Monitoring national immunization systems using core indicators

IMPLEMENTATION TASK FORCE (ITF)

Core Group

Formerly the Task Force for Country Coordination (TFCC)
Monitoring national immunization systems

using core indicators

Monitoring of immunization systems

Immunization systems rely on information to guide policies, strategies and to plan activities. Monitoring of immunization systems is based on the regular collection and analysis of well defined indicators. The information provided by indicators should be used for identifying and analysing problems, as well as monitoring progress towards stated targets. The collection of indicators over time will provide trends and thus guide management decisions.

The GAVI alliance partners wish to merge and align existing measurement efforts by defining a set of core indicators which satisfy GAVI requirements and streamline increasing reporting demands from the international community. It is also fundamental that this set of indicators be relevant to national authorities.

Scope of the core indicators

The core indicators are monitored at the national level (EPI manager/health information system). The list of indicators:
- provide a practical and representative profile of the status of the national immunization programme
- allows tracking of country performance. It is believed that the core set is common for every national programme and provides essential information needed by all EPI managers.
- allows comparisons between countries and monitoring at global level.
- provides evidence of progress towards GAVI immunization objectives.

In an effort to limit the amount of information requested, the proposed core indicator set are representative but limited. The ITF have decided to focus on priority indicators which are relevant, feasible to collect and to interpret, and inexpensive to measure in terms of time and cost. The indicators proposed will contribute to the requirements of the WHO/UNICEF Joint Reporting Form (JRF), conforming to its annual periodicity. At global level, it is believed that the information collected from the JRF should be used for the monitoring country progress and that a larger number of central ‘key’ indicators may give a more comprehensive picture of country’s performances than the core set. National programme managers are not limited to this core set of indicators, additional choices can
be made in accordance with their specific national programme objectives. They may also have their own periodicity of data collection and information gathering.

The core indicator set fits into the conceptual framework defining the four key components of a public health intervention: operations (with its five critical functions) and their three supporting elements, financial sustainability, strengthening human and institutional resources, and management development (annexe 1). It is, therefore, a core set of programme indicators. Beyond this framework, indicators of the impact of the programme (or outcome indicators) are needed, based on surveillance data, indicating the success of immunization i.e., disease and mortality reduction.

Given recent developments in health sector reform, particular emphasis has been put on information relevant to the district level.

A field test involving discussions with various EPI managers representing 8 countries (3 regions) was conducted to ensure the relevance, acceptability and feasibility of the core indicators and the current list reflects the changes made to the initial proposal. Although a number of the indicators will have a strong learning curve and prove to be difficult at first, their usefulness and importance was agreed upon. It is therefore acknowledged that the completeness of information will probably not be optimal at the start but it is recognised that all GAVI partners should strengthen the implementation and use of the Core Indicators.

Further development of additional core indicators

Some areas need to be further identified and developed within the key components and critical functions of the conceptual framework. A comprehensive picture may not be presently available due to the fact that continuous efforts are needed to define and track relevant indicators missing in those areas.

Sources and methods of data collection

Usually, the routine administrative reporting will be the main source of data coming from the districts. This may be complemented by specific assessments, surveys, and supervision visit reports. Routine reporting has a number of limitations and multiple factors may influence its accuracy: completeness and timeliness of reporting, pressure towards an upward bias to report, human errors, misunderstanding of the form etc. Additionally, a reliable denominator (e.g., for coverage: target population of children under one year of age) may be difficult to obtain. Data quality assessments are useful in improving the quality of reporting.

Sources may vary for types of national level information (existence of a plan, financial spending.)
Presentation of core immunization programme indicators

A. Operations

a. Service delivery

1. Proportion of districts in the country with \( \geq 80\% \) DPT3 coverage among infants

   Sub-function (area): coverage
   Comment: Key measurements of system performance and output. Major indicator corresponding to GAVI milestone: ‘by 2005, 80\% of developing countries will have routine immunization coverage of at least 80\% in all districts’. In the equity perspective, it allows identification of a high priority geographic area.

2. Proportion of districts in the country with \( \geq 90\% \) measles coverage among infants

   Sub-function (area): coverage
   Comment: Major indicator towards achieving reduction of measles mortality goal; also emphasised under GAVI’s objective to support the national and international accelerated disease control targets

3. Proportion of districts in the country with dropout rate (DTP1 to DTP3) of less than 10\%.

   Sub-function (area): utilization
   Comment: A major indicator for the utilisation of existing services. Compares the number of infants that started to receive immunizations with those who did not receive the last of vaccines. May reflect problems of supply, staffing, quality of service delivery and demand.

