Global Vaccine Action Plan

Priority Country reports on progress towards GVAP-RVAP goals

Annex to the GVAP Secretariat Annual Report 2016
Global Vaccine Action Plan

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Annex to the GVAP Secretariat Annual Report 2016
Introduction

In its Global Vaccine Action Plan (GVAP) Assessment Report 2015, the Strategic Group of Experts on Immunization (SAGE) made the recommendation that the « Decade of Vaccines secretariat agencies report to SAGE in 2016 on their supporting activities conducted in the 10 countries where most of the unvaccinated and under-vaccinated children live. This annual reporting mechanism should include discussion of those reports in regional technical advisory groups. ».

In this annex, the Decade of Vaccines secretariat is providing reports summarizing the issues, challenges, successes and opportunities faced by 7 priority countries in improving their immunization programme. Those reports also include some information on the activities conducted by some technical partners and donors to support those countries.

The objective of those reports is to give examples of issues and successes countries are facing. Even though the reports focus on some specific countries, the findings may apply to numerous countries including those having achieved most of the GVAP goals.

The 7 countries have been selected using several criteria including the number of unvaccinated-under-vaccinated children, the achievement of diseases elimination goals, some immunization coverage rates and some vaccine preventable diseases incidences.

The 7 seven countries are the following: Chad, Democratic Republic of Congo, Ethiopia, Indonesia, Nigeria, Pakistan and Uganda.

Acknowledgement

We would like to thank all the experts from the countries and the technical agencies that have provided information to develop those reports. Their names are included in each report.

We would like to thank Denise DeRoeck for coordinating the development and drafting of those reports.
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CHAD
Progress towards achievement of GVAP/RVAP goals
## 1. Summary

This summary table describes the current situation in Chad regarding achieving the GVAP goals. Data used to assess progress towards achievement of GVAP goals are included in the annex.

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Chad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio-demographic</td>
<td>GNI 2014</td>
<td>980</td>
</tr>
<tr>
<td></td>
<td>WB Status</td>
<td>Low Income</td>
</tr>
<tr>
<td></td>
<td>Infant mortality (&lt;12 mo.) 2015 (UN IAG CME)</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>GAVI status</td>
<td>Eligible</td>
</tr>
<tr>
<td></td>
<td>Total population</td>
<td>14,037,000</td>
</tr>
<tr>
<td></td>
<td>Birth cohort</td>
<td>630,000</td>
</tr>
<tr>
<td></td>
<td>Surviving infants (JRF)</td>
<td>573,000</td>
</tr>
<tr>
<td>1. Interrupt wild poliovirus transmission</td>
<td>Transmission interrupted</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Risk of late detection: Percent of adequate stool specimens (Rolling 12m) Target &gt; 80%</td>
<td>97.8</td>
</tr>
<tr>
<td></td>
<td>Risk of late detection: Non-polio AFP rate per 100,000 (rolling 12 mo.) (Target &gt; 2/100,000)</td>
<td>6.3</td>
</tr>
<tr>
<td></td>
<td>Risk of spread after importation: % of 6-59 month olds having received less than 3 doses in the last year before occurrence case/environmental positive</td>
<td>9</td>
</tr>
<tr>
<td>2. Neonatal tetanus elimination</td>
<td>Coverage for TT (administrative data for 2015)</td>
<td>96%</td>
</tr>
<tr>
<td></td>
<td>Protection at Birth against tetanus (WUENIC 2015)</td>
<td>75%</td>
</tr>
<tr>
<td></td>
<td>Last SIAs conducted in the country</td>
<td>SIAs taking place in 80% of the country in phases from 2011 to 2016. Two rounds took place in 46 districts. The last round in 12 remaining districts planned for 2016.</td>
</tr>
<tr>
<td></td>
<td>Elimination validation date</td>
<td>Not yet validated</td>
</tr>
<tr>
<td></td>
<td>Coverage MCV2</td>
<td>Not in schedule</td>
</tr>
<tr>
<td></td>
<td>Percentage of districts with MCV1 coverage ≥95% (2015 JRF)</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>Last national SIA</td>
<td>2012</td>
</tr>
<tr>
<td></td>
<td>Post SIA coverage survey conducted</td>
<td>No</td>
</tr>
<tr>
<td>4. Rubella/CRS Elimination</td>
<td>Rubella vaccine coverage</td>
<td>Not introduced</td>
</tr>
<tr>
<td></td>
<td>SIAs planned?</td>
<td>SIAs planned 2018</td>
</tr>
<tr>
<td>5. Reach 90% national coverage and 80% in every district with third dose of DTP-containing vaccine</td>
<td>National coverage (WUENIC 2015)</td>
<td>55%</td>
</tr>
<tr>
<td></td>
<td>Dropout rate DTP1 to DTP3 (2015 WUENIC)</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>Actual numbers of children who dropped out (2015 WUENIC)</td>
<td>28,600</td>
</tr>
<tr>
<td></td>
<td>Difference between poorest and richest quintile DTP3 coverage (2013 data)</td>
<td>38.3</td>
</tr>
<tr>
<td></td>
<td>% District coverage reaching 80% coverage from 2015 JRF</td>
<td>51%</td>
</tr>
</tbody>
</table>
### 6. Reach 90% and 80% coverage with all vaccines in national immunization program

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Chad</th>
</tr>
</thead>
</table>
| 6.   | Reach 90% and 80% coverage with all vaccines in national immunization program | National Coverage (2015 WUENIC) | BCG: 70%  
DTP1: 60%  
DTP3-HepB3-Hib3: 55%  
MCV1: 62%  
Polio3: 62%  
YF: 49% |

### 7. Introduction of new vaccines

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Chad</th>
</tr>
</thead>
</table>
| 7.   | Introduction of new vaccines | New Vaccines introduced | Yellow fever: 2005  
Pentavalent: 2008  
IPV: 2015  
Meningitis A in campaigns (phased in from 2011 to 2017) |

### 8. Reduction in under 5 mortality rate

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Chad</th>
</tr>
</thead>
</table>
| 8.   | Reduction in under 5 mortality rate | % reduction from 2010 to 2015 | 2010: 160.1  
2015: 138.7  
(13.4%) |

### 9. NITAG

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Chad</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.</td>
<td>NITAG established?</td>
<td>No</td>
</tr>
</tbody>
</table>

### 10. Government expenditure on routine immunization per live birth USD

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Chad</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.</td>
<td>Government expenditure on routine immunization per live birth USD</td>
<td>Baseline 2010-2011 and average for 2013-2015 (% change)</td>
</tr>
</tbody>
</table>

## 2. Country ownership of the immunization programme

### 2.1 Immunization policy decision-making capacity

The main decision-making body for immunization in Chad is the ICC, chaired by the Minister of Health or his representative, and consisting of high-level officials from other government ministries (e.g., Finance, Communications, Social Affairs) and various UN partner organizations. The committee approves the EPI annual plan and other key decisions, coordinates partner activities, mobilizes resources for different activities, and serves as a link between development partners and government agencies. The ICC does not meet regularly to plan and monitor activities, but instead meets on an "as needed" basis to approve recommendations, sign off on key documents (e.g., GAVI proposals and Joint Appraisal reports) and make other major decisions.

Recommendations for the immunization program are made by the EPI Technical Support Committee (Comité technique d'appui du PEV or CTA/PEV), which is chaired by the EPI Director and made up of MOH technical staff and the immunization focal points of the major partner organizations. The CTA/PEV meets weekly to plan immunization activities, develop documents, such as annual action plans, and monitor immunization activities. All recommendations and key documents developed by the CTA/PEV then go to the ICC for approval.

No independent national advisory committee on immunization (NITAG) yet exists in Chad, although there is a high-level technical advisory group (TAG) for polio that meets twice a year to make recommendations that are then presented to the Prime Minister or President. The TAG, which includes both national and international members, has expanded its portfolio to other vaccine preventable diseases. There have been initial discussions about establishing a NITAG to replace the polio TAG.
2.2 Government financing of immunization

Since 1996 the Government of Chad has fully funded the cost of traditional vaccines (TT, BCG, OPV, measles) and injection supplies. It has also met its co-financing obligations to GAVI each year for procurement of new vaccines (pentavalent and yellow fever) without defaults or delays. Funds for vaccines are covered through a budgetary line item established in 2011.

Once Chad started co-financing yellow fever and pentavalent vaccine in 2010, its financial contributions to the immunization program increased more than three-fold (from around 500,000 per year to $2.2 million) (Figure 1). As a result of advocacy from the Gates Foundation and other partners and in response to a polio outbreak in 2011, the Federal Government made a large, one-time investment of more than $49 million in 2011 as part of an emergency plan to finance polio SIAs, purchase vehicles and motorcycles, buy cold chain equipment and fuel, hold planning and review meetings and other related expenses. Since 2011, the Government’s contribution has largely remained flat – between $2.7 and $3.2 million per year. These funds cover, in addition to vaccine procurement, recurrent costs for cold chain and logistics and other programmatic costs (e.g., fuel for supervisory visits and for refrigerators); the Government’s share of operational costs for polio, measles and other vaccination campaigns; as well as the costs of EPI-specific staff. Local (e.g., district) governments also contribute to recurrent immunization program costs to some degree.

Figure 1: Trends in the Government of Chad’s expenditures for immunization, 2008-2014

However, international partners – mainly UNICEF, WHO and GAVI – are the main funders of the national EPI program, covering 86% of the non-salary program costs from 2012 to 2014, while the Government covered the remaining 14%. Partners cover much of the operational costs that makes the program function at the local level, including outreach activities, implementation of the Reach Every District (RED) strategy in selected districts, communication activities, and cold chain and logistics costs. They also pay the majority of the costs of polio, measles, MNT and meningitis vaccination campaigns, which in the 2016 EPI budget accounted for 75% of the service delivery budget and 40% of the entire immunization program budget. In addition, a number of partners, such as the French cooperation, World Vision and other bilateral agencies, provide funding and technical support for immunization activities directly to certain health districts.

A key obstacle to improving the performance of the immunization program in Chad has been the complicated process of getting program funds released by the Government bureaucracy and transferred to the EPI or to health regions and districts. Only 56% of the GAVI HSS funds, which finance cold chain improvements and the implementation of the RED strategy in 60% of the country’s health districts, was spent in 2015 and only 14% in 2014. This has significantly reduced the Government’s ability to increase vaccination coverage through the routine program and otherwise improve program performance.

1 EPI review 2012.
2 Joint Appraisal report, 2016.
3 Chad Annual EPI Action Plan, 2016.
4 Joint Appraisal report, 2016. The low spending rate in 2014 was due to the temporary suspension of GAVI funds, due to financial management issues.
2.3 Human resource situation

The number of permanent staff positions in the immunization program in Chad is quite small – with five medical officers and a total of 29 persons (including support staff) at the central level and 23 regional EPI focal points (one per region). Three of the professional staff in the central EPI office are CDC or WHO consultants. The small number of professional and technical staff in the central office has severely constrained the team’s ability to provide adequate technical support, oversight and financial management of the program. Considerable staff turnover in recent years has also affected the program. To supplement this staff, partners (UNICEF, WHO and GAVI) support a contingency of 145 surveillance medical officers, communications officers and other experts, who are under contract. Many of the WHO positions are funded with polio program funds, which will be reduced, starting in 2017, under the polio transition plan.

The Government has been increasing its health workforce, which now numbers around 9,200 health workers (mainly nurses) – an increase of 1,000 since 2013. While this yields a ratio of one health worker per 1,500 people, this workforce is very poorly distributed within the country and not all of them administer vaccinations. The skills level of health workers also varies; the EPI review of 2012 found that only 54% of health workers who provided immunizations had received any formal training and only half of the immunization trainings planned in 2011 (in vaccine and cold chain management, communication, safe injections) actually took place.

To further increase the number of health workers, the HSS II proposal, which is being resubmitted, calls for hiring and training an additional 174 health workers, who will focus on immunization activities.

3. Progress towards specific GVAP goals (issues/challenges/successes)

3.1 Goal 1: Achieve a world free of poliomyelitis

Has the GVAP target of interrupted polio transmission been achieved?

Chad has not had a case of wild polio virus (WPV) since June 2012 and no cases of vaccine-derived disease since 2013. The AFRO certification committee declared Chad polio-free in 2016. This achievement is the result of an emergency plan that the Federal Government put in place in 2011 in response to an outbreak of WVP that caused 132 lab-confirmed cases. The plan – financed with an infusion of funding from the Government (as mentioned above) and by development partners – involved improving the quality of polio SIAs, strengthening AFP surveillance, improving communications activities, and identifying priority areas for special efforts.

Is Chad considered at high risk of polio transmission?

The country is considered at medium risk of polio transmission as a whole. It does have several areas at high-risk – especially along the border with the Central African Republic (CAR) and in the Lake Chad region. These areas are at elevated risk due to the movement of populations, including refugees from conflict-ridden CAR who are often not vaccinated and those from Northern Nigeria where WVP is still circulating (with two cases reported in July 2016 in Borno state). These areas are also at high risk due to low routine polio immunization coverage rates. Pockets of inadequate AFP surveillance – with eight silent districts identified in 2015 – also places these areas at risk.

What needs to be done to ensure that Chad remains polio-free

Since the 2011 outbreak, the Chadian Government, with much partner support, has conducted a series of national and sub-national polio vaccination campaigns each year. Four national rounds and two local campaigns were conducted in 2015, achieving high coverage, according to administrative data. Sub-national campaigns have continued into 2016, including in the
Lake Chad area and among refugees from the CAR living in camps along the border. Sub-national polio vaccination campaigns will continue into 2017.

Improving polio vaccination coverage through the routine immunization program will also be critical to preventing future outbreaks from importations. The 2015 WUENIC estimate for national measles vaccination coverage is 62%, up from only 54% in 2014, and rates are likely to be considerably lower in many districts. This is clearly inadequate to ensure sustainability of polio eradication in Chad.

Strong surveillance is the other critical piece to preventing outbreaks of imported cases and ensuring that Chad remains polio-free. The country has a strong AFP surveillance infrastructure in place. There are six surveillance hubs established with funding from the Bill & Melinda Gates Foundation that cover the entire country. There are also WHO-supported regional surveillance officers and at least two Government surveillance focal points in each district, who are responsible for investigating all reported AFP cases. Private providers, including traditional leaders, are included in the surveillance system, though traditional healers rarely report cases. The AFP/polio surveillance results are published in a weekly bulletin. To further strengthen polio surveillance, the Government established four environmental sentinel sites in 2015 in canals in N’djamena to detect polio virus.

Case-based surveillance is conducted forAFP (as well as for measles, neonatal tetanus and yellow fever) and the country has, as a whole, met the AFP surveillance criteria since at least 2008. Over the past year (mid-July 2015 to mid-July 2016), 98% of notified cases were investigated within two days of being reported, and the non-polio AFP rate was 6.15/100,000 (meeting the target of >2/100,000 children). However, there remains no polio testing laboratory in the country, which uses a reference lab in Yaounde, Cameroon.

### 3.2 Goal 2: Meet global and regional elimination targets

#### 3.2.1 Achieve maternal and neonatal tetanus elimination

Chad developed an MNT elimination plan for 2008-2011, but it was not fully or adequately implemented. The country continues to report an average of around 200 cases each year and nearly all districts (84/87) in 2015 reported at least one MNT case. However, according to several documents, there is likely to be under-reporting of MNT cases in the country.11

There are two major challenges to Chad achieving MNT elimination by the target date of 2017 stated in its comprehensive multi-year plan for EPI (cMYP):

1. TT coverage for pregnant women remains inadequate. The majority of women (66%) still give birth without a skilled birth attendant and use of antenatal care services remains quite low, with only 31% of pregnant women making at least four antenatal care visits.12 As a result, according to the 2015 DHS/MICS study, the protection at birth (PAB) rate against tetanus was only 56% in 2014.

2. MNT case-based surveillance remains inadequate, with only 37% of cases reported in the first half of 2016 investigated and ring vaccination conducted in response to only 74% of these cases.13 Data on MNT cases are also not consistent across different sources. WHO is working with the Ministry of Health to improve MNT surveillance, which is conducted by the same surveillance teams that perform strong AFP surveillance.

While delayed, TT campaigns have been conducted for women of childbearing age in phases since 2010, covering around 80% of the country. The last phase – targeting the remaining 12 high-risk districts – is being carried out in 2016. The SIAs are a key factor contributing to the jump in the WUENIC estimate for children protected at birth from 60% in 2014 to 75% in 2015. Chad will begin to prepare a dossier for certification of elimination once the SIAs are completed. Improving routine TT coverage among pregnant women and MNT surveillance will be critical to achieving and sustaining MNT elimination.

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10 WHO. Situation polio et PEV/Tchad, Semaine 28 (du 11 au 17 juillet 2016).
12 Republic of Chad, Demographic and Health Survey (DHS) and Multiple indicator Cluster Survey (MICS), 2015.
13 WHO. Situation polio et PEV/Tchad, Semaine 28 (du 11 au 17 juillet 2016).
### 3.2.2 Achieve measles elimination and rubella & CRS elimination

#### Measles

Chad continues to report measles cases and outbreaks each year, with 1,275 cases reported to WHO in 2014 and 418 cases in 2015. Given that measles surveillance in the country is still not at the level of AFP/polio surveillance, the disease is likely significantly under-reported.

The main reasons why measles persists in Chad is inadequate vaccination coverage rates through the routine immunization program. With the WUENIC measles vaccination coverage rate only at 62% nationally, the routine program is failing to reach sufficient numbers of infants with measles vaccination. The problems related to vaccination coverage through the routine program are discussed in detail in Section 3.3 below. The Government does not yet have plans to introduce a second measles vaccine dose into the routine schedule.

To supplement routine immunization, the EPI has conducted national measles SIAs every three or four years since 2005, with smaller, local campaigns in between the SIA years and in response to outbreaks. SIAs for children under five (in most cases) have been taking place in 2016 in five districts experiencing local outbreaks. The last national measles catch-up campaigns – targeting all children under the age of ten – took place in 2013. However, the campaigns have reportedly not been well implemented in many instances and have missed many children, especially in urban areas, resulting in continual outbreaks.14

The suboptimal quality of the campaigns is not reportedly due to a lack of funding from the Government or delayed releases of funds, as is the case in many countries in the region. Unlike for the routine program, the Government has a record of providing funds to cover its share of the operational costs of SIAs in a timely fashion.15

With GAVI support, the EPI is conducting national follow-up campaigns in September and October 2016. To improve the quality of these SIAs and their evaluation, GAVI has provided an international consultant to assist with their planning, monitoring and assessment.

Measles surveillance has improved markedly in the past two years in Chad, earning the country congratulations from the WHO inter-country support team (IST) in Libreville. The percent of suspected cases that have been investigated and tested in the country’s measles laboratory in N’djamena rose from 3% in 2009 to 25% in 2011, 33% in 2015 and 45% thus far in 2016.16 These improvements are due to a new focus on measles surveillance starting in 2013, once polio cases disappeared. Measles is now included in the quarterly AFP surveillance meetings, and training of district and zonal surveillance focal points in measles surveillance has recently been conducted with WHO support. However, the rate of cases investigated is still well below the target of 80%. In addition, only 65% of districts in 2016 have thus far reported at least one suspected measles case, compared to the target of 80%.17

Meeting the goal of measles elimination in Chad by 2020 will require substantially improving the measles vaccination coverage rates through the routine program. Adding a second measles dose in the routine immunization schedule, which is not yet under consideration, would help the country in meeting this target.

#### Rubella

Rubella surveillance is taking place in conjunction with measles surveillance; all specimens collected from suspected measles cases are also tested for rubella in the measles laboratory in N’djamena. In addition, the country plans to conduct, with GAVI support, national catch-up measles-rubella vaccination campaigns in 2018.

### 3.3 Goal 3: Meet vaccination coverage targets

- **a.** Achieve 90% national coverage and 80% in every district with 3 doses of diphtheria-tetanus-pertussis containing vaccines
- **b.** Achieve 90% national coverage and 80% in every district with all vaccines included in the national schedule

Chad is still quite far from meeting the national and district-level coverage targets for DPT-containing vaccine (pentavalent) and for all other vaccines in the immunization schedule. The 2015 WUENIC estimates show national coverage of 55% for three pentavalent doses, 62% for measles and for three doses of OPV, and 49% for yellow fever. The 2014-2015 DHS/MICS

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14 Joint Appraisal report 2016.
15 Personal communications with WCO immunization focal point.
17 WHO. Situation polio et PEV/Tchad, Semaine 28 (du 11 au 17 juillet 2016).
survey shows considerably lower coverage rates, however, with rates for three pentavalent vaccine doses among 12-23 month olds of 33%, 50% for three doses of polio vaccine, and 57% for measles vaccination. High dropout rates – estimated to be 17-26% between DPT1 and DPT3 by several sources – are a major contributing factor for the low coverage rates of both pentavalent and polio vaccines. Administrative data show that 51% of districts in 2015 had achieved DPT3 coverage of ≥80% and these rates are likely to be inflated. Nonetheless, immunization coverage rates have improved somewhat in the past five years or so, especially for DTP3 and polio 3, with a noticeable jump from 2014 to 2015 (Figure 2). This increase has been mainly attributed to the recent expansion of the RED strategy – to now 54 of the country’s approximately 90 health districts. Efforts to improve coverage among hard-to-reach populations like nomadic herders through intensified vaccination activities may have also played a role. Other factors may include recent improvements in the security situation in the country and the movement of populations from insecure to secure areas, including camps, where they have better access to health care services.

Figure 2: Trends in WUENIC immunization coverage rates in Chad

While there has not been a formal equity assessment, the 2014–15 DHS/MICS showed a 64% increase in pentavalent 3 coverage from the lowest to the highest income quintile (27% vs. 45%), double the coverage rates for children whose mothers had a secondary school education over those with no education (54% vs. 27%) and an eight-point higher coverage rate in urban than rural areas (40% vs. 32%). Coverage is especially low among nomadic and hard-to-reach populations living in remote desert areas.

The main factors contributing to the low immunization coverage rates in Chad include:

- **Insufficient availability of health services, including immunization**
  There are not enough health facilities in Chad to make health care services assessable to all. While the government’s plan is to have one health zone (consisting of a health facility) for every 10,000 people – which would require around 1,450 facilities – there are at present around 1,160 functioning health facilities. Health facilities are especially lacking in remote areas with sparse populations. In addition, the 2012 EPI review found that about a quarter of health facilities (24%) do not offer immunization services.

- **Inadequate communications about immunization and weak community involvement in immunization activities**
  Chad has a system of health volunteers (agents de santé communautaire) in each village, who, among other tasks, promote immunization, inform their communities about upcoming immunization activities and track vaccination defaulters. However, these mobilizers are reportedly not well motivated or involved much in immunization in many areas. There has also been in the past little involvement of civil society organizations (CSOs) in immunization. In addition, the small (three-person) communication team within the central EPI office is over-stretched, has limited resources and focuses mainly on communications in conjunction with the national immunization days and other campaigns. While new vaccine introductions provide the opportunity to increase population awareness about immunization and to therefore increase demand, Chad has not introduced a new vaccine (other than IPV) since 2008. Communications and social mobilization for routine immunization is therefore inadequate. The low literacy rate among women in Chad (32%) creates an additional communications challenge with the public about immunization.

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18 Republic of Chad, Demographic and Health Survey (DHS) and Multiple indicator Cluster Survey (MICS), 2015.
19 WHO Immunization country profile (do link).
22 Joint Appraisal report 2016.
To improve this situation, 22 local associations in 10 districts where the RED approach is being implemented with GAVI support have signed an agreement to promote vaccination in their communities, with assistance from UNICEF. As a result, 1,500 community leaders participated in 2015 in promoting and assisting with immunization activities, 640 community volunteers were recruited and trained to conduct home visits, seek out defaulters and hold social mobilization meetings and other communications activities in their community. Through these efforts, nearly 46,000 children under the age of two were enumerated – the vast majority of whom (86-87%) had not completed their vaccinations and were referred to health facilities to receive missed doses.24

- Insufficient implementation of the Reach Every District (RED) strategy
With WHO and UNICEF technical support and funding from the Gates Foundation, Chad began implementing the RED strategy in 18 districts in 2004. The program has expanded gradually over time to now 54 of the country’s 90 or so districts, including 22 districts supported through the GAVI HSS grant. Through this support, districts have conducted a series of activities to increase vaccination coverage, including developing and implementing micro-plans, having UNICEF-paid consultants go house-to-house to track defaulters and get them vaccinated, procuring cold chain equipment, increasing the frequency of outreach activities, conducting regular review meetings, and increasing supervisory visits. In 10 of the districts supported by the GAVI HSS grant, 100 new health centers are also being built and equipped with cold chain equipment and motorcycles for outreach activities.

The RED strategy is supposed to be applied nationwide, but implementation is reportedly weak in the 40% of districts not receiving international assistance for its implementation. Even those that do receive support have had to curtail planned activities due to the slow release of government funds at times. In the GAVI-supported RED districts, activities that did not take place in 2014 due to delays in the disbursement of government funds included the purchase of a refrigerated truck, MLM training for health workers, and supportive supervisory visits.25 According to one WHO informant, the lack of available budgeted funds at the local level is the first barrier that needs to be overcome to improve the performance of the immunization program.

- Poor distribution of vaccines and supplies and an inadequate cold chain and logistics system
Vaccine stockouts at the central level are not a serious problem in Chad, since the Government pays for traditional vaccines and co-financing for yellow fever and pentavalent vaccines in time and in full. However, stockouts of vaccines and related supplies are quite common at the regional, district and health center levels because of a poor vaccine distribution system and inadequate stock management. While a regular vaccine distribution schedule exists on paper (with quarterly deliveries from the central stores to the regions and monthly deliveries from the regions to the health districts), in practice deliveries are erratic and depend on the availability of appropriate transport, which is often lacking.

At the local level, a 2015 cold chain inventory found that while 85% of health centers had refrigerators, only 72% of them were functioning and thus only 62% of health centers could store vaccines.26 This means that they must collect vaccine from the district stores or from another health center on the day of immunization sessions and are dependent on transportation being available.

- Weak quality and monitoring of immunization program data
Administrative coverage data show rates that are 20-40 percentage points higher than the WUENIC estimates; for instance 93% vs. 55% for three pentavalent doses in 2015 and 90% vs. 62% for measles.27 These high, inaccurate rates can create an unwarranted complacency and prevent the program from taking remedial action in low-performing areas. With partner assistance, district EPI coordinators in the 54 RED districts have been trained on the use of monitoring tools, data harmonization and validation meetings have taken place at the national level, and data review meetings are held at the district level. However, the district meetings are irregular in many places.

- Geographic inaccessibility and security issues
Around 4-7% of Chad’s population, including nomadic herders, live in remote areas with poor access to health services. They are also not sufficiently covered by outreach or mobile services, resulting in especially low immunization coverage rates. With support from WHO and other partners, a series of intensified vaccination activities have been carried out in the past several years in seven zones to improve immunization coverage in this population. These are integrated outreach sessions that provide all vaccinations for children under the age of five and TT for pregnant women, as well as distribute malaria medicines and issue birth certificates. An innovative strategy that is used as a further incentive to ensure high participation in these events is to also offer

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26 Chad EPI Annual Action Plan 2016.
27 Joint appraisal report 2016.
A lack of security in certain areas, including the Lake Chad region due to Boko Haram terrorists, has also negatively affected immunization coverage rates in the recent past. This situation has recently improved with a four-country security agreement and the removal of residents from insecure areas (e.g., the islands in Lake Chad) to IDP camps and more secure areas.

- **Interruption of routine immunization services during frequent SIAs**
  Polio and other SIAs have been frequent in Chad, with and six polio campaigns in 2015 (four national and two local) and many more in the recent past (e.g., 10 or 11 polio campaigns per year in 2010 and 2011). The impact of these frequent events on the delivery of routine immunization services has been raised as a particular issue in Chad in several documents and in interviews with informants. The 2012 EPI review found that 27% of health centers in the study reported that they stopped routine immunization services during the SIAs, mainly because of a lack of health workers and too heavy of a workload. Planning for the campaigns can also interfere with immunization services leading up to the events.

  Efforts to address several of these bottlenecks with partner support are discussed in Section B below.

### 3.4 Goal 4: Introduce new and improved vaccines and technologies

Chad introduced yellow fever vaccine in 2005 and pentavalent vaccine in 2008. It was also in the second group of countries in Africa to conduct catch-up campaigns of meningitis A vaccination for 1-29 year olds, which took place in four phases in 2011 and 2012 throughout the entire country. The EPI program also introduced IPV in 2015 with few reported problems.

Because of many competing activities, including the many polio and measles campaigns, and the need to expand cold chain capacity, the EPI decided to delay the planned introduction of several other new vaccines. The introduction of meningitis A vaccine into the routine schedule – originally planned for 2016 – is now planned for 2017. PCV introduction – planned in the cMYP for 2015 – has been pushed to 2018.

The Government will introduce MR vaccine by conducting nation-wide SIAs in 2018, with GAVI support, to begin to control rubella.
Partner support to address key challenges to meeting the GVAP goals
As mentioned in Section 2.2. above, development partners cover the majority of costs of the immunization program, with large portions of expenditures going towards polio, measles and other vaccination campaigns, improvements in the logistics and cold chain system, and implementation of the RED strategy in 54 districts. In addition, but WHO and UNICEF provide 145 staff and consultants to fill in the considerable gap in personnel for the immunization program. These include 55 staff and consultants paid by WHO to assist with RED activities, the intensified vaccination campaigns for nomads and other hard-to-reach populations described above, and other efforts to improve vaccination coverage and reduce missed opportunities. UNICEF's workforce includes more than 60 consultants providing on-the-ground assistance with communications and implementation of RED strategies.

Three areas of support from international partners that have been the most critical to the functioning and improvements with Chad's immunization program are:

- **Rehabilitation and expansion of the cold chain and logistics system.** With support from the GAVI HSS grant and technical support from several partners, the central cold rooms have been expanded from four to seven, four sub-national depots with cold rooms have been built, and solar-powered refrigerators are being procured for the district stores and health centers to reduce the need for kerosene. The plan is to have a (solar) refrigerator in all of the nation's 1,100 health centers. Partners are also providing technical support and training in cold maintenance, vaccine management and data monitoring.

- **RED strategy implementation.** This has been a major effort, involving many partners (the Gates Foundation, WHO, UNICEF, GAVI and others) to improve the routine immunization program in selected low-performing health districts, now 54. GAVI, jointly with the Government, supports implementation of the RED strategy in 22 districts, UNICEF supports another 22 districts and WHO supports ten. This funding has gone into creating and equipping new health centers in under-served areas, procuring cold chain equipment and vehicles, and paying for operational expenses such as fuel for vehicles and refrigerators. Besides funding, partners have provided technical assistance, though national and international staff and consultants – in developing micro-plans, working with communities to increase coverages rates through home visits and default tracking, among other activities. Administrative data show a significant increase in immunization coverage in the partner-supported districts, likely contributing to the increase in national WUENIC estimates from 2014 to 2015.

- **Training and capacity-building.** Partners have provided and are continuing to provide financial and technical support for a range of trainings to increase the skills and capacity of those involved in immunization and disease surveillance. This includes training of health staff in RED activities; surveillance training for zonal surveillance focal points; training of Regional EPI focal points in data collection, data management and interpretation using the DVD-MT software to improve data quality; and mid-level managers (MLM) training at the regional level.

### Acknowledgments

We would like to thank the following people who were interviewed for this report:

- Richelot Ayanma (WHO CO)
- Dah Cheikh (WHO IST)

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31 Joint appraisal report 2016.
32 Joint appraisal report 2016.
Annex 1: Country immunization profile

1. Polio
   - Transmission stopped in 2013
   - Eradication certified: not yet

2. Measles and rubella

   Figure 3: Reported Measles cases and MCV coverage, Chad, 1990-2015

   ![Reported Measles cases and MCV1 vaccination coverage, Chad, 1990-2015](chart.png)

   **Source:** WHO/IVB database, data reported to WHO by member states as of 30 June 2016.
   WHO/IVB estimates of immunization coverage (IUDC/IVC) to be updated by mid-2016.

