JOINT APPRAISAL ANALYSIS GUIDANCE 2019

Suggested minimum set of analysis for informing:

- Joint Appraisals
- Review of Health System Strengthening support during country missions
- Strategic in-country discussions relating to a new proposal and/or reprogramming of existing grants
Introduction

A key aspect of preparing for the Joint Appraisal and other relevant in-country discussions is reviewing available data and analyses (i) to understand progress achieved against planned targets and (ii) to inform decisions around possible bottlenecks (e.g. delayed reporting, unrealistic targets, unavailable data, key barriers to achieving expected results, etc.). A thorough data review enables appropriate design of new Gavi support as part of the country dialogue process (e.g. full portfolio planning). It also enables the redesign of existing HSS support and/or the prioritisation of targeted country assistance as part of the Joint Appraisal recommendations.

Wherever possible, data and analyses presented at the Joint Appraisal (and resulting report) should draw on already available analyses and reports routinely generated by countries. For example, EPI reviews, annual desk reviews, routine reports such as WHO / UNICEF Joint Reporting Form, routine programme monitoring metrics integrated into HMIS/DHIS2/EPI or supply chain dashboards or alternates, equity analyses, coverage evaluation or KAP surveys. Countries are encouraged to identify the data sources when presenting the data to facilitate the interpretation of the information. Gavi does not expect data and analyses to be generated solely for the purpose of the Joint Appraisal (or other relevant in-country discussions), but synthesis, review, analysis and interpretation of data takes time, effort and patience and programmes are encouraged to start preparing and compiling relevant data and analyses well in advance.

How to use this document

The use of this document should be especially considered when preparing Joint Appraisals, requests for new Health System Strengthening support and other relevant strategic discussions.

It outlines a suggested minimum set of analyses and indicators to inform in-country discussions on Gavi support across the different technical areas presented in this document as 8 different sections.

In each of these sections, a set of key analyses is suggested, followed by a detailed recommendation of useful presentations, relevant timeframes and levels of disaggregation. The key analyses included in this document were selected based on data that are generally available from information systems or regular assessments in most Gavi-supported countries. There is also extensive guidance from partner organisations on how these analyses are best performed. The additional analyses component of this module outlines complementary analyses for which data may not be available in many countries or for which it may not be relevant in some specific cases.

The key analysis, in each session, is followed by a description of the most typical interpretation and use for the described set, as well as the potential data sources that are generally available at the country level. This is finally followed by links to relevant guidance and resources made available from partner organisations. Some of these links provide technical guidance on how to perform the analyses. Others provide access to automated analytical tools or databases for raw data extraction that may simplify the work the country may wish to perform.

For each section, some illustrative examples are included. These have proven particularly effective in terms of presentation and level of disaggregation. Most examples are taken from previous Joint Appraisal reports. While these showcased analyses do not cover all suggested areas of analysis, the intention here is to provide some inspiration to countries and partners.
in order to trigger relevant in-country discussions. Of note, the content and the presentation of some included examples could still be further improved to facilitate the interpretation and use of key findings.

**Identifying relevant analysis to bring to the discussion**

Although many different routine key analyses are performed in every country for each technical area, not all of them present important findings with relevant programmatic implications. Countries are not expected to prepare and present all suggested analyses in this guidance, but are encouraged to compile and bring forward the most compelling ones in each section with potential programmatic impact.

This minimum set of analyses can be supplemented with additional information where deemed relevant by the country. The programmatic bottlenecks and problems identified with these analyses should guide decision-making on priorities for Gavi support and targeted country assistance based on the country’s needs. Subnational analysis and triangulation are considered particularly useful for this purpose.

**Subnational data**

**Gavi strongly recommends the use of subnational data analysis to inform decision-making and to prioritise resource allocation in specific geographic and thematic areas.**

Subnational data analysis is important for many reasons. It helps to target resource allocation to those geographic areas with a large number of unimmunised children and/or low immunisation coverage, better target resources to vulnerable populations, address equity concerns, identify susceptible areas for outbreaks of vaccine-preventable diseases, prioritise improvement in infrastructure and human resource development, target data quality efforts, and reward geographic areas with recent improvement in performance, among others. **There is value in performing subnational analysis in all sections of this guidance.**

When interpreting results of subnational data analysis, some caution should be exercised. In many countries, subnational data is incomplete and possibly inaccurate due to errors or estimate distortions. In many cases, there are mismatches among the numerator and denominators of different administrative units. Newly created districts, rapid growing urban areas, areas with increased participation of the private sector, areas afflicted by large refugee influx, and nomadic and migrant populations may also contribute to an increased uncertainty and compromise trend analysis. This may also suggest a coverage rate higher than 100% in certain districts.

More information on use and limitations of subnational data analysis, with a special focus on vaccine coverage, can be found on the [WHO Subnational immunization coverage data website](#).

