This module describes health service delivery and the issues involved in assessing this aspect of a health system, including measurable indicators of the strengths and weaknesses of a country’s delivery of health care services.
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ACRONYMS

ACE  Angiotensin-converting Enzyme
ACS  Antenatal Corticosteroids
AIS  AIDS Indicator Survey
ANC  Antenatal care
ARI  Acute Respiratory Infection
ART  Antiretroviral Therapy
BCG  Bacillus Calmette-Guérin
CAD  Coronary Artery Disease
CBO  Community-Based Organization
CHV  Community Health Volunteers
CHW  Community Health Workers
CPD  Continuous Professional Development
CQI  Continuous Quality Improvement
CVD  Cardiovascular Disease
DHS  Demographic Health Survey
FBO  Faith-Based Organization
FFS  Fertility and Family Survey
HIS  Health Information System
HMIS  Health Management Information System
HPV  Human Papilloma Virus
KAP  Knowledge, Attitudes, and Practices
MDR-TB  Multidrug-resistant Tuberculosis
MICS  Multiple Indicator Cluster Survey
MOH  Ministry of Health
NCD  Non-communicable Disease
ORS  Oral Rehydration Solution
PHC  Primary Health Care
PSBI  Possible Serious Bacterial Infection
QI  Quality Improvement
RHS  Reproductive Health Survey
STEPS  STEPS Risk Factor and Stroke Surveillance
SWOT  Strength, Weakness, Opportunity, Threat
UHC  Universal Health Care
I. INTRODUCTION

Health service delivery, including engagement of communities and households, is the backbone of a health system, directly contributing to good health outcomes. It is “a fundamental input to population health status, along with other factors, including social determinants of health” (WHO 2010). Service delivery seeks to provide “effective, safe and quality personal and non-personal health interventions that are provided to those in need, when and where needed (including infrastructure), with a minimal waste of resources” (De Savigny and Adam 2009).

Continuous changes in the global burden of disease, increased prevalence of common preventable causes of ill health, global infectious disease emergencies, and patients suffering from multiple comorbidities (both infectious and noncommunicable) present a new challenge to the typically fragmented facility-based health service delivery system. Hospital-based, disease-based, and “silo” curative care models that focus on disease-specific policies and programs (WHO 2015c) drive the fragmentation of health systems. To meet these challenges, a fundamental paradigm shift is needed to critically assess the way health services are funded, managed, delivered, and monitored to make informed policy decisions.

To address fragmented and inefficient service delivery systems, people need to be empowered to make decisions and participate in their own care. In addition, health systems need to adopt the perspectives of individuals, families, and communities as participants and beneficiaries of services that meet with their needs and preferences. WHO recommends an integrated, people-centered health service approach (WHO 2015c) to organize care around patients rather than diseases. To achieve universal health coverage (UHC), health systems need to shift to “continuous delivery of health promotion, disease prevention, diagnosis, treatment, disease management, rehabilitation and palliative care services, at the different levels and sites of care within the health system, and according to the needs of people throughout their life course” (WHO 2016a). For this reason, the service delivery module of the HSA incorporates several dimensions of people-centered integrated health services, including knowledge, attitudes, and practices of populations and patients; range of prevention and treatment services covered; and continuity at each and between different levels of care, including care delivered at the community level.

Many types of preventive and promotive health services are delivered at the community level. Challenges for health care delivery service at the community level include health disparities, access to care, quality of care, and health care costs. Community Health Workers (CHWs) and Community Health Volunteers (CHVs) are uniquely positioned as liaisons between health facilities and communities to help mitigate these challenges. There are several studies to suggest that CHWs can impact a variety of individual and population health outcomes and when appropriately organized and managed, they can be an effective mechanism to improve health, empower communities, and reduce health care costs where expensive, fully trained health care workers are not available. Performance of CHWs and CHVs at the community level strengthen the linkages between communities and health facilities. This link facilitates a flow of information and communication from household to community group to community committee to formal health facility and vice versa.

This module presents the service delivery component of the assessment. This core health system function is the most proximate to health outcomes and therefore is critical to assessing the underlying causes of poor performance. In addition to assessing the status of service delivery, this module will probe “why” and inform the assessment of the other core functions. The module provides a rapid yet comprehensive assessment of the health service delivery system and focuses on the demand for and
supply of key personal and non-personal health services from public, commercial, and not-for-profit entities at different levels of the health service delivery system (primary, secondary, tertiary care) across rural and urban environments.

The module is organized in the following five subsections:

- Subsection 2.1 defines health service delivery and its key components.
- Subsection 2.2 provides guidelines on preparing a profile of health service delivery for the country of interest, including instructions on how to customize the profile for country-specific aspects of health service delivery.
- Subsection 2.3 presents the indicator-based assessment tool, including detailed descriptions of the illustrative indicators and guidance on how to prioritize the assessment measures.
- Subsection 2.4 discusses how to summarize the findings and develop recommendations.
- Subsection 2.5 contains a checklist of topics that the team leader or other team members can use to make sure they have included all recommended content in the chapter.

2. WHAT IS HEALTH SERVICE DELIVERY?

To reach the main goal of a health system—to improve a population’s health—the essential process that any health system should perform is delivery of services (WHO 2000). Health services encompass the following categories: promotion, prevention, treatment, rehabilitation, and palliation. Service delivery is concerned with how inputs and services are organized and managed to prevent disease and ensure access, quality, safety, and continuity of care across health conditions, different locations, and over time (WHO 2007). According to WHO (2010), the main characteristics of well-functioning health systems, are:

1. **Comprehensiveness**: A comprehensive range of health services is provided, appropriate to the needs of the target population, including preventative, curative, palliative, and rehabilitative services and health promotion activities.

2. **Accessibility**: Services are directly and permanently accessible with no undue barriers of cost, language, culture, or geography. Health services are close to the people, with a routine point of entry to the service network at the primary care level (not at the specialist or hospital level). Services may be provided in the home, the community, the workplace, or health facilities as appropriate.

3. **Coverage**: Service delivery is designed so that all people in a defined target population are covered—the sick and the healthy, all income groups, and all social groups.

4. **Continuity**: Service delivery is organized to provide an individual with continuity of care across the network of services, health conditions, levels of care, and over the life cycle.

5. **Quality**: Health services are of high quality—they are effective, safe, centered on the patient’s needs, and given in a timely fashion.

6. **Person/patient centeredness**: Services are organized around the person, not the disease or the financing. Users perceive health services to be responsive and acceptable to them. There is participation from the target population in service delivery design and assessment. People are partners in their own health care.
7. **Coordination:** Local area health service networks are actively coordinated across types of provider, types of care, levels of service delivery, and for both routine and emergency preparedness. The patient’s primary care provider facilitates the route through the needed services and works in collaboration with other levels and types of providers. Coordination also takes place with other sectors (e.g., social services) and partners (e.g., community organizations).

8. **Accountability and efficiency:** Health services are well managed so as to achieve the core elements described above with minimum wastage of resources. Managers are allocated the necessary authority to achieve planned objectives and are held accountable for the overall performance and results. Assessment includes appropriate mechanisms for the participation of the target population and civil society (WHO 2010).

One of the main functions of health service delivery, as noted above, is to ensure that all people receive “the range of health services they need (coverage), including health initiatives designed to promote better health of sufficient quality to be effective while at the same time ensuring that the use of these services does not expose the user to financial hardship (access)” (WHO and The World Bank Group 2015). In order to reach UHC with quality health services, countries need to focus their efforts to expand the package of covered health services (access); reduce cost sharing and fees, including out-of-pocket expenses (financial risk protection); and extend coverage to those who are not covered (equity). This health service delivery module addresses UHC’s dimensions of access and equity, and adds quality.

### 3. DEVELOPING A PROFILE OF THE HEALTH SERVICE DELIVERY SYSTEM

Health service delivery can be represented from the systems perspective, with inputs, processes, outputs, and outcomes (Donabedian 1980) (Figure 3.2.1), similar to the overall health systems framework. The other core functions, leadership and governance, financing, and resources (including human resources, pharmaceuticals, and health information), are key inputs. The main processes associated with delivery of personal and public health services are selection, management, organization, provision, and continuous quality improvement (QI) of these services. These inputs and activities are carried out to improve patients’ health, change health behavior, and reduce morbidity and mortality in the population (service delivery outcomes).

Despite significant progress made in availability of essential inputs and processes to deliver effective, accessible, continuous, and high quality health services, many service delivery and health system gaps prevent countries from improving their population’s health outcomes.
The general profile of the health service delivery system describes the major inputs and processes contributing to its performance (Figure 3.2.1). The profile of the health service delivery system can be described in narrative form with relevant quantitative and qualitative data and graphics. The assessment is mainly based on a review of secondary data from different sources and key informant (stakeholder) interviews.

Begin by analyzing the burden of disease and effective coverage of prevention (public health) efforts and health services (Topic A and Topic B indicators). Which services and/or population groups have low coverage and why? Assess the proximal and root causes of low coverage that will overlap with the other core functions. Table 3.2.1 outlines key questions related to the health system inputs, processes, and output-outcome dimensions described above. The scope of the assessment of the health system’s service delivery function seeks to answer the questions below. If the assessment team addresses some of the cross-cutting questions in other modules of the assessment (e.g., Leadership and Governance; Financing; Human Resources for Health; Medical Products, Vaccines, and Technologies; Health Information Systems), the team can skip these questions in the service delivery section. These questions can also be helpful to guide stakeholder interviews, particularly when the secondary data are not available/accessible (See Annex 3.2.A for an alternate summary of issues to explore in stakeholder interviews and Annex 2.3.D for a country example of discussion guides for the subnational level).
### Table 3.2.1. Main Topics and Questions to Describe and Assess the Health Service Delivery System

<table>
<thead>
<tr>
<th>Topics</th>
<th>Questions</th>
</tr>
</thead>
</table>
| **Outputs and Outcomes** | See burden of disease and health outcome indicators in Country and Health System Overview (Module 1).  
1. What are the primary causes of mortality and morbidity? How have they changed over time? Have there been system shocks (such as epidemics, natural disasters, political unrest, or armed conflict) that have disrupted service delivery and affected mortality and morbidity?  
2. Describe significant variations in coverage (utilization) by population group: socioeconomic, urban/rural, gender, and ethnicity (equity). See Topic B.  
3. Are health services accessible (access)? See Topic A for indicators of physical, financial, and sociocultural access.  
4. What services are covered universally and for specific target groups (coverage)? See Topic B.  
5. What are the main gaps in clients’ knowledge, attitudes, and practices (including care-seeking behavior) related to priority health conditions (client knowledge, attitudes, and practices)? See Topic C.  
6. Is care safe, effective, patient centered, timely, and efficient (quality)? See Topic D. |
| **Service Delivery Processes and Activities** | 1. What are the main personal and public health services provided by the health service delivery system (public and private)?  
2. What personal and public health services are provided at the community level?  
3. What are the main services provided by each type of facility? How does the government regulate what services are provided by type of facility and/or provider?  
4. What services do the public, commercial, and NGO/faith-based organizations (FBO) sectors deliver? Where? To what population groups? |
| **Range of services provided by level and sector** | 1. Is facility-level management involved in dialogue related to planning and budgeting health services?  
2. Does facility management define and prioritize specific objectives for improving priority services? If yes, please describe.  
3. Does facility management have a system in place to identify and reward good performance?  
4. What information (clinical, administrative, and financial) is generally used to manage health services at the facility level?  
5. What mechanisms are in place to improve staff productivity and efficient use of resources?  
6. How is continuity of care encouraged or facilitated? How is care coordinated or integrated across levels, including community services?  
7. How are private providers organized? Provider networks? Health maintenance organizations? Degree of vertical integration?  
8. How is the community or patient population engaged by service providers in service provision, planning, and determining adequacy of provider performance? |
1. Describe national policies, strategies, and mechanisms to improve quality of care among public and private providers. How are these policies developed and monitored? What is the degree of collaboration among regulators, providers, and consumers?

2. Describe the government authorities responsible for regulation and oversight of health professionals, facilities, and pharmaceuticals.

**Module Links:**
Module 7—Governance, Topics D and G  
Module 4—Medical Products, Vaccines, Technologies, Topic A

3. Describe the “who” (regulatory bodies, private associations, payers [public or private]) and the “how” of the main regulatory functions (licensing, accreditation, certification, external audit, infection prevention control [WHO 2009 and WHO 2011], clinical and administrative supervision, coaching, continuous education requirements, clinical protocols, adverse event reporting/audits, provider payment methods based on quality, and patient/consumer accountability mechanisms such as scorecards) related to health service delivery and its quality at the national and subnational levels (see also Governance module).

4. For each regulatory function or strategy (Question 3 above), contrast how it is supposed to work with how it is actually working (or not). Present quantitative performance data if available (e.g., percentage of doctors licensed, facilities accredited, percentage of facilities with continuous quality improvement [CQI], percentage audited). Why are some functions and strategies not working? What alternative strategies are being explored?

5. What national and subnational/district structures (i.e., ministry of health [MOH] divisions or departments) are responsible to implement such policy? Are there budget allocations to fund these structures? Is funding available to implement national QI plans? Highlight any difference in governance of quality (policy, regulation) between public and private sectors.

6. How does the regulatory environment ensure that facilities have QI teams and institutionalized (CQI) processes in place? What proportion of facilities or provider organizations practice CQI? Briefly describe the process, including improvement in any specific priority clinical area (if any). Who is part of the QI team? What are the main activities of QI teams? How do QI teams monitor the progress of QI? How are the monitoring results documented and used?

7. Do care providers receive QI capacity building or coaching? If yes, describe the coaching, including frequency.


9. Do facilities conduct process mapping? In other words, do facilities assess the organization of service delivery (process of care)? If yes, describe.

10. Is the care consistently compliant with evidence-based best practices? If not, what are the main barriers? What clinical content areas are of concern?

11. Do facilities provide regular clinical supervision and coaching to care providers? If yes, describe the process (Who provides the supervision? Is it internal or external? Does the clinical supervision exist only in specific priority clinical area? Do providers have designated clinical supervisors? What is the frequency of supervision? How do supervisors stay up-to-date with evidence-based care? Is there a difference between public and private or by type of facilities?)