   **Table 1: SIA activities planned in 2016-2017**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Intervention</th>
<th>Year</th>
<th>Start Date</th>
<th>End Date</th>
<th>Age Group</th>
<th>Extent</th>
<th>Status</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow Up</td>
<td>Measles</td>
<td>2016</td>
<td>01/10/2016</td>
<td>9-59 M</td>
<td>National</td>
<td>planned</td>
<td>1,123,643</td>
<td></td>
</tr>
<tr>
<td>Follow Up</td>
<td>Measles</td>
<td>2016</td>
<td>01/11/2016</td>
<td>9-59 M</td>
<td>National</td>
<td>planned</td>
<td>1,664,934</td>
<td></td>
</tr>
<tr>
<td>SNID</td>
<td>bOPV</td>
<td>2016</td>
<td>01/09/2016</td>
<td>01/09/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>1,930,338</td>
</tr>
<tr>
<td>NID</td>
<td>bOPV</td>
<td>2016</td>
<td>01/10/2016</td>
<td>0 to 5 years</td>
<td>National</td>
<td>Planned</td>
<td>3,860,675</td>
<td></td>
</tr>
<tr>
<td>NID</td>
<td>tOPV</td>
<td>2016</td>
<td>26/02/2016</td>
<td>28/02/2016</td>
<td>0 to 5 years</td>
<td>National</td>
<td>Planned</td>
<td>4,179,810</td>
</tr>
<tr>
<td>NID</td>
<td>tOPV</td>
<td>2016</td>
<td>25/03/2016</td>
<td>27/03/2016</td>
<td>0 to 5 years</td>
<td>National</td>
<td>Planned</td>
<td>4,179,810</td>
</tr>
</tbody>
</table>

   **Source:** WHO/IVB Database as of 01 July 2016

3. MNT: not yet eliminated.
4. Coverage and Equity

Figure 4: All vaccines national coverage, Chad, 2000-2015

Table 2: Reported DTPCV doses administered & coverage, Chad, 2000-2015

* COE: country Official Estimates

Source: WHO/IVB database, data reported to WHO by member states as of 1 July 2016
WHO/UNICEF national coverage estimates, 2014 revision, data as of July 2015
Figure 5: Percentage of district achieving <50%; 50-79% and ≥80% coverage, 2000-2015

Figure 6: DTP3 coverage by district/province, Chad, 2010 and 2015 (admin)

Legend:
- <50%
- 50-79.95%
- 80% and above
- No data
5. Immunization systems highlights
   - Immunization schedule

   - Planning and management:
     - Vaccines stockout: no event in 2015
     - cMYP: 2013-2017
     - Annual Plan: Yes
     - Country decision making: No NITAG
     - % of total expenditures on vaccines financed by government funds: 98%
DEMOCRATIC REPUBLIC OF CONGO
Progress towards achievement of GVAP/RVAP goals
# 1. Summary

This summary table describes the current situation in DRC regarding achieving the GVAP goals. Data used to assess progress towards achievement of GVAP goals are included in the annex (Country immunization profile).

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>DR Congo</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socio-demographic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GNI 2015</td>
<td>410</td>
</tr>
<tr>
<td></td>
<td>WB income category</td>
<td>Low income</td>
</tr>
<tr>
<td></td>
<td>Infant mortality (&lt;12 mo.) 2015 (UN IAG CME)</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Gavi status</td>
<td>Eligible</td>
</tr>
<tr>
<td></td>
<td>Total population</td>
<td>77,267,000</td>
</tr>
<tr>
<td></td>
<td>Birth cohort</td>
<td>3,127,000</td>
</tr>
<tr>
<td></td>
<td>Surviving Infants (JRF)</td>
<td>2,994,000</td>
</tr>
<tr>
<td><strong>1. Interrupt wild poliovirus transmission</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transmission Interrupted</td>
<td>Yes (since 2012)</td>
</tr>
<tr>
<td></td>
<td>Risk of late detection Percent of adequate stool specimens (Rolling 12m) (Target &gt; 80%)</td>
<td>77%</td>
</tr>
<tr>
<td></td>
<td>Risk of late detection Non polio AFP rate/100,000 (Rolling 12 mo.) (Target &gt; 2/100,000 children &lt;15)</td>
<td>5.5/100,000</td>
</tr>
<tr>
<td></td>
<td>Risk of spread after importation: Percent of 6-59 month olds having received less than 3 doses in the last year before occurrence case/environmental positive</td>
<td>19</td>
</tr>
<tr>
<td><strong>2. Neonatal tetanus elimination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coverage for TT (reported in 2015 JRF)</td>
<td>91%</td>
</tr>
<tr>
<td></td>
<td>Protection at Birth against tetanus (WUENIC 2015)</td>
<td>82%</td>
</tr>
<tr>
<td></td>
<td>Last SIAs conducted in the country</td>
<td>SIAs in 2013 and 2014 in 75 high-risk districts, following SIAs in 2012 in 31 districts.</td>
</tr>
<tr>
<td></td>
<td>Elimination validation date</td>
<td>Not yet validated. Pre-validation assessment planned for Aug-Sept 2016</td>
</tr>
<tr>
<td><strong>3. Measles Elimination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coverage MCV1 (2015 WUENIC)</td>
<td>79%</td>
</tr>
<tr>
<td></td>
<td>Coverage MCV2</td>
<td>Not in schedule</td>
</tr>
<tr>
<td></td>
<td>Percentage of districts with MCV1 coverage ≥95% (2015 JRF)</td>
<td>36%</td>
</tr>
<tr>
<td></td>
<td>Last national SIA</td>
<td>2013 and 2014 (children &lt;5 years)</td>
</tr>
<tr>
<td></td>
<td>Post SIA coverage survey conducted</td>
<td>No</td>
</tr>
<tr>
<td><strong>4. Rubella/CRS Elimination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rubella vaccine coverage</td>
<td>Vaccine not introduced</td>
</tr>
<tr>
<td></td>
<td>SIAs planned?</td>
<td>SIAs planned for 2017</td>
</tr>
</tbody>
</table>
### Area 5. Reach 90% national coverage and 80% in every district with DTP3cv

<table>
<thead>
<tr>
<th>Indicator</th>
<th>DR Congo</th>
</tr>
</thead>
<tbody>
<tr>
<td>National coverage (2015 WUENIC)</td>
<td>81%</td>
</tr>
<tr>
<td>Drop-out rate DTP1 to DTP3 (2015 WUENIC)</td>
<td>1%</td>
</tr>
<tr>
<td>Actual numbers of children that dropped out (2015 WUENIC)</td>
<td>29,937</td>
</tr>
<tr>
<td>Difference between poorest and richest quintile in DTP3 coverage (2013 DHS data)</td>
<td>34.9</td>
</tr>
<tr>
<td>% of districts reaching 80% coverage (2015 JRF)</td>
<td>86%</td>
</tr>
</tbody>
</table>

### Area 6. Reach 90% and 80% coverage with all vaccines in national immunization programmes

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Drug</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>National coverage (2015 WUENIC)</td>
<td>BCG</td>
<td>74</td>
</tr>
<tr>
<td>DTP-HepB-Hib1: 82</td>
<td>DTP-HepB-Hib3: 81</td>
<td>MCV1: 79</td>
</tr>
<tr>
<td>DTP-HepB-Hib3: 81</td>
<td>PCV3: 73</td>
<td>Polio3: 78</td>
</tr>
<tr>
<td>Polio3: 78</td>
<td>YF: 65</td>
<td></td>
</tr>
</tbody>
</table>

### Area 7. Introduction of new vaccines

<table>
<thead>
<tr>
<th>New vaccines introduced</th>
<th>Pentavalent: 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PCV: 2011-2013 (phased in)</td>
</tr>
<tr>
<td></td>
<td>IPV: 2015</td>
</tr>
</tbody>
</table>

### Area 8. Reduction in under 5 mortality rate

<table>
<thead>
<tr>
<th>UMSR 201 and 2015 (% diminution between 2010 and 2015)</th>
<th>2010: 116.1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2015: 98.3</td>
</tr>
<tr>
<td></td>
<td>(15.3%)</td>
</tr>
</tbody>
</table>

### Area 9. NITAG

<table>
<thead>
<tr>
<th>NITAG established?</th>
<th>No (2015)</th>
</tr>
</thead>
</table>

### Area 10. Government expenditure on routine immunization per live birth (USD)

| Baseline 2010-2011 and average for 2013-2015 (% change) | 0.7 to 1.4 (+101%) |

---

2. Country ownership of the immunization programme

2.1 Immunization policy decision-making capacity

The main body for making recommendations and decisions concerning the immunization program continues to be the country’s Strategic Inter-Agency Coordinating Committee (ICC), which is headed by the Minister of Public Health (MOPH) and enjoys strong ownership by the Ministry. Members include Ministry of Public Health staff, representatives from the Ministry of Finance and Budget, and from several partner organizations, such as WHO and UNICEF. The core committee meets twice a year. Under it are four technical sub-committees – technical, logistics, communications, and finance – each of which meet monthly and are chaired by the Secretary General of the Ministry of Public Health or his designee. The Technical sub-committee is headed by the EPI manager and includes technical MOPH staff as well as the immunization focal points of the major partner organizations. The EPI program also meets on a weekly basis and produce a weekly report of progress against the annual EPI workplan. In addition, each province has its own ICC, headed by the provincial Health Minister or his/her designee, to discuss technical and financial issues and plan activities.

Several efforts have been made by partners to assist the country in establishing a NITAG, including a regional training at WHO/AFRO headquarters in Brazzaville attended by DRC representatives, and visits by EPI team.
members in 2016 to other countries (U.S., Belgium) to examine different models of NITAGs. A change in EPI managers has delayed a decision on establishing a NITAG, which is currently pending MOPH approval. Informants believe that a strong NITAG with well-respected members could speed up decision-making (e.g., to apply to GAVI for rotavirus vaccine introduction), help convince the Government to pay its GAVI co-financing obligations on time, and convince it of the value of introducing a second measles vaccine dose to reduce outbreaks and the need for costly measles vaccination campaigns.

DRC does benefit from having the Congolese Parliamentary Network to Support Vaccination (REDACAV) – an influential group of parliament members who lobby the Government for increased funding in immunization. REDACAV monitors the disbursement rate of funds for immunization, and individual members have been known to contact Ministry of Finance officials to get allocated funds released for GAVI co-financing and other expenditures. Some REDACAV members also participated in the development of the latest comprehensive multi-year immunization plan (for 2015-2019). With help from the Sabin Institute, the group drafted an Immunization Bill to make vaccination mandatory and lay out the Government’s responsibilities for immunization financing. However, the bill was not passed, since the Parliament is proposing an overall Health Act that will include immunization.

2.2 Government financing of immunization

As shown in Figure 1, government expenditures for immunization have increased since 2010, after DRC started paying for traditional vaccines in 2009 and co-financing new vaccine introductions. However, the figure clearly shows that government contributions have not been rising steadily, but in fact have dipped considerably in the past four years. This is due to the fact that the transfer of funds from the Government is often slow and funds can be diverted to other uses. As a result, the Government paid for only 20% of the cost of procuring traditional vaccines in 2014 ($2.4 million out of $11.8 million), with UNICEF covering the remaining 80%. These delays in releasing funds contributed to national stockouts of several vaccines in 2014 (BCG, TT, measles), as discussed below. The difficulty in getting the Government to release funds has greatly affected DRC’s ability to co-finance new vaccines. The country was in default to GAVI in 2014 and 2015 and did not pay the its co-financing obligation for 2014 until July of 2015. DRC continues to be late in making co-financing payments.

As a result of the disbursement problem, the Government provided only 15% of its immunization budget in 2015 ($2.3 million out of $15 million) and 25% in 2014, with most of the funds going to vaccine procurement and very little to the operational costs of routine immunization. Several partner organizations contributed more than budgeted to help make up the difference, especially for operational costs for vaccination campaigns and routine immunization. In all, the Government’s contribution to the EPI budget was 5% in 2014 (due to no co-financing in that year). This is a lower rate than in most countries and includes personnel costs. However, these costs are low since most health workers receive no government salary and at most, a small stipend (see next section).

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1 2015 joint appraisal report for DRC.
3 2015 joint appraisal report for DRC.
As a result of advocacy for immunization, most provincial governments are now contributing to the operational costs of the EPI, by, for example, buying fuel and BCG syringes and paying for transportation of supplies from higher levels.  

2.3 Human resource situation

The DRC Government has an extensive EPI team. In 2016, there were 115 staff members at the central level, including 36 professionals. At the provincial and antenne (sub-provincial) level, there are 364 immunization-specific staff, for a total at all levels of 479 people, including 75 doctors (16%). The size of the team is considered adequate and they are generally well-trained. However, there is considerable staff turnover.

Another factor affecting human resources for immunization is the recent change in the administrative structure of the health sector, in which 26 provincial health divisions (divisions provinciales de la santé or DPS) have replaced the 11 provinces. This change has required the creation of new EPI staff positions in the newly-established DPSs, who are currently in the process of being trained. This expansion in provincial health divisions has caused major disruptions to the health sector, including the immunization program.

At the operational level, most vaccines are administered by nurses working in government hospitals and the 8,830 health centers throughout the country. According to a situation analysis conducted for the 2015 GAVI joint appraisal, at least one person was trained in immunization in more than half of the health centers surveyed. However, most health center staff (90% according to the Joint Appraisal) receive no government salary and only a portion (e.g., 25%) receive a “risk bonus” (prime de risqué), which covers the cost of supporting a family for only five days. Health workers share a portion of the revenues from patient fees for curative care services, which constitute the main source of financing to keep health centers functioning in many places. However, this remuneration is low, especially in poor areas. Thus, health workers are often demotivated, resulting in retention problems, uneven quality of personnel, and a lack of interest in making special efforts for preventive health services that are not remunerated, such as conducting outreach visits and establishing immunization hours convenient to mothers.

3. Progress towards specific GVAP goals (issues/challenges/successes)

3.1 Goal 1: Achieve a world free of poliomyelitis

Has polio transmission been interrupted?

Polio transmission has been interrupted in DR Congo, with no cases of wild polio virus (WPV) detected since December 2011, when 93 cases were reported (and 100 cases the previous year). There were 29 cases of vaccine-derived disease from 2010 to 2012 and not again until 2016, when one case was reported in March. This decline in polio cases could be the result of a series of national immunization days and sub-national immunization days (Journées locales de vaccination or JLVs) that the country has conducted in response to the WPV cases and to eradicate the disease (see below). The Government presented a dossier to be declared polio-free in November 2015, which was granted by WHO.

Is the country considered at high risk of polio transmission?

According to the risk assessment for polio transmission conducted by WHO in June 2016, DR Congo is at medium risk of polio transmission for the country as a whole. This determination is based on the combination of the potential for transmission in-country and beyond its borders – which is considered high – and the strength of its capacity to respond to and contain an outbreak – which is considered strong. As shown in Figure 2,

---

Notes:
- Comprehensive multi-year EPI plan (cMYP) for DRC, 2015-2019, November 2014.
- The administrative structure for the health sector now consists of 26 DPSs (vs. 11 provinces formerly), 44 antennes (sub-provinces), 516 health districts (zones de santé) and around 8,800 health centers (aires de santé).
- 2015 joint appraisal report for DRC.
a number of the country’s 516 health districts (zones de santé) have levels of population movement, a lack of security due to armed conflicts, and poor immunization coverage that place them at risk.

**Figure 2: The level of polio risk from importations by health district, 2016**

Source: Risk assessment for polio virus transmission: DR Congo presentation (June 15, 2016)

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**What needs to be done to keep DRC polio free?**

To keep DRC free of polio outbreaks, good AFP and polio surveillance must be maintained. The country currently meets several AFP surveillance targets, including a national rate of non-polio AFP incidence of 5.5/100,000 children under the age of 15 and a rate of 91% of reported AFP cases investigated within 48 hours. The percent of cases with adequate stool samples nationwide is 77% – just below the target of 80%. However, the quality of AFP surveillance is uneven in the country, with 28% of the 516 districts “silent” (reporting no AFP cases) for the first six months of 2016 and six DPSs with adequate stool rates of 60% or less.12 In poor-performing areas, there is limited case-based surveillance and investigations of possible cases, often due to a lack of transport, as well as poor documentation.

The surveillance system is heavily supported by WHO, which maintains a team of several dozen staff and consultants in the provinces (including support staff and drivers), as well as 12 staff at the national level. The country is also supported by the CDC-funded international STOP teams, made up of 10-14 or so surveillance experts who spend time working with health authorities in silent districts to provide technical assistance and training to improve surveillance for AFP and other diseases. They hope to reduce the number of districts not reporting any AFP cases to zero in 2016.

The immunization program has conducted a series of sub-national polio campaigns, including catch-up campaigns following the detection of vaccine-derived polio cases, every year for the past several years. These include three rounds of JLVs (local vaccination days) in 2015 and two rounds of national immunization days in 2016, with a third planned for October. Due to problems with data quality, the campaigns constantly register coverage rates in excess of 100%. However, one LQA survey following the campaigns in 2015 found that 30% of the districts had what they considered “poor coverage” and an estimated 6% of the children had been missed.13

---

Achieving high polio vaccination coverage through the routine immunization program is also critical to reducing the risk of the disease from re-emerging. According to the WHO-UNICEF estimates, national coverage of three polio vaccine doses has been in the range of 74-79% since 2011 and was 78% in 2015. This is up from 42% national coverage in 2000, but below the GVAP target of 90% nationally. In addition, the 2016 polio risk assessment identified several districts with poor vaccination coverage, putting them at risk of transmission (see the lower middle map in Figure 2).

According to two studies conducted in 2011, refusal of parents to have their children vaccinated against polio was the second most common reason children were not vaccinated against polio, in contrast to measles, for which refusals were found to be negligible. Refusals to polio vaccination were found to be due to the existence of 60 or so religious groups who were against the polio SIAs, the population’s low perceived risk of the disease, the repetitiveness of polio vaccination campaigns, and inadequate communications and social mobilization activities targeting pregnant women and anti-vaccine groups. Intensified communications activities by national consultants and STOP Team members in low-performing provinces and antennes in 2012 reduced the number of groups still opposed to vaccination from 60 to 10 and otherwise increased parents’ knowledge about polio vaccination.

### Goal 2: Meet global and regional elimination targets

#### 3.2.1 Achieve maternal and neonatal tetanus elimination

DRC has not yet achieved elimination status of maternal and neonatal tetanus (MNT) and continues to officially report cases in most years, including more than 1,250 in 2012, 201 in 2014 and 330 to 2015. However, the actual incidence is likely to be much higher, since according to the cMYP, less than 10% of neonatal tetanus cases are reported by the routine surveillance system. According to a study conducted in 2005, 7% of neonatal deaths in DRC were due to neonatal tetanus.

A key problem affecting DRC’s ability to eliminate MNT is its continual weak surveillance of the disease, including active surveillance. Only 17% of reported NMT cases were investigated between 2012 and 2015, with considerable variation by province. This is in marked contrast to the 91% investigation rate cited above for AFP surveillance, into which donors have poured considerable funding and technical support. In addition, the standard response to confirmed cases by conducting ring vaccination in households surrounding a confirmed case only occurred on average 32-41% of the time during this period.

DRC has made considerable progress in providing TT vaccine to pregnant women in the past several years – with rates of children protected at birth (PAB) jumping from 45% in 2000 to 82% for the past two years, according to the WHO-UNICEF estimates. This has mainly been due to the marked increase in the use of antenatal care services – from 68% of pregnant women making at least one ANC visit in 2001 to 88% by 2013/14. However, many women remain unprotected due to large variations in TT2+ coverage by province and district. While the national TT2 coverage rate in the 2012 DHS was estimated at 62% in 2012, provincial rates ranged from 28% to 82%.

The EPI has also organized MNT campaigns for women of reproductive age in high-risk districts. These SIAs began in 31 out of 83 identified high-risk districts in 2012, during which a reported 1.8 million women were vaccinated with TT. The campaigns were marked by a high dropout rate between doses, relatively weak social mobilization and inadequate preparation.

DRC developed an MNT elimination plan in 2013, setting the goal of elimination by 2015. Seventy-five high-risk districts were identified in the plan and targeted for SIAs in 2013 and 2014, during which another approximately 1.8 million women received two TT doses. The Government reported an overall coverage rate of 82% for the campaigns, though several provinces reported rates of >100%, so the actual coverage rate is uncertain. A new analysis in 2015 identified two additional high-risk districts and targeted them for intensified immunization activities. The analysis also found 11 districts reporting at least one case per 1,000 live births (the threshold for elimination).

Achieving MNT elimination in the DRC will therefore require substantially improving case-based surveillance and response (e.g., ring vaccination around cases), as well as increasing TT coverage in areas where it continue to be low.
3.2.2 Achieve measles elimination and rubella & CRS elimination

Measles

DRC is not currently on track to eliminate measles by 2020. In fact, there has been a resurgence of measles since 2010, with annual outbreaks affecting more than 134,000 reported cases in 2011, more than 87,000 in 2013 and nearly 51,000 cases in 2015, including 565 deaths. The outbreaks jump around to different areas from year to year, but both the 2011 and 2015 epidemics were concentrated in Katanga province (or the DPSs that were formerly in Katanga), where 80% of cases in 2015 took place. Outbreaks have continued into 2016, but at a lower intensity, with around 5,400 reported cases from January to early July in 13 of the country’s 516 health districts (down from 44 affected districts in 2015).21

The main reason given in documents and by WHO informants for the continual measles outbreaks is insufficient measles vaccination coverage through the routine program and through measles SIAs that vary in quality and miss too many children. The 2015 Katanga outbreak, for instance, has been attributed to a large accumulation of children not vaccinated against measles, due to geographic inaccessibility in the worse-affected districts, insecurity caused by the presence of armed groups, an inadequate cold chain system at the local level – resulting in most health centers offering immunization only once a month (see below) – and resistance to vaccination in some communities due to religious or cultural reasons.22 The WUENIC estimates for national measles immunization coverage ranged from 72-77% from 2011 to 2014 and reached 79% in 2015, showing gradual improvement, but still quite a bit below the 90% national GVAP target. Some provinces and districts have much lower coverage rates, notably Katanga (at 53% in the 2013 DHS) and Kasi-Oriental (58%).23

DRC, with the support of many partners, has conducted a series measles campaigns in the past five years to reduce incidence and halt outbreaks. Catch-up campaigns for children under 15 years of age were conducted in 2012 in 31 health districts in eight provinces, followed by follow-up campaigns for children under five conducted nation-wide in three phases in 2013 and 2014, often in combination with polio campaigns. A series of catch-up campaigns took place in 2015 in 40 outbreak districts, targeting varying age groups (<5s, <10 or <14 or 15), depending on the area and supporting partner organization. Some of the 2015 SIAs took place quite late after cases were identified due to problems mobilizing funds for operational costs, they lacked coordination among various partners, and independent coverage surveys often didn’t take place.24 The 2015 campaigns have been described as “too little, too late”. One indication of the suboptimal quality and coverage of the SIAs in some areas is the fact that confirmed measles outbreaks in several districts took place within a month or more of SIAs having been conducted in these same districts.25 Nonetheless, administrative data consistently show coverage rates of more than 100% for nearly all measles campaigns since 2012.

While it has improved in recent years, measles surveillance – including case-based surveillance linked to the AFP/polio surveillance system – is considered inadequate and another key factor for DRC’s difficulty in reducing measles incidence. The country as a whole meets the target non-measles febrile infection rate of ≥2/100,000 children, with a national rate of 2.16/100,000 in 2015.26 However, more than half of the provinces (six out of 11) had rates below this threshold and three had rates of <1/100,000. In addition, the percent of districts reporting at least one measles case with a specimen obtained was 61% in 2015 (compared to the target of 80%) and only three provinces met this target.

Rubella

Rubella has also not been eliminated in DRC and rubella vaccine is not yet used in the public sector. Sentinel site surveillance for rubella – in the same three sites where rotavirus and bacterial meningitis surveillance is taking place – has just begun. However, for several years, blood samples of suspected measles cases that test negative for measles are tested for rubella and the number of positive rubella cases found each year through this testing has more than doubled in five years – from 320 in 2011 to more than 760 in both 2013 and 2014. Few cases of CRS have been detected, however. The sentinel site surveillance should provide better estimates of rubella and CRS incidence.

The 2015-2019 cMYP calls for the immunization program to conduct measles-rubella vaccination campaigns in 2017, followed by the introduction of two MR doses in the routine schedule in 2018. Activities have yet to take place (as of mid-July 2016) to apply for GAVI funding for the SIAs.

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26 DRC MOH and WHO. Situation epidemiologique de al rougeole en RDC, 21 June 2016 (weekly disease reporting bulletin).
3.3 Goal 3: Meet vaccination coverage targets

a. Achieve 90% national coverage and 80% in every district with three doses of diphtheria-tetanus-pertussis containing vaccines

b. Achieve 90% national coverage and 80% in every district with all vaccines included in the national schedule

While DRC has not yet reached the goal of 90% national coverage for three doses of DPT-containing vaccine (pentavalent), according to the WHO-UNICEF estimates, it achieved an overall coverage of 81% in 2015 – up from 74-75% from 2011 to 2013. The WUENIC dropout rate from the first to the third dose of pentavalent vaccine was reportedly 1%. However, the 2013 DHS found a pentavalent coverage rate of only 61% national in 2012 (while the WUENIC rate was the 2013 DHS found a pentavalent coverage rate of only 61% national in 2012 (while the WUENIC rate was 75% for that same year) and a dropout rate of 25%.27 Administrative data show a marked improvement in district-specific coverage rates in the past five years (see map in the Annex). However, there are no WUENIC estimates for district coverage and given the fact that there is a 13-point difference between administrative and WHO-UNICEF DPT3 coverage estimates for 2015 (94% vs. 81%), the actual degree to which the country has met the goal of 80% coverage in each district is unknown.

Concerning other vaccines in the immunization schedule, the WUENIC national estimates for 2015 were in the upper 70s for measles and three doses of polio vaccine, the mid-70s for PCV3 and BCG, and 65% for yellow fever vaccine. The increase in WUENIC coverage rates for these vaccines in the past five years was less than for pentavalent vaccine; for example, polio coverage was 77% in 2011 and 78% in 2015. The fact that administrative coverage data show national coverage rates of 90% or greater for most vaccines, except measles and PCV3 (at 89% and 86%) highlights issues with the quality of immunization data in DRC.

There are large income and geographic inequities in immunization coverage. The difference in coverage of three pentavalent doses between the lowest and highest income quintile in the 2013 DHS was 35 percentage points (48% vs. 83%), while the coverage rate for all vaccines jumped from 36% in the lowest quintile to 65% in the highest (see figure in the Annex). Those in the middle quintile had rates much closer to the lowest than the highest quintile – indicating great inequality by income. The largest number of non- or under-immunization children are in the country’s nine poorest DPSs.28

The performance of DRC’s routine immunization program is affected by serious health system challenges. These include:

- A lack of investment in human resources for health and consequent high attrition rates and low motivation among health workers.
- Insufficient availability of immunization services.
- Frequent vaccine shortages and stockouts.

The performance of DRC’s routine immunization program is affected by serious health system challenges. These include:

- A lack of investment in human resources for health and consequent high attrition rates and low motivation among health workers. As mentioned above, most health workers receive no government salary and many do not even receive the inadequate risk bonus. Consequently, they rely on a share of revenues generated by user fees for curative care services. This creates a disincentive for health workers to provide non-remunerative services, such immunization, especially outreach activities and other extra efforts to improve vaccination coverage that require time away from the health center. Many health facilities in the poorest provinces, where user free generation is low, reportedly charge patients for vaccinations, further suppressing coverage.29

- Insufficient availability of immunization services. According to a Service Availability and Readiness Assessment (SARA) conducted in 2014, the number of health facilities in DRC – both public and private – is sufficient, with more than 600 hospitals, 10,000 health centers (of different levels) and more than 5,500 health posts.30 This yields a ratio of 2.2 health facilities per 10,000 people, meeting the WHO recommended benchmark of 2/10,000. Seventy-five percent of the facilities in the assessment were found to provide immunization services. However, most (59%) held immunization sessions only once a month, 37% held them once a week, and only 2% had immunization services available on a daily basis. A key reason – in addition to the health worker issues described above – is the fact that only 16% of the 1,012 health facilities in the SARA study had refrigerators, and only 2% of health posts. Thus, health facilities must collect vaccine from the district medical stores themselves on the day of an immunization session. This situation may have improved recently with the purchase of addition cold chain equipment through the GAVI HSS grant.

- Frequent vaccine shortages and stockouts. Vaccine stockouts are common at all levels of the health system in DRC. At the central level, there were stockouts of BCG, yellow fever, and PCV vaccines in 2015 and of measles and BCG in 2014.31 As of early July 2016, there was no supply in the central stores of bivalent OPV and IPV and only one month’s supply of TT vaccine. Some of these stockouts are due to a global supply shortage, notably BCG, which was absent from the central store for 73 days in 2015.32

28 2015 joint appraisal report for DRC.
29 2015 joint appraisal report for DRC.
30 WHO. Service Availability and Readiness Assessment (SARA) in the Democratic Republic of Congo, June 2015.
Government releasing funds for vaccine purchases also contribute to the stockouts at this level.

At the sub-national level, 92% of districts surveyed in the PCV post-introduction evaluation (PIE) in 2014 had experienced a stockout of at least one vaccine in the previous six months, including PCV, even though it was available at the central level during at the time.33 This points to severe distribution problems from the national to the lower levels. Only two provinces (Bas-Congo and Bandundu) and the city of Kinshasa have vaccines delivered by road; all other provinces are at the mercy of a few air-freight companies for their vaccine deliveries. These companies have routes and itineraries that do not necessarily meet the needs of the provinces, and they charge more than $2 million a year to airship vaccines to the interior. In addition, many health provinces (DPSs) do not have appropriate, functioning means of transporting vaccines to the districts, although more are now obtaining vehicles with HSS support.

The unavailability of vaccines at the health facility level was the top reason found in the 2013 DHS that children did not get vaccinated – cited by 26% of parents whose children did not receive vaccines on schedule.34 Vaccine stockouts were also found in the 2012 EPI review to be the cause in 27% of the cases where planned outreach activities did not take place.35 While health facilities without refrigerators are not expected to store vaccine, the SARA study found that vaccine stockouts in facilities with refrigerators were also common. At the time of the assessment team’s visit, 44% of these facilities had no PCV vaccine and 19-24% had stockouts of measles, pentavalent or polio vaccines.36 These stockouts are due to the vaccine shortages at high levels, as well as to a lack of transport at health facilities to collect vaccine from the district stores.

**Inadequate outreach activities.** According to the SARA study, 80% of health facilities offering immunization provide services only at the facility. The 2013 DHS found that, while 27% of children lived far enough away from a health facility to be eligible for outreach services, only 7% of vaccinated children were reached through this strategy, increasing the likelihood of their being missed or not completing these immunizations. A lack of transportation was given as the reason outreach activities did not take place in 41% of cases in the 2012 EPI review.37 Other likely factors are the shortage of health workers and lack of financial incentive to conduct outreach activities.

**Insufficient community-based communications and community involvement in health and immunization promotion.** DRC has established a system to link health facilities to each community and involve community members in health promotion, including immunization. In principal, one community volunteer (relais communautaire) exists for every 25-30 households, and one volunteer per village is a member of the Development Committee (CODESA) for the catchment area (aire de santé) of the health center. In the area of immunization, these volunteers inform community members about vaccines and immunization services, help plan and implement disease surveillance and vaccination activities, track immunization defaulters, and participate in health district council meetings. Each DPS has a communications focal point and most districts have community workers (animateurs communautaires) who support the health centers and community volunteers with communication and social mobilization activities. The PCV post-introduction evaluation (PIE) found that 34% of mothers knowledgeable about the new vaccine had learned about it from a community volunteer and they were the #2 source of information after health personnel.38

However, although the number of community volunteers has reportedly increased, the reality on the ground is different. According to the 2012 EPI review, these volunteers often lack motivation and are increasingly disengaged in some districts.

Inadequate knowledge and demand from the population were found to be a major reason for children not being vaccinated. In the 2012 DHS, coverage for pentavalent vaccine fell from 81% for the first dose to 61% for the third (a dropout rate of 25%), while the dropout rate for polio vaccine from the first to the third dose was 28%. A lack of knowledge about the importance of vaccination, about the need for more than one dose for several vaccines, and about the time and place of vaccination were commonly cited by mothers whose 1-11 month olds did not complete their vaccinations.39 Religious objections were also a reason for children not being vaccinated, accounting for 7% of responses about all factors contributing to the non-vaccination of children.

The results of these factors – along with inadequate supervision – is many missed opportunities. A child may come to the health center, but it’s not the one day of the month when an immunization session is held, or if it is, certain vaccines are not available, discouraging parents from coming back. Health workers may also miss the opportunity to inform mothers of the needs to

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34 IMYP 2015-2018
35 HSS II application to GAVI by DRC, 20 April 2014.
36 HSS II application to GAVI by DRC, 20 April 2014.
37 HSS II application to GAVI by DRC, 20 April 2014.
bring their child back for subsequent doses and when to do this.