---

1 For the GAVI alliance partners monitoring purposes, the time period for all indicators is one calendar year.
4. Proportion of districts in the country that have been supplied with adequate (equal or more) number of AD syringes for all routine immunizations during the year

Sub-function (area): injection safety
Comment: reflects the adoption of auto-disable (AD) syringes policy (and the progress toward the adoption of the WHO – UNICEF – UNFPA joint statement) and the adequacy of supply management (procurement and distribution of appropriate related equipment). Particularly important to monitor as the Vaccine Fund decided to provide the injection safety supplies for all infant immunizations.

b. Logistics and cold chain

5. National level wastage rates of DTP and new vaccines (Hepatitis B and Hib).
Sub-function (area): vaccine management
Comment: critical indicator regarding GAVI requirements for new vaccines. Interpretation will need to be done according to the various factors influencing vaccine wastage: vial size in use, open vial policy adoption, etc. The calculation of national wastage needs to be well documented.

The vaccine wastage rate (%) = 100 – vaccine usage rate

Where the vaccine usage rate (%) =
No. doses used for immunization / {(number of vials opened for use + number of closed vials discarded) * number of doses per vial}

c. Vaccine supply & quality

6. Proportion of districts in the country that had no interruption in vaccine supply during the year
Sub-function (area): vaccine supply
Comment: definition of interruption in vaccine supply = district vaccine store has no remaining doses of any one EPI vaccine, for any period of time. The above is a reflection of vaccine management, vaccine storage and handling.

d. Surveillance and monitoring
7. **Proportion of districts disease surveillance reports received at national level compared to number of reports expected**
   
   **Sub-function (area):** reporting system
   
   **Comment:** Evaluates the completeness of reporting, however, it does not assess the quality of the reports themselves or their representativeness. This is crucial to evaluate the reporting system information. The district disease surveillance report definition is the monthly or quarterly report which should mention all vaccine preventable diseases. This is not disease specific.

8. **Proportion of districts coverage reports received at national level compared to number of reports expected**
   
   **Sub-function (area):** reporting system
   
   **Comment:** Evaluates the completeness of reporting, however it does not assess neither the quality of the reports themselves nor their representativeness (of delivery facilitites). This is crucial to evaluate reporting system information.

**e. Advocacy and Communication**

9. **Existence of an advocacy and communications strategic plan (annual) with identified focal point and annual budget**

   **Sub-function (area):** political commitment
   
   **Comment:** Reviews a country’s proposed advocacy and communications activities but does not give an indication of the quality of activities carried out. The level of resources allocated gives an indication of commitment by the government.

**B. Financial sustainability**

10. **Government financed recurrent program-specific immunization spending in the past year per million US dollars of total government spending**

    **Sub-function (area):** financial sustainability
    
    **Comment:** Shows the financial effort made from national sources for immunization. Spending means actual expenditures, not budgeted or planned amounts. Government financed includes direct Government spending and the expenditure of loan funds. It excludes any external public financing, i.e. any support from the Vaccine Fund (GAVI) or any grants from bilateral (DFID, JICA,…) or multilateral (UNICEF, WHO,…) agencies provided to national government for immunization services.
Recurrent program-specific spending includes all recurrent spending on items such as vaccines and supplies; wages and benefits for those personnel working exclusively on the immunization program; and fuel, maintenance and per diem associated with immunization-specific activities. It excludes spending on capital items (e.g. vehicles, cold chain equipment, buildings) and all ’shared’ personnel and other inputs (e.g. health workers who perform immunization along with other service delivery and wages, per diem, and fuel for supervisors who oversee immunizations along with other service delivery and health promotion activities).

The denominator will be obtained separately from recognised international sources.
C. Strengthening human and institutional resources

11. Proportion of districts that have had at least one supervisory visit of all health facilities in last calendar year
   Sub-function (area): supervision
   Comment: Extremely useful for capacity building. Although once a year appears as a minimum requirement for supervision, logistical field difficulties make the target (all health facilities once a year) challenging. The supervisory visit may not necessarily be specific to immunization but should include the supervision of immunization activities.

D. Management development

12. Proportion of districts with microplans that include immunization activities.
   Sub-function (area): strategic planning
   Comment: Does not give any information on the quality of the plan or to what extent activities have been implemented. Reference guidelines: "Increasing immunization coverage at health facility level" module.

Other relevant key indicators to measure progress towards global immunization goals

Immunization policy
Proportion of countries with measles 2nd dose opportunity.
Proportion of countries combining delivery of vitamin A with immunization.
Proportion of countries with substantial disease (Hib) burden having introduced Hib with routine.
Proportion of countries having introduced Hepatitis B.

Process indicators
Proportion of countries providing written feedback on immunization to district level at least every quarter.
Proportion of countries with 3-5 year strategic plan for the national immunization system.
Proportion of countries with national annual work plan for immunization services.
Proportion of countries with injection safety as a component to the national workplan.

---

2 Not exhaustive list. These key indicators are the ones presented in the advocacy set by the partners of the alliance
Output indicators
Proportion of countries with HepB3 coverage ≥ 80%.

