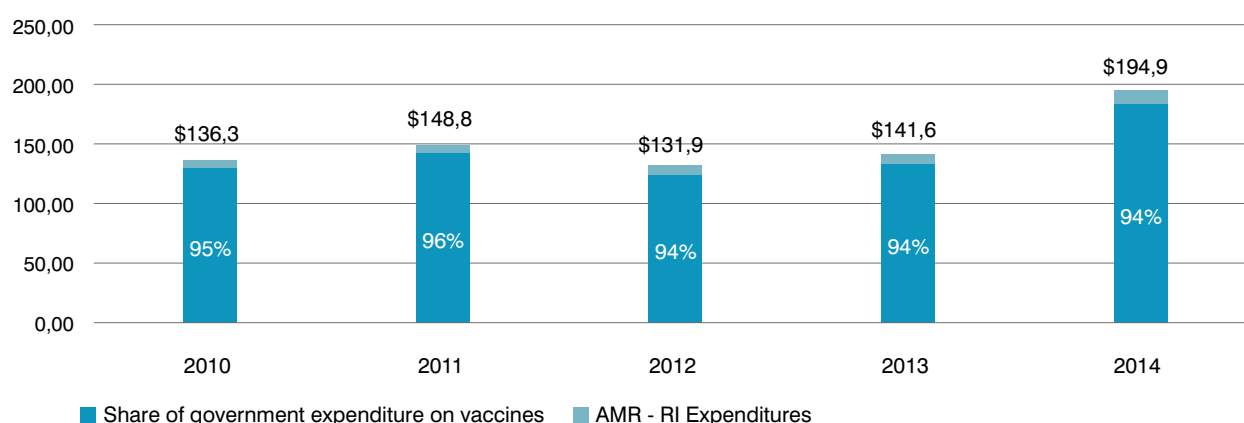
### European Region

Figure 44 shows the government expenditures on routine immunization for the European Region to be fairly stable, with no real trend being displayed over the 5-year period. While the expenditures are increasing and decreasing, these changes are small and the government expenditures on routine immunization per live birth remain relatively constant at around the US\$ 100. However, the percentage of expenditure which goes towards vaccines can be seen to have declined over the 5-year period, from 77% to 64%.

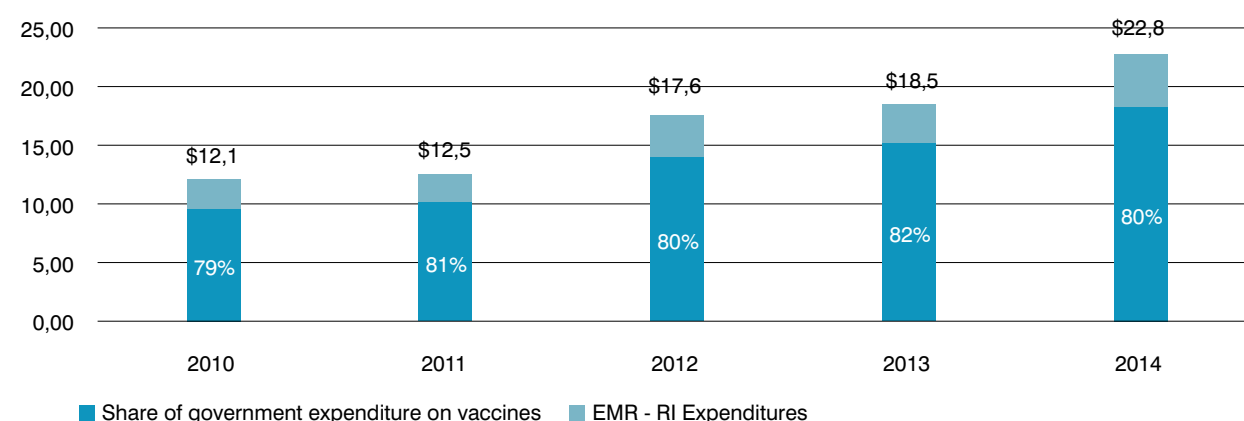
**Figure 41: Government expenditure on routine immunization per live birth for African region (Population weighted averages, 14 countries)**



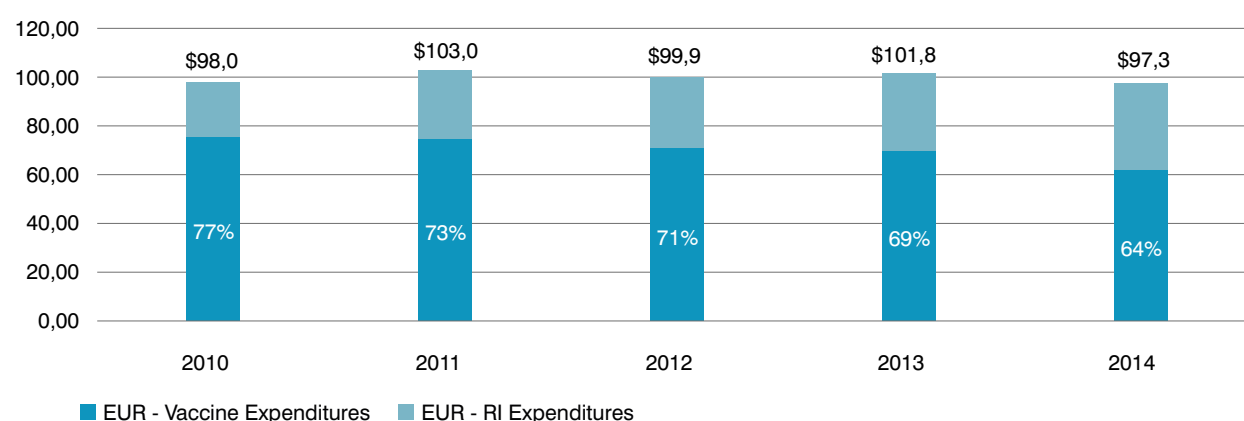
**Figure 42: Government expenditure on routine immunization per live birth for the region of the Americas (Population weighted averages)**



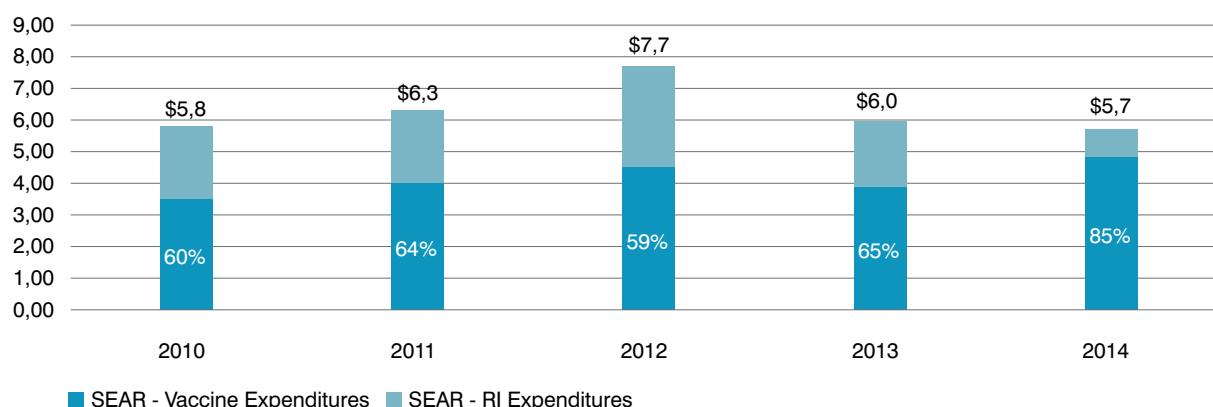
**Figure 43: Government expenditure on routine immunization per live birth for the Eastern Mediterranean region (Population weighted averages)**



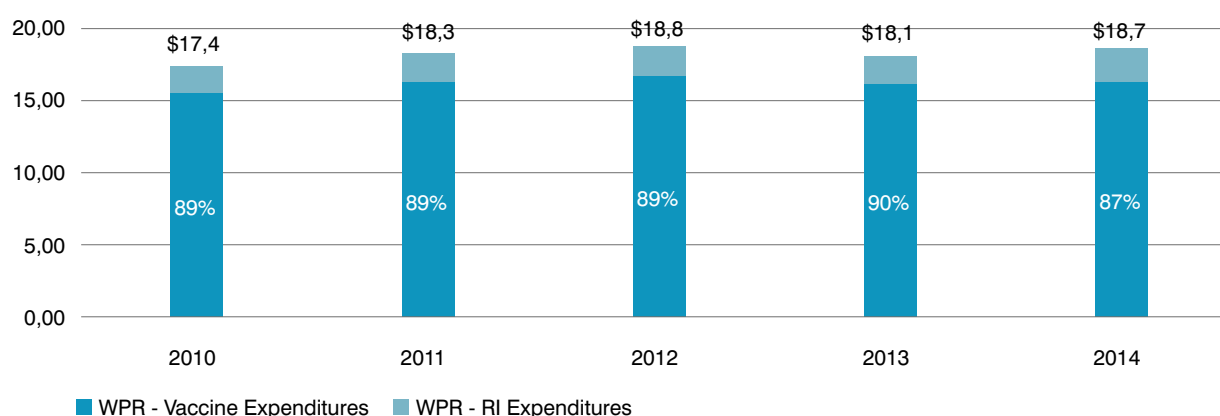
**Figure 44: Government expenditure on routine immunization per live birth for the European region (Population weighted averages)**



**Figure 45: Government expenditure on routine immunization per live birth for the South-East Asia region (Population weighted averages)**



**Figure 46: Government expenditure on routine immunization per live birth for the Western Pacific region (Population weighted averages)**



### South-East Asia Region

The average expenditure for the South-East Asia Region was calculated using the data from five countries which reported a full time-series of data (Figure 45). The trend for the South-East Asia Region's average expenditure from 2010 to 2014 was extremely variable, increasing until 2012 at which point the expenditures peaked and subsequently declined. Overall, the expenditure on routine immunization declined slightly over the 5-year period from US\$ 5.8 to US\$ 5.7. This marginal decline seems representative of the higher proportion of Member States which exhibit a declining trend in the South-East Asia Region (Table 24).

### Western Pacific Region

Figure 46 shows the average expenditures for six Western Pacific Region Member States which reported a full time-series; it shows a fluctuating but generally increasing trend in government expenditures on routine immunization per live birth. Although the trend is fluctuating, the magnitude of change is relatively low with only a 4% increase between 2010 and 2014. Alongside this, the percentage of government funds directed towards vaccine purchases remained relatively stable, but did show a decrease from 2013 to 2014, when it dropped from 90% to 87%. These percentages are relatively high compared to other regions such as the South-East Asia Region, implying that a large amount of government funds are directed towards vaccines rather than programmatic costs.

## Conclusion

Overall, 58 (63%) Member States showed an increasing trend in government expenditures on routine immunization whereas 34 (37%) reported a decreasing trend over the period 2010–2014. This, coupled with the results of the analysis for each region, represents global progress towards meeting the GVAP target of increasing the domestic allocation of resources for immunization. The response rate and quality of reported data have been progressively improving in recent years.

However, the variability of trends among regions should be further investigated. WHO and partner institutions place great emphasis on the strengthening of the JRF financing indicator as a means to move towards financial sustainability for immunization. Additional initiatives for building capacity at country level will be further discussed and promoted by the Gavi Immunization Financing and Sustainability Task Force.



# Annexes

**Table 20: African Region<sup>a</sup>**

Country	Income classification	2010	2011	2012	2013	2014	Trend between baseline (2010) and 2014/13	Percentage change (2010–2014/2013)
Seychelles*	HIC	28.3	21.3	45.0		218.5	Increasing	673
Uganda*	LIC (Gavi)	2.1			3.6	11.7	Increasing	452
Equatorial Guinea*	HIC	1.6	2.7			8.3	Increasing	425
Congo (the)	LMIC (Gavi)	3.4	5.3	10.5	11.8	17.8	Increasing	419
Madagascar*	LIC (Gavi)	0.6	1.3	1.9	3.0		Increasing	414
Mauritania*	LMIC (Gavi)	6.9		1.9		30.1	Increasing	336
Botswana*	UMIC	17.5	36.3			73.8	Increasing	321
Eritrea	LIC (Gavi)	0.6	2.2	2.2	2.3	2.3	Increasing	287
Burundi*	LIC (Gavi)	0.8	0.9		1.6	2.2	Increasing	175
Democratic Republic of the Congo (the)	LIC (Gavi)	0.7	0.7	1.8	2.0	1.5	Increasing	108
United Republic of Tanzania	LIC (Gavi)	4.9	6.2	3.5	3.3	9.2	Increasing	90
Nigeria*	LMIC	4.0				7.2	Increasing	82
Central African Republic (the)*	LIC (Gavi)	0.5	1.1	0.4	0.9		Increasing	70
Mozambique*	LIC (Gavi)	3.9	4.5	5.1	6.6		Increasing	67
Zambia*	LMIC (Gavi)	29.8	46.0	47.4	48.8		Increasing	63
Sao Tome and Principe	LMIC (Gavi)	75.1	67.6	106.5	127.6	98.3	Increasing	31
Rwanda	LIC (Gavi)	5.7	6.2	6.7	6.8	6.6	Increasing	15
Côte d'Ivoire	LMIC (Gavi)	8.5	5.8	16.1	14.1	9.6	Increasing	13
Swaziland	LMIC	56.0	71.1	61.2	58.2	51.7	Decreasing	–8
Burkina Faso	LIC (Gavi)	6.2	6.5	5.8	5.2	5.7	Decreasing	–8
Cameroon	LMIC (Gavi)	7.2	8.4	3.8	5.9	6.6	Decreasing	–8
Benin	LIC (Gavi)	6.9	5.8	6.1	6.3	6.3	Decreasing	–10
Ethiopia*	LIC (Gavi)	14.2		1.9		12.3	Decreasing	–13
Kenya	LMIC (Gavi)	4.4	4.6	4.3	4.1	3.8	Decreasing	–15
Chad*	LIC (Gavi)	7.7		7.1	6.0	4.1	Decreasing	–47
Malawi*	LIC (Gavi)	6.0	5.8		2.4	2.9	Decreasing	–52
Gabon*	UMIC	67.5		34.6	35.7	28.2	Decreasing	–58
Togo	LIC (Gavi)	20.0	21.8	25.8	24.6	4.2	Decreasing	–79
Comoros (the)	LIC (Gavi)	16.6	12.9	9.2	4.5	2.2	Decreasing	–87
<b>Population Weighted Average</b>		<b>4.8</b>	<b>5.1</b>	<b>5.4</b>	<b>5.3</b>	<b>5.6</b>		<b>17</b>

<sup>a</sup> Countries are in order of the magnitude of change between the baseline (2010) and 2014/2013 expenditures.

WHO estimates in *italics*.

Countries with an asterisk (\*) do not have a full time-series and so have not been included in the calculation of the population weighted average.

**Table 21: Americas region<sup>a</sup>**

Country	Income classification	2010	2011	2012	2013	2014	Trend between baseline (2010) and 2014/13	Percentage change (2010–2014/2013)
Argentina	HIC	81.68	278.44	229.77	170.48	268.64	Increasing	229
Dominica	UMIC	16.73	56.56	62.10	54.75	47.39	Increasing	183
Dominican Republic (the)*	UMIC	14.01	19.40	27.09		36.58	Increasing	161
Guatemala	LMIC	29.24	30.06	68.05	50.45	59.50	Increasing	104
Paraguay*	UMIC	53.14	122.33		163.05	103.34	Increasing	94
Colombia	UMIC	63.89	108.86	100.68	123.91	108.46	Increasing	70
Venezuela (Bolivarian Republic of)*	HIC	52.09	77.59	80.85	73.46		Increasing	41
Uruguay	HIC	145.79	166.84	160.86	154.87	197.25	Increasing	35
Saint Vincent and the Grenadines	UMIC	25.15	16.57	20.78	22.38	33.38	Increasing	33
Bahamas (the)	HIC	140.42	116.21	145.48	138.65	181.79	Increasing	29
Brazil	UMIC	203.64	169.69	148.14	177.28	259.35	Increasing	27
Bolivia (Plurinational State of)	LMIC (Gavi)	45.59	47.00	43.10	37.93	56.40	Increasing	24
Cuba	UMIC (Gavi)	178.89	169.99	148.66	122.38	209.32	Increasing	17
Honduras	LMIC (Gavi)	51.09	61.08	41.86	47.57	53.49	Increasing	5
Nicaragua	LMIC (Gavi)	78.09	58.45	59.62	75.38	79.38	Increasing	2
Saint Lucia	UMIC	26.67	19.14	28.86	38.58	25.85	Decreasing	–3
Belize	UMIC	57.39	70.84	40.32	44.79	52.98	Decreasing	–8
Saint Kitts and Nevis	HIC	28.30	22.51	24.44	29.83	25.49	Decreasing	–10
Grenada	UMIC	55.19	39.76	59.06	38.28	49.37	Decreasing	–11
El Salvador	LMIC	98.77	118.03	79.38	88.64	78.65	Decreasing	–20
Mexico*	UMIC	203.78				145.20	Decreasing	–29
Ecuador*	UMIC	153.93	162.76	147.82	97.30		Decreasing	–37
Chile*	HIC	203.45		259.24	125.17		Decreasing	–38
<b>Population Weighted Average</b>		<b>136.29</b>	<b>148.84</b>	<b>131.94</b>	<b>141.59</b>	<b>194.85</b>		<b>43</b>

<sup>a</sup> Countries are in order of the magnitude of change between the baseline (2010) and 2014/2013 expenditures.

WHO estimates in *italics*

Countries with an asterisk (\*) do not have a full time-series and so have not been included in the calculation of the population weighted average.

**Table 22: Eastern Mediterranean region<sup>a</sup>**

Country	Income classification	2010	2011	2012	2013	2014	Trend between baseline (2010) and 2014/13	Percentage change (2010–2014/2013)
Djibouti	LMIC (Gavi)	35.3	30.4	62.5	71.2	75.6	Increasing	114
Iran (Islamic Republic of)	UMIC	13.1	13.1	19.2	19.2	30.7	Increasing	135
Tunisia	UMIC	15.6	34.1	32.8	33.2	33.5	Increasing	115
Lebanon	UMIC	51.6	46.7	61.5	79.9	93.5	Increasing	81
Yemen	LMIC (Gavi)	5.5	5.8	8.1	8.4	8.9	Increasing	60
Sudan (the)	LMIC (Gavi)	3.4	2.9	6.8	5.9	5.1	Increasing	51
Jordan	UMIC	84.2	84.2	101.1	117.9	117.9	Increasing	40
Pakistan*	LMIC (Gavi)	9.4		14.2	6.9	7.7	Decreasing	–18
Afghanistan*	LIC (Gavi)	2.1	2.2	2.5	1.1		Decreasing	–47
<b>Population Weighted Average</b>		<b>12.1</b>	<b>12.5</b>	<b>17.6</b>	<b>18.5</b>	<b>22.8</b>		<b>88</b>

<sup>a</sup> Countries are in order of the magnitude of change between the baseline (2010) and 2014/2013 expenditures.

WHO estimates in *italics*

Countries with an asterisk (\*) do not have a full time-series and so have not been included in the calculation of the population weighted average.

**Table 23: European region<sup>a</sup>**

Country	Income classification	2010	2011	2012	2013	2014	Trend between baseline (2010) and 2014/13	Percentage change (2010–2014/2013)
Uzbekistan	LMIC (Gavi)	5.41	10.59	10.59	15.77	14.57	Increasing	86
Republic of Moldova (the)	LMIC (Gavi)	15.75	32.19	32.19	48.63	43.53	Increasing	86
Belarus	UMIC	74.30	79.80	118.88	86.09	102.48	Increasing	35
Georgia	LMIC (Gavi)	48.14	76.83	18.13	39.42	58.90	Increasing	14
Kyrgyzstan	LMIC (Gavi)	6.48	6.48	6.51	7.01	7.37	Increasing	14
Iceland	HIC	275.50	391.23	441.73	380.79	319.85	Increasing	11
Finland	HIC	384.93	460.56	425.44	402.34	429.45	Increasing	10
Tajikistan	LMIC (Gavi)	5.76	7.06	4.23	4.78	5.33	Decreasing	–6
Azerbaijan	UMIC (Gavi)	41.04	38.83	36.63	36.40	38.55	Decreasing	–6
Netherlands (the)	HIC	610.29	603.82	596.76	616.50	555.70	Decreasing	–9
Andorra	HIC	733.66	764.50	687.43	699.09	593.78	Decreasing	–18
<b>Population Weighted Average</b>		<b>98.0</b>	<b>103.0</b>	<b>99.9</b>	<b>101.8</b>	<b>97.3</b>		<b>–1</b>

<sup>a</sup> Countries are in order of the magnitude of change between the baseline (2010) and 2014/2013 expenditures.

WHO estimates in *italics*

Countries with an asterisk (\*) do not have a full time-series and so have not been included in the calculation of the population weighted average.

**Table 24: South-East Asia region<sup>a</sup>**

Country	Income classification	2010	2011	2012	2013	2014	Trend between baseline (2010) and 2014/13	Percentage change (2010–2014/2013)
Democratic People's Republic of Korea (the)*	LIC (Gavi)	3.9	13.3	24.4	23.5		Increasing	506
Thailand	UMIC	31.4	33.6	50.7	47.2	42.3	Increasing	35
India	LMIC (Gavi)	3.8	4.1	5.8	3.6	3.9	Increasing	2
Bangladesh	LMIC (Gavi)	7.6	7.2	6.0	5.0	7.3	Decreasing	–5
Indonesia	LMIC (Gavi)	11.4	13.7	13.6	13.5	9.8	Decreasing	–14
Sri Lanka*	LMIC (Gavi)	33.1	8.8		37.2	16.4	Decreasing	–50
Timor–Leste*	LMIC (Gavi)	24.7				10.8	Decreasing	–56
Nepal	LIC (Gavi)	7.1	4.1	2.8	6.6	3.0	Decreasing	–58
<b>Population Weighted Average</b>		<b>5.8</b>	<b>6.3</b>	<b>7.7</b>	<b>6.0</b>	<b>5.7</b>		<b>–2</b>

<sup>a</sup> Countries are in order of the magnitude of change between the baseline (2010) and 2014/2013 expenditures.

WHO estimates in *italics*

Countries with an asterisk (\*) do not have a full time-series and so have not been included in the calculation of the population weighted average.

**Table 25: Western Pacific Region<sup>a</sup>**

Country	Income classification	2010	2011	2012	2013	2014	Trend between baseline (2010) and 2014/13	Percentage Change (2010–2014/2013)
Cambodia	LIC (Gavi)	7.8	8.6	7.5	6.4	25.8	Increasing	230
Papua New Guinea	LMIC (Gavi)	5.5	8.4	15.7	10.5	16.4	Increasing	199
Viet Nam*	LMIC (Gavi)	6.0	7.3	7.8	7.7		Increasing	28
Marshall Islands (the)	UMIC	12.5	15.9	15.9	15.9	15.9	Increasing	28
Malaysia*	UMIC	83.0	87.4	91.8	96.2		Increasing	16
Tonga*	UMIC	16.3	19.9	20.0	17.5		Increasing	7
Philippines (the)*	LMIC	22.8			20.0	24.2	Increasing	6
China	UMIC	17.7	18.5	19.0	18.4	18.5	Increasing	5
Vanuatu	LMIC	19.9	18.7	17.4	18.6	19.9	Decreasing	–0.2
Samoa*	LMIC	28.7	28.5	28.2	28.0		Decreasing	–3
Lao People's Democratic Republic (the)	LMIC (Gavi)	1.9	1.7	1.5	1.5		Decreasing	–22
Solomon Islands	LMIC (Gavi)	61.7	61.7	72.4	46.2	19.9	Decreasing	–68
<b>Population Weighted Average</b>		<b>17.4</b>	<b>18.3</b>	<b>18.8</b>	<b>18.1</b>	<b>18.7</b>		<b>4</b>

<sup>a</sup> Countries are in order of the magnitude of change between the baseline (2010) and 2014/2013 expenditures.

WHO estimates in *italics*. Countries with an asterisk (\*) do not have a full time-series and so have not been included in the calculation of the population weighted average.

## Indicator SO1.2: Presence of an independent technical advisory group that meets the defined criteria



### Highlights

- By the end of 2014:
  - 81 Member States reported having a National Immunization Technical Advisory Group (NITAG) that met six process indicators, representing a 111% increase over the 37<sup>39</sup> reported in 2010 (including 41 developing countries and 4 low-income countries).
  - 115 (60%) Member States reported the existence of a NITAG with an administrative or legislative basis. These Member States account for 86% of the global population.
- As long as there is commitment, progress in the establishment and strengthening of NITAGs can be fast. Looking at progress achieved since last year's report highlights the need accelerate progress further to reach the GVAP NITAG target.
- Exploration and formalization of special approaches to allow small Member States to benefit from subregional or other Member States' advisory groups has lagged over the last couple years.
- Together with the possibility of accessing health system strengthening (HSS) funds for establishing and strengthening NITAGs for Gavi-eligible countries, prompt funding of the strengthened decision-making for immunization area of the Middle-Income Countries Strategy (MICs) will help boost progress.

<b>DEFINITION OF INDICATOR</b>	<p>A functional NITAG has been defined as one that meets all of the six following process indicators agreed upon in 2010 by the World Health Organization (WHO) and its partners involved with the strengthening of NITAGs:</p> <ol style="list-style-type: none"> <li>1. legislative or administrative basis for the advisory group;</li> <li>2. formal written terms of reference;</li> <li>3. at least five different areas of expertise represented among core members;</li> <li>4. at least one meeting per year;</li> <li>5. circulation of the agenda and background documents at least one week prior to meetings;</li> <li>6. mandatory disclosure of any conflict of interest.</li> </ol> <p>These six indicators do not guarantee the functionality of the NITAG but have been agreed upon as a minimum set of indicators that will allow for monitoring of progress at the global level. A more comprehensive set of indicators has been published for use at national level (1).</p>
<b>DATA SOURCES</b>	<p>Process indicators related to the establishment of NITAGs have been included in the WHO-UNICEF joint reporting form (JRF) since 2011 and in that year data were collected for 2010. In this summary of information from Member States regarding the existence of a NITAG, the specific criteria are derived from the 2015 JRF and compared with JRF data collected for previous years. For those Member States that did not submit or fully complete the JRF for 2015, information from the previous year's JRF was used.</p> <p>The denominator used to calculate the proportion of NITAGs in existence is the number of Member States that completed the NITAG-related section of the JRF. The results are presented by WHO region, World Bank national income status categories and population size. Population figures are those from the United Nations Population Division (2).</p>
<b>TARGET</b>	<p>Functional NITAGs in all Member States by 2020</p>

<sup>39</sup> Note that this is fewer than the 43 quoted in last year's report as misreporting in 2010 has been retrospectively corrected.

## Data limitations

As highlighted in last year's GVAP secretariat's report (3), these results are subject to data limitations including some incomplete data, the lack of a systematic data validation process with national counterparts, and some confusion between the existence of a NITAG and of an Inter-agency Coordinating Committee. This confusion was documented but has been minimized over time. An increasing number of countries have corrected the information provided during previous years and corrections were retrospectively applied to the reported data concerned. To assess the evolution of NITAG implementation and functionality since 2010, we conducted a thorough data-cleaning based on

consistency of responses on the overall time trend with final approval at country level.

When Member States report the existence of a NITAG with formal terms of reference or the existence of a NITAG with a formal administrative or legislative basis, data should be less susceptible to reporting bias than if a Member State merely reports the existence of a NITAG. Such data should therefore correspond more closely to the actual number of NITAGs in existence. The number of Member States reporting the existence of a NITAG that complies with all six JRF indicators is also less susceptible to reporting bias.

## Results

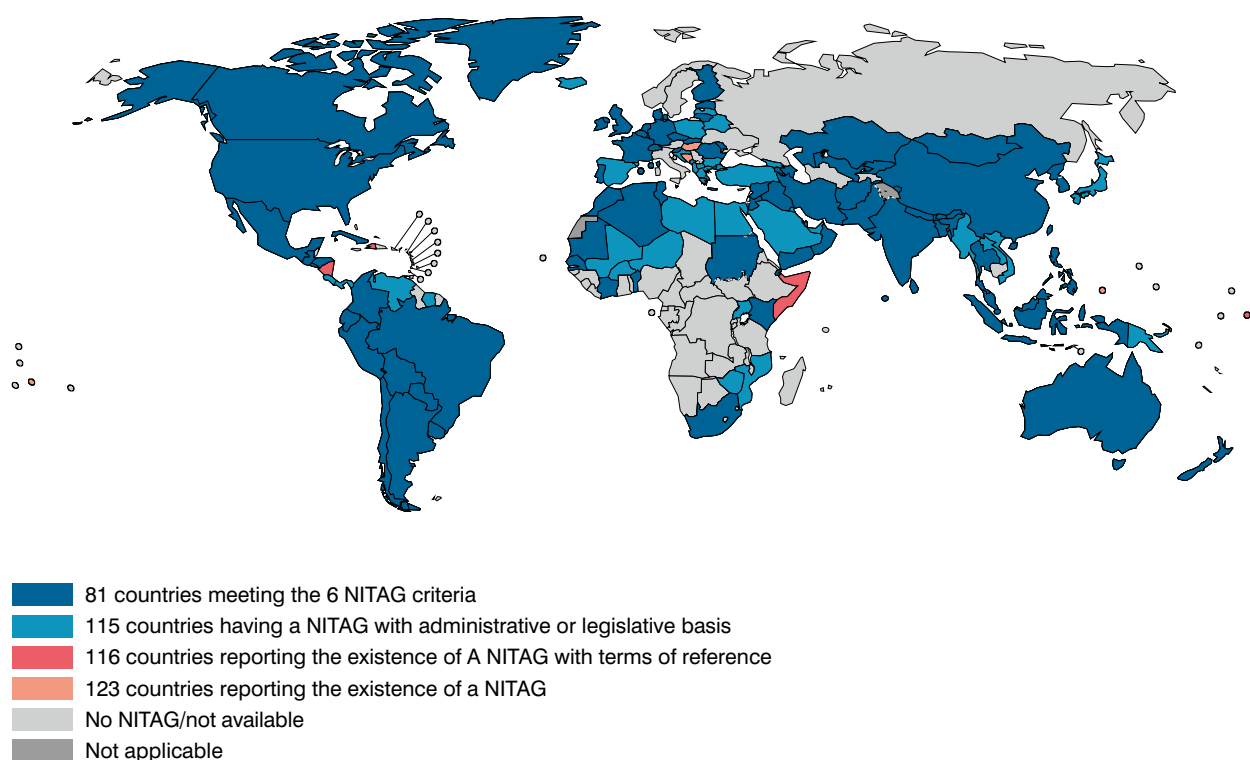
As of 26 June 2015, 183 (94%) of 194 Member States had completed the 2015 JRF<sup>40</sup> reporting immunization-related data for 2014 and 181 (93%)<sup>41</sup> had provided a response to at least one of the NITAG-related JRF questions. Among the Member States that did not submit their JRF or their NITAG-related data for 2014, Canada, Finland, Italy, Luxembourg, Niue, Poland, Singapore, Tonga, Tuvalu and Ukraine had reported NITAG data in last year's JRF, i.e. data for 2013. Data for 2013 were included in the 2014 dataset for these Member States. Monaco reported considering itself to be part of France's NITAG and therefore French data were included in the dataset for Monaco.

Overall, data for 192 Member States were available for the analysis as presented in Figure 47 and Table 26. Table 27 presents a more detailed analysis of the NITAG status, including a review of the specific compliance with each of the six process indicators and a comparison of NITAG status and evolution between 2010 and 2014 at global level and by WHO region. The comparison between 2010 and 2014 is provided only at global level as progress made in some regions before 2010 and the small numbers at that time could lead to spurious interpretation of the trends when broken down by region. Figure 48 attempts to present the 2010–2014 trajectory in the establishment of NITAGs and highlights the need for acceleration of progress in order to reach the GVAP NITAG target.