**Triangulation of different data sources**

To mitigate data quality problems and achieve deeper insight into the phenomena of interest, data triangulation may be particularly helpful. Data triangulation is an approach for critical synthesis of two or more existing data sources to address relevant questions for programme planning and decision-making. Data triangulation identifies and aims to address limitations of any one data source and/or data collection methodology, and can be used to compare coverage, surveillance, stock, sociodemographic and other qualitative or quantitative data.

Limitations include the quantity and quality of the original data. Also, the potential exists for interpretations of data to converge at a single conclusion that is not accurate. Due to its
limitations, it is recommended that triangulation analysis are focused on key relevant questions
and explore patterns and differences of programmatic relevance through descriptive and
graphical methods for better understanding.

Countries are encouraged to perform triangulation analysis under each section of this
guidance. For example, triangulation can be used to check the consistency of different data
sources for coverage and for denominator estimates. The last section of the document also
explores potential triangulation analyses that can be performed by using data from previous
sections. We expect that those analyses will help make sense of complementary information
and will help integrate the knowledge of the broader context and underlying processes. Partner
organisations are preparing further guidance on this topic which will soon be available.

Programming guidance

Gavi also provides programming guidance, which is intended to provide evidence-based
information for supporting countries in targeting investments to address identified bottlenecks
in specific strategic focus areas. These programming guidance materials can be useful for the
in-country planning process. For more information on this, refer to Gavi applications
guidelines.
<table>
<thead>
<tr>
<th>Area</th>
<th>Suggested Analysis / Indicators</th>
</tr>
</thead>
</table>
| **Coverage**                | DTP3 and MCV 1 Coverage  
DTP1 and DTP3 under/unimmunized infants  
Ranking of lower level coverage districts by DTP3 and MCV1  
Additional analysis |
| **Equity**                  | Inequality difference and/or ratio  
Geographic equity  
Additional analysis |
| **Surveillance of VPDs and AEFI** | Number of cases (suspected and confirmed)  
Outbreaks  
Number of AEFI reported  
Additional analysis |
| **Supply**                  | Number of health facilities providing EPI services  
Frequency of vaccination sessions provided  
Number of cold chain equipment  
Number of health workers  
Additional analysis |
| **Demand**                  | Drop-out rates (DPT1-DPT3/DPT1-MCV1/MCV1-MCV2)  
Additional analysis |
| **Data Quality**            | Completeness and timeliness of reporting  
Internal data consistency  
Denominators  
Additional analysis |
| **Financing**               | Immunisation programme financing  
EPI budget execution  
Additional analysis |
| **Triangulation of different data sources** | Surveillance of Vaccine Preventable Diseases (VPD) and vaccine coverage  
Vaccine utilization and vaccine coverage |
Suggested Analysis / Indicators

**Key Analyses**

**DTP3 and MCV Coverage**
Trend analysis for the past 3-5 years (or more) with national and sub-national disaggregation (province, district level). Special attention to districts supported by GAVI HSS funds if relevant. Consider MCV campaign coverage analysis at both the national and subnational level if relevant.

**DTP1 and DTP3 under/unimmunized infants**
Total estimated number across provinces and districts. Consider comparison with coverage data. Consider use of maps / heat maps to present data.

**Ranking of lower level coverage and unimmunised districts by DTP3 and MCV1**
Consider use of maps / heat maps to present data.

**Additional analysis**
- Coverage across other antigens (whether routine or campaign).
- Full immunisation coverage (as defined by country) should also be considered if data is available.
- Missed opportunities for vaccination. Consider estimation of missed opportunities by comparison of antigens given at the same time (e.g. MCV1 and YF or Penta3, OPV3 and PCV3), especially for new vaccines.

**Interpretation and use**
- Understanding where the under-immunised children are in order to prioritise support; further analysis of bottlenecks may be warranted in order to understand what interventions might be required.
- Understanding EPI performance over the last year vis-à-vis delivering routine immunisation services and campaigns may help identify potential problems with the overall programme or with specific antigens and may be used to inform performance based schemes.
- Understanding if there are missed opportunities for immunisation (and for which antigens) which may help target demand interventions in some areas or address distribution issues.

**Data Sources**
Administrative, Official Estimates, WHO-UNICEF estimates, Surveys

**Guidance and Resources**
- Data and visualizations: Immunization coverage - DTP3 at district level, WHO [http://apps.who.int/gho/data/view.other.immu-admin2-dtp3?lang=en](http://apps.who.int/gho/data/view.other.immu-admin2-dtp3?lang=en)
Coverage

Examples

1. DTP3 and MCV1 coverage (time trends, across data sources, sub-national disaggregation)

   Changes in Immunisation coverage 2014-2017

   Burkina Faso JA, 2018

2. Ranking of lower level coverage and unimmunised districts by DTP3 and MCV1

   Top 10 HDs with the greatest number of infants not immunised

   Cameroon JA, 2018
3. DTP3 unimmunized infants

**Coverage**

Myanmar JA, 2017

Ethiopia JA, 2017
4. District ranking by DPT1 and DPT3 under/unvaccinated infants

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**Coverage**

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Madagascar JA, 2017

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Guinea-Bissau JA, 2016
**Suggested Analysis / Indicators**

**Key Analyses**

- **Inequality difference and/or ratio**
  Disaggregated per household economic status (quintile 5- quintile 1), mother's education (secondary school or higher-no education), place of residence (urban-rural), sex (male-female).