Given the severity of these problems – the lack of salaries for most health workers, the infrequency of immunization services and frequent vaccine stockouts – not to mention the low disbursement rate and delays in the release of government funds for immunization and the presence of armed groups in some areas – it seems quite remarkable that the WHO-UNICEF national coverage estimate for DPT3 is 81%, a figure that surpasses that of several other countries in the region (e.g., Nigeria, Uganda, Chad) and matches that of Indonesia. It may be that the WUENIC estimate is high, given the 14 percentage point difference between the WUENIC and DHS DPT3 coverage estimates for 2012. Other possible explanations for this relatively high coverage include:

- **Implementation of vaccination campaigns and special events** that raise awareness of and/or increase access to immunization. These include periodic intensified routine immunization campaigns (PIRIs) that have taken place in some provinces in recent years, and African Vaccination Weeks. In addition, the numerous polio campaigns that go door-to-door have increased the population's knowledge about and demand for vaccination in general.
- **Implementation of the Reach Every Zone (REZ) strategy** in 65 of the worse-performing districts (13% of all districts) through the GAVI HSS I grant, supplemented by support from the Gates Foundation, WHO and other partners. Immunization coverage in these districts has increased markedly from 2010 to 2014 (see Section B below). Through the HSS II grant, the number of target districts for REZ support has increased to 112.

### 3.4 Introduce new and improved vaccines and technologies

DRC introduced PCV-13 vaccine over a 2.5 year period from 2011 to 2013. The introduction was phased in and delayed due to the Government defaulting on its GAVI co-financing obligations and to delays in procuring and installing cold chain equipment needed to accommodate the new vaccine throughout the country. Post-introduction evaluations (PIEs) were conducted for the first four provinces, the fifth province and the country as a whole. The introduction was plagued by stockouts of the vaccine at all levels, high wastage rates (11% in the facilities included in the national PIE), and high dropout rates between doses one and three (19% according to administrative data from 2013). However, the situation has improved since, with the WHO-UNICEF estimates of PCV3 coverage reaching 73% by 2015. The PIE also described good planning and social mobilization for the PCV introduction, as well as good population acceptance of the vaccine.

IPV was introduced over a four-month period in 2015, with few reported problems. Meningitis A vaccine campaigns were conducted in 2015/16 for 1-29 year olds in the country’s three provinces where the disease is endemic. No decision has yet been made concerning its introduction into the routine immunization schedule in these three provinces.

Rotavirus vaccine introduction was originally planned for 2014, but was postponed as a result of the country’s problems meeting its co-financing obligations and the prolonged roll-out of the PCV introduction. According to the cMYP, the country is supposed to introduce the vaccine by 2019. DRC also plans to apply to GAVI in early 2017 for a pilot HPV project in two districts. As mentioned above, the cMYP also calls for measles-rubella campaigns to take place in 2017, to be followed by introduction of two MR doses into the routine program in 2018. Preparation of the application to GAVI for the SIAs has not yet begun.
Partner support to address remaining challenges to meet the GVAP goals and targets
Partners, including GAVI, WHO, UNICEF, USAID and others, have been instrumental to the functioning and improvements of DRC’s immunization program, providing financing, manpower, technical assistance and training. As mentioned above, they have covered the vast majority of the costs of the program for many years. Much of the financial and technical support has gone into:

- **Immunization campaigns** (polio, measles, meningitis A), with WHO, UNICEF and GAVI covering most of the operational costs of the campaigns and providing technical assistance, along with other partners, in communications, planning and other activities. SIAs accounted for 13% of the EPI expenditures in 2015, most of that for polio campaigns.40

- **Disease surveillance**: WHO heavily supports the country’s surveillance system for polio and other vaccine-preventable diseases (VPDs), financing a team of around 100 people working in the provinces, including surveillance medical officers, logisticians, administrative assistants and drivers. While the team is supported by polio funding, they also work to improve case-based surveillance of measles and other VPDs. Periodic international STOP teams, described above, provide additional support to the country in conducting disease surveillance and organizing SIAs.

- **New vaccine introductions**: Partners have been critical to the introduction of PCV and IPV, providing assistance in planning, training, communications/social mobilization and other areas. GAVI financial support for pentavalent, PCV and yellow fever vaccines accounted for 45% of the total EPI expenditures in 2014 ($51 million out of $114 million).41

Three projects or activities where partner support has especially made a difference to the immunization program are highlighted below:

- **Support for implementation of the Reach Every Zone (REZ) approach**. GAVI, through the HSS grant, along with the Gates Foundation and other partners, has provided financial and technical assistance to implement the REZ approach in 65 of the country’s 516 health districts (zones de santé). Catalytic funding, along with technical assistance, has enabled these districts to conduct MLM training, pay for vaccine transport and cold chain maintenance, purchase cold chain equipment, conduct many more outreach activities (based on micro-planning), and increase supportive supervision and monitoring, including monthly meetings to review immunization coverage and activities. This support has also helped activate community participation in default tracking and in promoting health and immunization services. An external evaluation showed an increase in pentavalent 3 coverage in these 65 districts from 57% in 2010 to 80% in 2014, and a doubling of districts reaching 80% coverage in three years (Figure 2).42 Support for REZ implementation is being expanded to 112 districts in all through the HSS II grant. Sustainability of this effort, once partner support ends, is a major question.

- **An upgrading of the vaccine supply chain and cold chain system**. With support from the GAVI HSS grant, UNICEF and WHO, DRC is substantially expanding and modernizing its cold chain system to accommodate new vaccines and greatly improve its distribution and storage of vaccines. In addition to constructing new cold rooms in Kinshasa, the project involves establishing three sub-national distribution hubs to which vaccines will be flown directly from the central stores. This should lessen the storage capacity needs of the central level and improve efficiency in vaccine distribution to the DPs and districts. To reduce the system’s dependence on a few airlines as well as airfreight costs, GAVI funds are being used to acquire a boat equipped with cold chain equipment that will travel up the Congo River to deliver vaccines and other medical supplies to the new hubs. Solarization of the cold chain system to reduce the costs of procuring and distributing fuel, is another major component, with the procurement of solar refrigerators at the central, hub and DPS levels, as well as solar generators in all DPSs currently off the grid or that experience frequent power outages. These stores are also being equipped with remote temperature monitoring systems.

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41 2015 joint appraisal report for DRC.
42 2015 joint appraisal report for DRC.
Figure 3: Change in DTP3 coverage in the 65 districts receiving support for Reach Every Zone (REZ) implementation

![Map showing DTP3 coverage changes](image)

**Source:** 2015 Joint Appraisal report

- A civil society organization (CSO) project funded by GAVI, with support from UNICEF, USAID and other partners. Four local CSOs operating in 33 districts in five provinces work with communities to strengthen community participation in health promotion, tracking defaulters, and strengthen links between the communities and health centers. These efforts led to a substantial increase in demand for immunization, resulting in an increase in coverage of three pentavalent vaccine doses from less than 60% to more than 80% in these districts.

Acknowledgments

We would like to thank the following people who were interviewed for this report:

- Patrick Lydon (WHO HQ)
- Yolande Masambe Vuo (WHO CO)
- Renee Nsamba (WHO CO)
Annex 1: Country immunization profile

1. General indicators
   - GNI (USD): 410
   - WB Status: Low income
   - Infant mortality (<12 M) rate: 75
   - GAVI Status: Eligible
   - Total Population: 77,267,000

2. Polio
   - Transmission stopped in 2011.
   - Eradication certified: not yet.

3. Measles and rubella

Figure 4: Reported Measles cases and MCV coverage, DRC, 1990-2015

Table 1: SIA activities planned in 2016-2017

<table>
<thead>
<tr>
<th>Activity</th>
<th>Intervention</th>
<th>Year</th>
<th>Start Date</th>
<th>End Date</th>
<th>Age Group</th>
<th>Extent</th>
<th>Status</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catch up</td>
<td>MR</td>
<td>2017</td>
<td></td>
<td></td>
<td>6 M-14 Y</td>
<td>National rollout</td>
<td>planned</td>
<td>7,320,281</td>
</tr>
<tr>
<td>Follow up</td>
<td>Measles</td>
<td>2016</td>
<td>19/07/2016</td>
<td>01/11/2016</td>
<td>6-59 M</td>
<td>National rollout</td>
<td>planned</td>
<td>16,109,995</td>
</tr>
<tr>
<td>SNID</td>
<td>bOPV</td>
<td>2016</td>
<td>01/10/2016</td>
<td></td>
<td>0 to 5 years</td>
<td>Sub-national</td>
<td>Planned</td>
<td>8,121,548</td>
</tr>
<tr>
<td>NID</td>
<td>tOPV</td>
<td>2016</td>
<td>14/04/2016</td>
<td>16/04/2016</td>
<td>0 to 5 years</td>
<td>National</td>
<td>Planned</td>
<td>18,166,533</td>
</tr>
<tr>
<td>NID</td>
<td>tOPV</td>
<td>2016</td>
<td>24/03/2016</td>
<td>26/03/2016</td>
<td>0 to 5 years</td>
<td>National</td>
<td>Planned</td>
<td>18,166,533</td>
</tr>
<tr>
<td>SNID</td>
<td>tOPV</td>
<td>2016</td>
<td>25/04/2016</td>
<td>27/04/2016</td>
<td>0 to 9 years</td>
<td>Sub-national</td>
<td>Planned</td>
<td>1,430,939</td>
</tr>
<tr>
<td>Campaign</td>
<td>MenA</td>
<td>2016</td>
<td>01/02/2016</td>
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<td>1-29 Y</td>
<td>Sub-national</td>
<td>planned</td>
<td>10,117,371</td>
</tr>
<tr>
<td>Campaign</td>
<td>MenA</td>
<td>2016</td>
<td>01/05/2016</td>
<td></td>
<td>1-29 Y</td>
<td>Sub-national</td>
<td>planned</td>
<td>7,927,555</td>
</tr>
</tbody>
</table>

Source: WHO/IVB Database as at 12/4/2016
4. **MNT**

5. **Coverage and Equity**

**Figure 5: All vaccines national coverage, DRC, 2000-2015**

**Table 2: Reported DTPcv doses administered & coverage, DR Congo, 2000-2015**

* COE: country Official Estimates

Source: WHO/IVB database, data reported to WHO by member states as of 1 July 2016
WHO/UNICEF national coverage estimates, 2014 revision, data as of July 2015
Figure 6: Percentage of district achieving <50%; 50-79% and ≥80% coverage, 2000-2015

Figure 7: DTP3 coverage by district/province, DRC, 2010 and 2015 (administrative data)
6. Immunization systems highlights

- Immunization schedule

- Planning and management:
  - Vaccines stockout issues: DRC: 1 DTP (less than 1 month), 1 BCG (3 months duration), see Table 3: stock outs of vaccines, RDC, 2016 below for 2016.
  - cMYP: 2013-2015
  - Annual Plan: Yes
- Country decision making: No NITAG
- % of total expenditures on vaccines financed by government funds: 4%

**Table 3**: stock outs of vaccines, RDC, 2016

![Table 3: stock outs of vaccines, RDC, 2016](image)

**Figure 9**: Change in administrative boundaries from 11 provinces to 26 Divisions de provinces sanitaires (DPSs)

![Figure 9: Change in administrative boundaries from 11 provinces to 26 Divisions de provinces sanitaires (DPSs)](image)
ETHIOPIA
Progress towards achievement of GVAP/RVAP goals
1. **Summary**

This summary table describes the current situation in Ethiopia regarding achieving the GVAP goals. Data used to assess progress towards achievement of GVAP goals are included in the annex (Country immunization profile).

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Ethiopia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socio-demographic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GNI 2014</td>
<td></td>
<td>550</td>
</tr>
<tr>
<td>WB status</td>
<td></td>
<td>Low Income</td>
</tr>
<tr>
<td>Infant mortality (&lt;12 mo.) 2015 (UN IAG CME)</td>
<td></td>
<td>41</td>
</tr>
<tr>
<td>GAVI status</td>
<td></td>
<td>Eligible, in preparatory transition phase</td>
</tr>
<tr>
<td>Total population</td>
<td></td>
<td>99,391,000</td>
</tr>
<tr>
<td>Birth cohort</td>
<td></td>
<td>3,176,000</td>
</tr>
<tr>
<td>Surviving infants (JRF)</td>
<td></td>
<td>3,031,000</td>
</tr>
<tr>
<td><strong>1. Interrupt wild poliovirus transmission</strong></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Transmission interrupted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk of late detection:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of adequate stool specimens (rolling 12 mo.) (2015) Target &gt; 80%</td>
<td></td>
<td>93.1</td>
</tr>
<tr>
<td>Risk of late detection:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-polio AFP rate per 100,000 (rolling 12 mo.) (2015-2016) Target &gt; 2/100,000</td>
<td></td>
<td>2.5</td>
</tr>
<tr>
<td>Risk of spread after importation:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of 6-59 month olds having received less than 3 doses in the last year before occurrence of last case/environmental positive)</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td><strong>2. Neonatal tetanus elimination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coverage for TT (official country estimate 2015)</td>
<td></td>
<td>92%</td>
</tr>
<tr>
<td>Protection at birth against tetanus (WUENIC 2015)</td>
<td></td>
<td>89%</td>
</tr>
<tr>
<td>Last SIAs conducted in the country</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elimination validation date</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIA in 2015 in 4/103 zones (3rd round of SIAs in high-risk districts that started in 2012.</td>
<td>Partial validation in 2011 (remaining Somali Region likely before the end of 2016 and national validation by 2018)</td>
<td></td>
</tr>
<tr>
<td><strong>3. Measles elimination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coverage MCV1 (2015 WUENIC)</td>
<td></td>
<td>78%</td>
</tr>
<tr>
<td>Coverage MCV2</td>
<td></td>
<td>Not in schedule</td>
</tr>
<tr>
<td>Percentage of districts with MCV1 coverage ≥95% (2015 JRF)</td>
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<td>30%</td>
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<tr>
<td>Last national SIA</td>
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<td>2013</td>
</tr>
<tr>
<td>Post SIA coverage survey conducted</td>
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<td>Yes</td>
</tr>
<tr>
<td><strong>4. Rubella/CRS elimination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coverage rubella vaccine</td>
<td></td>
<td>Not introduced</td>
</tr>
<tr>
<td>SIAs planned?</td>
<td></td>
<td>SIAs planned for 2019</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Ethiopia</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Reach 90% national coverage and 80% in every district with 3 doses of DTP-containing vaccine</td>
<td>National coverage (2015 WUENIC)</td>
<td>86%</td>
</tr>
<tr>
<td></td>
<td>Drop-out rate DTP1 to DTP3 (2015 WUENIC)</td>
<td>8.5%</td>
</tr>
<tr>
<td></td>
<td>Actual numbers of children who dropped out (2015 WUENIC)</td>
<td>242,480</td>
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<tr>
<td></td>
<td>Difference in DPT3 coverage between poorest and richest quintile (2010 data from WHO Health Equity Monitor Database)</td>
<td>37.5 percentage points</td>
</tr>
<tr>
<td></td>
<td>% of districts achieving ≥80% coverage for DPT3 (2015 JRF)</td>
<td>74%</td>
</tr>
<tr>
<td>6. Reach 90% national coverage and 80% coverage in every district with all vaccines in the national immunization program</td>
<td>National coverage (%) (2015 WUENIC)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BCG: 75</td>
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<tr>
<td></td>
<td>Penta1:94</td>
<td></td>
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<tr>
<td></td>
<td>Penta3: 86</td>
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<tr>
<td></td>
<td>MCV1: 78</td>
<td></td>
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<tr>
<td></td>
<td>PCV3: 85</td>
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<tr>
<td></td>
<td>Polio3: 85</td>
<td></td>
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<tr>
<td></td>
<td>Rotavirus: 83</td>
<td></td>
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<tr>
<td>7. Introduction of new vaccines</td>
<td>New vaccines introduced</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PCV in 2011; rotavirus in 2013; MenA SIAs (2013-15); IPV and HPV demonstration in 2015</td>
<td></td>
</tr>
<tr>
<td>8. Reduction in under 5 mortality rate</td>
<td>Percent reduction from 2010 to 2015</td>
<td>21.8%</td>
</tr>
<tr>
<td></td>
<td>(from 75.7/1,000 live births in 2010 to 59.2 in 2015)</td>
<td></td>
</tr>
<tr>
<td>9. NITAG</td>
<td>NITAG established?</td>
<td>Yes: in 2016 (no meeting has yet taken place)</td>
</tr>
<tr>
<td>10. Government expenditure on routine immunization per live birth (US$)</td>
<td>Average for 2013-15 and 2010-2011 (% change) (JFR 2015)</td>
<td>13.8 to 11.5 (-16%)</td>
</tr>
</tbody>
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2. Country ownership of the immunization program

2.1 Overview of country ownership in its primary health care system, including immunization

The Ethiopian government has made a significant commitment to increase access to primary health care services for its nearly 100 million people in the past 12 years or so, with the construction of more than 16,000 new health posts in order to bring health services to where people live. The health care delivery system now consists of a three-tiered Primary Health Care Unit in each of the country’s 914 districts – each comprising a primary care hospital, health centers (serving 15,000 – 25,000 people) and five satellite health posts for each health center (serving 3,000 – 5,000 people) – all connected by a referral system. Approximately 90% of the population now lives within 10 kilometers of a health facility, even if rudimentary. Concurrently, the Government has rapidly scaled up its workforce of health extension workers (HEWs) – created in 2004 as part of its Health Extension Program – to staff the new health posts, and created a Health Development Army of community-based volunteers to further increase population access to health care services (both are further described in Section 2.4 below).

Country ownership of the immunization program, including response to infectious disease outbreaks, such as measles, was described by one informant, as “strong, almost to a fault”. Plans for vaccination

1 Ethiopia: summary on key barriers in EPI, June 2013.
campaigns in response to outbreaks are not always shared with partners; the lack of a detailed proposal to GAVI for a measles campaign resulted in GAVI delaying its release of funds for this purpose. At the local level, with the devolution of power to the 11 regions and city administrations, ownership of the EPI is demonstrated by the fact that some regions and districts (woredas) are starting to allocate funds from their budgets for immunization operational costs.2

2.2 Immunization policy decision-making capacity

The ICC has been the principal group advising the Government on immunization and in assisting with resource mobilization and advocacy, as well as with the preparation of new vaccine introductions. The main ICC meets twice a year, is chaired by State Minister of Health and includes members from UN agencies, NGOs, Directorates of the Federal Ministry of Health and civil society organizations. The ICC also has a technical sub-committee that meets quarterly (see Figure 1). Under the technical sub-committee is a National EPI Task Force, which meets every two weeks, and along with technical working groups, is responsible for preparing and overseeing new vaccine introductions, vaccination campaigns, and improvements with the routine immunization program. In the absence of a NITAG, the ICC has made recommendations on the introduction of new vaccines.

A NITAG has only recently been established, with WHO and SIVAC assistance. Its first meeting had not yet taken place as of mid-July 2016. It took some time for government officials to understand the role and importance of having an advisory group independent of both the Government and development partners. The newly-formed NITAG consists of professionals with strong and diverse skills.

The FMOH has also established a Ministerial Delivery Unit to strengthen leadership in the immunization program and to make immunization a regular agenda item in key policymaker meetings.

Figure 1: The ICC structure in Ethiopia

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2.3 Government Financing of Immunization

The Government has a pooled funding mechanism – the MDG Performance Fund – into which funds from the Government and development partners, including GAVI HSS funding – are placed to finance health programs and health system strengthening. The Fund, established as part of the country’s Joint Financing Arrangement (under the IHP+), in an effort to simplify budgetary and financial management by having one plan, one budget, and one reporting mechanism to which all development partners agree.

In 2014/15, the federal Government paid for 63% of the costs of procuring traditional vaccines ($1.8 million out of $2.9 million), using Government and MDG funds, while UNICEF paid for the remaining 37%. A budget line item now exists for vaccine purchases, including co-financing of the new vaccines that Ethiopia has introduced with GAVI support. While the Government co-financing of the new vaccines that Ethiopia has line item now exists for vaccine purchases, including co-financing, the actual government contribution for vaccines and to the overall EPI budget is not clear, nor is it clear to what extent the Government has increased immunization spending using its own funds.

2.4 Human resource situation and its impact on EPI performance

Immunization services in Ethiopia are largely provided by Health Officers (nurses) working from health centers and by the large cadre of health extension workers (HEWs) operating from the 16,000 or so health posts built in the 2000s. The workforce of community-based HEWs, created to address Ethiopia’s critical shortage of skilled health workers, numbered more than 35,000 by 2013. These female health workers are recruited from the communities in which they served, with the active participation of community leaders and members. They must have at least 10 years of schooling and are trained for one year at technical vocational education centers, including practical training at health centers. Two HEWs work at each health posts – splitting their time between the health post and nearby communities – and are responsible for providing a range of health services, from immunization and other MCH services, to the prevention and treatment of infectious diseases (e.g., TB, HIV/AIDS, malaria), first aid, sanitation and health education. The also work with community volunteers, village councils and local health offices and health centers.

According to several studies, these health workers have become the focal point in many communities for health and specifically for immunization. Through their work organizing immunization sessions, raising awareness about immunization, establishing partnerships with community leaders and volunteers, and default tracking, they are considered a key factor in the country’s increase in immunization coverage since 2004, when DPT3 rates were 40% nationally. According to informants, the problems of high attrition rates and low morale among rural health workers that plague many countries are less prominent thus far among the HEWs. This is due to the fact that they come from the communities in which they serve and their government salaries (paid out of the MDG Development Fund) have increased over time and are considered quite competitive.

Assessments have found deficiencies in the skills and knowledge of this new workforce and consequently, they are currently receiving additional training and will continue to do through in-service training. There are also gaps in the supervision, monitoring and accountability of HEWs by district and health center officials. In addition, the HEWs sometimes have other responsibilities beyond health and in some cases are reportedly spending increasing amounts of time attending political meetings, taking time away from their service delivery duties.

Another key strategy of the Health Extension Program to improve access to health services was the development, beginning in 2010/11, of the Health Development Army (HDA), consisting of one community-based volunteer for every five households in a village, who together form health development teams.

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5 Now renamed the SDG Development Fund.
7 GAVI Joint Appraisal report for Ethiopia, 2015.
The purpose of the HDA is to improve the use of high-impact maternal, newborn and child health services by identifying cultural, behavioral and other bottlenecks preventing families from using these services, and to devise and execute strategies to overcome these bottlenecks. HDA members receive 7-10 days of training from HEWs and district health officials. To increase immunization coverage, these volunteers promote immunization among their assigned households, help organize outreach activities in their community, and assist with default tracking. According to the Government, there were three million HDA volunteers as of 2016.

The Government has not had an indigenous case of wild polio virus (WPV) reported since 2001. However, due to importations along the Somali and S. Sudanese borders in 2013/2014 – with a total of 10 confirmed cases – the country has not yet been certified polio-free. The last case was in January 2014 and Ethiopia was removed from the polio outbreak list in March 2015. Sporadic cases of vaccine-derived disease have also been detected (seven cases between 2008 and 2012), but none since 2012.

However, because of its location in the “WPV importation belt” in Africa and its proximity to Somalia, which has large numbers of children not immunized against polio, Ethiopia is still classified by WHO as “vulnerable to international spread” of WPV.

In response to the 2013/14 outbreak, the country has conducted a series of national and sub-national immunization days – with 12 rounds of SNIDs and three NIDs alone in 2013/14. Another NID took place in 2015 and SNIDs in high-risk areas are continuing into 2016. These campaigns – often combined with measles vaccination – receive substantial financial and technical assistance from international partners, and according to independent monitoring data, have achieved high coverage (>90% in most areas).

EPI-specific staff in the Government consist of 7-8 people on the national EPI team, as well as immunization focal points in each of the country’s 11 regions or city administrations, who deal exclusively with immunization. However, there are no longer EPI focal points devoted exclusively to immunization in most of the country’s 103 zones and more than 900 districts, and those responsible for EPI at these levels have many other responsibilities. To fill in this critical gap, the partner-supported Routine Immunization Improvement Plan (RIIP) includes funding and support for EPI technical assistants in the 51 zones where the Plan is operating (see more information on the RIIP in Section B below).

3. Progress towards specific GVAP goals (issues/challenges/successes)

3.1 Goal 1: Achieve a world free of poliomyelitis

Ethiopia has not had an indigenous case of wild polio virus (WPV) reported since 2001. However, due to importations along the Somali and S. Sudanese borders in 2013/2014 – with a total of 10 confirmed cases – the country has not yet been certified polio-free. The last case was in January 2014 and Ethiopia was removed from the polio outbreak list in March 2015. Sporadic cases of vaccine-derived disease have also been detected (seven cases between 2008 and 2012), but none since 2012.

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Along with improvements to the routine immunization program in recent years, the polio SIAs have led to a jump in coverage of three doses of polio vaccine from 70% in 2011 to 85% in 2015 (WUENIC estimates). The country has also set up 28 permanent vaccination points at border crossing with Somalia and major transit points. In addition, IPV was introduced into the routine immunization (for the third polio vaccine dose) in 2015. Ethiopia plans to present its dossier for polio eradication in 2017, in anticipation of being declared polio-free in 2018.

Besides vaccination, the country's primary means of preventing polio transmission is through strong AFP and polio surveillance. Ethiopia is considered to have a good polio surveillance infrastructure in place, due to a high commitment to and ownership of disease surveillance by the Government, led by the Public Health Emergency Management division of the Ethiopian Public Health Institute. Unlike for the immunization program, there are dedicated disease surveillance focal points in place at all levels (regional, zonal, district). Private health providers, including some traditional healers, participate in disease reporting in most regions. Community-based surveillance – using HEWS and HDA volunteers – has also been implemented in most regions, most intensively in five regions with the support of 12 local NGOs. In one year
(from 2014 to 2015), the percent of AFP cases notified by community volunteers in these five regions tripled – from 5% of all notified cases to 15%.\textsuperscript{12}

An external review of the surveillance system conducted in 2015 found that more than 80% of AFP cases were validated, surveillance focal points conducted active surveillance of health facilities and submitted weekly reports (compiled into a national weekly bulletin shared with stakeholders), and the quality of case investigations was strong. However, there remain a number of gaps in the country’s AFP/polio surveillance system, which need to be addressed to reduce the risk of transmission from imported cases and to achieve polio-free status by 2018. The quality of active surveillance was found in the external review to be inadequate in all regions, due to high staff turnover and limited transportation and resources for surveillance. Some AFP cases were consequently unreported in three regions. In addition, community-based surveillance is still being developed in many regions, which is further complicated by the seasonal movement of people in some regions.

3.2 Goal 2 : Meet global and regional elimination targets

3.2.1 Achieve maternal and neonatal tetanus elimination

Ethiopia has partially achieved this goal – with elimination validated in 2011 in 10 of the country’s nine regions and two city administrations (all but the Somali region). This has been accomplished through TT vaccination campaigns targeting 15-49 year old females in 62 high-risk zones with three vaccine doses, beginning in 1999, when the country had an estimated 13,400 neonatal tetanus deaths.\textsuperscript{13} The campaigns – using nurses, HEWS, nursing and medical students – vaccinated 15 million women from 1999 to 2013, achieving an average coverage rate of 81% for two TT doses and 66% for three doses, according to EPI administrative data.\textsuperscript{14} The WHO-UNICEF (WUENIC) estimated coverage rate for protection at birth was 80% in 2015. The AFP/polio surveillance network is used for case-based MNT surveillance.

According to informants, the country is on track to achieve MNT elimination nation-wide by the end of 2016, after it completes TT SIAs recommended by the validation committee in five zones in the Somali region that had achieved less than 80% coverage through the SIAs conducted there in 2012.

3.2.2 Achieve measles elimination and rubella and CRS elimination

Measles

Ethiopia is not currently on track to meet the goal of measles elimination by 2020, despite the federal Government’s commitment to do so and its considerable efforts to combat the disease with multiple national and sub-national campaigns. The number of reported measles outbreaks has increased in recent years – from 145 in 2012, to 243 in 2013 and 302 in 2014,\textsuperscript{15} as has the number of reported cases (see figure in the Annex). The highest number of annual reported cases was, in fact, in 2015 (nearly 18,000 cases, as compared to 5,000 or less each year from 2006 to 2013). Improved measles surveillance and reporting could be a factor in the increased reported incidence, however. Annual national measles incidence for 2015/16 (laboratory and epidemiologically confirmed cases) was estimated at 83 per one million population, compared to the elimination threshold of <1/1 million.\textsuperscript{16} Reported measles incidence varies dramatically by region – from as low as 0 to as high as 220 per million.

Outbreaks earlier in this decade (e.g., 2010/11) were concentrated in “developing regions”, such as Somali and Afar, and were believed to be caused by an increase in refugees from Somalia. However, the disease has spread in recent years to other areas far from the Somali border, such as Oromia in the South and the Southern Nations Nationalities Peoples (SNNP) region.

The main reason given by informants and reports for the recent increase in measles incidence is the accumulation of susceptible individuals due to a failure to vaccinate sufficient numbers of children through routine immunization and SIAs. Ethiopia conducted its first national measles catch-up campaign in a phased manner from 2003 to 2005 for children up to 15 years of age, followed by three follow-up campaigns for children under four or five every three years or so. While these later SIAs led to a sharp reduction in measles cases in children four years and younger, the disease struck older children and adults; 70% of confirmed cases in the first four months following the 2011 SIAs were more than five years of age.\textsuperscript{17} The movement of people from sparsely-populated areas with low vaccination coverage, such as Somali and Afar, to more populated parts of...
the country is implicated in the geographic spread and increase in incidence of the disease.

The immunization program is now conducting measles SIAs on a yearly basis, though they reportedly vary in quality, with some, including the recent April 2016 campaign, implemented without adequate preparation time, making it more difficult to reach more remote areas. However, the main problem remains the inability of the routine immunization program to achieve sufficiently high measles vaccination coverage to eliminate the disease. According to the WUENIC estimates, national measles coverage reached 78% in 2015, but ranged from 62-68% in the four previous years. Coverage is very uneven by region – with rates ranging from 34% to 98% among 12-23 months in the 2012 immunization coverage survey.18 According to administrative coverage data, only 30% of districts in 2015 met the target of ≥95% measles vaccination coverage.

An investigation of continual measles outbreaks in the SNNP region conducted in 2014 attributed the insufficient performance of the routine immunization program to many of the problems discussed under Section 3.3 below (e.g., lack of daily immunization services, cold chain inadequacies, frequent vaccine stockouts).19 Two additional problems identified in the measles outbreak investigation were:

- A reluctance among health workers to open multidose vials of measles vaccine for less than six or seven children at a time to reduce wastage, resulting in missed opportunities to vaccinate against measles;
- Over-reporting of coverage numbers due to “persistent demand for unrealistically perfect performance” from higher-ups and a performance-based reward system. This results in high administrative coverage rates for measles, and complacency until outbreaks began to occur. In one area, a post-outbreak survey revealed a covered rate of 52%, compared to 80-100% administrative coverage rates for the previous seven years.

As mentioned above, the Government has increased the frequency of measles SIAs in order to halt the increase and spread of outbreaks, and measles vaccination coverage has improved in the past three years. Coverage should also improve once the EPI introduces a second measles vaccine dose into the routine program, currently planned for 2018. Ethiopia also has a relatively strong surveillance infrastructure for measles, due to the existence of surveillance focal points at all levels of the health system, and district-level rapid response teams, as well as epidemic response committees at all levels. This system is heavily supported by WHO and UNICEF, which cover the costs of the 11 regional surveillance coordinators and surveillance medical officers (SMOs) and supporting staff in zonal health departments throughout the country. The WHO-supported surveillance team alone, including administrative assistants and drivers, numbered 114 persons in 2015.

**Rubella**

The incidence of rubella has been tracked in Ethiopia since 2011, as a result of intensive measles case-based surveillance, in which lab testing for rubella is conducted on measles IgM-negative cases. Hundreds of rubella cases have been confirmed each year and an outbreak identified in the Benishangul-Gumuz region in 2012 (with >800 confirmed cases), led to increased recognition of the disease in the country. Rubella surveillance indicators, however, remain below target.

The FMOH plans to introduce MR vaccine with GAVI support in 2019, beginning with SIAs, which will be followed by the introduction of two MR doses into the routine immunization schedule. Under GAVI’s new policy, the Government will be required to pay 100% of the cost of the first MR dose, which could be a challenge, given that Ethiopia does not yet cover the costs of all traditional vaccines. Given that rubella vaccine will not be incorporated into the routine immunization schedule until 2019, it is unlikely that the country will be able to achieve elimination of the disease by the target date of 2020.