12. Do facilities regularly update providers’ clinical knowledge and skills? If yes, describe the process and frequency.

13. Describe the “who” (regulatory bodies, private associations, payers [public or private]) and the “how” of strategies and mechanisms to ensure that patients feel respected and services are oriented to their needs. How are patients/consumers/communities engaged? How it is supposed to work? How it is working (or not)?
<table>
<thead>
<tr>
<th>14. Do health services meet expressed needs and concerns of patients?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INPUT: Human Resources</strong> See Section 3, Module 3: Human Resources for Health, for more details.</td>
</tr>
<tr>
<td>1. To what degree and how are service delivery problems caused by human resources constraints? What are the major human resource constraints and the causes? Shortages by cadre? Absenteeism? Dual employment (public sector providers moonlighting)? Limited or poor quality of preservice training? Low salaries? Poor deployment to underserved areas? Loss of staff to overseas? Insufficient in-service training to enhance skills? Unclear scopes of practices between cadres (e.g., doctors/nurses), limited scopes (e.g., nurses prevented from doing simple treatment), limited teamwork and communication between care providers?</td>
</tr>
<tr>
<td>2. Are there differences in scopes of practice between public and private sectors?</td>
</tr>
<tr>
<td><strong>INPUT: Infrastructure, Medical Products, Vaccines, and Technologies</strong> See Section 3, Module 4: Medical Products, Vaccines, and Technologies, for more details.</td>
</tr>
<tr>
<td>Health infrastructure</td>
</tr>
<tr>
<td>1. To what degree and how are service delivery problems caused by constraints in physical infrastructure and equipment, or inadequate supply, or inappropriate use of pharmaceuticals, supplies, and vaccines?</td>
</tr>
<tr>
<td>2. How many health facilities are there in total (public and private)?</td>
</tr>
<tr>
<td>3. What are the main types of health facilities? How many total health facilities are there by type?</td>
</tr>
<tr>
<td>4. Are facilities evenly distributed by urban and rural settings?</td>
</tr>
<tr>
<td>5. What are the barriers to physical access to health services in general? By public/private sector?</td>
</tr>
<tr>
<td>6. Are health services equitably accessible to urban and rural populations? What are the main barriers to availability of medical facilities in rural settings?</td>
</tr>
<tr>
<td>7. Is cost of travel for care a barrier for people accessing appropriate care?</td>
</tr>
<tr>
<td>8. What and where are the major infrastructure gaps (including availability of water and electricity)?</td>
</tr>
<tr>
<td>9. What organizations are responsible for short- and long-term capital investments in health service delivery infrastructure? What is the process for making infrastructure investment decisions to ensure efficiency and equity? What is the process for avoiding overcapacity of tertiary capacity (facilities and equipment) and provider-induced demand?</td>
</tr>
<tr>
<td>10. Are there enough funds to support development or rehabilitation of government health facilities?</td>
</tr>
<tr>
<td>11. How efficiently is the health infrastructure distributed (allocative efficiency) and utilized (technical efficiency)?</td>
</tr>
<tr>
<td>See Medical Products, Vaccines, and Technologies (Module 4) for more details</td>
</tr>
<tr>
<td>1. What are the main barriers to the availability and quality of essential equipment, vaccines, and supplies at the facility level?</td>
</tr>
<tr>
<td>2. How well are health infrastructure, vaccines, and supplies distributed and utilized to maximize capacity of the health service delivery system?</td>
</tr>
<tr>
<td>3. What are the main barriers to the availability of quality medications within the facilities?</td>
</tr>
<tr>
<td>4. What are the main barriers to safe and rational prescription/administration of medications within the facilities?</td>
</tr>
<tr>
<td>5. What are the main barriers to access (physical and financial) to essential medications by patients?</td>
</tr>
<tr>
<td>6. What are the main barriers to the rational use of medications by patients?</td>
</tr>
<tr>
<td>7. What are the main barriers to adherence to prescribed treatment by patients?</td>
</tr>
</tbody>
</table>
### INPUT: Information Systems and Clinical Guidelines

**See Section 3, Module 5: Health Information Systems, for more details.**

| Information systems | 1. What health information systems (HIS) deficiencies constrain the ability to measure service delivery performance?  
2. What and how do HIS deficiencies contribute to service delivery problems?  
3. What HIS deficiencies impede the implementation of service delivery improvements?  
4. What is the main document where the provider records clinical information (registry or clinical record)?  
5. Does the HIS within the facility allow providers to track the medical history of individual patients across the continuum of care?  
6. What information is shared during the referral to higher level facility? What information is usually given to patients during discharge? Does it include a follow-up time and place and information for the primary care provider?  
7. Are medical facilities regularly collecting information on quality of clinical services? If yes, please, list 2–3 process or outcome measures routinely collected.  
8. What regular data reports are shared with district and national health authorities regarding health service delivery? Are these records standardized across different facilities? |

| Clinical guidelines | 1. What are the main mechanisms to ensure continuous updating, access to, and use of evidence-based clinical guidelines and protocols?  
2. What are the main organizations responsible for development, continuous updating, and adoption of clinical guidelines? Protocols?  
3. What are the main organizations supporting dissemination and implementation of evidence-based medical information at the facility level?  
4. Describe the main barriers to the continuous updating, access to, and use of evidence-based clinical guidelines and protocols by care providers. |

### INPUT: Governance

**See Section 3, Module 7: Governance, for more details**

| MOH structure, composition, roles and responsibilities | 1. How is service delivery performance affected by health system governance?  
2. From the health governance module, summarize the main issues that directly affect service delivery.  
3. Describe the central- and mid-level health authorities responsible for planning clinical services delivered in both the public and private sectors.  
4. Describe the central- and mid-level government department responsible for planning and administration of public health services.  
5. Are there any government structures for specific priority services (e.g., communicable, non-communicable diseases (NCDs), maternal and child health)? If yes, are any coordination mechanisms in place to ensure integrated planning and delivery of range of priority services?  
6. Is coherence and consistency across these departments achieved?  
7. Highlight aspects of the service delivery system that significantly differs from international norms. |

| Role of subnational government | 1. Describe the role of subnational government authorities with respect to health services delivery: regional, district, and local. |
1. Describe the main players involved in planning, implementing, and evaluating clinical and public health service delivery.
2. Which policies support collaboration, partnerships, or integration among different types of care providers (public and private, levels of care)?
3. Describe policy barriers constraining delivery of health services by private commercial organizations and NGO/FBOs.
4. What type of information (routine reporting, surveys) is regularly used by the government to make informed policy decisions regarding service delivery and its quality?
6. What are the main regulatory barriers that affect availability of key inputs and access to high quality continuous and equitable health services at each level of the health service delivery system?

**INPUT: Financing** See Section 3, Module 6: Health Financing, for more details

1. Use information from the health financing module to summarize the main public and private sources and systems for financing health services.
2. What are the main gaps in financing health services in terms of services or population groups that lack coverage (i.e., rely on out-of-pocket payment)?
3. Please describe the main vertically funded and administered health services (if any).
4. To what degree and how are health financing constraints contributing (directly and indirectly) to service delivery performance in terms of coverage, access, equity, and allocative and technical efficiency?
5. How does health financing affect how service delivery is organized and managed in the public and private sectors?
6. How does health financing currently provide positive incentives to improve service delivery? Quality (e.g., accreditation required to participate in public insurance scheme); technical efficiency (e.g., rational medication prescription and other cost-containment strategies); and allocative efficiency (e.g., focus on high-burden diseases and high-impact clinical and public health services)?
7. Are there negative incentives that constrain improvements?

Annex 3.1.A has a template for the level of decentralization of a health system that can be filled in to indicate at what level in the health system key service delivery functions are performed.

The description of the general profile of the health service delivery system may include a graphic presentation of different levels of care. Figure 3.2.2 is an illustrative example of major levels of a health service delivery system; it shows in pyramid form the central, intermediate, and peripheral levels of care in a health system and the number of facilities at each level.
Figure 3.2.2. Sample: Health Sector Pyramid (Public and Private Sector)

A more comprehensive way to present a country’s service delivery system in graphic form is to map the types of health facilities, care providers, and major functions/service categories delivered at each level of care. Figure 3.2.3 provides an example of this type of depiction for the Republic of Georgia. This approach is an effective way to visualize the organization of care across different levels of a health service delivery system and enhances the narrative report. Developing a holistic and comprehensive profile of the health system will help to show how the entire system works, including the relationships between different sectors and levels of care.
Figure 3.2.3. Map of the Georgian Health Service Delivery System (2007)

Providers

<table>
<thead>
<tr>
<th>Rayon PHC organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical (Nurse/midwife)</td>
</tr>
<tr>
<td>Medical (Nurse/midwife)</td>
</tr>
<tr>
<td>PHC team</td>
</tr>
<tr>
<td>PHC team</td>
</tr>
<tr>
<td>PHC practice</td>
</tr>
</tbody>
</table>

Types of services provided

Primary level

1. Curative or preventive consultation in the GP office or at patient’s home
2. PHC priority programmes
3. Public health activities

Secondary level

1. Specialists outpatient care (limited according to functions)
2. Rayon lab and diagnostics
3. Proximity emergency care
5. Ambulance-transportation

Tertiary level

1. Highly specialized outpatient care
2. Highly specialized lab and diagnostics
3. Highly specialized in-patient care
4. Teaching function

4. ASSESSMENT INDICATOR OVERVIEW

This section focuses on service delivery indicators, grouped into five topics. For each topic, the rationale for examining the area, data sources for the indicators, indicator definitions, and suggestions for interpretation or specific issues to explore are provided. Most importantly, the section suggests a strategy for prioritizing the key indicators that should be the focus of the service delivery module of the HSA based on the country context, priorities, and data availability. Analyze service delivery indicators over time and note any system shocks (such as natural disasters, epidemics, political or armed conflict) and how these indicators may have changed.

4.1 Topics

The indicators for this module are grouped into the five topics listed in Table 3.2.2. The topics are based on the organization and objectives of the service delivery function.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Indicator Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Access to Health Services</td>
<td>1–11</td>
</tr>
<tr>
<td>B. Coverage, Utilization, and Equity of Health Services</td>
<td>12–31</td>
</tr>
<tr>
<td>C. Consumer Knowledge and Behaviors</td>
<td>32–33</td>
</tr>
<tr>
<td>D. Quality of Health Services</td>
<td>34–52</td>
</tr>
</tbody>
</table>

4.2 Data Sources

There are many sources to help the team assess and analyze the health service delivery system. They are organized into three main categories:

1. Standard health indicators

- The World Bank (2017) also has a database on development indicators.
- WHO (2015a) developed a global reference list of 100 Indicators that will be updated regularly.
- The following surveys contain a wealth of information that, with additional analysis, can provide more nuanced analysis of access, equity, efficiency, and quality of health services in a specific country:
  - CHW/CHV program surveys
  - Demographic Health Surveys (DHS)
  - AIDS Indicator Survey (AIS)
  - Household health utilization and expenditure survey
  - National Health Accounts Living Standards Measurement Survey (LSMS)
  - Reproductive Health Survey (RHS)
  - STEPS Risk Factor and Stroke Surveillance (STEPS)
  - Behavioral Surveillance Surveys (BSS)
2. Secondary sources

The health indicators need to be supplemented with other research and documents, such as policies, regulations, and health statistics. Here is a suggested list of secondary sources that are readily available:

- Organization chart of MOH
- MOH service delivery statistics
- MOH registry of facilities (public, commercial, NGO, FBO)
- Registry of care providers
- MOH health laws, policies, and regulations governing standards of care and health personnel
- Recent (past five years) MOH policy statements, strategies, strategic plans, and annual plans
- Studies conducted by health projects in the area of reproductive, maternal, newborn and child health, TB, HIV, and other priority fields
- Situational analyses and operations research, including assessment of quality of care
- Facility-generated data that include routine facility information systems and health facility assessments and surveys, including assessment of quality of care and supporting system functions
- Community health registry
- Country studies on access and referral systems
- Civil registration and vital statistics systems
- Other population-based health surveys
- Administrative data sources such as financial and human resources information systems
- Brochures, websites of private, NGO, and FBO health providers
- Indicators from other sources, including modeling

3. Stakeholder interviews

- MOH planning division that compiles and analyzes service delivery data
- Public and private professional councils
- MOH division responsible for quality compliance
- MOH division that inspects and licenses facilities
- MOH program managers of vertical programs (e.g., family planning, AIDS, TB)
- MOH district supervisors
- Government structure(s) responsible for collecting and analyzing routine health statistics and health system performance indicators at the national level (e.g., Center of Disease Control and Public Health)
- MOH hospital and health center managers and providers
- Managers and providers of private hospitals and health centers
- Heads of provider associations (physicians, nurses and midwives, clinical officers, lab technicians, pharmacists)
- Managers of NGO/FBO/CBO health care organizations
4.3 Detailed Indicator Description

This section provides an overview of each topic area and then a table that gives a definition and interpretation of each indicator.

4.4 Topic A: Access to Health Services

Overview

Access describes the extent to which services are directly and permanently accessible, with no undue barriers of cost, language, culture, or geography (WHO 2010). Various factors limit access, including distance to point of service, lack of transportation, economic barriers, and cultural appropriateness.

Describing Access to Health Services

Access is often measured as a proxy of physical availability and financial affordability of health services. Illustrative measures of physical availability of health services include: distance traveled to health facilities, opening hours of the closest health facilities, waiting times for planned hospitalizations, distribution of health services of health workers per 10,000 population, frequency of outreach clinics/mobile clinics in the community/village per month, and balance between generalist and specialist physicians and nurses to physicians ratio. Financial access often is measured by affordability of outpatient and inpatient health services and chronic medications. Table 3.2.3 contains indicators to measure access to health services.

The following are suggestions on how to analyze and describe barriers to access care:

- Compare access to health services in rural versus urban areas (distance).
- Compare access to health services to poor and disadvantaged populations.
- Compare access to health services in the public and private sectors (convenience, opportunity, cost in transport, and wages lost to travel to distant MOH provider compared to local private providers).
- Examine percentages of women or other target groups with specific barriers in accessing health care (cultural).
- Use available DHS data or other secondary data sources (e.g., community, household, or patient studies) to explore the range of access barriers from a client perspective. Interviews with health care providers, patients, and key stakeholders also provide valuable data about the existence of such barriers and any policy or implementation tools to address them.
### Table 3.2.3. Access to Health Services

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Definition and Interpretation</th>
</tr>
</thead>
</table>
| 1. Health worker density and distribution (per 1000 population) | **Definition:** Number of health workers per 1000 population. Where possible, complement presentation of health worker density and distribution by a) its compliance with appropriate or minimum staffing by facility level and b) presenting results of human resource capacity analysis conducted in the country, aimed at determining the ability of the health system to fill its human resource needs in the future (see Human Resources section for more details).  
**Numerator:** Number of health workers by cadre.  
**Denominator:** Total population.  
**Disaggregation/additional dimension:**  
- By cadre, including generalist medical practitioners, specialist medical practitioners (surgeons, anesthetists, obstetricians, emergency medicine specialists, cardiologists, pediatricians, psychiatrists, ophthalmologists, gynecologists, etc.), nursing and midwifery professionals, traditional and complementary medicine professionals, etc.  
- Distribution: place of employment (urban/rural), subnational (district)  
- Primary care level and hospital level  
**Method of measurement:** National database or registry of health workers, preferably at individual level.  
**Method of estimation:** If there is a national database or registry, there should be regular assessments of completeness using census data, professional association registers, facility censuses, etc.  
**Health worker concentration:** Percentage of all health workers in urban areas divided by percentage of total population in urban areas.  
**Preferred data sources:** Health worker registry, national Health Management Information System (HMIS).  
**Other possible data sources:** National health workforce database (aggregate).  
**For further information and related links, see WHO 2015a.**  
**Module Link:**  
Module 3—Human Resources for Health Indicators (health worker density per 1000 population per cadre, by gender) and (accessibility of the health workforce). |
| 2. Hospital bed density (per 10,000 population) | **Definition:** Total number of hospital beds per 10,000 population. In most cases (where information is available), beds for both acute and chronic care are included. Inpatient bed density serves as a proxy to assess the adequacy of the availability of health service delivery and particularly hospital service delivery.  
**Numerator:** Number of hospital beds (excluding labor and delivery beds)  
**Denominator:** Total population.  
**Disaggregation/additional dimension:** Distribution (by province/district), ownership (public/private), type of bed.  
**Method of measurement:** A national database is usually maintained. Regular updates through surveys or facility censuses are needed.  
**Preferred data sources:** Routine facility information systems/national database.  
**For further information and related links, see WHO 2015a.** |
| Definition: Total number of primary care facilities per 10,000 population.  
| Numerator: Number of primary care facilities (functional).  
| Denominator: Total population.  
| Disaggregation/additional dimension: Distribution (by urban/rural), ownership (public/private), type of bed.  