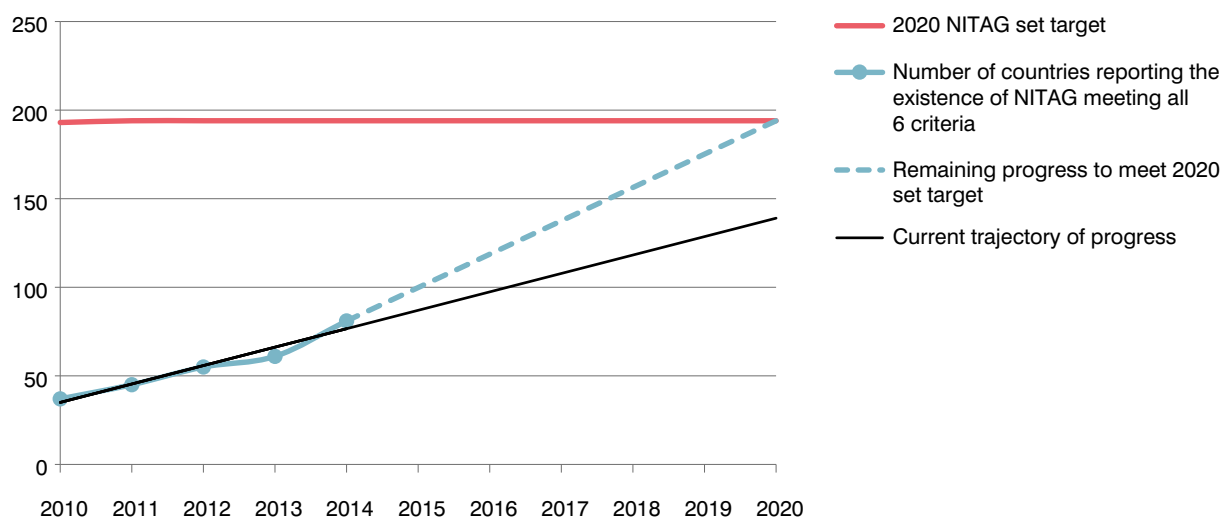
<sup>40</sup> As of 26 June 2015, Member States that had yet to submit JRF data for 2014 included Austria, Finland, Italy, Luxembourg, Monaco, Niue, Poland, Singapore, Tonga, Tuvalu and Ukraine.

<sup>41</sup> Member States that had not completed the NITAG portion of JRF include Canada and Marshall Islands.



**Figure 47: Worldwide distribution of NITAGs in 2014**

Map production: Immunization Vaccines and Biologicals, (IVB) WHO . Date of slide: 16 July 2015.  
 © WHO 2015. All rights reserved  
 Source: WHO/UNICEF coverage estimates 2015 revision.

**Figure 48: 2010–2014 time trend in the establishment of NITAGs meeting all six process criteria with remaining progress needed to reach 2020 target**

**Table 26: Analysis of the NITAG JRF 2014 data at global level and by WHO region**

INDICATOR	WHO region						
	Overall	AFR	AMR	EMR	EUR	SEAR	WPR
No. of Member States with NITAG data available/WHO Member States (%)	192/ 194 (99)	47/47 (100)	35/35 (100)	21/21 (100)	52/53 (98)	11/11 (100)	26/27 (96)
Existence of a NITAG	No. (%) of responding Member States reporting the existence of a NITAG	123 (64)	13 (28)	22 (63)	20 (95)	42 (81)	10 (91)
	% of population covered by a NITAG	87	34	98	99	67	100
NITAG meeting all 6 process indicators	No. of Member States reporting the existence of a NITAG meeting all 6 process indicators/No. of Member States reporting existence of NITAG (%)	81/123 (66)	7/13 (54)	16/22 (73)	14/20 (70)	27/42 (64)	9/10 (90)
	% of responding Member States with a NITAG meeting all 6 process indicators	42	15	46	67	52	82
	% of the entire population covered with a NITAG and meeting all 6 process indicators	75	20	92	76	43	97

Notable progress was achieved between 2010 and 2014, and 115 (60%) Member States of the 192 Member States included in the analysis reported the existence of a NITAG with a formal legislative or administrative basis. In 2014, there were 81 Member States<sup>42</sup> with a NITAG that met all six process indicators, including 41 developing Member States. This is a 111% increase compared to 2010, when only 37 countries reported having a NITAG meeting all six process indicators.

In 2014, 13% of low-income countries, 44% of middle-income countries, and 55% of high-income countries reported having a NITAG meeting all six process criteria. Overall, 75% of the global population resides in a country with a NITAG that meets all six process indicators. Of the Member States with smaller populations (less than the median population of all responding Member States) 30% reported the existence

of a NITAG that meets all six process indicators, compared with 54% of more populated Member States.

The South-East Asia Region had the highest proportion of Member States reporting the existence of a NITAG that met all six process indicators (90%) and the Western Pacific Region had the lowest (50%). The South-East Asia Region had the greatest percentage (91%) of Member States that had a NITAG based on a formal legislative decree compared to 28% in the African Region, 50% in the Western Pacific Region, and 57% in the Region of the Americas (the last two regions being affected by having a substantial number of small Member States), 77% in the European Region, and 90% in the Eastern Mediterranean Region.

Table 26 presents the status of the NITAG-related indicators at the global and regional levels in 2014.

<sup>42</sup> Afghanistan, Algeria, Andorra, Argentina, Armenia, Australia, Azerbaijan, Bahrain, Bangladesh, Belgium, Benin, Bhutan, Bolivia (Plurinational State of), Brazil, Canada, Chile, China, Colombia, Côte d'Ivoire, Cuba, the Czech Republic, Democratic People's Republic of Korea, Denmark, Djibouti, Ecuador, El Salvador, Estonia, Finland, France, Germany, Guatemala, Honduras, India, Indonesia, Iran (Islamic Republic of), Iraq, Ireland, Israel, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Lithuania, Luxembourg, Malaysia, Maldives, Malta, Mauritania, Mexico, Monaco, Mongolia, Morocco, Nepal, the Netherlands, New Zealand, Oman, Pakistan, Paraguay, Peru, Philippines, Portugal, Qatar, Republic of Korea, Republic of Moldova, Romania, Senegal, Singapore, Slovakia, Slovenia, South Africa, Sri Lanka, the Sudan, Switzerland, the Syrian Arab Republic, Thailand, Tunisia, the United Kingdom of Great Britain and Northern Ireland, the United States of America, Uruguay, Uzbekistan, Yemen.

## Narrative

From 2010 to 2014, there was an increase of 111% of in the number of Member States reporting having a NITAG meeting all six process indicators (81 versus 37). Despite the short period of time and considering that establishing and strengthening NITAGs is a continuous process, significant progress in the establishment and strengthening of NITAGs has occurred over the past few years. After less progress having been noted the year before, there seems to have been a slight acceleration of progress in 2014, as an additional 20 countries met the six process indicators compared with last year. Although one should be cautious about drawing conclusions from Figure 48, which is indicative only, it is apparent that progress should be accelerated if the target is to be reached in 2020.

As repeatedly emphasized in previous reports, because the proportion of Member States with a NITAG is greater in the more populous Member States than in the less populous ones, the overall proportion of the population supported by a NITAG is substantially greater than the proportion of countries with a NITAG, both at the global and regional levels. In areas where regional engagement has been strong and there have been strong regional Technical Advisory Group (TAG) statements with regard to the need to strengthen NITAGs, rapid progress is being achieved. The participation of NITAG chairs at immunization meetings and regional TAG meeting in most regions and the fostering of exchanges between NITAGs have been received very positively by all and contribute to capacity-strengthening by emulation. Country and intercountry NITAG workshops and meetings organized in the past year have been very successful and will help to accelerate progress.

Despite the progress reported, efforts need to be increased to reach the GVAP indicator of ensuring that all Member States have the support of a fully functional NITAG. Such progress is particularly necessary in the African Region. A major positive development this year has been the organization of the NITAG orientation workshop in May 2015. This workshop, unfortunately long delayed because of the Ebola outbreak, was very successful and highlighted countries' eagerness to move forward, but also the need for support. The Regional Vaccine Action Plan for 2014–2020, endorsed at the November 2014 Regional Committee meeting, stresses the importance of the establishment and strengthening of NITAGs. This plan has the objective of the establishment of NITAGs in 20 countries by the end of 2015 and in 40 by the end of 2020. The European Vaccine Action Plan, endorsed in 2014 by the Regional

Committee, includes strengthening of NITAGs as one of the three key aims.

The MICs Strategy proposed by MICs Task Force and endorsed by the Strategic Advisory Group of Experts (SAGE) in April 2015 lists the strengthening of evidence-based decision-making as one of its four main pillars. It also identified a lead agency and a set of focus activities. When resources have been secured, this should lead to substantial additional support for MICs. Another positive development in terms of NITAG financial support, and one that it is hoped could be adopted by other professional societies, is that the European Society for Paediatric Infectious Disease Board has agreed to include NITAG-to-NITAG visits in its general travel award scheme.

The Gavi Board has approved a framework for its 2016–2020 strategy that recognizes the importance of improving country leadership, management and coordination, which includes NITAG strengthening. Therefore, Gavi is organizing a consultation of stakeholders and major partners to engage them in this process in a manner that is sustainable and builds capacity at country level. Enhancing communication on the possibility of accessing Gavi HSS funds to establish or strengthen NITAGs remains necessary as few, if any, countries have yet used this opportunity.

A special approach has started to allow Member States with small populations to benefit from subregional or other Member States' advisory groups, and it was referred to in last year's report. This approach needs to be accelerated, in particular in the Caribbean islands and the small island nations in the Western Pacific Region, which do not have a large enough population to justify the establishment of a NITAG and/or adequate resources to do so. Discussions on this have been initiated in the Region of the Americas for the Caribbean and in the Western Pacific Region for the Pacific islands Member States but have not yet been brought to fruition and have actually lagged in the Pacific Islands.

Current challenges to the establishment of NITAGs continue to include the need to ensure adequate expertise, independence from the government, transparency of the process, and quality review of the evidence on which recommendations are based. Continuing efforts are needed to ensure that NITAGs develop evidence-based recommendations according to appropriate standards. The absence of systematic declaration of interests by core members remains problematic in some countries owing to historical and cultural influences. This should be easily manageable

although it is currently the limiting factor for several countries whose NITAG would otherwise meet all six specific indicators. Meeting these indicators is only a first step, however, because all committees should continue to be strengthened, and this has to be communicated to countries. Progress on meeting the requirement for indicator quality improvement in the processes of many NITAGs continues, although this remains hard to quantify at global level.

Fostering exchanges between NITAGs is an important way to facilitate support and progress. These exchanges should extend to making evidence available to other groups, such as through public posting of systematic reviews orchestrated by or for NITAGs, but this remains limited. An international meeting took place in Paris, France, from 8 to 9 December 2014 with the aim of defining the content of the collaboration between NITAGs, such as sharing of experiences and operational terms. The meeting stressed the need to establish regional NITAG networks and this has started in some regions, including the Region of the Americas, the Eastern Mediterranean Region and the European Region. The concrete mutualization of work (through real exchange between the NITAGs, e.g. of background documents and data) is still slow to start.

The appointment of liaison members on NITAGs should be encouraged as a way to help build country ownership and facilitate adoption and implementation of recommendations.

Various NITAG-related tools, including training and assessment material, continue to be developed and are accessible on the NITAG Resource Centre (NRC) website, which aims to be a one-stop-shop towards an information and collaborative platform for NITAGs. The new NRC platform was launched on 18 March 2015 and it offers NITAG members and secretariats centralized access to NITAG recommendations from around the world, the background documents used to issue them, systematic reviews, scientific publications, technical reports, updates from partners, and details of upcoming immunization events. A dedicated network manager, backed up by a strong network of regional and national focal points, will proactively update all content. Information is shared through services such as technical newsletters and emails highlighting relevant new recommendations. This is maintained by the WHO Collaborating Centre (4) for evidence-informed immunization policy-making, at the Agence de

Médecine Préventive (AMP), which, together with other partners, represents a resource to help strengthen NITAGs. The WHO Collaborating Centre has received meaningful funding from Gavi and the Bill and Melinda Gates Foundation in 2015 to enhance its activities.

Exploring potential transitions from polio or other vaccine-preventable disease (VPD)-specific TAGs, where they exist, to NITAGs has started and is of particular relevance in the context of the polio endgame strategy, with emphasis on strengthening routine immunization and integration. In some regions, in particular the African Region, the multiplicity of existing vertical committees hinders the establishment of NITAGs.

Functioning NITAGs have proved to have a great impact on immunization programmes. There is no disputing that the intervention of independent committees in many high-income countries may result in faster vaccine introduction and optimization of immunization programmes. It is hoped that NITAGs in low and middle-income countries and middle-income countries may attain similar levels of trust and credibility. In order to achieve the target set for 2020, a set of recommendations for the years to come could be highlighted (5):

- to reinforce NITAGs' institutional integration to promote sustainability and credibility, particularly to withstand political turmoil, and to facilitate financial security;
- to build technical capacity within NITAG secretariats and evaluate performance. Future efforts should focus on building these capacities so that the secretariats have adequate resources to carry out their responsibilities;
- to implement assessments and encourage self-assessments of NITAG performance through their outputs and outcomes;
- to increase networking and regional and bilateral collaboration and tutoring between NITAGs.

Advocacy by the stakeholders involved at national and global levels is necessary to ensure that sufficient time, effort and money are invested. Countries still need to take an active role in establishing and maintaining NITAGs and to investigate innovative mechanisms to sustain funding for NITAGs.

Without an accelerated and joint effort, the GVAP objective of all countries having a functional NITAG by 2020 will not be achieved.



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**Table 27: Analysis of the NITAG 2010 and 2014 JRF data at global level and by WHO region**

Indicator		Region							
		Overall		AFR	AMR	EMR	EUR	SEAR	WPR
Year		2014	Rate of increase between 2010 and 2014 <sup>a</sup>	2014	2014	2014	2014	2014	2014
No. (%) of Member States with NITAG data available/WHO Member States		n = 192/ 194 (99%)	n = 7 (3%)	n = 47/ 47 (100%)	n = 35/ 35 (100%)	n = 21/ 21 (100%)	n = 52/ 53 (98%)	n = 11/ 11 (100%)	n = 26/27 (96%)
Existence of a NITAG	Number of countries	123	27	13	22	20	42	10	16
	% of responding countries reporting the existence of a NITAG	64	23	28	63	95	81	91	62
	% of the entire population covered by existing NITAGs	87	6	34	98	99	67	100	99
Existence of a NITAG with formal terms of reference (ToR)	Number of countries	116	31	13	22	19	39	10	13
	% of responding countries reporting a NITAG with formal ToR	60	31	28	63	90	75	91	50
Existence of a NITAG with a legislative or administrative basis	Number of countries	115	35	13	20	19	40	10	13
	% of responding countries reporting a NITAG with a legislative or administrative basis	60	39	28	57	90	77	91	50
Existence of a NITAG with ≥ five areas of expertise represented	Number of countries	114	46	13	20	18	41	10	12
	% of responding countries reporting a NITAG with ≥ five areas of expertise represented	59	62	28	57	86	79	91	46
Existence of a NITAG which met at least once in 2014	Number of countries	110	28	7	21	19	39	10	14
	% of responding countries reporting a NITAG which met at least once in 2014	57	29	15	60	90	75	91	54
Existence of a NITAG for which the agenda and background documents are distributed ≥ one week prior to meetings	Number of countries	108	26	7	22	17	39	10	13
	% of responding countries reporting a NITAG for which the agenda and background documents are distributed ≥ one week prior to meetings	56	27	15	63	81	75	91	50



Indicator		Region							
Existence of a NITAG whose members are required to disclose conflict of interest	Number of countries	92	35	12	16	16	29	9	10
	% of responding countries reporting a NITAG whose members are required to disclose conflict of interest	48	56	26	46	76	56	82	38
Existence of a NITAG meeting all six criteria above	Number of countries	81	44	7	16	14	27	9	8
	% of countries reporting the existence of a NITAG	66	71	54	73	70	64	90	50
	% of responding countries reporting a NITAG meeting all six criteria above	42	111	15	46	67	52	82	31
	% of the entire population covered by existing NITAG meeting all six criteria above	75	73	20	92	76	43	97	86

<sup>a</sup> The rate of increase in the establishment and functioning of NITAGs during the 2010–2014 period was considered relevant at the global level. Because regions have progressed differently regarding NITAGs before 2010 and during the period assessed, it appeared unfair to specify the rate of progression at regional level because this would have given a flawed picture of national commitments and efforts dedicated to NITAGs.



## 5. VACCINE HESITANCY AND DEMAND FOR IMMUNIZATION

STRATEGIC OBJECTIVE 2: INDIVIDUALS AND COMMUNITIES UNDERSTAND THE VALUES OF VACCINES AND DEMAND IMMUNIZATION BOTH AS A RIGHT AND A RESPONSIBILITY

Vaccine hesitancy: percentage of countries that have assessed the top three reasons for vaccine hesitancy (Indicator SO2.1) and assessments of the level of hesitancy in vaccination at a national or subnational level in the past 5 years (Indicator SO2.2)

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## Highlights

- The high response rate for both indicators reveals the successful implementation and a general acceptance of the indicators.
- Of the countries that submitted the form, 131 (73%) provided at least one reason for vaccine hesitancy (Indicator 1), only 49 (27%) did not answer the question. Of the 131 countries that provided a reason for vaccine hesitancy, 50 (38%) based their response on opinion, 77 (59%) based their response on evidence and 4 (3%) did not specify.
- Fifty-two (29%) countries reported having undertaken an assessment of vaccine hesitancy within the past 5 years, while 84 (47%) reported that no assessment had been undertaken and 44 (24%) did not respond to the question (Indicator 2). More countries in the European Region indicated some form of vaccine hesitancy assessment in 2014 than in 2013 and 2012 (14 (31%) versus 10 (22%) and 8 (17%) respectively). When comparing the number of assessments between regions, it is interesting to note the high proportion of studies completed in the African Region.
- The most frequently mentioned reasons for vaccine hesitancy were related to:
  - risk–benefit issues;
  - knowledge and awareness issues;
  - religion, culture, gender and socioeconomic issues.
- Major issues specifically mentioned were fear of side-effects of the vaccination, lack of knowledge, low perceived risk of vaccine-preventable disease, religious reasons and the influence of anti-vaccination reports.
- Ebola was a major barrier to vaccination this year in the African Region as it has caused major disruptions in health-care services. In addition, it was noted that many people were anxious about visiting health clinics where the risk of transmission was higher.

<b>TARGET</b>	Assess the top three reasons for vaccine hesitancy in the country in the past year to monitor determinants of vaccine hesitancy over time. Monitor the trend in the percentage of Member States that have assessed confidence in vaccination at subnational level
<b>DEFINITION OF INDICATOR</b>	<p><b>Indicator 1: Reasons for vaccine hesitancy</b></p> <ul style="list-style-type: none"> <li>• Question 1: what are the top three reasons for not accepting vaccines according to the national schedule?</li> <li>• Question 2: is this response based on or supported by some type of assessment, or is it an opinion based on your knowledge and expertise?</li> </ul> <p><b>Indicator 2: Percentage of countries that have assessed the level of hesitancy in vaccination at the national or subnational level</b></p> <ul style="list-style-type: none"> <li>• Question 1: has there been some assessment (or measurement) of the level of confidence in vaccination at national or subnational level in the past (&lt;5 years)?</li> <li>• Question 2: if yes, please specify the type and year and provide assessment title(s) and reference(s) to any publication or report.</li> </ul>
<b>DATA SOURCES</b>	All 194 countries within the six WHO regions included both indicators in their 2015 JRF

## Background

As part of the Decade of Vaccines Global Vaccine Action Plan (GVAP), the Strategic Advisory Group of Experts (SAGE) on Immunization Vaccine Hesitancy Working Group was asked to develop indicators that could be used to monitor vaccine confidence and measure how well individuals and communities understand the value of vaccines and demand immunization as both a right and a responsibility. Two proposed indicators were first included in the 2012 WHO-UNICEF Joint Reporting Form (JRF) and pilot-tested in the Region of the Americas and the European Region, as well as during an African immunization managers' meeting. An analysis of the data revealed a suboptimal response rate, prompting the revision of the indicators.

In 2013 the European Region volunteered again to pilot test the revised indicators, now focusing on vaccine hesitancy. The response rate had improved from the previous year.

The GVAP Working Group revisited the indicators in September 2014 and decided to keep these two indicators with a slight alteration i.e. reversing the order of the indicator to ensure that even countries that had not performed an assessment moved on to reporting the three main reasons for hesitancy and towards specifying the time frames for both indicators.

## Results

### INDICATOR SO2.1: REASONS FOR VACCINE HESITANCY

Of the 180 countries that submitted the JRF form, 131 (73%) provided at least one reason for vaccine

hesitancy (Indicator 1), 49 (27%) did not answer the question (Table 28).

**Table 28: Number and percentage of countries that responded to the question on the top three reasons for vaccine hesitancy (Indicator 1) in 2014**

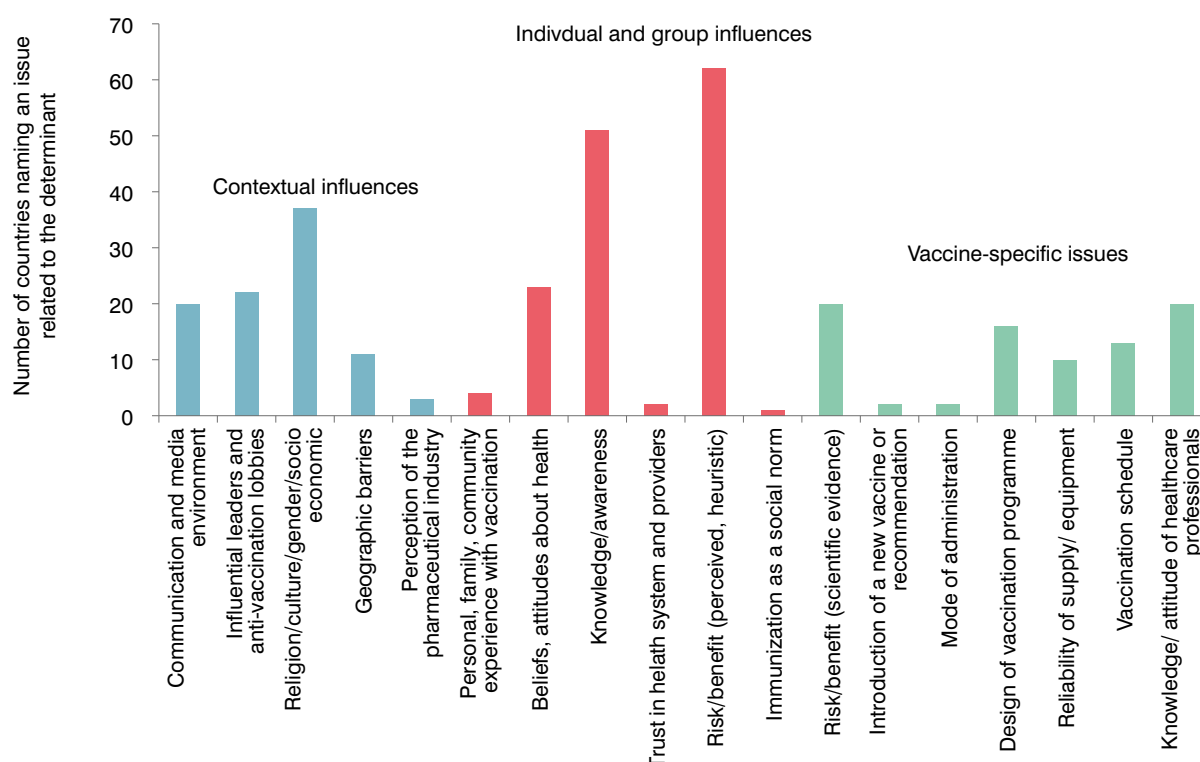
	All regions n (%)	AFR n (%)	AMR n (%)	EMR n (%)	EUR n (%)	SEAR n (%)	WPR n (%)
<b>Reasons given</b>	131 (73)	33 (70)	25 (76)	14 (67)	34 (76)	11 (100)	14 (61)
<b>Question not completed</b>	49 (27)	14 (30)	8 (24)	7 (33)	11 (24)	0 (0)	9 (39)
<b>Total</b>	180	47	33	21	45	11	23

Data from the previous year on reasons for vaccine hesitancy are available only from the European Region. When comparing the response rate in the European Region to that for the pilot test conducted there in 2013, an increase is seen; 76% (34 out of 45 Member States) responded to the question in 2014 whereas only 36% (16 out of 45) responded in 2013.

The data collected for vaccine hesitancy were mapped against the matrix of determinants (1) of vaccine hesitancy which is grouped into three categories: contextual, individual, and group and vaccine/vaccination-specific influences (Figure 49).



**Figure 49: Main themes indicated as top three reasons for vaccine hesitancy for all WHO regions (Indicator 1)**



Twelve (8%) of the 180 countries that submitted the JRF form reported no knowledge of vaccine hesitancy in their population.

The countries were further asked whether these reasons were evidence-based or opinion-based relying on the expertise of the immunization manager. Of the 131 countries that provided a reason, 50 (38%) based their response on opinion, 77 (59%) based their response on evidence and 4 (3%) did not specify.

The reasons for vaccine hesitancy were then categorized by income group (high income versus low and middle income). The response rates were similar for the two groups. Among the high-income countries, 72% (36 of 50) countries provided a response for indicator 1, whereas 28% (14 out of 50) did not answer the question. Among the low- and middle-income countries, 73% (95 out of 130) provided a response for indicator 1, while 27% (35 of 130) did not answer the question. The most common reasons reported for vaccine hesitancy by the high-income countries were:

1. risk/benefit (23%);
2. beliefs, attitudes about health and promotion (15%);
3. religion, culture, gender and socioeconomic factors (8%).

The most commonly reported reasons in the middle- and low-income countries were:

1. knowledge/awareness (18%);
2. risk/benefit (17%);
3. religion, culture, gender and socioeconomic issues (12%).

## INDICATOR SO2.2: ASSESSMENT OF VACCINE HESITANCY

Of the 180 Member States that submitted the JRF, 136 (76%) responded to the second indicator, 44 (24%) did not answer the question.

Of the responding countries, 52 (29%) reported that an assessment of vaccine hesitancy had been completed in their country within the previous 5 years; 84 (47%) reported that no assessment had taken place (Table 29). Fifty-three countries provided assessment title(s) and reference(s) to any publication or report on vaccine hesitancy.



**Table 29: Number and percentage of assessments conducted at a national or subnational level**

	All regions n (%)	AFR n (%)	AMR n (%)	EMR n (%)	EUR n (%)	SEAR n (%)	WPR n (%)
Assessment	52 (29)	21 (45)	3 (9)	3 (14)	14 (31)	5 (45)	6 (26)
No assessment	84 (47)	16 (34)	22 (67)	11 (52)	19 (42)	5 (45)	11 (48)
Question not completed	44 (24)	10 (21)	8 (24)	7 (34)	12 (27)	1 (10)	6 (26)
Total	180	47	33	21	45	11	23

Data from the 2012 and 2013 JRFs are available from the Region of the Americas and the European Region. More countries in the European Region reported some form of vaccine hesitancy assessment in 2014 than in 2013 and 2012 (14 (31%) versus 10 (22%) and 8 (17%)

respectively). However, fewer assessments were reported in the Region of the Americas (3 (9%) versus 7 (20%)) in 2014 vs 2012. A high proportion of all reported assessments in 2014 were completed in the African Region (45%).

## Discussion

In general, it takes approximately 3 years to reach an adequate response rate when a new indicator is introduced. However, the high response rate achieved for both hesitancy indicators across all regions, even from those regions with no prior exposure to the indicators, demonstrates their general acceptance and understanding.

The reversal of the order of the indicators might have contributed to the notable increase in response rate for Indicator SO2.1 in the European Region, which more than doubled (36% versus 76%) between 2013 and 2014.

The majority of reported reasons for vaccine hesitancy related to personal perception of the vaccine or influences of the social and peer environment, followed by vaccine-specific factors. The most frequently mentioned reasons were related to:

1. risk/benefit, such as vaccine safety issues or low perceived risk of vaccine-preventable diseases;
2. knowledge/awareness, such as limited information on the importance of immunization;
3. religious, cultural, gender and socioeconomic factors, such as lack of halal certification of vaccines or anthroposophical beliefs.

Specifically mentioned issues included fear of side-effects of the vaccination, lack of knowledge of vaccination programmes, low perceived risk of vaccine-preventable disease, religious reasons and the influence of anti-vaccination reports. These results indicate a possible disconnect between the medical or scientific community and the general public regarding the safety and benefits of vaccines. This can pose significant problems especially in low-income settings

where lack of reliable programmes, or geographical barriers, may also contribute to under-vaccination.

Limitations of the grouping used for the responses include difficulties in categorizing the brief responses to a given determinant, for example reporting “sick child at vaccination” could be related to a knowledge or awareness issue of the caregiver or to the role of the health-care professional.

Interestingly, four countries reported Ebola as a major barrier to vaccination in 2015. Ebola has contributed to a disruption in health services and many immunization managers reported that people were afraid to access health-care centres where they were at risk of Ebola (2).

When comparing the results across regions, the top three causes of vaccine hesitancy remain relatively common. However, in the Region of the Americas and the Eastern Mediterranean Region, communication and media environment, as well as influential leaders and anti-vaccination lobbies, were often cited. Many immunization managers specifically pointed out the influence of increasing anti-vaccination lobbies and misinformation quoted in the media as a driving influence for vaccine hesitancy. This is especially important as the Region of the Americas and the Eastern Mediterranean Region have seen a re-emergence of some vaccine-preventable diseases (such as measles, mumps and pertussis) despite reliable vaccination programmes. These regions also mention a low perceived risk of disease as a factor contributing to vaccine hesitancy. This can result in lower participation in vaccination programmes, which ultimately leads to negative consequences for the entire community as

many outbreaks in these regions have been attributed to intentional under-vaccination (3).

Overall, the high response rates demonstrate the successful implementation and general acceptance of the two indicators. The data gathered from these indicators highlight issues and differences in factors contributing to vaccine hesitancy across regions and show that vaccine

hesitancy affects all countries regardless of income status. Both indicators help to monitor progress in addressing vaccine hesitancy across the regions.

Efforts are ongoing within the WHO Middle Income-Country Task Force to ensure funding for initiatives providing support to countries facing vaccine hesitancy.<sup>43</sup>

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<sup>43</sup> Meeting of SAGE, April 2015. Sustainable access to vaccines in middle-income countries (MICs): report of the WHO convened MIC Task Force (<http://www.who.int/wer/2015/wer9022.pdf?ua=1>, accessed July 2015).

## STRATEGIC OBJECTIVE 2: INDIVIDUALS AND COMMUNITIES UNDERSTAND THE VALUES OF VACCINES AND DEMAND IMMUNIZATION BOTH AS A RIGHT AND A RESPONSIBILITY

### CASE STUDIES SUBMITTED BY GAVI CSOS CONSTITUENCY

#### Facing the Challenge: Civil Society Organizations Extend Reach of the Health System, Cameroun

In rural Cameroon, where deeply rutted roads wind tenuously through rural forests, distance is measured not in miles, but rather in time. Seeing the poor roads combined with a growing refugee population from neighboring countries and active attacks by armed groups, one can get a sense of the challenges facing those trying to reach the nation's children with vaccinations. In response, the Network of Civil Society Organizations Involved in Immunization Promotion and Health System Strengthening in Cameroon – PROVARESSC by its French acronym – is extending the reach of Cameroon's overstretched health system through a network of 300 civil society organizations mostly working at the district level, using a four-step approach.