### 3.3 Goal 3: Meet vaccination coverage targets

**a. Achieve 90% national coverage and 80% in every district with 3 doses of diphtheria-tetanus-pertussis containing vaccine**

According to WHO-UNICEF estimates, Ethiopia has come close to meeting the national coverage targets of 90% for three doses of DPT-containing vaccine – reaching 86% for three doses of pentavalent (DPT-HepB-Hib) vaccine in 2015. This is a significant jump from the WUENIC estimate of 77% in 2014 and 65% in 2011. A decline in the dropout rate between the first and third doses has been one factor contributing to
the recent increase in pentavalent 3 coverage – falling by more than half from 19% in 2011 to 8.5% in 2015, according to the WUENIC estimates.

However, the immunization program has been less successful in achieving high coverage in all parts of the country. Administrative data, which is almost certainly inflated, shows that only 65% of districts in 2015 achieved coverage of ≥80% for three pentavalent vaccine doses. A perhaps more accurate picture comes from data from the Routine Immunization Improvement Plan (RIIP) being implemented in 51 of the country’s 103 zones. The percent of zones achieving ≥80% for the third pentavalent dose was 41% in 2015 (but up from 17% in 2013) (see Figure 2 in Section B below). There are also large disparities in immunization coverage by income level. The 2013 immunization coverage survey found a difference in pentavalent 3 coverage rates of 49 percentage points between the richest and poorest income quintiles, while data from 2010 found a difference of 37.5 percentage points (WHO Health Equity Monitor database).20

There has been a similar jump in national coverage estimates by WHO and UNICEF for other vaccines in the immunization schedule, with three vaccines approaching the 90% national coverage target in 2015: PCV3 and polio 3 – both at 85% – and rotavirus (at 83%). The lowest rates are for BCG (75% and measles (78%). WUENIC estimates for these vaccines are not available by district to determine their progress in meeting the goal of at least 80% coverage in all districts.

Some of the key factors contributing to the 21 percentage point gain in pentavalent 3 coverage from 2011 to 2015 are:

- **The continual buildup of the HEW workforce**, as well as an increase in local and international NGOs supporting health facilities directly;
- Implementation of the Reach Every Community (REC) strategy, which began in 2004;
- Implementation of the Routine Immunization Improvement Plan (RIIP), starting in 2014, in the half of the country’s zones with the poorest immunization program performance. The maps in Figure 2 below suggest that the project has had an important impact on improving vaccination coverage rates in the target zones (see Section B).
- **Establishment of the Health Development Army**. This army of community-based volunteers, describe in Section 2.4 above, forms the backbone of the Government’s new Intensification Plan to reduce the number of unimmunized or under-immunized children by 80% in each zone, in large part by identifying missed children, tracking defaulters, and ensuring catch-up immunization of these children. According to one informant, however, these volunteers could be used more efficiently, and given the newness of the program and its rapid scale-up, there is to date little information on their impact in improving utilization of immunization services.

While progress has been significant in the past five years, there are a number of issues that need to be addressed in order for Ethiopia to meet its immunization coverage targets, especially in narrowing the geographic and income class inequities in performance. These include:

- The existence of geographic pockets with low coverage, especially in pastoralist communities that are concentrated in three regions (Afar, Somali and Gambella). The sparse populations, nomadic lifestyle and weaker health infrastructure in these areas make it challenging to provide immunizations on schedule. The situation is reportedly improving with the increase in the number of health posts and HEWs in these areas, and through efforts by NGOs in pastoralist areas to find creative ways to deliver immunization and other health services to this population. One strategy, for example, involves government health workers meeting nomadic groups at pre-arranged locations and dates to provide immunization and other health services.

- The fact that most health facilities do not provide immunization services on a daily basis – as stipulated in the national routine immunization policy. The 2012 immunization coverage survey found that only 26% of health facilities surveyed (mainly health centers) offered daily immunization services, and only 5% of health posts did so. Three-quarters (76%) of health posts offered immunization once a month, as did 48% of all health facilities in the study. The infrequency of EPI services results in many missed opportunities to reach children with vaccinations.

- Vaccine supply chain and cold chain issues: A major reason that health posts do not offer daily immunization is that only around 30% of them have cold chain equipment, according to an EVM assessment conducted in 2013.21 In addition, many refrigerators were found in a 2013 cold chain inventory to be non-functional – 38% of those at health facilities and 36% of those at zonal and district stores – due to a lack of trained cold chain technicians, spare parts and fuel (kerosene). The country’s five-tier vaccine supply chain system is also weak – often

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20 WHO Health Equity Monitor database (found at: https://whoequity.shinyapps.io/HEAT/).
resulting in overstocking at the central level and vaccine shortages or stockouts at sub-national cold rooms. This situation is improving with the transition of vaccine logistics management from the FMOH to the quasi-governmental Pharmaceuticals Fund Supply Agency (PFSA), which is now responsible for delivering vaccines to the zones and districts. Health facilities must still collect the vaccines themselves from zonal or district stores, which can be difficult due to limited staff (especially at health posts) and limited transportation.

As a result of both the lack of working refrigerators in health facilities and weak vaccine distribution, local-level vaccine stockouts are quite common. The 2015 rotavirus post-introduction evaluation found that nearly half (47%) of health facilities surveyed had experienced a vaccine or supply stockout in the previous six months.22 The 2012 immunization coverage survey found that vaccine stockouts were the major reason that health facilities cancel planned immunization sessions, resulting in further missed opportunities to vaccinate children.

- Gaps in monitoring and supervision: There is a supportive supervision system in place, but its impact on the immunization program is considered insufficient, due to the lack of funding for regular, consistent visits to the field and to the fact that the supervisory visits cover all components of the minimum health services package, therefore not always focusing sufficiently on immunization.23

There is also anecdotal, but no documented evidence that multiple rounds of polio and measles campaigns – as many as 19 over three years in some areas – can negatively impact the delivery of routine immunization services. Each campaign can require two weeks of planning, leaving the often over-stretched HEWs little time to provide routine immunization. On the other hand, the repeated campaigns and accompanying social mobilization, has reportedly increased population awareness of and demand for vaccination. Some districts have used the opportunity of the SIAs to catch up children with all their immunizations, by, for instance, having nearby health posts offer routine immunization services at the same time as an SIA is being held at an outreach site, and encouraging parents to take their children to the health post for their other vaccinations.

Vaccine hesitancy is not considered to be a major issue in Ethiopia, according to informants.

### 3.4 Goal 4: Introduce new and improved vaccines and technologies

Ethiopia has an impressive record of introducing new vaccines with GAVI support, beginning with pentavalent (DPT-HepB-Hib) vaccine in 2007, followed by PCV-10 in 2011, rotavirus and meningitis A (through campaigns) in 2013, and IPV (as the third polio vaccine dose) in 2015. The introduction of PCV, originally planned for 2010, was delayed until the following year as a result of a global vaccine shortage. Rotavirus vaccine introduction took place in late 2013 in all regions, except Somali, where it was delayed until August 2014 due to the polio outbreak and response in that region.

Post-introduction evaluations (PIEs) conducted for the PCV and rotavirus vaccine introductions indicate generally successful and smooth introductions of both vaccines and good acceptance by the population.24 In both cases, there was extensive training nationwide – with most HEWS trained – and personnel from private and NGO-run health facilities were included in the training of training (TOT) courses. Both vaccine introductions had a strong advocacy and communications component, including the participation of influential leaders in launch ceremonies and in raising public awareness of the new vaccine, as well as extensive media coverage. No stockouts of the new vaccines were reported in either PIE, nor in the 2014 and 2015 JFRs. There also were not any indications of the vaccine introduction disrupting the routine immunization program.

Immunization coverage rates for the new vaccines were low in the year following their launches. The PCV3 coverage rate was only 38% in 2012 and the PCV rollout took three months to reach all regions. However, coverage has risen steadily each year and is now 85% (WUENIC estimate). Rotavirus coverage also rose from 63% in 2014 to 83% in 2015.

While the introduction of each vaccine stimulated expansion of the cold chain system, cold chain capacity was still found to be insufficient, especially after the introduction of rotavirus vaccine, which resulted in crowded cold rooms and over-packed refrigerators at different levels. Other problems reported with both vaccine introductions include poor temperature monitoring, uneven quality and length of the training at lower levels (which ranged from as little as 30 minutes to one day for HEWs in the case of PCV), inadequate coverage monitoring and reporting in many locations, and poor AEFI surveillance. To improve the cold chain and temperature monitoring gaps, the Ministry of Health, in collaboration with GAVI and

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23 Ethiopia: summary on key barriers in EPI, June 2013.
partners, subsequently procured cold rooms, ice-lined refrigerators, and introduced solar direct drive (SDD) refrigerators, as well as a continuous temperature monitoring system.

Ethiopia conducted nation-wide meningitis A campaigns for 1-29 year olds in three phases from 2013 to 2015, starting with the regions at highest risk and ending in late 2015 with those at lowest risk. A post-campaign survey conducted in the Phase II zones in 2014 found a 93.5% coverage rate.

The national immunization program plans to introduce two more vaccines into the routine program in 2018 – meningitis A and HPV – and two more in 2019 – measles-rubella and yellow fever. A pilot HPV introduction in two zones is currently underway, with reportedly high demand for the vaccine, due to media coverage about cervical cancer.
Partner support to address remaining challenges to meet the GVAP goals and targets
The Ethiopian government has benefited from every type of GAVI support that the organization offers, including support for new vaccine introductions, immunization system strengthening (ISS), health system strengthening (HSS) and civil society organizations (CSO).

Technical and financial support from GAVI and many other partners has been critical in developing the country’s disease surveillance system for polio, measles and other vaccine-preventable diseases, and in the implementation of numerous polio and measles SIAs, the national meningitis vaccination campaigns and TT campaigns in high-risk areas. Partners, including through the HSS grant, also provide critical aid to the routine immunization program, by supporting refresher training of HEWs; equipping newly constructed health centers; procuring essential drugs and supplies for health posts; and assisting with microplanning and data quality improvements. GAVI’s CSO grant has supported local organizations to improve immunization services in hard-to-reach and low-coverage areas, especially pastoralist areas.

Two partner-supported activities to highlight that are aimed at resolving key bottlenecks and challenges to the country further strengthening and expanding its immunization program are the following:

The Cold Chain Rehabilitation and Expansion Plan (2014-18)

This plan, supported by the GAVI HSS grant and many partners, will enable the country to introduce HPV, MR and other new vaccines without compromising the cold chain system. It should also help increase the availability of daily EPI services at health facilities, including health posts, by equipping them with cold chain equipment and by improving the local distribution of vaccines. The plan involves the transition of the vaccine supply chain system from the FMOH to the PFSA and includes constructing cold rooms at the airport in Addis Ababa; procuring 20 refrigerator trucks and thousands of vaccine carriers and cold boxes; establishing a network for 17 regional storage and distribution hubs; establishing a continuous temperature monitoring system at all vaccine storage sites; and providing refrigerators and other cold chain equipment to all health facilities, including health posts, with a focus on solar-powered equipment. Four regional hubs have already been established, manned by several newly-created and trained Technical Assistants responsible for cold chain maintenance and vaccine management. While the regional hubs are currently delivering vaccines and supplies to the zonal and district-level stores, during the last phase of the transition plan, these hubs will make monthly deliveries directly to health facilities, eliminating the need for the zonal and regional stores or for health facilities to pick up vaccines. The delivery of vaccines to health facilities, coupled with the acquisition of refrigerators in all facilities, will enable health centers and posts to comply with the government policy of providing immunization services on a daily basis, and should therefore have an important impact on immunization coverage.

The Routine Immunization Improvement Plan (RIIP)

This plan, started in 2014 to increase immunization coverage in the country’s 51 poorest-performing zones, is heavily supported by multiple partners, including UNICEF, WHO, CDC and USAID's Last 10 Kilometers (L10K) project. A key component of the plan involves the recruitment, training and placement of 51 EPI Technical Assistants (one per zone) whose salaries and other costs are supported by the various partners. These EPI Technical Assistants help zones and districts with immunization-related trainings, microplanning, social mobilization, and monitoring and reporting. Coverage data collected by the project shows a marked improvement in the overall coverage of three pentavalent doses in the 51 zones and in the percent of zones achieving coverage of ≥80% (from 17% in 2013 to 41% in 2015) (Figure 2). However, partner funding for the RIIP is only assured for 2.5 years, after which time the Government will need to assume the costs of the Technical Assistants and associated operational costs or mobilize new resources.
Many partners are providing assistance to the immunization program in Ethiopia, often in specific parts of the country. It has been suggested that a mapping of partner activities be undertaken to allow better coordination and planning by the Government, avoid duplication and identify current gaps in support.

Acknowledgments

We would like to thank the following persons who were interviewed or who reviewed this report:

- Robert Perry (WHO HQ)
- Messeret Eshetu, (WHO ESA IST)
- Thomas Karengera, (WHO CO)
- Assefu Lemlem, (WHO CO)
Annex 1: Country immunization profile

1. **Polio**
   - Transmission stopped in year 2001 (imported cases in 2013 and 2015).
   - Eradication certified: not yet (planned for 2018).

2. **Measles and rubella**

   *Figure 3: Reported Measles cases and MCV coverage, Ethiopia, 1990-2015*

   ![Reported Measles cases and MCV1 vaccination coverage, Ethiopia, 1990-2015](image)

   **Table 1: SIA activities planned in 2016-2017**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Intervention</th>
<th>Year</th>
<th>Start Date</th>
<th>End Date</th>
<th>Age Group</th>
<th>Extent</th>
<th>Status</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORI</td>
<td>Measles</td>
<td>2016</td>
<td>22/04/2016</td>
<td>28/04/2016</td>
<td>6 months to &lt;15 years</td>
<td>Sub-national</td>
<td>done</td>
<td>25,894,518</td>
</tr>
<tr>
<td>SNID</td>
<td>tOPV</td>
<td>2016</td>
<td>19/02/2016</td>
<td>21/02/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>4,043,159</td>
</tr>
<tr>
<td>NID</td>
<td>tOPV</td>
<td>2016</td>
<td>01/03/2016</td>
<td>01/03/2016</td>
<td>0 to 5 years</td>
<td>National</td>
<td>Planned</td>
<td>12,251,996</td>
</tr>
<tr>
<td>Follow Up</td>
<td>Measles</td>
<td>2016</td>
<td>01/10/2016</td>
<td>31/10/2016</td>
<td>9 months to 14 years</td>
<td>Sub-national</td>
<td>planned</td>
<td>11,777,083</td>
</tr>
<tr>
<td>SNID</td>
<td>bOPV</td>
<td>2016</td>
<td>01/05/2016</td>
<td>01/05/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>3,732,146</td>
</tr>
<tr>
<td>SNID</td>
<td>bOPV</td>
<td>2016</td>
<td>01/09/2016</td>
<td>01/09/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>4,043,159</td>
</tr>
</tbody>
</table>

   *Source: WHO/IVB Database as at 12/4/2016*

3. **MNT**
   - Partial validation in 2011 (remaining Somali Region likely before the end of 2016)
4. Coverage and Equity

Figure 4: All vaccines national coverage, Ethiopia, 2000-2015

Table 2: Reported DTPcv doses administered & coverage, 2000-2015

* COE: country Official Estimates

Source: WHO/IVB database, data reported to WHO by member states as of 1 July 2016
WHO/UNICEF national coverage estimates, 2014 revision, data as of July 2015
Figure 5: Percentage of district achieving <50%; 50-79% and ≥80% coverage, 2000-2015

% of District reporting <50%, 50-79% and ≥80% DTP3 coverage,
Ethiopia
2000-2015

Legend
- < 50%
- 50 - 79.99%
- ≥80%
- No Report / shape file issue

Figure 6: Map with DTP3 coverage by district/province 2010 and 2015 (admin. data)

2010

Legend
- < 50%
- 50 - 79.99%
- ≥80%
- No Report / shape file issue
5. Immunization systems highlights

- Immunization schedule

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCG</td>
<td>birth;</td>
</tr>
<tr>
<td>DTwP/Hib/HepB</td>
<td>6, 10, 14 weeks;</td>
</tr>
<tr>
<td>HPV</td>
<td>9-13 years;</td>
</tr>
<tr>
<td>IPV</td>
<td>14 weeks;</td>
</tr>
<tr>
<td>Measles</td>
<td>9 months;</td>
</tr>
<tr>
<td>OPV</td>
<td>6, 10, 14 weeks;</td>
</tr>
<tr>
<td>Pneumo_conj</td>
<td>6, 10, 14 weeks;</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>6; 10 weeks;</td>
</tr>
<tr>
<td>TT</td>
<td>1st contact pregnancy;</td>
</tr>
<tr>
<td>VitaminA</td>
<td>6-59 months;</td>
</tr>
</tbody>
</table>

- Planning and management:
  - Stockouts: No stockouts reported in 2015 (as reported in JRF 2015)
  - cMYP: 2011-2015

- Annual Action Plan: Yes
- % of total expenditures on vaccines financed by government funds (JRF 2015):
**Figure 8:** Percentage of total expenditures on vaccines financed by government funds (JRF 2015):

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethiopia</td>
<td>LIC</td>
<td>13.80</td>
<td>1.79</td>
<td>9.42</td>
<td>11.54</td>
<td>13.62</td>
<td>13.80</td>
<td>11.53</td>
<td>-16%</td>
<td></td>
</tr>
</tbody>
</table>
INDONESIA
Progress towards achievement of GVAP/RVAP goals
1. Summary

This summary table describes the current situation in Indonesia regarding achieving the GVAP goals. Data used to assess progress towards achievement of GVAP goals can be found in the annex.

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Indonesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio-demographic</td>
<td>GNI 2014</td>
<td>3650</td>
</tr>
<tr>
<td></td>
<td>WB Status</td>
<td>Lower Middle Income</td>
</tr>
<tr>
<td></td>
<td>Infant mortality (&lt;12 M) 2015 UN IAG CME</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>GAVI status</td>
<td>Graduating (2016)</td>
</tr>
<tr>
<td></td>
<td>Total population</td>
<td>257,564,000</td>
</tr>
<tr>
<td></td>
<td>Birth cohort</td>
<td>5,037,000</td>
</tr>
<tr>
<td></td>
<td>Surviving infants (JRF)</td>
<td>4,918,000</td>
</tr>
<tr>
<td>1. Interrupt wild poliovirus transmission</td>
<td>Transmission Interrupted</td>
<td>Yes (since 2006)</td>
</tr>
<tr>
<td></td>
<td>Risk of late detection: Percent of adequate stool specimens (Rolling 12 mo.) (Target &gt; 80%)</td>
<td>95.4</td>
</tr>
<tr>
<td></td>
<td>Risk of late detection: Non polio AFP rate (Rolling 12 mo.) (Target &gt; 2/100,000 children)</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>Risk of spread after importation: % of 6-59 month olds having received less than 3 doses in the last year before occurrence case/environmental positive</td>
<td>23%</td>
</tr>
<tr>
<td>2. Neonatal tetanus elimination</td>
<td>TT2+ coverage (reported on JRF 2015)</td>
<td>63%</td>
</tr>
<tr>
<td></td>
<td>Protection at Birth against tetanus (WUENIC 2015)</td>
<td>85%</td>
</tr>
<tr>
<td></td>
<td>Last SIAs conducted in the country</td>
<td>2013</td>
</tr>
<tr>
<td></td>
<td>Elimination validation date</td>
<td>May 2016</td>
</tr>
<tr>
<td>3. Measles Elimination</td>
<td>Coverage MCV1 (WUENIC 2015)</td>
<td>69%</td>
</tr>
<tr>
<td></td>
<td>Coverage MCV2</td>
<td>76%</td>
</tr>
<tr>
<td></td>
<td>Percentage of districts with MCV1 coverage ≥95% (2015 JRF)</td>
<td>39%</td>
</tr>
<tr>
<td></td>
<td>Last national SIA</td>
<td>2009-2011, SIAs in 183 high-risk districts planned for August 2016</td>
</tr>
<tr>
<td></td>
<td>Post SIA coverage survey conducted</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>SIAs planned?</td>
<td>MR SIAs planned for 2017-2018</td>
</tr>
<tr>
<td>5. Reach 90% national coverage and 80% in every district with 3rd dose of DTP-containing vaccine</td>
<td>National coverage (WUENIC 2015)</td>
<td>81%</td>
</tr>
<tr>
<td></td>
<td>Drop-out rate DTP1 to DTP3 (WUENIC 2015)</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Actual numbers of children that dropped out (WUENIC 2015)</td>
<td>442,652</td>
</tr>
<tr>
<td></td>
<td>Difference between poorest and richest quintile DTP3 coverage (2013 survey data)</td>
<td>27.3 percentage points</td>
</tr>
<tr>
<td></td>
<td>% District coverage reaching 80% coverage from 2015 JRF</td>
<td>59%</td>
</tr>
</tbody>
</table>
1. In the case of JE, the vaccine will be introduced only in high-risk areas.

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Indonesia</th>
</tr>
</thead>
</table>
| 6. Reach 90% national coverage and 80% in every district with all vaccines in the national immunization schedule | National Coverage (WUENIC 2015) | BCG: 89%  
Pentavalent 1: 90%  
Pentavalent 3: 81%  
MCV1: 72%  
MCV2: 76%  
Polio 3: 82% |
| 8. Reduction in under 5 mortality rate | Percent reduction from 2010 to 2015 | 2010: 33.1  
2015: 27.2  
(17.8%) |
| 9. NITAG | NITAG established? | Yes |
| 10. Government expenditure on routine immunization per live birth (USD) | Baseline 2010-2011 and average for 2013-2015 (% change) | 13.2 to 10.7 (-19%) |

2. Country ownership of the immunization program

2.1 Immunization policy decision-making capacity

There is strong county ownership of and commitment to immunization in Indonesia, which has its own vaccine production capacity at Bio Farma – a major producer of WHO pre-qualified vaccines for UNICEF and GAVI – a fully-functioning national regulatory authority, a strong vaccine storage and transport system, and supportive government policies.

The country has had a NITAG – the Indonesia Technical Advisory Group for Immunization (ITAGI) since 2007. The committee consists of 18 core members who are experts in a range of fields (paediatrics, public health, infectious diseases, epidemiology, immunology, etc.) and who serve for three years (with the possible renewal for an additional three years). There are additional ex-officio and liaison members from other agencies (e.g., the NRA). ITAGI has received assistance from the SIVAC project and WHO to strengthen its decision-making skills based on a technical review of evidence. It is fully-functional, as defined by WHO, and meets at least four times a year (and seven times in 2015).

ITAGI’s main role has been to make recommendations to the MOH about the introduction of new vaccines. For each specific vaccine under consideration, a working group is formed to weigh the evidence and conduct or commission specific studies. Studies requested by the ITAGI and reviewed by the working groups on the impact and cost-effectiveness of JE vaccination in high-risk areas (e.g., Bali) and on the cost effectiveness of introducing measles-rubella (MR) vaccine to control rubella were instrumental to the Government’s decision to apply to GAVI for support for targeted JE campaigns and for nation-wide MR campaigns (to be followed by their introduction into the routine program). The ITAGI has recently expanded its role to include monitoring of the national immunization program's progress and to address programmatic issues. In 2013, it recommended changes to the childhood immunization schedule to add a booster dose of DTP at 18 months and a second measles vaccine dose at 24 months. The committee also serves as a trusted, credible voice to the public when issues about vaccine safety arise. For instance, the group communicated with...
2.2 Government financing of immunization

The Government of Indonesia covers the vast majority of expenditures for the immunization program, including the cost of all traditional vaccines, co-financing for new vaccines, all cold chain and logistics costs, and most EPI personnel costs. In 2014, central government expenditures accounted for 90.6% of total estimated expenditures for the program ($140 million out of $154.7 million). Most of the remaining 9% was financed by GAVI ($14.3 million), mainly to cover 50% of the cost of pentavalent vaccine, 16% of the cost of AD syringes, and activities implemented through the HSS grant. As the country is graduating from GAVI support in December 2016, it will pick up 100% of the costs of pentavalent vaccine and injection supplies starting in 2017 and the HSS grant will end. However, GAVI will provide “exceptional catalytic support” to the country for the introduction of new vaccines by co-financing the costs of IPV vaccine and injection supplies starting in 2017 and 2018. GAVI will also continue to co-finance the recently-introduced IPV vaccine up to 2018. The Government has a history of making its co-financing payments in full and on time and for fully paying for traditional vaccines and other essential supplies and equipment for the immunization program.

The main issues regarding immunization financing in Indonesia are insufficient government funding for health, the great variation in health spending at the local level since the government was decentralized, and the lack of guaranteed funding at the local level for the delivery of immunization services. Although the central government is required by law to allocate at least 5% of its budget to health, health expenditures each year make up only around 2% of total government spending. In addition, since decentralization in 2001, half of national government expenditures on health occur at the district level, using block grants that districts receive from the central government to pay for health and other public services. The district governments are responsible for managing and covering the costs of health services in their area, including the costs of operating health centers and village health posts, and all the operational costs associated with service delivery, including transportation, cold chain maintenance, and so forth. It is up to the district government officials to decide how to allocate the block grant funds and, while they are mandated to spend at least 10% on health (excluding salaries), there is no means of enforcing or monitoring this rule. In fact, less than half (48%) of districts included in a World Bank health financing assessment spent 10% or more of their funds on health in 2013, and it ranged from 3% to over 18% (see orange bars in Figure 1).

The consequence of these factors – insufficient government health spending and a lack of guaranteed funding for health or immunization at the local level – is that available funding for many key immunization activities, such as default tracking, supervision, VPD surveillance, monitoring and evaluation, and transport is inadequate in many districts.

The Government is in the process of expanding its national health insurance program (JKN) in the aim of providing universal health coverage to all of its citizens (with premiums for the poor and non-poor heavily subsidized) under a single payer insurance scheme. The Government contracts with both public and private health facilities to provide health services, including routine immunization, to beneficiaries and pays the facilities on a capitation basis (i.e., per beneficiary). This should increase not only the Government’s overall health spending, but also the funds that health facilities have to deliver preventive health services, such as immunization. However, the JKN benefits package is not at present clearly defined, causing confusion among health providers about whether preventive health services are covered. This has reportedly led to some public sector health facilities to no longer offer immunization services or to charge a user fee for vaccinations. The World Bank is working with the JKN to improve the design of the program and to ensure the inclusion of immunization and other preventive health services by developing a well-defined benefits package and exploring performance-based payments to providers (e.g., based on immunization coverage results).

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2 GAVI Annual Progress Report 2014.
3 Joint Appraisal Report 2015.
6 World Health Organization. Joint national and international EPI and VPD surveillance review, Indonesia, 2014.
2.3 Human resources situation and its impact on the immunization program

Indonesia benefits from a relatively large workforce of health professionals. Most health workers who administer vaccinations are midwives, many working from outreach health posts called *posyandus*, Immunizations are also provided by nurses, doctors and other health workers at health centers (*puskesmas*) and hospitals. Each *puskesmas* has an EPI coordinator, though their skills and training in immunization may be limited. At the provincial and district levels, there are typically two health officers dedicated to immunization – one responsible for program management and the other for cold chain, vaccine, and logistics management. The number of these positions is inadequate in many places and often not proportional to the size of the population in their area. In recognition of the lack of immunization personnel at the sub-national level, new positions – called supervisor assistants or *wasor* – were created in the past ten or so years in low-performing districts to supplement the immunization staff, with funding from the GAVI HSS grant and from local governments. In 2013, there were more than 200 *wasors* operating in 184 of the country’s 511 districts across 25 of the country’s 33 provinces. According to one informant, these positions are likely to continue with local government funding after GAVI support ends because their value has been well demonstrated.

According to several assessments, a major human resources problem affecting the immunization program at the district and village level is the high turnover rate – often every 3-6 months – among EPI coordinators and managers, nurses, midwives, and cold chain technicians and other health workers. This reduces the development of expertise in immunization and commitment to immunization activities, and requires frequent staff training on the topic. In 2013 alone, more than 111,000 health personnel received training in routine immunization. A joint EPI and VPD surveillance review conducted in 2013 also found little or no supportive supervision occurring at below the district level.

At the central Ministry of Health level, there are 20 full-time positions in the national immunization program (NIP), as well as several staff on contract for special assignments (e.g., ITAGI secretariat, AEFI monitoring). However, at the time of the EPI/surveillance review, only 14 of the permanent positions were filled. Some of these positions are supported financially by WHO, and this assistance will end in December, along with most GAVI support. The central immunization program team also experiences a high level of turnover; most there at present are relatively new and not specialists in immunization. They have recently received mid-level management (MLM) training in

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11 GAVI.
immunization with GAVI and WHO support. The team members make supervisory visits to the provinces on average 2-3 times a year. Their influence to affect change and to advocate for increased immunization funding and activities at the local level is, however, somewhat limited by their relatively small number, lack of skills in advocacy, relatively junior status and newness to the field of immunization, and by the decentralized government structure.

3. Progress towards specific GVAP goals (issues/challenges/successes)

3.1 Goal 1: Achieve a world free of poliomyelitis

Has polio transmission been interrupted?

Indonesia has not experienced a case of wild polio virus since 2005, when there was an outbreak in Aceh province following the tsunami, with more than 300 cases reported.\(^{13}\)

Is the country at high risk of polio transmission?

The polio risk assessment conducted by WHO in 2015 assessed the nation as a whole as at low risk of polio importation and spread. However, the assessment found that 19 of the country's 33 provinces were at high risk of polio transmission, seven were at medium risk and eight were at low risk. The main factors accounting for the continual risk in many provinces are:

- **Pockets of low immunization among young children** due to inadequate coverage of polio vaccination. The WHO-UNICEF (WUENIC) estimated national coverage rate for three polio vaccine doses is 82% – well below the 90% target – and coverage is considerably lower in several areas. According to the 2013 Riskesdas immunization coverage survey, one-quarter of provinces (8 out of 33) had coverage rates for the four polio vaccine doses in the national schedule of less than 70%, with the lowest rate in Papua province at 49%.

- **Inadequate performance of AFP/polio surveillance in many areas.** AFP surveillance is conducted in all 33 provinces, through a network of provincial and district surveillance officers. It is integrated with measles surveillance and supported by three national laboratories. Environmental polio surveillance is also in place in two sites. However, the 2013 EPI/surveillance review found weak active surveillance at hospitals in the provinces, with poor understanding of AFP case definitions among doctors, and identified several unreported AFP cases.\(^{14}\) While the polio risk assessment found that the national rate of non-polio AFP just meets the target indicator (at 2.02/100,000 children), 14 provinces did not meet this standard and many had stool adequacy rates below the 90% target. Several sources report a recent decline in the performance of the AFP/polio surveillance system overall, coinciding with a reduction in donor support.

Other sources also cite the risk of possible importation from immigrants from at-risk countries and from the large number of travellers to the Haj each year.

What needs to be done to ensure sustainability of polio eradication?

Until recently, Indonesia had not conducted polio vaccination campaigns since sub-national campaigns were held in 2011. The country conducted a national immunization day (NID) in March 2016, which targeted more than 22 million children under the age of five prior to the switch from trivalent to bivalent OPV in April. This was followed by the introduction of IPV as the third polio vaccine dose in the routine immunization schedule in July. A second NID is planned for 2017 to increase population immunity and further reduce risk of transmission.

Sustaining polio-free status and reducing the risk of transmission in Indonesia in high-risk areas will require strengthening case-based surveillance in health facilities, including hospitals (through training of staff) and increasing polio vaccine coverage through the routine immunization program in all low-performing districts in the country.

\(^{13}\) World Health Organization. Joint national and international EPI and VPD surveillance review, Indonesia, 2014.

\(^{14}\) World Health Organization. Joint national and international EPI and VPD surveillance review, Indonesia, 2014.
3.2 Goal 2: Meet global and regional disease elimination targets

3.2.1 Achieve maternal and neonatal tetanus (MNT) elimination

Indonesia was certified by WHO in May 2016 as having eliminated MNT nation-wide. This follows validation of elimination in three of the country’s regions in 2011, and a recent validation assessment in the fourth region – consisting of four remote provinces (Papua, West Papua, Maluku and North Maluku). Achieving MNT elimination in the last region required conducting two rounds of TT vaccination (integrated into the polio NIDs) in very isolated, hard-to-reach districts in the country’s extreme East, which involved intensive district-level technical assistance from WHO in micro planning, training and in increasing community awareness. There were reports of vaccine hesitancy against TT vaccine among some ethnic groups in Papua province. The country reported 69 cases in 2013, 0 in 2014, and 53 in 2015 (for an incidence rate of <0.01/1,000 live births).