- **Geographic equity**
  Percentage of districts with Penta3 coverage above 80%.

**Additional analysis**

- Vulnerable groups: Coverage trends among identified / suspected vulnerable groups (ethnic, religious, slums, refugees, internally displaced etc.).
- Gender-related barriers: qualitative analysis of gender related barriers for immunisation from available gender related studies and KAP surveys. Trend analysis of sex disaggregated data on coverage from surveys or Electronic Immunisation Registers (EIR) when available. Sub-national disaggregation highly desirable.
- Other analyses available from a recent equity analysis.

**Interpretation and use**

- Understanding where the under-immunised children are in order to prioritise support; further analysis of bottleneck may be warranted in order to understand what interventions might be required.
- Understanding the equity profile of the country may lead to more effective intervention designs that address its specific components and the most important barriers to immunisation.
- Identifying vulnerable groups, its distribution and size may help with targeting and tailoring specific interventions to reach them.

**Data Sources**

Surveys, Administrative, Others

** Guidance and Resources**

WHO health inequality monitoring tools and resources, WHO (2018)

http://apps.who.int/iris/bitstream/10665/252541/1/9789241511735-eng.pdf

Explorations of inequality: childhood immunization, WHO (2018)
https://www.who.int/gho/health_equity/explorations-of-inequality-childhood-immunization

Global Health Observatory (GHO) data: Health Equity Assessment Toolkit (HEAT),WHO

EQUIST, UNICEF

Global Health Observatory (GHO) data repository: Urban Health, Health Service coverage, WHO
http://apps.who.int/gho/data/node.main.n252?lang=en

MICS Surveys, UNICEF
http://mics.unicef.org/surveys

The DHS program (Demographic and Health Surveys): all surveys by countries, DHS
https://dhsprogram.com/What-We-Do/survey-search.cfm?pgtype=main&SvTyTp=country

STATcompiler: The DHS program
https://www.statcompiler.com/en/

The guide to tailoring immunization programmes (TIP), WHO (2013)
http://www.euro.who.int/__data/assets/pdf_file/0003/187347/The-Guide-to-Tailoring-Immunization-Programmes-TIP.pdf?ua=1

Global routine immunisation strategies and practices (GRISP), WHO (2016)
http://apps.who.int/iris/bitstream/10665/204500/1/9789241510103_eng.pdf?ua=1
Equity Examples

**DISPARITIES IN IMMUNIZATION COVERAGE**

- **Area of Residence**
  - 25% Rural
  - 51% Urban
- **Caregiver’s Age**
  - 15-19 yrs
- **Caregiver’s Education**
  - 9% Non-formal
  - 30% Primary
  - 57% Secondary
  - 74% Higher
- **Wealth Index Quintile**
  - 10% Poorest
  - 63% Richest

Note: Pentavalent coverage (%) represented by circles. Bars represent upper and lower bounds of two-sided 95% confidence interval. Wealth index quintile shows the poorest 20% and richest 20% of population.

*Ethics JA, 2017*

**Figure 7: Trend in immunization inequities in Ethiopia, EDHA 2000-2016**

| Trends of immunization inequities in Ethiopia |

*Ethics JA, 2017*
DTP3 immunization coverage among one-year-olds in Afghanistan, disaggregated by background characteristics (DHS 2015)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Subgroup</th>
<th>0-50</th>
<th>50-100</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Child’s sex</strong></td>
<td>Female</td>
<td>58.2</td>
<td>68.4</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>58.4</td>
<td>68.6</td>
</tr>
<tr>
<td><strong>Birth order</strong></td>
<td>1st born</td>
<td>62.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2nd-3rd born</td>
<td>54.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4th-5th born</td>
<td>58.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6th born or higher</td>
<td>59.3</td>
<td></td>
</tr>
<tr>
<td><strong>Mother’s age at birth</strong></td>
<td>15-19 years</td>
<td>49.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20-34 years</td>
<td>59.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>35-49 years</td>
<td>64.0</td>
<td></td>
</tr>
<tr>
<td><strong>Mother’s education</strong></td>
<td>No education</td>
<td>64.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Primary school</td>
<td>70.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Secondary school or more</td>
<td>79.8</td>
<td></td>
</tr>
<tr>
<td><strong>Mother’s ethnicity</strong></td>
<td>Baloch</td>
<td>44.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hazara</td>
<td>66.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nuristani</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pashtai</td>
<td>43.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pashtun</td>
<td>51.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tajik</td>
<td>64.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Turkman</td>
<td>57.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uzbek</td>
<td>73.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>84.6</td>
<td></td>
</tr>
<tr>
<td><strong>Size of household head</strong></td>
<td>Female</td>
<td>65.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>58.2</td>
<td></td>
</tr>
<tr>
<td><strong>Household economic status</strong></td>
<td>Quinile 1 (poor)</td>
<td>49.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quinile 2</td>
<td>52.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quinile 3</td>
<td>54.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quinile 4</td>
<td>54.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quinile 5 (rich)</td>
<td>70.4</td>
<td></td>
</tr>
<tr>
<td><strong>Place of residence</strong></td>
<td>Rural</td>
<td>59.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>68.2</td>
<td></td>
</tr>
</tbody>
</table>