**Tier 1:** PROVARESSC organizes *capacity-building trainings* for its members at the regional level using government staff with the national Expanded Program on Immunization (EPI) as trainers to ensure accurate information and consistency in messaging. These members then conduct trainings at the community level two times a year on awareness raising strategies and approaches. PROVARESSC has trained at least one CSO in each of the country's 189 health districts on how to deliver accurate information on immunization and vaccines.

**Tier 2:** PROVARESSC establishes a core group of *grassroots volunteers* in each district that help raise awareness about immunization campaigns. Before any campaign, these volunteers develop a joint action plan with district health officials, spread out into the target community to inform families about the benefits of vaccines and provide details on the upcoming immunization drive. In most places, joint cooperation between the government and civil society

organizations did not exist before, but this is changing as these combined efforts have demonstrated success in increasing the number of children being vaccinated, in some cases by 100%.

**Tier 3:** PROVARESSC recognizes that without its efforts, many communities in the northern region would not have access to immunization. PROVARESSC is working to *close the equity gap* especially in areas where the government system does not reach or where communities are cut off due to high insecurity. In these cases, CSOs are not only educating communities through sensitization campaigns, but also increasing manpower to provide immunizations directly to ensure that every child gets immunized.

**Tier 4:** A core area of the work of PROVARESSC has also been *advocacy and resource mobilization* to expand and sustain its work as well as improve the overall health system. Working closely with the Sabin Vaccine Institute, PROVARESSC has been advocating for a designated line in the national health budget for immunization. The Sabin Vaccine Institute organized meetings with parliamentarians and provided opportunities to PROVARESSC to share the success of its efforts and to articulate the necessity of a specific budget line for immunization. In November 2015, a draft budget will be sent to the Ministry of Public Health for approval before going to the National Assembly.

In a country faced with challenges of infrastructure and security, the extended reach of PROVARESSC is proving invaluable support to Cameroon's immunization program. With more than half of Cameroon's poor living in rural areas, taking a message of immunization to distant communities is critical to preventing disease.

*Source: Adapted from the Gavi CSO country platform project case studies prepared by Catholic Relief Services at the request of the Gavi CSO Steering Committee for the June 2015 Gavi Board meeting; with additional editing from the Cameroon Civil Society Platform for Immunization and Health Systems Strengthening*

## Hand in Hand: Gavi Civil Society Builds a Bridge to the National Immunization Program in India

With an estimated six million children in India under the age of 14, the need for effective immunization is critical. In India, civil society organizations are filling the gaps between the national immunization program and underserved communities. In 2014, the Alliance for Immunization in India (AII), supported by the Gavi CSO country platform project, launched an effort to bring together health-focused civil society organizations in a single, coordinated network that promotes the government's immunization program. AII's goal is to support the government in reaching its targets of 90% immunization coverage at national level and more than 80% coverage at district level. To date, AII has a membership of 180 local-level organizations and partners.

In 2014, AII established a partnership with the government by first explaining the network's goals to government officials and then how it could support the program. With input from the government, AII members surveyed underserved communities in four poorly performing states in the northern part of the country – Bihar, Jharkhand, Uttar Pradesh and Rajasthan. The organizations came back with one unified message: people need more information about the government's immunization program.

Equipped with survey results, AII trained volunteer members to mobilize communities to utilize immunization services. Because volunteers are from the communities in which they work, they understand the communities' needs and challenges. Volunteers fanned out into communities with street performances, media campaigns and films promoting immunization. Through thousands of hours in the field, the civil society organizations worked to overcome the misinformation, ignorance, and cultural practices that hindered immunization efforts across northern India.

Many of AII's members had not previously done a great deal of social mobilization, but their experiences as part of AII's work has made them realize the added value they could have in generating greater demand for immunization. Their work has expanded to not just supporting the national program by tracking children who are due for vaccinations, but also in sensitizing communities to bring their children to health centers to get immunized.

Overall, AII has seen an increase in community awareness of immunization due to the social mobilization efforts of its member organizations.

And while the mobilization efforts have had a significant impact on raising community awareness, the trainings and collective engagement engendered by the AII approach extends far beyond the communities. The capacity of member organizations has increased and improved, and they no longer feel they were working in isolation, but in a united effort towards a single goal. The cohesion among AII members has motivated them to work harder, to open themselves to learning from others and to now work towards a strategy for sustainability.

In December 2014, the Indian government launched a new initiative called *Mission Indradhanush*, a campaign to increase immunization coverage from 65% to 90% by 2020 and to provide vaccines against seven vaccine-preventable diseases free of cost. As evidence of the recognition of its work, AII has been invited to be a partner in the campaign. In India, where the value of community actors is not always recognized, this partnership is a significant sign of progress and one that serves as a model for other countries.

*Source: Adapted from the Gavi CSO country platform project case studies prepared by Catholic Relief Services at the request of the Gavi CSO Steering Committee for the June 2015 Gavi Board meeting; with additional editing from the India Civil Society Platform for Immunization and Health Systems Strengthening*

## A Comprehensive Approach: Civil Society's Advocacy Combined with Grassroots Service Delivery for Increased Immunization Coverage in Malawi

Blessed with bountiful lakes and known by many as the 'Warm Heart of Africa,' Malawi is a country with much to offer. Unfortunately, it is also a country where many people have difficulties in accessing quality health care. In recent years, this unequal access has been further exacerbated by a shrinking national health care budget, which currently stands at 8.8% of the national budget in 2014 down from 14.1% in 2010. Civil society watchdog organizations including the Malawi Health Equity Network (MHEN), a health advocacy platform of more than 40 members working in the country's 28 districts, conducted a situational analysis to document the impact of the reduced health budget on immunization. MHEN's assessment found that as funding dropped, underserved communities struggled to get immunizations for their children and that overall there were many gaps in health service provision and demand creation.

MHEN brought its findings and analysis to the Parliamentary Committee on Health, which used it to lobby the government for an increased health budget. MHEN's evidence that showed that much of the funding



intended for the health sector was being diverted to other projects, a troubling trend in a country where an estimated 68 of every 1000 children born dies before their fifth birthday. When the final budget for 2014-15 was passed, it included a 1% increase for health—a boost of approximately \$17 million, including more than \$2.1 million earmarked specifically for immunization. Inspired by its advocacy success, MHEN is aiming higher for the 2015-2016 budget to get it back on track following years of shrinking budgets.

This time around, MHEN will also be advocating to expand Mother Care Groups into every district in the country. In 2013, MHEN launched the Mother Care Groups, a pilot project being implemented in five of the country's most underserved districts aimed at supporting the national immunization program. The Mother Care Group concept was a simple one: train community-based volunteers to sensitize local residents on upcoming immunization campaigns, follow up with mothers who have missed vaccination appointments and register children under five in their communities. Recruiting women for the teams – 150 members across five districts – made sense in a culture where men are usually busy with businesses and fieldwork, while the women traditionally take care of the house and tend to the needs of children.

In 2014, Mother Care Groups were trained by MHEN to gather and report health data up through the immunization chain – data that district health staff can use to address immunization gaps and inform national immunization policy. The role of Mother Care Groups has now expanded to become a critical link between the real situation on the ground in communities and the government. It was through such reporting that the Mother Care Group convinced the Neno District Health Officer to turn a local meeting place into the Binje Health Post. Now, government health officials use the Binje Health Post to carry out vaccination campaigns. The results have been significant. Before, about 100-200 children in the community were vaccinated each month; that number has now climbed to more than 286 – an increase that government officials attribute directly to the work of the Mother Care Groups.

Civil society in Malawi is demonstrating the critical role it can play in increasing immunization coverage, from its advocacy success to increase the national health and immunization budget to community mobilization and partnership with government to ensure a constantly expanding and improved national immunization program.

*Source: Adapted from the Gavi CSO country platform project case studies prepared by Catholic Relief Services at the request of the Gavi CSO Steering Committee for the June 2015 Gavi Board meeting in June 2015; with additional editing from the Malawi Civil Society Platform for Immunization and Health Systems Strengthening*

## Taking Charge: Community Systems Filling Gaps in the Health System to Deliver Immunizations in Pakistan

### Basic Development Needs Nowshera (BDN)

In the remote villages of Nowshera District, Khyber Pakhtunkhwa Province in Pakistan, the civil society organization, Basic Development Needs (BDN), works to increase demand for maternal and child health services, and to strengthen the availability of high-quality health services. To do this, BDN used Gavi support to first establish two maternal and child healthcare centers which are now being supported through small service fees and community donations. These centers are located in areas where there are no government facilities. Combined these centers serve the needs of 250,000 people.

BDN's model is grounded in community ownership. It established a network of village development committees that comprise teachers, students and lady health workers – all volunteers dedicated to helping their communities stay healthy. They work with household-level clusters of 15 to 50 households to identify needs and plan and carry out local initiatives, thereby ensuring that interventions are tailored to the unique needs of each of the target villages.

BDN recognizes the importance of coordinating with and complementing the activities of district authorities. BDN works closely with the district Department of Health to provide vaccination and pharmacy services. The district Department of Health provides BDN with technical materials for staff training, and ensures a continuous supply of vaccines in high-risk and inaccessible areas. In return, the BDN network of community volunteers, vaccinators, and lady health workers identify missed and default children making it possible for the government immunization program to have accurate data – and to act on it to ensure no child is missed. The district government now uses one BDN center to carry out routine immunization campaigns, including the campaign to eradicate polio. As a result, hundreds of children are vaccinated each month.

### Sherhi Ijتماعي Taraqiyati Council (SHATAC)

The story of the evolution of civil society organization, Sherhi Ijتماعي Taraqiyati Council (SHATAC) in Pakistan, is one of individual motivation turned into action and community empowerment. It all started with one man's idea of asking community members to pool a small amount of flour each day to distribute to the needy. This simple act then turned into deeper support to cover school fees for students and small stipends for orphans and widows. In 1992, SHATAC took on the health needs of its community by establishing a clinical lab. Over time, SHATAC added an ambulance service, a maternity home, a health center, a maternal and child health care unit, and a pharmacy.

Today SHATAC's holistic approach is reaching 1.4 million people in Mandi Bahauddin District, Punjab Province, Pakistan with health, education and poverty alleviation services. SHATAC sustains itself by charging minimal fees, and for those unable to pay, charges no fees at all for services and medication. These fees have allowed it to continue to operate.

SHATAC works closely with the district Department of Health to ensure routine immunization. In 2014, SHATAC used government-provided vaccines to vaccinate more than 2,000 children who were at risk of being missed.

*Source: Adapted from the Gavi CSO country platform project case studies prepared by Catholic Relief Services at the request of the Gavi CSO Steering Committee for the June 2015 Gavi Board meeting; with additional editing from the Pakistan Civil Society Platform for Immunization and Health Systems Strengthening*





The image shows an open notebook with a grid pattern. The left page has handwritten text in a non-Latin script, possibly Thai. The right page contains handwritten numbers and dates, such as '11/01/11', '25/12/11', and '14/11/11'. A hand is visible on the right side, holding a blue pen or pencil, poised to write.

## 6. SURVEILLANCE

### STRATEGIC OBJECTIVE 4: STRONG IMMUNIZATION SYSTEMS ARE AN INTEGRAL PART OF A WELL-FUNCTIONING HEALTH SYSTEM

#### Indicator SO4.4: Number of countries with case-based surveillance for vaccine-preventable diseases: invasive bacterial vaccine-preventable and rotavirus disease surveillance



#### Highlights

- Case-based sentinel hospital surveillance for meningitis, pneumonia and sepsis is now being received at WHO HQ from all six regions.
- An online data management tool is in development and is currently being piloted. This tool will facilitate the case-based data collection, entry and analysis at the sentinel site and also the consolidation of data at the WHO HQ level.
- Pilot testing of integrated typhoid surveillance at four IB-VPD surveillance sites (two each in Africa and Asia) is under way and the selection of sites and initiation of surveillance is expected before the end of 2015.

<b>TARGET</b>	75% of low- and middle-income countries for sentinel site surveillance by 2020
<b>DEFINITION OF INDICATOR</b>	The number of countries that report conducting case-based surveillance, including laboratory confirmation for rotavirus and invasive bacterial vaccine-preventable diseases (IB-VPD), at one or more hospital-based sentinel sites, the data from which are included in WHO databases
<b>DATA SOURCES</b>	Data reported annually through the WHO-UNICEF joint reporting form (JRF); and Data reported by sentinel sites participating in a WHO-coordinated surveillance network



# 1. Overview of the WHO-coordinated sentinel hospital surveillance networks, 2008–2014

## 1. 1 2008–2012

In 2008, WHO brought together existing regional surveillance networks to establish standardized global sentinel hospital surveillance networks for rotavirus disease and invasive bacterial vaccine-preventable diseases (IB-VPD). The main objectives of the network are to:

1. provide data for describing disease epidemiology, including disease burden estimates;
2. establish a platform to measure impact of vaccine introduction;
3. identify circulating serotypes of genotypes of the principal vaccine-preventable pathogens;
4. assess disease trends;
5. monitor changes in circulating strains; and
6. increase use of the platform to document vaccine effectiveness.

From 2008 to 2012, WHO provided managerial oversight, technical assistance to countries, and financial support to Gavi-eligible countries for surveillance activities. WHO also established networks of sentinel hospitals and national laboratories supported by regional

and global reference laboratories and launched an annual external quality assessment (EQA) programme that targeted participating laboratories; developed a standardized protocol for sentinel site assessments; provided technical advice and laboratory supplies to sites; and shared data semi-annually via a global surveillance and information bulletin.<sup>44</sup>

By 2012, the Global Rotavirus Surveillance Network (Figure 50 and Figure 51) had expanded to 178 sentinel surveillance sites in 60 countries (72% Gavi-eligible) and the Global IB-VPD Network had grown to 150 sentinel sites in 58 countries (79% Gavi-eligible).

## 1.2 Strategic review of the networks, 2013

In 2013, WHO, under the oversight of the internal technical advisory group (iTAG) and with technical partner guidance, conducted a strategic review of the surveillance network. The outcomes and recommendations from this review, which were endorsed by the Strategic Advisory Group of Experts (SAGE), were reported in GVAP Secretariat Report 2014 (1).

# 2. Implementing recommendations from the strategic review, 2014–2015

In response to the recommendations made in the review the following key actions have been completed or are on track:

- i. Surveillance network objectives were revised to correspond to the evolving demands and objectives of the surveillance data.
- ii. Case-based data reporting was established for five regions and all six WHO regions report quarterly data to WHO Headquarters.
- iii. An online data management tool to facilitate data collection, entry and analysis has been developed and is currently being piloted in one region.
- iv. Surveillance protocols are being revised to facilitate case-based reporting and linking of all clinical and laboratory data.
- v. Regular monitoring of sites and laboratories through standard process and performance indicators has begun.

- vi. Surveillance funds and resources were targeted to sites meeting minimum data and performance quality standards (i.e. that report 12 months a year and have at least 100 meningitis or 500 meningitis, pneumonia and sepsis cases), to focus the limited resources.
- vii. Pilot testing of integrated typhoid surveillance at four IB-VPD surveillance sites (two each in Africa and Asia) is under way and the selection of sites and initiation of surveillance is expected before the end of 2015.

Work on two recommendations has not yet begun:

- i. Specimen sharing with the Regional Reference Laboratories (RRL) among the 71 target hospitals was deemed not to be feasible by April 2015 because of limitations of RRL capacity and of human and financial resources required (for packing, transporting and storing frozen cerebrospinal fluid (CSF).

<sup>44</sup> [http://www.who.int/immunization/monitoring\\_surveillance/resources/NUVI/en/](http://www.who.int/immunization/monitoring_surveillance/resources/NUVI/en/)

- ii. Studies of surveillance costs to help strengthen in-country support of the network and improve sustainability were deferred because of staff transition in country and at WHO Headquarters.

### 3. Comparison of SO4.4 indicator and target with strategic review recommendations

In 2014, SAGE accepted a change in the indicator and target for SO4.4, which was amended to read as follows:

- Number of countries meeting established surveillance standards with case-based surveillance for vaccine-preventable diseases and with viral and bacterial laboratory confirmation of suspect or probable cases.
- Seventy-five per cent of low- and middle-income countries have sentinel hospital surveillance that meets surveillance standards for rotavirus diarrhoea or other national priority vaccine-preventable diseases.

WHO monitors the performance of sites globally each quarter when data are reported, and regional offices are given an in-depth report of sentinel site performance. The report includes the value and grade for each of the 15 rotavirus and 15 IB-VPD process and performance indicators. Sites are only given an overall grade of green, yellow or red when data for one full calendar year are available.

The surveillance standards for the IB-VPD sentinel surveillance sites (Table 30) are as follows.

- Green (on track):
  - reports data for all 12 months in the calendar year;
  - enrolls more than 100 suspect meningitis (tier 1) or more than 500 suspect meningitis, pneumonia and sepsis cases (tier 2 and tier 3);
  - more than 90% of suspect meningitis cases (tier 1) or more than 75% of suspect meningitis, pneumonia and sepsis cases (tier 2 and tier 3) have a specimen (CSF or blood) collected; and
  - the sentinel hospital laboratory (or laboratory that processes surveillance specimens) passes the external quality assessment (EQA).
- Yellow (at risk):
  - reports data for 12 months in the year;
  - enrolls more than 100 suspect meningitis (tier 1) or more than 500 suspect meningitis, pneumonia and sepsis cases (tier 2 and tier 3); and
  - meets one additional performance indicator.
- Red (off track):
  - does not meet green or yellow criteria.

**Table 30: Summary of the grading of IB-VPD sentinel surveillance sites in the WHO network for 2014**

IB-VPD site grade	AFR		AMR		EMR		EUR		SEAR		WPR		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
On track	13	29	0	0	4	36	0	0	0	0	1	5	18	16
At risk	7	16	6	33	3	27	0	0	4	67	1	5	21	19
Off track	25	56	12	67	4	36	12	100	2	33	17	90	72	65
<b>Total</b>	<b>45</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>11</b>	<b>100</b>	<b>12</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>19</b>	<b>100</b>	<b>111</b>	<b>100</b>

In total, only 18 (16%) of IB-VPD sites met the standards for surveillance in 2014 (Table 31). When considering only the sites that received targeted support (financial and technical resources), this increased to 25% of sites. The yellow criteria were met by 29% and the red criteria by 26% of targeted sites.

The surveillance standards for the rotavirus disease sentinel surveillance sites (Table 31) are as follows.

- Green (on track):
  - reports data for all 12 months in the calendar year;
  - enrolls more than 100 suspect rotavirus cases; and
  - meets three additional performance indicators.
- Yellow (at risk):
  - reports data for all 12 months in the calendar year;
  - enrolls more than 100 suspect rotavirus cases; and
  - meets two additional performance indicators.
- Red (off track):
  - does not meet green or yellow criteria.

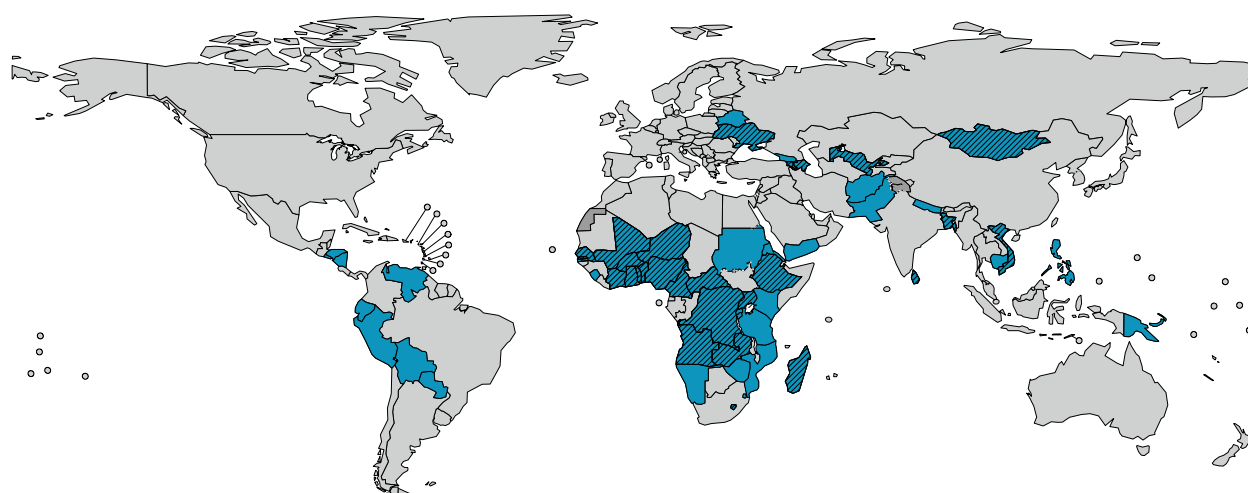
**Table 31: Summary of the grading of rotavirus sentinel surveillance sites in the WHO network for 2014**

Rotavirus site grade	AFR		AMR		EMR		EUR		SEAR		WPR		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
On track	15	28	11	79	10	91	0	0	2	18	8	53	46	40
At risk	4	8	0	0	0	0	0	0	0	0	1	7	5	4
Off track	34	64	3	21	1	9	10	100	9	82	6	40	63	55
<b>Total</b>	<b>53</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>11</b>	<b>100</b>	<b>10</b>	<b>100</b>	<b>11</b>	<b>100</b>	<b>15</b>	<b>100</b>	<b>114</b>	<b>100</b>

In total, only 46 (40%) of Rotavirus sites met the standards for surveillance in 2014 (Table 2). The yellow criteria were met by 4% and the red criteria by 55% of targeted sites.

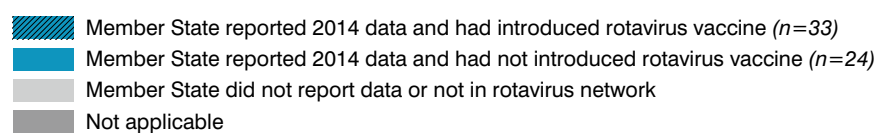
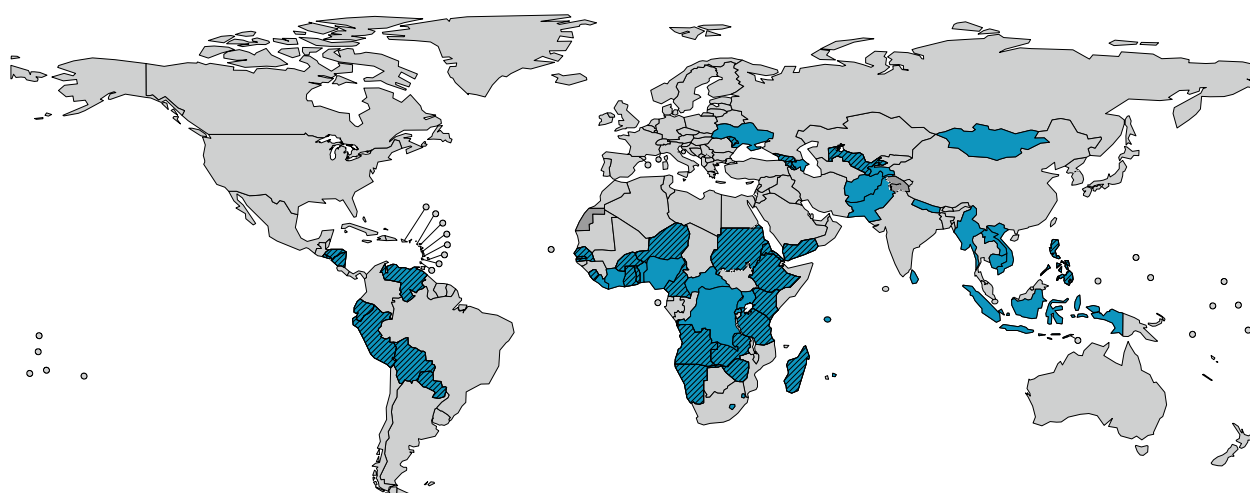
The performance data have been shared with the sentinel sites. Follow-up discussions with the sentinel sites have indicated the need to review and revise

some of the performance indicators, e.g. prioritization of laboratory tests to be performed on CSF, based on volume of sample available and cost-effectiveness considerations by some sites have led to them receiving lower performance scores even though the overall performance of the site in terms of the data generated seemed to be reasonably good. The performance indicators will be reviewed, and revised if required.

**Figure 50 : WHO Member States reporting data to the Global Invasive Bacterial Vaccine-Preventable, Diseases Surveillance Network, 2014**

- Member State reported 2014 data and at least one site with WHO focused support ( $n=27$ )
- Member State reported 2014 data ( $n=28$ )
- Member State did not report data or not in IB-VPD network
- Not applicable

Map production: Immunization Vaccines and Biologicals (IVB), WHO.  
Source: WHO/IVB Database as of 17 July 2015.

**Figure 51: Member States reporting data to the Global Rotavirus Surveillance Network, 2014**

Map production: Immunization Vaccines and Biologicals (IVB), World Health Organization.  
Source: WHO/IVB Database as of 17 July 2015.

## Reference

1. Global Vaccine Action Plan monitoring, evaluation & accountability: Secretariat annual report 2014. Geneva: World Health Organization; 2014 ([http://www.who.int/immunization/global\\_vaccine\\_action\\_plan/gvap\\_secretariat\\_report\\_2014.pdf](http://www.who.int/immunization/global_vaccine_action_plan/gvap_secretariat_report_2014.pdf), accessed 27 August 2015).







## 7. STOCKOUT, PQS, CTC AND USE OF ASSURED QUALITY VACCINE

### STRATEGIC OBJECTIVE 5: IMMUNIZATION PROGRAMMES HAVE SUSTAINABLE ACCESS TO PREDICTABLE FUNDING, QUALITY SUPPLY AND INNOVATIVE TECHNOLOGIES

#### Indicator SO 5.1: Percentage of doses of vaccine used worldwide that are of assured quality



#### Highlights

##### 2015

- In early 2015, Russia's National Regulatory Authority (NRA) was declared non-functional and its reassessment is due by the end of 2015. WHO hopes to restore the Russian (NRA) to functionality by end of 2015 or early 2016.
- In June 2015, Viet Nam was assessed and declared to have a functional NRA following intensive and accelerated implementation of its road map and institutional development plan initiated in 2013.
- Viet Nam will develop its road map for vaccine prequalification by the end of 2015.

##### 2014

- The percentage of assured quality vaccines used in national immunization programmes was sustained as for 2013. Globally, 98% of the total vaccine doses used globally in all national immunization programmes are of assured quality.
- All vaccines used by national immunization programmes are produced in 43 Member States,

of which 36 have a functional assessed national regulatory system, as monitored by WHO.

- Domestic manufacturers in Mexico and Bangladesh have developed a road map supported by the regulator to invest in potential vaccines to be prequalified.
- Major vaccine suppliers, China and India, have continued to increase significantly their investment in order to sustain and expand their prequalified products.

##### 2013

- The first vaccines were prequalified from China in October 2013 and the successful reassessment of the China Food and Drug Administration (CFDA) opened and supported the pathway for more vaccines to be prequalified from China in the coming 5 years.
- An accelerated road map and Institutional Development Plan (IDP) has been developed for Viet Nam to have a functional NRA by end of 2014 or early 2015.

<b>TARGET</b>	<b>100% of vaccine doses by 2020</b>
<b>DEFINITION OF INDICATOR</b>	<p>The proportion of vaccine doses used globally by national immunization programmes that are of assured quality.</p> <p>Vaccines of assured quality include vaccines produced in a country with a functional national regulatory authority (NRA), including vaccines prequalified by WHO (see below)</p>
<b>DATA SOURCES</b>	<p>WHO database of prequalified vaccines</p> <p>WHO-UNICEF joint reporting forms (JRFs) (for number of doses used)</p> <p>WHO assessments of NRAs</p> <p>Additional information from vaccine manufacturers, NRAs and national control laboratories, and national immunization programmes</p>

## A note on defining vaccines “of assured quality”

For a definition of this terminology please refer to last year’s report (1).

## Data sources, availability and quality

No additional information was available at the time of the current report; please refer to last year’s report (1).

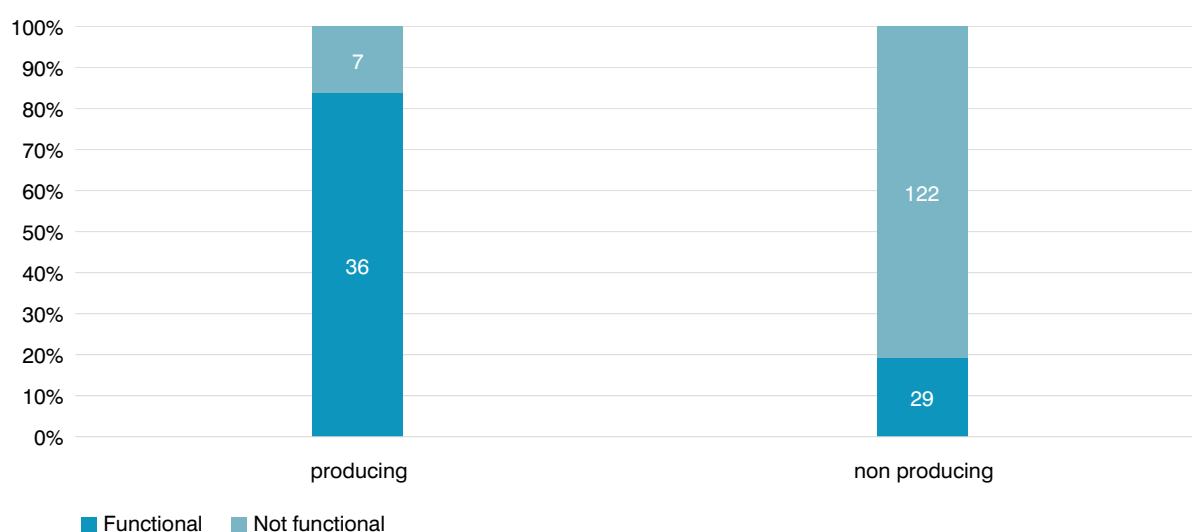
## Results

As of June 2015, WHO reported the number of vaccine-producing countries (according to the WHO definition<sup>45</sup>) as 43 countries producing human vaccines, of which 36 had functional NRAs, as assessed by WHO (Figure 52). 24 of the vaccine-producing Member States were producing one or more WHO-prequalified vaccines by the end of 2014.

In terms of global population, there was no significant change as 69% (4.77 billion people) still live in the 65 countries, both vaccine-producing and non-producing, where there is direct oversight by a functional NRA. However, Figure 53 shows that even in the remaining countries without functional NRAs, where 31% of the world’s population lives, people have access to WHO-prequalified vaccines through their national immunization programmes, as the vaccines offered are produced in countries with functional NRAs.