Indonesia used a multi-pronged approach to eliminate the disease, which included:

- A focus on clean deliveries and cord care practices, which is facilitated in Indonesia by the high rate of pregnant women making at least four antenatal care visits (84%) and institutional births (70%).
- Routine infant immunization with four doses of DPT-containing vaccine, as well as vaccination of pregnant women with two TT doses;
- A unique school-based vaccination program called BIAS, begun in 1984, which provides DT vaccine to all first graders (both girls and boys) nation-wide and dT to those in Grades 2 and 3. As a result of infant vaccination and the school-based program, many women have received the five recommended doses of TT-containing vaccine by the time they reach child-bearing age. The WUENIC estimated national rate for children protected at birth in 2015 is 85%.
- TT campaigns for women of child-bearing age in high risk districts since 2003. The last SIA was conducted in 2013 in 18 districts in the three remaining high-risk provinces.

Ensuring sustainability of neonatal tetanus elimination will require maintaining high-quality case-based MNT surveillance throughout the country, but especially in the last areas to have eliminated the disease; strengthening the BIAS program in areas where it is not fully operational; improving the recording of TT vaccination among pregnant women; reviewing neonatal tetanus cases and TT coverage regularly; and conducting additional SIAs if surveillance data reveals clusters of cases.

3.2.2 Achieve measles elimination and rubella & CRS elimination

Measles

Is the GVAP target achieved?

While measles incidence has declined significantly since the 1990s and early 2000s, Indonesia continues to experience measles transmission, with between 8,400 and around 22,000 cases reported each year on the Joint Report Format from 2010 to 2014 and 65 to 251 lab-confirmed outbreaks. Measles incidence seems to have declined in 2015, with only 26 lab-confirmed outbreaks and 818 reported cases – by far the lowest in many years.

To control the disease, the NIP conducted a national measles catch-up vaccination campaign for children 9 months to 15 years in phases between 2005 and 2007. Follow-up campaigns for children under five – combined with polio vaccination – took place from 2009 to 2011 in three phases. Once the country shifted its goal from measles control to measles elimination, it introduced case-based surveillance in a phase manner (starting in 2008), added measles vaccination to the schedule for first graders through the school-based BIAS program, and in 2013 added a second measles dose at 24 months to the routine immunization schedule (the third dose for school children will be phased out).

To meet the 2020 target date for measles elimination, the NIP will be conducting "crash" vaccination campaigns in August 2016 in 183 high-risk districts identified through the surveillance system for four million children 9-59 months old. This will be followed by GAVI-supported national measles-rubella (MR) campaigns for children nine months to 15 years in 2017 and 2018 targeting over 70 million children.

Key issues affecting progress towards measles elimination

There are two main challenges to achieving measles elimination by 2020 in Indonesia:

- Insufficient case-based measles surveillance.

The joint EPI/surveillance review conducted in 2013 found that the implementation of case-based measles surveillance...
surveillance has been uneven. The review found evidence of unreported measles outbreaks, as well as suspected outbreaks that were not investigated (accounting for 12% of all suspected outbreaks in 2013). Only around 16-26% of suspected cases each year between 2010 and 2013 were lab-tested, due in part to insufficient funding to test all individual cases (the NIHRD lab continues to rely on WHO funds for testing specimens).

- **Lackluster measles coverage rates and pockets of low coverage.** According to the WUENIC estimates, coverage rates for a single measles vaccine dose have not improved significantly in the past ten years and have declined somewhat in the past four years (from 82% in 2012 to 72% in 2015) (see Figure 2). (Coverage with the dose given to six year olds in school (referred to as MCV2 in the figure) appears to be greater than that of the infant dose.) Measles coverage rates also vary widely by province; the 2013 Riskesdas survey found that provincial coverage rates among 12-23 month olds ranged from 57% to 94%. This points to a need to improve the delivery of vaccination to infants through the routine immunization program. Issues concerning the routine program are discussed in the next section.

**Rubella**

There appears to be a significant burden of rubella in Indonesia. Of 145 suspected measles outbreaks that were investigated in 2012, more of them (56%) turned out to be rubella or mixed measles/rubella outbreaks than measles. The country’s disease surveillance system reported between seven and 76 rubella outbreaks each year between 2010 and 2015, including 152 outbreaks and more than 3,200 reported cases in 2014. The estimated incidence of rubella in 2015 was nearly identical to that for measles: 3.26 cases per million population for rubella and 3.23 cases for measles. CRS surveillance has been established with WHO support in 13 major hospitals in 10 provinces.

As mentioned above, Indonesia will introduce rubella vaccination (MR vaccine) in catch-up campaigns in 2017 and 2018 and in the routine immunization schedule in two doses (at nine and 24 months), starting in 2018.

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**Figure 2: Measles vaccination coverage rates and measles cases, 1980 to 2015, WUENIC estimates**

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1. WHO/UNICEF coverage estimates (draft as of May 2016)
3.3 Goal 3: Meet vaccination coverage targets

a. Achieve 90% national coverage and 80% in every district with 3 doses of diphtheria-tetanus-pertussis containing vaccines

b. Achieve 90% national coverage and 80% in every district with all vaccines included in the national schedule

Are the targets achieved?

The WHO-UNICEF estimated national coverage rate for three doses of DPT-containing vaccine in 2015 was 81%, which compares to the official county estimate of 84% and to 76% from the 2013 Riskesdas national coverage survey. According to the country's official data on the JRF, 70% of the country's districts achieved DPT3 coverage of ≥80%. However, the Riskesdas survey – which showed coverage data at the provincial level – found a broad range in coverage rates among 12-23 month olds – from a low of 41% in Papua to a high of 95% in Yogyakarta. Only 36% of provinces (12 out of 33) were found to reach the target coverage rate of ≥80%.

Concerning other vaccines in the immunization schedule, only BCG comes close to reaching the 90% national coverage target – with a WUENIC estimate of 89% in 2015. National coverage rates for the other childhood vaccines in 2015 were 72% for measles and 81-82% for DPT3 and OPV3. As shown in Figure 3, coverage rates have budged little in 10 years, with DPT3 rates showing the greatest increase – from 72% in 2005 to 81% in 2015. The WUENIC data actually show a reduction in coverage since 2013, especially for the first measles dose, as mentioned above, as well as for BCG.

A manifestation of the insufficient vaccination coverage rates in Indonesia is the continual reporting of cases of diphtheria and pertussis each year. Reports of diphtheria cases peaked in 2012 – at 1,192 cases – and were concentrated in East Java. Vaccine hesitancy in this population was reportedly a factor. The NIP conducted sub-national diphtheria vaccine campaigns in E. Java in 2012 and since then, incidence has fallen each year – to 252 cases in 2015.

Major factors contributing to inadequate improvements in immunization coverage rates in Indonesia

• High dropout rates between the first and third doses of DPT-containing vaccine. The WUENIC estimated dropout rate between DPT doses nationally in 2015 was 10% (the difference between 90% and 81%). However, dropout rates are reportedly between 10% and 20% in many provinces. The main factors attributed to these high dropout rates are the lack of awareness among parents in many areas about the vaccination schedule and need for repeat doses of certain vaccines, and inadequate tracking and follow-up of children who haven’t completed their vaccinations. Recent efforts to reduce dropout rates through an initiative called Drop Out Follow-Up (DOFU) are discussed in Section B below.

• Infrequency of immunization services for much of the population. Indonesia has made great strides to make primary health care services accessible to the population by establishing in the 1980s a system of 260,000 outreach sites called posyandus, where midwives operating from the country’s more than 9,300 health centers and 22,000 sub-health centers bring basic preventive health care services, including immunization, to the community. The posyandus can be mosques, schools, someone’s home or other village meeting places that function as an integrated health
post for a few hours a day. While health centers and sub-centers, as well as private clinics and hospitals, also provide immunizations, an estimated 70-75% of all childhood vaccinations are delivered at these outreach posts. However, the majority of posyandus have immunization sessions for only a half day once a month, often with only a day’s notice. When health centers are not able to reach their immunization targets at the end of the year, they conduct “sweeps” by visiting villages to catch up children on their vaccinations by going door-to-door. While there are funds available for these sweeps, the funding is irregular and often delayed, resulting in missed or delayed immunizations.

- Insufficient demand generation for and community involvement in routine immunization. In many parts of the country, especially the highly-populated areas of Java and Sumatra, the problem with children not completing their immunizations is not so much a lack of physical access to health services, but to a lack of information and other social barriers. While the population in general has a positive attitude towards immunization, with 85% of women in a recent coverage assessment in three provinces believing that their children should be vaccinated, many have inadequate knowledge about immunization, including the vaccination schedule and need for repeat doses, as well as concerns and misperceptions about the safety of vaccines. The issue of reagents and other vaccines was found to be the #1 reasons in the 2013 Ruskades survey for children not being vaccinated (cited by 29% of respondents). These safety concerns have sometimes been exacerbated by rumors and negative publicity about AEFI cases, as well as by a recent scandal involving counterfeit vaccines.

- Each year, more than five million women in Indonesia become pregnant and therefore need information about routine immunization, including its importance for the health of their children, the risks of not being vaccinated, the vaccine schedule, vaccine side effects and vaccine safety. Communications around routine immunization must therefore be strengthened through community-based health promotion, mass communications, and training of health workers to improve their inter-personal communication skills. Indonesia does have a large network of community volunteers, called kaders, who are selected by the community and responsible for educating mothers about immunization, working with midwives to organize EPI sessions at posyandus, tracking pregnant women, and assisting with default tracking. However, these volunteers, who are under the responsibility of local governments, are often not sufficiently trained or provided with tools to counter vaccine safety concerns and misinformation, nor are they adequately monitored or provided with feedback. As a result, they are not always motivated or actively involved in immunization.

- Health systems issues. As mentioned in Section 2.2, decisions about allocated funds to immunization and other health services are made by local governments and thus the amount of available funding is dependent on the local leaders’ priority for immunization. Funding for critical operational expenditures, such as transportation, cold chain maintenance, and health worker incentives, is often inadequate, affecting the performance of the immunization program. The program’s performance is also affected by the limited number and capacity of the NIP staff at the national and provincial levels to provide critical monitoring, technical assistance, and follow-up in low-performing districts, as well as the high turnover rate among staff at all levels.

- Difficulty in accessing remote, hard-to-reach areas. There are very remote, inaccessible areas in Indonesia, such as Papua province, with difficult terrain and small and dispersed populations. It is therefore difficult, time-consuming and costly to deliver health care services on a regular basis to these populations, and consequently, they have amongst the lowest vaccination coverage rates in the country (e.g., 41% for DPT3 in Papua in the Ruskades survey). While the size of these populations is relatively small, low coverage rates in these areas contribute to Indonesia’s challenge in meeting the GVAP goal of ≥80% coverage in all of the country’s districts. A project to improve the delivery of health services in remote areas (the Sustained Outreach Service project) is described in Section B below.

- Missed opportunities to provide vaccinations to children. The 2013 EPI/surveillance review found that several health worker practices and a lack of clear policies regarding them resulted in missed opportunities for children to receive all of their immunizations on schedule during immunization sessions. These include the reluctance among health workers to open a multi-dose vaccine vial if few children are to be vaccinated, to administer multiple injections to a child during the same session (despite little evidence of concern on the part of parents), and in some provinces, to provide vaccines to children once they reach the age of one year. This points to the absence of clear national policies for handling multi-dose vials and for catch-up immunization for children over the age of one.

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26 Assessment of district immunization coverage at three provinces (West Sumatra, West Nusa Tenggara and South Kalimantan), 2013.
27 World Health Organization. Joint national and international EPI and VPD surveillance review, Indonesia, 2014.
• **Data quality issues.** Despite a well-established system and regular schedule for reporting immunization data in Indonesia, there are often differences of 10 or 20 percentage points or more between administrative coverage data (often >90%), official country estimates, and the WHO-UNICEF estimates. For example, the official country estimate for coverage of one measles dose in 2015 is 86%, compared to the WUENIC estimate of 72%. A main factor is inaccurate and differing population estimates. While all programs are required to use estimates from the National Statistics Bureau, many provinces and districts use their own population estimates based on birth registrations – resulting in the central NIP generating two sets of coverage estimates.\(^29\) There are also problems with the recording of immunizations at *posyandus*, with retention of immunization cards by mothers (<50%) and with the submission of immunization data by some private sector providers. Inflated and inaccurate coverage data can mask poor program performance and areas of low immunization coverage. A major activity under the GAVI HSS project involves addressing this issue by conducting independent data quality assessments (DQAs).

• **Local vaccine stockouts.** This is generally less of an issue in Indonesia than in many other GVAP priority countries, given Bio Farma's strong track record and long experience in vaccine production, procurement and distribution (up to the province level). A facility census conducted in 2011, for instance, found that more than 90% of health centers visited had all mandated vaccines available.\(^30\) The country's buffer stock policies – requiring provincial stories to have a four-month buffer stock and health facilities to have a five-week buffer – help to prevent local stockouts in case of procurement or transportation delays. Nonetheless, there are sometimes local vaccine shortages or stockouts due to delays in finalizing procurement contracts or in delivering vaccine from the provinces to the districts and health centers, which is the responsibility of local governments. The lack of vaccines was reported by mothers in the 2013 three-province coverage assessment was the third most common reason for their children missing a vaccination (11% of responses).\(^31\)

### 3.4 Introduce new and improved vaccines and technologies

The introduction of new vaccines has been slower in Indonesia than in many other GVAP priority countries, a key reason being the country's dependence on Bio Farma to produce vaccines for the national immunization program. The introduction of Hib vaccine – by replacing DPT-Hepatitis B vaccine with the pentavalent (DPT-HepB-Hib) – did not begin until 2013, once Bio Farma received market authorization by the NRA for its vaccine. The rollout of pentavalent – supported by GAVI – took place in five phases (by province) over a year and a half period, from mid-2013 to early 2015. According to the 2015 Joint Appraisal report, the introduction of the vaccine went smoothly, with health staff well trained, a well-planned communications and social mobilization strategy that engaged all sectors of society and pre-empted serious opposition from anti-vaccine groups, and no serious AEFI cases reported. GAVI’s co-financing of the vaccine ends in December 2016 when the country graduates from GAVI support.

The Government’s policy of linking the introduction of new vaccines with Bio Farma’s R&D agenda and production plans has begun to change. The country – with three years of support from GAVI – introduced IPV in July 2016 before the Bio Farma-produced vaccine was available. A stepped approach is being used, in which the vaccine is initially supplied by Sanofi, then Bio Farma will fill-finish sanofi’s bulk vaccine, and finally, Bio Farma will produce its own vaccine. Several other new vaccine introductions are also planned for the next few years:

- Measles-rubella vaccine is being introduced with one-time financial support from GAVI in national catch-up campaigns that will take place in 2017 and 2018. As mentioned above, the vaccine will then be introduced into the routine immunization schedule, replacing the monovalent measles vaccine. Indonesia will use imported vaccine until Bio Farma obtains licensure of its own MR vaccine, expected around 2018.
- Japanese encephalitis vaccine is being introduced in campaigns in Bali (a high-risk area) in 2017, with GAVI supported, using the Chinese vaccine. The vaccine will be incorporated into the routine immunization schedule in Bali and other high-risk provinces (determined by epidemiological research) after that.
- A demonstration of HPV vaccine will take place in two districts in Yogyakarta province in 2017 and 2018, with GAVI support, using imported vaccine. In addition, the Government will introduce the vaccine in 2016 in the city of Jakarta, with central and local government funding.

\(^{29}\) ibid.


\(^{31}\) Assessment of district immunization coverage at three provinces (West Sumatra, West Nusa Tenggara and South Kalimantan), 2013.
• Pilot introductions of PCV and rotavirus vaccines are being planned with government funding (for 2017 in the case of PCV). The demonstrations will evaluate the impact and cost-effectiveness of the vaccines to inform government decisions about their introduction nation-wide. Both vaccines are in development at Bio Farma, with the rotavirus vaccine further advanced. Rotavirus surveillance is currently on-going in four sentinel hospitals in different parts of the country.
Partner support to address major challenges to meet the GVAP goals and targets
While financial support from partners for the immunization program makes up a relatively small portion of immunization financing in Indonesia, partners have provided important technical support and expertise to the Government in specific areas for several years. Critical support has included assistance in developing the surveillance system for AFP/polio and other vaccine-preventable diseases, including laboratory support; strengthening capacity of the country's national regulatory authority (POM); and assistance in designing and implementing studies and assessments to guide the immunization program and measure the impact and value of vaccination. These include coverage surveys, studies of cost-effectiveness, among many others. With financial support from GAVI, partners have also assisted in the introduction of pentavalent and IPV vaccines.

Though the GAVI HSS grant, partners have helped improve the immunization program's performance by: 1) assisting with special efforts to improve immunization coverage; 2) improving the quality of immunization data and local capacity in data collection, reporting and analysis; and 3) improving health worker skills and knowledge in immunization by developing teaching materials on immunization and MCH service delivery for midwifery training institutes. Two initiatives to note that are supported by partners with GAVI HSS financing in the aim of addressing the country's lagging immunization coverage rates are:

- The **Drop-Out Follow-Up (DOFU) strategy** being implemented in 60 districts in 18 provinces,
- The **Sustained Outreach Service (SOS) strategy** to improve the delivery of immunization and other MCH services to remote, sparsely-populated islands in three provinces (E. Nusa Tenggara, Maluku and N. Maluku). This strategy, supported by UNICEF and WHO, involves outreach visits to these communities (at least 3-4 times a year) to provide children and women with integrated MCH services. Local governments have recognized the benefits of this strategy and have started to contribute to its implementation.

Much of the funding for technical support from partners, including WHO and UNICEF, will end when regular GAVI support, including the HSS grant, concludes in December 2016. However, it will be critical that partners continue to provide technical assistance to both the central government and sub-national governments with such activities as VPD surveillance, new vaccine introductions (e.g., JE, PCV, HPV), impact assessments, and other advocacy efforts to justify investments in immunization. Technical assistance from partners will help ensure that the gains made with past support, including polio eradication and progress towards measles elimination, can be sustained and reach their full potential.

**Acknowledgments**

We would like to thank the following people who were interviewed for this report:

- Xiao Xian Huang (WHO HQ)
- Vinod Bura (WHO CO)
Annex 1: Country immunization profile

1. **Polio**
   - Eradication certified in 2014

2. **Measles and rubella**

   **Figure 4:** Reported Measles cases and MCV coverage WHO-UNICEF estimates, Indonesia, 1990-2015

   ![Reported Measles cases and MCV1, MCV2 vaccination coverage, Indonesia, 1990-2015](chart)

   **Table 1:** SIA activities planned in 2016-2017

<table>
<thead>
<tr>
<th>Activity</th>
<th>Intervention</th>
<th>Year</th>
<th>Start Date</th>
<th>End Date</th>
<th>Age Group</th>
<th>Extent</th>
<th>Status</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow Up</td>
<td>Measles</td>
<td>2016</td>
<td>01/10/2016</td>
<td></td>
<td>9-59 M</td>
<td>Sub-national</td>
<td>planned</td>
<td>3,900,554</td>
</tr>
<tr>
<td>Campaign</td>
<td>MR</td>
<td>2017</td>
<td>01/08/2017</td>
<td></td>
<td>9 M-15 Y</td>
<td>National</td>
<td>planned</td>
<td>70,000,000</td>
</tr>
<tr>
<td>NID</td>
<td>tOPV</td>
<td>2016</td>
<td>01/03/2016</td>
<td></td>
<td>0 to 5 years</td>
<td>National</td>
<td>Planned</td>
<td>23,093,592</td>
</tr>
</tbody>
</table>

Source: WHO/IVB Database as at 01 July 2016

3. **MNT eliminated in 2016.**
4. Coverage and Equity

**Indonesia**

![Graph showing vaccination coverage in Indonesia from 2000 to 2015](image)

**Legend**

- 10% - 20% - 30% - 40% - 50% - 60% - 70% - 80% - 90% - 100%

**Table 2: Reported DTPCV doses administered & coverage, Indonesia, 2000-2015**

* COE: country Official Estimates

Source: WHO/IVB database, data reported to WHO by member states as of 1 July 2016

WHO/UNICEF national coverage estimates, 2014 revision, data as of July 2015
Figure 6: Percentage of district achieving <50%; 50-79% and ≥80% coverage, 2000-2015

Figure 7: DTP3 coverage by district/province, Indonesia, 2010 and 2015 (admin)
Figure 8: Immunization coverage data disaggregated by sex and wealth quintile

Figure 9: Immunization schedule, Indonesia 2015

5. Immunization systems highlights

- Planning and management:
  - Stockout of vaccines: no events in 2015.
  - cMYP: 2015-2019
  - Annual Plan: Yes
- Country decision making: NITAG meeting the 6 minimum criteria defined by WHO for a functioning NITAG
- % of total expenditures on vaccines financed by government funds: 78
NIGERIA
Progress towards achievement of GVAP/RVAP goals
1. Summary

The summary table below describes the current situation in Nigeria regarding achieving the GVAP goals.

Data used to assess progress towards achievement of GVAP goals are included in the annex.

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Nigeria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio-demographic</td>
<td>GNI 2014</td>
<td>$2,950</td>
</tr>
<tr>
<td></td>
<td>WB Status</td>
<td>Lower Middle Income</td>
</tr>
<tr>
<td></td>
<td>Infant mortality (&lt;12 M) 2015 (UN IAG CME)</td>
<td>69</td>
</tr>
<tr>
<td>GAVI status</td>
<td>Eligible (will be in accelerated transition phase starting in 2017 and will graduate in 2021)</td>
<td></td>
</tr>
<tr>
<td>Total population</td>
<td>182,202,000</td>
<td></td>
</tr>
<tr>
<td>Birth cohort</td>
<td>7,133,000</td>
<td></td>
</tr>
<tr>
<td>Surviving Infants (JRF)</td>
<td>6,622,000</td>
<td></td>
</tr>
<tr>
<td>1. Interrupt wild poliovirus transmission</td>
<td>Transmission Interrupted</td>
<td>No, 2 new WPV cases detected in 2016</td>
</tr>
<tr>
<td></td>
<td>Risk of late detection: Percent of adequate stool specimens (Rolling 12m) (target &gt; 80%)</td>
<td>99.1</td>
</tr>
<tr>
<td></td>
<td>Risk of late detection: Non polio AFP rate (Rolling 12m) (target &gt; 2/100,000)</td>
<td>18/100,000</td>
</tr>
<tr>
<td></td>
<td>Risk of spread after importation: % of 6-59 month olds having received less than 3 doses in the last year before occurrence case/environmental positive)</td>
<td>2%</td>
</tr>
<tr>
<td>2. Neonatal tetanus elimination</td>
<td>TT2+ coverage (reported on JRF 2015)</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>Rate of protection at birth against tetanus (2015 WUENIC)</td>
<td>55%</td>
</tr>
<tr>
<td></td>
<td>Last SIAs conducted in the country</td>
<td>Round 1 conducted in 61 high-risk districts in October 2014. Rounds 2 and 3 scheduled for Sept 2016 and 2017 in same districts.</td>
</tr>
<tr>
<td>3. Measles elimination</td>
<td>Elimination validation date</td>
<td>Not yet validated: pre-validation assessment planned in 1-2 geopolitical zones before the end of 2016</td>
</tr>
<tr>
<td></td>
<td>Coverage MCV1 (2015 WUENIC)</td>
<td>54%</td>
</tr>
<tr>
<td></td>
<td>Coverage MCV2</td>
<td>Not in schedule</td>
</tr>
<tr>
<td></td>
<td>Reported percentage of districts with MCV1 coverage ≥95% (2015 JRF)</td>
<td>53%</td>
</tr>
<tr>
<td></td>
<td>Last national SIA</td>
<td>2015</td>
</tr>
<tr>
<td></td>
<td>Post SIA coverage survey conducted</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>SIAs planned?</td>
<td>Not to date</td>
</tr>
</tbody>
</table>
2. Country ownership of the immunization program

2.1 Immunization policy decision-making capacity

The main decision-making and coordinating body for the immunization program in Nigeria is the ICC, which is chaired by the Minister of Health and includes senior-level officials from the Federal Ministry of Health (FMoH) and around 18 development partners and bilateral organizations. The ICC, which meets every two months, endorses the GAVI work plan, makes decisions about new vaccine introductions and other key program decisions. The technical arm of the ICC is called the Core Group, which is chaired by the Executive Director of the parastatal organization that manages the immunization program – the National Primary Health Care Development Agency (NPHCDA) – and includes EPI team leaders from different immunization stakeholders and partners in the country. The Core Group, which meets once a month, provides direction to and oversight of various technical working groups, and makes recommendations based on their input and analysis, which must then be approved by the ICC.

Among the technical working groups – which include logistics, social mobilization, M&E and finance – is the Routine Immunization Working Group, which is chaired by the director of routine immunization at the NPHCDA and whose members are immunization program officers and experts from different stakeholder and partner organizations. The states – which are responsible, along with local government authorities (LGAs), for the delivery of health services in the country and implementation of health programs – also each have
their own working groups (e.g., routine immunization and logistics).

The functioning of the ICC and regularity of meetings have improved considerably in the past few years and the committee is reportedly held in high esteem by the Government.

A NITAG has recently been established, with support from WHO, CHAI and SIVAC, and its inaugural meeting held in August 2015. Unlike the ICC and Core Group, its 10-12 members are independent of the immunization program and include pediatricians, microbiologists and other experts from academia, research institutes and the private sector. A number of partner organizations, including WHO, UNICEF and CHAI, participate as observers. Unlike the ICC, the NITAG will have solely an advisory – not a decision-making role. Its impact on decision-making for the immunization program, as well as its role vis-à-vis that of the ICC’s Routine Immunization Working Group, has yet to be determined. It should also be noted that decisions have already been made about most vaccine introductions currently supported by GAVI (e.g., rotavirus, meningitis A, HPV).

The Nigeria Government’s decision-making capacity and implementation of the immunization program is complicated by the fact that the program – along with several other components of the primary health care program – is managed not by the Federal Ministry of Health, but by the NPHCDA, which is a separate, parastatal organization. However, a number of key activities related to immunization, such as disease surveillance and supportive supervision, fall under the responsibility of the FMOH. In some cases, the NPHCDA and FMOH have parallel systems, causing confusion and duplication of effort. There are, for example, separate supervision checklists for each agency and two health information systems – the HMIS run by the FMOH and the immunization program’s vaccination monitoring system run by the NPHCDA. Each system uses a different platform (the DHIS2 in the case of the HMIS and the DVT-MT in the case of the EPI’s system) and different population data for their denominators. Key primary health care programs, including malaria control, nutrition and family planning, are still under the FMOH, complicating the delivery of integrated health services and such activities as intensified vaccination activities that provide other MCH interventions. As another example, disease surveillance officers are under the FMOH at the state level, while those at the LGA level report to the local PHCDA.

### 2.2 Government financing for immunization

According to the 2015 GAVI Joint Appraisal report, the federal government contributed 36% of the estimated immunization expenditures in 2014, while its contribution in 2011 was 34%. There was thus a marginal increase in the Government’s share of immunization expenditures in four years. The federal Government’s expenditures cover the cost of traditional vaccines ($12.6 million in 2013), co-financing for the GAVI-supported new vaccines (pentavalent and PVC) (≈$25 million in 2015), personnel costs for the EPI staff as well as per diems for vaccinators and supervisory staff, and other recurrent costs.1 The Government also pays for a share of the operational costs of polio and other SIAs. In addition to the federal government’s contribution, subnational (state and LGA) governments contribute personnel and other operational costs for the routine program – to the tune of $14.6 million (7%) of the estimated total routine immunization program costs in 2013.2

The Government has been making its co-financing payments for GAVI-supported vaccines without delays or defaults, as well as purchasing traditional vaccines for the routine program, though there have been some reports delays in vaccine purchases, causing stock-outs. This has not occurred, however, since 2013.

Financing for the routine immunization program is considered inadequate and the often slow release of government funds results in delays in planned immunization activities. Other recent developments that have had an impact on immunization funding are:

- The sharp reduction in oil revenues, which account for 70% of the country’s consolidated revenues, as a result of the decline in global oil prices. This has affected the ability of some states – which are responsible for the delivery of immunization services – to pay health worker salaries, operational costs for outreach activities and other costs affecting the immunization program. Several states have declared bankruptcy in recent years as a result;

- The freezing of all GAVI cash support, including HSS grant funding since March 2014, due to financial management issues. This has delayed several planned activities, including the training of health workers on integrated PHC service delivery, TT campaigns as part of the maternal and neonatal elimination program,

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2. cMYP 2016-2020.
and an immunization coverage survey. Some priority activities funded through the HSS grant are being implemented with funds channeled through UNICEF.

There have been two recent developments that should increase financing for immunization. The first is the Government’s plan to extend health services to the entire population, including to under-served areas, by providing “primary health care under one roof” (PHCUOR). The vision is to establish functional PHC centers open 24 hours a day in each of the country’s more than 9,500 political wards, manned by at least two certified nurses or midwives. To fund this plan, the Government passed a National Health Act in 2014 that creates a Basic Health Care Provision Fund – half of which will be used to cover the costs of the PHC centers, including vaccines, equipment and operational costs. The National Health Act is currently in the planning stage and is being affected by the decline in oil revenues, which are a major source of funding for its implementation.

The second effort to increase immunization financing is the development of agreements between state governments and two foundations to secure more stable funding for routine immunization, using a basket funding mechanism with contributions from the state governments and the foundations (the latter to be phased out over time). This initiative – currently operating in two states and being planned in four more – is described in more detail in Section B.

2.3 Human resource situation

Immunization program staff in Nigeria consist of a national EPI team at the NPHCDA, EPI teams in each of the country’s 37 states, and LGA immunization officers (LIOs) in each of the 774 LGAs. There are also surveillance officers at each level. There have been MLM and other trainings for these staff in recent years, although turnover and transfers are common.

To supplement this staff, partners have been supporting a contingent of more than 11,000 persons funded through the polio eradication program, including 408 WHO staff, 2,070 “surge staff” and more than 8,600 social mobilizers who work for UNICEF. The EPI has come to rely on these staff for not just polio activities (AFP surveillance and polio SIAs), but also for measles control, disease surveillance, and improvements to the routine immunization program. As part of the polio transition, polio program funds (apart from funds for SIAs) will be cut by more than half between 2016 and 2019 – likely resulting in a substantial reduction in this supplemental workforce.

At the operational level, most vaccinations given in the public sector are administered by nurses or midwives or – especially in the under-served North – by community health extension workers (CHEWs). These are facility-based, salaried health workers with secondary school education and a year or so of training, who focus on providing preventive health services, including in the community. In addition, an estimated 15% of vaccinations are provided by nurses and midwives working in private health facilities.

As in many countries, the number of health workers in the public sector is inadequate in many parts of the country, due to insufficient funding at the state level (health worker salaries are paid out of state budgets) and a high rate of staff transfers. In addition, most health workers prefer to work in urban vs. rural areas, resulting in an imbalanced distribution in which more than 70% work in urban areas, and with greater concentrations in the South than in the North. This leaves many rural areas, especially in Northern states, with vastly insufficient numbers of health workers to serve the population. The skills level of many health staff is also considered to be low.

Making matters worse are frequent and prolonged health worker strikes – often lasting 4-6 months – in a number of states, especially those that have not paid their health workers for months, due to either state bankruptcies or the freezing of salaries of civil servants, as part of a “verification” process mandated by the new President to determine who actually works for the state and to weed out “ghost workers”.

To increase the health workforce, in alignment with the Government’s plan to make PHC services accessible to all, the federal government began two initiatives in the past five years. The Midwives Service Scheme (MSS) involves recruiting 8,000 qualified midwives as well as CHEWs to work in PHC facilities in under-served areas, while the SURE-P-MCH program also recruits and deploys midwives and CHEWs, as well as 5,000 village health workers, using results-based incentives. However, these initiatives are funded by the MDG debt relief funding or savings from reductions in the petroleum subsidy and both have been affected by the country’s worsening economy. The state of Kano, for instance, has had to lay off 600 midwives hired through the MSS due to the decline in the state’s revenues. Recruitment of SURE-P-MCH health workers has also reportedly been put on hold in many areas.

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1 Internal WHO briefing note for the 2016 joint appraisal.
2 cMYP
3. Progress towards specific GVAP goals (issues/challenges/successes)

3.1 Goal 1: Achieve a world free of poliomyelitis

Has Nigeria interrupted polio transmission?