Select country:
Afghanistan

Afghanistan JA, 2018
Suggested Analysis / Indicators

Key Analyses

Number of cases (suspected and confirmed)
Measles, Rubella, Congenital Rubella Syndrome (CRS), Pertussis, Polio, Diphtheria. Consider use of maps / graphs to present data and triangulation with coverage data. Consider disaggregating by age, vaccination status and geographic area.

Outbreaks
Distribution (e.g. across districts) and characteristics of cases of any VPD outbreak in the country, depending on local epidemiology (e.g. Measles, Meningitis, Yellow Fever, Japanese Encephalitis, Cholera).

Number of AEFI reported
Number of AEFI reported per 100 thousand surviving infants and comparison with international standard. Proportion of serious AEFI cases that were investigated or assessed by AEFI causality committee. Consider disaggregation on regional level if possible and analysis on AEFI after routine or campaign.

Additional analysis
- Number of other VPDs cases reported and confirmed per year, including Rotavirus, Pneumococcus, Typhoid and others, when available.

Interpretation and use
- Understanding the distribution of cases by geographical area, age groups or other key characteristics may help identify low immunity populations and target service delivery activities and intensification strategies.
- Assessing cases by vaccination status may also help identify areas with low quality vaccine supply and/or injection practices and help prioritise investments in improving cold chain and/or vaccine administration.
- Understanding where outbreaks occur may improve understanding of population immunity status and guide the needs for intensification of routine services and/or campaigns.
- Understanding the performance and results of the AEFI system may provide information for strengthening AEFI monitoring and provide input into communications and risk mitigation plans.
- Understanding where cases are both being reported and confirmed informs the functionality of surveillance systems and helps prioritise activities for improvements in human resources, sample transportation and laboratory capacity.

Data Sources
Administrative, Surveys, Surveillance Systems

Guidance and Resources
Immunization, vaccines and biologicals: disease surveillance and burden, WHO
https://www.who.int/immunization/monitoring_surveillance/burden/en/
Immunization, vaccines and biologicals: vaccine preventable diseases surveillance standards, WHO
https://www.who.int/immunization/monitoring_surveillance/burden/vpd/standards/en/
Indicators for monitoring district and national performance, WHO
http://www.who.int/immunization/monitoring_surveillance/routine/indicators/core_set_national_district.pdf
Measles programmatic risk assessment tool, WHO
Global Vaccine Safety: reference documents and publications, WHO
http://www.who.int/vaccine_safety/publications/en/
Immunization, vaccines and biologicals: Measles and Rubella Surveillance Data, WHO
https://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/active/measles_monthlydata/en/
AFP/polio data. WHO
https://extranet.who.int/polis/public/CaseCount.aspx
Examples

Confirmed cases of measles by geographical location

Figure 7 District performance of MCV1 against districts with measles cases 2016

Comments
Proportion of districts with a coverage \( \geq 90\% \) is 45\% (50). A total of 42 districts had at least one confirmed measles case.
Suggested Analysis / Indicators

Key Analyses

**Number of health facilities providing EPI services**

The analysis of the proportion of health facilities providing immunisation services should also be considered. Distribution and trends are desirable. Disaggregation per district and province is highly recommended. The total population covered by health facilities should be considered if estimations of population per catchment area are available. Otherwise, average population covered per health facility on district/province level could be used. Consider analysis of the proportion of the population living up to 5 km from a health facility if available.

**Frequency of vaccination sessions provided**

Compare planned versus actual if possible. Disaggregated by delivery model (fixed/outreach/mobile). Consider analysis of average number of children immunised by vaccination session per health facility, district or province if feasible. Subnational disaggregation and trend analysis are highly recommended.

**Number of cold chain equipment**

Also consider analysis of the proportion of functional cold chain equipment. Breakdown coverage of cold chain equipment. Suggested disaggregation per province, district or health facilities level if feasible.

In countries implementing the Cold Chain Equipment Operational Platform (CCEOP), consider analysis of proportion of health facilities in which expansion, extension and/or replacement of equipment are being conducted and compare with planned targets.