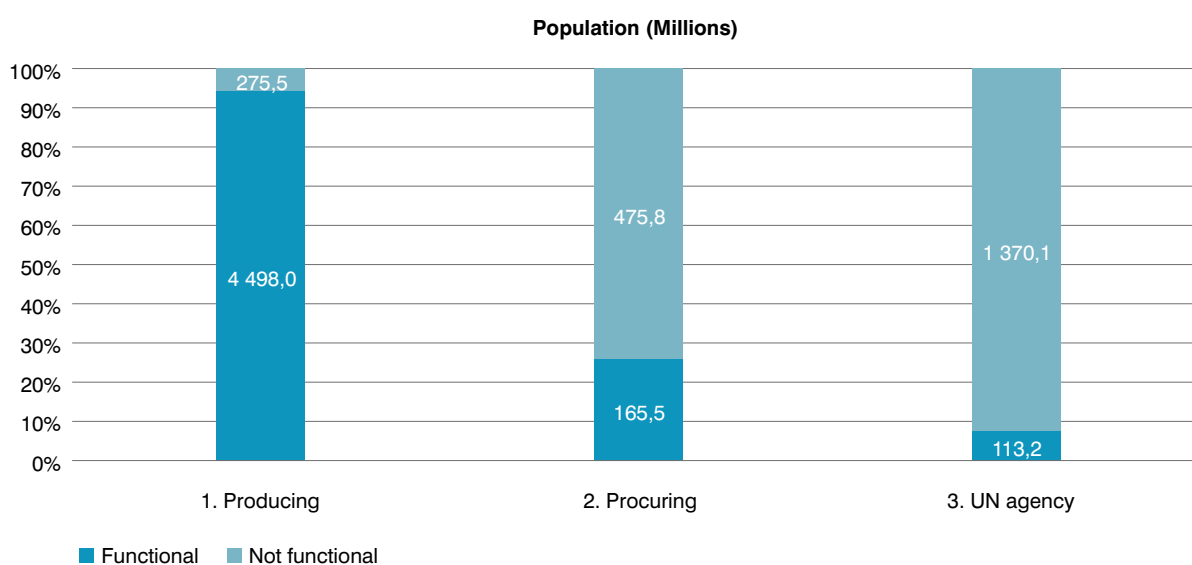
<sup>45</sup> WHO has defined “vaccine producing country”. WHO considers that a human vaccine producing country is a country that is able to produce at least 5% of national human vaccine demand. However this definition will be amended at the next informal consultation of experts planned in November 2015.

**Figure 52: Number and percentage of Member States (vaccine-producing and non-producing) with an NRA assessed as functional as of June 2015**



World Health Organization/RSS/HIS, as of June 2015

**Figure 53: Proportion of the global population living in countries with functional regulatory oversight for vaccines in 2015**



World Health Organization/RSS/HIS, as of June 2015

1. Producing: Main source of vaccine is producing

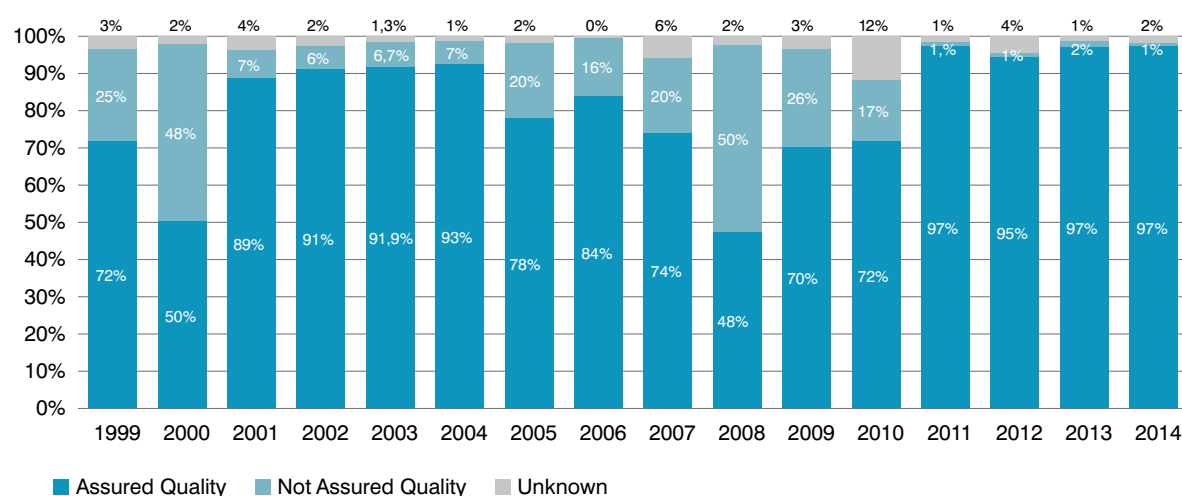
2. Procuring: Main source of vaccine is self-procurement

3. UN Agency: Main source of vaccine is procuring through a UN agency

Overall, 97% (same figures as for 2013) of the global doses of vaccines used in national immunization programmes are of assured quality (Figure 54). This is well on the way to meeting the target, which is that 100% of vaccine doses used by national immunization programmes are of assured quality by 2020.

WHO expects Russia's NRA to become functional by the end of 2015. Viet Nam has now been functional since June 2015 and Bangladesh's NRA by the end of 2018. This will bring us close to the 100% dose of assured quality expected to be used into national immunization programmes at least 10 years before the target date.

**Figure 54: Percentage of assured (dark blue) versus non-assured (light blue) quality vaccines used worldwide, 1997–2014**



Source: World Health Organization/Essential Medicines and Health Products, as of May 2015  
Doses of vaccines reported mainly from country's lot release and WHO/UNICEF Joint Reporting Form (JRF).

In 2015, Viet Nam celebrated achieving a functional NRA after putting a lot of effort into implementing its Institutional Development Plan.

In 2014, upon reassessing Russia, its NRA was reported to be nonfunctional. Some effort will be required to regain its functionality status.

Since 2009, India and China – two Member States with large populations and large capacity to produce different types of vaccines – have accelerated their efforts to strengthen their regulatory oversight for vaccines. India – one of the world's major suppliers of prequalified vaccines – already had a functional NRA by 2009. China's NRA became functional in early 2011 and Mexico more recently in early 2014. Mexico's current vaccine production, however, does not have a significant impact on the doses of assured quality vaccines. Both China (all types of vaccines) and Mexico (hepatitis B, polio and influenza and quadravalent or pentavalent vaccines) may contribute to increasing the availability of prequalified vaccines. Continuous efforts by these two Member States to meet the highest quality standards have been documented through reassessment conducted in China (April 2014) and Mexico (March 2014) and reflect strong commitments by their respective governments and NRAs. This commitment has involved a massive recruitment of regulatory staff in CFDA and substantially increased budgets (totaling US\$ 500 million to US\$ 1 billion in both countries) between 2008 and 2012.

Moreover Mexico, through its NRA (COFEPRIS), has also invested in a risk management approach, including improving its pharmacovigilance system

and its regulatory inspections. The system is 100% self-funded through the fees system and has considerable managerial autonomy as well as a long-term vision and clear goals to sustain the regulatory system as a Pan-American Health Organization (PAHO) reference NRA.

Both China and Mexico have committed to additional support for their NRAs in their national five-year strategic plans. CFDA is now engaged, through a declaration of intent, with WHO in another long-term expansion of its regulatory functions to cover medicines, medical devices, blood, traditional medicines and food safety management.

WHO's primary priority efforts as indicated in the previous report is still targeting different groups (high-risk, medium-risk and low-risk). As matter of fact most of these priority countries are non-functional vaccine-producing countries that may have a significant impact on global supply. Russia and Viet Nam, which produce significant volume of vaccines, could have constituted a risk for securing assured global supply of vaccines as their respective NRAs' loose functionality (Russia in 2015) or lack of functionality (Viet Nam until June 2015).

However Viet Nam's NRA was declared functional in June 2014 and it is expected that Russia's NRA will become functional by the end of 2015. Another risk group are the countries that have the potential to develop their local production and/or where major investments have been made by the vaccine industry and/or the government in specific vaccines, such as



influenza. This applies to Argentina, Bangladesh, Iran, Romania, Serbia and Ukraine.

Moreover, there are countries potentially at risk of not being reassessed as functional. These include India (where some 33 generic medicines were suspended from the European Union market and this may have an impact on vaccine regulation), Senegal (slight progress and difficulties in sustaining performance) and Egypt (changes in regulatory policy may affect functionality).

Finally, there is a group of countries that are producing vaccines but are having difficulties in sustaining their production, namely, Egypt, Iran, Pakistan, Myanmar, Venezuela and Tunisia.

WHO's second priority is to guide other NRAs to build up their regulatory system through a decentralized approach, or to assist NRAs to delegate or develop the recommended regulatory functions by relying on another functional NRA, assisted by WHO regional offices of Center of Excellence (CoE).

## References

1. Global Vaccine Action Plan monitoring, evaluation & accountability: Secretariat annual report 2014. Geneva: World Health Organization; 2014 ([http://www.who.int/immunization/global\\_vaccine\\_action\\_plan/gvap\\_secretariat\\_report\\_2014.pdf](http://www.who.int/immunization/global_vaccine_action_plan/gvap_secretariat_report_2014.pdf), accessed 27 August 2015).



## INDICATOR SO 5.2: AVAILABILITY OF VACCINES FOR ROUTINE IMMUNIZATION AT NATIONAL LEVEL (STOCKOUTS)



### Highlights

- Fifty countries reported a total of 110 national-level stockout events for at least one vaccine and for at least one month.
- On average, these 50 countries experienced at least two stockout events during 2014, and these events lasted for almost 2 months – 53 days on average.
- 40% of the national stockouts concerned diphtheria–tetanus–pertussis (DTP) or DTP-containing vaccines with hepatitis B (HepB) or *Haemophilus influenzae* type b (Hib).
- Compared to a year earlier, fewer countries reported national stockout even if the cumulative number of stockout events between 2013 and 2014 was about the same. However, the average duration of a national-level stockout significantly increased compared to a year earlier.
- The incidence of national stockout of vaccines is concentrated primarily in middle-income countries of the Americas (that suffered shortages of oral polio vaccine (OPV) and DTP-containing vaccine), and low-income countries in east and southern Africa (that mainly suffered shortages of bacilli Calmette–Guérin ((BCG)).
- National level stockouts of vaccine occur in countries of all income groups. Yet, middle-income countries represent 60% of the 50 countries reporting national vaccine stockout in 2014.
- A greater number of upper- and higher-income countries reported national-level stockouts in 2014 than in 2013. The opposite trend is seen for low- and lower-middle-income countries.
- The new stockout indicators for 2014 shed light on the situation and impact at subnational levels.
- 44 countries reported district-level stockouts. In 38 of these countries, the district-level stockout was caused by the national-level stockout.
- More concerning however, is that in 33 countries (or 86% of countries with a district stockout) the district-level stockouts led to an interruption of vaccination services. How this then impacted on immunization performance and coverage is unclear.
- While the sub-level stockout indicators provide valuable insights, the magnitude of the problem is difficult to gauge without an understanding of how many districts (for each country reporting district stockouts) were affected.

<b>TARGET</b>	Two thirds reduction in countries reporting national level stockouts by 2020 (from 2010 level)
<b>DEFINITION OF INDICATOR</b>	Number of countries reporting a national-level stockout of a least one vaccine for at least 1 month <sup>a</sup>
<b>DATA SOURCES</b>	WHO-UNICEF joint reporting forms (JRFs)

<sup>a</sup> A stockout event is defined as taking place when a stockout of a vaccine occurred for a duration of at least 1 month at national level. This indicator is a proxy measure for a stressed immunization supply chain system – a shortage of vaccines at national level is not a desirable situation and indicates that recommended 3-month safety stocks have been depleted and vaccine availability for lower levels of the system could be compromised. If a stockout in one country is reported for two vaccines, these would be considered as two stockout events for that country. Note that events are defined by antigen. In the case of one national stockout of pentavalent vaccine, we would consider that several antigens of that one vaccine are facing a stockout. As such, the number of events is adjusted by antigen. To improve cross-country comparisons, the analysis focused on selected vaccines common to all national immunization schedules. These include: BCG; DTP and measles-containing vaccines (e.g. DTP-HepB-Hib or (measles, mumps and rubella (MMR)); and polio (ex: OPV and/or inactivated polio vaccine (IPV)).

For more information on the definitions, methods and data sources, please consult the 2014 GVAP Secretariat Report (1).

## National-level stockouts – situation in 2014

Of the 194 Member States, 50 (or 26% of countries) reported experiencing a national-level stockout in 2014, for at least one vaccine and for at least 1 month (Table 32). This represents a slight improvement of the situation in 2013 when 54 (or 28% of countries)

had reported national-level stockouts. Compared to the baseline in 2010, this implies that the incidence of stockouts has dropped by 25%, which indicates good progress towards the target of two thirds reduction by 2020.

**Table 32: Summary statistics for countries reporting at least one national level stockout event<sup>a</sup>**

	2014	2013	2012	2011	2010
Total number of countries reporting stockouts	50	54	57	66	67
% countries reporting stockouts	26	28	29	34	35
Total number of stockout events	110	111	120	148	153
% of stockout events <sup>b,c</sup>					
<i>BCG vaccine</i>	25	32	34	28	33
<i>DTP-containing vaccines</i>	40	35	42	45	47
<i>Measles-containing vaccines</i>	14	14	9	14	7
<i>OPV/IPV vaccines</i>	21	18	15	13	13
Average number of stockout events <sup>c</sup>	2.20	2.06	2.11	2.24	2.28
Average duration of a stockout event (days) <sup>c</sup>	52.7	32.0	34.0	35.3	45.2

<sup>a</sup> For BCG and DTP, measles- and polio-containing vaccines.

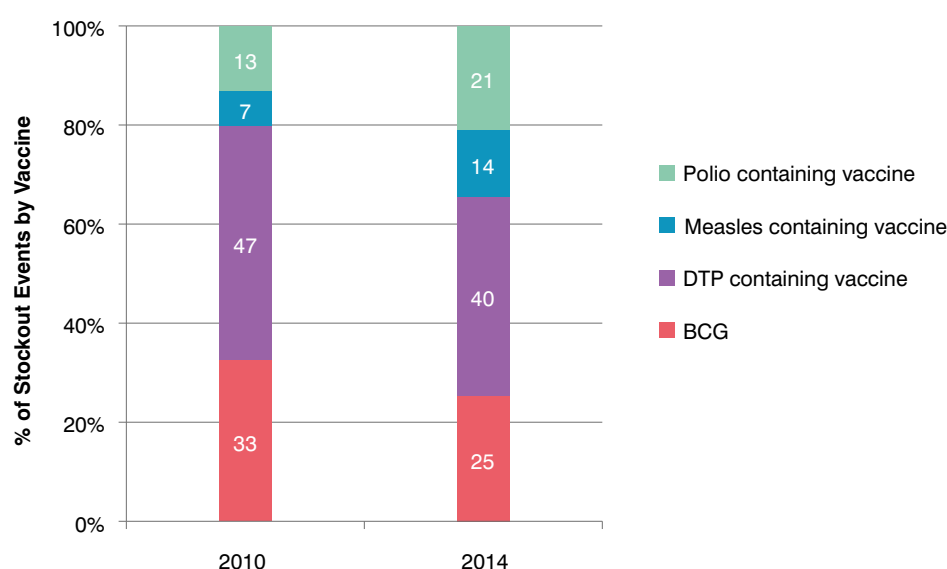
<sup>b</sup> Some countries reported multiple stockouts in a given year, which is why this number is higher than the number of countries reporting stockouts.

<sup>c</sup> For countries reporting stockouts.

A single stockout event is more often the exception than the rule. For countries reporting national-level stockouts, multiple events occur within a reporting year (separate stockout events in the same year for different vaccines). The number of stockout events in 2014 in the 50 countries concerned totalled 110. In other words, in the countries reporting stockouts in 2014, an average of 2.2 stockout events was estimated. This is a slight deterioration compared to the situation a year earlier when 2.06 stockout events a year occurred on average. In addition, the average duration of a stockout event was estimated at approximately 53 days – a significant increase in the average duration of a stockout event and the highest since the 2010 baseline of 45 days.

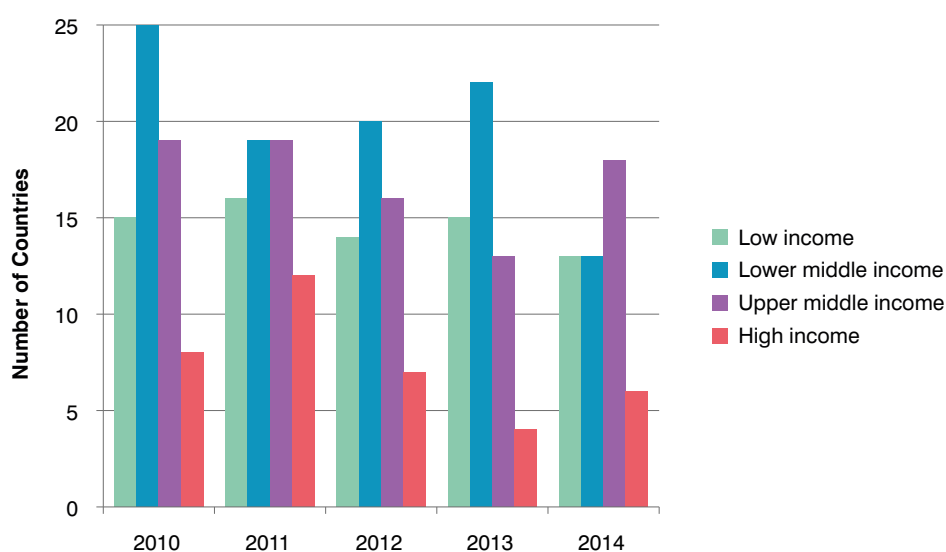
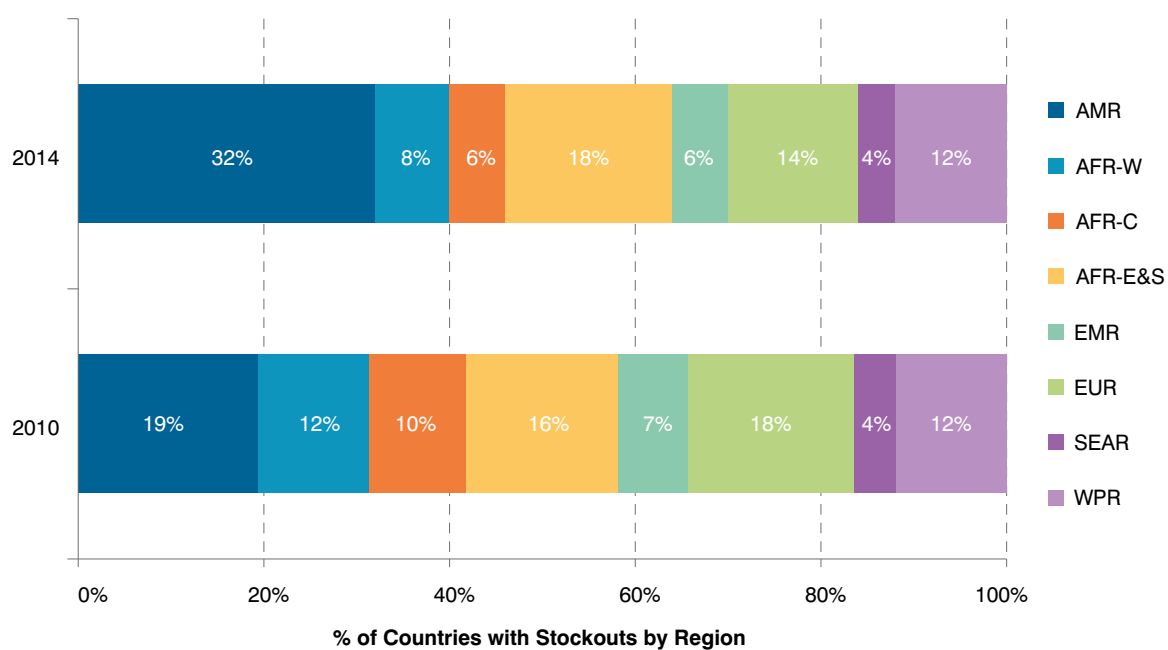
A deeper analysis by vaccine indicates that shortages of DTP-containing vaccine (including HepB and

Hib) represent 40% of the stockout events reported in 2014 (Figure 55). Interestingly, the same set of DTP-containing vaccines had the longest average stockout duration. Given the recent constraints on supply of BCG one would have expected that this vaccine would be more prone to national-level stockouts and possibly for longer durations. That said it may be that the impact of the constrained global supply of BCG will not be seen until the 2015 information from the joint reporting form becomes available. It has to be noted that as the information on global supply of DTP-containing vaccines is not available for this analysis, it does not allow an understanding of the global supply situation, and so whether the global shortages in the supply were the reasons behind the shortages of DTP-containing vaccine reported by countries in 2014.

**Figure 55: Proportion of national level stockout events by vaccine (2010 and 2014)**

<sup>A</sup> review of the typology of countries reporting national-level stockouts of vaccines in 2014 reveals the following.

1. **The incidence of national stockout of vaccines is concentrated in middle-income countries of the Americas and low-income countries of east and southern Africa (Figure 56, Figure 57, Figure 58 and Table 33).** Of all countries reporting national-level stockouts, 32% are in the Region of the Americas and 18% in the east and southern parts of the African Region. The vaccines most affected by stockouts in the Americas were OPV and DTP-containing vaccines. For east and southern Africa, the vaccine most affected by stockouts was BCG. Whereas the situation in the Americas had deteriorated since 2013, it had improved in east and southern Africa.
2. **National-level stockouts of vaccine occur in countries of all income groups with middle-income countries being the group of countries that report the majority of stockout events – 60% of stockout events occurred in lower- and upper-middle-income countries.** Interestingly, more upper-middle-income and high-income countries reported stockouts in 2014 than had done so a year earlier – the trend is reversed for low- and lower-middle-income countries. BCG vaccine accounted for most of the stockout events in low- and high-income countries whereas middle-income countries primarily had stockouts of DTP-containing vaccine and OPV.
3. **Close to 63% of countries that reported national-level stockout have medium to large birth cohorts.** If national-level stockouts do lead to subnational stockouts and interruption in vaccination service, the impact will be greater knowing that medium to large birth cohort countries are most prone to vaccine stockouts.

**Figure 56: Number of countries with national-level stockout by income group (2010 and 2014)****Figure 57: Proportion of countries with national-level stockout by WHO region (2010 and 2014)**



**Table 33: National-level stockout events – percentage of countries by region, income and population<sup>a</sup>**

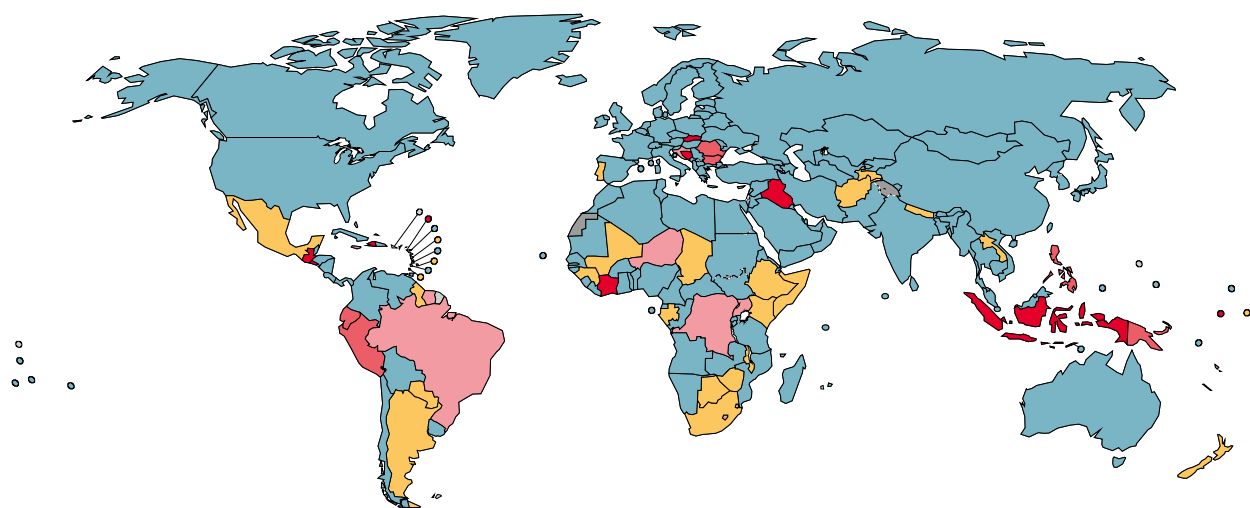
	2014	2013	2012	2011	2010
<b>Grouping by region</b>					
AMR	32	17	16	18	19
AFR-west	8	19	11	9	12
AFR-central	6	11	7	8	10
AFR-east and southern	18	17	21	21	16
EMR	6	6	5	12	7
EUR	14	7	18	17	18
SEAR	4	7	5	2	4
WPR	12	17	18	14	12
<b>Grouping by income<sup>b</sup></b>					
Low income	26	28	25	24	22
Lower middle income	26	41	35	29	37
Upper middle income	36	24	28	29	28
High income	12	7	12	18	12
<b>Grouping by population size<sup>c</sup></b>					
< 100 000	38	43	49	39	37
> 100 000 < 500 000	24	22	19	23	27
> 500 000	38	35	32	38	36

<sup>a</sup> Percentage of countries that experience at least one stockout event for at least one vaccine during a least 1 month.

<sup>b</sup> This column represents the breakdown of the 194 countries by region, income and population size.

<sup>c</sup> According to the World Bank classification of countries.

<sup>d</sup> As expressed by the number of births in the country.

**Figure 58: Countries with national-level stockouts (2014)**

Source: WHO-UNICEF joint reporting forms (JRFs) 2014.

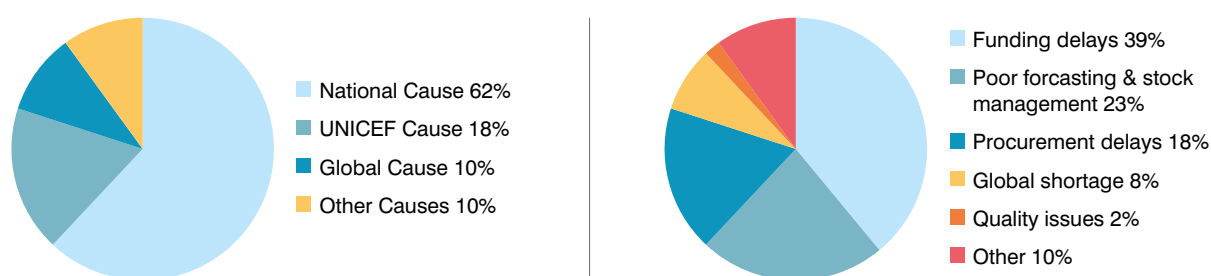
Map production: Immunization Vaccines and Biologicals, (IVB). World Health Organization

## Root cause analysis national-level stockouts – situation in 2014

In 2014, UNICEF conducted an analysis of the root causes of national-level stockouts for the 90 countries that procure their vaccines through the Supply Division (Figure 59). The data analysed were from the UNICEF annual forecasting exercise where the causes of stockouts are reported by recipient government staff and/or UNICEF country office staff.

The results of this analysis indicate that 62% of the causes of national-level stockouts are endogenous in nature – i.e. the reasons are internal to countries. In 39% of cases, the stockout results from national funding delays as the countries know that UNICEF is not able to supply vaccines unless payment is made up front. In 23% of cases, the stockout is the result of poor forecasting and stock management at country level.

**Figure 59: Root cause analysis of national-level stockout of vaccines (2010–2014)**



Source: UNICEF Supply Division, 2015.

The causes of national stockouts for the remaining 38% are exogenous and independent of the country. In 18% of these cases, the reasons rest with the procurement agency where procurement delays are the cause of

the stockout. In 10% of cases, the causes are global in nature – either resulting from a global shortage of vaccines or a quality issue related to a particular vaccine (see Figure 59).

## Subnational level stockouts – situation in 2014

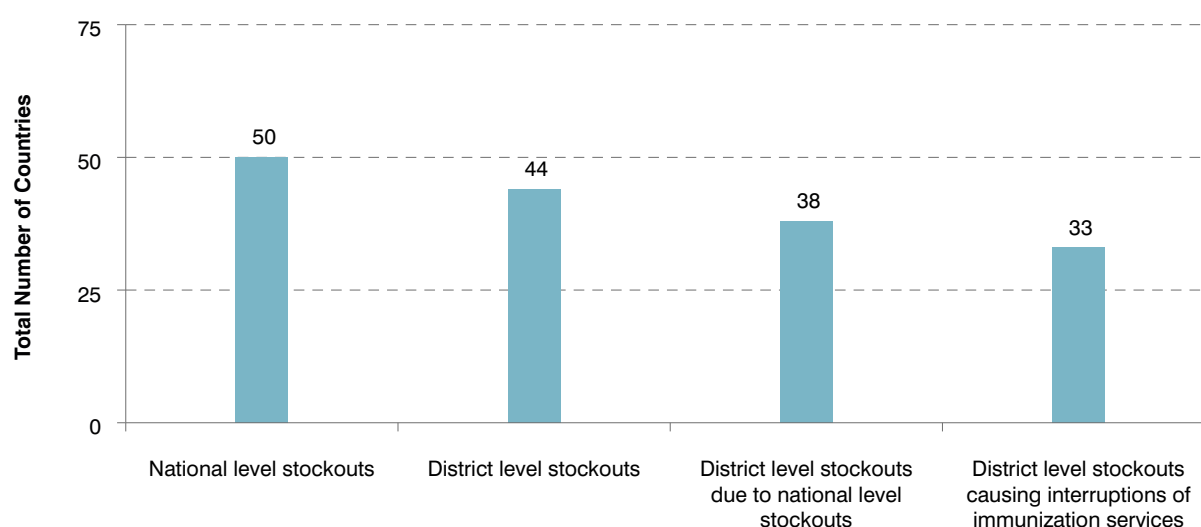
In 2014, the WHO-UNICEF joint reporting form was amended to include three additional stockout indicators allowing a better understanding of the impact of national-level stockouts on subnational availability of vaccines and potential interruption of vaccination services. For each vaccine in the national immunization schedule, a WHO Member States responds to a yes/no questions about:

- whether stockouts occurred at the district level;
- whether the district-level stockout was caused by the national-level stockout;
- whether the district-level stockout (if this occurred) led to an interruption in vaccination services.

To improve cross-country comparisons, the analysis focused on the same set of vaccines as for the national-level stockout: BCG; DTP and

measles-containing vaccines (e.g. DTP-HepB-Hib or MMR); and polio-containing vaccines (e.g. OPV and/or IPV). Data for these three new indicators are available for 2014 only – the last reporting year available. While these new indicators are not among the GVAP indicators tracked for Goal 5, a brief analysis of these new data points is provided to complement the national-level stockout findings for 2014.

The results of the subnational analysis indicate that, in 2014, a total of 44 countries (of the 50 that reported national-level stockout) had a district-level stockout (see Figure 60). In 38 countries (of the 44) the district-level stockout resulted from the shortage of vaccine at national level. In other words, 86% of these countries had a district-level stockout that was caused by the national-level stockout.

**Figure 60: Subnational impact of national-level vaccine stockouts in 2014**

This limited information provides some evidence that the effect of a national-level shortage of vaccine often ripples down the immunization supply chain and translates into shortages of vaccine at subnational levels. This information provides additional evidence of other reasons for district-level shortages to occur. For 13% of countries (6 countries) the reported district-level stockouts were caused by other factors – a breakdown of the distribution system or poor stock management at lower levels of the supply chain.

More concerning however, is that in 33 countries (or 86% of countries with a district-level stockout) the district-level stockouts led to an interruption of vaccination services. How this then impacted on immunization performance and coverage is unclear.

Table 24 provides additional information by vaccine. For those countries that reported interruptions in vaccination services owing to a district-level stockout, this was related to DTP-containing vaccines in 50% of cases and to BCG in 30% of cases.

**Table 34: Information on stockout by vaccine, 2014**

	No. of Countries	% LMICs	% DTP	% MCV	% OPV	% BCG
National-level stockout	50	52	40	14	21	25
District-level stockouts	44	46	47	17	9	28
District-level stockouts caused by national stockout	38	42	43	16	9	32
District-level stockout leading to interruption of vaccination services	33	38	49	16	5	30

LMICs, low- and middle-income countries.

While the sub-level stockout indicators provide valuable insights, the magnitude of the problem is difficult to gauge without an understanding of how many

districts (for each country reporting district stockouts) were affected.