Official data from the country’s extensive AFP/polio surveillance system showed that transmission of wild polio virus (WPV) had been interrupted by the first quarter of 2015 – with the last case reported in July 2014. WP incidence had been decreasing each year since 2012 (when 122 cases were confirmed) to only six cases in 2014, and the map of the disease had narrowed to two remote states with security problems (Kano and Yobe) (Figure 1). The incidence of vaccine-derived polio virus (VDPV) – reported since 2005 – has also declined from a peak of 155 cases in 2009 to only one case in 2015.

There has been a recent setback, however, with the detection of two cases of WPV type 1 in July 2016 in Borno state in the extreme Northeast corner of the country, a remote area where Boko Haram is centered. The strain was found to be closely linked to the last WPV1 cases reported from Borno state in 2011, indicating that the virus has been circulating undetected in the state for five years. This is clearly a setback to the country’s plans to achieve certification of cessation of all types of WPV by 2018, as stated in the immunization program’s multi-year plan (cMYP).

The Nigeria Government – with partner support and under the direction of the National Polio Emergency Operations Centre (EOC) – has been conducting a series of polio vaccination campaigns for several years to halt transmission of the disease. The country has held two or three rounds of national immunization days (NIDs) and six or seven round of sub-national immunization days (SNIDs) per year, including in reaction to cases. In response to the two recent WPV cases, three large-scale SIAs using the bivalent OPV are currently being planned in Borno state.

Figure 1: Trends in incidence of confirmed wild polio virus and vaccine-derived disease in Nigeria

Source: WHO, Highlights of new wild poliovirus and cVDPV cases reported globally, week of August 9, 2016 (presentation)

The quality of the SIAs has improved in recent years, with the Government funding innovative ways and making special efforts to reach under-served and hard-to-reach areas. These include:

- Vaccination campaigns in registered IDP camps in four states (Adamawa, Borno, Gombe and Taraba) that, despite the insurgency, was able to vaccinate nearly 58,000 children 0-59 months old in one month in 2014;
- Health camps in 2013 and 2014 in areas with low utilization of routine immunization and health services. In three state where health camps were used to introduce IPV (Borno, Yobe and Kano), three million children were vaccinated in 2013.

Official data show high coverage of these campaigns (e.g., 95% of more), but given issues with data quality (often showing coverage of >100%), the numbers of children being missed by polio SIAs is uncertain.

Key problems contributing to the continual risk of polio transmission in Nigeria

- Gaps in AFP/polio surveillance. Nigeria’s AFP surveillance system – implemented by Disease Surveillance and Notification Officers in all 774 LGAs, State Epidemiologists and the polio “surge” staff – has met the global performance targets for more than 10 years, with a current AFP detection rate of 18

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*WHO, Highlights of new wild poliovirus and cVDPV cases reported globally, week of August 9, 2016 (presentation).
per 100,000 children under 15 years of age (up from 13/100,000 in 2014) and a 99% rate of adequate stool specimens. The system is supported by two national laboratories, a reference lab and specialized lab in the U.S. Nonetheless, both the two recent cases found in Borno state and orphan viruses detected in 2014 through genetic sequencing suggest that the virus has been circulating undetected in certain areas – for five years in the case of WPV1 in Borno state – and thus there remain gaps in the surveillance system. The challenge in conducting consistent, high-quality surveillance in inaccessible and insecure areas like Borno state is likely a key reason for this gap.

- **Continued low performance of the routine immunization program.** The WHO-UNICEF estimated routine vaccination coverage rate for three doses of polio vaccine was only 55% nationally in 2015 and 49% in 2014.\(^6\) Coverage in remote and unsafe areas is likely considerably lower than these rates. This points to a failure of the routine program to reach children with all required vaccine doses. While issues affecting routine immunization coverage are covered in detail in Section 3.3 below, two main factors for the poor OPV coverage we can mention here are the insufficient availability of health services and low population utilization rates, especially in remote areas; and the shortage of health workers in many areas. The insecurity caused by Boko Haram in the North and militants in the South contribute to both of these problems.

### 3.2 Goal 2: Meet global and regional elimination targets

#### 3.2.1 Achieve maternal and neonatal tetanus (MNT) elimination

Nigeria has the goal of eliminating MNT by 2020 and an intermediate goal of more than 70% of LGAs having less than one case per 1,000 live births by 2018.\(^7\) As of 2014, 17 states (46%) still reported more than one MNT per 100,000, though this represents considerable progress since 2010, when 27 states were over this threshold.\(^8\) In addition, case-based MNT surveillance has improved since 2008, when it was added to the AFP/measles surveillance platform. However, according to the cMYP, there is still a high level of under-reporting of the disease.

Nigeria faces two main challenges to meeting its MNT elimination goal:

1. Relatively low rates of utilization of maternal health services. According to the 2013 Nigeria Demographic and Health Survey (DHS), just more than half (51%) of women made four or more antenatal care (ANC) visits during their last pregnancy, 48% received two or more TT injections, and 36% delivered their babies in a health facility.\(^9\) Many areas have much lower rates of maternal health utilization. Nearly half (47%) of women in rural areas reported no ANC visits during their last pregnancy compared to 11% in urban areas, and eight states – all in the Northeast and Northwest regions – had protection at birth (PAB) rates of less than 40%, with some states (Kebbi, Sokoto, Zamfara) as low as 14-17%. The national PAB rate – which WHO and UNICEF estimated at 55% in 2015 – has changed little since 2000, when it was 57%. While the cMYP has the goal of reaching more than 80% national coverage with two or more doses of TT vaccine, the lack of improvement in routine TT coverage remains a key impediment to Nigeria achieving MNT elimination;

2. Delays in conducting TT campaigns in high-risk areas. SIAs for women aged 15 to 49 years and pregnant women began on a pilot bases in 2009 in five states, with the aim of providing three TT doses (through three rounds). However, only three states were able to complete all three rounds, resulting in an overall coverage rate in the pilot states of 49% for TT3.\(^10\) Subsequently, targeting by states was abandoned and 61 LGAs were identified as high-risk areas. Plans were made to conduct three rounds of SIAs from 2014 to 2016 in these areas. The first round took place as planned in 2014, but the second round, originally scheduled for 2015, was delayed until early 2016, due to a lack of funding as a result of the suspension of GAVI operational cash support and to competition with planning for national measles campaigns. The third round is now scheduled for 2017.

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\(^6\) These are recently revised estimates that were lowered following a recent survey.

\(^7\) cMYP

\(^8\) cMYP


\(^10\) cMYP
3.2.2 Achieve measles elimination and rubella & CRS elimination

Measles

Nigeria has the goal of reducing measles morbidity by 90% mortality by 95% from 2014 to 2020.\(^{11}\) The number of cases reported through the disease surveillance system in 2015 was more than 12,200, which is significantly down from nearly 53,000 cases in 2013 and more than 212,000 cases in the year 2000.\(^{12}\) The number of reported measles outbreaks has similarly declined from 338 in 2010 to 133 in 2014.\(^{13}\)

To reduce measles incidence, the country developed a strategy of nation-wide measles vaccination campaigns, coupled with case-based surveillance, beginning with catch-up campaigns for children 9 months to 15 years that were conducted in two phases in 2005 and 2006. National follow-up campaigns for children under five have taken place with WHO and UNICEF support every two or three years since then (in 2008, 2011, 2013/14 and most recently in 2015/16). A coverage survey found that the 2013/14 campaign achieved an overall coverage rate of 74.5%.\(^{14}\) The Government plans to continue the SIAs every two or three years, as needed, based on surveillance reports; SIAs are currently planned for 2017 and 2020.

Key challenges that need to be addressed to meet Nigeria’s measles reduction targets are:

- The need to improve measles vaccination coverage rates. Routine measles coverage rates remain low and have risen very gradually in the past several years.

The national rate was 49% in 2011, dipped to 42% in 2012 and then rose to 47% in 2013 and to 55% by 2015.\(^{15}\) Large parts of the country – the Northeast and Northwest regions – have extremely low coverage rates. According to the 2015 National Nutrition and Health Survey (NNHS), which found a national measles vaccination coverage rate of 51% among 12-23 month olds – four states had rates of 4% to 7%, while seven other states had rates of 15-30%\(^{16}\) (see Figure 2). These findings indicate that measles immunization through the routine program in these areas is almost non-existent, though the lack of retention of immunization cards could also have been a factor for the low rates. In all, only four states reached the country’s target measles vaccination coverage rate of 80% (the federal capital territory and three Southern states), 19 states achieved coverage between 50 and 80% and 14 states had rates of less than 50%. According to the cMYP, the EPI plans to add a second measles dose to the routine immunization schedule within the next several years.

- The need to further improve measles surveillance. Measles surveillance includes both passive surveillance (as part of the IDSR system) and case-based surveillance, using the same infrastructure as for AFP surveillance and support from four national labs. The system appears to be fairly sensitive, reporting a non-measles febrile rash illness rate of 2.7/100,000 children in 2014, surpassing the target of <2/100,000. However, case-based surveillance still needs improvement, as 16% of LGAs did not report at least one suspected case in 2014 and only 75% of cases that year were investigated (with a blood sample obtained).\(^{17}\)
Figure 2: Estimated coverage rates for three doses of pentavalent vaccine and measles vaccine among children 12-23 months of age, 2015 National Nutrition and Health Survey

Rubella

There are as yet to firm plans to introduce rubella vaccination (MR vaccine) into the routine immunization schedule, nor any plans to conduct mass MR campaigns. Rubella surveillance has also not yet been established in Nigeria.
3.3 Goal 3: Meet vaccination coverage targets

a. Achieve 90% national coverage and 80% coverage in every district with three doses of diphtheria-tetanus-pertussis containing vaccines
b. Achieve 90% national coverage and 80% coverage in every district with all vaccines included in the national schedule

The WHO-UNICEF estimated coverage rate for the third dose of DPT-containing vaccine (pentavalent) in 2015, which was recently revised downward following the 2015 NNHS, was 56% among children 12-23 months of age, with a dropout rate between the first and third doses of 20% (from 70% to 56%). According to the 2015 NNHS, five of the country's 37 states (14%) reached the target of at least 80% coverage for DPT3, 15 states (40%) achieved coverage rates of between 50% and 75%, and 16 states (43%) had coverage of less than 50%. As with measles vaccination, the range of DPT3 coverage by state is enormous – from 4.4% in Sokoto state to 91% in the Southeastern state of Imo (see Figure 2 above). There are also vast inequities in rates by rural vs. urban location and by household wealth. According to the 2013 DHS, DPT3 coverage in rural areas was only 40% of that of urban areas (25% vs. 62%) and there was an eleven-fold increase in rates from the lowest wealth quintile (7%) to the highest (79.5%). The NNHS also found that 21% of 12-23 month olds had not received a single vaccination. A more in-depth equity assessment will be conducted as a condition of Nigeria applying for GAVI support for rotavirus vaccine introduction (currently planned for 2018), along with preparation of a plan to address this problem.

Nigeria has also not been able to meet these targets for other vaccines in the immunization schedule – with national coverage for measles, three doses of polio and yellow fever vaccines all at 54-55%, and BCG at the highest at 68%, according to the revised WHO-UNICEF estimates. Unimmunized children in Nigeria account for one in three of all unimmunized children in Sub-Saharan Africa and for one in six of all of those in GAVI-supported countries.19

The country has made progress, however, with immunization coverage rates over the past five years, especially in the past two years. According to the WUENIC estimates, BCG coverage climbed 11 percentage points from 2011 to 2015 (from 57% to 68%), DPT 3 coverage rose eight percentage points (from 48% in 2011 to 56% in 2015), yellow fever vaccine coverage increased by 16 points – from 38% to 54% (a 42% increase), and measles by five points (from 49% to 54%). Among the reasons given by informants for these gains are increased population awareness of and thus demand for vaccination as a result of the recent introduction of pentavalent vaccine and on-going introduction of PCV and accompanying communications and social mobilization activities, greater involvement of traditional and political leaders in informing the public about vaccination, and the improved regularity of the vaccine supply, especially at the national level (as there has not been a national vaccine stockout since 2013).

The most prominent factors contributing to the country’s low immunization coverage rates are the following:

- The shortage of health personnel in the public sector. As mentioned in Section 2.3 above, there are insufficient numbers of frontline health workers in many areas in Nigeria, due to high attrition and transfer rates and the difficulty of recruiting workers for remote, rural areas. The frequent health worker strikes in recent years in several states have exacerbated the problem, making immunization and other health services unavailable for months at a time in these areas and increasing the pool of unimmunized children. With the continued poor economy in the country, more states are facing severe financing problems, resulting in non-payment of health workers’ salaries – a major reason for the strikes.

- Lack of security in several parts of the country. The Boko Haram insurgency that has been going on for several years – causing tens of thousands of people to flee to IDP camps and more secure areas – has made it difficult to provide immunization and other health services in parts of the North. There have also been multiple attempts – some successful – to attack health workers engaged in immunization. It is not surprising that the recently found cases of wild polio virus were in Borno State, where Boko Haram has its headquarters and where immunization coverage rates are low (28% for measles and 32% for DPT3, according to the 2015 NNHS). At the same time, the Niger Delta has experienced a series of bombings and kidnappings to “Delta avengers”, militants who are rebelling against the Government’s decision to end “amnesty fee” payments to communities damaged by oil drilling and production. These security problems limit the free movement of the population to seek services and of health workers to provide outreach and mobile services, as well as the Government’s ability to recruit health workers to these areas.

- Uneven availability of immunization services. There are around 25,000 PHC facilities in the country, including more than 1,150 health centers and 228
maternities recently built as part of the Government’s plan to increase the accessibility of PHC services to all communities throughout the country. According to the cMYP, most states and LGAs follow the “1-2-3 strategy”, which entails at least one immunization session at the facility per week, two outreaches per month, and three supportive supervision visits per month. However, many health facilities have trouble adhering to this strategy, due to a lack of personnel, a lack of transportation for outreaches or to collect vaccines from the LGA stores (in health centers without functioning cold chain equipment), and a general lack of funds for operational expenses. Those with functioning refrigerators are more likely to conduct immunization sessions on a weekly or more frequent basis.

- Insufficient communications and social mobilization activities for routine immunization services and inadequate community participation. Nigeria has a structure for promoting immunization and other health services through social mobilization committees in each LGA, guided by the National Social Mobilization Working Group of the ICC. There is also a network of around 10,000 volunteer community mobilizers, supported with polio funding, who help with social mobilization for SIAs, track pregnancies, refer parents for routine immunization and so forth through home visits. These efforts have reportedly been important for polio and other SIAs, but are less focused on routine immunization. In many areas in the North, there has been a low demand for and lack of trust in immunization and other health services, including past resistance to polio vaccination. To address this problem and increase demand, the country, with HSS and ISS funding, established and trained more than 700 ward or village development committees (WCDs/VCDs) in 13 states in 2010 to promote health services in the community and build transparency and accountability into the management of PHC activities. The WDCs are involved in planning community-based health activities, educating the community about health, including immunization, tracking immunization defaulters, and co-managing the health facilities. A study found that the increase in DPT3 coverage rates was significantly greater in wards with GAVI-supported WCDs than in those without. However, this is a partner-driven activity and the 2015 Joint Appraisal report found that only around 40% of the targeted wards had established WDCs and 20% of these were not functional. Many also lacked a sense of community ownership and were not very engaged with the health facilities. Since then, many more are likely to be inactive, because of the suspension of GAVI HSS funds since 2014.

- Lack of funds for routine immunization and Reach Every Ward (REW) activities at the local level. Nigeria has a national policy of Reach Every Ward and there has been a series of trainings on this strategy, using GAVI HSS and ISS funds. This has led to all LGAs developing microplans and improving other aspects of planning (e.g., vaccine forecasting, supervision plans). However, the lack of operational funds at the local level has affected the ability of many LGAs and health facilities to implement key components of REW, especially communications, activities to involve the community in planning, supportive supervision, and monitoring for action. According to the 2015 Joint Appraisal report, LGAs also often lack funding for essential operational expenses for routine immunization, such as cold chain maintenance and fuel costs, and transport for vaccine deliveries, outreach activities and supervision visits. This is due to inadequate budgets at the state and LGA levels for such routine expenses, as well as the slow release of GAVI ISS funds available to the states. In the combined post introduction evaluation (PIE) report for the introductions of PCV and IPV, 85% of health facilities reported having had a supportive supervision visit in the previous six months. However, the majority of these visits were conducted not by government officials, but by partners. The lack of funds at the local level may at least partially explain the finding during pentavalent vaccine PIE that 8-55% of mothers interviewed in six out of the first 14 states to introduce the vaccine reported having to pay for the immunizations their children received that day. A summary of the impact of limited funds for operational expenses at the local level is shown in Figure 3.

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20 cMYP
22 Presentation of Post-introduction evaluation (PIE) of pentavalent vaccine introduction in Nigeria Phase I states, March 2013.
3.4 Goal 4: Introduce new and improved vaccines and technologies

Nigeria has been slower to introduce new vaccines than a number of other countries in the region, in large measure because of GAVI’s policy for many years that required that countries achieve a national DPT3 coverage rate of at least 70% before being able to apply for support for new vaccine introductions. All vaccine introductions have received GAVI financial support, as well as technical support from several partners. These vaccine introductions have also all been phased in by state – taking eight months to one and a half years. The phased-in introductions have allowed for the variation among states in their readiness to introduce a new vaccine, including their cold chain capacity, and for the time needed to expand their cold chain and logistics system to accommodate the new vaccine. In the case of pentavalent vaccine, the phased introduction was also due to the limited global availability of the vaccine. The following vaccine introductions have taken place in the past four years:

**Meningitis A vaccine in mass campaigns**

Campaigns for 1-29 year olds were conducted in four phases – one per year – between 2011 and 2014 in the country’s 23 states at high risk for meningitis. A post campaign survey conducted in the Phase 4 states in...
2014 estimated a coverage rate of 88% for that phase, indicating good quality of the campaigns and high population demand for the vaccine.24

Pentavalent (DPT-HepB-Hib) vaccine

This vaccine was introduced in three phases from May 2012 to December 2013. A post-introduction evaluation was conducted in the 14 Phase 1 states in March 2013 to provide lessons learned and inform the introduction for the two remaining phases. According to the evaluation, the introduction generally went well, with a good training program in which at least one health worker per health facility had been trained; extensive publicity about the introduction, including launch ceremonies; good population acceptance of the vaccine and high demand; and the availability of updated data collection tools in all states.25 The main weaknesses were the lack of introduction plans at the LGA level; insufficient funds at the LGA and health facility levels to transport vaccine, repair or replace broken refrigerators or to conduct supervisory visits; and the absence of adverse events following immunization (AEFI) surveillance.

PCV-10 vaccine

PCV introduction was approved by GAVI in 2013 and slated to begin later that year in most of the same Phase 1 states as for pentavalent vaccine introduction. Phase 1 was delayed until December 2014 due to a global shortage of the vaccine and to delays in finalizing an agreement between the Government and UNICEF to allow UNICEF to serve as the fiduciary agent (or “pass through”) for GAVI vaccine introduction grant funds after GAVI HSS funds were frozen in early 2014, as described above. Phase 2, in nine more states, was scheduled for October 2015, but delayed till January 2016, and Phase 3 (originally planned for January 2016) took place in July. A key reason for the delays in the later phases was the failure of several states to pass the readiness assessment required for PCV-10 introduction to ensure proper handling by health workers of this vaccine, which is presented in two-dose vials without preservative and requires open vials be discarded within six hours.

A PIE conducted in the Phase 1 states found a generally successful introduction, with early and strong planning, strong buy-in from some state political leaders (who participated in launch ceremonies), training of at least two health workers per facility, which included refresher training and was well-received; and no major issues with vaccine logistics or distribution.26 The main problems identified were:

- A lag of around two months between the training of health workers and introduction of the vaccine in some states because of health workers strikes and security issues;
- Gaps in communication about the vaccine due to a lack of funds for local social mobilization activities, insufficient availability of IEC materials and inadequate inter-personal communications between health workers and parents. Consequently, 60% of caregivers interviewed for the evaluation were not aware of which vaccines their child had just received, and 24% overall (and 85-90% in two states) weren’t aware of the date for the next visit for subsequent doses;
- The reluctance among 15% of health workers overall – and 40% in three states – to administer three injections (for pentavalent, IPV and PCV) to a child during the same visit, potentially resulting in missed opportunities and increased dropout rates.

Despite these issues, the introduction of PCV, as well as pentavalent vaccine, did not appear to disrupt the routine program or negatively impact coverage rates of other vaccines in the schedule, since the WUENIC coverage rate estimates of all vaccines have increased each year since these vaccine introductions began.

Inactivated polio vaccine (IPV)

This vaccine was introduced over an eight-month period in 2015 in six phases, with delays in some states due to a delay in GAVI approval of the vaccine introduction grant and to health worker strikes. All accounts are that the introduction was well implemented.

Concerning future vaccine introductions, Nigeria is graduating as a GAVI country in December 2021, and has up to the end of 2017 to apply for GAVI support for any other vaccine introductions. Its plans call for meningitis A vaccine to be introduced into the routine schedule in 2017 in the 23 high-risk states, followed by rotavirus vaccine introduction in 2018. The country’s application for GAVI for rotavirus vaccine, first submitted in 2014, has recently been resubmitted (with revisions to address the review committee’s comments) and approved (with clarifications). Introduction of the vaccine is planned to begin in 2018.

The addition of a second measles dose, MR campaigns and a pilot HPV project are also mentioned in the 2016-2020 cMYP. However, these introductions are still in the discussion stage.

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25 Presentation of Post-introduction evaluation (PIE) of pentavalent vaccine introduction in Nigeria Phase I states, March 2013.
26 Report on the Post-Introduction Evaluation of Pneumococcal Conjugate Vaccine (PCV10) and Inactivated Polio Vaccine (IPV) in Phase 1 States in Nigeria, March 2016.
Partner support to address remaining challenges to meet the GVAP goals and targets
As in other countries, development partners have played a key role in Nigeria’s efforts to eradicate polio – by helping to build a robust AFP/polio surveillance system and conduct polio vaccination campaigns, as well as to control other epidemic-prone diseases (measles, yellow fever, meningitis A) through case-based disease surveillance and vaccination campaigns. The more than 11,000 health workers supported by WHO and UNICEF with policy eradication program funds have been critical to these efforts, as well as to helping with improvements to the routine immunization program. Technical and financial support from partners, including GAVI funding, has also played an important role in the country’s successful introduction of three new vaccines in the past four years.

Below we highlight three areas of partner support that are addressing key issues that have been discussed above.

**Expansion of the cold chain system and improving vaccine management**

The ability of health facilities to provide immunization services on a weekly or more frequent basis has been hampered in the past by inadequate cold chain capacity at state and LGA stores and a lack of refrigerators in many health centers. This problem has been compounded by inadequate vaccine stock management, resulting in frequent stockouts of vaccines at sub-national levels. In the PCV/IPV’ post-introduction evaluation, for instance, 36% of health facilities visited reports stockouts of vaccines (BCG, IPV, yellow fever) in the past six months.

To address this problem, a major activity of partners in the past several years has been to strengthen the cold chain system and vaccine management, using funds from the GAVI HSS grant and other partner support. Two sub-national hubs were established to store and distribute vaccine and devices, in addition to the central stores in Abuja. In the past few years, more than 1,600 solar direct drive (SDD) refrigerators have been procured and installed in health facilities in wards with large populations, as well as other cold chain equipment. There has also been a series of national and state-level trainings in cold chain maintenance and operations for cold officers and technicians. To address the issue of vaccine management and to prevent unnecessary local stockouts, partners (WHO, UNICEF and CHAI), worked with the Government to set up a vaccine stock management “dashboard” in 2015. This is an Excel-based tool that provides a snapshot of the vaccine inventory at all levels of the system, based on weekly reports sent to LGAs to the states, which are then passed on to the National Logistics Working Group. The dashboard has greatly increased the ability of the national and state logistics personnel to monitor vaccine stock levels at the lower levels on a weekly basis and to act accordingly. According to one source, many LGAs that were chronically under-supplied with several vaccines in the past have not experienced a single stockout during the first half of 2016.

**Ensuring sustainable financing for routine immunization**

As described above, a lack of funds for operational costs at the local level has been a key bottleneck in improving immunization coverage rates in Nigeria. A major reason for the lack of funds is that such expenditures are not included in the states’ recurrent budgets – which are guaranteed – but are instead often included under ad hoc, unprotected budgets. To ensure more adequate funding for routine immunization activities, the Gates Foundation and the local Dangote Foundation have entered into three-year agreements with two Northern states, Kano and Bauchi, which require the states to include all operational costs for routine immunization in their recurrent budgets. Each state has also set up a routine immunization basket into which the state funds are placed, along with contributions from both foundations. The share of the budget paid by the foundations is 75% in the first year (and includes capital costs for refrigerators to ensure that at least one health facility per ward is able to store vaccines), and 50% in the second year. By year 3, the states will cover all costs. The partners, which also include USAID, are providing technical support under this initiative in microplanning, data management, supportive supervision, M&E and community engagement. The plan is to establish similar agreements and routine immunization basket funding in four additional Northern states.

**Development of a single, integrated data management system for immunization program data**

As mentioned above, there are currently two parallel systems for collecting immunization data – the EPI’s system in the NPHCDA that uses the DVD-MT platform, and the FMOH’s HMIS, which uses the DHIS2 platform. Each system at present uses different population data and produces different coverage estimates. Partners, including CDC, are assisting the Government to improve the immunization component of the HMIS in the aim of creating a single immunization data management system (the DVD-MT system will be phased out over time).
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- Jenny Sequeira, Gates Foundation

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Annex 1: Country immunization profile

1. General indicators
   - GNI (USD): 2,950
   - WB Status: Lower Middle Income
   - Infant mortality (<12 M) rate: 69
   - GAVI Status: Graduating
   - Total Population: 182,202,000
   - Birth Cohort: 7,133,000
   - Surviving Infants: 6,622,000

2. Polio
   - Transmission stopped in 2014, but new WPV cases have been detected in August 2016.
   - Eradication certified (not yet).

3. Measles and rubella

Figure 4: reported measles cases and MCV1 coverage, Nigeria, 1990-2015

![Reported Measles cases and MCV1 vaccination coverage, Nigeria, 1990-2015](chart.png)

Source:
- WHO-VSV database, data reported to WHO by member states as of 30 June 2016
- WHO-UC/IEF estimates of immunization coverage (WUE/VC) to be updated by mid-July 2016
**Table 1: SIA activities planned in 2016-2017**

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<td>14/06/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>2,536,136</td>
</tr>
<tr>
<td>NID</td>
<td>tOPV</td>
<td>2016</td>
<td>27/02/2016</td>
<td>01/03/2016</td>
<td>0 to 5 years</td>
<td>National</td>
<td>Planned</td>
<td>62,037,657</td>
</tr>
<tr>
<td>SNID</td>
<td>bOPV</td>
<td>2016</td>
<td>15/10/2016</td>
<td>18/10/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>27,916,946</td>
</tr>
<tr>
<td>SNID</td>
<td>tOPV</td>
<td>2016</td>
<td>16/01/2016</td>
<td>19/01/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>2,528,986</td>
</tr>
<tr>
<td>Mop up</td>
<td>mOPV2</td>
<td>2016</td>
<td>09/05/2016</td>
<td>12/05/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>2,670,459</td>
</tr>
<tr>
<td>Mop up</td>
<td>mOPV2</td>
<td>2016</td>
<td>18/06/2016</td>
<td>19/06/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>3,440</td>
</tr>
<tr>
<td>NID</td>
<td>tOPV</td>
<td>2016</td>
<td>19/03/2016</td>
<td>22/03/2016</td>
<td>0 to 5 years</td>
<td>National</td>
<td>Planned</td>
<td>62,037,657</td>
</tr>
<tr>
<td>SNID</td>
<td>bOPV</td>
<td>2016</td>
<td>14/05/2016</td>
<td>18/05/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>30,000,000</td>
</tr>
<tr>
<td>SNID</td>
<td>tOPV</td>
<td>2016</td>
<td>16/01/2016</td>
<td>19/01/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>27,500,275</td>
</tr>
<tr>
<td>Mop up</td>
<td>IPV + mOPV2</td>
<td>2016</td>
<td>09/07/2016</td>
<td>16/07/2016</td>
<td>0 to 5 years,0-23M</td>
<td>Sub-National</td>
<td>Planned</td>
<td>2,534,469</td>
</tr>
<tr>
<td>Mop up</td>
<td>mOPV2</td>
<td>2016</td>
<td>25/06/2016</td>
<td>28/06/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>1,957,604</td>
</tr>
<tr>
<td>Mop up</td>
<td>mOPV2</td>
<td>2016</td>
<td>23/07/2016</td>
<td>26/07/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>1,955,575</td>
</tr>
<tr>
<td>Mop up</td>
<td>mOPV2</td>
<td>2016</td>
<td>27/08/2016</td>
<td>30/08/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>1,955,575</td>
</tr>
</tbody>
</table>

Source: WHO/IVB Database as at 12/4/2016

4. **MNT**
   - Not yet validated - planning a pre-validation assessment in 1-2 geopolitical zones before the end of the year
5. Coverage and Equity

**Figure 5**: All vaccines national coverage, Nigeria, 2000-2015

**Table 2**: Reported DTPCV doses administered & coverage, Nigeria, 2000-2015

* COE: country Official Estimates

Source: WHO/IVB database, data reported to WHO by member states as of 1 July 2016
Figure 6: Percentage of district achieving <50%; 50-79% and ≥80% coverage, 2000-2015

Figure 7: Map with DTP3 coverage by district/province 2010 and 2015 (administrative data)
Figure 8: Immunization coverage data disaggregated by sex and wealth quintile

6. Immunization systems highlights

- Immunization schedule

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCG</td>
<td>birth</td>
</tr>
<tr>
<td>DTaP-HbHib-HepB</td>
<td>6, 10, 14 weeks;</td>
</tr>
<tr>
<td>HPV</td>
<td>birth</td>
</tr>
<tr>
<td>HepB</td>
<td>14 weeks;</td>
</tr>
<tr>
<td>IPV</td>
<td>9 months;</td>
</tr>
<tr>
<td>Measles</td>
<td>9 months;</td>
</tr>
<tr>
<td>MenA</td>
<td>birth; 6, 10, 14 weeks;</td>
</tr>
<tr>
<td>OPV</td>
<td>6, 10, 14 weeks;</td>
</tr>
<tr>
<td>Pneumo_conj</td>
<td>1st contact in pregnancy; +1, +6 months; +1, +1 years;</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>1st contact in pregnancy; +1, +6 months; +1, +1 years;</td>
</tr>
<tr>
<td>TT</td>
<td>6, 12 months;</td>
</tr>
<tr>
<td>Td</td>
<td>9 months;</td>
</tr>
<tr>
<td>VitaminA</td>
<td></td>
</tr>
<tr>
<td>YF</td>
<td></td>
</tr>
</tbody>
</table>

- Planning and management:
  - Stockout events 2015: none
  - cMYP: 2011-2015
  - Annual Plan: Yes
- Country decision making: NITAG recently established
- % of total expenditures on vaccines financed by government funds: 41%
PAKISTAN
Progress towards achievement of GVAP/RVAP goals
## 1. Summary

This summary table describes the current situation in Pakistan regarding achieving the GVAP goals. Data used to assess progress towards achievement of GVAP goals are included in the annex (Country immunization profile).