**Number of health workers**

Disaggregation by cadres, highlighting those most commonly providing vaccination services. Disaggregation by province / district / health facility level if possible. Consider analysis of proportion of health facilities with adequate/trained immunisation staffing according to national policies.

**Additional analysis**

- Wastage rates (closed and open vials), stock outs / full stock availability, vaccine utilization rates and triangulation with coverage data for different antigens, suggested disaggregation on health facility level if possible.
- Frequency of cold chain maintenance.
- Availability of temperature monitoring devices and number/proportion of alarms.
- Availability of transportation means and percent of orders delivered on-time and in-full (OTIF)

**Interpretation and use**

- Understanding the supply profile of the immunisation services and its capacity may help inform investments in infrastructure, and rebalance the distribution of human resources, equipment and training.
- It may also help redesign delivery strategies in some areas. (e.g. in a district with low population density and a low number of health facilities providing immunisations, programmes may need to rely more heavily upon outreach and mobile strategies, while in densely populated urban areas with an adequate number of facilities, fixed services with community involvement may be preferred).

**Data Sources**

JRF, Administrative, Health Facility Assessments, Other assessments

**Guidance and Resources**

Health statistics and information systems: service availability and readiness assessment (SARA), WHO [https://www.who.int/healthinfo/systems/sara_introduction/en/](https://www.who.int/healthinfo/systems/sara_introduction/en/)

Indicators for monitoring district and national performance, WHO [http://www.who.int/immunization/monitoring_surveillance/routine/indicators/core_set_national_district.pdf?ua=1](http://www.who.int/immunization/monitoring_surveillance/routine/indicators/core_set_national_district.pdf?ua=1)

Examples

1. Number of health facilities providing EPI services

Density of health facilities in Cameroon in 2016

![Map of Cameroon showing density of health facilities in 2016](image1)

*Cameroon JA, 2018*

Number of FCs and vaccinators

![Graph showing number of FCs and vaccinators from 2004 to 2017](image2)

*Afghanistan JA, 2018*
2. Frequency of vaccination services provided

Number of sessions held for each in relation to minimum number of sessions for an adequate service level (April, 2018)

![Graph showing frequency of vaccination services provided in DRC and Sudan]

**Figure 1: Trend of EPI service by strategy 2010-2015:**

![Bar chart showing trend of EPI service by strategy 2010-2015]

Sudan JA, 2016

3. Number of cold chain equipment
4. Additional Analyses

Comparison of doses of Pentavalent vaccine used with children immunised and calculation of wastage rate

<table>
<thead>
<tr>
<th>Pentavalent vaccine</th>
<th>Carryover 1 January 2017</th>
<th>Qty received in 2017</th>
<th>Stock as of 31/12/17</th>
<th>Wastage identified</th>
<th>Total useful doses 2017_2</th>
<th>Children immunised MR</th>
<th>Gap CI - Dose 2</th>
<th>Wastage Rate 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adamawa</td>
<td>63,000</td>
<td>183,100</td>
<td>18,700</td>
<td>0</td>
<td>227,400</td>
<td>132,307</td>
<td>95,093</td>
<td>41.8%</td>
</tr>
<tr>
<td>Centre</td>
<td>11,610</td>
<td>498,180</td>
<td>43,230</td>
<td></td>
<td>466,560</td>
<td>368,392</td>
<td>98,168</td>
<td>21.0%</td>
</tr>
<tr>
<td>East</td>
<td>31,550</td>
<td>95,810</td>
<td>4,500</td>
<td></td>
<td>122,860</td>
<td>108,949</td>
<td>13,911</td>
<td>11.3%</td>
</tr>
<tr>
<td>Far North</td>
<td>71,500</td>
<td>377,600</td>
<td>8,900</td>
<td></td>
<td>440,200</td>
<td>484,443</td>
<td>-44,243</td>
<td>-10.1%</td>
</tr>
<tr>
<td>Littoral</td>
<td>31,170</td>
<td>461,100</td>
<td>60,470</td>
<td>17,290</td>
<td>414,510</td>
<td>240,923</td>
<td>173,587</td>
<td>41.9%</td>
</tr>
<tr>
<td>North</td>
<td>320</td>
<td>299,740</td>
<td>10,800</td>
<td>0</td>
<td>289,260</td>
<td>296,481</td>
<td>-7,221</td>
<td>-2.5%</td>
</tr>
<tr>
<td>Northwest</td>
<td>52,800</td>
<td>203,200</td>
<td>21,460</td>
<td>52,500</td>
<td>182,040</td>
<td>163,900</td>
<td>18,140</td>
<td>10.0%</td>
</tr>
<tr>
<td>South</td>
<td>46,250</td>
<td>229,100</td>
<td>-</td>
<td>17,300</td>
<td>258,050</td>
<td>217,471</td>
<td>40,579</td>
<td>15.7%</td>
</tr>
<tr>
<td>Southwest</td>
<td>22,820</td>
<td>82,970</td>
<td>9,450</td>
<td>3,990</td>
<td>92,350</td>
<td>72,614</td>
<td>19,736</td>
<td>21.4%</td>
</tr>
<tr>
<td>Total</td>
<td>377,270</td>
<td>2,582,300</td>
<td>200,540</td>
<td>118,960</td>
<td>2,640,070</td>
<td>598,991</td>
<td>80,289</td>
<td>3.0%</td>
</tr>
<tr>
<td>National Level</td>
<td>2,140,600</td>
<td>383,100</td>
<td>33,600</td>
<td>0</td>
<td>2,490,100</td>
<td>650,543</td>
<td>1,839,557</td>
<td>73.9%</td>
</tr>
</tbody>
</table>