## Reference

1. Global Vaccine Action Plan: monitoring Evaluation and accountability. Secretariat annual report 2014 ([http://www.who.int/immunization/global\\_vaccine\\_action\\_plan/gvap\\_secretariat\\_report\\_2014.pdf](http://www.who.int/immunization/global_vaccine_action_plan/gvap_secretariat_report_2014.pdf), accessed 12 September 2014).

# NUMBER OF VACCINES THAT HAVE EITHER BEEN RE-LICENSED OR LICENSED FOR USE IN A CONTROLLED-TEMPERATURE CHAIN AT TEMPERATURES ABOVE THE TRADITIONAL +2–8 °C RANGE (Indicator SO6.4)



## Highlights

- A new total of three vaccines are expected to be licensed and prequalified for controlled-temperature chain (CTC) by the end of 2015: MenAfriVac® (meningitis A vaccine), Prevnar13™ (13-valent pneumococcal conjugate vaccine), and Shanchol™ (oral cholera vaccine).
- New advocacy tools have been developed to promote CTC both during the upstream vaccine development stages and the downstream implementation stages.
- New operational data supporting CTC were generated during the successful integration of this approach into three national MenAfriVac immunization campaigns during the last quarter of 2014.
- Regulatory guidelines to facilitate CTC re-licensing are expected to be complete by the end of 2015.
- There is a need for a closer examination of drivers and barriers faced by manufacturers considering CTC-compatibility for candidate vaccines.

<b>TARGET</b>	None specified
<b>DEFINITION OF INDICATOR</b>	<p>This indicator measures the number of vaccines used in low- and middle-income countries that are licensed for use in a controlled temperature chain (CTC) for a limited period of time at ambient temperatures of up to 40 °C</p> <p>CTC is defined as:</p> <ul style="list-style-type: none"> <li>• allowing vaccines to be kept and administered at ambient temperatures, up to 40 °C, specified on their product label and with the appropriate temperature monitoring tools;</li> <li>• a single excursion for a limited period of time (length of time will vary by antigen and setting, although a minimum of three days is preferred by WHO) immediately preceding administration;</li> <li>• Up until this excursion, the vaccine should continue to be kept in the traditional 2–8 °C cold chain</li> </ul>
<b>DATA SOURCES</b>	<p>To monitor outcomes (label change): Revised vaccine product inserts allowing for use of the vaccine at ambient temperatures up to 40 °C, accessed from the WHO Vaccine Prequalification Database, manufacturers' websites and hard copies of product inserts</p> <p>To monitor progress: Public announcements made by vaccine companies of on-going studies to assess feasibility of using their vaccines in a CTC, including journal articles, media reports and conference presentations</p> <p>Private correspondence and information disclosed to WHO under non-disclosure agreements such as email correspondence and meeting minutes</p>

## Quality of data

Reliable data continue to be obtained by the following means:

- a. coordination between the team responsible for managing the Expanded Programme on Immunization at WHO, which drives the CTC programmatic agenda and the team responsible for facilitating WHO prequalification of vaccines;
- b. direct dialogue maintained with vaccine manufacturers who are undertaking thermostability studies with a view to an eventual label variation in support of a CTC approach; and
- c. oversight and technical support of country-level operational research linked to CTC implementation.

## Results

The past year saw considerable progress on the overall CTC agenda. Notably, a second vaccine, the 13-valent pneumococcal conjugate vaccine (Pneumovax 13™), was licensed and WHO-prequalified for use in a CTC. Moreover, CTC implementation was scaled up for the meningitis A vaccine, MenAfriVac®, in three West African countries during the fourth quarter of 2014, reaching over 1.5 million people. With the increasing number of vaccines being confirmed as compatible with a CTC, there is also a more pronounced need for effective advocacy and support, as well as facilitation of regulatory approval.

Pfizer's Pneumovax 13™ obtained approval from the European Medicines Agency (EMA) in January 2015 and from WHO (as part of the prequalification process) on 1 May 2015 for a label variation relating to storage conditions. The new wording in Pneumovax 13™'s package insert is as follows:

*"Pneumovax 13 is stable at temperatures up to 40 °C for three days. At the end of this period Pneumovax 13 should be used or discarded. These data are intended to guide health care professionals in case of temporary temperature excursions."*

In 2014, Shantha Biotech submitted a request for prequalification to WHO, following revision to the package insert of its oral cholera vaccine, Shanchol™, confirming compatibility with use in a CTC. However, in order to fully evaluate the vaccine for prequalification, WHO has requested that Shantha generate further data in support of its CTC claim. The additional results are expected in 2015.

In February 2015, Sanofi Pasteur shared conclusive data with WHO demonstrating that currently their yellow fever vaccine could not meet the conditions set out for a CTC and therefore they could not seek licensure. Early stability test results from two manufacturers of human papilloma virus (HPV) vaccines as well as one of a hepatitis B vaccine suggest that more encouraging outcomes can be expected before the end of 2015.

WHO continues to promote the CTC approach, and new advocacy tools such as an infographic<sup>46</sup> and a three-part film on the subject, have facilitated this task. The film was produced in three episodes so as to allow its messages to be targeted to three specific audiences:

- a. global health immunization stakeholders;
- b. country-level immunization policy-makers; and
- c. vaccine manufacturers and regulators.

CTC has also featured on the agendas of important immunization-themed conferences.

An important recent CTC success has been the scaled up implementation efforts during meningitis A campaigns in Mauritania in September 2014, Togo in November 2014, and Côte d'Ivoire in December 2014, using the MenAfriVac® vaccine. More than 1.5 million people were vaccinated through the CTC approach in selected districts where access is known to be difficult and cold chain constraints are most pronounced. Emphasis was placed on effective training, supervision, and documentation of best practices and lessons learnt. It was noted that the strategy was well understood, allowing for good compliance and very low wastage linked to the CTC. In addition, no severe adverse events were found to be associated with the CTC. Health workers responded with enthusiasm to the lightened burden and increased flexibility offered by this new approach. Operational research linked to this experience includes a cost-benefit study and coverage survey in Togo, as well as a knowledge, attitude and practice survey conducted in Mauritania. Analysis of the results of these three studies is under way.

In March 2014, WHO hosted an Informal Consultation on Stability Evaluation of Vaccines for CTC with the objective of reviewing and discussing updates to the draft WHO guidelines on CTC regulatory considerations and defining a work-plan. A new draft document was posted on the Internet for public consultation in late May 2015 and is currently being revised with a view of submitting a final version to the Expert Committee on Biological Standardization in October 2015.

<sup>46</sup> [http://www.who.int/immunization/programmes\\_systems/supply\\_chain/resources/WHO\\_CTC\\_Infographic.pdf?ua=1](http://www.who.int/immunization/programmes_systems/supply_chain/resources/WHO_CTC_Infographic.pdf?ua=1)



## Analysis

While Pevnar13™'s CTC re-labelling is clearly a milestone in the CTC programme, reflecting a growing momentum of CTC licensure efforts, it should be recognized that Pevnar13™ is mainly used in routine immunization, administered together with DTP-HepB-Hib and polio vaccines. Given the current cold chain requirements of DTP-HepB-Hib and polio vaccines, the CTC flexibility offered to Pevnar 13™ has minimal utility in a routine context and, if applied, could cause confusion and pose a legitimate risk of heat damaged or non-potent vaccine being delivered, as well as increased wastage. There is important potential for Pevnar13™'s new CTC option to be of value in a complex emergency or humanitarian setting, as Médecins Sans Frontières (MSF) typically uses it. Discussion is therefore under way with MSF concerning potential field implementation guidance to be developed collaboratively.

Other vaccines have been slower to achieve re-labelling approval and dialogue with various manufacturers

has revealed numerous barriers, including lack of general awareness of CTC advantages, insufficient economic incentives, uncertainty around vaccine demand and policies, and insufficient clarity about the regulatory pathway. These are among the reasons why one manufacturer of tetanus toxoid (TT) vaccine, has chosen not to pursue a label variation for its TT vaccine, despite a recent study undertaken in Chad which demonstrated its tolerance in CTC conditions. While improved advocacy, generating more data in support of CTC implementation, and the publication of the regulatory guidelines will mitigate some of these issues, a closer examination of current barriers to upstream progress on the CTC agenda is required. In an effort to better understand the factors behind manufacturers' reluctance and de-prioritization of CTC testing and licensure, WHO is planning an evaluation of vaccine manufacturers' positions and concerns with respect to CTC, with a view to identifying information gaps and potential solutions for overcoming recognized bottlenecks or obstacles.



# NUMBER OF VACCINE DELIVERY TECHNOLOGIES (DEVICES AND EQUIPMENT) THAT HAVE RECEIVED WHO PREQUALIFICATION (Indicator SO6.5)



## Highlights

- A total of 258 products had been prequalified as of 31 December 2014 compared to 163 in 2010, corresponding to a 58% increase between 2010 and 2014.
- A multipartner Performance, Quality and Safety (PQS) Specification Working Group was established with the United Nations Children's Fund (UNICEF), PATH, Clinton Health Access Initiative (CHAI), Solar Electric Light Fund (SELF) and Gavi to develop target product profiles (TPPs) for innovative solutions to a high demand for solarization of equipment and to the risk of freezing during transport and storage.
- TPPs have been created for solar direct drive refrigerators and solar systems. TPPs have also been initiated for waterpack freezers, a freeze-safe cold box, a freeze-safe vaccine carrier and for a remote temperature monitoring system, all expected in 2015.
- In 2014, the first long-term passive container was prequalified against new specifications. It can keep vaccines for more than 35 days without being recharged.

TARGET	None specified
DEFINITION OF INDICATOR	<p>The number of products (cold chain equipment, injection devices and others) that had been prequalified by the WHO performance, quality and safety (PQS) system as of 31 December 2014, as compared to the number of prequalified products on 31 December 2010, which was 163 products</p> <p>It does not take into account the number of products that might have entered the list and been withdrawn in the interim period. Therefore, it is just the difference between two data points</p>
DATA SOURCES	The WHO PQS programme database
COMMENTS ON DATA QUALITY	Data reflect the difference between the number of products that were listed in the PQS as prequalified on 31 December 2010 and those as of 31 December 2014. The record of the date after each change of a product's status ensures the quality of data

## Background

The PQS scheme for the prequalification of equipment selects immunization equipment to be purchased by United Nations agencies. It requires the industry to comply with criteria for PQS based on an assessment by

independent, WHO-accredited laboratories. For more details please refer to last year's report or to the PQS website.<sup>47</sup>

<sup>47</sup> [http://apps.who.int/immunization\\_standards/vaccine\\_quality/pqs\\_catalogue/](http://apps.who.int/immunization_standards/vaccine_quality/pqs_catalogue/)

## Results

**Innovation:** Efforts are now focusing on innovating products to meet the needs of the changing vaccine landscape. These include the need for responding to the need for storage of a substantially increased volume of vaccines as well as for improved technologies to monitor the temperature at which vaccines are stored.

As vaccine costs and storage volumes increase, countries are much more demanding in terms of their storage and logistics needs and are looking for innovative solutions to address barriers or bottlenecks in their supply chains.

In 2014, a multipartner PQS specifications Working Group (WG) was established with WHO, the United Nations Children's Fund (UNICEF), PATH, Clinton Health Access Initiative (CHAI), Solar Electric Light Fund (SELF) and GAVI the Vaccine Alliance, with the objective of developing TPPs for innovative solutions and the revision of existing specifications. This WG met twice in 2014 and coordinated with the nongovernmental organization SELF to develop and initiate TPPs in response to a high demand for solarization of equipment. The WG has coordinated:

- solar direct drive refrigerators;
- solar systems; and
- waterpack freezers (expected in 2015).

In response to the risk of freezing during transport and storage the WG collaborated with PATH to draft

TPPs on a freeze-safe vaccine cold box and a freeze-safe vaccine carrier, which are currently being developed and tested. This technology would protect vaccines from being frozen in cold boxes and vaccine carriers. PQS and CHAI are also collaborating to create a TPP on remote temperature monitoring systems, expected in the second half of 2015.

The WG has also begun the revision of ISO 788-3 on auto-disable syringes to respond to better and safer injection practices. It is expected to be made available by International Organization for Standardization (ISO) in 2016.

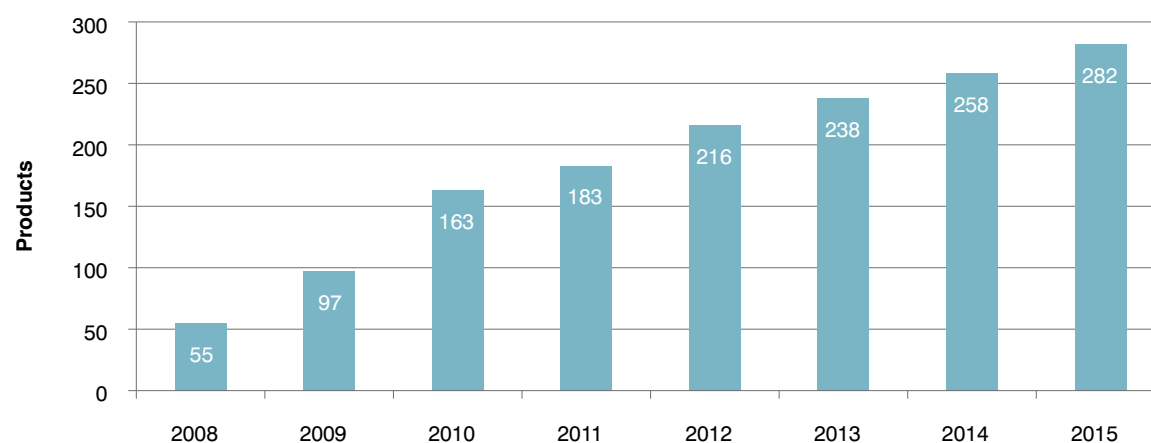
**Products:** In 2014, the first long-term passive container was prequalified against new specifications. This device, ARTEK™, has been developed by Intellectual Venture and is commercialized by a Chinese company (AUCMA Co. Ltd.). It can keep vaccines for more than 35 days without being recharged. For more information about the device, please visit the Intellectual Venture website.<sup>48</sup>

Procurement agencies today can choose between 258 PQS-prequalified products from 55 manufacturers. This is an increase of 58% from the 163 products that were available on 31 December 2010 since which time the availability of products has been increasing steadily (Table 35 and Figure 61).

<sup>48</sup> <http://www.intellectualventures.com/inventions-patents/our-inventions/vaccine-cold-chain-device/>

**Table 35: Number of prequalified products per year and per category between 2008 and 2015<sup>a</sup>**

	Products								Increase (percentage)
	PQ 2008	PQ 2009	PQ 2010	PQ 2011	PQ 2012	PQ 2013	PQ 2014	PQ 2015 <sup>a</sup>	2010–2014
Cold rooms and related equipment	0	1	3	3	3	3	3	4	0.0
Refrigerators and freezers	0	8	14	23	33	36	44	51	214.3
Cold boxes and vaccine carriers	0	2	31	32	34	37	39	41	25.8
Waterpacks	0	1	15	16	18	17	17	17	13.3
Temperature monitoring devices	7	10	11	12	17	22	24	30	118.2
Auto-disable syringes for immunization	21	31	30	27	29	33	36	39	20.0
Waste management equipment	5	9	10	10	10	10	11	11	10.0
Therapeutic injection devices	22	35	49	60	72	80	84	89	71.4
<b>Total</b>	<b>55</b>	<b>97</b>	<b>163</b>	<b>183</b>	<b>216</b>	<b>238</b>	<b>258</b>	<b>282*</b>	<b>58.3</b>

<sup>a</sup> As of 30 June 2015.**Figure 61: Cumulative Number of prequalified products per year, 2008–2015<sup>a</sup>**<sup>a</sup> As of 30 June 2015.







# 8. GVAP VACCINE PRICE REPORT 2015

## Introduction and objectives

### Context

The sixty-sixth World Health Assembly (WHA) in 2013 requested that the Global Vaccine Action Plan (GVAP) Secretariat prepare an annual progress report on the Decade of Vaccines (DoV) for the WHA upon review by the Strategic Advisory Group of Experts (SAGE), including indicators monitoring vaccine price trends. At the subsequent WHAs, countries have continued to ask for greater vaccine affordability and access to vaccine price information.

In 2015, delegates at the sixty-eighth WHA expressed concern that progress with the implementation of the GVAP was patchy, slow and off-track for achieving five out of six targets for 2014 and 2015. The WHA adopted a resolution<sup>49</sup> (WHA 68.6) specifically addressing the issue of access to sustainable supplies of affordable vaccines for low-income countries (LICs) and middle-income countries (MICs), including the promotion of vaccine price transparency, support for pooled procurement mechanisms, increased supply availability and market-shaping initiatives.

### Importance of reporting on vaccine prices

Acknowledging that price is not the only factor influencing the introduction and uptake of new vaccines, greater availability of price data will nevertheless enable an educated and informed discussion on the role of price in country decision-making processes.

Price transparency is a way for countries to ascertain what they are paying for their vaccines relative to other countries, although prices may not always represent the same total costs to countries because of differences in Incoterms<sup>50</sup> and costing methods used by countries. Price information sharing also allows countries to understand what factors may influence prices. Countries become better equipped for informed decision-making and budgeting as well as for negotiations with manufacturers.

The WHO Vaccine Product, Price and Procurement (V3P) project has been designed to collect and disseminate vaccine price information in the best comparable way. Participation of all countries,

particularly MICs, in the V3P project is a key element in realizing the above-mentioned benefits of this mechanism. With more countries sharing vaccine price information, the V3P dataset will become more comprehensive and the analyses more precise. In October 2014, SAGE issued recommendations to both countries and partners to “change the rules of the game on vaccine affordability” and to create price transparency. In 2015, WHA resolution WHA68.8 specifically urged Member States to share their vaccine price data with WHO through the V3P project.

The prices paid for vaccines represent a large share of countries’ immunization budgets<sup>51</sup> and, with the prices of new vaccines being several-fold higher than those of traditional vaccines, many countries, especially the 63 MICs that are not Gavi-eligible, have expressed concern that prices of new vaccines represent a strong barrier to introduction. This report will therefore emphasize participation and vaccine affordability for this group of countries.

<sup>49</sup> 68th World Health Assembly 2015, Resolution WHA68.6, Global Vaccine Action Plan. Accessible at: [http://apps.who.int/gb/ebwha/pdf\\_files/WHA68/A68\\_R6-en.pdf](http://apps.who.int/gb/ebwha/pdf_files/WHA68/A68_R6-en.pdf)

<sup>50</sup> Incoterms rules (or International Commercial Terms) are a series of predefined three-letter commercial terms published by the International Chamber of Commerce (ICC). They are widely used in international commercial transactions or procurement processes to define tasks, costs, and risks associated with the transportation and delivery of goods.

<sup>51</sup> GVAP Indicator SO1.1 Domestic expenditures for immunization per person targeted.

## Objectives

Two indicators were developed in the 2013 and 2014 GVAP price reports to measure progress in terms of vaccine price transparency and to monitor vaccine price

trends (Table 36). Based on data available from 2014, analyses on the same indicators were conducted for this 2015 report.

**Table 36: GVAP vaccine price indicators**

Indicator	Goal
1. Number of countries sharing price information through the Vaccine Product, Price, and Procurement (V3P) <sup>52</sup> Project by WHO region	Monitoring country progress in sharing pricing data over time
2. Annual average or unit vaccine prices as data permit:	This indicator aims to:
a. annual weighted average vaccine price (WAP), weighted by volume purchased, over time in relationship to procurement mechanism;	• facilitate country planning for the introduction of new vaccines; and
b. unit prices of vaccines in relationship to country level of income and volume;	• increase country and global knowledge of the vaccine market and price trends.
c. minimum–maximum price range by country level of income.	

The first objective of this report is to present an updated review of the GVAP price indicators and key findings that can be derived from the newest data available.

The second objective of this year's report is to provide a high-level overview of potential obstacles to more affordable prices and review currently available solutions.

## Reporting on the indicators

Comparing vaccine prices is challenging owing to limited availability of vaccine price information and the complex nature of vaccine products and markets. Limitations of the V3P price database include: limited availability of historical data (the database was launched in June 2014); imbalance in the number of countries reporting from each region, which can skew analyses towards trends specific to one particular region; limited collection of variables on procurement systems, which limits the scope of analyses possible to understand factors that may influence prices.

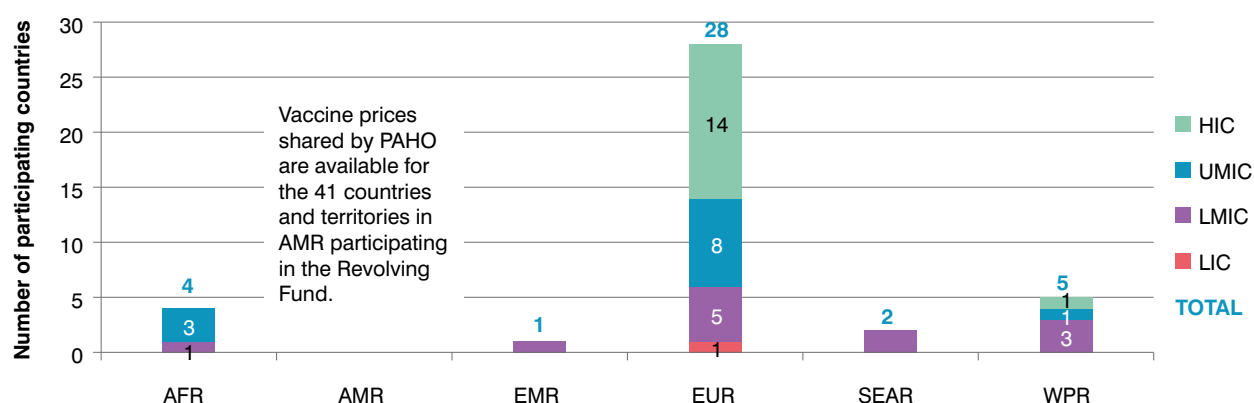
Note: throughout the report and to follow the regular WHO/UNICEF Joint Reporting Form (JRF) collection process, data collected in 2015 refers to 2014 data, and data collected in 2014 refers to 2013 data. Graphs presented here use only data collected and cleaned before 30 June 2015.

More information, detailed analyses and charts as well as the full dataset are available on the database section of the V3P platform: [www.who.int/immunization/v3p](http://www.who.int/immunization/v3p)

### Indicator 1: Number of countries sharing price information through the Vaccine Product, Price and Procurement (V3P) Project, by WHO region

**As of 30 June 2015, 40 countries had shared 2014 data, with participation from five WHO regions (Figure 62):** European Region (EUR), Western Pacific Region (WPR), African Region (AFR), South-East Asia Region (SEAR) and Eastern Mediterranean Region (EMR). The Region of the Americas (AMR) also contributed price information as the Pan American Health Organization Revolving Fund (PAHO RF) shares its vaccine prices with the V3P project every year. Vaccine prices shared by PAHO are available for the 41 countries and territories in AMR participating in the Revolving Fund.

<sup>52</sup> V3P website: [www.who.int/immunization/v3p](http://www.who.int/immunization/v3p)

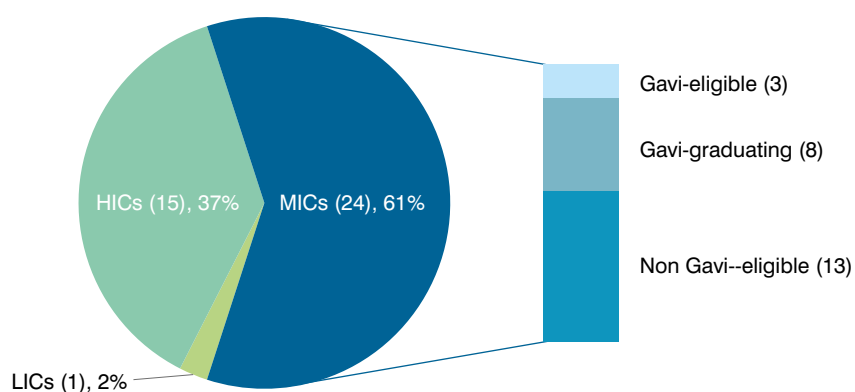
**Figure 62: Number of countries reporting vaccine price data in 2015 by WHO region and income group<sup>a</sup>**

<sup>a</sup> HIC: High Income Country; UMIC: Upper-Middle Income Country; LMIC: Lower-Middle Income Country; LIC: Low Income Country

This is a considerable increase in participation (+67%) compared to 2014, when 24 countries had shared vaccine price data.

More than half of the countries reporting prices are MICs (24 countries, including 12 lower

middle income countries (LMICs) and 12 upper middle-income countries (UMICs)), of which eight are Gavi-graduating countries and 13 are non-Gavi-eligible countries (Figure 63).

**Figure 63: Number of countries reporting vaccine price data in 2015 by income group and Gavi status**

Several countries have not yet shared price information this year and represent an opportunity to increase country engagement with V3P in future years. A potential 53 MICs remain to be added to the database,

including 37 Gavi-graduating and non-Gavi-supported MICs (excluding countries receiving PAHO support). Table 37 shows the number of countries that have not shared price data in 2015.

**Table 37: Number of countries NOT reporting vaccine price data in 2015 over total number of countries, by WHO region and income group<sup>53</sup>**

Income group	AFR	EMR	EUR	SEAR	WPR	TOTAL
LIC	25/25	2/2	0/1	4/4	1/1	32/33
LMIC	12/13	6/7	1/6	3/5	7/10	29/41 <sup>a</sup>
UMIC	5/8	6/6	5/13	2/2	6/7	24/36 <sup>b</sup>
HIC	1/1	6/6	19/33	0	5/6	31/46
TOTAL	43/47	20/21	25/53	9/11	19/24	116/156

<sup>a</sup> Includes 6 graduating countries and 7 non-Gavi-eligible countries.

<sup>b</sup> Includes 1 graduating country and 23 non-Gavi-eligible countries.

The main reasons reported by countries (mainly based on information collected in the European Region and the Western Pacific Region) for not sharing price information include: lack of knowledge on the initiative; procurement not conducted at the national level; and issues of reporting period and confidentiality clauses or legal restrictions preventing price data sharing. For instance, in the European Region, 4 out of 16 countries that have completed their JRF but not provided vaccine price information have listed confidentiality issues as the reason for not sharing data. However, the data collected this year are insufficient to determine whether this situation is similar in other regions, especially in regions with a high number of MICs (e.g. Eastern Mediterranean Region). A deeper analysis of the validity and prevalence of such legal or contractual clauses is needed to better capture the extent of such practices and their potential impact on vaccine prices.

Even though new countries and regions started to share their price information this year, the great majority of countries reporting prices are still from the European Region. With 28 countries sharing price data, this is by far the most advanced region in terms of vaccine price transparency. Based on this strong participation, WHO Regional Office for Europe produced a detailed and tailored report on vaccine pricing and market characteristics in the region.<sup>54</sup>

**Data quality has also improved compared to previous years.** In the group of countries that shared their prices in the last two years, 15% of the records collected last year could not be properly identified (e.g. product did not exist or volumes were incoherent), whereas this year most of the data submitted were usable. This is

probably attributable to greater country experience and to the various training sessions and presentations that were conducted on the topic by WHO and partners. Data quality can still be improved, especially on the more detailed and complex questions on procurement and contractual agreements. Obtaining better quality data on these variables will allow for a more refined analysis of procurement and contractual factors that may influence prices. Over time, data quality is expected to improve, as demonstrated by the increase in data quality for the group of European countries that have shared information in the past two years.

**This year, data collection has been connected to the JRF annual data collection exercise, which has increased reporting.** Through the JRF file, countries are given the choice to either fill in an Excel spreadsheet with their vaccine price information and send it back with their JRF (EUR is the only region to have fully integrated the table into the JRF file), or to enter their data directly on the V3P web-based platform. Seven countries chose to share all or part of their 2014 price data through the V3P platform, and 33 through the Excel file. The second option seems to be favoured by most countries and therefore increases participation. However, it lowers data quality, as data collected directly through the V3P platform are of better quality than those collected through the Excel file. The availability of WHO regional staff to work with countries on sharing price data has proven important to increase participation, as shown for instance by the considerable involvement of WHO EURO in data collection and the subsequent high participation in the region.

<sup>53</sup> Excluding countries from AMR, as the PAHO RF procures on behalf of most countries in the region and already shares its vaccine price data.

<sup>54</sup> WHO EURO, Review of vaccine price data submitted by WHO European Region Member States through the WHO/UNICEF Joint Reporting Form for 2013, July 2015 (<http://www.euro.who.int/en/health-topics/disease-prevention/vaccines-and-immunization/publications>).

### CONCLUSION ON INDICATOR 1:

Participation has greatly increased compared to last year, but is still limited in several regions. Efforts should be strengthened in such regions to increase participation and to apply WHA Resolution 68.6 that urges all Member States to share vaccine price information with WHO. Having additional countries share prices will improve the usefulness of the data and the variety and quality of analyses. Promoting data collection through the JRF and continuing advocacy for the initiative should gradually increase the number of countries participating and the quantity and quality of data available for analyses.

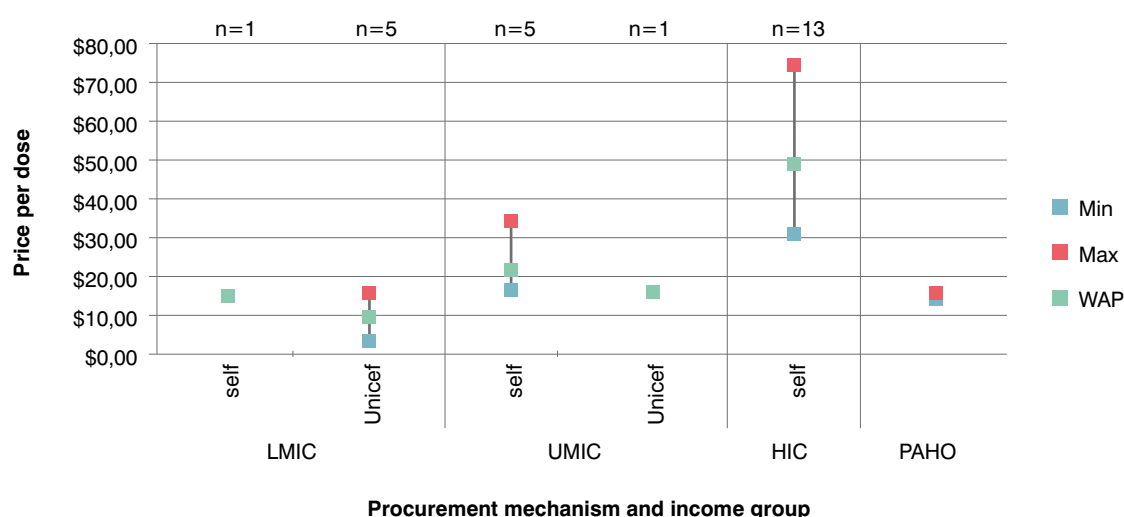
### Indicator 2: Annual average or unit vaccine prices as data permits

*Note:* for all the indicators below we selected data for one or two antigens for data visualization purposes. The full set of data is available on the V3P website at [www.who.int/immunization/v3p](http://www.who.int/immunization/v3p)

#### 2a. Annual WAP, weighted by volume purchased, over time in relationship to procurement mechanism

**Based on current data, countries that self-procure pay higher prices than countries that procure through a pooled mechanism.** This relationship is particularly important for the newer vaccine market where vaccines are more costly. From the UMIC group, we note that WAP of single-dose PCV is approximately 48% lower when procured through UNICEF than when self-procured (Figure 64). WAP for single-dose hepatitis B (HepB) (paediatric) (all manufacturers combined) is approximately 70% lower when pool-procured than when self-procured in the UMIC group. In the LMIC group, WAP of HepB is 44% lower when pool-procured. Although the difference in price between procurement mechanisms is greatest for HepB in the UMIC group, the absolute reduction in WAP price is greater for more expensive vaccines such as PCV (US\$ 14.60/dose in the UMIC group).