Outcome indicators
Proportion of countries certified polio-free.
Proportion of countries with MNT elimination status
number of districts as being of high risk for MNT (% of districts with <1
NT case per 1000 live births).

Conclusions
The core indicators list consists of 12 indicators representative of national immunization programmes. Seven of those are based on data collected at district level and five from national level. Only seven core indicators were in the JRF (2001 data) meaning that an effort is needed to promote them and ensure that countries provide accurate information.
Summary list of immunization programme core indicators

<table>
<thead>
<tr>
<th>Key component</th>
<th>Critical Function</th>
<th>Area</th>
<th>Core indicator</th>
<th>Available in JRF 2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations</td>
<td>Service delivery</td>
<td>Coverage</td>
<td>% of districts with &gt;= 80% DTP3 coverage</td>
<td>Yes</td>
</tr>
<tr>
<td>Service delivery</td>
<td>Coverage</td>
<td>% of districts with &gt;= 90% measles coverage</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Service delivery</td>
<td>Utilization</td>
<td>% of districts with a DTP3-DTP1 dropout rate &lt;= 10%</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Service delivery</td>
<td>Safety</td>
<td>% of districts that have been supplied with adequate (equal or more) number of AD syringes for all routine immunizations during the year</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Logistics &amp; cold chain</td>
<td>Vaccine management</td>
<td>National level vaccine wastage rates of DTP and new vaccines (Hep B and Hib)</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Vaccine supply &amp; quality</td>
<td>Vaccine supply</td>
<td>% of district that had no interruption in vaccine supply (any vaccine) during the reporting year</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Surveillance</td>
<td>Reporting</td>
<td>% district disease surveillance reports received at national level compared to number of reports expected</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Surveillance</td>
<td>Reporting</td>
<td>% of district coverage reports received at national level compared to number of reports expected</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Advocacy / Communication</td>
<td>Political commitment</td>
<td>country having a plan / budget line / focal point in advocacy and communication</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Financial sustainability</td>
<td></td>
<td>Government financed recurrent program-specific immunization per million US dollars of total government spending</td>
<td>Yes (minor changes to current one)</td>
<td></td>
</tr>
<tr>
<td>Strengthening Human and Institutional resources</td>
<td>Human resources</td>
<td>Supervision</td>
<td>% districts that have had at least one supervisory visit of all health facilities in the reporting year</td>
<td>No</td>
</tr>
<tr>
<td>Management development</td>
<td>Strategic planning</td>
<td>Micro planning</td>
<td>% of districts with microplans that include immunization activities</td>
<td>No</td>
</tr>
</tbody>
</table>
Annex 1

Operations
Five critical functions:

Service delivery: the strategies and activities involved in giving vaccinations at the service-delivery level.
Vaccine supply & quality: forecasting vaccine needs; procurement of vaccines; vaccine utilization monitoring.
Logistics: delivery of vaccines and other equipment to the place of use, including arrangements of transport, cold chain and waste disposal.
Surveillance: measurement of disease incidence, record-keeping and reporting; laboratory testing.
Advocacy & communication: immunization, education and promotion; social mobilization; political and media advocacy.

Sustainable financing:
Developing, implementing and funding realistically costed annual workplans. 
Identifying and developing sustainable sources of finance for the priority elements derived from the Multi-Year Plan.
Strengthening financial oversight and accountability, tracking cash flows and remuneration and developing funding sources.
Assessing the gaps between planned budget and actual expenditure.

Management development
Management of the system to support service delivery needs. 
Management of human resources.
Decision-making.
Budgeting, financing and resource forecasting skills.
Monitoring and evaluating operations to make revisions.
Strengthening human and institutional resources:
Systematic and progressive national capacity-building and institutional strengthening.
Strengthening national human resource capabilities.
Augmenting the capacity of global, regional and other external mechanisms which support in-country activities.
Strengthening the ability to identify and fill capacity gaps through training, and the development of knowledge management systems.
Annex 2

GAVI Objectives

1. Improve access to sustainable immunization services.

2. Expand the use of all existing, safe and cost-effective vaccines and promote delivery of other appropriate interventions at immunization contacts.

3. Accelerate development and introduction of new vaccines and technologies.

4. Support the national and international accelerated disease control targets for vaccine-preventable diseases.

5. Accelerate R&D efforts for vaccines needed primarily in developing countries.

6. Make immunization coverage a centerpiece in international development efforts.

GAVI Milestones

1. By 2005, 80% of developing countries will have routine immunization coverage of at least 80% in all districts.

2. By 2002, 80% of countries with adequate delivery system will introduce Hepatitis B vaccine and all countries by 2007.

3. By 2005, 50% of poorest countries with high burden of disease and adequate delivery systems will have introduced Hib vaccine.

4. By 2005, the world will be certified polio-free.

5. By 2005, the vaccine efficacy and burden-of-disease will be known for all regions for rotavirus and pneumococcal vaccines, and mechanisms identified to make the vaccines available to the poorest countries.