Democratic Republic of Congo JA, 2018

Cameroon JA, 2018
Gestion des stocks

Source : Données administratives
## Demand

### Suggested Analysis / Indicators

| Key Analyses | Drop-out rates (DPT1-DPT3/DPT1-MCV1/MCV1-MCV2)<sup>1</sup>  
Trend analysis. Consider disaggregation at subnational level, with special attention to districts supported by GAVI HSS. Consider analysis if information is available for vulnerable and high risk groups. |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional analysis</td>
<td>In the case of a recent Knowledge, Attitudes and Practice (KAP) survey, list the main reasons for non-vaccination and drop-out, as well as a quantitative and qualitative analysis for people not seeking immunisation.</td>
</tr>
<tr>
<td>Interpretation and use</td>
<td></td>
</tr>
</tbody>
</table>
- Understanding where the access is granted but children are still getting lost to follow up through the immunisation schedule, may inform the targeting of demand generation strategies.  
- Understanding reasons for non-immunisation may help tailor demand generation strategies to specific populations and inform communications plans. |
| Data Sources | JRF, Administrative, KAP Surveys, Surveys, Other assessments |
| Guidance and Resources | Immunization in practice: Monitoring and using your data., WHO  
[http://www.who.int/immunization/monitoring_surveillance/resources/IIP_Module7.pdf?ua=1](http://www.who.int/immunization/monitoring_surveillance/resources/IIP_Module7.pdf?ua=1) |

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<sup>1</sup> Drop-out rates may be affected by different causes, which are not necessarily related to immunisation demand. Discussing reasons for drop-out including a service delivery perspective will be also relevant.
Demand

Examples

**Uganda JA, 2016**

Sixty seven (67; 60%) of the districts had a dropout rate of >10%

Fifty four (54; 48%) of the districts had a dropout rate of >10%

Fifty (50; 45%) of the districts had a dropout rate of >10%

Over the past three years there is an increase in the number of districts with a dropout rate of >10%.

**India JA, 2018**

Reasons for partial/no immunisation

1. Awareness & Information gap 36%
2. AEFI apprehension 29%
3. Operational gap 8%

Number of reasons as per caregiver = 43,101

**Tajikistan JA, 2018**

Reasons for refusing immunisation of children under 5 among those who did not vaccinate their children:
## Suggested Analysis / Indicators

<table>
<thead>
<tr>
<th>Key Analyses</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Completeness and timeliness of reporting</strong></td>
<td>Suggested analysis on district level and facility level, if possible.</td>
<td></td>
</tr>
<tr>
<td><strong>Internal data consistency</strong></td>
<td>Based on desk reviews or in-depth assessments. Consider analysis of verification factors, outliers, negative dropouts and coverage higher than 100% per district and health facilities if possible. Trend analysis should also be considered.</td>
<td></td>
</tr>
<tr>
<td><strong>Denominators</strong></td>
<td>Analysis of population estimates difference or ratio between different data sources such as EPI projections and UNPD estimates or others as available. Consider disaggregation on district or province level if possible. Consider comparing district level population estimates with population catchment areas of health facilities if available.</td>
<td></td>
</tr>
<tr>
<td><strong>Additional analysis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• External data consistency based on surveys. Consider geographical disaggregation by regions.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Trend analysis on admin-survey differences and admin-WUENIC differences.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Trend analysis of Home-Based Records (HBR) for children: printing, ownership and availability</td>
<td></td>
</tr>
<tr>
<td><strong>Interpretation and use</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Understanding which districts/areas present important data quality issues may help the targeting of data quality efforts.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Understanding the main problems and the scale of data quality issues may help inform the interpretation of country performance at national and subnational levels.</td>
<td></td>
</tr>
<tr>
<td><strong>Data Sources</strong></td>
<td>JRF, Administrative, KAP Surveys, Surveys, UNPD estimates, EPI projections, others denominators sources available, other assessments</td>
<td></td>
</tr>
<tr>
<td><strong>Guidance and Resources</strong></td>
<td>Immunization, Vaccines and Biologicals: Monitoring and assessing immunization systems, WHO <a href="https://www.who.int/immunization/monitoring_surveillance/routine/en/">https://www.who.int/immunization/monitoring_surveillance/routine/en/</a></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Indicators for monitoring district and national performance, WHO <a href="http://www.who.int/immunization/monitoring_surveillance/routine/indicators/core_set_national_district.pdf?ua=1">http://www.who.int/immunization/monitoring_surveillance/routine/indicators/core_set_national_district.pdf?ua=1</a></td>
<td></td>
</tr>
</tbody>
</table>
Examples