If available, the distribution of public primary care facilities among rural and urban health districts is a measure of equity in access. Try to obtain population estimates for rural and urban areas to compare the ratio of resources to the total population. If this information is unavailable, inquire whether regional differences are available and whether each region can be classified as overall urban or rural. If the urban-rural distribution is extremely skewed, you can examine recent budget expenditures and work plans to see if they contain line items or plans for capital investments, particularly for the building of new facilities.  

**Method of measurement:** A national database is usually maintained. Regular updates through surveys or facility censuses are needed.  

**Preferred data sources:** Routine facility information systems/national database.
**Definition:** Number of health facilities offering specific services per 10,000 population. Where possible, analyze this indicator together with hours when particular service(s) is offered (hours of operation) and hours when it is actually available. Analysis can be focused on context-specific priority services.

If this indicator is not readily available, use survey data that assess availability of services for population when seeking care (e.g., percentage of respondents [households] that reported availability of health services, when needed, stratified by types of health services, urban-rural, household income, expenditure, or wealth).

**Numerator:** Number of facilities that offer and meet tracer criteria for specific services:
- Family planning
- Antenatal care (ANC)
- Basic emergency obstetric and neonatal care (BEmONC)
- Comprehensive emergency obstetric and neonatal care (CEmONC), post-abortion care
- Essential newborn care
- Immunization
- Child health preventative and curative care
- Adolescent health services
- Lifesaving commodities for women and children
- Malaria diagnosis or treatment
- TB services
- HIV counselling and testing
- HIV and AIDS care and support services
- Antiretroviral prescription and client management
- Prevention of mother-to-child transmission of HIV
- Sexually transmitted infections diagnosis or treatment
- NCDs diagnosis or management: diabetes, cardiovascular disease (CVD), chronic respiratory disease, cervical cancer screening
- Basic and comprehensive surgical care, including caesarean section, laparotomy, and open fracture
- Blood transfusion
- Laboratory capacity
- Counseling, education, home visits, screening at the community level (e.g., nutrition, malaria, TB etc.)

**Denominator:** Total number of health facilities and total number of facilities offering specific services.

**Disaggregation/additional dimension:** Facility type, managing authority (public/private); Also: general service availability and readiness.

**Method of measurement:** Facility assessment.

**Preferred data sources:** Health facility assessments.

Other possible data sources: Household/population survey for alternative indicator (e.g., percentage of respondents [households] that reported availability of health services, when needed).

For further information and related links, see WHO 2015a.
5. Service-specific availability per 10,000 population

**Definition:** Number of health facilities offering specific services per 10,000 population. Where possible, analyze this indicator together with hours when particular service(s) is offered (hours of operation) and hours when it is actually available. Analysis can be focused on context-specific priority services.

If this indicator is not readily available, use survey data that assess availability of services for population when seeking care (e.g., percentage of respondents [households] that reported availability of health services, when needed, stratified by types of health services, urban-rural, household income, expenditure, or wealth).

**Numerator:** Number of facilities that offer and meet tracer criteria for specific services:
- Family planning
- ANC
- Basic emergency obstetric and neonatal care (BEmONC)
- Comprehensive emergency obstetric and neonatal care (CEmONC), post-abortion care
- Essential newborn care
- Immunization
- Child health preventative and curative care
- Adolescent health services
- Lifesaving commodities for women and children
- Malaria diagnosis or treatment
- TB services
- HIV counselling and testing
- HIV and AIDS care and support services
- Antiretroviral prescription and client management
- Prevention of mother-to-child transmission of HIV
- Sexually transmitted infections diagnosis or treatment
- NCD diagnosis or management: diabetes, CVD, chronic respiratory disease, cervical cancer screening
- Basic and comprehensive surgical care, including caesarean section, laparotomy, and open fracture
- Blood transfusion
- Laboratory capacity
- Community outreach services (home visits, counseling, education, screening services)

**Denominator:** Total number of health facilities and total number of facilities offering specific services.

**Disaggregation/additional dimension:** Facility type, managing authority (public/private); Also: general service availability and readiness.

**Method of measurement:** Facility assessment.

**Preferred data sources:** Health facility assessments.

Other possible data sources: household/population survey for alternative indicator (e.g., percentage of respondents [households] that reported availability of health services, when needed).

For further information and related links, see WHO 2015a.
### 6. Community Health Worker (CHW)/Community Health Volunteer (CHV) Density and Distribution

**Definition:** Number of CHWs/CHVs per 500 population. Where possible, complement presentation of health worker density and distribution by a) its compliance with appropriate or minimum staffing by facility level and b) presenting results of human resource capacity analysis conducted in the country, aimed at determining the ability of the health system to fill its human resource needs in the future (see Human Resources Section for more details).  
**Numerator:** Number of CHWs/CHVs.  
**Denominator:** Total population.  
**Calculation:** \( \frac{\text{Number of CHWs/CHVs per 500}}{\text{total population}} \).  
**Disaggregation/additional dimension:**  
- Distribution: communities/villages rural versus urban  
- Primary care level and hospital level  
**Method of measurement:** National database or registry of CHWs/CHVs, preferably at individual level.  
**Method of estimation:** If there is a national database or registry, there should be regular assessments of completeness using census data, professional association registers, facility censuses, etc.  
**CHW concentration:** Percentage of all CHWs working in urban areas divided by percentage of total population in urban areas.  
**Preferred data sources:** CHW/CHV registry, national HMIS.  
**Other possible data sources:** National health workforce database (aggregate).  
**For further information and related links, see** [WHO 2015a](https://www.who.int).  

### 7. Geographic Access to Health Services

**Definition:** Percentage of population living within 5 kilometers of a health facility (total number of health facilities per 10,000 population). In addition to this indicator, where possible, present information about outreach services available for remote communities (including frequency of outreach visits and services offered).  
**Alternative/additional indicators:**  
- Percentage of respondents who have to travel more than 1 hour to reach the closest health care facility (stratified by facility type, acute/chronic condition)  
- Access to emergency surgery (percentage of the population who can access, within 2 hours, a facility that can perform emergency caesarean section, laparotomy, and open fracture fixation)  
**Numerator:** Number of facilities in public and private sectors.  
**Denominator:** Total population.  
**Disaggregation/additional dimension:** Density of specific services, facility ownership, location (district, province, national or urban/rural), type of health facility.  
**Method of measurement:** Availability (health facility assessment, census, master facility list). Geographical accessibility is the preferred indicator and is often measured by distance or travel time to a static health facility. A more objective and easy indicator uses facility databases to assess density and distribution.  
**Preferred data sources:** Facility database, geospatial modeling.  
**Other possible data sources:** Surveys.  
**For further information and related links, see** [WHO 2015a](https://www.who.int).  

**Module Link:**  
Module 4—Medical Products, Vaccines, and Technologies Indicator (percentage of households more than 5/10/20 km from health facility/pharmacy that dispense essential medicines)
<table>
<thead>
<tr>
<th>8. Financial access to health services</th>
</tr>
</thead>
</table>
| **Definition:** Percentage of households (respondents) not seeking health care services when needed because household cannot afford it.

The following indicator was selected to provide insight into the degree to which financial access may be a barrier in the health services. Other indicators assessing financial access and unmet demand on health services due to financial access include:
- Out-of-pocket payment for health (as percentage of current total expenditures on health)
- Headcount ratio of catastrophic health expenditure (household surveys)
- Headcount ratio of impoverishing health expenditure (household surveys)

Individuals’ and households’ out-of-pocket spending (on user fees for facility consults and purchase of related tests and medicines) that exceeds 60 percent of total expenditure on health suggests limited government funding of health care and a potentially prohibitive financial barrier to accessing care, while the ratio of catastrophic and impoverishing health expenditures measure the percentage of households facing catastrophe and/or impoverishment due to health expenses.

**Numerator:** Number of respondents who or whose household member was not able to access health care services when needed because the household could not afford it.

**Denominator:** Total number of respondents/households.

**Disaggregation/additional dimension:** By types of health services (primary care, planned hospitalizations, urgent care, emergency services, household income, expenditure or wealth, place of residence (urban versus rural)).

**Preferred data sources:** Household health utilization and expenditure surveys, DHS, other household surveys, national health accounts.

**Other possible data sources:** DHS, multiple indicator cluster surveys, other household surveys, national health accounts.

**For further information and related links,** see WHO 2015a.

**Module Links:**
- Module 4—Medical Products, Vaccines, and Technologies Indicator (out-of-pocket spending on medicines)
- Module 6—Health Financing Indicator (out-of-pocket expenditure as a percentage of total expenditure on health)
### 9. Availability of essential medicines and commodities (physical availability)

**Definition:** Percentage of health facilities with essential medicines and lifesaving commodities.

**Numerator:** Number of facilities with essential medicines in stock.

**Denominator:** Total number of health facilities.

**Disaggregation/additional dimension:** Facility type, facility managing authority (public/private), specific type of medicine/commodity (e.g., priority medicines for women and children, vaccines, antiretroviral therapy [ART], family planning, essential NCD medicines).

WHO recommends the following essential core list of medicines: bronchodilator inhaler, steroid inhaler, glibenclamide, metformin, insulin, angiotensin-converting-enzyme (ACE) inhibitor, calcium channel blocker, statin, aspirin, thiazide diuretic, beta-blocker, omeprazole tablet, diazepam injection, fluoxetine tablet, haloperidol tablet, carbamazepine tablet, amoxicillin tablet/capsule, amoxicillin suspension, ampicillin injection, ceftriaxone injection, gentamicin injection, oral rehydration salts, and zinc sulfate.

**Essential NCD medicines:** At least aspirin, statin, ACE inhibitor, thiazide diuretic, long-acting calcium channel blocker, metformin, insulin, bronchodilator, and steroid inhalant.

**Priority medicines for women and children:** Amoxicillin tablet/capsule, amoxicillin suspension, ampicillin injection, ceftriaxone injection, gentamicin injection, oral rehydration salts, zinc sulphate, oxytocin injection, and magnesium sulphate injection.

**Suggested core list of medicines for pricing/affordability surveys:** Salbutamol inhaler 100 mcg per dose (200 doses); beclomethasone inhaler 100 mcg/dose (200 doses); glibenclamide 5 mg tablet; metformin 500 mg tablet; insulin regular 100 IU/ml, 10 ml vial; enalapril 5 mg tablet; amlodipine 5 mg tablet; simvastatin 20 mg tablet; aspirin 100 mg tablet; hydrochlorothiazide 25 mg tablet; carvedilol 12.5 mg tablet; omeprazole 20 mg tablet; diazepam 10 mg/2 ml injection; fluoxetine 20 mg tablet; haloperidol 5 mg tablet; carbamazepine 200 mg tablet; amoxicillin 500 mg capsule/tablet; amoxicillin 250 mg/5 ml suspension; ampicillin 500 mg injection; ceftriaxone 1 G vial; gentamicin 80 mg/2 ml injection; oral rehydration salts (sachet for 1 liter); zinc sulfate 2 0 mg tablet; oxytocin injection (5 or 10 iu); and magnesium sulfate 50 percent injection 10 ml vial.

**Method of measurement:** Stock-out data may also refer to specific time period (1 month, 3 months).

Data on the availability of a specific list of medicines are collected from a survey of a sample of facilities. Availability is reported as the percentage of medicine outlets where a particular medicine was found on the day of the survey. Health facility reports may also include stock-out indicators but require regular independent verification.

**Preferred data sources:** Special facility surveys.

**Other possible data sources:** Routine facility information systems.

For further information and related links, see WHO 2015a.

**Module Link:**
Module 4—Medical Products, Vaccines, and Technologies Indicator (stock-out rates)
<table>
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<tr>
<th>10. Financial access to medicines</th>
<th>Definition: Percentage of respondents who or whose household member was not able to take medicines because household cannot afford medicines. In addition to availability of essential medicines in the facility (geographic), it is important to measure financial access to medicines, particularly for those with chronic conditions. <strong>Numerator:</strong> Number of respondents who or whose household member was not able to take medicines because household cannot afford medicines. <strong>Denominator:</strong> Total number of respondents. <strong>Disaggregation/additional dimension:</strong> By disease categories (at least acute versus chronic), household income, expenditure or wealth, place of residence, and gender. <strong>Preferred data sources:</strong> Household health utilization and expenditure surveys. <strong>Other possible data sources:</strong> Other household surveys. <strong>For further information and related links</strong>, see WHO 2008b. <strong>Module Links:</strong> Module 4—Medical Products, Vaccines, and Technologies Indicators (out-of-pocket expenditure on medicines) and (financial access to medicines). Module 6—Health Financing indicator (out-of-pocket expenditure as a percentage of total expenditure on health).</th>
</tr>
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<tbody>
<tr>
<td>11. Financial access to medicines (alternative): Households whose monthly medicine expenditures represent at least 20 percent of total expenditures</td>
<td>Definition: Percentage of households whose monthly medicine expenditures represent at least 20 percent of total expenditures. In addition to availability of essential medicines in the facility (geographic), it is important to measure financial access to medicines, particularly for those with chronic conditions. <strong>Numerator:</strong> Households whose monthly medicine expenditures represent at least 20 percent of total expenditures. <strong>Denominator:</strong> Total number of respondents/households. <strong>Disaggregation/additional dimension:</strong> By disease categories, household income, expenditure or wealth, place of residence. <strong>Preferred data sources:</strong> Household health utilization and expenditure surveys. <strong>Other possible data sources:</strong> Other household surveys. <strong>For further information and related links</strong>, see WHO 2008b. <strong>Module Links:</strong> Module 4—Medical Products, Vaccines, and Technologies Indicator (out-of-pocket expenditure on medicines) Module 6—Health Financing Indicator (out-of-pocket expenditure as a percentage of total expenditure on health).</td>
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</table>
4.5 Topic B: Coverage and Utilization of Health Services Considering Equity

Overview

Coverage refers to the proportion of the population in need of health services that actually receives them. Utilization refers to the number of times per year the population uses specific types of health services. The utilization of health services represents effective coverage and access to health care, assumed to be the result of the interaction between supply and demand factors (Acuña et al. 2001).

Coverage is one of the central functions of the health service delivery system contributing to good health outcomes. Improved health of the population cannot be attained if everyone who needs health services (promotion, prevention, treatment, rehabilitation, and palliation) is not able to get them without undue financial hardship (WHO and The World Bank 2014). Coverage with health services has two main components: 1) services covered (range of services within the benefit package) and 2) population covered, referred as equity (percentage of population that receives health services when needed). These are the main dimensions of UHC, represented on the bottom of the UHC prism (see Section 1, Figure 1.1.1).

Assessing health service coverage

Measures of health service coverage should comprise the full spectrum of essential prevention and treatment interventions. The measures should also capture all levels of the health service delivery system, including services provided at the population (e.g., health promotion) and individual levels (e.g., care of a particular disease) in different types of health facilities.

The assessment of coverage is challenging, since very few treatment coverage indicators are in routine use. The WHO framework proposes widely available indicators and a limited set of NCD indicators for priority adult and pediatric conditions to measure UHC. There are very limited data on coverage of NCD services, which account for about 55 percent of the global disease burden and are estimated to become the main cause of mortality across all regions of the world by 2020. Nevertheless, for conditions such as hypertension or diabetes in which clinical tests are used, household surveys can help determine the size of the population in need and also the number treated.