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socio-demographic</strong></td>
<td>GNI 2014</td>
<td>1410</td>
<td></td>
</tr>
<tr>
<td></td>
<td>WB Status</td>
<td>Lower Middle Income</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Infant mortality (&lt;12 M) 2015 UN IAG CME</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gavi Status</td>
<td>Eligible</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Population</td>
<td>188,925,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Birth Cohort</td>
<td>5,451,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Surviving Infants (JRF)</td>
<td>5,088,000</td>
<td></td>
</tr>
<tr>
<td><strong>1. Interrupt wild poliovirus transmission</strong></td>
<td>Transmission Interrupted</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Risk of late detection</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percent of adequate stool specimens (Rolling 12m) Target &gt; 80%</td>
<td>89.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Risk of late detection</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non polio AFP rate (Rolling 12m ) Target &gt; 2</td>
<td>9.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Risk of spread after importation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(% of kids 6M-59M having received less than 3 doses in the last year before occurrence case/environmental positive)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>2. Neonatal tetanus elimination</strong></td>
<td>Coverage for TT (reported 2015)</td>
<td>68%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Protection at Birth against T (WUENIC 2015)</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Last SIAs conducted in the country</td>
<td>Last activity done was in September 2013.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elimination validation date</td>
<td>Not yet validated. A validation survey being planned for Punjab in October/November 2016</td>
<td></td>
</tr>
<tr>
<td><strong>3. Measles Elimination</strong></td>
<td>Coverage MCV1 (2015 WUENIC)</td>
<td>61%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coverage MCV2</td>
<td>53%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percentage of districts with MCV1 coverage &gt;=95% (2015 JRF)</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Last national SIA</td>
<td>2008</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post SIA coverage survey conducted</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td><strong>4. Rubella/CRS Elimination</strong></td>
<td>Coverage R</td>
<td>Not introduced (2014)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIAs planned?</td>
<td>SIAs planned 2018</td>
<td></td>
</tr>
<tr>
<td><strong>5. Reach 90% national coverage and 80% in every district with DTP3cv</strong></td>
<td>National coverage (WUENIC 2015)</td>
<td>72%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Drop-out rate DTP1 DTP3 (2015 WUENIC) (DTP1-DTP3)/DTP1*100</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Actual numbers of children that dropped out (2015 WUENIC)</td>
<td>356163</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Difference between poorest and richest quintile DTP3 coverage (2013 data)</td>
<td>58.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% District coverage reaching 80% coverage from 2015 JRF</td>
<td>60%</td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>Indicator</td>
<td>Pakistan</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
</tbody>
</table>
| 6. Reach 90% and 80% coverage with all vaccines in national immunization programmes | National Coverage (2015 WUENIC)                                           | BCG 85  
DTP1 79  
DTP3-HepB3-Hib3 72  
MCV1 61  
MCV2 53  
PCV3 72  
Pol3 72 |
| 7. Introduction of new vaccines                                      | New Vaccines introduced                                                   | PCV in 2012 and Rota planned in 2017                                                         |
| 8. Reduction in under 5 mortality rate                               | UM5R 2010 and 2015 (% diminution between 2010 and 2015)                   | 2010: 91.8  
2015: 81.1 (11.7%)                                                                         |
| 9. NITAG                                                            | NITAG established?                                                        | Yes                                                                                           |
| 10. Government expenditure on routine immunization per live birth USD | Baseline 2010-2011 and average for 2013-2015 (% change)                   | 8.5 to 5.8 (-32%)                                                                             |

2. Country ownership of the immunization programme

2.1 Overview of country ownership in its primary health care system, including immunization

In 2011, an amendment to the Pakistani constitution devolved the responsibility of health services from the Federal to the Provincial level and dissolved the Ministry of Health. Decentralization significantly changed the management of immunisation in Pakistan; it permitted a tailored approach to meeting provincial needs but caused initial confusion around the roles and responsibilities of EPI staff and financing at all levels, primarily due to the unclear division of roles and responsibilities for federal and provincial governments. There is also concern about the limited capacities of provincial governments to provide services, possibilities of differing immunization schedules and protocols, and disparate delivery strategies between provinces. Significant progress has been made since 2015 on the clarification of roles and responsibilities.

As it stands, provincial governments are responsible for the implementation and execution of immunization services and of increasing immunization coverage, while the Federal EPI Cell under the newly created Ministry of National Health Services, Regulations and Coordination (MoNHSRC) has the responsibility for coordination, technical support, international collaborations and donor coordination, disease information and surveillance, monitoring of infectious diseases in addition to regulations, standards and accreditations. Recently a Health Planning, System Strengthening and Information Analysis unit was created to oversee and coordinate health systems related work in the country. Immunization and health systems objectives are both represented in Pakistan’s National Immunisation Support Project (2016-2020) which is tasked with increasing the equitable coverage of services for immunisation against vaccine preventable diseases (VPD), for children under 2 years of age. This includes improving immunisation services through strengthening of routine immunisation systems (as part of the country’s health system).

Within the newly decentralized health system, the federal health authorities remains exclusively
responsible for fulfilment of national commitments at the global and regional levels (such as the Sustainable Development Goals) while supporting sub-national entities in the implementation of their respective immunization programs. Political leadership on immunization has improved over the past few years, particularly at the federal level, but varies between provinces. However, despite significant efforts by the government and its partners, Pakistan’s immunization indicators have yet to reach expected benchmarks. The key goals of polio eradication and measles and neonatal tetanus elimination are still not achieved. Additionally routine vaccination coverage remains insufficient, as evident in several recent outbreaks of measles, pertussis and diphtheria in different parts of the country. Coverage of maternal and child health services, contraception, vaccination and communicable disease control is mostly better in urban areas than in rural areas, and there are significant geographic disparities.

CSOs can be essential to reaching immunization targets, particularly in hard to reach areas and urban slums. However communication and roles need to be better defined and coordinated with the EPI programme. This has been recognized in the creation of the CSO unit, a coordinating unit to serve as an interface between the Government, CSOs and UNICEF. This unit was relocated to the office of Federal EPI in 2013 to ensure that it is better position to fulfill its function to strengthen health systems, but has recently become non-functional due to vacancies in key positions. A window of opportunity exists in the engagement of CSOs in Pakistan in demand generation for better health service delivery, as well as community mobilisation through advocacy, communication for development and other social mobilisation approaches. By the virtue of their presence, CSOs can augment the capacity and coverage of public sector community health workers by deploying additional workforce. This would be particularly suited to areas where people resist vaccination due to some myths and misconceptions. Civil society has played a significant role in health systems strengthening in Pakistan, by extending support to government counterparts.

### 2.1.1 Immunization policy decision-making capacity

A National Immunization Technical Advisory Group (NITAG) exists comprised of renowned scientists, experts in different technical disciplines as core members along with key technical partners and relevant professional bodies as liaison members. This body provides technical advice on immunization to the ministry and has been instrumental in recommending new vaccine introductions. The ICC, as a strong governing body for Gavi support and overall immunization, is not fully functional and needs to be further strengthened.

#### 2.1.2 Government Financing of Immunization

Except for Penta and PCV10, all other vaccines and required injection equipment are procured by the federal government with its own resources. Penta and PCV10 are procured through co-financing agreements with Gavi, but Pakistan has been in default repeatedly since 2012 due to non-fulfilment of obligations in timely procurement of these vaccines. These defaults can be attributed to delayed or unsuccessful tenders and issues with release of funds under PC-1, which follow the financial cycle of June – July as compared to the Gavi requirement of making co financing by the end of calendar year. During the last quarter of 2015, based on government’s request, Gavi approved certain flexibilities in its programmatic interaction, under the country tailored approach policy (CTA), which includes an alignment of the co-financing cycle with the country’s fiscal year (adjusting Pakistan’s co-financing for 2015 until June 2016). Despite this - the country did not meet all of its co-financing obligations for 2015. Pakistan is in the process of introducing IPV in the RI schedule with GAVI support and Hepatitis B birth dose with its own resources. Significantly, devolution of health services without clear division of roles and responsibilities for federal and provincial governments has negatively affected performance of Gavi grants. However in the past year, PC-1s have been approved for the provinces and implementation is underway, a milestone of post-devolution financing.

#### 2.1.3 Human resource situation

The EPI in Pakistan has serious shortfalls in the quality and number of human resources at both the management and operational level. Most of the provincial/area program offices including the Federal EPI have insufficiently skilled staff with insufficient technical and managerial competency. Certain areas (Particularly FATA, CDA/ICT, GB and AJK) experience severe human resource shortages. In some areas, there are only 1-2 dedicated EPI staff. The population of the areas combined is around 10 million and contains territory with challenging terrain because of the lack of infrastructure and high insecurity. TORs are unspecific, there is an overall lack of accountability, limited career potential and often limited job security. Orientation,
training and continued education is only rudimentarily provided. There is a frequent staff turnover at all levels.

Significant gaps exist specifically in cold chain and logistics staff number and technical knowledge at Federal and Provincial levels. Temporary support is provided by partners (WHO, UNICEF and USAID) to the federal and provincial program offices through secondments or other contractual arrangements, but their adequacy as well as current state of utilization is being questioned due to limited management capacity. The vaccinator / population ratio is very low resulting in highly irregular service delivery. The new EPI policy requires a minimum number of vaccinators per population and geographic area. Provinces have taken initiatives to recruit more vaccinators and at the same time train Lady Health Workers (LHWs) to perform routine immunization services.

The use of Lady Health Workers (LHWs) and Lady Health Supervisors (LHSs) is being explored by a number of provinces to strengthen Routine Immunisation through service delivery. If more LHWs are used in campaigns, then vaccinators will have more time for RI. Previously, LHWs were used in social mobilisation and health education. Pakistan has more than 110,000 Lady Health Workers at the community level and they play an integral role in bridging between health facility and community for providing essential health services to communities, especially in rural areas that are difficult to reach. Currently not all provinces allow LHWs to provide all vaccines, but this is under discussion. Ongoing training activities (funded from unspent funds from HSS-1) for LHWs and an assessment of their contribution to RI is underway. In May 2016, WHO with Gavi funding support held a consultation on the use of LHWs in RI. One of the significant workshop decisions included the formation and establishment of coordination committees at the Federal, Provincial, District and Health Facility level. Availability of these LHWs as female vaccinators will not only be a tremendous boost for vaccination service delivery for improving EPI coverage in Pakistan, but will also be more culturally acceptable to the community. LHWs have access to women and households in ways that other healthcare givers might not; they are important for increasing routine immunization and in strengthening other childcare practices.

CSOs have continued to play a significant role, particularly focusing on strengthening routine immunization, and have somewhat alleviated the personnel shortage. CSOs have clearly agreed on concrete results in terms of number of children immunized/percentage increase in immunization (BCG, Penta 3 and Measles). Because the CSOs are successful at social mobilization, they have been key for arranging vaccination camps and vaccination points to ensure vaccination of children (missed and defaulter children). There is some concern that CSOs are not fulfilling their task to reach children in areas where government vaccinators cannot go; however the CSOs have remained successful in increasing immunization coverage and addressing refusals. The district governments also truly appreciate and realize CSOs contribution. At many occasions, district health offices, issued letter of appreciation in recognition of CSOs work for immunization.

3. Progress towards specific GVAP goals (issues/challenges/successes)

3.1 Goal 3: Meet vaccination coverage targets

- Achieve 90% National coverage and 80% in every district with 3 doses of diphtheria-tetanus-pertussis containing vaccines
- Achieve 90% National coverage and 80% in every district with all vaccines included in the national schedule

Immunization coverage in Pakistan has stayed steady over the last decade. Most of the coverage surveys in Pakistan have given varying figures, yet have a consensus on a slow progress on immunization coverage. The current coverage, as estimated by different surveys, varies between 47% and 88%. The elements of over reporting in the routine data and of recall biases in the PDHS and PSLM cannot be ruled out. Pakistan's
coverage rate with the most basic vaccines stood at 73% in 2014 although there are large variations between the four main provinces – the most recent Pakistan Demographic Health Survey, from 2013, showed Punjab had 76% coverage while in Balochistan the figure was just 27%. This can be largely attributed to Punjab’s strong political commitment to increasing coverage; through the DFID sponsored Roadmap project, which gives Android phones to vaccinators and requires them to check in to vaccination posts, coverage has increased from 64% to 82% in one year. This successful program is now being expanded to KPK and Balochistan. Measles coverage ranged from 57% to 95% by province. Children under 2 years of age who never received any vaccination ranged from 2% to 30%. The estimated coverage for a fully immunized child in Pakistan varies between 56% and 88%, with considerable variation among provinces5 (PDHS, PSLM).

Except for two provinces, the vaccine delivery model is almost entirely vertical, with challenges even for creating synergies between non-RI vaccination programs. Questions were raised about the certification of vaccinators (currently non-existent), the lack of use of other health providers such as CHWs and overall how to standardize vaccination outreach services.

### 3.2 Goal 1: Achieve a world free of Poliomyelitis (G1.1 & G1.2)

Polio remains a top priority in Pakistan as one of the two remaining countries in the world still harboring the wild virus. There are increasing opportunities for synergies between the Polio and EPI programs at federal and provincial level – with improved collaboration in the Emergency Operating Centers, now also – at times - covering routine immunization issues. A PEI-EPI Synergy Plan was agreed in 2013 and updated in June 2015. Structural interaction can be much improved here, e.g. with regards to the joint oversight of service provision, the role of vaccinators in campaigns and routine immunization, the monitoring of immunization performance, and the reduction of missed opportunities.

In Pakistan, the number of children in inaccessible areas has been reduced from more than 600,000 in 2013 to 16,000 in 2015. The programme is prioritizing efforts to access the remaining unreached children, and maximizing immunity through a series of strategies including OPV SIAs, using IPV in specific areas, setting-up health camps, and expanding Continuous Community Protected Vaccination (CCPV). There have been no persistent cVDPVs since March 2015 in Pakistan. There is an ongoing study in Pakistan to assess the immunogenicity (i.e. humoral immunity) of fractional-dose IPV and its usability in SIAs.

Pakistan is one of the ten countries where UNICEF aims to enhance equity in routine immunization hence contributing to health system strengthening efforts with improved immunization outcomes. GAVI provided funds for the technical support to introduce and support methodologies to identify main drivers of inequities shifting the focus beyond national level planning for ‘Reaching Every District / Reaching Every Community’ (RED/REC) approach. Recent surveys have identified multiple barriers to immunization, including but not limited to: Disease awareness and risk perception, vaccine doubts, alternative means of prevention, healthcare provider risk perception, transport and waiting time, unavailability of vaccine and vaccinators, and missing home-based vaccination cards/imunization record.

Additionally, there is very low level of coverage of children belonging to parents migrating for economic or social reasons. To address this, the government of Punjab took the initiative to address internal migration between districts through targeting vaccination outreach at transit points. The initiative focuses on children under 5 years of age. Transitory point locations include bus stations, airports and regular transit areas between districts.

It is well documented that parental doubts about the efficacy and safety of vaccines and immunization have the potential to lead to refusal and rejection of vaccination in both developed and developing countries. In Pakistan, supplementary immunization activities (large scale campaigns) for polio eradication have been the target of malicious rumours and misinformation, which often centre on the polio vaccine. This may to some extent have had a negative effect on public attitudes towards vaccines in general.

The delivery of the polio vaccine house to house, has left communities with the expectation that all immunisation services will be delivered to their home. There is a need to change perception/behaviours to enable community to differentiate between polio eradication efforts and routine vaccine preventable diseases. While hesitancy and vaccine refusal may be less significant in some areas, behaviour change interventions need to focus on shifting the mind set of caregivers to seeking immunisation services from fixed vaccination centres. Communication strategy should focus on overcoming barriers to improving coverage and equity, engage effectively with communities, and localize demand generation interventions specific to the target populations. In light of increasing polio cases...
since 2007, a major share of funding for immunization services is earmarked to polio eradication campaigns. Continuous polio campaigns have a significant impact on routine EPI services, particularly since this entails cessation of routine EPI services for a few days every month. Polio and routine immunization interactions bring lots of opportunities and some challenges. Synergy between the two programmes should be strengthened according to the approved plan. One window of opportunity is the EPI-PEI Synergy Plan and there is a critical need for using Polio assets for strengthening RI through integrated communication for both Polio and EPI. IPV introduction under RI is a good example of integrated communication yet there is a strong need for a close coordination between National and provincial EOCs.

The number of polio cases decreased from 558 in 199 to 91 in 2013, primarily from inaccessible and security compromised areas.

3.3 Goal 2: Meet global and regional elimination targets

3.3.1 Achieve maternal and neonatal tetanus elimination (G2.1)

TT vaccination of pregnant ladies varied from 22% in Loralai to 79% in Rawalakot; Antenatal care coverage from 22% in Tharparkar to 92% in Peshawar; and deliveries by skill birth attendants from 22% in Tharparkar to 94% in Kotli. Knowledge about proper timing of first antenatal care visit was the lowest (25%) in Sanghar and the highest (81%) in Rawalakot.

TT SIAs were implemented in early 2015 in selected tehsils of districts in Punjab. Pre-validation surveys were done in Punjab in April 2016, with validation planned for November 2016. Other provinces will be considered for validation later down the line and are currently conducting risk assessments with SIAs in high risk areas. Issues hampering progress towards this goal are active polio virus circulation, insecurity and poor access to certain areas, and availability of TT Uniject.

The number of cases of tetanus (neonatal and total) has been decreasing steadily from 1,660 in 1999 to 320 in 2012.

3.3.2 Achieve measles elimination (G2.2) and rubella & CRS elimination (G2.2)

Pakistan experiences outbreaks of measles in 2006, 2008, and 2013. Out of the 108,888 suspected cases, 8,046 cases of measles were laboratory confirmed. GAVI partially supported the Measles SIA following the massive measles outbreak in Pakistan in 2012 and 2013. The measles campaign was launched in 2014 in the whole of Pakistan except FATA (~3.9% of target population), where the campaign was planned to be conducted in August 2015. The campaign covered 58 million children from 6 months to 10 years of age for measles vaccine with a reported national coverage of 103%. A third party evaluation of the coverage in Sindh province found coverage to be 95%. Following the massive measles outbreak in Punjab in the early 2013, Punjab government took initiative to conduct a mass immunization activity in all districts of Punjab. The provincial government used their own resources to conduct the activity across the province in phases. All vaccine and operational cost were borne by the provincial government. Later, upon completion of the campaign in 23 districts, Punjab Health Dept. decided to conduct a 3rd party survey to assess the coverage independently. Overall coverage was estimated 91.8%. Vaccination coverage was found higher among the <5 age cohort (92.6%) than 5 to <10 years age cohort (90.9%).

Rubella was laboratory confirmed in 483 out of 2,907 suspected cases. Rubella-containing vaccine has not yet been introduced in Pakistan.

3.4 Introduce new and improved vaccines and technologies

Gavi commenced support to Pakistan through the introduction of Hep B vaccine in 2002 and has been supporting Pakistan’s National Immunisation Programme through different windows of support, namely New Vaccine Support (NVS), Immunisation Services Support (ISS) and Health System Strengthening (HSS). Civil Society Organization (CSO) funding was also available through the programme cycles. Penta and PCV10 were introduced in 2008 and 2012 respectively and Pakistan most recently introduced Inactivated
Polio Vaccine (IPV) in July 2015, starting from Punjab province and nationally completed roll-out in January 2016 (in FATA). The introduction of IPV in 2015/2016 and the switch from tOPV to bOPV are significant recent achievements in immunisation in Pakistan. In addition, a Rotavirus application has been received by the IRC and recommended for approval with some clarifications. The Government of the Punjab Province has committed to introduce rotavirus in 6 districts in 2016 through its own resources and is getting ready for roll out the entire Province in 2017 with Gavi support. This introduction was mainly driven by strong political leadership in Punjab and a great immunization success.
Partner support to address remaining challenges to meet the GVAP goals and targets area
Partner support for immunization activities is similar to that in many other GAVI-supported countries, with major partners providing financial support and technical assistance for polio and measles immunization campaigns, new vaccine introductions, surveillance, training, social mobilization, cold chain improvements and so forth (see Table 1).

## 1. Activities conducted by partners by category

### Table 1: Partners and areas of assistance in Pakistan

<table>
<thead>
<tr>
<th>Partner</th>
<th>Assistance Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHO</td>
<td>Policy and leadership (development of cMYP, financial sustainability plan)</td>
</tr>
<tr>
<td></td>
<td>Disease surveillance (case-based measles surveillance as part of integrated VPD surveillance)</td>
</tr>
<tr>
<td></td>
<td>Immunization campaigns/SIAs</td>
</tr>
<tr>
<td></td>
<td>Microplanning for Reach Every District (RED)/ Reach Every Community (REC) approach</td>
</tr>
<tr>
<td></td>
<td>New vaccine introductions (PCV10, IPV)</td>
</tr>
<tr>
<td></td>
<td>HR support to Federal and Provincial levels</td>
</tr>
<tr>
<td></td>
<td>Cold chain improvements (EVM assessment and implementation)</td>
</tr>
<tr>
<td>Government of China</td>
<td>Provides cold rooms, refrigerators, refrigerator trucks, and repair and maintenance of the cold rooms and trucks</td>
</tr>
<tr>
<td>USAID</td>
<td>Support in the development of vaccine logistics management information system (vLMIS) for immunization along with its operationalization in 54 districts through the Deliver Project</td>
</tr>
<tr>
<td></td>
<td>Deliver provided both hardware and software along with the trainings on vLMIS</td>
</tr>
<tr>
<td></td>
<td>Funding MCHIP for routine immunization in some districts of Sindh</td>
</tr>
<tr>
<td>UNICEF</td>
<td>Implementing RED/REC starting in 23 districts; plans to scale up this approach in one-fifth of the country during the next five years</td>
</tr>
<tr>
<td></td>
<td>Procurement of vaccines and logistics</td>
</tr>
<tr>
<td></td>
<td>Supported the construction/renovation of 19 warehouses across four provinces and one area i.e., Gilgit Baltistan (GB)</td>
</tr>
<tr>
<td></td>
<td>Cold chain improvements (EVM assessment and implementation)</td>
</tr>
<tr>
<td></td>
<td>Development and implementation of the communication plans for the Measles SIA across four provinces and four areas (AJK, GB, FATA, ICT/CDA) in addition to development of Measles and RI messages</td>
</tr>
<tr>
<td></td>
<td>New vaccine introductions (PCV10, IPV)</td>
</tr>
<tr>
<td></td>
<td>Based on the findings of the National KAPB survey, supported the development of the national communication strategy for RI</td>
</tr>
<tr>
<td>World Bank</td>
<td>Support in the designing and development of National Immunization Support Project to improve coverage</td>
</tr>
<tr>
<td></td>
<td>Provided technical support in holding workshops for the development of Disbursement linked indicators (DLI) and for building understanding and consensus amongst the provincial programmes</td>
</tr>
<tr>
<td></td>
<td>Provided consultants for the development of NISP PC-1s for the Provincial and Federal levels</td>
</tr>
<tr>
<td>JICA</td>
<td>Support has been provided to measles SIAs and cold chain in KPK</td>
</tr>
<tr>
<td>Rotary International</td>
<td>Supported immunization primarily through polio work</td>
</tr>
</tbody>
</table>
2. Gaps in support to meet needs

The main areas identified for future technical support were trainings and capacity building of health workers, LHWs and polio workers on EPI; trainings on surveillance and M&E; reporting, trainings on data reporting, use of data and analysis; need for development of robust and integrated management information system, expansion of vLMIS and scale up for integration of functions of surveillance, and M&E. The need for upgrading standardized cold chain equipment across all districts was highlighted during the EVM Assessment. In addition, demand creation for RI and the renewed engagement strategy with CSOs is an area that needs close attention.

Significantly, a census has not been undertaken for almost 18 years, leading to different practices to estimate immunisation targets. The use of different sources of data, such as polio SIA data (<1 year children from SIA tally sheet) and micro census data in certain UCs and LHW records to determine a more accurate estimate of the denominator is suggested. Provinces may consider triangulating different available sources of micro data in consultation with local experts e.g. Provincial bureau of statistics, P&D etc. and technical partners. Until this data is made available, EPI could be encouraged to use polio data for target setting in microplanning.

There are large coverage discrepancies within the country, with Punjab having the highest coverage levels and very strong political commitment, KPK and Balochistan also having strong political interest but a lower baseline than Punjab, and Sindh struggling the most. In Sindh in particular, there is significant political turnover, and a recently installed chief minister could lead to changes for the province, though this remains to be seen.

Acknowledgments

We would like to thank the following people who were interviewed for this report:

- Qamrul Hasan (WHO CO)
- Carsten Mantel (WHO HQ)
Annex 1: Country immunization profile

1. **General indicators**
   - GNI (USD): 1410
   - WB Status: Lower Middle Income
   - Infant mortality (<12 M) rate: 66
   - GAVI Status: Eligible
   - Total Population: 188,925,000
   - Birth Cohort: 5,451,000
   - Surviving Infants: 5,088,000

2. **Polio**
   Transmission not yet interrupted.

3. **Measles and rubella**

**Figure 1:** Reported measles cases and MCV coverage, Pakistan, 1990-2015
Table 2: SIA activities planned in 2016-2017

<table>
<thead>
<tr>
<th>Activity</th>
<th>Intervention</th>
<th>Year</th>
<th>StartDate</th>
<th>EndDate</th>
<th>AgeGroup</th>
<th>Extent</th>
<th>Status</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>NID</td>
<td>Measles</td>
<td>2016</td>
<td>01/05/2016</td>
<td></td>
<td>6-59 M</td>
<td>Sub-national</td>
<td>planned</td>
<td>1120163</td>
</tr>
<tr>
<td>NID</td>
<td>TT</td>
<td>2016</td>
<td>01/05/2016</td>
<td></td>
<td>15-49 Y</td>
<td>Sub-national</td>
<td>planned</td>
<td>2900000</td>
</tr>
<tr>
<td>NID</td>
<td>TT</td>
<td>2016</td>
<td>01/11/2016</td>
<td></td>
<td>15-49 Y</td>
<td>Sub-national</td>
<td>planned</td>
<td>2900000</td>
</tr>
<tr>
<td>NID</td>
<td>Measles</td>
<td>2017</td>
<td>01/03/2017</td>
<td></td>
<td>6-59 M</td>
<td>Sub-national</td>
<td>planned</td>
<td>15786660</td>
</tr>
<tr>
<td>SNID</td>
<td>bOPV</td>
<td>2016</td>
<td>24/10/2016</td>
<td>27/10/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>16430173</td>
</tr>
<tr>
<td>NID</td>
<td>bOPV</td>
<td>2016</td>
<td>11/01/2016</td>
<td>14/01/2016</td>
<td>0 to 5 years</td>
<td>National</td>
<td>Planned</td>
<td>35717767</td>
</tr>
<tr>
<td>SNID</td>
<td>bOPV</td>
<td>2016</td>
<td>18/07/2016</td>
<td>21/07/2016</td>
<td>0 to 5 years</td>
<td>National</td>
<td>Planned</td>
<td>6289433</td>
</tr>
<tr>
<td>Mop up</td>
<td>bOPV</td>
<td>2016</td>
<td>20/06/2016</td>
<td>27/06/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>2795304</td>
</tr>
<tr>
<td>SNID</td>
<td>bOPV</td>
<td>2016</td>
<td>22/08/2016</td>
<td>25/08/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>16430173</td>
</tr>
<tr>
<td>NID</td>
<td>bOPV</td>
<td>2016</td>
<td>16/05/2016</td>
<td>19/05/2016</td>
<td>0 to 5 years</td>
<td>National</td>
<td>Planned</td>
<td>35717767</td>
</tr>
<tr>
<td>Mop up</td>
<td>bOPV</td>
<td>2016</td>
<td>30/05/2016</td>
<td>02/06/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>698826</td>
</tr>
<tr>
<td>SNID</td>
<td>bOPV</td>
<td>2016</td>
<td>18/04/2016</td>
<td>21/04/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>22681250</td>
</tr>
<tr>
<td>SNID</td>
<td>bOPV</td>
<td>2016</td>
<td>15/02/2016</td>
<td>18/02/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>17335214</td>
</tr>
<tr>
<td>Mop up</td>
<td>bOPV</td>
<td>2016</td>
<td>27/01/2016</td>
<td>29/01/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>3040270</td>
</tr>
<tr>
<td>NID</td>
<td>tOPV</td>
<td>2016</td>
<td>26/09/2016</td>
<td>29/09/2016</td>
<td>0 to 5 years</td>
<td>National</td>
<td>Planned</td>
<td>34941294</td>
</tr>
<tr>
<td>NID</td>
<td>tOPV</td>
<td>2016</td>
<td>14/03/2016</td>
<td>17/03/2016</td>
<td>0 to 5 years</td>
<td>National</td>
<td>Planned</td>
<td>35717767</td>
</tr>
</tbody>
</table>

Source: WHO/IVB Database as at 01 July 2016

4. **MNT**
MNTE not yet validated. A validation survey being planned for Punjab in October/November 2016

5. **Coverage and Equity**

Figure 2: All vaccines national coverage, Pakistan, 2000-2015
Figure 3: Reported DTPCV doses administered & coverage, Pakistan, 2000-2015

* COE: country Official Estimates

Source: WHO/IVB database, data reported to WHO by member states as of 1 July 2016
WHO/UNICEF national coverage estimates, 2014 revision, data as of July 2015

Figure 4: Percentage of district achieving <50%; 50-79% and ≥80% coverage, 2000-2015

% of District reporting <50%, 50-79% and ≥80% DTP3 coverage, Pakistan
2000-2015

Source: WHO/IVB database, data reported to WHO by member states as of 30 June 2015
WHO/UNICEF national coverage estimates, 2014 revision, data as of July 2015
Figure 5: DTP3 coverage by district/province, Pakistan 2010 (admin)

Figure 6: DTP3 coverage by district/province, Pakistan 2015 (admin data)
6. Immunization systems highlights

- Immunization schedule

- Planning and management:
  - Vaccines stockout: 1 event for BCG (3 months duration)
  - cMYP: 2014-2018
  - Annual Plan: Yes

- Country decision making: NITAG meeting the 6 minimum criteria defined by WHO for a functioning NITAG

- % of total expenditures on vaccines financed by government funds: 1%
UGANDA
Progress towards achievement of GVAP/RVAPAP goals
1. Summary

This summary table describes the current situation in Uganda regarding achieving the GVAP goals. Data used to assess progress towards achievement of GVAP goals are included in the annex (Country immunization profile).

### Socio-demographic

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Data for Uganda</th>
</tr>
</thead>
<tbody>
<tr>
<td>GNI 2014</td>
<td></td>
<td>660</td>
</tr>
<tr>
<td>WB status</td>
<td>Low Income</td>
<td></td>
</tr>
<tr>
<td>Infant mortality (&lt;12 M) 2015 (UN IAG CME)</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>GAVI status</td>
<td>Eligible</td>
<td></td>
</tr>
</tbody>
</table>

#### 1. Interrupt wild poliovirus transmission

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Data for Uganda</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission Interrupted</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Risk of late detection:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of adequate stool specimens (rolling 12 mo.) (Target &gt; 80%)</td>
<td>91.3</td>
<td></td>
</tr>
<tr>
<td>Risk of late detection:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non polio AFP rate (rolling 12 mo.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Target &gt; 2 per 100,000)</td>
<td>3/100,000</td>
<td></td>
</tr>
<tr>
<td>Risk of spread after importation:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of 6-59 month olds having received less than 3 doses in the last year before occurrence case/environmental positive)</td>
<td>8%</td>
<td></td>
</tr>
</tbody>
</table>

#### 2. Neonatal tetanus elimination

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Data for Uganda</th>
</tr>
</thead>
<tbody>
<tr>
<td>TT2 coverage (reported 2015 on JRF)</td>
<td>58%</td>
<td></td>
</tr>
<tr>
<td>Protection at birth against tetanus (WUENIC 2015)</td>
<td>85%</td>
<td></td>
</tr>
<tr>
<td>Last SIAs conducted in the country</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

#### 3. Measles Elimination

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Data for Uganda</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage MCV1 (2015 WUENIC)</td>
<td>82%</td>
<td></td>
</tr>
<tr>
<td>Coverage MCV2</td>
<td>Not in schedule</td>
<td></td>
</tr>
<tr>
<td>Percentage of districts with MCV1 coverage ≥95% (2015 JRF)</td>
<td>46%</td>
<td></td>
</tr>
<tr>
<td>Last national SIA</td>
<td>2015</td>
<td></td>
</tr>
<tr>
<td>Post SIA coverage survey conducted</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

#### 4. Rubella/CRS Elimination

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Data for Uganda</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubella-containing vaccine coverage</td>
<td>Not introduced</td>
<td></td>
</tr>
</tbody>
</table>

#### 5. Reach 90% national coverage and 80% in every district with 3rd dose of DTP-containing vaccine

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Data for Uganda</th>
</tr>
</thead>
<tbody>
<tr>
<td>National coverage (WUENIC 2015)</td>
<td>78%</td>
<td></td>
</tr>
<tr>
<td>Drop-out rate DTP1 to DTP3 (2015 WUENIC)</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Actual numbers of children that dropped out (2014 WUENIC)</td>
<td>173,000</td>
<td></td>
</tr>
<tr>
<td>Difference between poorest and richest quintile DTP3 coverage (2013 data)</td>
<td>0.3%</td>
<td></td>
</tr>
<tr>
<td>% District coverage reaching 80% coverage from 2015 JRF</td>
<td>89%</td>
<td></td>
</tr>
</tbody>
</table>
2. Country ownership of the immunization programme

2.1 Immunization policy decision-making capacity

In November 2014, Uganda transitioned its Advisory Committee on Immunization (ACVI) into a national independent immunization technical advisory group (NITAG), with technical assistance and training from WHO and the Gates Foundation-funded SIVAC project. Core members come from academia, research institutes and other organizations, with representatives of the MOH, WHO and UNICEF serving as ex-officio members. It currently meets all of the six criteria that WHO has established for a functioning NITAG.