Timeliness of Health Facility Report submission analysis by district 2016-2017

Malawi JA, 2018

Immunisation data congruence

Uganda JA, 2018
Data Quality

Nigeria JA, 2017

Penta 3 - Difference between survey and administrative coverage
## Suggested Analysis / Indicators

### Key Analyses

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health and immunisation programme financing</td>
<td>Trend analysis by funding sources (government vs others). Analysis of main donors involved in immunisation activities by theme and regions is highly desirable.</td>
</tr>
<tr>
<td>Health and EPI budget execution</td>
<td>Trend analysis. Disaggregation by administrative level (e.g. central, provincial, district) and by programmatic function (e.g. salary vs non-salary) is highly desirable.</td>
</tr>
<tr>
<td>Additional analysis</td>
<td>Trends in Gross Domestic Product (GDP) and economic growth perspectives. Trends in General Government Health Expenditures (GGHE) in absolute terms and as share of the General Government Expenditure (GGE). Consider disaggregation by level of care (primary, secondary and tertiary) and international comparisons.</td>
</tr>
</tbody>
</table>

### Interpretation and use

- Understanding the financing profile of the health and immunisation programme may lead to better understanding of the sustainability of the program and help inform funding related activities and strategies.
- The health and budget execution profile aids in the understanding of the funds absorption capacity of the country and may help in the re-prioritisation of activities with low absorption and adjust financial flows.

### Data Sources

- Ministry of Health budget execution report, EPI budget execution report, EPI operational plan report, Other assessments

### Guidance and Resources

- Immunization financing: a resource guide for advocates, policymakers, and program managers. Results for Development (2017)
- Global health expenditure database, WHO
  - [http://apps.who.int/nha/database](http://apps.who.int/nha/database)
- International Monetary Fund DataMapper, IMF
  - [http://www.imf.org/external/datamapper/NGDP_RPCH@WEO/WEOWORLD/DZA](http://www.imf.org/external/datamapper/NGDP_RPCH@WEO/WEOWORLD/DZA)
- GDP growth (annual %), WB
- Immunisation delivery cost catalogue, ICAN (Immunization Costing Action Network)
  - [http://immunizationeconomics.org/ican-idcc](http://immunizationeconomics.org/ican-idcc)
Financing

Examples

Immunisation financing 2017

Malawi JA, 2017

- **Budget of local government**

Support from central government for EPI, 2012-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Billion VND</td>
<td>240</td>
<td>240</td>
<td>264</td>
<td>311</td>
<td>330</td>
<td>301</td>
</tr>
<tr>
<td>US$</td>
<td>10,909,511</td>
<td>10,808,692</td>
<td>12,909,334</td>
<td>14,136,298</td>
<td>14,999,986</td>
<td>13,881,790</td>
</tr>
</tbody>
</table>

Support from local government for EPI, 2012-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Billion VND</td>
<td>12,459</td>
<td>13,116</td>
<td>14,877</td>
<td>22,287</td>
<td>52,739</td>
<td>51,437</td>
</tr>
<tr>
<td>US$</td>
<td>666,340</td>
<td>966,160</td>
<td>675,240</td>
<td>1,013,040</td>
<td>2,381,770</td>
<td>2,338,040</td>
</tr>
<tr>
<td># provinces</td>
<td>2463</td>
<td>2963</td>
<td>2063</td>
<td>3863</td>
<td>3963</td>
<td>5063</td>
</tr>
</tbody>
</table>

Total funding support from local government for routine EPI, in 2017 total 50 of 63 provinces support for routine EPI: US$ 2,338,040.

However, 4/63 provinces did not support for routine EPI during 2012 - 2017.

Vietnam JA, 2018
Financing

GDP growth, Burkina Faso and Sub-Saharan Africa, 1980-2016 (actuals), 2017-2021 (trends)

Government Health Expenditures as a share of General Government Expenditures, Lao PDR and lower-middle-income countries (2001-2014)
Glossary of terms

Financing

Funds allocated and executed for primary health care in Angola, 2015-2017

Average LGA level budget execution of the PHC budget in Ekiti (left) and Niger (right) States, 2015

World Bank, 2017. Public expenditure tracking survey
Suggested Analysis / Indicators

**Key Analyses**

- **Surveillance of Vaccine Preventable Diseases (VPD) and vaccine coverage**
  - Comparison of cases of Measles and Rubella with MCV (M or MR) coverage.
  - Comparison of cases of Diphtheria with DTP3 coverage.
  - Comparison of cases of Acute Flaccid Paralysis (polio and non-polio) with Polio coverage if relevant.