WHO proposes a limited set of indicators on prevention and treatment of hypertension, Type 2 diabetes, and CVDs that may be available in DHS or other population surveys and are essential to measure UHC. An illustrative set of tracer prevention and treatment indicators based on essential, high-impact interventions is presented in Table 3.2.4. According to WHO and The World Bank Group (2015), “This core set of interventions can be built upon over time as and when comparable, reliable measures of coverage for other intervention areas, such as rehabilitation and palliation, become available. Several of these indicators include a quality component, often referred to as ‘effective coverage’ (e.g., drug therapy and counseling to prevent heart attack or stroke), rather than simply measuring ‘contact’ coverage (e.g., at least four ANC visits). For other services, indicators additional to service coverage are required to capture quality.” Thus, the assessment team may prioritize the range of coverage indicators, based on additional prioritization criteria: a) the indicator measures high-impact health services for priority/high-burden diseases and b) the indicator assesses quality-adjusted coverage, and no complementary information is needed on the quality of service covered.
Assessing equity in coverage

Measures of coverage with health services, when disaggregated by socioeconomic and demographic strata, allow assessment of the equitable distribution of service coverage among different population groups (equity). Equity is at the heart of UHC and ensures that the entire population throughout the life course (including all ages and both genders) receives health services when needed. In the UHC prism, equity is represented as the front horizontal line (see Section 1, Figure 1.1.1 of UHC prism). In all health systems, there is significant stratification of risks for ill health and access to and payments for services according to household income, place of residence, gender, and other factors. Without effective UHC measures, there is the risk that poorer, less advantaged segments of the population may not receive health services (WHO and The World Bank Group 2015). Thus, in addition to measuring levels of coverage of essential health services, it is critical to have measures disaggregated by a range of socioeconomic and demographic “stratifiers.” The global framework proposes three primary elements for disaggregation of service coverage data to measure equity in all settings: 1) household income, expenditure, or wealth (coverage of the poorest segment of the population as compared with richer segments); 2) place of residence (rural or urban); and 3) gender. Depending on the country context and availability of data, the assessment team may also add additional equity stratifiers (age, education, etc.).

Present summary findings on coverage and equity

Below are examples of ways to present summary findings on coverage and equity of health services. Figure 3.2.4 presents service coverage data from four countries. This illustrative graphic can be used to compare coverage of priority prevention and treatment services (six interventions each) within each country, as well as compare the coverage among different subgroups or the regional average. The markers in Figure 3.2.4 show coverage with each intervention, while the bars signify the unweighted mean of the coverage rates for prevention and treatment interventions, respectively.

The assessment team can design a similar graph to facilitate comparison of progress toward UHC among countries. The set of priority services for the assessment can be determined based on mortality, disease burden, and risk factor data to tailor the assessment of health service coverage to country’s context.

Summary findings of health service coverage and equity in coverage can also be presented using following outline (WHO and The World Bank Group 2015):

a) Prevention
   - Coverage: Aggregate coverage with a set of tracer interventions for prevention services
   - Equity: A measure of prevention service coverage as described above, stratified by wealth quintile, place of residence, and gender

b) Treatment
   - Coverage: Aggregate coverage with a set of tracer interventions for treatment services
   - Equity: A measure of treatment service coverage as described above, stratified by wealth quintile, place of residence, and gender
Figure 3.2.4. Service Coverage Rates for Six Illustrative Prevention Interventions and Six Illustrative Treatment Interventions for Four Countries

* Dots, single intervention coverage values; bars, unweighted means. For computation of means, the water and sanitation indicators and the tuberculosis case detection and treatment success indicators are each combined into a single indicator for an intervention area.

Source: household surveys and facility data for 2010 or later.
### Table 3.2.4. Illustrative Tracer and Treatment Indicators for Coverage, Utilization, and Equity Stratifiers

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Definition and Interpretation</th>
</tr>
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<tbody>
<tr>
<td>12. Number of primary care or outpatient department visits per person per year</td>
<td><strong>Definition</strong>: Number of outpatient department visits per person per year. Where possible, also measure hospital (inpatient) admissions per 100 population per year (number of hospital inpatient admissions/total number of population X 100). The indicator measures both utilization and access to primary care. Although not direct measure, it also indicates the preventive nature of the health service delivery system in comparison with utilization of emergency care visits and hospital services. <strong>Numerator</strong>: Total number of outpatient department visits per year. <strong>Denominator</strong>: Total population. <strong>Disaggregation/additional dimension</strong>: Age, place of residence, sex, public versus private. <strong>Equity</strong>: Equity can be measured though disaggregating the indicator by main equity stratifies: based on household income, expenditure or wealth, place of residence. <strong>Method of estimation</strong>: Requires complete and reliable recording and reporting of the number of outpatient department visits by public and private facilities. Recall in population surveys can also be used. Visits at the health post, health center, as well as hospital outpatient department should be included in the calculation. <strong>Preferred data sources</strong>: Routine facility information systems and population-based health surveys. <strong>For further information and related links</strong>, see WHO 2015a.</td>
</tr>
</tbody>
</table>
| 13. Demand for family planning satisfied with modern methods | **Definition**: Percentage of women of reproductive age (15–49) who are sexually active and have their need for family planning satisfied with modern methods. **Numerator**: Number of women with family planning demand who use modern methods. **Denominator**: Total number of women in need of family planning. **Disaggregation/additional dimension**: Age, marital status, place of residence, socioeconomic status. **Equity**: Equity can be measured though disaggregating coverage indicator by main equity stratifies: based on household income, expenditure or wealth, place of residence. **Method of measurement**: Household surveys include a series of questions to measure modern contraceptive prevalence rate and demand for family planning. **Total demand for family planning** is defined as the sum of the number of women of reproductive age (15–49) who are married or in a union and are currently using—or whose sexual partner is currently using—at least one contraceptive method, and the unmet need for family planning. Unmet need for family planning is the proportion of women of reproductive age (15–49), either married or in a consensual union, who are fecund and sexually active but who are not using any method of contraception—modern or traditional—and report not wanting any more children or wanting to delay the birth of their next child for at least two years. Included are:  
- All pregnant women (married or in a consensual union) whose pregnancies were unwanted or mistimed at the time of conception.  
- All postpartum amenorrheic women (married or in consensual union) who are not using family planning and whose last birth was unwanted or mistimed.  
- All fecund women (married or in consensual union) who are neither pregnant nor postpartum amenorrheic, and who either do not want any more children (want to... |
limit family size) or wish to postpone the birth of a child for at least two years or do not know when or if they want another child (want to space births) but are not using any contraceptive method.

**Preferred data sources:** Population-based health surveys.

For further information and related links, see WHO 2015a.

<table>
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<tr>
<th>14. Antenatal care coverage—at least four visits (percentage)</th>
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| **Definition:** Percentage of women age 15–49 with a live birth in a given time period who received ANC four times or more. This indicator shows utilization of reproductive health services for women, of which availability and accessibility are key components. If these rates are low, then access might be constrained because such services are not available, are not promoted, or are associated with high out-of-pocket expenditures (limiting the access to low-income households). Low utilization may also reflect weak demand for ANC.

**Numerator:** Number of women age 15–49 years with a live birth in a given time period who received ANC four or more times.

**Denominator:** Total number of women age 15–49 with a live birth in the same period.

**Disaggregation/additional dimension:** Age, place of residence, socioeconomic status, type of provider.

**Also:** At least one visit; The DHS data permit secondary analysis including ANC by source (public, commercial, NGO/FBO).

**Equity:** Equity can be measured though disaggregating coverage indicator by main equity stratafies: based on household income, expenditure or wealth, place of residence.

**Method of measurement:** The number of women age 15–49 with a live birth in a given time period who received ANC four or more times during pregnancy is expressed as a percentage of women age 15–49 with a live birth in the same period. (Number of women age 15–49 attended at least four times during pregnancy by any provider for reasons related to the pregnancy/total number of women age 15–49 with a live birth) x 100.

The indicators of ANC (at least one visit and at least four visits) are based on standard questions that ask if and how many times the health of the woman was checked during pregnancy. This is because the key national-level household surveys do not collect information on type of provider for each visit. The indicators of ANC (at least one visit and at least four visits) are based on standard questions that ask if, how many times, and by whom the health of the woman was checked during pregnancy.

**Preferred data sources:** Household surveys that can generate this indicator include MICS, DHS, FFS, RHS, and other surveys based on similar methodologies. **Service/facility reporting systems** can be used where the coverage is high, usually in industrialized countries.

For further information and related links, see WHO 2015a.
**Definition:** Percentage of live births attended by skilled health personnel during a specified time period.

This indicator measures coverage as well as utilization. A skilled birth attendant is a licensed or certified health professional, such as a midwife, doctor, or nurse, who has been educated and trained to proficiency in (1) the skills needed to manage normal (uncomplicated) pregnancies, childbirth, and the immediate postnatal period and (2) the identification, management, and referral of complications in women and newborns. Traditional birth attendants, trained or not, are excluded from the category. Skilled birth attendants and facility deliveries are important coverage indicators since they have the potential to reduce early neonatal mortality in developing countries. But the results should be interpreted with caution. Recent analysis of the data from 192 DHS household surveys by Günther et al. (2015) suggest that “the quality, utilization and protective effects of institutional deliveries vary widely across countries and major improvements in both utilization and quality of care are be needed to achieve further improvements in maternal and child health.”

**Numerator:** Number of births attended by skilled health personnel (doctors, nurses or midwives) trained in providing life-saving obstetric care, including giving the necessary supervision, care, and advice to women during pregnancy, childbirth and the postpartum period; to conduct deliveries on their own; and to care for newborns.

**Denominator:** The total number of live births in the same period.

**Disaggregation/additional dimension:** Age, parity, place of residence, socioeconomic status, type of provider.

*Also: Institutional delivery coverage (women giving birth in a health institution) among all births in the population.*

**Equity:** Equity can be measured through disaggregating coverage indicator by main equity stratiﬁes: household income, expenditure or wealth, place of residence.

**Method of measurement:** Definition of skilled birth attendant varies among countries. The percentage of births attended by skilled health personnel is calculated as the number of births attended by skilled health personnel (doctors, nurses, or midwives) expressed as a percentage of the total number of births in the same period. Births attended by skilled health personnel = (number of births attended by skilled health personnel)/(total number of live births) x 100.

**Method of estimation:** Data for global monitoring are reported by UNICEF and WHO. These agencies obtain the data—both survey and registry data—from national sources. Before data can be included in the global databases, UNICEF and WHO undertake a process of data verification that includes correspondence with field offices to clarify any questions.

**Preferred data sources:** Household surveys, such as DHS, MICS and RHS. The respondent is asked about each live birth and who helped during delivery for a period up to five years before the interview. Service/facility records could be used where a high proportion of births occurs in health facilities and are therefore recorded. Other possible data sources: routine facility information systems.

**Further information and related links**, see WHO 2015a.
<table>
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<tr>
<th>16. Children with diarrhea receiving oral rehydration solution (ORS) (<em>and Zinc, if data available</em>)</th>
</tr>
</thead>
</table>
| **Definition:** Percentage of children under age 5 with diarrhea in the last two weeks receiving ORS (fluids made from ORS packets or prepackaged ORS fluids) at health facility and/or community levels.  
**Numerator:** Number of children under 5 with diarrhea in the two weeks preceding the survey given fluid from ORS packets or prepackaged ORS fluids.  
**Denominator:** Number of children with diarrhea in the two weeks preceding the survey.  
**Disaggregation/additional dimension:** Place of residence (e.g., villages, counties, districts), sex, socioeconomic status. *Also: with continued feeding, oral rehydration therapy.*  
**Equity:** Equity can be measured though disaggregating coverage indicator by main equity stratifies: household income, expenditure or wealth, place of residence, and gender.  
**Method of measurement:** According to the DHS, the term(s) used for diarrhea should encompass the expressions used for all forms of diarrhea, including bloody stools (consistent with dysentery), watery stools, etc. The term encompasses the mother’s definition as well as locally used term(s).  
**Preferred data sources:** Household surveys, routine facility information systems.  
**For further information and related links, see WHO 2015a.** |

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<tr>
<th>17. Percentage of children under age 5 with suspected pneumonia/acute respiratory infection taken/referred to facility</th>
</tr>
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</table>
| **Definition:** Percentage of children under 5 with suspected pneumonia (cough and difficult breathing NOT due to a problem in the chest and a blocked nose) in the two weeks preceding the survey taken to an appropriate health provider and/or referred to a health facility by CHWs/CHVs. This is an indicator of coverage and utilization of services by children. These data also allow analysis of effectiveness of community services (danger signs recognition/counselling and referral to health facility) and where the mother takes her child to receive treatment.  
**Numerator:** Number of children with suspected pneumonia in the two weeks preceding the survey taken to an appropriate health provider and/or referred to a health facility by CHWs/CHVs.  
**Denominator:** Number of children with suspected pneumonia in the two weeks preceding the survey.  
**Disaggregation/additional dimension:** Place of residence, provider, sex, socioeconomic status, self-referred versus referred by CHWs/CHVs.  
*Also: with “receiving appropriate antibiotics” (generally, Ampicillin and Gentamicin).*  
**Equity:** Equity can be measured though disaggregating coverage indicator by main equity stratifies: household income, expenditure or wealth, place of residence, and gender.  
**Method of measurement:** During the UNICEF/WHO meeting on Child Survival Survey-based Indicators held in New York on 17–18 June 2004, it was recommended that suspected acute respiratory infection (ARI) be described as “presumed pneumonia” to better reflect the probable cause and the recommended interventions. The definition of ARI used in the DHS and MICS was chosen by the group and is based on the mother’s perceptions of a child who has a cough, is breathing faster than usual with short, quick breaths, or is having difficulty breathing, excluding children who had only a blocked nose.  
**Preferred data sources:** Household surveys.  
**For further information and related links, see WHO 2015a.** |
18. Immunization coverage rate by vaccine for each vaccine in the national schedule

**Definition:** Percentage of the target population that has received the last recommended dose for each vaccine recommended in the national schedule by vaccine. This should include all vaccines within a country’s routine immunization schedule (e.g., BCG; polio; PCV; rotavirus; diphtheria, tetanus, pertussis-Hepatitis B-Haemophilus influenza type B vaccine, DTP-HepB Hib; measles; rubella; human papilloma virus [HPV]; TT; influenza; and others as determined by the national schedule). Priority is generally given to measure DTP3 and measles. DPT3 vaccine coverage is often used as a proxy for health system performance, justified on the grounds that DPT3 requires three visits to a health care facility, thus allowing one to distinguish between contact and effective coverage and utilization. DTP1-DTP3 dropout rate and MCV1-MCV2 dropout rates assess effectiveness of community outreach.

**Numerator:** The number of individuals in the target group for each vaccine that has received the last recommended dose in the series. For vaccines in the infant immunization schedule, this would be the number of children aged 12–23 months who have received the specified vaccinations before their first birthday.

**Denominator:** The total number of individuals in the target group for each vaccine. For vaccines in the infant immunization schedule, this would be the total number of infants surviving to age one.

**Disaggregation/additional dimension:** Age, place of residence, sex, socioeconomic status; DTP1-DTP3 dropout rate, MCV1-MCV2 dropout, full immunization coverage where possible.