**Figure 64: WAP by volume for single-dose PCV, by procurement method, for 2014**



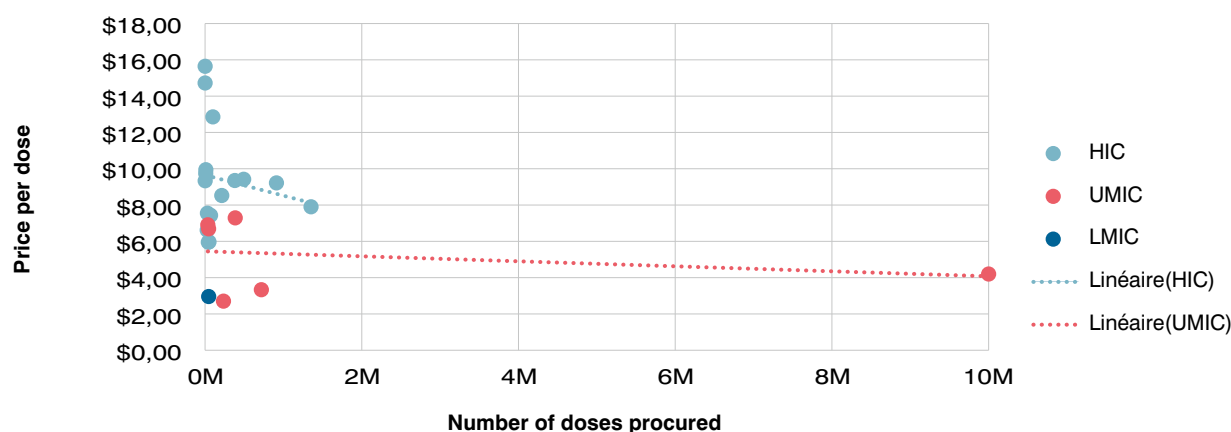


## 2b. Unit prices of vaccines in relationship to country level of income and volume

**Based on current data, there is no consistent correlation between volume and price from self-procuring countries.** For some vaccines, the analyses show that there may be a small reduction in price for higher purchase volumes (Figure 65). The existing data suggest that, at country level,

the number of doses procured is unlikely to be a significant driver of price. An analysis by manufacturer shows that there does not seem to be a consistent correlation between volume and price (see Figure 65), or this relationship may be confounded by differential pricing based on the purchasing country's level of income. With additional countries providing data to V3P in the future, more accurate and significant analyses could be done.

**Figure 65: Price by volume procured for the measles, mumps and rubella (MMR) single-dose vaccine, for 2014**

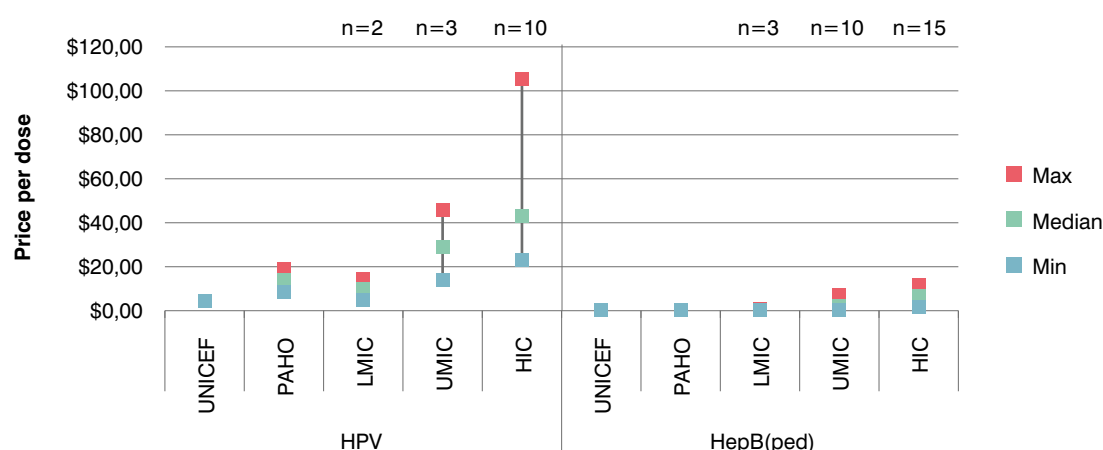


### 2c. Minimum–maximum price range by country level of income

**Based on current data, analyses show that, for several vaccines, the price is higher and the price range wider among higher income groups.** This is particularly noticeable in the new vaccines market where the price range can be substantial within and across income groups. For instance, the highest price for HPV in the LMIC, UMIC and HIC groups is approximately 3 to 4.5 times greater than the lowest price in each of these groups, showing quite a wide range of prices within each income group. The difference in prices between income groups is also large. The highest price recorded for HPV in the UMIC group is about 10 times the lowest price registered for a LIC (vaccine procured through UNICEF) (Figure 66). The highest price paid in the UMIC group is also twice as high as the lowest price registered in the HIC group, revealing that prices in the UMIC and HIC groups greatly overlap.

Less visibly, the price range can also be large for traditional vaccines, but prices tend to be lower in these more mature markets. For instance, the highest price for the HepB paediatric vaccine in the LMIC, UMIC and HIC groups is approximately 2 to 20 times greater than the lowest price in each income group, also exhibiting a wide price range. However, the absolute price of the vaccine is low (e.g. median price for the LMIC group is US\$ 0.5 for HepB), which means that the impact of the price difference on immunization budgets is less significant than for more costly vaccines such as HPV (e.g. median price for the LMIC group is US\$ 9.7 for HPV). A lower median price for some of the new vaccines was observed in the UMICs than had been reported in 2013. However, given the variation in the data variables from one year to the next, it is not possible to conclude definitively that there has been a decline in price. This will be monitored and further analysed as more data become available.

**Figure 66: Minimum, maximum and median price by income level for HPV and HepB (paediatric) single dose, for 2014**



Note: for each income group, this Figure provides the price range independently of the way vaccines were procured by the country (through self- or pool-procurement)

### CONCLUSION OF INDICATOR 2:

The analyses conducted reflect the fact that the strongest factors influencing prices seem to be linked to procurement mechanism and income level. These relationships seem stronger for the new vaccine<sup>55</sup> markets. In these markets, vaccine prices are considerably higher than in the more mature traditional vaccine markets and manufacturers apply tiered pricing strategies to extend the reach of their vaccines to all income groups through differentiated prices and to capture the highest market share. For traditional vaccines, there is also a strong relationship between price and income level but, given the overall lower prices in these markets, the impact of this price differentiation on national immunization budgets is less substantial (Figure 66). In markets where vaccine prices are high, countries using pooled procurement systems usually manage to secure vaccines at lower prices than countries that self-procure their vaccines. No strong correlation could be established between price and volume, except when products are procured in very large quantities, for instance by procurement agencies like PAHO RF or UNICEF Supply Division.

## Access to affordable and timely supply: issues and solutions

Previous GVAP vaccine price reports have noted that vaccine prices are the consequence of several factors linked to market dynamics (e.g. level of maturity, competition), manufacturers' pricing strategies (e.g. differential pricing), demand (e.g. accuracy of demand forecasting and predictability) and procurement mechanisms (e.g. volumes, contractual terms, pricing knowledge and requirements). Several initiatives are already in place to act on these price levers. In some areas, efforts should be strengthened to achieve a greater impact on prices.

Therefore, efforts to increase price transparency should be integrated as much as possible into existing initiatives that aim to strengthen national procurement and decision-making knowledge and skills, such as

the Middle Income Countries Strategy (MIC strategy – see below). These initiatives will contribute to a fuller understanding of how pricing information can be used in relation to other factors that impede access to vaccines.

Following a SAGE recommendation to this effect, the MIC Task Force, a group of nine immunization partners<sup>56</sup> convened by WHO in June 2014, presented to SAGE in April 2015 a proposed strategy and way forward for coordinated action to enhance sustainable access to vaccines in MICs. The MIC strategy identified four main areas:

1. strengthened decision-making for timely and evidence-based immunization policy and programmatic choices;

<sup>55</sup> New vaccines include: HPV, Rotavirus, PCV, IPV, DTaP-HepB-Hib and DTaP-HepB-Hib-IPV

<sup>56</sup> AMP, BMGF, Gavi Secretariat, Sabin, UNICEF PD, UNICEF SD, WHO (HQ & Regional Offices), World Bank.

2. increased political commitment and financial sustainability of immunization programmes;
3. enhanced demand for and equitable delivery of immunization services; and
4. improved access to affordable and timely supply.

Most of the activities within these areas could ultimately support access to lower vaccine prices, and levers on affordability and prices are particularly articulated in the fourth area, which presents the following as enablers of affordability:

- increasing procurement skills and knowledge;
- increasing access to revolving funds;

- harmonizing product choice and registration processes;
- increasing availability of price and contract information;
- strengthening pooled procurement options;
- influencing market dynamics.

Based on the findings of the MIC Task Force, Table 38 summarizes potential causes of unaffordable vaccines and ongoing efforts to develop solutions, and highlighting where efforts could be strengthened to help countries access more affordable and timely supplies of vaccines. More information on these initiatives is available from the MIC shared strategy report.<sup>57</sup>

**Table 38: Potential causes of unaffordable vaccines for MICs and ongoing efforts to develop solutions.**

<b>1. Identified issue: procurement inefficiencies and unpredictable demand</b>
<b>ENABLER: Increasing procurement skills and knowledge (also related to financing and decision-making enablers)</b>
<ul style="list-style-type: none"> <li>• <b>Impact on affordability:</b> Previous studies have identified inefficient procurement as an important barrier to MICs obtaining competitive prices and reliable supply of new and traditional vaccines.<sup>58</sup></li> <li>• <b>Partners engaged:</b> UNICEF, PAHO, WHO regions</li> <li>• <b>Examples of impact of implemented activities:</b> Efforts are ongoing.</li> <li>• <b>Recommendation by the MIC Task Force:</b> A few organizations are currently helping MICs improve procurement practices, but efforts are limited owing to unclear roles and responsibilities, limited capacity and country scope. Several partners, including WHO regional offices and UNICEF, have organized or are developing procurement workshops targeting MICs. Another important area in which countries are recommended to invest is demand predictability. Demand predictability will come from the implementation of strong national policies and from having tools in place to support immunization decision-making (e.g. a functional NITAG<sup>59</sup>) and financing (e.g. completed cMYP<sup>60</sup>), and the development of demand forecasting skills and long-term procurement arrangements (e.g. long-term contracts).</li> </ul>
<b>2. Identified issue: payment barriers</b>
<b>ENABLER: Increasing access to revolving funds</b>
<ul style="list-style-type: none"> <li>• <b>Impact on affordability:</b> Revolving Funds overcome the issue that some countries may face with prepayment when purchasing through pooled mechanisms, as this approach facilitates the placement of orders and the reimbursement by the country after the goods are delivered (i.e. 60 days after delivery).</li> <li>• <b>Partners engaged:</b> PAHO RF, UNICEF (Vaccine Independence Initiative (VII))</li> <li>• <b>Examples of impact of implemented activities:</b> The UNICEF VII has enabled 13 Pacific island countries to access an uninterrupted supply of low-cost, high-quality vaccines. The PAHO RF is a known key to success in the strong immunization programmes in the region.</li> <li>• <b>Recommendation by the MIC Task Force:</b> There is still a large unmet need for pre-financing support. The UNICEF VII has been authorized by the Board to expand its capital base to US\$ 100 million. Therefore, efforts need to be continued in this area, including for capitalizing the VII.</li> </ul>
<b>3. Identified issue: regulatory barriers</b>
<b>ENABLER: Harmonizing product choice and registration processes</b>
<ul style="list-style-type: none"> <li>• <b>Impact on affordability:</b> Less complex registration processes and reasonable fees could allow more manufacturers to register products in a country and participate in national procurement tenders, thus making markets more competitive and reducing prices, while increasing the increasing the availability of supply.</li> <li>• <b>Partners engaged:</b> WHO</li> <li>• <b>Examples of impact of implemented activities:</b> The recent experience with facilitating regulation processes for the introduction of IPV as part of the Polio Eradication and Endgame Strategic Plan was well received by both countries and manufacturers.<sup>61</sup></li> <li>• <b>Recommendation by the MIC Task Force:</b> In the long term, efforts should focus on continuing to streamline and align requirements for vaccine registration regionally and globally. In the shorter term, expedited processes for prequalified vaccines could be a useful compromise.</li> </ul>

<sup>57</sup> Sustainable Access to Vaccines in Middle-Income Countries (MICs): A Shared Partner Strategy, Report of the WHO-Convened MIC Task Force, March 2015 ([http://www.who.int/immunization/sage/meetings/2015/april/Cernuschi\\_MIC\\_Strategy\\_SAGE\\_Apr2015.pdf?ua=1](http://www.who.int/immunization/sage/meetings/2015/april/Cernuschi_MIC_Strategy_SAGE_Apr2015.pdf?ua=1)).

<sup>58</sup> Makinen M, Kaddar M, Molidrem V, Wilson L. New vaccine adoption in lower-middle income countries. Health Policy and Planning. 2012;27: ii39–ii49 ([http://heapol.oxfordjournals.org/content/27/suppl\\_2/ii39.long](http://heapol.oxfordjournals.org/content/27/suppl_2/ii39.long)).

<sup>59</sup> National Immunization Technical Advisory Group.

<sup>60</sup> Comprehensive Multi-Year Plan.

<sup>61</sup> This work is still ongoing and a full assessment of its impact has not been conducted yet.

#### 4. Identified issue: information asymmetry, lack of vaccine price information

##### ENABLER: Access to price and contract information

- **Impact on affordability:** Better access to price information allows countries to be better equipped for decision-making, budgeting and negotiations.
- **Partners engaged:** WHO (V3P), UNICEF (SD), PAHO (RF), MSF (Access Campaign)
- **Examples of impact of implemented activities:** More and more countries are sharing and using vaccine price information.
- **Recommendation by the MIC Task Force:** Efforts need to be continued in this area.

#### 5. Identified issue: lack of market power and economies of scale

##### ENABLER: Pooled procurement and access to external procurement services

- **Impact on affordability:** Pooled procurement creates economies of scale and higher volumes that may provide greater market leverage and better access to reliable, affordable supply.
- **Partners engaged:** PAHO (RF), UNICEF (SD), WHO EMRO (Pooled Vaccine Procurement: PVP), Gavi (Access to Appropriate Price: ATAP)
- **Examples of impact of implemented activities:** The PAHO RF combines pooled procurement with a revolving fund line of credit and technical assistance to countries, and is one of the most successful examples of pooled procurement. UNICEF SD also successfully manages procurement for many countries, offering low-cost and high-quality vaccines. A recent Gavi Board decision allows Gavi-graduated countries to choose to be included in UNICEF tenders on behalf of other Gavi countries for specific vaccines for 5 years: through these tenders these countries may benefit from manufacturers offering Gavi or similar prices.
- **Recommendation by the MIC Task Force:** Several barriers need to be overcome before setting up an efficient pooled procurement mechanism, including accurate demand consolidation; political commitment and harmonization of product registration processes. Efforts should therefore focus on demand consolidation (and demand predictability) as well as developing lessons learnt from past and current initiatives.

#### 6. Identified issue: lack of competition

##### ENABLER: Influencing market dynamics

- **Impact on affordability:** Market dynamics play a fundamental role in setting the price and availability of vaccines. A healthy market with a strong manufacturer base is a key element of affordable vaccines and availability of supply.
- **Partners engaged:** UNICEF, Bill & Melinda Gates Foundation (BMGF), Gavi
- **Examples of impact of implemented activities:** Market-shaping initiatives have enabled several developing country manufacturers to enter the global market with minimum investment, increasing competition, increasing supply availability and lowering prices (e.g. of the DTP-HepB-Hib market).
- **Recommendation by the MIC Task Force:** While a lot of work has been done in this area, most of it focuses primarily on the Gavi market. Organizations working with manufacturers are therefore encouraged to include provisions benefiting non-Gavi MICs in access agreements.

Other factors can also influence the cost of vaccines, for instance the progress of research in terms of vaccine adaptability and schedule adaptations. Research is on the way to create vaccines that are better adapted to the developing world (eg. new developments in vaccine administration technologies, vaccines that can be taken out of the cold chain, among others). While the price of these new vaccines may not necessarily be lower, the programmatic costs associated with vaccination

could be drastically reduced as these new vaccines require fewer human resources for administration and/or less stringent supply chain requirements. Schedule updates could also contribute to lowering the overall cost of vaccination. For instance, recent recommendations to use a two-dose schedule instead of a three-dose schedule for HPV<sup>62</sup> reduced the full schedule purchasing price by one third.

## Conclusions

Countries, especially MICs not benefiting from donor support, have expressed concern in the last few years about their ability to sustain their immunization programmes because of the high cost of newer vaccines. The adoption of WHA Resolution 68.6 in 2015, which

specifically addresses the issue of access to sustainable supplies of affordable vaccines for LICs is the latest sign that MICs are willing to make efforts in this area while WHO and partner agencies are encouraged to provide the appropriate support to countries. Access to vaccine

<sup>62</sup> Human papillomavirus vaccines, WHO position paper, October 2014. (<http://www.who.int/wer/2014/wer8943.pdf?ua=1>)

price information has been recognized as an important step towards access to affordable prices.

This report showed that, based on the two indicators:

- As of June 2015, 40 countries had shared 2014 vaccine price data. This represents an important increase in data quantity and quality but with discrepancies remaining between regions in terms of participation. Countries of all regions are encouraged to share their vaccine price information, as more price data is needed to increase the quality of the analyses and confirm trends. Reasons for not sharing price data should be further analysed.
- Analysis of information shared by countries, UNICEF and PAHO with V3P suggests that the main drivers for high prices seem to be linked to the maturity of the market and the level of competition, procurement

mechanism and income level. But the depth of analysis of this indicator remains limited by the quality of data collected on procurement and contractual variables as well as the lack of historical data.

Not all details are being captured by the V3P database and several other factors may influence vaccine prices. The causes of unaffordable vaccine prices have been identified by the MIC strategy, and partners are working on solutions to address these challenges. Efforts should be continued and strengthened to ensure that more affordable and sustainable prices are available to all countries, particularly to MICs not receiving donor support.





# III

Tracking resources invested in  
immunization: report on health  
account activities







## Background

As per the Monitoring and Evaluation/Accountability (M&E/A) Framework presented to the Sixty-sixth World Health Assembly in May 2013, resources invested in immunization will be tracked and monitored on a yearly basis throughout the decade using the framework of the Organisation for Economic Co-operation and Development (OECD)/Eurostat/WHO System of Health Accounts 2011 (SHA 2011). The SHA 2011<sup>63</sup> is an effort

to create a single platform for collecting and analysing all of a country's health expenditures including those for priority programmes such as immunization.

Since January 2013, a total of 10 regional introductory training workshops have been held around the globe. These workshops have provided 99 countries with the knowledge and training required to begin their own SHA 2011 reports.

## Results

Thirty-three countries have completed at least one SHA 2011 report. These countries are: Benin, Burkina Faso, Burundi, Bosnia and Herzegovina, Cambodia, Cameroon, Comoros, Côte d'Ivoire, Democratic Republic of the Congo, Egypt, Fiji, Gabon, Gambia, Ghana, Haiti, Iraq, Kenya, Lao People's Democratic Republic, Liberia, Malawi, Mali, Mauritania, Morocco, Mozambique, Niger, Philippines, Seychelles, Sierra Leone, Tajikistan, Togo, Tunisia, Uganda and the United Republic of Tanzania.

Of these countries, 22 have included specific information regarding expenditures on vaccine-preventable diseases and immunization: Benin, Burkina Faso, Burundi, Cambodia, Côte d'Ivoire, the Democratic Republic of the Congo, Egypt, Gambia, Ghana, Haiti, Iraq, Liberia, Mali, Mauritania, Niger, the Philippines, Seychelles, Sierra Leone, Togo, Tunisia, Uganda and the United Republic of Tanzania.

Although each of these nations has completed at least one SHA 2011 report that includes information on

vaccine-preventable diseases, only Benin, Burkina Faso, Cambodia, the Democratic Republic of the Congo, Haiti, Niger, the Philippines, Sierra Leone and Uganda have made the data publicly available. Data from all the other countries have still to be approved for official publication and thus cannot be circulated yet. These data have, however, been reviewed by the WHO Health Accounts team and some estimates have been flagged as needing to be re-evaluated.

An additional 35 countries are currently producing or are about to start producing their first SHA 2011: Angola, Armenia, Bahrain, Bangladesh, Botswana, China, Eritrea, Georgia, Guinea, Guyana, India, Indonesia, Kuwait, Lesotho, Madagascar, the Federated States of Micronesia, Myanmar, Namibia, Nepal, Nigeria, Papua New Guinea, Paraguay, Sao Tome and Principe, Saudi Arabia, Senegal, South Africa, South Sudan, Sri Lanka, Suriname, Swaziland, The Former Yugoslav Republic of Macedonia, Uzbekistan, Viet Nam, Zambia and Zimbabwe.

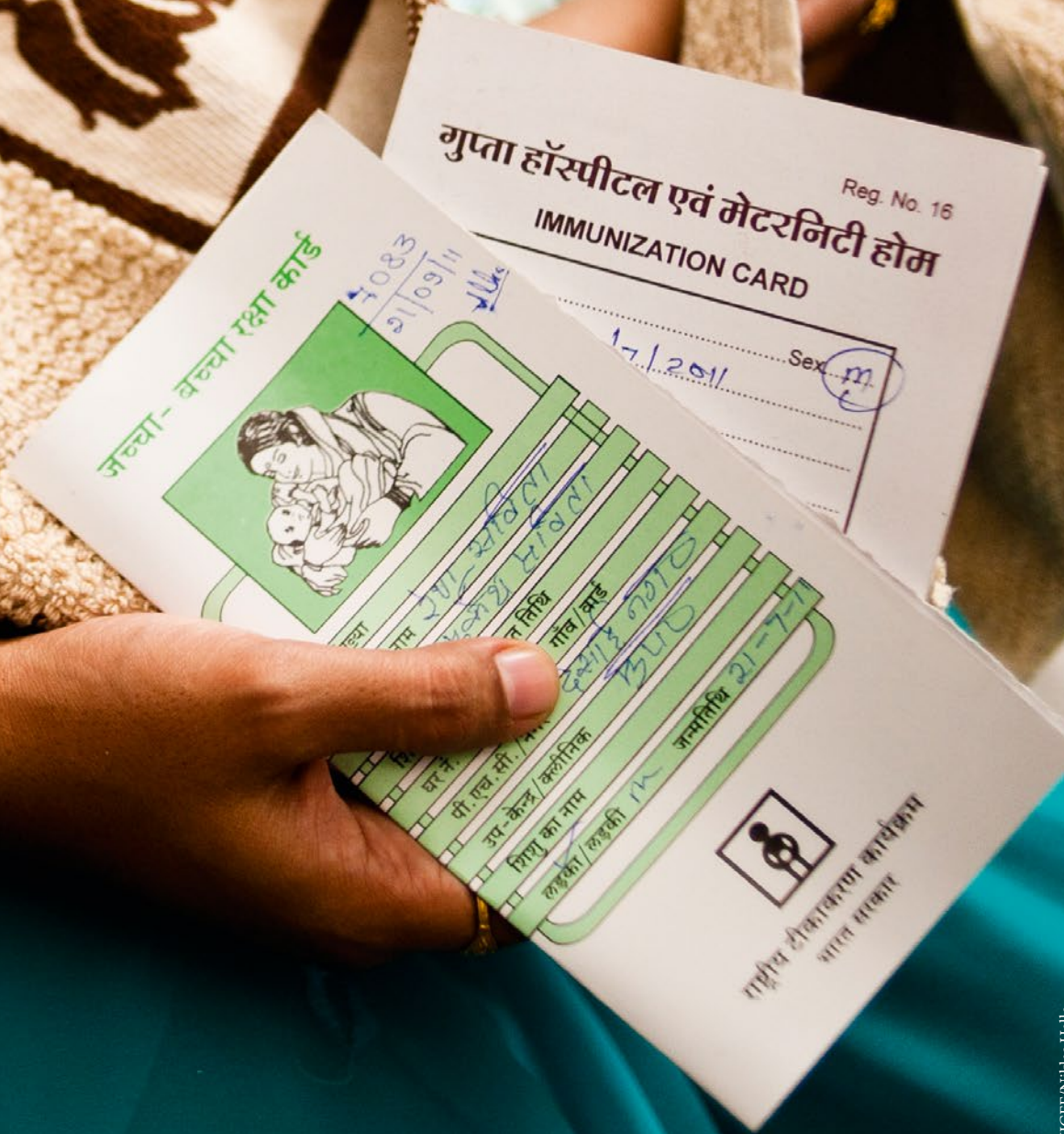
<sup>63</sup> For more information about the GVAP and the System of Health Accounts 2011, please refer to p. 108 of the Global Vaccine Action Plan monitoring, evaluation & accountability: Secretariat annual report 2013. Geneva: World Health Organization; 2013 ([http://www.who.int/entity/immunization/global\\_vaccine\\_action\\_plan/GVAP\\_secretariat\\_report\\_2013.pdf](http://www.who.int/entity/immunization/global_vaccine_action_plan/GVAP_secretariat_report_2013.pdf)).



# III

Documenting and monitoring  
commitments for immunization:  
the partnership for maternal,  
newborn and child health 2015  
accountability report





Aligned with the Global Strategy (2011–2015) for Women's and Children's Health<sup>64</sup> to save 16 million lives in 49 countries by 2015,<sup>65</sup> adopted by the United Nations Secretary-General Ban Ki-moon, the Every Woman Every Child (EWEC) effort was established to intensify global action to improve reproductive, maternal, newborn and child health.

Following UN Commission on Information and Accountability for Women's and Children's Health-(COIA) recommendations for a global accountability framework for women's and children's health (1), the independent Expert Review Group (iERG) regularly report to the United Nations Secretary-General on progress. Three reports have been released to date (2– 4).

Supporting the work of the iERG, the Partnership for Maternal, Newborn and Child Health (PMNCH) has tracked and analysed the Global Strategy commitments<sup>66</sup> since 2011 and assessed their implementation on an annual basis, as well as the degree to which financial commitments and overall funding of reproductive, maternal, newborn and child health (RMNCH) are aligned with the priorities spelled out in the Global Investment Framework (GIF) for Women's and Children's Health.<sup>67</sup>

The PMNCH 2014 accountability report (5) focuses exclusively on the commitments made to the Global Strategy that were specifically expressed in financial terms, i.e. financial commitments. It reviews progress made in implementing these financial commitments

and how they have affected financing for reproductive, maternal, newborn and child health more broadly. While many significant non-financial commitments were also made to the Global Strategy (e.g. service delivery, policy and advocacy commitments), these are difficult to monetize and are not analysed in this report. Efforts by WHO and the Executive Office of the Secretary-General, in collaboration with PMNCH, are under way to develop a streamlined reporting platform that would bring the tracking and reporting of all commitments made to the Global Strategy and EWEC, both financial and non-financial, under one umbrella. For now, it has been done only for the non-financial commitments.

The analysis of financial commitments in the 2014 report shows a number of encouraging trends in the implementation of Global Strategy commitments and reproductive, maternal, newborn and child health financing more broadly, although it also points to important areas requiring more focus.

Building on the PMNCH 2014 Report, the analysis of disbursements for immunization has been updated to include the most recent data. Results are shown in Figure 67 and Table 39.

When focusing on disbursements for immunization, it is clear that this aspect has received significant attention since 2009 both for the 75 Countdown countries and the 49 Global Strategy countries, as shown in Figure 67 and Table 39. This attention includes the Global Vaccine Action Plan (GVAP) 2011–2020.

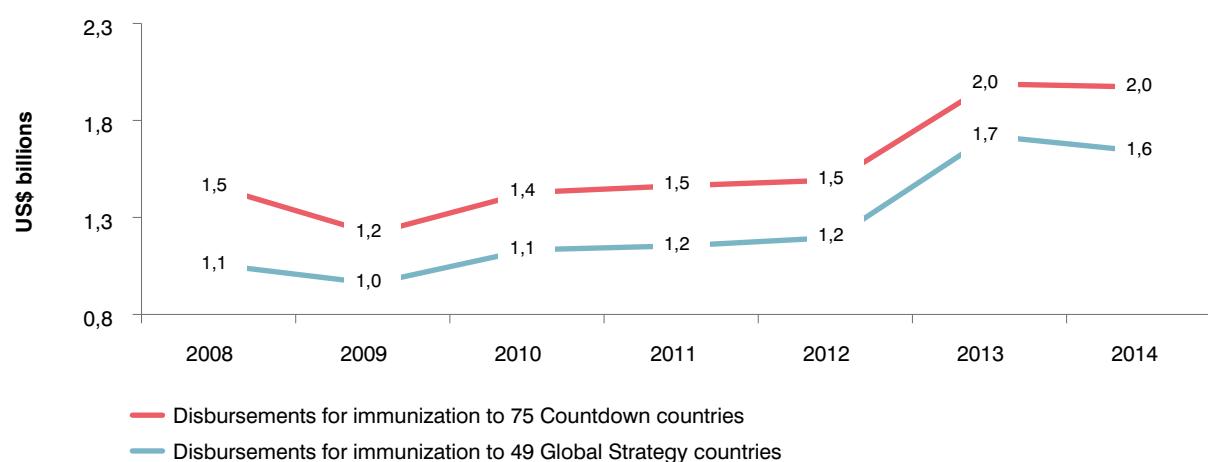
<sup>64</sup> [http://www.everywomaneverychild.org/images/content/files/global\\_strategy/full/20100914\\_gswch\\_en.pdf](http://www.everywomaneverychild.org/images/content/files/global_strategy/full/20100914_gswch_en.pdf)

<sup>65</sup> These were the 49 lowest-income countries according to the World Bank list of economies as of April 2008. These countries were the focus of the work of the Taskforce on Innovative International Financing for Health Systems and then became the focus countries of the Global Strategy. A list of the countries is provided in the 2014 GVAP Secretariat report.

<sup>66</sup> All commitments to the Global Strategy are listed on the Every Woman Every Child website: <http://www.everywomaneverychild.org>, accessed 1 March 2014.

<sup>67</sup> Stenberg K, Axelson H, Sheehan P, Anderson I, Gülmezoglu AM, Temmerman M, et al. Advancing social and economic development by investing in women's and children's health: a new Global Investment Framework. *Lancet*. 2014;383(9925):1333–54.



**Figure 67: Time trend in disbursements for immunization to 49 Global Strategy and 75 Countdown countries 2008–2014**

Source: Gavi, WHO and UNICEF data

**Table 39: 2008–2014 Disbursements for immunization to 49 Global Strategy and 75 Countdown countries**

US\$ billion	2008	2009	2010	2011	2012	2013	2014
Disbursements for immunization to 49 Global Strategy countries	1.1	1.0	1.1	1.2	1.2	1.7	1.6
Annual change in %		–9	18	2	4	44	–5
Disbursements for immunization to 75 Countdown countries	1.5	1.2	1.4	1.5	1.5	2.0	2.0
Annual change in %		–16	17	2	2	33	–1

Source: Gavi, WHO and UNICEF data.

RMNCH Official Development Assistance delivered through Gavi and GPEI targets the immunization package. Table 40 shows the combined GPEI and Gavi spending for the 49 Global Strategy countries and the 75 Countdown countries for the period 2008–2014.