UNITAG has already had an important decision-making role in its short history. First, it raised concerns about the impending introduction of rotavirus and the government’s ability to meet its co-financing obligations and cover operational costs for rotavirus and the other vaccines in the immunization schedule. As a result, the introduction of rotavirus and all other new vaccines is currently on hold until a cost analysis of the immunization program and financial sustainability plan are developed (currently underway with WHO support). Second, UNITAG helped to convince the Parliament to add a provision for an Immunization Fund to the 2016 Immunization Act that mandates vaccination of children and women (with TT). The purpose of the Fund, described below, is to better protect funding for immunization and mobilize additional resources from different sources.

Immunization also enjoys high-level support as a result of the establishment of a Parliamentary Forum on Immunization. The Chairperson of this group was able to block the Parliament’s approval of the entire budget in 2012/13 until additional funds were added to the budget to increase the number of health workers and health worker salaries. The Forum also played a key role in the development and government approval of the Immunization Act (described below).
2.2 Government financing of immunization

The Government is meeting its financial commitments in that it is paying for 100% of the procurement costs of all traditional vaccines (BCG, TT, OPV and measles). It was estimated in FY2013/14 that the Government paid 49% of the total immunization budget, with the majority going towards health worker salaries, procurement of traditional vaccines and co-financing of new vaccines (pentavalent, PCV, HPV), vaccine storage and distribution, the staff and operations of the Uganda National EPI (UNEPI), operational costs for polio and measles campaigns, and block grants to the districts to cover the costs of providing primary health care services (called PHC grants).

- The Government’s contribution in absolute terms has been increasing – 41% from 2009/10 to 2013/14 – mainly as a result of co-financing of newly introduced vaccines, which has increased six-fold from 2013 to 2016, as first PCV and then HPV were added to the immunization schedule (Figure 1). The country’s co-financing obligation now stands at $2.5 million per year. The Government’s contribution actually declined from 2011 to 2014, due in part to delays in making its co-financing obligations. Uganda has, in fact, been in default in co-financing for GAVI-supported vaccines each year since 2014. This is due to the fact that funds for co-financing are not “ring-fenced” and have been diverted to cover emergencies, such as pension arrears for health staff and salary increases for intern doctors who went on strike. The mismatch between the Government’s quarterly budgetary procedures and GAVI’s fiscal year cycles, as well as devaluation of the Uganda shilling have also contributed to delays in co-financing. These defaults have delayed the introduction of additional vaccines into the routine immunization program, including rotavirus vaccine.
- Apart from the issue of co-financing of new vaccines, the government budget for immunization is considered insufficient, and as a result, more costly activities, such as polio and measles campaigns, can mean less funding for routine immunization activities. As mentioned in one report, one national measles campaign can cost the equivalent of two years of recurrent costs for the routine immunization program. Because the Ugandan government could not raise its share of the operational costs for the 2015 measles campaign, the campaign was combined with the introduction of HPV vaccine and Child Health Days, to save costs and to allow funding from the GAVI vaccine introduction grant (VIG) to be used in part for the measles campaign. This resulted in a reduction in the planned activities for the HPV introduction (see below).

Figure 1: Trends in Ugandan Government financing for immunization
In the top chart, the purple bar (GOU) is Uganda government contribution, including shared costs for health worker salaries and the proportion of PHC grant funding going to immunization. Funding for immunization at the local level comes from PHC grants from the central government, which must pay for all of the operational costs of providing the National Minimum Health Care Package, of which immunization is one component. The grants are distributed to each district, but do not have a fixed percentage allocated to immunization. PHC funding is considered inadequate and as a result, health facilities often lack funding for fuel to operate refrigerators and means of transport and fuel to pick up vaccines from district medical stores or to conduct outreach immunization activities. A lack of funding at the district level makes it difficult for EPI coordinators to conduct supervisory and monitoring visits, assist with RED/REC activities and the like. All of this can negatively affect immunization coverage and overall program performance.

In the aim of mobilizing additional resources for immunization and to meet the Government's growing co-financing obligations, an Immunization Fund is being established as part of the 2016 Immunization Act. The Fund, currently being designed, will pool funds from the Government, donations and "voluntary contributions" to pay for "vaccines and related supplies, cold chain expenses and immunization outreach activities." Its reported purpose will be to better protect immunization funding (including co-financing) through "ring-fencing" to prevent its diversion, and to mobilize new resources for immunization, including from private industries, such as telecommunications and pharmaceutical companies.

### 2.3 Human resource situation

Nurses and nursing assistants make up the bulk of health workers who provide immunization services in Uganda. There is a wide range of staffing levels of health professionals by region and district, with the numbers especially inadequate in hard-to-reach and under-served areas, where retention rates are particularly low. Low salaries and a lack of housing in remote areas are key factors making it difficult to recruit and retain qualified health workers. More than 50% of the facilities visited for the Resource Tracking study reported a health worker shortage, while the 2016-2020 Comprehensive EPI Multi-Year Plan (cMYP) reported that 39% of districts reported a health worker vacancy rate of more than 35%. Staff shortages at the health facility level affect morale, as well as the ability of facilities to deliver adequate immunization and other services in the minimum package, including outreach activities.

---

Sources:
Concerning immunization-specific staff at the sub-national level, all districts have an EPI focal point, as do 66% of health facilities. Due to staff shortages, this person is often a nursing assistant. Sixty-one percent of districts had no cold chain technician in 2014. Each district also assigns a health officer to serve as the surveillance focal points, who has other responsibilities as well. In addition, there are around 12 surveillance medical officers (SMOs) working at the country’s nine IDS sub-national hubs and in districts. These are government employees who receive additional funding from WHO to enable them to focus on surveillance and supportive supervision for immunization. WHO also supports most technical staff of the national reference laboratory (Ugandan Viral Research Institute or UVRI).

To link communities to local health facilities, Uganda has a system of Village Health Teams (VHTs), made up of several community-based volunteers in each community who assist with disease surveillance, social mobilization, sanitation activities, registering births, distributing anti-malarial drugs and the like. In the area of immunization, these volunteers participate in social mobilization, especially for vaccination campaigns and new vaccine introductions; community-based surveillance; and default tracking. The recent EPI review found that 89% of health facilities visited had established links with VHTs and that these volunteers are the communities’ primary source of information concerning immunization.

However, the volunteers receive no salary and only a stipend or allowance, as possible, and they must also juggle immunization activities with other health priorities and programs. As a result, the activism and impact of VHTs varies considerably by area. To improve this situation, the Government has approved plans to create a new position of Community Health Extension Worker (CHEW), who will receive a government salary, have higher minimal qualifications that VHTs, and who will gradually replace the VHTs. To make the program more financially sustainable, one CHEW will cover several (e.g., three) villages.

3. Progress towards specific GVAP goals (issues/challenges/successes)

3.1 Goal 1: Achieve a world free of poliomyelitis

Uganda was certified polio-free in October 2006, but has experienced outbreaks of imported wild polio virus (WPV) in 2009 and in 2010/2011. The country has a robust AFP and polio surveillance system, as indicated by the polio target indicators on page 1. This has been the result of various partner-supported efforts and innovations, including:

- A national roll-out of an integrated disease surveillance and reporting (IDSR) system, operating from nine sub-national hubs. By the end of July 2016, district health staff in 108 out of the country’s 112 districts have received IDSR training.
- Both international and national STOP teams that provide on-the-ground short-term assistance to “silent” or poor-performing districts to improve their ability to detect AFP/polio cases as well as other outbreak-prone diseases (e.g., measles, yellow fever) and to improve routine immunization services. The international teams – supported by the U.S. CDC and WHO/AFRO – stay in a region for about a month, while the national STOP team (NSTOP) consists of public health students who spend a week in an area visiting all health facilities to train staff in surveillance and outbreak investigations. The NSTOP program is partner-supported, but funding is considered insufficient.
- An innovative specimen transport system established by the MOH with support from partners that delivers specimens on filter paper to the UVRI laboratory within 24 hours.
- An electronic (mTRAC) system, established in 2012 with WHO and UNICEF support, in which health facility staff submit IDSR data for key diseases to districts via mobile phones using a simple interface on a weekly basis. The data are then transferred up the chain. While it has been implemented nation-wide, there are issues with the availability of cell phones and reliability of network connections.

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In addition, the country has organized polio national immunization days (NIDs) every year for several years, as well as sub-national immunization days (SNIDs) in high-risk and outbreak districts for children under five. Additional doses of OPV are also provided during the country’s annual Child Health Days. UNEPI introduced IPV into the immunization schedule in April 2016.

There are, however, a number of challenges to sustaining the country’s polio-free status:

- While the national AFP detection and stool adequacy rates meet the targets, not all districts achieve the minimum rates. The surveillance system is also not sensitive enough to detect every possible case of wild polio virus or vaccine-derived virus in a timely fashion. In addition, active surveillance of vaccine-preventable diseases is not conducted systematically in some areas, due to delays in the disbursement of funds from higher levels, affecting the timely investigation and notification of cases. Reportedly, inadequate surveillance led to under-detection of WPV circulating along the border with Kenya, which caused the last outbreak in 2011.
- There is cross-border transmission of polio from areas and populations with low immunization rates, such as across the borders with Kenya and S. Sudan. Synchronized NIDs with bordering countries have been discussed, but have yet to take place.
- There also exist pockets of low polio immunization coverage within the country, including in communities bordering S. Sudan and some fishing communities.
- The frequent turnover of health staff at the district and health facility levels mean that many people trained in IDSR have left. Thus, frequent trainings are needed to train new staff, which is costly.

3.2 Goal 2: Meet global and regional elimination targets

3.2.1 Achieve maternal and neonatal tetanus elimination

Uganda received validation for having eliminated MNT in 2011. The main strategies the country is employing to sustain elimination consist of:

- TT immunization of high school girls (15-17 year olds) through annual school-based vaccination campaigns;
- A strong culture of vaccinating all women who come for antenatal care services (the rates of which have been increasing) with at least two doses of TT;
- Mandating of TT vaccination for all women 18-49 years of age, as well as for all 15-17 year old girls through the new Immunization Act. Parents and schools are held responsible for ensuring vaccination of girls and can receive fines or imprisonment if they are not (the same holds true for 18-49 year old women).

The current TT coverage rate for two or more doses is 58% among pregnant women, while the protection at birth (PAB) rate among infants is 85%. The low TT coverage rate is reportedly due to recording problems rather than to women not being vaccinated, as women who have received the full time doses or only need one more dose when they are pregnant are not often not included in the TT2 coverage reports.

There remains some risk of not sustaining the elimination in some areas of the country, however, due to weak implementation of case-based NNT surveillance in some districts to confirm whether reported cases are truly NNT. At least one district in the 2011 MNT risk assessment report had a rate above 1/1,000 live births. In addition, the stated policy of ring vaccination around a confirmed case is probably not taking place, according to two informants. A further constraint to high TT coverage rates is that target-age girls not enrolled in school are missed through the school-based program. In addition, health personnel have difficulty calculating PAB rates and require training in this.

The following steps can help ensure sustainability of MNT elimination:

- Improve NMT surveillance, including investigating and testing all suspected cases;
- Strengthening and sustaining the school-based TT vaccination program for girls, and extend it to 15-17 year old girls not in school;
- Provide additional booster doses (of TT or Td) during childhood and include boys, since there have been a few cases in young men following circumcision. This proposal is currently under discussion within the government.
3.2.2 Achieve measles elimination and rubella & CRS elimination

Measles

An estimated 46% of districts achieved coverage with a single dose of measles vaccine of ≥95% in 2015, against the GVAP target of 100% of districts, according to the Joint Reporting Form. National measles vaccination coverage is estimated by WHO and UNICEF at 82% in 2015. The country has experienced measles outbreaks each year of different magnitude, in areas with low vaccination coverage. Uganda is therefore not currently on track to eliminate the disease by 2020.

A key factor contributing to the continuing outbreaks is that, due in part to a global shortage of measles vaccine, actual measles vaccination coverage in 2012 was only around 30%, according to the cMYP (in contrast to the considerably higher WUENIC estimate). Because of this as well as continued low coverage in some areas of the country, there were an estimated 1.56 million children not immunized against measles by 2013. This has created a large susceptible population of unimmunized older children and a consequent shift in the age of cases to older children and adults, who have the potential of causing outbreaks.

Key challenges and issues affecting Uganda’s ability to meet the measles elimination target include:

- The fact that case-based measles surveillance is still weak and only an estimated 35% of cases are investigated, according to one informant. There continues to be some “silent districts” and delays in reporting cases to higher levels of the system. The reasons are many of the same mentioned above, including a shortage of health workers, means of transport and fuel to investigate cases in the field and to collect and transport specimens to the reference lab. Polio funds are often used for case investigations, specimen transport and testing.
- While national measles SIAs take place every three years, along with localized campaigns in outbreak areas, actual coverage rates of these campaigns is unknown, due to data quality issues (reported coverage rates are often 100% or higher). The frequency of the SIAs is, however, considered adequate.
- Rapidly reducing the population of susceptibles who were missed due to poor vaccination coverage in the past would require conducting SIAs (e.g., using MR vaccine) for a wide-age cohort, such as 9 month to 15 year olds. However, the Government lacks the funding to conduct these and GAVI provides supports only for SIAs targeting children under five. However, UNEPI plans to conduct SIAs with measles-rubella vaccine in 2018, with GAVI support, which will target children up to 14 years of age.

It should be noted that the Government plans to introduce a second measles vaccine dose into the routine schedule (using MR vaccine). The year of introduction will depend on the results of the cost assessment and financial sustainability plan currently in progress and subsequent decisions about other new vaccine introductions.

Rubella

According to informants, rubella outbreaks have been occurring, and many suspected cases of measles that are not lab-confirmed are believed to be rubella. For instance, while the routine disease surveillance system reported more than 60,000 cases of measles in 2015, many of these are believed to have been rubella. To quickly reduce rubella transmission in the population, UNEPI is planning MR catch-up campaigns in 2018, with GAVI support.

3.3 Goal 3: Meet vaccination coverage targets

a. Achieve 90% national coverage and 80% coverage in every district with 3 doses of diphtheria-tetanus-pertussis containing vaccine
b. Achieve 90% national coverage and 80% coverage in every district with all vaccines included in the national schedule

These targets have largely not been met. The WUENIC estimates for the third dose of pentavalent (DPT-HepB-Hib) vaccine have been 78% national for the past three years (2012 to 2014), and slightly down from 82% in 2011, with an estimated drop-out rate between the first and third doses of 12% nationally. However, according to data from the Joint Report Format, the country is close to meeting the district target, with 86% of districts having achieved 80% or greater coverage for three pentavalent doses. There are no district-specific WUENIC estimates, however, and the JRF data are based largely on administrative data, so caution should be taken in reading these statistics. A coverage survey is currently underway, which should provide a more complete picture.
accurate picture of both national and district-level immunization coverage.

According to the 2015 WUENIC estimates, the 90% national coverage goal has been achieved for BCG (93%), but was 82% for three polio doses, 82% for measles, and 66% for PCV3, which was introduced over a period of a year in 2013 and 2014. District-level WUENIC estimates for these vaccines (to determine the percent of districts reaching 80% coverage) are not available.

An assessment of equity of immunization coverage by geographic areas, income level and other variable is currently taking place.

Key factors affecting UNEPI’s ability to reach its coverage targets include:

- **Insufficient availability of static immunization services:** While national policy requires that all health facilities with refrigerators offer immunization services on a daily basis, the 2015 Comprehensive EPI, surveillance and immunization financing review (referred to as the “EPI review” in this document) found that only 40% of the 55 health facilities visited provided EPI daily, 18% had sessions 2-3 times a week, and 58% provided only one session per week. This is despite the fact that most facilities (88%), including hospitals and health centers levels II-IV, had working refrigerators. A key factor is staff shortages, making it difficult for health clinics to provide daily immunization along with all of the other services in the minimum health services package. One informant fears that adding more vaccines to the immunization schedule will make it even more difficult for health facilities to provide all vaccines on schedule. Another factor is spotty social mobilization, especially for routine immunization, affecting demand, especially for subsequent vaccine doses.

- **Insufficient outreach activities in many areas and inadequate implementation of Reach Every Community (REC) strategies:** Outreach activities were found to be irregular and insufficient in many sites included in the EPI Review. The shortage of health workers is a key reason; many facilities have only two or so qualified personnel and thus conducting outreach activities (which usually require at least two staff members) means closing down the clinic. The lack of transport and fuel due to insufficient PHC grant funds is another key factor. The 2015 GAVI Full Country Evaluation for Uganda found that only around 10% of Health Centres II had access to any vehicle for vaccination, while the rate was around 45% and 60% for Health Centres II and IV, respectively.10 The EPI Review found that only 20% of health facilities had REC microplans, as did only 8 out of 112 districts. Poor implementation of REC/RED is reportedly due to insufficient training of health workers in microplanning, high health worker attrition rates, resulting in many workers not knowledgeable in microplanning, and a lack of funding to carry out microplanning activities.

- **Vaccine shortages or stock outs at the local level:** The transition of responsibility for the storage and distribution of vaccines from UNEPI to the National Medical Stores (NMS) in 2012/13 has been completed, and after initial problems, the system was deemed “robust” since April 201411 and the time it takes for vaccines to reach all districts from the central level has been cut in half (to two weeks). Nonetheless, 71% of health facilities and 96% of districts in the 2015 EPI review reported at least one vaccine stock out in the previous three months, especially PCV and BCG. While a global shortage of BCG contributed to the stock outs of this vaccine, other contributing factors for local vaccine stock outs are poor vaccine forecasting (especially denominator issues), lack of adequate cold storage space in some district stores, and perhaps most importantly, the continuing need for health facilities to collect vaccine from the district stores and their difficulty in doing so due to the lack of vehicles and fuel discussed above. “Last mile” vaccine delivery will therefore require additional funding.

- **Insufficient monitoring and supportive supervision:** A supervision infrastructure is in place, with EPI Coordinators in each district and some sub-districts. However, regular supervision is lacking in many areas, due to insufficient funds and transportation to make supervisory visits. In addition, the EPI review found that defaulting tracking was occurring regularly in only 38% of health facilities. However, the situation is improving with the establishment of Regional Supportive Supervision Teams, starting in 2015. The teams, described in the last section of this report, are already operating in 11 of the country’s 14 regions, with funding from the polio program (and the HSS grant in the future).

The EPI Revitalization Plan, enacted by the Government from 2012 to 2014 in response to declining or plateauing coverage rates and disease outbreaks, has demonstrated that many of these issues and bottlenecks can be resolved with an infusion of funds and attention. With funding from many partners, the plan focused on improving coverage in poor-performing districts by providing the means with which to strengthen social mobilization, outreach activities, vaccine collection from district stores, supervision and the like (see description

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11 cMYP
in the last section). Administrative coverage data show an increase in coverage between 2010 and 2015, which many attribute in large measure to the plan (see maps in annex).^{12}

### 3.4 Goal 4: Introduce new and improved vaccines and technologies

In recent years, UNEPI has introduced PCV (in 2013-14), HPV (in 2015) and IPV (in April 2016. Below is a summary of the PCV and HPV introductions:

- **PCV**: The vaccine was launched in one district in April 2013, but not in the rest of the country until 2014, when introduction was phased in from January to June in three phases. Nation-wide introduction was stretched out over more than a year for a number of reasons, including delays in the release of government funds to the districts for training, due to the establishment of a new financial management system. The training at the local level was comprehensive (lasting three days, including refresher EPI training) and the PCV post-introduction evaluation (PIE) indicates good knowledge about the vaccine among health workers.^{13} However, it also found that not all staff administering PCV had received formal (vs. on-the-job) training in 35% of facilities. PCV coverage has been low (50% in 2014), due to the phased in roll-out, global shortages of PCV, which required the national medical stores (NMS) to ration the vaccine; and forecasting issues, including under-estimating the demand for the vaccine. The PIE conducted in February 2015 found “suboptimal routinization of PCV”, but it has become a regular part of the immunization schedule since then.

- **HPV**: UNEPI’s strategy is to vaccinate all 10 year old girls through fixed facilities, combined with outreach at schools and other community settings. The introduction, originally planned for April 2015, was delayed until November, due to a shortage of cold storage space at the central level and of refrigerators as lower levels. This was in turn due to procurement problems that have prevented the expansion of the cold chain system, including central cold storage facilities at NMS, with HSS funding. To enable the introduction of HPV, UNICEF renovated existing NMS facilities for temporary storage of the vaccine using GAVI HSS funds. The introduction was combined with measles SIAs and Child Health Days to save costs, since the Government was unable to raise its 50% share of operational costs for the measles campaign. Consequently, GAVI vaccine introduction grant funds for HPV were used for the training and other operational costs for the combined campaigns/HPV introduction. This resulted in short changing the HPV introduction, as training was reduced from three to one day and little social mobilization for HPV took place. Nonetheless, population acceptance has reportedly been good. Coverage data are not yet available, though reportedly the outreach activities, such as to schools, are insufficient, due to a lack of funding.

The introduction of rotavirus vaccine was scheduled for 2016, but due to problems with the Government meeting its co-financing obligations and concerns voiced by UNITAG about the financial sustainability of additional vaccines, this activity is currently on hold. UNEPI plans to apply to GAVI for support for rotavirus vaccine introduction once the financial sustainability plan has been completed, UNITAG has provided guidance, and the country has paid its co-financing arrears, as well as responded to the recommendations of the GAVI program capacity assessment conducted in 2015.

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^{12} Note that the WUENIC estimates for those years to not reflect these reported increases in coverage over this period and the WUENIC estimates are currently being challenged.

Partner support to address remaining challenges to meet the GVAP goals and targets
Partner support for immunization activities is similar to that in many other GAVI-supported countries, with major partners providing financial support and technical assistance for polio and measles immunization campaigns, new vaccine introductions, surveillance, training, social mobilization, cold chain improvements and so forth (see Table 1). It should be noted that much of the GAVI HSS funding had been on hold for several years due to procurement issues related to the expansion of the cold chain system (including cold room expansion at the national level, construction of district-level cold rooms, and procurement of cold chain equipment), as well as the construction of health worker housing. These issues have recently been resolved and GAVI has approved a second HSS grant (HSS II), with implementation expected to begin in 2017.

Table 1: Major partners supporting Uganda’s immunization program and their main activities14

<table>
<thead>
<tr>
<th>Donor/partner</th>
<th>Recent key activities funded</th>
<th>Financial contribution to EPI (as a percent of total spending in 2013/14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAVI</td>
<td>New vaccine introductions&lt;br&gt;Measles/polio SIAs&lt;br&gt;EPI training&lt;br&gt;EPI outreach activities&lt;br&gt;Supportive supervision&lt;br&gt;Social mobilization&lt;br&gt;HSS (partially implemented): funding for cold chain system expansion, construction of health worker housing, provide private sector health facilities with cold chain equipment and training</td>
<td>27%</td>
</tr>
<tr>
<td>UNICEF</td>
<td>Social mobilization (e.g., at community level)&lt;br&gt;Immunization campaigns/SIAs&lt;br&gt;Family Health Days&lt;br&gt;Microplanning/RED/REC implementation&lt;br&gt;Cold chain improvements (e.g., remote temperature monitoring system development)&lt;br&gt;Equity assessment</td>
<td>11.5%</td>
</tr>
<tr>
<td>WHO</td>
<td>Disease surveillance&lt;br&gt;Immunization campaigns/SIAs</td>
<td>8%</td>
</tr>
<tr>
<td>USAID/MCSP (in 5 districts)</td>
<td>Support RED strategy and local-level micro-planning&lt;br&gt;Supportive supervision</td>
<td>=3%</td>
</tr>
<tr>
<td>U.S. CDC</td>
<td>Data quality improvements (DITs)&lt;br&gt;NSTOP activities to strengthen surveillance</td>
<td>NA</td>
</tr>
<tr>
<td>CHAI</td>
<td>Supportive supervision&lt;br&gt;Logistics management</td>
<td>NA</td>
</tr>
</tbody>
</table>

At the local level, partner support is especially critical to fill in the gaps in funding for both routine immunization and campaigns, given the inadequacy of PHC grant funds from the government and lack of earmarking of these funds for EPI. The GAVI Resource Tracking Evaluation (2013/14) showed that in the seven districts included in the study, if one excludes health worker salaries and the costs of purchasing, storing and distributing vaccines, partners paid for nearly all (97%) of district-level immunization-specific activities –

14 I got this table from the GAVI Resource Tracking document and expanded upon it, using the PEF and what I know. Not sure of its accuracy and I need some help to complete (e.g., from WCO).
largely SIAs and training – with UNICEF covering 57%, WHO 21%, and GAVI 19%. PHC funding covered only 3% of these expenditures.15

Below we describe by objective several partner-supported projects or initiatives that address specific weaknesses in Uganda's immunization program and have made or have the potential to make a significant difference in the program's performance.

To increase government funding for immunization and improve advocacy and decision-making:

- **Support to a high-level immunization lobbying group:** Through a Gates Foundation-funded project, the Sabin Institute, along with WHO and other partners, has assisted the Parliamentary Forum on Immunization in advocating for increased government spending on immunization. The Forum's efforts led to the drafting and enactment of the Immunization Act that includes a provision for an Immunization Fund. The Forum also encourages politicians to promote immunization amongst their constituents.

- **Support for the NITAG:** Partners, especially WHO and the SIVAC project, supported the country in establishing a NITAG and making it operational. UNITAG, as described above, has already played a critical role in making decisions about new vaccine introductions – adding the criteria of affordability and sustainability – called for a financial sustainability plan to be conducted, and was instrumental in getting an Immunization Fund provision added to the 2016 Immunization Act.

To improve EPI coverage and program performance:

- **Implementation of EPI Revitalization Plan:** This plan was enacted by the Government from 2012 to 2014 with funding from UNICEF, WHO, USAID, CHAI, CDC, and other partners to fill in gaps in immunization service delivery in poor-performing districts. The infusion of funding, along with technical assistance, was used to strengthen the role of VHTs in promoting immunization and in organizing outreaches; purchase vehicles and fuel to increase outreach activities and to pick up vaccines from district stores; increase supervisory visits; and implement RED/REC and microplanning. As shown in the Annex, the number of districts meeting the target of 80% coverage with three doses of DPT-containing vaccine increased significantly from 2010 to 2015, with informants attributing these gains to this Plan.

- **Assisting private health facilities in providing quality immunization services:** One objective of the GAVI HSS grant that is being implemented is to improve immunization services in private sector health facilities, which make up an estimated 19% of all health service providers in the country.16 This is being done by procuring refrigerators and other cold chain equipment for around 90 private clinics in Kampala, as well as providing immunization training and supportive supervision to health workers in these facilities. The equipment procurement was delayed due to the lack of involvement of key stakeholders in selecting the health facilities and to other issues, but is now being implemented.

- **Establishment of Regional Supportive Supervision Team:** Partners, including WHO, CHAI and UNICEF, have assisted the Government in establishing these teams to increase the regular supervision of health workers, a critical element in improving and sustaining the performance of the immunization program and other components in the minimum health care services package. The teams – made up of regional EPI and IDSR supervisors, and other health professionals – operate from the regional reference hospitals and are each responsible for providing integrated supervision in to the districts in their region. Begun in 2003 with polio funding, teams have already been established in 11 of the country’s 14 regions.

To improve the quality of EPI and other health data:

- **Establishment of Data Improvement Teams (DITs):** The quality of immunization and other health data in Uganda needs to be strengthened, as evidenced by the 11 or 12 point difference in immunization coverage estimates between the government's administrative data and the WHO/UNICEF estimates (e.g., 89% vs. 78% for pentavalent 3 and 94% vs. 82% for measles). Several partners, including the U.S. CDC, WHO and UNICEF, are supporting the establishment and training of district-level teams, each consisting of the district biostatistician, immunization focal point, surveillance officer and other relevant district health team members. The teams are responsible for mentoring and training health facility staff in data management and harmonization, with an focus on immunization data and using DHIS2 software. Training of trainers and district-level trainings have taken place and teams are currently operating in 13 of the country’s 14 regions. The DITs are envisioned to have regular meetings to review data, such as part of surveillance meetings. A major gap is that there is at present little supervision and follow up of the DITs.

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16 CMVR
Acknowledgments

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- Meseret Eshetu (WHO IST/ESA)
- Tracey Goodman (WHO HQ)

Annex 1: Country immunization profile

1. General indicators
   - GNI (USD): 660
   - WB Status: Lower Income
   - Infant mortality (<12 M) rate: 38
   - GAVI Status: Eligible
   - Total Population: 39,032,000
   - Birth Cohort: 1,665,000
   - Surviving Infants: 1,568,000

2. Polio
   - Transmission stopped in 2011.
   - Eradication certified in 2006 and in 2015 ARCC accepted a report on the response to the imported WPV outbreak following complete documentation.

3. Measles and rubella

Figure 2: Reported measles cases and MCV1 coverage, Uganda, 1990-2015
### Table 2: SIA activities planned in 2016-2017

<table>
<thead>
<tr>
<th>Activity</th>
<th>Intervention</th>
<th>Year</th>
<th>Start Date</th>
<th>End Date</th>
<th>Age Group</th>
<th>Extent</th>
<th>Status</th>
<th>Target population</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNID</td>
<td>tOPV</td>
<td>2016</td>
<td>23/01/2016</td>
<td>25/01/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>2,540,476</td>
</tr>
<tr>
<td>NID</td>
<td>tOPV</td>
<td>2016</td>
<td>01/04/2016</td>
<td>03/04/2016</td>
<td>0 to 5 years</td>
<td>National</td>
<td>Planned</td>
<td>8,092,606</td>
</tr>
<tr>
<td>SNID</td>
<td>tOPV</td>
<td>2016</td>
<td>23/04/2016</td>
<td>25/04/2016</td>
<td>0 to 5 years</td>
<td>Sub-National</td>
<td>Planned</td>
<td>4,046,303</td>
</tr>
</tbody>
</table>

Source: WHO/IVB Database as at 01 July 2016

4. **MNT**
   MNTE elimination was validated in 2011.

5. **Immunization coverage and equity**

![Uganda Immunization Chart](chart.png)

**Legend**

- BCG
- HepBb
- DTP1
- DTP3
- HepB3
- Hib3
- Pol3
- PCV3
- Rotac
- Rcv1
- Mcv1
- Mcv2

- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%
- 90%
- 100%
Figure 3: Reported DTPCV doses administered & coverage, Uganda, 2000-2015

* COE: country Official Estimates

Source: WHO/IVB database, data reported to WHO by member states as of 1 July 2016
WHO/UNICEF national coverage estimates, 2014 revision, data as of July 2015

Figure 4: Percentage of district achieving <50%; 50-79% and ≥80% coverage, 2000-2015, administrative data

% of District reporting <50%, 50-79% and ≥80% DTP3 coverage,
Uganda
2000-2015

Source:
WHO/IVB database, data reported to WHO by member states as of 30 June 2016
WHO/UNICEF national coverage estimates, data as of July 2016
Figure 5: DTP3 coverage by district/province 2010 and 2015 (administrative data)

Figure 6: Three-dose pentavalent coverage from 2010 to 2015, based on the GAVI Full Country Evaluation household survey conducted in 19 districts in 2015
Figure 7: Immunization coverage data disaggregated by sex and wealth quintile

6. Immunization systems highlights

- Immunization schedule

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCG</td>
<td>birth; 6, 10, 14 weeks;</td>
</tr>
<tr>
<td>DTwP, Hib, HepB</td>
<td>10 years; +6 months;</td>
</tr>
<tr>
<td>HPV</td>
<td>9 months; birth; 6, 10, 14 weeks;</td>
</tr>
<tr>
<td>Measles</td>
<td>15 years; +4 weeks; +6 weeks; +1, +1 year;</td>
</tr>
<tr>
<td>OPV</td>
<td>6, 12, 18, 24, 30, 36 months;</td>
</tr>
<tr>
<td>Pneumo_conj</td>
<td></td>
</tr>
<tr>
<td>TT</td>
<td></td>
</tr>
<tr>
<td>Vitamin A</td>
<td></td>
</tr>
</tbody>
</table>

- Planning and management:
  - Stockouts events in 2015: 1 month for BCG
  - cMYP: 2012-2016
  - Annual Plan: Yes

- Country decision making: A NITAG was established in 2014 and meets five of the six minimum criteria defined by WHO for a functioning NITAG.

- % of total expenditures on vaccines financed by government funds: 15%