**Method of measurement:** Example of a national schedule is:

At birth: BCG, HepB, oral polio vaccine
- At 6, 10, and 14 weeks: DTP-HepB-Hib, PCV, rotavirus, oral polio vaccine (with one dose of inactivated polio vaccine)
- At 9 months: measles
- At 18 months: measles
- For adolescents: HPV
- TT: multiple
- For persons over age 60: influenza

**Method of estimation:** For survey data, the vaccination status of children age 12–23 months is used for vaccines included in the infant immunization schedule, collected from child health cards or, if there is no card, from recall by the caretaker.

**Preferred data sources:** Household surveys, facility information systems.

**For further information and related links**, see WHO 2015a.
<table>
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<tr>
<th>19. People living with HIV who have been diagnosed (percentage)</th>
</tr>
</thead>
</table>
| **Definition:** Percentage of people living with HIV who have been diagnosed.  
**Numerator:** Number of people living with HIV who have been diagnosed.  
**Denominator:** Estimated number of people suspected with HIV.  
**Disaggregation/additional dimension:** Age (under 1, 1–4, 5–9, 10–19, 20–24, 25–49, 50+ years), sex, key populations, other target populations.  
**Equity:** Equity can be measured through disaggregating coverage indicator by main equity stratifies: household income, expenditure or wealth, place of residence, and gender.  
**Method of measurement:** The numerator is the estimated total number of people living with HIV based on HIV estimation models, such as Spectrum. If an HIV case report registry that is regularly updated is available, the numerator can be calculated by taking the number of cases reported in the registry and subtracting any deaths that may have occurred. Case report data can provide cumulative information on the overall number of people living with HIV who have been diagnosed since the beginning of record-keeping. Household surveys with HIV testing and questions to assess whether respondents know their positive status is another means of measurement.  
**Method of estimation:** If death records are not widely available for counting the number of people living with HIV who know their HIV status and are alive, other proxy data could be reviewed in order to estimate the indicator value. For example, the number of HIV-related deaths may be estimated from other sources (e.g., cause-specific death registries, modeling). Survey data on the percentage of people living with HIV who know their HIV status (ever, and in the past 12 months) can also be used to triangulate estimates.  
**Preferred data sources:** Case registry.  
**Other possible data sources:** Surveys and models for estimates.  
For further information and related links, see WHO 2015a. |

<table>
<thead>
<tr>
<th>20. Prevention of mother-to-child transmission</th>
</tr>
</thead>
</table>
| **Definition:** Percentage of HIV-positive pregnant women provided with ART to reduce the risk of mother-to-child transmission during pregnancy.  
**Numerator:** Number of HIV-positive pregnant women who received ART as recommended by WHO.  
**Denominator:** Estimated number of HIV-positive pregnant women.  
**Disaggregation/additional dimension:** Already on ART, newly on ART, other regimen categories specific to setting.  
**Method of measurement:** Numerator: National program records aggregated from program monitoring tools, such as patient registers and summary reporting forms.  
**Denominator:** Estimation models such as Spectrum or ANC clinic surveillance surveys, in combination with demographic data and appropriate adjustments related to coverage of ANC surveys.  
**Preferred data sources:** Routine facility information systems.  
For further information and related links, see WHO 2015a. |
<table>
<thead>
<tr>
<th>21. Antiretroviral therapy (ART) coverage (percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition:</strong> Percentage of people living with HIV currently receiving ART among the estimated number of adults and children living with HIV.</td>
</tr>
<tr>
<td><strong>Numerator:</strong> Number of adults and children who are currently receiving ART at the end of the reporting period.</td>
</tr>
<tr>
<td><strong>Denominator:</strong> Estimated number of adults and children living with HIV.</td>
</tr>
<tr>
<td><strong>Disaggregation/additional dimension:</strong></td>
</tr>
<tr>
<td>- <strong>Age:</strong></td>
</tr>
<tr>
<td>o Minimum for paper-based (routine): under 15, 15 and older</td>
</tr>
<tr>
<td>o Annual data extraction of disaggregated data if not reported routinely: under 5, 5–9, 10–14, 15–19, 20–24, 25–49, 50 and older</td>
</tr>
<tr>
<td>o Electronic system: 5-year age groups</td>
</tr>
<tr>
<td>- <strong>Key populations, provider type (public/private), regimen type (e.g., first line, second line), sex</strong></td>
</tr>
<tr>
<td><strong>Equity:</strong> Equity can be measured though disaggregating coverage indicator by main equity stratifies: household income, expenditure or wealth, place of residence, and gender.</td>
</tr>
<tr>
<td><strong>Method of measurement:</strong></td>
</tr>
<tr>
<td><strong>The numerator</strong> can be generated by counting the number of adults and children who received antiretroviral combination therapy at the end of the reporting period. Data can be collected from facility-based ART registers or drug supply management systems. These are then tallied and transferred to cross-sectional monthly or quarterly reports that can then be aggregated for national totals. Patients receiving ART in the private sector and public sector should be included in the numerator where data are available.</td>
</tr>
<tr>
<td><strong>The denominator</strong> is generated by estimating the number of people with advanced HIV infection requiring (in need of/eligible for) ART. This estimation must take into consideration a variety of factors, including, but not limited to, the current number of people with HIV, the current number of patients on ART, and the natural history of HIV from infection to enrolment on ART. A standard modeling HIV estimation method, such as in the Spectrum model, is recommended.</td>
</tr>
<tr>
<td><strong>Preferred data sources:</strong> Facility reporting system.</td>
</tr>
<tr>
<td><strong>For further information and related links, see</strong> WHO 2015a.</td>
</tr>
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<tr>
<th>22. HIV test results for registered new and relapsed TB patients</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition:</strong> Number of new and relapsed TB patients who had an HIV test result recorded in the TB register, expressed as a percentage of the number registered in a specified time period.</td>
</tr>
<tr>
<td><strong>Numerator:</strong> Number of new and relapsed TB patients registered during the specified time period who had an HIV test result recorded in the TB register.</td>
</tr>
<tr>
<td><strong>Denominator:</strong> Total number of new and relapsed TB patients registered in the TB register in the specified time period.</td>
</tr>
<tr>
<td><strong>Disaggregation/additional dimension:</strong></td>
</tr>
<tr>
<td>- Adults (age under and over 15 years) and children (age 0–4 and 5–14 years)</td>
</tr>
<tr>
<td>- HIV status (positive, negative, unknown)</td>
</tr>
<tr>
<td>- Sex</td>
</tr>
<tr>
<td><strong>Equity:</strong> Equity can be measured though disaggregating coverage indicator by main equity stratifies: household income, expenditure or wealth, place of residence, and gender.</td>
</tr>
<tr>
<td><strong>Method of measurement:</strong> TB treatment cards and TB registers at the basic management unit should document the HIV status of TB patients. The history of previous TB treatment should also be documented systematically to identify new and relapsed TB patients.</td>
</tr>
<tr>
<td><strong>Numerator:</strong> Count the total number of new and relapsed TB patients registered in a specified time period who had their HIV status documented as positive or negative, including those previously documented to be HIV-positive (e.g., documented evidence of enrollment in HIV care). HIV-negative TB patients are those who had a negative HIV test result at the time of current TB diagnosis.</td>
</tr>
</tbody>
</table>
| **Denominator:** Count the total number of new and relapsed TB patients registered during the
23. TB patients with results for drug susceptibility testing

**Indicator name:** Percentage of TB patients with test results for isoniazid and rifampicin drug susceptibility.

**Definition:** Percentage of TB cases with results for diagnostic drug susceptibility testing for resistance to isoniazid and rifampicin in a specified time period.

**Numerator:** Number of TB cases with drug susceptibility testing results for both isoniazid and rifampicin resistance in a specified time period.

**Denominator:** Number of TB cases identified during the specified time period.

**Disaggregation/additional dimension:** Risk factors specified in the national policy, treatment history (new, previously treated).

**Equity:** Equity can be measured though disaggregating coverage indicator by main equity stratifies: household income, expenditure or wealth, place of residence, and sex.

**Method of measurement Numerator:** Laboratory register.

**Denominator:** Basic TB register and treatment card. For some risk categories (e.g., contacts of multidrug-resistant tuberculosis [MDR-TB]), the information may have to be traced from elsewhere in the medical records.

**Preferred data sources:** Routine facility information systems.

For further information and related links, see WHO 2015a.

24. TB case detection rate for all forms of tuberculosis

**Definition:** Percentage of estimated new and relapsed TB cases detected in a given year under the internationally recommended tuberculosis control strategy. The term “case detection,” as used here, means that TB is diagnosed in a patient and is reported within the national surveillance system and then to WHO. The term “rate” is used for historical reasons. The indicator is actually a ratio (expressed as a percentage) and not a rate.

**Numerator:** Number of new and relapsed cases notified in a given year.

**Denominator:** Number of estimated incident cases in the same year.

**Method of measurement:** Notification data reported by national TB programs or national surveillance systems (TB notification rate indicator). For methods used for TB incidence, see methods described for that indicator.

**Method of estimation:** The number of new and relapsed TB cases diagnosed and treated in national TB control programs and notified to WHO, divided by WHO’s estimate of the number of incident TB cases for the same year, expressed as a percentage. Uncertainty bounds are provided in addition to best estimates.

**Preferred data sources:** Facility information systems, surveillance systems.

**Other possible data sources:** Routine facility information systems/health facility assessments and surveys.

For further information and related links, see WHO 2015a.
25. Second-line treatment coverage among multidrug-resistant tuberculosis (MDR-TB) cases

**Definition:** Percentage of notified TB patients estimated to have MDR-TB who were detected with MDR-TB and enrolled on second-line anti-TB treatment in a specified time period.

**Numerator:** Number of rifampicin-resistant MDR-TB cases (presumptive or confirmed) registered and started on a prescribed MDR-TB treatment regimen in a specified time period.

**Denominator:** Estimated number of notified TB patients with MDR-TB.

**Disaggregation/additional dimension:** Treatment history (new, previously treated).

**Method of measurement:** Number of cases started on treatment is counted from the second-line TB treatment register. Number of notified TB patients with MDR-TB is estimated by combining the number of notifications with evidence about the proportion of cases that have MDR-TB from drug resistance surveys or continuous surveillance systems with high coverage of diagnostic testing for drug resistance.

**Preferred data sources:** Continuous surveillance systems with drug resistance surveys.

For further information and related links, see WHO 2015a.

26. Intermittent preventive therapy for malaria during pregnancy

**Definition:** Percentage of women who received three or more doses of intermittent preventive treatment during ANC visits during their last pregnancy.

**Numerator:** Number of women receiving three or more doses of recommended treatment.

**Denominator:** Total number of pregnant women/surveyed with a live birth in the last 2 years.

**Disaggregation/additional dimension:** Age, place of residence, socioeconomic status.

**Equity:** Equity can be measured through disaggregating coverage indicator by main equity stratifies: household income, expenditure or wealth, and place of residence.

**Preferred data sources:** Household surveys, facility information systems.

For further information and related links, see WHO 2015a.

27. Cervical cancer screening

**Definition:** Proportion of women age 30–49 years who report they were screened for cervical cancer using any of the following methods: visual Inspection with acetic acid/vinegar, pap smear, HPV test.

**Numerator:** Number of women age 30–49 years who report ever having had a screening test for cervical cancer using any of these methods: VIA, pap smear, and HPV test.

**Denominator:** All female respondents age 30–49 years.

**Disaggregation/additional dimension:** Age, other relevant sociodemographic stratifiers where available.

**Method of estimation:** \( \frac{\text{Number of female respondents age 30–49 years who report ever having had a screening test for cervical cancer}}{\text{number of female respondents age 30–49 years}} \times 100 \).

**Preferred data sources:** Population-based (preferably nationally representative) surveys.

Other possible data sources: Facility-based data.

For further information and related links, see WHO 2015a.
28. Drug therapy and counseling to prevent heart attacks and strokes

**Indicator name:** Proportion of eligible persons receiving drug therapy and counseling (including glycemic control) to prevent heart attacks and strokes.

**Definition:** Percentage of eligible persons (defined as age 40 and older with a 10-year CVD risk* plus or minus 30 percent, including those with existing CVD) receiving drug therapy** and counseling*** (including glycemic control) to prevent heart attacks and strokes.

*A 10-year CVD risk of plus or minus 30 percent is defined according to age, sex, other relevant sociodemographic stratifiers where available, blood pressure, smoking status (current smokers OR those who quit smoking less than 1 year before the assessment), total cholesterol, and diabetes (previously diagnosed OR a fasting plasma glucose concentration more than 7.0 mmol/l (126 mg/dl)).

**Drug therapy is defined as taking medication for raised blood glucose/diabetes, raised total cholesterol, or raised blood pressure, or taking aspirin or statins to prevent or treat heart disease.

***Counseling is defined as receiving advice from a doctor or other health worker to quit using tobacco or not start, reduce salt in diet, eat at least five servings of fruit and/or vegetables per day, reduce fat in diet, start or do more physical activity, maintain a healthy body weight or lose weight.

**Method of estimation/calculation:** Number of survey respondents who are receiving drug therapy and counseling/number of eligible survey participants x 100 percent.

**Numerator:** Number of eligible survey participants who are receiving drug therapy and counseling.

**Receiving drug therapy and counseling** is calculated by self-report from respondents reporting they are taking medication for raised blood glucose/diabetes, raised total cholesterol, or raised blood pressure, or taking aspirin or statins to prevent or treat heart disease; and receiving advice from a doctor or other health worker to quit using tobacco or not start, reduce salt in diet, eat at least five servings of fruit and/or vegetables per day, reduce fat in diet, start or do more physical activity, maintain a healthy body weight or lose weight.

**Denominator:** Total number of eligible survey participants. Eligible people are those age 40 and older who either currently self-report that they have existing CVD or who have a 10-year cardiovascular risk of 30 percent or higher calculated by using the WHO/ISH risk prediction charts for 14 WHO epidemiological subregions that provide the approximate estimates of CVD risk in people who do not have established coronary heart disease, stroke or other atherosclerotic disease, based on responses to the following: age, sex, smoking status, SBP, TC, and absence or presence of diabetes.

**Disaggregation:** Age, sex, other relevant sociodemographic stratifiers where available.

**Equity:** Equity can be measured though disaggregating coverage indicator by main equity stratifies: household income, expenditure or wealth, place of residence, and sex.

**Preferred data sources:** Population-based (preferably nationally representative) survey, facility-level surveys.

**Other possible data sources:** NCD framework risk factor exposure.

For further information, see WHO 2014b.
Contraceptive prevalence is the percentage of women who are currently using, or whose sexual partner is currently using, at least one method of contraception, regardless of the method used. It is usually reported for married or in-union women age 15–49 (WHO n.d.a).

**Definition**: Percentage of women age 15–49 years, married or in a union, who are currently using, or whose sexual partner is using, at least one method of contraception, regardless of the method used.

**Note**: Where possible, obtain data on contraceptive use among sexually active women and stratify by marital status.

The measure indicates the extent of people’s conscious efforts to control their fertility. Increased contraceptive prevalence is, in general, the single most important proximate determinant of inter-country differences in fertility and of ongoing fertility declines in developing countries. Contraceptive prevalence can also be regarded as an indirect indicator of progress in providing access to reproductive health services, including family planning (one of the eight elements of primary health care [PHC]) (UNICEF 2001).