  Consider comparison of vaccine coverage for a specific cohort year with the corresponding age group when relevant. Consider disaggregation on province or district level if possible. Consider analysis on routine or campaign coverage if relevant.

- **Vaccine utilization and vaccine coverage**
  Compare the number of vaccines doses reported as used by health facilities with the number of vaccines doses made available by districts for different antigens according to the stock management system. Compare those numbers with the number children vaccinated considering all doses (e.g. DTP1+DTP2+DTP3 for Penta or MCV1+MCV2 for Measles). Consider disaggregation on province, district or health facility level if available. Interpret results with care depending on data quality of Admin and Stock Management System.

  Additional Analysis
  - Comparison of Infant Mortality Rates according to different sources and its impact in different denominators projections
  - Comparison of cases of other available VPD data with their respective vaccine coverage.

**Interpretation and use**

- Leads to a better understanding of data quality issues and identifies and aims to address limitations of any one data source and/or data collection methodology.
- Helps achieve a deeper insight into the phenomena of interest, and integrates knowledge of the broader context and underlying processes.
- Is particularly useful to have a better understanding on quality of data and performance of service delivery of vaccines and population immunity.

**Data Sources**

- Stock Management System, Administrative system, Surveillance System, Surveys

**Guidance and Resources**

- Data triangulation: use of health facility immunisation reporting tools, JSI [https://www.jsi.com/JSIInternet/Inc/Common/_download_pub.cfm?id=18693&lid=3](https://www.jsi.com/JSIInternet/Inc/Common/_download_pub.cfm?id=18693&lid=3)
Examples

1. Surveillance of Vaccine Preventable Diseases (VPD) and vaccine coverage

**Fig. 16: Measles data triangulation by different source, 2007-2017**

**Figure 7 District performance of MCV1 against districts with measles cases 2016**

Comments:
Proportion of districts with a coverage >=90% is 45% (30).
A total of 42 districts had at least one confirmed measles case.

*Ethiopia JA, 2017*

*Uganda JA, 2017*
Triangulation of different data sources

Comparison of number of children immunised for DTP-HepB-Hib with number of vaccines available to health regions (2017)

Madagascar JA, 2018
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEFI</td>
<td>Adverse Event Following Immunisation</td>
</tr>
<tr>
<td>AHS</td>
<td>Annual Health Survey</td>
</tr>
<tr>
<td>CRS</td>
<td>Congenital Rubella Syndrome</td>
</tr>
<tr>
<td>DTP</td>
<td>Diphtheria Pertussis Tetanus Containing Vaccine</td>
</tr>
<tr>
<td>ECS</td>
<td>EPI cluster survey</td>
</tr>
<tr>
<td>EPI</td>
<td>Expanded Programme on Immunisation</td>
</tr>
<tr>
<td>GAVI</td>
<td>The Global Alliance for Vaccination and Immunisation</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GGE</td>
<td>General Government Expenditure</td>
</tr>
<tr>
<td>GGHE</td>
<td>General Government Health Expenditure</td>
</tr>
<tr>
<td>HBR</td>
<td>Home Based Record</td>
</tr>
<tr>
<td>HF</td>
<td>Health Facility</td>
</tr>
<tr>
<td>HSS</td>
<td>Health System Strengthening</td>
</tr>
<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
</tr>
<tr>
<td>JA</td>
<td>Joint Appraisal</td>
</tr>
<tr>
<td>JRF</td>
<td>Joint Report Form</td>
</tr>
<tr>
<td>KAP</td>
<td>Knowledge Attitudes and Practices</td>
</tr>
<tr>
<td>MCV</td>
<td>Measles Containing Vaccine</td>
</tr>
<tr>
<td>MICS</td>
<td>Multiple Indicator Cluster Survey</td>
</tr>
<tr>
<td>MR</td>
<td>Measles Rubella Vaccine</td>
</tr>
<tr>
<td>NRVA</td>
<td>National Risk and Vulnerability Assessment</td>
</tr>
<tr>
<td>OPV</td>
<td>Oral Polio Vaccine</td>
</tr>
<tr>
<td>PCV</td>
<td>Pneumococcus Vaccine</td>
</tr>
<tr>
<td>Penta</td>
<td>Pentavalent Vaccine</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations International Children's Fund</td>
</tr>
<tr>
<td>USD</td>
<td>United States Dollars</td>
</tr>
<tr>
<td>VPD</td>
<td>Vaccine Preventable Disease</td>
</tr>
<tr>
<td>WB</td>
<td>World Bank</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
<tr>
<td>WUENIC</td>
<td>WHO/UNICEF Estimates of National Immunization Coverage</td>
</tr>
<tr>
<td>YF</td>
<td>Yellow Fever</td>
</tr>
</tbody>
</table>