Gavi more than doubled its overall disbursements to 75 Countdown countries from US\$ 627 million in 2010 to US\$ 1.3 billion in 2014. The growth rate accelerated from 8% in 2010–2011 (an increase of US\$ 47 million) to 41% in 2011–2012 (an increase of US\$ 275 million), and to 46% in 2012–2013 (an increase of US\$ 440 million). The increased disbursements in 2011–2013 resulted from increased country demand and the rollout of new Gavi programmes that were approved in 2011. In 2011, a record number of 55

new programmes were approved, of which more than 30 targeted pneumococcal or rotavirus vaccines.

GPEI funding to 75 Countdown countries declined from US\$ 802 million in 2010 to US\$ 543 million in 2012 (a 32% decrease compared to 2010), but then grew to US\$ 682 million in 2014 (a 26% increase compared to 2012).

The Global Strategy calculated a US\$ 5 billion funding gap for immunization for 2011–2015. Between 2010 and 2014, Gavi, the major multilateral mechanism for financing vaccines, and the GPEI increased their disbursements to 49 Global Strategy countries by a total of US\$ 510 million. The GIF estimates that the amount of additional investments required for immunizations is as large as the amount for Maternal and Neonatal Health (US\$ 70 billion for 2013–2035).

**Table 40: Disbursements for immunization to 49 Global Strategy and 75 Countdown countries, 2008 – 2014**

US\$ billion	2008	2009	2010	2011	2012	2013	2014
Gavi disbursements to 49 Global Strategy countries	0.5	0.3	0.6	0.6	0.8	1.2	1.1
Annual change in %		–39	79	1	39	47	–10
GPEI disbursements to 49 Global Strategy countries	0.5	0.6	0.6	0.6	0.4	0.5	0.6
Annual change in %		20	–13	2	–32	38	8
Gavi disbursements to 75 Countdown countries	0.6	0.4	0.6	0.7	0.9	1.4	1.3
Annual change in %		–39	71	8	41	46	–7
GPEI disbursements to 75 Countdown countries	0.9	0.9	0.8	0.8	0.5	0.6	0.7
Annual change in %		0	–6	–2	–31	10	14

Source: Gavi, WHO and UNICEF data.

As part of PMNCH recommendations based on the 2014 accountability report, funding should be focused on the most cost-effective, evidence-based intervention packages that have the largest impact on reducing mortality and that are currently receiving too little attention. Donors and countries should refer to the Global Investment Framework for Women's and Children's Health to guide their investments, which should be particularly targeted at the most underfunded of its six packages and those with the highest impact. The child health, maternal and neonatal health, and immunization packages require the largest

additional investments alongside the other packages. The family planning package has the potential to have the largest impact on reducing mortality.

New opportunities for international and national stakeholders to invest in neonatal health are emerging, such as the Every Newborn Action Plan (ENAP), developed and officially launched in June 2014. Among other occasions, the Gavi pledging conference in January 2015 was a new opportunity for global health donors to make additional pledges for immunization.

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# IV

Independent submission from  
the GAVI CSOs constituency



# Gavi CSO Constituency Stakeholders' Report

July 2015

## I. Introduction

The role and contributions of civil society at all levels, particularly at the community level, in facilitating immunization delivery and uptake is one that is recognized and acknowledged, but often underappreciated and underestimated. The Global Vaccine Action Plan (GVAP) 2011-2020 includes civil society as a key stakeholder with clearly identified responsibilities that, if supported, contribute to the achievement of the GVAP target of preventing 24-26 millions of deaths by 2020 (see Table 1). Informed

by the GVAP's six guiding principles of country ownership, shared responsibility and partnership, equity, integration, sustainability, and innovation, civil society has been shaping its response to fulfill these responsibilities often in under-resourced settings and with limited support and infrastructure. Driven by community needs, CSOs are constantly adapting to serve as advocates, educators, trainers, health promoters, researchers, data collectors and analysts, logisticians, coordinators, and health and immunization workers.

**Table 1: GVAP Annex 2: Stakeholder Responsibilities**

Civil society including nongovernmental organizations and professional societies, should do the following:
<b>GET INVOLVED</b> in the promotion and implementation of immunization programmes at both country and global level.
<b>PARTICIPATE</b> in the development and testing of innovative approaches to deliver immunization services that reach the most vulnerable people.
<b>FOLLOW</b> national guidelines and regulations in the design and delivery of immunization programmes that fulfil the duty of accountability to national authorities.
<b>EDUCATE</b> , empower and engage vulnerable groups and communities on their right to health, including vaccines and immunization.
<b>BUILD</b> grass-roots initiatives within communities to track progress and hold governments, development partners and other stakeholders accountable for providing high-quality immunization services.
<b>CONTRIBUTE</b> to improved evaluation and monitoring systems within countries.
<b>ENGAGE</b> in country, regional and global advocacy beyond the immunization community to ensure vaccines and immunization are understood as a right for all.
<b>COLLABORATE</b> within and across countries to share strategies and build momentum for improved health, vaccines and immunization.

This report represents the second independent civil society report for inclusion in the 2015 GVAP Secretariat report. Similar to last year's report, the purpose of the 2015 civil society report is to:

- Summarize CSO-reported *country-level* contributions to the achievement of the GVAP goals and Strategic Objectives (SOs) in 2014 with a focus on the Gavi CSO platform project countries<sup>68</sup>;

- Highlight ongoing challenges and missed opportunities in civil society's ability to fully contribute to GVAP implementation and immunization delivery overall; and
- Offer recommendations for consideration by the Strategic Advisory Group of Experts on Immunization (SAGE) GVAP Working Group.

In addition, this year's report includes a progress update from 2014 civil society recommendations.

<sup>68</sup> The 24 Gavi CSO country platforms project countries include Bangladesh, Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Democratic Republic of the Congo, Ethiopia, Ghana, Guinea, Haiti, India, Kenya, Liberia, Madagascar, Malawi, Mali, Nigeria, Pakistan, Sierra Leone, South Sudan, Togo, Uganda and Zambia.



## II. Methodology

This report was prepared by an external consultant guided by the Gavi CSO constituency coordinator, the Gavi CSO constituency project staff, and the 20-member Gavi CSO Steering Committee. The preparation of the report was funded by the World Health Organization (WHO)/Immunization, Vaccines and Biologicals (IVB) team. The content for the report is based on two main sources of data and information. First, existing data was drawn from the Gavi CSO

constituency project administered by Catholic Relief Services and available on the Gavi CSO constituency website – <http://www.Gavi-cso.org/cso-hss-platforms>. Second, GVAP questionnaires that were developed for the preparation of the 2014 civil society report were used again this year to elicit organizational and country-specific information from CSOs. Responses from the GVAP questionnaires were received by a total of 18<sup>69</sup> out of the 24<sup>70</sup> Gavi CSO country platforms.

## III. Civil society contributions in 2014 to gvap goals and strategic objectives

CSOs from 18 out of the 24 Gavi CSO country platforms submitted responses to the GVAP questionnaire. The number of CSOs responding for each country platform ranged from 5 CSOs (DRC) to approximately 100 CSOs (Cameroon). Over 500 individual CSOs submitted questionnaire responses of which approximately 26% were not included due to incomplete and/or unclear responses. Responses were based on how the individual who completed the questionnaire

interpreted each question; responses were not verified at the country level.

Among the questionnaires that were included, Table 2 shows how many CSOs indicated that their activities contributed to the GVAP goals, and Table 3 shows how many CSOs indicated that their activities contributed to the GVAP SOs. CSOs from six Gavi CSO country platforms – Burkina Faso, Guinea, Malawi, Mali, Nigeria, and South Sudan – did not submit questionnaires and are not included in Tables 2 and 3.



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<sup>69</sup> CSOs from the following 18 Gavi CSO platform countries responded to the GVAP questionnaire. These include Benin, Cameroon, Chad, Côte d'Ivoire, Democratic Republic of the Congo, Ethiopia, Ghana, Kenya, Liberia, Madagascar, Sierra Leone, Togo, Uganda, Zambia, Haiti, Pakistan, Bangladesh, and India.

<sup>70</sup> The 24 Gavi CSO platform project countries include Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Democratic Republic of the Congo, Ethiopia, Ghana, Guinea, Kenya, Liberia, Madagascar, Malawi, Mali, Nigeria, Sierra Leone, South Sudan, Togo, Uganda, Zambia, Haiti, Pakistan, Bangladesh, and India.

**Table 2: Country-Level CSO Contributions to the GVAP Goals**

CSO COUNTRY PLATFORM	# of completed GVAP questionnaires submitted <sup>71</sup>	GOAL 1 Achieve a world free of poliomyelitis	GOAL 2 Meet global and regional elimination targets	GOAL 3 Meet vaccination coverage targets in every region, country and community	GOAL 4 Develop and introduce new and improved vaccines and technologies <sup>72</sup>	GOAL 5 Exceed Millennium Development Goal 4 target for reducing child mortality
<b>WHO Africa</b>						
Benin	14	9	6	5	2	4
Cameroon	~1001 <sup>73</sup>	x	x	x	x	x
Chad	88	88	88	87		88
Côte d'Ivoire	16	12	14	11	2	9
Democratic Republic of the Congo	5	3	4	2	1	1
Ethiopia	22	19	19	21	7	20
Ghana	1 <sup>74</sup>	1	1	1	1	1
Kenya	6			3		2
Liberia	3			1	1	2
Madagascar	9	9	9	8	5	8
Sierra Leone	0 <sup>75</sup>					
Togo	16	13	12	5	1	3
Uganda	8	8	6	8	4	7
Zambia	8	3	4	4	2	5
<b>WHO Americas</b>						
Haiti	26	11	13	6	4	9
<b>WHO Eastern Mediterranean</b>						
Pakistan	22	21	19	17	9	16
<b>WHO South-East Asia</b>						
Bangladesh	3	3	3	3	1	3
India	47 <sup>76</sup>	42	32	40	35	38
<b>TOTAL</b>	<b>394</b>	<b>242</b>	<b>230</b>	<b>222</b>	<b>75</b>	<b>216</b>

<sup>71</sup> This column includes the number of CSOs that submitted completed questionnaires for each CSO platform country. Incomplete questionnaires are not included in the total.

<sup>72</sup> The majority of CSO respondents described their contribution to Goal 4 in terms of their involvement in the introduction and/or rollout of rotavirus, pneumococcal conjugate vaccine (PCV) and/or pentavalent.

<sup>73</sup> Over 100 Cameroon organizations, groups and health committees submitted questionnaire responses, however, many were incomplete, unreadable or unclear as to whether the submission was from a CSO or a government unit. From a scan of responses among those that appeared to be CSOs, contributions range across all GVAP goals and SOs.

<sup>74</sup> The Ghana Coalition of NGOs in Health submitted one completed questionnaire on behalf of its 400+ member organizations instead of member organizations submitting individual questionnaires.

<sup>75</sup> One CSO submitted a questionnaire, but indicated lack of knowledge of the GVAP. Responses did not indicate any contributions to the GVAP goals and SOs.

<sup>76</sup> Responses were received from CSOs in the states of Bihar, Jharkhand, Rajasthan, and Uttar Pradesh.



**Table 3: Country-Level CSO Contributions to the GVAP Strategic Objectives**

CSO COUNTRY PLATFORM	# of completed GVAP questionnaires submitted <sup>77</sup>	SO 1 All countries commit to immunization as a priority	SO 2 Individuals and communities understand the values of vaccines and demand immunization as both their right and responsibility	SO 3 The benefits of immunization are equitably extended to all people	SO 4 Strong immunization systems are an integral part of a well-functioning health system	SO 5 Immunization programmes have sustainable access to predictable funding, quality supply and innovative technologies	SO 6 Country, regional and global research and development innovations maximize the benefits of immunization <sup>78</sup>
<b>WHO Africa</b>							
Benin	14	5	8	5	2	2	
Cameroon	~1002 <sup>79</sup>	x	x	x	x	x	x
Chad	88	88	88	88	88		
Côte d'Ivoire	16	5	13	10	7	5	
Democratic Republic of the Congo	5	1	3	2	2	1	
Ethiopia	22	8	15	12	17	6	5
Ghana	1 <sup>80</sup>	1	1	1	1	1	
Kenya	6	2	3			1	5
Liberia	3	1		1			
Madagascar	9	9	9	9	9	5	3
Sierra Leone	0 <sup>81</sup>						
Togo	16	3	13	8	4	1	2
Uganda	8	6	6	6	6	4	4
Zambia	8	4	4	3	2		
<b>WHO Americas</b>							
Haiti	26	11	9	9	12	4	1
<b>WHO Eastern Mediterranean</b>							
Pakistan	22	11	14	9	9	6	6
<b>WHO South-East Asia</b>							
Bangladesh	3	3	2	1	1	1	1
India	47 <sup>82</sup>	36	39	19	34	28	27
<b>TOTAL</b>	<b>394</b>	<b>194</b>	<b>227</b>	<b>183</b>	<b>194</b>	<b>65</b>	<b>54</b>

<sup>77</sup> See footnote 71<sup>78</sup> The majority of CSOs cited their implementation and/or operational research as contributions to SO6.<sup>79</sup> See footnote 73<sup>80</sup> See footnote 74<sup>81</sup> See footnote 75<sup>82</sup> See footnote 76

## IV. Main contributions of civil society to the gvap strategic objectives

CSOs responded with a number of examples of how their activities are contributing to the GVAP SOs. These are summarized below in Table 4.

**Table 4: Summary of CSO-Reported Activities in Support of GVAP SOs**

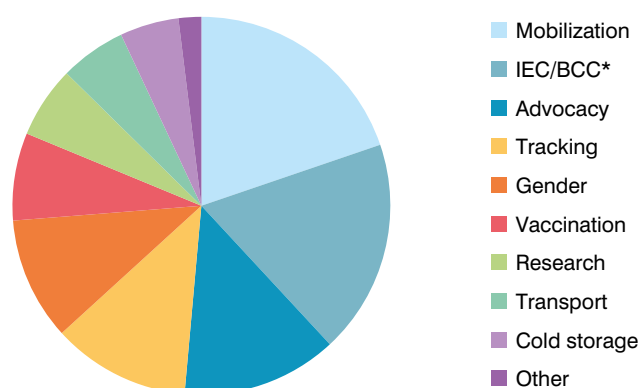
GVAP Strategic Objective (SO)	CSO-Reported Activities in 2014
<b>SO 1:</b> <b>All countries commit to immunization as a priority</b>	<ul style="list-style-type: none"> <li>✓ Advocacy to ensure governments stay committed to sustaining immunization programs that are adequately funded</li> </ul>
<b>SO 2:</b> <b>Individuals and communities understand the value of vaccines and demand immunization as both their right and responsibility</b>	<ul style="list-style-type: none"> <li>✓ Organize community sensitization campaigns on the benefits of each vaccine, why multiple dosing is important for some vaccines; conduct sensitizations in the local language for ease of understanding, and for specific groups such as pregnant women</li> <li>✓ Door-to-door outreach to families who cannot travel to fixed sites to receive immunization</li> <li>✓ Household visits for sensitizations on benefits and schedule of immunizations, for newborn tracking and to ensure no missed vaccines and/or defaulters</li> <li>✓ Radio campaigns and programmes used to sensitize and mobilize communities around immunization campaigns and/or national immunization days</li> <li>✓ Training of community mobilizers and volunteers to conduct sensitizations and door-to-door visits on the importance of vaccines, what they are and how they protect against specific diseases, when and where to get children immunized, immunization schedule</li> <li>✓ Identifying community champions that can help promote immunization</li> <li>✓ Advocacy targeting community and religious leaders to be involved in immunization campaigns</li> <li>✓ Educate students at school on importance of vaccination, students then share information with their parents and encourage them to get their younger siblings vaccinated</li> </ul>
<b>SO 3:</b> <b>The benefits of immunization are equitably extended to all people</b>	<ul style="list-style-type: none"> <li>✓ Focused outreach to sensitize communities and delivery of vaccines in rural, remote and hard-to-reach areas that are a long way from health facilities</li> <li>✓ Promotion of immunization as part of the right to health</li> <li>✓ Partnering with government to receive supplies of vaccines in order to offer free vaccination</li> </ul>
<b>SO 4:</b> <b>Strong immunization systems are an integral part of a well-functioning health system</b>	<ul style="list-style-type: none"> <li>✓ Integrating immunization activities with antenatal care, post delivery, post natal care and family health services</li> </ul>
<b>SO 5:</b> <b>Immunization programmes have sustainable access to predictable funding, quality supply and innovative technologies</b>	<ul style="list-style-type: none"> <li>✓ Advocacy for dedicated immunization budget lines or increased funding for immunization</li> <li>✓ Procurement and use of solar refrigeration to address problems in the cold chain system – solar fridges are regarded by CSOs as a more cost-effective and reliable technology to address lack of electricity in certain areas; reduces need for fuel and maintenance</li> </ul>
<b>SO6:</b> <b>Country, regional and global research and development (R&amp;D) innovations maximize the benefits of immunization</b>	<ul style="list-style-type: none"> <li>✓ Conducting implementation or operational research to generate evidence base and best practices for immunization demand and delivery in various settings; research on factors that hinder immunization uptake for different groups; research to track instances and types of side effects from vaccines</li> </ul>

In 2015, the Gavi CSO constituency project conducted its annual survey of civil society's contribution to immunization in 2014.<sup>83</sup> The survey was conducted in nine Gavi CSO platform countries: Chad, Guinea, Haiti, India, Liberia, Malawi, Nigeria, Pakistan, and Uganda. Survey results revealed that

the majority of activities conducted by CSOs fall into one of three areas – community mobilization, Information-Education-Communication (IEC) / Behaviour Change Communication (BCC), and advocacy. The range of CSO activities are shown in Figure 1 below.

**Figure 1: Breakdown of CSO-related immunization activities in 2014**

**Civil society organization (CSO) activities related to immunization**



\* IEC = Information-Education-Communication; BCC = Behaviour Change Communication

## V. Ongoing challenges faced by civil society

Questionnaire responses reveal a range of challenges faced by CSOs in their efforts to fully and effectively implement and scale up immunization activities in support of GVAP implementation at the national level. These challenges are highlighted below and organized by the six main areas of Gavi's bottlenecks/barriers framework.

### 1. Supply chain challenges due to problems with distribution, infrastructure, and overall planning and management

- Cold chain system difficult to access especially in rural areas where it is managed at the district center, which is far away from communities
- Frequent stock outs of vaccines, syringes and other materials
- Lack of spare parts to maintain the cold chain system
- Inadequate storage capacity for vaccines
- Lack of sufficient number of vehicles to deliver vaccines
- Delay in vaccine deliveries
- Outdated fridges prone to breakdowns
- Power outages with lack of generator back up affecting cold chain system
- Short lifespan of some vaccines sometimes leading to wastage if not all are used during a certain period of time

### 2. Service delivery challenges especially for poor, remote, mobile, and/or rural populations due to weak road infrastructure and lack of adequately skilled, equipped, motivated, supervised, and socially- and culturally-appropriate staff

- Poor radio signals making it difficult to carry out regular radio campaigns and programmes
- Lack of transport to access hard-to-reach areas often at long distances and with difficult terrain; also to reach mobile, pastoral, tribal, nomadic, and cross-border populations
- Lack of adequate, regular and quality supervision of immunization programs due to insufficient human resources; some areas of the country get more supervision support than others
- Education levels of mothers are low making comprehension difficult during sensitizations
- Difficulties reaching communities that are far away from health facilities during the rainy season
- Insufficient number of trained and skilled staff compromising delivery of vaccines and quality of service in both urban (e.g. high-rise buildings, concentrated neighborhoods) and rural areas (e.g far away, difficult to reach due to terrain)
- High turnover of staff in hard-to-reach areas; difficulties in motivating staff and community workers who are not adequately compensated for their work

<sup>83</sup> The full survey report can be accessed at <http://www.gavi-cso.org/csos-news/surveys-from-cso-platforms>.

- Funding for district health center operations and staff inadequate
- Delayed disbursement of funds to the district to support supervision affecting delivery and quality of programs
- Lack of funding to support training for community mobilization volunteers and for stipends

### 3. Weak demand due to social, cultural, and/or religious reasons

- Resistance by some religious leaders who discourage immunization in favor of relying solely on divine healing and “protection from God”
- Lack of adequate resources to conduct regular sensitizations and advocacy to ensure acceptance by communities and leaders in order to reach full coverage
- Need to continue to engage political leaders for consistent support to counter resistance to immunization
- Lack of motivation and support by village chiefs due to lack of appropriate information to sensitize them
- Cultural beliefs that vaccines cause rather than prevent disease in children

### 4. Poor data collection, analysis, reporting, use, and quality due to lack of tools and training and skilled staff

- Stockout of tally sheets affecting recordkeeping – quality, completeness, accuracy, etc.
- Lack of an effective system to inform feedback in real-time so that problems from the grassroots can be addressed in good time – only seeing problems through reports of low coverage or poor vaccine service quality
- Lack of training opportunities for civil society in data collection, analysis, use and quality, including refresher trainings
- Low literacy level affecting ability to monitor and utilize data collection tools; tools sometimes too complicated to use
- Lack of support and funding for CSOs to train staff and volunteers to collect, analyze, document and use data
- Poor quality of data leading to inconsistencies between and gaps in data sets by CSOs, government and WHO-UNICEF
- Need for transport support to enable CSOs to regularly track and monitor programs
- Each district has a target number of clients for vaccination but there is poor usage of the information to stock vaccines equivalent to the target population
- Inaccurate population denominators in many communities

- Lack of funds to conduct research periodically
- Lack of accessible computers to input data leading to regular delays in submitting data on time
- Loss of vaccination cards (by families and health centers)

### 5. Weak leadership, management and coordination, including around financing

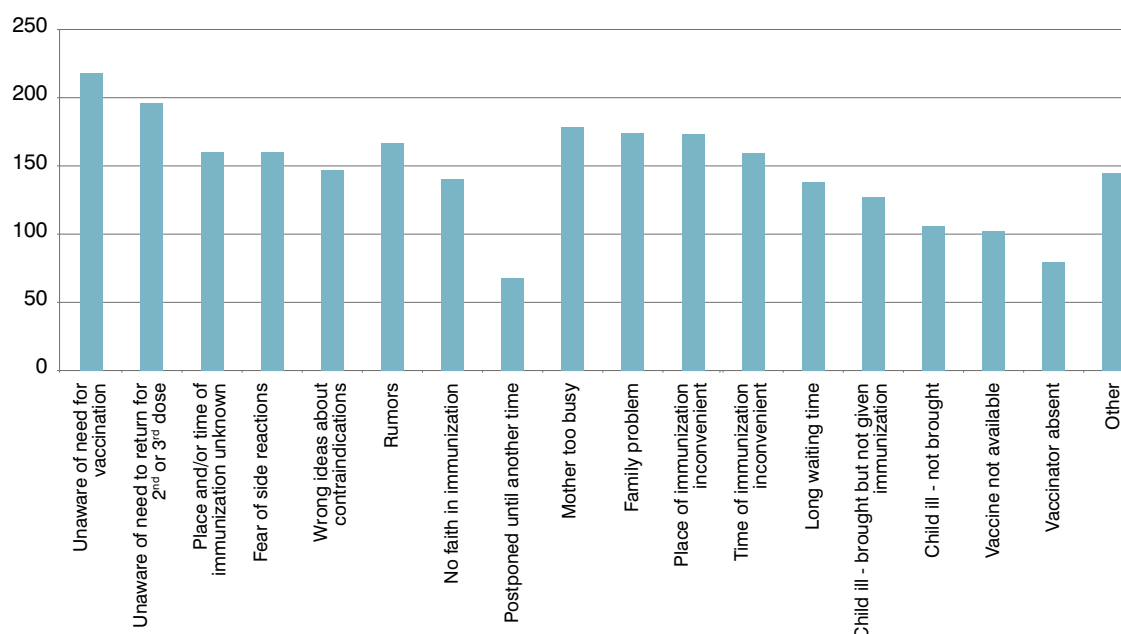
- Annual planning does not respond to findings from evaluations, thus problems reoccur
- Limited resources for immunization especially outreach activities; underappreciation of the time and effort involved in getting to every child in every corner of the country – CSOs are well placed to do this since most of them live with the communities, but are not funded sufficiently to carry out this important work
- Need to strengthen the coordination among sectors and partners through stakeholder meetings and capacity building programs to increase partnership and learning and to ensure equitable geographic coverage of activities; need to ensure that coordination is efficient and does not delay decision making
- Need for strong leadership to put in place a strategic plan for the sustainability of immunization after 2020
- Delay in funds disbursement affecting service delivery; inadequate funding for CSOs and districts to meet the full needs
- Phasing out of donor support for CSOs to continue carrying out immunization activities; need government to step in to fill the gap as well as champion CSO activities to ensure donor support continues
- Need national leadership to empower district staff and CSOs working in collaboration at the district level to have ownership and authority to make decisions; decentralize control for efficiency, but needs good supervision and communication between national and district levels

### 6. Challenging country contexts, such as political conflict, insecurity, frequent changes in government leadership and technical staff

- Political instability and insecurity in parts of some countries (e.g. Boko Haram in West Africa, Pakistan); higher insecurity faced by female workers
- Political leadership changes resulting in staff changes and changes in programs and objectives
- Lack of policies that provide the enabling environment for universal vaccine coverage for all children

Similar and additional barriers were cited in the 2015 Gavi CSO constituency project survey of nine Gavi CSO platform countries. These barriers are noted in Figure 2 below. The left axis refers to the number of CSOs reporting.

**Figure 2: Gavi CSO constituency project survey responses to the question “In the communities where you work, why are children not fully immunized?”**



Source: 2015 Gavi CSO constituency project survey

## VI. Progress on civil society recommendations from 2014

As part of an independent submission to the 2014 GVAP Secretariat report, civil society put forward several recommendations for consideration by the SAGE GVAP working group that would better support national and sub-national CSOs to contribute to the achievement of the GVAP. Civil society proposed that the first four recommendations should be tracked and monitored annually as part of the GVAP monitoring process.

1. National and regional immunization plans, programmes and strategies should clearly articulate civil society's role and expected contributions to their implementation and monitoring

**STATUS:** In the SAGE 2014 Assessment Report of the GVAP, the SAGE recommended that: “Countries give civil society organizations substantially more formal involvement in the delivery and improvement of vaccination services, establishing clear responsibilities for which they are accountable.” To date, Regional Vaccine Action Plans (RVAPs) for Africa (AFRO), Eastern Mediterranean (EMRO) and Western Pacific (WPRO) have been adopted.<sup>84</sup> These RVAPs articulate specific roles and contributions by civil society toward the achievement of regional objectives and targets. Following adoption of the RVAPs, countries have revised or are in the process of revising their comprehensive midyear plans (cMYPs) using revised

*guidelines that align with RVAP and GVAP goals and objectives. These processes are being led by Expanded Programme on Immunization (EPI) managers. It is unclear how civil society is involved in the cMYP process, what specific roles for civil society are described in the cMYPs, and whether and how civil society's contributions will be tracked.*

2. Memorandums of understanding (MOU) and signed agreements between governments or development partners and CSOs should be formalized and increased to enable CSOs to expand their reach and contribution to immunization plans and programmes

**STATUS:** In 2014, eight CSO platforms signed MOUs with their government and development partners vs three in 2013; a total of 13 MOUs were signed compared to eight in 2013.<sup>85</sup>

3. Immunization Coordinating Committees (ICCs) as well as technical and non-technical working groups at national and sub-national levels (where they exist) should include CSOs working in immunization so that they can share their experiences (e.g. routine immunization, demand generation, etc.) and propose solutions to addressing barriers to increasing vaccine coverage

<sup>84</sup> RVAPs that have been formally adopted include the European Vaccine Action Plan 2015-2020 (EMRO), Regional Strategic Plan for Immunization 2014-2020 (AFRO) and the Regional Framework for Implementation of the Global Vaccine Action Plan in the Western Pacific (WPRO).

<sup>85</sup> Source: Gavi CSO country platform project annual tracking



**STATUS:** As of 2014, a total of eight Gavi-supported CSO platforms had a seat in their country's ICC/HSCC vs six CSO platforms in 2013.<sup>86</sup>

4. WHO and UNICEF country representatives and offices should organize roundtables with CSOs at national and sub-national levels to increase overall awareness and understanding of the GVAP and civil society's role in its achievement

**STATUS:** WHO confirms that EPI managers have been sensitized on the need to raise awareness among CSOs especially when RVAPs have been discussed, however, the number of roundtables organized with CSOs is not currently being monitored and therefore, the exact number is unknown.

5. WHO should develop clear information on the timeline and processes to develop regional and country level GVAPs, and communicate this information widely across stakeholders, including CSOs; information should include the contact details for specific persons responsible for overseeing these efforts

**STATUS:** Among the RVAPs that have been adopted (at the time of this report), from a review of the Plans, it does not appear that civil society was specifically consulted in their development. Similar to recommendation 1, it is unclear if country governments, WHO or other immunization partners have developed and disseminated information for civil society to engage in the country cMYP process.

6. WHO should include during its regional Expanded Program on Immunization (EPI) meetings a forum for countries to exchange experiences and lessons on regional and country level GVAP development as well as on successes, challenges, and innovative approaches to addressing barriers to immunization scale up; CSO leadership from Gavi-supported CSO country platforms should be invited to the annual regional and global EPI review meetings

**STATUS:** No information available

7. GVAP Secretariat should convene a sub-working group within the GVAP Monitoring & Evaluation/Accountability working group to develop CSO or community-level indicators for each SO to be integrated in the GVAP M&E/Accountability framework

**STATUS:** The Gavi CSO constituency coordinator was invited to participate in the SAGE GVAP SO2 demand-side indicator working group, however overall, the SAGE GVAP working group did not adopt this recommendation and therefore no specific progress has been made to develop CSO or community-level indicators for each SO.

8. GVAP Secretariat should task the GVAP M&E/Accountability working group with developing CSO-friendly tools and processes to allow CSO contributions to the GVAP to be assessed and verified as part of a systematic and standardized process for reporting by all stakeholders to the GVAP

**STATUS:** The GVAP questionnaire that was developed for CSO reporting to the 2014 GVAP Secretariat report has since been integrated in the annual survey of the Gavi CSO constituency project, administered and managed by Catholic Relief Services. To date, there has been no other effort to develop a more systematic process for CSO reporting.

9. CSOs should be supported to carry out annual GVAP reporting at country, regional and global levels

**STATUS:** CSOs were supported by the Gavi CSO constituency project to complete GVAP questionnaires that were used in this year's independent civil society report. In addition, the GVAP Secretariat provided funding to hire an external consultant to prepare this report.

<sup>86</sup> Ibid.

## VII. Civil society recommendations for 2015

In addition to ensuring the 2014 recommendations are implemented and monitored, CSOs submitted additional recommendations to improve and increase their involvement at the country, regional and global levels to support the achievement of the GVAP. These are described below:

To improve the involvement of CSOs **at country level** in the development and implementation of national immunization plans and programs, governments and in-country development partners should:

- Consult and include CSOs in developing outcome-based plans for national immunization and in evaluating progress towards reaching national immunization targets
- Include CSOs in National Immunization Technical Advisory Groups (NITAGs) to enable them to provide input on technical issues from the community perspective
- Increase funding and support (e.g. stipends, equipment, supplies, materials, supervision) for CSO-led immunization activities and capacity building, including training more community mobilizers and documenting approaches to increase demand and coverage
- Involve CSOs in technical trainings, especially on national program data collection processes and how to use data collection tools; develop with CSOs a mechanism for regular data collection and reporting
- Coordinate CSO activities within districts and regions to ensure that they are complementary to the national program and inclusive of all geographic areas; include CSOs in the planning of activities
- Establish task forces at various administrative levels that are responsible for addressing problems in vaccine delivery; include CSOs in the process to establish them and in developing guidelines on member responsibilities

- Involve CSOs in national and sub-national planning and projections for vaccines and materials with the aim of preventing stockouts and resolving problems with the vaccine supply chain

To improve the involvement of CSOs **in regional and global processes** related to GVAP implementation, governments and development partners should:

- Support regional institutions and CSO coalitions/platforms/networks to organize annual meetings to review RVAP and GVAP progress
- Facilitate the establishment of regional CSO platforms/coalitions for immunization advocacy and information sharing
- Develop and/or improve the regularity of information sharing with CSOs on RVAP and GVAP progress at regional and country levels

**In 2015, civil society recommends that:**

1. A meeting should be organized with the Gavi CSO Steering Committee and the SAGE GVAP working group to discuss how recommendations from 2014 and 2015 can be supported, implemented and monitored as appropriate and relevant at the country, regional and global levels.
2. Guidance should be made available to country-level immunisation and Health Systems Strengthening (HSS) staff regarding how to work with CSOs to strengthen immunisation and health programmes, with a focus on engaging local CSOs. As this guidance does not currently exist, the Gavi CSO Steering Committee would welcome an opportunity to collaborate with WHO, the SAGE GVAP working group and the GVAP Secretariat to produce it.