**Numerator**: Number of women using or partner using a contraceptive method.

**Denominator**: Number of women married or in a union.

**Disaggregation/additional dimension**:
- Age (disaggregated by 5-year categories, where possible, or at least 15–19, 20–24, and 25–49 age groups)
- Method (short, long, permanent)
- Place of residence (urban/rural; also by administrative units)
- Sexually active (irrespective of marital status or whether in a union)
- Socioeconomic status

**Method of measurement**: Contraceptive prevalence = (women of reproductive age [15–49 years] who are married or in a union and who are currently using any method of contraception)/(total number of women of reproductive age [15–49 years] who are married or in a union) x 100.

**Method of estimation**: The United Nations Population Division compiles data from nationally representative surveys, including the DHS, MICS, FFS, the CDC-assisted RHS and national family planning, or health, or household, or socioeconomic surveys. In general, all nationally representative surveys with comparable questions on current use of contraception are included. There is no attempt to provide estimates when country data are not available. The results are published regularly in the World Contraceptive Use report.

**Preferred data sources**: Household surveys that can generate this indicator include DHS, MICS, Fertility and Family Surveys (FFS), Reproductive Health Surveys (RHS)

**Other possible data sources**: CHW/CHV monthly register or record book, routine facility information systems/health facility assessments and surveys, other surveys based on similar methodologies.

**For further information and related links**, see WHO 2015a.
30. Unmet need for family planning (percentage)

**Definition:** The standard definition of unmet need for family planning includes in the numerator women who are fecund and sexually active, but are not using any method of contraception, and report not wanting any more children or wanting to delay the birth of their next child for at least two years. The concept of unmet need points to the gap between women’s reproductive intentions and their contraceptive behavior. For millennium development goal monitoring, unmet need was expressed as a percentage based on women who are married or in a consensual union. The sum of contraceptive prevalence and unmet need indicates **the total demand for family planning.** The sum of unmet need for family planning and prevalence of traditional methods indicates the level of unmet need for modern methods. In principle, this indicator may range from 0 (no unmet need) to 100 (no needs met). However, values approaching 100 percent do not occur in the general population of women, since, at any one time, some women wish to become pregnant and others are not at risk of pregnancy. Unmet need levels of 25 percent or more are considered very high, and values of 5 percent or less are regarded as very low. It should be noted that, even when contraceptive prevalence is rising, unmet need for family planning may sometimes fail to decline or may even increase. This can happen because in many populations, the demand for family planning increases because of declines in the number of children desired.

**Numerator:** Women of reproductive age (15–49) who are married or in a union and who have an unmet need for family planning.

**Denominator:** Total number of women of reproductive age (15–49) who are married or in a union.

**Disaggregation/additional dimension:**
- Age (disaggregated by 5-year categories, where possible, or at least 15–19, 20–24, and 25–49 age groups)
- Place of residence (urban/rural)
- Sexually active (irrespective of marital status or whether in a union)
- Socioeconomic status

**Data sources:** Information on unmet need for family planning is collected through household surveys that are internationally coordinated, such as DHS, MICS, RHS, and national surveys based on similar methodologies.

**For further information and related links,** see United Nations 2014a and United Nations 2014b.

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31. Coverage of first preventive infant visit

**Indicator name:** Coverage of first preventive infant visit.

**Definition:** Percentage of children aged less than 2 months who attended the health facility for the first preventive infant visit. Use of this indicator assesses effectiveness of health services (including at community level) to utilize postnatal/well-baby services, including vaccination.

**Numerator:** Number of children age less than 2 months who attended the health facility for the first preventive infant visit.

**Denominator:** Number of children age 0–11 months.

**Limitation:** The denominator will be inflated because it does not exclude neonatal deaths.

**Method of estimation:** This denominator should reflect the total number of children
surviving to 12 months (live births minus infant deaths). However, to ease calculation, the total number of children age 0–11 months is taken as 4 percent of the population. Used consistently over time, this estimate will provide adequate evidence of change for decisionmaking at different levels (community/facility/district/national). 

**Disaggregation/additional dimension:** Place of residence (urban/rural; also by administrative units/community) and socioeconomic status, young infant’s age at first preventive infant visit (6 or fewer days, 7–28 days, 29–59 days).

**Data sources:** DHS, CHW/CHV and facility registers, or record books.

For further information and related links, see WHO n.d.b and WHO n.d.e.

### 4.6 Topic C: Consumer Knowledge and Behavior

#### Overview

While the supply of inputs (infrastructure, labor, products) and price determines access, what consumers ultimately demand (i.e., utilize) is influenced by consumer knowledge, attitudes, and practices (KAP). Demand is an economic concept that describes the quantity of a good or service that an individual or household will purchase and consume at given price (including free). It is distinct from need which, in the context of health, can be seen as the level of health services that are medically necessary. Demand and need do not always coincide. When individuals demand health services that are not medically necessary, it wastes resources. On the other hand, if individuals do not demand medically necessary health services, their health will worsen, and if the disease is communicable, then others’ health is at risk (School of Health Systems Studies 2011). The assessment of demand and health needs for a given population is acknowledged as a precursor for the planning and targeting of services to manage needs and to proactively address known risk factors (Tello J. at al., 2015).

Knowledge and behavior also determine household production of health—individual, household, and community practices to promote health (diet and exercise, breastfeeding, maintenance of communal water source) and prevent and manage disease (hand washing, use of mosquito nets, burial practices to prevent Ebola). The main data sources for assessing populations’ and patients’ knowledge and behaviors are population-based surveys (DHS, AIS) and patient surveys for KAP. The DHS and AIS include KAP measures for key health indicators. Secondary analysis of these data can complement these indicators by studying consumer provider preferences (e.g., source: public, private, NGO/FBO) and developing consumer profiles for specific health services. The assessment team can supplement the secondary data with stakeholder interviews to shed light on provider knowledge with respect to priority prevention and treatment services (including health promotion, disease prevention, as well as care seeking and patient self-management practices).
**Table 3.2.5. Consumer Knowledge and Behavior**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Definition and Interpretation</th>
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</table>
| **32. Condom use at last sex with high-risk partner** | **Definition:** Percentage using a condom during last sexual intercourse with a higher risk partner (women and men who have more than one sexual partner in the past 12 months, sex workers with most recent client, men who have sex with men anal sex with a male partner, people who inject drugs, condom use at last sex). For people who inject drugs, also measure number of needles per person who injects drugs per year.  
**Numerator:** Number of respondents using a condom during last sexual intercourse with a higher risk partner.  
**Denominator:** Total number of respondents having sex with a higher risk partner.  
**Disaggregation/additional dimension:**  
- Age (15–24, 15–49 years), sex  
- Sex workers: by sex (female, male, transgender) age (younger than 25/25 and older)  
- Men who have sex with men: age (younger than 25/25 and older)  
- People who inject drugs: sex, age (younger than 25/25 and older)  
**Method of measurement:** Population-based surveys for general population; surveys targeting key populations such as IBBS.  
*For further information and related links, see WHO 2015a.* |
| **33. Knowledge, attitudes, and practices (KAP) regarding key health issues and services** | KAP data are collected using a survey instrument. KAP survey data on key health issues (e.g., TB) can identify knowledge gaps, cultural beliefs, or behavioral patterns that may facilitate understanding and action, information that is commonly known and attitudes that are commonly held (WHO 2008a).  
Useful KAP indicators can often be found in DHS survey reports. KAP indicators commonly found in DHS surveys include:  
- Treatment of symptoms for a child illness (i.e., ARI, diarrhea, fever)  
- Knowledge of ORS  
- Exposure to messages on malaria  
- Exclusive breastfeeding  
- Knowledge of HIV prevention methods  
Other useful KAP indicators can be obtained from STEPwise approach to risk factor surveillance and the STEPwise approach to stroke surveillance. They provide valuable information on population’s/patient’s knowledge, attitudes, and practices related to NCD risk factors and stroke, particularly in the countries with high NCD risk factor and CVD prevalence (WHO n.d.d.). Also see the Hand Hygiene Self Assessments (WHO 2015d).  
If these data are available, select one or two indicators from the list above that are relevant to the country context. Where DHS information is not available or is outdated, similar indicators can sometimes be found in UNICEF surveys or other surveys conducted by external development partner-funded projects at different levels. Finally, if no quantitative data are available, interviews with community members or patients can provide qualitative information on KAP regarding key health issues and problems related to priority services. Low levels of KAP regarding key health issues and services indicate an important gap in the health system’s ability to reach communities with essential health messages that are critical for preventing or modifying risky behaviors and improve population’s/patients’ KAP (including risky and care seeking behavior, disease self-management practices).  
*For further information and related link, see WHO n.d.d.* |
4.7 Topic D: Quality of Health Services

Overview

UHC is a pathway to achieve better health outcomes only if there is universal access to quality services. “What good does it do to offer free maternal care and have a high proportion of babies delivered in health facilities if the quality of care is substandard or even dangerous” (WHO 2012)? Poor quality health services waste limited resources and therefore constrain a country’s ability to expand coverage to more beneficiaries (equity), include more services in benefit package (access), and reduce cost-sharing and fees (financial protection) and thus can shrink the UHC cube (see Figure 3.2.6).

Figure: 3.2.6. Addressing Universal Health Coverage through Quality Improvement

The quality of health services is an essential aspect of a well-performing health service delivery system. Health service quality is defined as the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge (National Academy of Sciences 2003). There is general agreement on the complex and multidimensional nature of quality, the challenges of measuring quality, and the inclusion of the perceptions patients, families, and communities. Both resources (inputs) and activities carried out (processes) need to be addressed together to improve quality of care (outputs/outcomes) (Stover et al. 2015). Activities or processes within a health care organization contain two major components: 1) what is done—what care is provided (technical content of care) and 2) how it is done—when, where, and by whom care is delivered (process or organization of care). Improvement can be achieved by addressing component, content, or process of care. But consistent improvement in health care quality can be achieved only by addressing both technical content and process of care.

Traditionally, quality improvement—as well as its measurement—has focused on recommended technical content of care. The care is recommended if it improves patient outcomes and saves lives.
Recommended care is updated regularly based on the best available up-to-date evidence from systematic reviews or other types of research (“evidence-based” care). Thus, quality improvement and assessment are often focused on evidence-based clinical guidelines, training, and measuring compliance with recommended standards of care. But the problem of evidence-based health care interventions not being implemented consistently persists for various reasons: limited time, provider convenience, or resistance.

Achieving quality health care requires reorganizing care delivery in order to provide the appropriate content of care to every patient who needs it, every time it is needed (Massoud et al. 2001). By improving processes, quality improvement addresses many of its dimensions, including timeliness, continuity and efficiency. Thus, in addition to assessing compliance with evidence-based care, assessment of quality of care involves process mapping. Process mapping is a tool commonly used to assess health care processes within a system of care at the provider level. It provides a visual diagram of a sequence of steps that result in a particular outcome. Reviewing the steps and their sequence as to who performs each step provides opportunity to understand how efficiently or timely the process works and where the quality gaps occur. An illustrative flow chart to map the process of diagnosis and treatment of uncomplicated febrile illness among children under 5 is provided in Figure 3.2.7.
Figure 3.2.7. Illustrative Flow Chart for Diagnosis and Management of Uncomplicated Febrile Illness among Children between 2 Months and 5 Years Old at Community and Facility Level

The quality of care may influence an immediate or future health outcome. For example, bag and mask ventilation (the process) is closely linked to survival (the immediate health outcome) for the newborn who does not breathe spontaneously at birth. A process of care may influence a future outcome, one that will not be observed at the same time care is given. Assessing quality of care can be difficult, since it covers both the complex processes of evaluating, diagnosing, and treating a patient (process measures) as well as intermediate (or long-term) outcomes of that treatment for the patient (WHO 2010). Both process (gaps in compliance with evidence-based standards or organization of care) and outcome measures are important in assessing quality of service delivery at different levels in the health system, and neither type of measure alone is sufficient (Smith et al. 2010).

Other difficulties associated with measuring quality of health services are their multidimensional nature and data availability. The care is high quality if it is effective, safe, patient centered, integrated, efficient, and timely. While these dimensions can easily be described, they are difficult to measure. “For example, with regard to safety, health systems around the world have for a number of years tried to institute patient safety reporting and learning systems to help track and assess trends in adverse events, but are only beginning to achieve a common understanding of what terminology to use. There are examples of national data collection systems that work reasonably well, but not many, and without exception they are found in developed countries” (WHO and The World Bank 2015). Because of the general lack of
internationally comparable data on health service quality, comparative health system research at the international level has been limited to comparisons of cost and utilization of care, supplemented by appraisals of health status based on broad indicators such as mortality rates and life expectancy (WHO and The World Bank 2015). These indicators are influenced by multiple different factors, including environmental and economic conditions, and thus are not effective measures of quality of health services. Similarly, the Service Availability and Readiness Assessment (SARA) has facility-level data but only covers availability of key inputs essential to deliver quality health services.

There are various tools and resources to assess quality of care domains (e.g., maternal care), clinical conditions (e.g., pneumonia), and individual health services (e.g., newborn resuscitation). Guidance on how to assess the quality of essential public health functions (prevention and promotion) can be found at the World Federation of Public Health Associations. Despite data availability and comparability issues, death registers and reviews of mortality for case-fatality rates are feasible sources of information in many settings. There are also many globally adapted process and outcome measures that are integrated in countries’ HMIS or routinely measured by governmental, NGO, or external development partner organizations in developing countries. Table 3.2.6 provides illustrative process and outcome measures that have been adopted globally to assess quality of health services and progress toward ending preventable death from various priority clinical conditions.

Table 3.2.6. Quality of Health Services

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Definition and Interpretation</th>
</tr>
</thead>
</table>
| 34. Institutional maternal mortality ratio (per 100,000 deliveries) | **Definition:** Number of maternal deaths among 100,000 deliveries in health facilities/institutions.  
**Numerator:** Number of maternal deaths in institutions.  
**Denominator:** Total number of deliveries in institutions.  
**Disaggregation/additional dimension:** Age, cause of death, geographic location, and parity.  
**Method of measurement:** Labor ward registers, emergency admission registers, specialist ward registers. Regular quality control for completeness, assessment and misclassification.  
**Method of estimation:** Number of maternal deaths among 100,000 deliveries in health facilities/institutions.  
**Preferred data sources:** Routine facility information systems, maternal deaths surveillance, CHW/CHV monthly register, and response systems.  
**For further information and related link,** see WHO 2015a. |
| 35. Cause-specific death per 1000 admissions for major causes of death | **Definition:** Cause-specific death per 1000 admissions for major causes of death.  
**Numerator:** Number of deaths from specific disease within the facility.  
**Denominator:** Total number patients admitted with this disease.  
**Disaggregation/additional dimension:**  
- Age (under 5 and 5-plus years)  
- Overall and cause specific  
- 30-day hospital case fatality rate for acute myocardial Infarction and stroke  
- Facility/facility type specific  
**Method of measurement:** Facility registers, admission registers, discharge registers.  
**Preferred data sources:** Routine facility information systems.  
**For further information and related links,** see WHO 2015a. |
| 36. Percentage of women who had blood pressure measured at the last antenatal care visit | **Definition:** Percentage of women who had blood pressure measured at the last ANC visit.  
**Numerator:** Number of women who had blood pressure measured at the last ANC visit.  
**Denominator:** Total number of ANC visits.  
**Disaggregation/additional dimension:** Age, geographic location, socioeconomic status, type of facility.  
**Preferred data sources:** ANC registers, facility-level assessment reports.  
For further information and related links, see WHO 2015a. |
|---|---|
| 37. Antenatal corticosteroid use | **Definition:** Percentage of all preterm newborns born between 24 weeks and 34 weeks of gestation in the health facility whose mothers received antenatal corticosteroids (ACS) (intramuscular dexamethasone or intramuscular betamethasone (total 24 mg in divided doses) (WHO QoC indicator).  
*Note:* Every Newborn Action Plan Matrix specifies gestational age as below 34 weeks: Percentage of women giving birth in facility who are less than 34 completed weeks and received one dose of ACS for being at risk of preterm birth (later testing focus on splitting by gestational age).  
**Numerator:** Number of all preterm newborns born between 24 weeks and 34 weeks of gestation in the health facility whose mothers received antenatal corticosteroids  
**Denominator:**  
- Total number of preterm newborns born between 24 weeks and 34 weeks of gestation in the health facility. If this denominator is not available, calculate the indicator among:  
  - Live births in the facility  
  - Total births in the facility (including stillbirth)  
  - Estimated births (live or total)  
**Disaggregation/additional dimension:** Gestational age.  
**Preferred data sources** Facility registries, health facility assessment reports.  
For further information and related links, see WHO 2015a and Moxon et al. 2015.  
**Module Link:** Module 4—Medical Products, Vaccines, and Technologies, Topic G, has a number of indicators to assess appropriate use of medicines and supplies. |
|   | Definition: Percentage of all women giving birth in the health facility who received Oxytocin within 1 minute of birth of their infant, before the birth of placenta, irrespective of mode of delivery.  
**Numerator:** Number of all women giving birth in the health facility who received Oxytocin within 1 minute of birth of their infant, before the birth of placenta, irrespective of mode of delivery.  
**Denominator:** Total number of women giving birth in the health facility.  
**Preferred data sources:** HMIS, health facility assessment reports, facility registries.  
**For further information and related links, see WHO 2015a.**  
**Module Link:**  
Module 4—Medical Products, Vaccines, and Technologies, Topic G, has a number of indicators to assess appropriate use of medicines and supplies. |
|---|---|
| 38. Prevention of postpartum hemorrhage in health facilities | Definition: Percentage of women in health facilities with severe systemic infection/sepsis in the postnatal period, including readmissions (after birth in a facility).  
**Numerator:** Number of women in health facilities with severe systemic infection/sepsis in the postnatal period, including readmissions (after birth in a facility).  
**Denominator:** Total number of mothers giving birth in the facility within specified period.  
**Preferred data sources:** HMIS, health facility assessment reports, facility registries.  
**For further information and related links, see WHO 2015a.**  
**Module Link:**  
Module 4—Medical Products, Vaccines, and Technologies, Topic G, has a number of indicators to assess appropriate use of medicines and supplies. |
| 39. Severe systemic infection/sepsis in the postnatal period | Definition: Percentage of all women in the health facility with severe preeclampsia or eclampsia who received the full dose of magnesium sulfate or loading dose of magnesium sulfate and referral.  
**Numerator:** Number of women in the health facility with severe preeclampsia or eclampsia who received the full dose of magnesium sulfate or loading dose of magnesium sulfate and referral.  
**Denominator:** Total number of women in the health facility with severe preeclampsia or eclampsia.  
**Preferred data sources:** Health facility assessment reports, facility registries, etc.  
**For further information and related links, see WHO 2015a.**  
**Module Link:**  
Module 4—Medical Products, Vaccines, and Technologies, Topic G, has a number of indicators to assess appropriate use of medicines and supplies. |
| 41. Maternal death occurring in the facility that were audited (percentage) *(Also neonatal and perinatal death reviews)* | **Definition:** Percentage of maternal deaths occurring in the facility that were audited. If information is available, include also an indicator on neonatal and perinatal death reviews (percentage of neonatal/perinatal death occurring in the facility that were audited) in the analysis.  
**Numerator:** Number of health facility maternal deaths reviewed.  
**Denominator:** All maternal deaths in facilities.  
**Disaggregation/additional dimension:** Community deaths, facilities, major administrative regions.  
**Method of measurement:** Need for a clear definition of what qualifies as a “review.” This may or may not include actions taken, if these can be measured objectively.  
**Preferred data sources:** Specific monitoring with routine facility information systems.  
**Module Link:** Module 4—Medical Products, Vaccines, and Technologies, Topic G, has a number of indicators to assess appropriate use of medicines and supplies. |
|---|---|
| 42. Successful newborn resuscitation (percentage) | **Definition:** Percentage of newborns not breathing spontaneously/crying (excluding macerated stillbirths and including fresh stillbirths as a surrogate of intrapartum stillbirths) at birth for whom resuscitation actions (stimulation and/or bag and mask) were initiated.  
**Numerator:** Number of newborns not breathing spontaneously/crying (excluding macerated stillbirths and including fresh stillbirths as a surrogate of intrapartum stillbirths) at birth for whom resuscitation actions (stimulation and/or bag and mask) were initiated.  
**Denominator:** Total number newborns in the facility not breathing spontaneously or crying (including fresh and excluding macerated stillbirth) at birth.  
**Disaggregation/additional dimension:**  
- Successfully resuscitated after stimulation only  
- Successfully resuscitated after bag and mask ventilation  
**Preferred data sources:** HMIS, facility-level assessment reports.  
For further information and related links, see Hill et al. 2014. |
| 43. Young infants who received appropriate antibiotic therapy for possible serious bacterial infection (percentage) | **Definition:** Number of young infants (children under 2 months) with possible serious bacterial infection (PSBI)* who received appropriate antibiotic therapy. **  
*PSBI: Young Infants not able to feed since birth or stopped feeding well, had convulsions, fast breathing (60 breaths per minute or more for infants under 7 days), severe chest in-drawing, fever (38-degrees Celsius or greater), low body temperature (less than 35.5-degrees Celsius), movement only when stimulated or no movement at all.  
*Appropriate antibiotic therapy: The following: a) one dose of injectable ampicillin and Gentamicin and referral to higher level facility; b) if referral is not acceptable/available, prescribed outpatient treatment regimen with injectable Gentamicin and oral amoxicillin; or c) Inpatient treatment (injectable ampicillin and Gentamicin).  
**Numerator:** Number of young infants (children under 2 months) with PSBI who received appropriate antibiotic therapy.  
**Denominator:** Number of young infants (children under 2 months) with PSBI.  
**Disaggregation/additional dimension:**  
- By facility type/service delivery level (outpatient, inpatient)  
- By treatment regimen (initial treatment and referral, inpatient treatment, outpatient treatment)  
- Urban/rural  
**Preferred data sources:** Facility-level assessment reports, facility medical documentation.  
For further information and related links, see WHO 2015a and WHO 2015b. |
### Module Link:
Module 4—Medical Products, Vaccines, and Technologies, Topic G, has a number of indicators to assess appropriate use of medicines and supplies.

<table>
<thead>
<tr>
<th>44. Children who are correctly prescribed antibiotic for pneumonia (percentage)</th>
</tr>
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<tbody>
<tr>
<td><strong>Definition:</strong> Percentage of children 2 months–5 years with diagnosis of pneumonia (or signs as chest in-drawing or fast breathing) to whom first-line antibiotic (oral amoxicillin 2 times for 5 days) was prescribed.</td>
</tr>
<tr>
<td><strong>Numerator:</strong> Number of children 2 months–5 years with diagnosis of pneumonia (or signs as chest in-drawing or fast breathing) to whom first-line antibiotic (oral amoxicillin 2 times for 5 days) was prescribed.</td>
</tr>
<tr>
<td><strong>Denominator:</strong> Number of children 2 months–5 years with diagnosis of pneumonia (or signs as chest in-drawing or fast breathing).</td>
</tr>
<tr>
<td><strong>Disaggregation/additional dimension:</strong> Age, prescription based on age or weight, urban or rural.</td>
</tr>
<tr>
<td><strong>Preferred data sources:</strong> Facility-level assessment report, HMIS, facility registers. For further information and related links, see WHO 2015a and WHO 2014a.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>45. Percentage of patients with hypertension with established blood pressure control during the last visit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition:</strong> Percentage of patients age 18–85 with a diagnosis of hypertension and whose blood pressure was adequately controlled (less than 140/90) during the measurement during the last visit.</td>
</tr>
<tr>
<td><strong>Numerator:</strong> Number of patients with established hypertension with control of blood pressure (less than 140/90) during the last visit.</td>
</tr>
<tr>
<td><strong>Denominator:</strong> Number of patients with established hypertension.</td>
</tr>
<tr>
<td><strong>Disaggregation/additional dimension:</strong> Age, sex</td>
</tr>
<tr>
<td><strong>Preferred data sources:</strong> Facility-level assessment report, HMIS, facility registers, STEPs survey (if facility data are not available). For further information and related links, see Department of Health and Human Services 2016.</td>
</tr>
</tbody>
</table>

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<tr>
<th>46. Assessment of 10-year CVD risk (percentage) among adult patients</th>
</tr>
</thead>
</table>
| **Definition:** Percentage of adult patients (18 and older) with at least two CVD risk factors* in which risk of CVD event in next 10 years** calculated.  
* CVD risk factors to be assessed: Older than age 45, high blood pressure, obese or overweight, smoking, early family history of coronary artery disease (CAD) (not applicable for diabetes, previous diagnosis of CAD, heart failure, or stroke since in these cases, 10-year CVD risk is high).  
** A 10-year CVD risk of plus-or-minus 30 percent is defined according to age, sex, other relevant sociodemographic stratifiers where available, blood pressure, smoking status (current smokers OR those who quit smoking less than 1 year before the assessment), total cholesterol, and diabetes (previously diagnosed OR a fasting plasma glucose concentration more than 7.0 mmol/l (126 mg/dl). |
| **Numerator:** Number of patients with at least two CVD risk factors in which risk of CVD event in next 10 years calculated. |
47. Drug therapy and counseling to prevent heart attacks and stroke in high CVD risk individuals and people with diabetes and established CVD (percentage)

| Denominator: | Number of patients with at least two CVD risk factors. |
| Disaggregation: | By age, sex, CVD risk factors, type of facility. |
| Preferred data sources: | Facility-level surveys, facility registries/charts. |
| Other possible data sources: | NCD framework risk factor exposure, STEPs survey if indicator is not available at facility level. |
| For further information and related links, see | WHO 2014b and WHO 2015a. |

**Definition** Percentage of eligible persons (defined as 40 years and older with a 10-year CVD risk* plus-or-minus 30 percent, including those with existing CVD receiving drug therapy** and counseling*** (including glycemic control) to prevent heart attacks and strokes.  
*A 10-year CVD risk of plus-or-minus 30 percent is defined according to age, sex, other relevant sociodemographic stratifiers where available, blood pressure, smoking status (current smokers OR those who quit smoking less than 1 year before the assessment), total cholesterol, and diabetes (previously diagnosed OR a fasting plasma glucose concentration more than 7.0 mmol/l (126 mg/dl)).  
**Drug therapy is defined as taking medication for raised blood glucose/diabetes, raised total cholesterol, or raised blood pressure, or taking aspirin or statins to prevent or treat heart disease.  
***Counseling is defined as receiving advice from a doctor or other health worker to quit using tobacco or not start, reduce salt in diet, eat at least five servings of fruit and/or vegetables per day, reduce fat in diet, start or do more physical activity, maintain a healthy body weight, or lose weight.  

**Method of estimation/calculation:** Number of patients who are receiving drug therapy and counseling/number of eligible patients times 100%.  

**Numerator:** Number of eligible patients who are receiving drug therapy and counseling.  
Receiving drug therapy and counseling is calculated from medical documentation (charts, registries).  

**Denominator:** Total number of eligible patients. Eligible patients are those 40 and older who either currently self-report that they have existing CVD or who have a 10-year cardiovascular risk of 30 percent or higher calculated by using the WHO/ISH risk prediction charts for 14 WHO epidemiological subregions that provide the approximate estimates of CVD risk in people who do not have established coronary heart disease, stroke, or other atherosclerotic disease, based on responses to the following: age, sex, smoking status, SBP, TC and absence or presence of diabetes.  

**Disaggregation:**  
- Type of service  
- Primary prevention (patients with high risk)/secondary prevention (patients with established disease)  
- Type of facility  

**Preferred data sources:** Facility-level surveys, HMIS.  
**Other possible data sources:** NCD framework risk factor exposure.  
**For further information and related links, see** WHO 2014b.  

**Module Link:**  
Module 4—Medical Products, Vaccines, and Technologies, Topic G, has a number of indicators to assess appropriate use of medicines and supplies.
| 48. Hospital readmission rates | **Definition:** Percentage of unplanned and unexpected hospital readmissions for tracer conditions (acute myocardial infarction, pneumonia, asthma, diabetes). Note: Depending on the information available and priority conditions, pick one or two tracer conditions.  
**Numerator:** Number of unplanned and unexpected hospital readmissions for tracer conditions (acute myocardial infarction, pneumonia, asthma, diabetes) within 12 months.  
**Denominator:** Total number of patients admitted with tracer conditions (acute myocardial infarction, pneumonia, asthma, diabetes).  
**Disaggregation/additional dimension:** Readmission within 30 days, 3 months, 6 months, 12 months.  
**Preferred data sources:** Routine HMIS, facility registry, facility assessment reports.  
For further information and related links, see WHO 2015a. |
| --- | --- |
| 49. Antiretroviral Therapy retention rate | **Definition:** Percentage of adults and children with HIV alive and on ART at 12 months, 24 months, 36 months (etc.) after initiating treatment among patients initiating ART during a specified time period.  
**Numerator:** Number of people on ART at 12 months, 24 months, and 60 months.  
**Denominator:** Total number of people who initiated treatment and should have completed 12 months, 24 months, 36 months (etc.).  
**Disaggregation/additional dimension:**  
- **Age:** a) Minimum for paper-based (routine): less than 15, 15 plus; b) Annual data extraction of disaggregated data if not reported routinely: Under 5, 5–9, 10–14, 15–19, 20–24, 25–49, 50 plus; c) Electronic system: 5-year age groups  
- Breastfeeding  
- Pregnancy  
- Sex  
**Method of measurement:** A cohort analysis can be used to estimate ART retention at specific points in time after initiation of treatment.  
**Preferred data sources:** ART register  
For further information and related links, see WHO 2015a. |
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| 50. Tuberculosis treatment success rate | **Definition:** Percentage of TB cases successfully treated (cured plus treatment completed) among TB cases notified to the national health authorities during a specified period.  
**Numerator:** Number of TB cases registered in a specified period, which were successfully treated.  
**Denominator:** Total number of TB cases registered in the same period.  
**Disaggregation/additional dimension:**  
- Age  
- Bacteriological confirmation status  
- Drug resistance status (drug-susceptible and treated with first-line drugs, drug-resistant and treated with a second-line regimen)  
- HIV status  
- Previous treatment history (new and relapse, previously treated excluding relapse)  
- sex  
**Preferred data sources:** TB register and related quarterly reporting system (or electronic TB registers).  
For further information and related links, see WHO 2015a. |
| 51. Patient satisfaction | **Definition:** Percentage of survey respondents who report to be satisfied or very satisfied with the health services.  
**Numerator:** Number of survey respondents who report to be satisfied or very satisfied with the health services.  
**Denominator:** Total survey respondents.  
**Disaggregation/additional dimension:** Type of service, type/level of facility, sex.  
**Preferred data sources:** Patient satisfaction surveys.  
For further information and related links, see WHO 2015a. |
| 52. Unnecessary or harmful practices during labor, childbirth, and the early postnatal period | **Definition:** Percentage of all births in the health facility that underwent unnecessary practices (enemas, pubic/perineal shaving, vaginal examinations under 4 hours, artificial rupture of membranes, episiotomy, intravenous fluids, caesarean section, instrumental vaginal childbirth, suction of the newborn, unjustified antibiotic use). Note: if information is not available on all practices, present any abovementioned unnecessary practice.  
**Numerator:** Number of all births in the health facility that underwent unnecessary practices (enemas, pubic/perineal shaving, vaginal examinations under 4 hours, artificial rupture of membranes, episiotomy, intravenous fluids, cesarean section, instrumental vaginal childbirth, suction of the newborn, unjustified antibiotic use.  
**Denominator:** Number of all births in the health facility.  
**Disaggregation:**  
- By unnecessary or harmful practice  
- By type/level of facility  
- Urban/rural  
- Type of health worker providing care  
**Preferred data sources:** Facility assessment reports/registries/documentation  
For further information and related links, see WHO 2016b. |
5. SUMMARIZING FINDINGS AND DEVELOPING RECOMMENDATIONS

Section 2—Steps to Conduct the Assessment, Step 4—Analyze Findings and Develop Recommendations, describes the process that the HSA team will use to synthesize and integrate findings and prioritize recommendations across modules. To prepare for this effort, each team member must review the process recommended in Step 4 and follow this process to analyze the data collected for that team member’s module(s) to distill findings and propose potential interventions. Each module assessor should be able to present findings and conclusions for his or her module(s), first to other members of the team and eventually in the assessment report (see Annex 2.1.A for a suggested outline for the report). This process is interactive; findings and conclusions from other modules will contribute to sharpening and prioritizing overall findings and recommendations. Below are some generic methods for summarizing findings and developing potential interventions for this module.