# V

Independent submissions from  
the gavi csos constituency

## Bill & Melinda Gates Foundation Global Vaccine Action Plan 2015 Stakeholder Report

Contact: [Angela.Hwang@gatesfoundation.org](mailto:Angela.Hwang@gatesfoundation.org)

Global immunization has made tremendous strides. Coverage has never been higher, with more than 100 million children immunized each year against tuberculosis, polio, measles, diphtheria, tetanus, pertussis, hepatitis B, *Haemophilus influenzae* type B, pneumonia, rotavirus diarrhea, rubella, and other diseases. Vaccines are saving an estimated 2.5 million lives each year.

The Bill & Melinda Gates Foundation believes that all lives have equal value, and that all children, no matter where they live, deserve the same access to life-saving vaccines. We are working to build on this success as one entity within the greater vaccine community. We achieve

impact as a funder in collaboration with grantees and other partners, who join with us in taking risks, pushing for new solutions, and harnessing the transformative power of science and technology. Our collective progress also depends on the support and resources of governments, the private sector, communities, and individuals.

Our priorities are to ensure that existing vaccines are introduced into countries where people need them most and to develop new vaccines and new delivery technologies and approaches for sustained impact. These investments in vaccines and immunization contribute to the goals of the Decade of Vaccines and the Global Vaccine Action Plan (GVAP).

### Improving Access to New and Better Vaccines

Gavi, the Vaccine Alliance is our key partner in delivery of new vaccines. Gavi is helping countries introduce an array of vaccines, including vaccines against pneumococcal disease and rotavirus, the main causes of pneumonia and severe diarrhea, which are among the leading causes of child deaths in developing countries. Gavi also supports pilot projects to plan for the introduction of the Human Papillomavirus vaccine, which helps protect against cervical cancer, a leading cause of cancer-related mortality among women in developing countries.

We also invest in the development of new vaccines. For example, we supported a major partnership between PATH, the World Health Organization (WHO), the Serum Institute of India, and African governments to develop an affordable vaccine to prevent meningitis A. MenAfriVac™ is the first vaccine designed specifically for use in Africa, and within a year of its introduction it led to a dramatic drop in meningitis A infections. We are also targeting many other diseases for vaccination, as shown in the box below.

In addition, we are exploring ways to improve existing vaccines, such as:

- using new adjuvants that strengthen immune response and could reduce the amount of antigen needed per dose, thereby lowering the cost of immunizations
- reducing the number of doses necessary to fully vaccinate a child
- simplifying vaccine delivery through innovations such as needle-free delivery systems and heat-stabilized vaccines that don't require refrigeration

Healthy markets are critical to the long-term use of any vaccine, and we work to ensure sustainable supply and price for priority vaccines. Vaccine markets are complex and we recognize the need for vaccine procurement to be financially sustainable for both purchasers and suppliers. We are addressing this challenge by working with Gavi, UNICEF, and industry on innovative, market-based financing mechanisms to ensure that vaccines are manufactured and sold at sustainably affordable costs. These innovations include ways to assess and communicate vaccine demand as well as manufacturing innovations to lower production costs. In addition, we continue to advocate for the value and importance of vaccines with procuring countries and agencies.

## Building Strong Delivery Systems

Progress in immunization depends on strong delivery systems within countries. We invest in partners whose programs strengthen and provide comprehensive support for country immunization systems to improve efficiency and reach more children with vaccines. Our partners include civil society organizations, WHO, UNICEF, and Gavi.

One of the ways in which we are working to optimize the performance of country immunization systems is by supporting the collection, analysis, and use of high-quality vaccine-related data, including improving the measurement and evaluation of vaccination efforts, and developing new diagnostic tools to help health workers assess population immunity to disease.

Another priority is strengthening vaccine-related supply chains and logistics. We support the development of new ways to help countries improve the storage, transportation, and distribution of vaccines. This is particularly crucial as countries prepare to deliver a greater volume of vaccines to a greater number of people. Many vaccines are temperature-sensitive and require special storage, transport, and handling to ensure that they maintain their potency.

In addition, we make direct investments with partners in India, Nigeria, and Ethiopia, which together account for more than 7.5 million of the world's unvaccinated and under-vaccinated children and where we have strong relationships with governments and a wide range of other investments.

## Eradicating Polio

Polio eradication is a top priority of the Bill & Melinda Gates Foundation. As a major supporter of the Global Polio Eradication Initiative (GPEI), we contribute technical and financial resources to accelerate efforts to eradicate polio, through strategies such as targeted vaccination campaigns, community mobilization, and strengthening routine immunization efforts. We are also working with partners on innovative ways to enhance polio surveillance and outbreak response, accelerate the development and use of

safer, more effective, and more affordable polio vaccines, and galvanize financial and political support for polio eradication efforts from donor and polio-affected countries.

Our efforts to support polio eradication are an integral part of our country-based approach in the last three polio-endemic countries— Nigeria, Pakistan, and Afghanistan—as well as in countries that have experienced polio outbreaks.

## Advocating for Sustained Commitment to Vaccination

We work at the international, national, and local levels to build demand and political commitment and ensure that immunization remains on the global agenda. Our priorities include increasing national financing

commitments and donor funding for immunization; helping partners such as Gavi, GPEI and civil society organizations advocate effectively for vaccines; and supporting GVAP implementation.

## The Way Forward

The job is not yet done: nearly 1.5 million children die each year of diseases that could be prevented by vaccines that already exist today, and globally 18.7 million children are still under-vaccinated or missed completely. Moreover, the challenges of reaching the 20% of children who are missed are quite different than the challenges of reaching the first 80% of children.

Now is the time to ensure that the global community fulfills its commitment to reach every child, everywhere, with life-saving vaccines. To make sure vaccines reach all children so they can live healthy, productive lives,

- **We need commitment to immunization.** Governments in developing countries must make funding vaccines a top health priority, and continue to strengthen their primary health care systems to ensure that vaccines reach all children who need them.
- **We need an innovative mindset.** We must stop relying on standard procedures and protocols and adopt approaches driven by problem-solving and learning. Innovation, not business as usual, will strengthen immunization systems.
- **We need a data revolution.** We need more and better data in the hands of people who manage immunization



programs so they can make sound decisions. Better decisions lead to healthier children and communities.

- **We need strong partnerships.** It takes a global community to deliver vaccines to children, and implementing countries are at the center of this partnership. We must engage as a global community to take new approaches and problem-solve together.

Vaccines are one of the best investments we can make to give every child a healthy start at life. The world has a tremendous opportunity to build on progress and ensure

that children everywhere receive the vaccines they need. The challenges in achieving this are wildly disparate, but they share the characteristics of being deeply rooted, dynamic, and complex. None will be solved easily, quickly, or through individual effort, and we must work together to achieve the goals of GVAP. The Bill & Melinda Gates Foundation is committed to doing our part in this shared mission.

Further information: [www.gatesfoundation.org](http://www.gatesfoundation.org)

## Key Targets for Vaccine Research, Development, and Delivery

- **Pneumococcus.** The pneumococcus is the leading cause of pneumonia and is responsible for at least 40 percent of cases in children under age 5. We work to broaden access to the two commercially available pneumococcal conjugate vaccines while also investing in the development, regulatory approval, and deployment of newer and improved vaccines.
- **Rotavirus.** We work closely with Gavi and national governments to support the introduction and sustainable delivery of rotavirus vaccines where they are most needed and are working to ensure adequate supply and appropriate formulations, packaging, and labeling.
- **Polio.** We are investing in the development of multiple vaccines to enable continued success in eradication, including new, safer oral poliovirus vaccine and inactivated poliovirus vaccines that have lower manufacturing production costs and will enable broader coverage.
- **Pentavalent (Diphtheria-Tetanus-Pertussis-Haemophilus influenzae type B-Hepatitis B).** We are exploring innovative approaches to reduce the cost of procuring pentavalent vaccine distributed in developing countries while ensuring reliable, sustainable supply.
- **Human Papillomavirus.** HPV vaccination is a highly effective primary prevention strategy against cervical cancer. We aim to bring down the disease burden and accelerate impact by optimizing Gavi-supported HPV vaccine introduction and maximizing coverage; developing evidence to support global recommendation of reduced vaccine schedule; and supporting the development of lower cost vaccines.
- **Measles and Rubella.** The majority of Gavi-eligible countries will move from measles monovalent vaccine to a combination measles-rubella vaccine in the near future. However, there is currently only one supplier of measles-rubella vaccine, placing supply and price at risk. To improve supply security and increase price competition, we have invested in two additional vaccine manufacturers to develop measles-rubella vaccines.
- **Malaria.** We are working closely with Gavi and the Global Fund for AIDS, TB, and Malaria around potential introduction of ppRTSS, ensuring it is integrated with other existing preventive interventions and will be guided by the WHO recommendation expected in late 2015. We are also working to develop transmission-blocking vaccines and other interventions that can contribute to malaria eradication.
- **Maternal immunization.** Vaccinating women during pregnancy has the potential to protect young infants in the first months of life through the natural transfer of antibodies from mother to her baby. We are focused on building the evidence base for maternal immunization and the development of vaccines against respiratory syncytial virus, group B streptococcus, and pertussis for use by pregnant women, especially in low income settings.
- **Meningitis A.** With support from the Gavi Alliance, more than 200 million individuals at risk for epidemic meningitis have now been immunized with MenAfriVac, and countries in the meningitis belt are preparing to deliver the vaccine by routine immunization.
- **Cholera.** With our support and the support of other international partners, WHO established a global oral cholera vaccine stockpile in 2013—a key milestone for cholera prevention and control. Stable vaccine demand should expand supply, lead to more competitive pricing, and spur demand in countries with a high burden of cholera.

- **Human Immunodeficiency Virus (HIV).**

We support the global HIV vaccine pipeline at multiple levels. At the early discovery phase, we invest in an array of vaccine concepts through the foundation's Grand Challenges Explorations competition. We use broadly neutralizing monoclonal antibodies to confirm epitopes critical for future vaccines. We also provide funding to move novel product concepts toward human clinical trials, such as the Human Cytomegalovirus-based vaccination candidates, and invest in late-stage clinical trials, such as the Pox-Protein Public Private Partnership, to advance promising candidates toward licensure. To strengthen and accelerate the HIV vaccine field broadly, we invest in research consortia as well as product development and manufacturing platforms.

- **Tuberculosis (TB).** We are investing in the development and approval of more effective TB vaccines. However, the mechanisms of

vaccine-induced protection against TB are poorly understood, and there are no known ways to predict the efficacy of a TB vaccine candidate. This means vaccine development currently involves lengthy and costly trials of candidates with high uncertainty in terms of their efficacy. To address these challenges, we created the TB Vaccine Accelerator program, which works to identify promising alternatives to vaccine concepts currently in the pipeline that can improve our understanding of TB and contribute to more effective vaccine development.

- **Ebola.** The foundation's contribution to the global Ebola response includes outbreak control; accelerating research and development for new tools and interventions, including vaccines; and emergency preparedness, especially for "firewall" countries crucial to limiting the spread of the epidemic.

See [www.gatesfoundation.org](http://www.gatesfoundation.org) for additional targets.



The Network for Education and Support in Immunisation (NESI), based at the University of Antwerp in Belgium, is an international, multidisciplinary network with the mission to strengthen immunisation programmes in low- and middle-income countries. As human resources play a crucial role in the delivery of quality immunisation services to the public, NESI focusses on capacity building, education and training, and institutional strengthening through partnerships with WHO, academic institutions, Ministries of Health and other partners.

NESI's pre- and in-service educational programmes are tailored to the needs of the immunisation programme in the respective partner countries, with country ownership as guiding principle. The high-level in-service courses and workshops, enable NITAG members and policy-makers to make evidence-based recommendations and decisions on vaccines and immunisation. Mid-level management courses targeting EPI managers and other EPI staff contribute to efficient management of immunisation programmes, while maintaining public trust in vaccination through effective communication with individuals and communities.

Support to pre-service health training institutions for the incorporation of EPI in the curriculum of undergraduate education is a successful multi-level process. Pre-service health training institutions are critical in delivering medical and nursing staff deployable in immunisation programmes capable of addressing complex situations, sustaining routine immunisation and implementing new developments and strategies, towards closing the immunisation gaps.

During 2014, NESI contributed to three of the six strategic objectives of the Global Vaccine Action Plan.

**Table xx: Summary of NESI-reported activities in support of GVAP SOs**

<b>SO1:</b> All countries commit to immunisation as a priority	<b>Strengthen national capacity to formulate evidence-based policies.</b> <ul style="list-style-type: none"> <li>Regional forum organised to exchange best practices on decision-making for new vaccine introduction with participation of NITAG chairs/members of ten countries of the South-East Asian Region, in collaboration with the University of Padjadjaran (Bandung, Indonesia, November 2014).</li> <li>Support provided to the NITAG meeting in the Eastern Mediterranean Region (Amman, Jordan, November 2014).</li> </ul>
<b>SO2:</b> Individuals and communities understand the value of vaccines and demand immunisation as both their right and responsibility	<b>Build advocacy capacity</b> <ul style="list-style-type: none"> <li>Experience Exchange Workshop organised on "Public confidence in vaccines: building trust, managing risk", in collaboration with the London School of Hygiene and Tropical Medicine (London, UK, April 2014).</li> </ul>
<b>SO4:</b> Strong immunisation systems are an integral part of a well-functioning health system	<b>Strengthen capacity of managers and frontline workers</b> <u>In-service training:</u> <ul style="list-style-type: none"> <li>Co-organised and co-facilitated vaccinology (Berlin, Germany, January 2014) and mid-level management (Maputo, Mozambique, November 2014) courses.</li> <li>Contributed to the development of an integrated EPI/IMCI interactive resource, as partner of WHO/AFRO.</li> </ul> <u>Pre-service training:</u> <ul style="list-style-type: none"> <li>Contributed to the revision of EPI prototype curricula, as partner of WHO/AFRO.</li> <li>Country support given to Kenya and Morocco to strengthen EPI training at medical faculties and nursing schools.</li> <li>Advocated for strengthening EPI training at training institutions during international congress in Kenya (August 2014).</li> </ul>

## GLOBAL VACCINE ACTION PLAN



## Driving GVAP progress through innovation

PATH is dedicated to accelerating innovation to save lives and improve health. Our work in vaccines and immunization spans vaccine development, optimization, introduction, and sustained implementation. Below are examples of how our work in the past year has supported the objectives of the Global Vaccine Action Plan.

**Objective 1—country commitment:** To strengthen national policymakers' capacity to make evidence-based immunization decisions, PATH provides technical assistance, facilitates peer learning, and strengthens advocacy capacity. For example:

- In 2015, PATH co-launched an interactive, web-based *Advocacy for Immunization* platform that packages guidance, tools, and case studies for advocacy in support of country decision-making and political commitment to immunization.
- As of 2015, PATH has assisted governments of more than 20 low-resource countries in Africa and Asia in the planning, implementation, and evaluation of HPV vaccine delivery.
- In 2014, PATH launched an African-led, member-owned, peer-to-peer learning network to bring countries together to inform national and global decision-making around immunization data.

**Objective 2—demand:** To build demand for vaccines, PATH develops evidence on the efficacy, impact, safety, and cost-effectiveness of vaccines and disseminates it through advocacy outreach and training. For example:

- In 2014, PATH partnered with the Ethiopia Ministry of Health, the Afar Regional Health Bureau, and the Regional Islamic Affairs Office to work with imams from 100 mosques in the Afar Region to disseminate immunization messages to their communities.

**Objective 3—equity:** To help ensure vaccines reach every child in even the most remote regions, PATH works with countries to test and scale innovative technologies, tools, strategies, and policies that improve the performance of supply chains and logistics systems and maximize the use of immunization data. For example:

- In 2014, the vaccine vial monitor—a small sticker that changes colors as it is exposed to heat, letting providers know if heat-sensitive vaccines were damaged during storage and transport or if they can still be used for immunization—surpassed 5 billion units procured since its development and introduction by PATH and our partners more than 20 years ago.
- In 2014, the first vaccination campaign was conducted in Africa with a vaccine that did not require constant refrigeration, even in hot weather. This vaccine was MenAfriVac®, a meningitis vaccine developed by PATH and WHO in partnership with the Serum Institute of India.

**Objective 4—stronger immunization systems:** PATH works alongside countries to build, identify, test, scale, and advocate for innovative solutions that strengthen immunization systems as part of an integrated health system. For example:

- In 2015, PATH launched a pilot electronic immunization registry in the Arusha region of Tanzania in partnership with government agencies. The registry tracks all immunization encounters and exchanges data with other data systems.
- PATH has worked in partnership with global, national, and regional institutions to strengthen and expand disease surveillance systems and vaccine safety monitoring, allowing countries to develop more accurate data on the impact and safety of vaccine introduction.

**Objective 5—supply:** PATH helps predict, measure, and ensure a sustainable supply of safe and effective vaccines in partnership with manufacturers and procurement agencies. For example:

- An agreement between PATH and a Chinese manufacturer has allowed endemic countries to introduce Japanese encephalitis vaccine—the first-ever vaccine from China to be prequalified by WHO—at an affordable public-sector price. As of 2015, more than 220 million doses of the vaccine have been delivered through this agreement.

**Objective 6—research & development:** PATH supports research and development of innovative, affordable vaccines as well as delivery and formulation technologies and strategies that increase the impact, safety, and reach of immunization. For example:

- Results from the phase 3 trial of the RTS,S malaria vaccine candidate, conducted by PATH and GSK, led European regulators to issue a positive opinion on the vaccine in mid-2015.
- In 2014, the Indian government licensed the Indian-manufactured ROTAVAC® rotavirus vaccine, whose development was supported by PATH, and announced plans to introduce it into routine immunization.
- After research showed that the MenAfriVac® vaccine was safe and effective in infants, WHO expanded the approved age range in 2014, opening the door for routine immunization of infants against meningitis.
- PATH helped conduct studies investigating optimal rotavirus vaccine dosing and schedules as well as the effects on immunogenicity of factors such as breastfeeding.

PATH is the leader in global health innovation. An international nonprofit organization, we save lives and improve health, especially among women and children. We accelerate innovation across five platforms—vaccines, drugs, diagnostics, devices, and system and service innovations—that harness our entrepreneurial insight, scientific and public health expertise, and passion for health equity. By mobilizing partners around the world, we take innovation to scale, working alongside countries primarily in Africa and Asia to tackle their greatest health needs. Together, we deliver measurable results that disrupt the cycle of poor health. Learn more at [www.path.org](http://www.path.org).

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July 2015

**Save the Children activities in 2014 in support of GVAP goals and objectives**  
*(Contributing to goals 1, 3, 4 and 5, and strategic objectives 1, 2, 3, 4 and 5)*

Save the Children advocates at global and national levels to ensure that all children, regardless of where they are born, enjoy the full benefits of immunisation, towards the realisation of their right to essential health care. We also work with Ministries of Health and national immunisation programmes in a number of countries – Afghanistan, DRC, Ethiopia, Kenya, India, Indonesia, Liberia, Pakistan, Myanmar, Niger, Nigeria, Pakistan, Sierra Leone, Somalia, South Sudan, Tanzania and Yemen – to strengthen routine immunisation (as part of integrated maternal and child health programmes) ensuring that immunisation is an integral part of a well-functioning health system.

To deliver on this, and in support of GVAP goals and objectives, some of our 2014 activities included:

- Training health workers, supporting their deployment, providing essential equipment and supplies for immunisation and rehabilitating infrastructure where needed. For example, in Ethiopia we supported the functioning of health facilities through the provision of kerosene for vaccine refrigerators and transportation of vaccines to prevent interruption of service.
- Improving supply chains to ensure a reliable supply of vaccines, providing support on improving vaccine management, cold chain systems and district-level logistics. For example, in DRC we supported the cold chain through the procurement and installation of solar fridges in Cilundu and Kinshasa. We also supported the procurement and distribution of solar fridges for the Somali region of Ethiopia to improve vaccine management and the routine immunisation programme.
- Increasing awareness among communities on immunisation, using culturally sensitive information to improve acceptance and uptake of immunisation services, in partnership with religious and community leaders, teachers and frontline health workers.
- Supporting governments to set minimum quality guidelines for immunisation services, supporting outreach services and monitoring coverage and community surveillance for vaccine preventable diseases. For example, in Ethiopia we supported immunisation outreach activities in five Woredas (Dollo Ado, Dollo Bay, Bare, Moyale, and Mubarek) to reach community members that live distances of 5-15km from their nearest health centre.
- Supporting the introduction of new vaccines, as part of strengthened routine immunisation programmes. For example, in India, Pakistan and Nigeria, we are supporting the respective EPI programmes on the introduction of rotavirus vaccine.
- In emergencies, supporting the delivery of routine immunisation services as part of our response – such as in Central African Republic (CAR), Myanmar, Syria and Pakistan. For example, in CAR we supplied petrol for vaccine fridges and helped with their maintenance, supported transportation of vaccines from the capital to field sites, and provided incentives for planned vaccination outreach activities. We also supported the implementation of mass measles vaccination activities.
- Supporting mass polio campaigns in emergencies (e.g. CAR, Syria) and in polio endemic countries (e.g. Nigeria) as part of our work to strengthen routine immunisation. For example, in northern Syria we supported campaigns carried out through local health actors, reaching approximately 250,000 children under five in every round and exceeding 95% coverage. We provided technical and financial support to ensure that all campaigns were carried out in a timely manner and with quality-assured, leading to demonstrable improvement in the capacity of local health actors to lead and carry out vaccination campaigns in this difficult context. In Ethiopia, we supported community surveillance of AFP (acute flaccid paralysis) cases, leading to six cases being reported by trained community volunteers. We also supported seven rounds of polio vaccination campaigns in five Woredas of Somali Region through the provision of logistics (e.g. vehicle, fuel, reporting and recording formats, per diem for social mobilizers) and technical support. Coverage for each campaign exceeded 90%.



- Advocating at global and national levels to influence immunisation policies in support of strong routine immunisation systems that prioritise equity and are integrated with health systems. For example, in Nigeria we contributed to the development of the 2013-2015 Routine Immunisation Strategy, which represents a re-focusing of Government policy on routine immunisation. Building from this federal strategy, we started the process of promoting effective implementation in four states and have continued to engage with government and community members, advocating for them to take ownership and increase funding to sustain immunisation services. This has resulted in increased coverage of routine immunisation in all the four states, alongside increasing financial commitments. Globally we have been advocating to raise the profile of equity, to ensure that all children (in particular those from the poorest families and the most remote areas) enjoy the full benefits of immunisation. Through a number of advocacy activities, social media and blogs, we called for equity to be at the centre of Gavi's 2016-2020 strategy, calling for the hardest-to-reach children to be prioritised and for investment in strengthening health systems, as outlined in our [position paper](#).
- Advocating for sufficient and sustainable funding for immunisation. For example, through our funding and policy report [A Chance to Reach Every Child](#) (jointly authored by the ACTION partnership) and a number of advocacy and campaigning activities in various countries (e.g. UK, Norway, Canada, US and Germany), we called for full funding of Gavi's new strategy, calling on Gavi, recipient governments, private sector partners and donors to turn this strategy into effective action.

Submitted to WHO/GVAP Secretariat by USAID July 27, 2015

**Support for Routine Immunization (Supports GVAP Goal 3; Strategic objectives 1-4)**

USAID technical inputs into immunization programs help countries improve quality, equity and coverage metrics while strengthening the systems to extend equitable access to life-saving vaccines in a timely, reliable, and sustainable manner. Our technical contributions to immunization system improvements protect and optimize the investments to Gavi for vaccine procurement, since a newly-introduced vaccine can achieve its promised impact only if the vaccination services are strong. To this end, USAID supports the development of sound immunization policy, strategies, and guidelines so routine immunization programs are well-planned and managed.

Last year, USAID and its implementing partners supported countries through participation in national immunization planning, external immunization reviews and evaluations, national ICC meetings and other important activities. USAID also supported countries in immunization systems strengthening activities which included human resource capacity, cold chain and logistics, data quality and use and demand creation as well as the implementation of innovative approaches and tools such as the reaching every district (RED) and reaching every community (REC) and micro planning to expand equitable access to vaccination.

Ending Preventable Child and Maternal Deaths (EPCMD) within a generation is a top priority of the U.S. Agency for International Development. Immunization stands as a central component of USAID's strategy for EPCMD. USAID has refocused resources on 24 priority countries, primarily in sub-Saharan Africa and South Asia, that account for 70 percent of maternal and child deaths and half of the global unmet need for family planning services<sup>1</sup>. USAID's support to routine immunization contributes to goal 3 and strategic objectives 1-4 of the global vaccine action plan.

**Engagement in Global Polio Eradication**

USAID has been a key player in polio eradication activities since the beginning of the initiative. Last year, USAID and its implementing partners provided financial and technical support targeted to the three polio endemic countries, the outbreak countries in the Horn of Africa, Central Africa and the Middle East and in several high risk countries which are prone for importation. USAID's main implementing partners are WHO, UNICEF, and the CORE Group Polio Project. The activities we have supported include surveillance, supplementary immunization activities and communications and social mobilizations. USAID actively participated in global and regional polio advisory group meetings, surveillance reviews and outbreak response assessments. This financial (\$59 million) and technical support of USAID is in line with the endgame plan and contributes to Goal 1 and strategic objectives 1 and 2 of the global vaccine action plan.

**Engagement in New Vaccine Introduction and Vaccine development**

Since 2001, USAID has contributed \$1.35 billion to Gavi, the Vaccine Alliance, and has a further commitment of \$800 million to 2018. Through its annual contribution (over \$200 million) to Gavi, USAID supports the accelerated introduction of new and underutilized vaccines in 73 Gavi-eligible countries. USAID also engages

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<sup>1</sup> The 24 EPCMD countries include Afghanistan, Bangladesh, Congo DR, Ghana, Ethiopia, Haiti, India, Indonesia, Kenya, Liberia, Mali, Malawi, Madagascar, Mozambique, Nepal, Nigeria, Pakistan, Rwanda, South Sudan, Senegal, Tanzania, Uganda, Yemen and Zambia

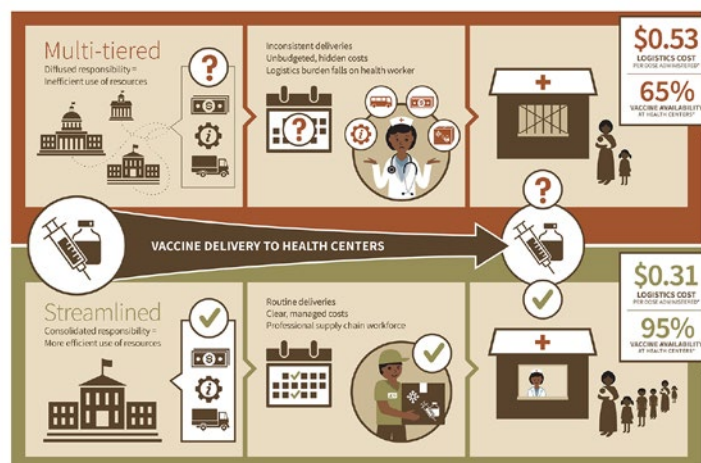
in Gavi governance bodies as a member of the Gavi Board and the Board's Program and Policy and Audit and Finance Committees. At country level, USAID and its partners provide technical support for the introduction of the new vaccines in to the routine immunization system. Over the years, USAID's flagship reproductive, maternal, newborn, and child health Projects and bilateral Mission projects have played an important role in the smooth introduction of new vaccines in several countries. USAID has also supported a number of post introduction evaluations and assessments.

USAID also supports vaccine research and development. USAID provides financial support for ongoing malaria vaccine toward the development of three malaria vaccine approaches targeting the parasite before and during liver stages and during the blood stage). USAID also funds HIV vaccine research and development focused on candidate products that address the specific challenges of low and lower-middle income countries hardest hit by the HIV pandemic These USAID programs contribute to Goal 4 and strategic objectives 3, 4 and 6 of the global vaccine action plan.

### VillageReach Contribution to GVAP - 2014

VillageReach is helping meet the Global Vaccine Action Plan target to ensure national vaccination coverage of 90% in all countries, with no district's coverage less than 80%. VillageReach also helps support the strategic objective to reduce stock-outs and ensure access to sustained supply of quality vaccines. In 2014, VillageReach focused its resources and technical assistance in Mozambique, where the organization helped provincial governments manage their redesigned immunization supply chain leading to remarkable improvements.

A streamlined logistics system – Dedicated Logistics System (DLS) for vaccines – was developed by VillageReach, the Ministry of Health, and the Foundation for Community Development (FDC), replacing the previous multi-tier system (see infographic, right). The streamlined distribution system reduces the burden on frontline health workers, consolidates logistics tasks to small dedicated teams of individuals, integrates supervision and data collection into system design, and uses existing transport infrastructure. It also adds an electronic logistics management information system that provides routine data to decision-makers in order to help reduce stockouts and improve the cold chain.



The DLS is now running in four provinces and is supporting one-third of the immunization posts in Mozambique. The DLS has resulted in a dramatic decrease in stock outs – health facilities have increased vaccine availability to a consistent level of 92% in four provinces. This was done at a lower cost per dose delivered and cost per child vaccinated than the original multi-tier distribution system. Additionally, cold chain uptime increased significantly; 90% of the health centers have functioning refrigerators.

The success of the DLS in Mozambique is influencing other Gavi countries including Senegal, Nigeria, and Benin. Lessons learned from this work also helped shape Gavi's Immunization Supply Chain strategy. As a result, VillageReach is advocating for a fundamental shift in thinking to drive Gavi-eligible countries toward Immunization Supply Chain 2.0 (ISC 2.0). ISC 2.0 is dynamic, data-driven, and developed through a holistic approach. This includes a bottom up approach that focuses on data visibility at the last mile, along with agreement and planning at the national level, implementation support and upskilling at the subnational level, and strong partnerships to coordinate efforts, collaborate on evidence, and communicate results to influence change at all levels across all areas of ISC design.

VillageReach is now developing potential models for ISC 2.0 in other countries and seeks to accelerate change by amplifying the evidence through global enabling mechanisms. The results will be major gains in vaccine availability, cold chain performance, and system efficiency across multiple countries – and ultimately lead to an increase in coverage and equity.









## “Innovation for a healthier world: How the research-based manufacturers are contributing to the Decade of Vaccines Global Vaccine Action Plan”, International Federation of Pharmaceutical Manufacturers and Associations (IFPMA), 2015

Document is available on:

[http://www.ifpma.org/uploads/media/IFPMA\\_Innovation\\_for\\_a\\_Healthier\\_World\\_-\\_Vaccines.pdf](http://www.ifpma.org/uploads/media/IFPMA_Innovation_for_a_Healthier_World_-_Vaccines.pdf)