5.1 Analyzing Data and Summarizing Findings

Table 3.2.7 provides an easy way to summarize and group findings. It organizes each core function module by topic. Rows can be added to the table if additional areas are needed to accommodate the HSA country context. In anticipation of working with other team members to put findings in the Strength, Weakness, Opportunity, Threat (SWOT) framework, each finding should be labeled as an S, W, O, or T (See Section 2, Step 4 for more detailed guidance on summarizing findings and on the SWOT framework). The “Comments” column is used to highlight links to other modules and possible impact on health system performance in terms of coverage, equity, access, utilization, demand, and quality of health services. Examples of system impacts on performance criteria are discussed in Section 1 and summarized in Annex 2.4.B. Table 3.2.8 provides a proposed list of indicators for each WHO performance criterion.

<table>
<thead>
<tr>
<th>Indicator or Topical Area</th>
<th>Findings (Designate as S=Strength, W=Weakness, O=Opportunity, T=Threat)</th>
<th>Source(s) (List specific documents, interviews, and other materials)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governance (MOH structure, composition, roles, and responsibilities)</td>
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<tr>
<td>Role of local administrative government</td>
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<tr>
<td>Role of community groups, civil society, CBOs/NGOs/FBOs</td>
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<td>Policy and regulatory framework</td>
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<td>Financing</td>
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<tr>
<td>Health infrastructure, vaccines, and supplies</td>
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<tr>
<td>Pharmaceuticals</td>
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<td>Human resources</td>
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<td>Information systems</td>
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<td>Clinical standards and</td>
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</table>
Table 3.2.8. List of Suggested Service Delivery Indicators Addressing the Key Health System Performance Criterion

<table>
<thead>
<tr>
<th>Performance Criterion</th>
<th>Suggested Indicators for Service Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity</td>
<td>Percentage of births attended by skilled health personnel per year (If possible, disaggregated by wealth quintile)</td>
</tr>
<tr>
<td>Access</td>
<td>Hours of services, distance to nearest facility</td>
</tr>
<tr>
<td>Quality</td>
<td>Existence of adaptation of clinical standards into a practical form that can be used at local level</td>
</tr>
</tbody>
</table>

Alternatively, summary findings can be presented as Table 3.2.9, where the performance criteria are used to develop the SWOT analysis. The SWOT rows may also be combined into two rows: strengths and opportunities versus weaknesses and threats.
<table>
<thead>
<tr>
<th>Strengths/Weaknesses</th>
<th>SWOT</th>
<th>Inputs</th>
<th>Processes</th>
<th>Access</th>
<th>Coverage, Utilization, and Equity</th>
<th>Knowledge/Demand</th>
<th>Quality</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strengths</strong></td>
<td>Strong policy framework; earmarked funding to improve quality at national and subnational levels; updated clinical guidelines available at facilities</td>
<td>Population have designated primary care provider; facility-level management is involved in dialogue related to planning and financing health services</td>
<td>Good financial and geographic access to primary care in urban area; good financial access to HIV and TB treatment medications</td>
<td>Good knowledge of harmful effects of tobacco and alcohol; good knowledge of newborn danger signs to seek care</td>
<td>Improved care outcomes of HIV, TB, and malaria; improved cancer survival</td>
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<tr>
<td><strong>Weaknesses</strong></td>
<td>Health service delivery infrastructure in rural areas is obsolete; limited availability of providers in rural areas</td>
<td>Care is fragmented at each and between different levels of care; counter-referral system between hospitals and primary care is not functional</td>
<td>Limited affordability of chronic NCD medications; limited availability of provider cadre during weekends in rural areas</td>
<td>Low utilization of primary care services; increased emergency visits and hospital admissions for avoidable conditions; limited coverage with chronic medications for NCDs</td>
<td>QI structures are not functional; low compliance with evidence-based maternal and newborn care practices; timeliness of initial assessment and referrals to higher level facilities; high readmission rates among patients with ACS</td>
<td>Increased premature mortality before age 70; increased prevalence of NCDs and associated risk factors, including incidence of cervical cancer; increased prevalence of HIV</td>
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</table>
5.2 Developing Recommendations

After summarizing findings, it is time to synthesize them across chapters and develop recommendations for health systems interventions. In developing recommendations, team members should consider the country’s specific context and the feasibility of the proposed intervention. Simultaneously, team members should propose the best practices used in other countries in the region to address problems similar to those identified in this assessment. It is always useful to group the recommendations around specific objectives that address particular service delivery gaps or poor health system performance. Sometimes, it is useful also to group recommendations into short-term and long-term solutions or recommendations proposed at different levels (national, subnational, facility, community) or for different actors (MOH, state regulatory agency, national center for disease control, professional associations, district health officials, etc.).

Section 2, Step 4, suggests a number of approaches that the HSA team can use for synthesizing findings across core function topics and for crafting recommendations. This subsection focuses on illustrative service delivery interventions to consider in developing recommendations (Table 3.2.10). As much as possible, make conclusions about service delivery findings within the first week of the assessment so that findings can be validated with interviewees. Organize this section by the proposed outline above unless another organizational structure is clearly preferable. One approach may be to start from the end—in other words, identify service delivery outputs and outcomes (e.g., high-burden diseases, highly prevalent risk factors, main causes of mortality) to pinpoint and focus on the weakest areas in the service delivery system. The service delivery assessment should then explore which inputs and/or processes are the main contributors of weak service delivery and health system outcomes and propose feasible recommendations to address specific gaps in a given context.

**Table 3.2.10. Illustrative Recommendations for Service Delivery Issues**

<table>
<thead>
<tr>
<th>Health System Gap</th>
<th>Possible Interventions</th>
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</thead>
</table>
| System Performance Criteria: Increase Access to Critical Health Services | • Organize community transportation.  
• Coordinate with local government and mobilize local resources.  
• Coordinate assessment, counseling, and referral process with community midwives, traditional healers, and CHWs/CHVs and support information sharing between community and facility levels.  
• Seek collaborative partnerships with private sector (for-profit, NGOs/CBOs, church, community groups, pharmacies) to cover more people.  
• Explore partnerships with commercial entities operating in remote areas.  |
| Limited access to health facilities in rural/remote areas | • Create some form of risk pooling mechanism (see Module 6—Health Financing).  
• Develop sustainable funding and reimbursement mechanisms for prevention, diagnosis, and management of priority diseases by integration of public funding, external development partner financial support, and innovative financing mechanisms (including public private partnerships).  
• Develop/revise the basic benefit package of essential high-impact, cost-effective services and integrate it in publicly funded health care programs and in private insurance schemes.  |
<p>| Financial barriers to access priority services           |                                                                                                                                                                                                                      |</p>
<table>
<thead>
<tr>
<th>Health System Gap</th>
<th>Possible Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System Performance Criteria: Improve Coverage, Utilization, and Equity of Needed Health Services</strong></td>
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</table>
| Scarce coverage and low treatment adherence to outpatient chronic medications, particularly among the poor | • Rationalize benefit package by integrating high-impact, cost-effective services for the prevention, timely diagnosis, and management of priority diseases in publicly funded health care programs to achieve budgetary savings for essential medications.  
• Integrate essential outpatient medicines for chronic conditions in the National List of Essential Medications, making them universally available for all in need (or only for patients living below the poverty line) to address limited treatment compliance caused by limited financial access to essential medications.  
• Improve access to essential outpatient medicines by planning and implementing effective cost containment and rational medication use strategies (including, but not limited to, supporting the prescription of generic medications through different regulatory and financial tools; group purchasing of essential medications by government agencies; improving rational medication prescription practices through capacity building of medical personnel; and supporting patient/parent education activities at population and facility levels). |
| Limited utilization of preventive and screening services by the public             | • Inform the population (beneficiaries) about the preventive and screening services covered by state health programs and their associated benefits to ensure effective utilization of these services.  
• Enhance community outreach though establishing/strengthening the network of CHWs/CHVs and its linkages with existing community structures and health facilities. |
| Limited consumer knowledge on and high prevalence of modifiable NCD risk factors  | • Promote assessment and early detection of cross-cutting behavioral and physiologic risk factors of NCDs at every clinical visit.  
• Reduce tobacco consumption through increased individual- and population-level tobacco control interventions (taxation, restriction of smoking and advertisement, individual screening, counseling, and treatment).  
• Reduce sodium content in food for catering facilities and food processing industries by development/revision and implementation of relevant regulatory tools.  
• Support introductions of limits for trans fat, saturated fats, and sugar content in food for catering facilities and food processing industries by development and implementation of regulatory mechanisms.  
• Improve access to healthy food in wholesale and retail outlets by development and implementation of regulatory mechanisms.  
• Support a healthy diet (including increased fruit and vegetable and lower sodium consumption) by planning and implementing national information campaigns and social marketing initiatives.  
• Increase awareness among the population of food content by implementing international labeling standards of Codex Alimentarius. |
<table>
<thead>
<tr>
<th>Health System Gap</th>
<th>Possible Interventions</th>
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<tbody>
<tr>
<td><strong>System Performance Criteria: Improve Quality of Health Services</strong></td>
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<tr>
<td>Poor clinical skills among care providers (in particular clinical content area)</td>
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<tr>
<td>• Integrate updated recommendations on evidence-based care of priority clinical conditions into all levels of medical education, including pre-service, post-diploma, and continuous professional development (CPD) for health providers, pharmacists, health administrators, and public health providers, with close involvement of respective professional associations.</td>
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<tr>
<td>• Support increased participation of medical personnel into CPD programs through different regulatory and/or financial tools/incentives (e.g., establish providers’ participation in CPD programs as one of the criteria for the accreditation of health care facilities).</td>
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<tr>
<td>• Develop and initiate standard accreditation/clinical certification programs (including standards, methodology, and implementation tools) for medical facilities with close involvement of professional associations.</td>
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<tr>
<td>There are only a few facilities with established continuous quality improvement structures and processes</td>
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<tr>
<td>• Create an enabling policy and regulatory environment to support continuous QI and regular clinical supervision to address gaps in quality of care.</td>
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<tr>
<td>• Support establishment of QI teams within medical facilities.</td>
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<tr>
<td>• Support facility QI teams to assess the quality of care for priority clinical conditions and plan, implement, and evaluate changes in their health care processes to address the gaps and continuously improve quality of care.</td>
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<tr>
<td>• Support generation, collection, and use of clinical data for routine quality monitoring through integration of key QI indicators for prevention and management of priority clinical conditions in medical documentation, routine reporting forms, and the national HMIS.</td>
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<tr>
<td>• Revise regulatory tools to ensure quality, safety, and rational medication practices by medical care providers and patients.</td>
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<td>Limited availability and use of evidence-based clinical guidelines</td>
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<td>• Develop and implement mechanisms to support close involvement of professional medical associations in development/adaptation of evidence-based medical information applicable for local settings.</td>
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<tr>
<td>• Provide regular supervision to facility care providers to improve compliance with evidence-based practices by subnational/district MOH structures or professional associations.</td>
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<tr>
<td>• Promote compliance with evidence-based practices through development of different policy, regulatory, and financial tools at different levels of the health system.</td>
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<tr>
<td>Delayed referral of sick patients to higher level facilities</td>
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<tr>
<td>• Conduct process mapping of initial assessment/triage, diagnosis, treatment, and referral of sick patients to identify inefficiencies in referral process and address the reasons s of delay.</td>
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<tr>
<td>• Redesign the process to improve timely referral and review standard referral protocol accordingly.</td>
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<tr>
<td>• Establish effective communication and information sharing between the community level to lower and higher level facilities and ambulance access.</td>
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<tr>
<td>Health System Gap</td>
<td>Possible Interventions</td>
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<tr>
<td>---------------------------------------------------------------------------------</td>
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<tr>
<td>Fragmented and duplicated services at each and between different levels of care</td>
<td>• Establish gate keeping function with designated care provider at primary care level.</td>
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<tr>
<td></td>
<td>• Build clinical knowledge, skills, and competencies of primary care providers in</td>
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<td></td>
<td>integrated care of high burden diseases.</td>
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<td></td>
<td>• Create enabling policy, regulatory, and financial environment for integrated and</td>
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<td></td>
<td>patient-centered care.</td>
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<td></td>
<td>• Support communication and data exchange at each and between different levels of care,</td>
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<td>including between health facilities and community level.</td>
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<td></td>
<td>• Conduct process mapping to identify duplicated services and redesign the process to</td>
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<td></td>
<td>streamline patient care.</td>
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<tr>
<td>Informal horizontal community system consists of community groups and their</td>
<td>• Strengthen linkage between community and health facility.</td>
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<tr>
<td>networks</td>
<td>• Utilize community groups and their networks as a system but not as ad hoc campaign.</td>
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<td></td>
<td>• Mobilize existing community structures/groups to support CHWs/CHVs in identifying</td>
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<td>and reaching target population with community services.</td>
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</table>
6. ASSESSMENT REPORT CHECKLIST: SERVICE DELIVERY CHAPTER

The assessment team may use the proposed outline below to present findings from the service delivery module of the HSA:

- **Profile of Country Health Service Delivery**
  - A. Inputs (governance, financing, health infrastructure, pharmaceuticals, HIS, human resources, clinical guidelines)
  - B. Processes (provision and organization of services, managing care, improving quality)

- **Performance of the Health Service Delivery System**
  - A. Access to health services
  - B. Coverage, utilization, and equity of health services
  - C. Consumer knowledge and demand
  - D. Quality of health services

- **Outcomes of the Health Service Delivery System**
  - A. Mortality
  - B. Morbidity
  - C. Fertility
  - D. Risk factors

- **Summary of Findings and Recommendations**
  - A. Presentation of findings
  - B. Recommendations

In some cases, it may be helpful to create additional subheadings in addition to or in place of the topics to organize the Service Delivery chapter write-up.
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