

HARMONIZED HEALTH FACILITY ASSESSMENT (HHFA)

Quick guide

WORKING DOCUMENT
JANUARY 2022



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This is a working document that will be updated intermittently based on implementation experience and feedback from users. Users are invited to submit comments through the HHFA feedback form at: <https://feedback.hhfa.online>

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Contents

Acknowledgements	iv
Abbreviations	v
1 HHFA summary	1
1.1 What is the Harmonized Health Facility Assessment?	1
The HHFA resource package	2
2 Background	4
2.1 Why assess health facility services?	4
2.2 Concepts for assessing health facility services	4
2.3 Context of the HHFA	5
2.4 Rationale for the HHFA	7
2.5 HHFA development process	7
2.6 Timeline of HHFA implementation	8
3 HHFA overview	9
3.1 HHFA objectives	9
3.2 HHFA modules	10
3.3 HHFA questions and questionnaires	11
3.4 HHFA CSPro electronic data collection tool	14
3.5 HHFA indicators and indicator inventory	15
3.6 HHFA data analysis platform	24
4 HHFA methodology	28
4.1 Establishing a master facility list (MFL)	28
4.2 HHFA design methodology	28
4.3 Selecting HHFA modules and questionnaires for implementation	30
4.4 Adapting the questionnaire to the country context	31
5 HHFA planning and implementation steps	34
5.1 Summary of survey planning and implementation steps	34
5.2 Pre-survey planning and preparation	35
5.3 Data collection	43
5.4 Data processing and analysis	45
5.5 Data interpretation, report-writing, dissemination, and archiving	46
Annex. Calculating HHFA indices	50

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Abbreviations

ACT	artemisinin-based combination therapy
ART	antiretroviral therapy
ARV	antiretroviral
CBR	crude birth rate
CSPRO	Census and Survey Processing System
CDC	Centers for Disease Control and Prevention
deff	design effect
DQA	data quality assurance
EDC	electronic data collection
FBO	faith-based organization
GPS	global positioning system
HDC	Health Data Collaborative
HHFA	Harmonized Health Facility Assessment
HIV	human immunodeficiency virus
HRIS	human resources information system
ID	identification
IHP	International Health Partnership
LMIC	low- and middle-income country
M&E	monitoring and evaluation
MDG	Millennium Development Goal
MFL	master facility list
MoH	ministry of health
NGO	nongovernmental organization
ORS	oral rehydration salt
PEPFAR	President's Emergency Plan for AIDS Relief
PHC	primary health care
PMTCT	prevention of mother-to-child transmission (of HIV)
PSU	primary sampling unit
RDT	rapid diagnostic test
RHIS	routine health information system
RUTF	ready-to-use therapeutic food
SARA	Service Availability and Readiness Assessment
SDG	Sustainable Development Goals
SDI	Service Delivery Indicators
SPA	Service Provision Assessment
TB	tuberculosis
UHC	Universal Health Coverage
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

1 HHFA summary

1.1 What is the Harmonized Health Facility Assessment?

The Harmonized Health Facility Assessment (HHFA) is a comprehensive, standardized health facility survey that provides reliable, objective information on the availability of health facility services and the capacities of facilities to provide the services at required standards of quality.

Availability and quality of health services are integral to achieving universal health coverage (UHC) and the health-related Sustainable Development Goals (SDGs). HHFA data can support health sector reviews and evidence-based decision-making for strengthening country health services. Developed through multi-stakeholder collaboration, the HHFA builds on previous facility survey instruments, is based on global service standards and uses standardised indicators, questionnaires, data collection methodologies and data analysis tools.

HHFA content

The HHFA includes four modules: 1) service availability, 2) service readiness, 3) quality of care, and 4) management and finance.

Figure 1. HHFA modules



A module represents a set of questions (in questionnaire format) and indicators for a main topical area. Countries may choose to implement all four modules or only selected modules. Core questions represent the recommended minimum information, while optional additional questions enable countries to further adapt the HHFA to their contexts and needs. All questions must be linked to defined indicators. The HHFA questionnaires are programmed into the HHFA Census and Survey Processing System (CSPro) electronic data collection tool. (Refer to **Figure 2** for a diagram of the HHFA modules and questionnaires.) Data from the HHFA questions are analysed to produce indicators within five service dimensions: Service availability, General service readiness, Service-specific readiness, Quality of care, and Management and finance.

HHFA implementation

The HHFA can be conducted on a representative sample of facilities or as a census of all facilities in the country. An updated master facility list (MFL) including all public and private facilities in the country serves as the sampling frame for the survey.

Trained data collectors visit the facilities to collect data on electronic devices (e.g., tablets, mobile phones) using the HHFA CSPro electronic data collection tool. Once data collection is completed, the data are transferred to the HHFA data analysis platform. The analysis platform produces the HHFA indicators in tables and charts in a standard report outline format. Countries can use this outline as the basis for a comprehensive survey report, with interpretation of the findings within the country context and recommendations for action.

Countries should aim to establish a plan of regular HHFAs (e.g., one to five years) as part of the health sector monitoring and evaluation framework. Selected modules could be implemented as sample surveys in alternating years for monitoring purposes. The HHFAs should be synchronised with the country’s schedule of routine analytical reviews and planning processes, so that the results can feed into these processes.

Figure 2. The HHFA modules and questionnaires

Module 1 Service availability	Module 2 Service readiness	Module 3 Quality of care	Module 4 Management and finance
<ul style="list-style-type: none"> Facility characteristics Staff Beds Availability of specific services Building structure 	Capacity to provide services according to defined standards: <ul style="list-style-type: none"> Guidelines, trained staff, equipment, diagnostics, commodities Systems to support quality and safety Provider competency 	<ul style="list-style-type: none"> Adherence to standards in patient care process Patient experience 	Practices to support continuous service availability and quality: <ul style="list-style-type: none"> Management Finance Health information systems Quality assurance Health worker absenteeism
Questionnaires	Questionnaires	Questionnaires	Questionnaires
<ul style="list-style-type: none"> Availability: Core 	<ul style="list-style-type: none"> Readiness: Core 	<ul style="list-style-type: none"> Quality of care: Additional/Supplementary - Record review* 	<ul style="list-style-type: none"> Management and Finance: Core
<ul style="list-style-type: none"> Availability: Core+Additional 	<ul style="list-style-type: none"> Readiness: Additional/Supplementary - Provider competency† 	<ul style="list-style-type: none"> Quality of care: Additional/Supplementary - Patient experience† 	<ul style="list-style-type: none"> Management and Finance: Core+Additional
<ul style="list-style-type: none"> Availability: Additional/Supplementary - Building structure 			<ul style="list-style-type: none"> Management and Finance: Additional/Supplementary - Health worker absenteeism†
Combined questionnaire			
*Available 2022 †Future development			

The HHFA resource package

The HHFA resource package is a comprehensive set of downloadable tools and guidance to support countries in adapting, planning and implementing a HHFA. (Refer to **Figure 3.**)

The resource package is available at:

<https://www.who.int/data/data-collection-tools/harmonized-health-facility-assessment/introduction>

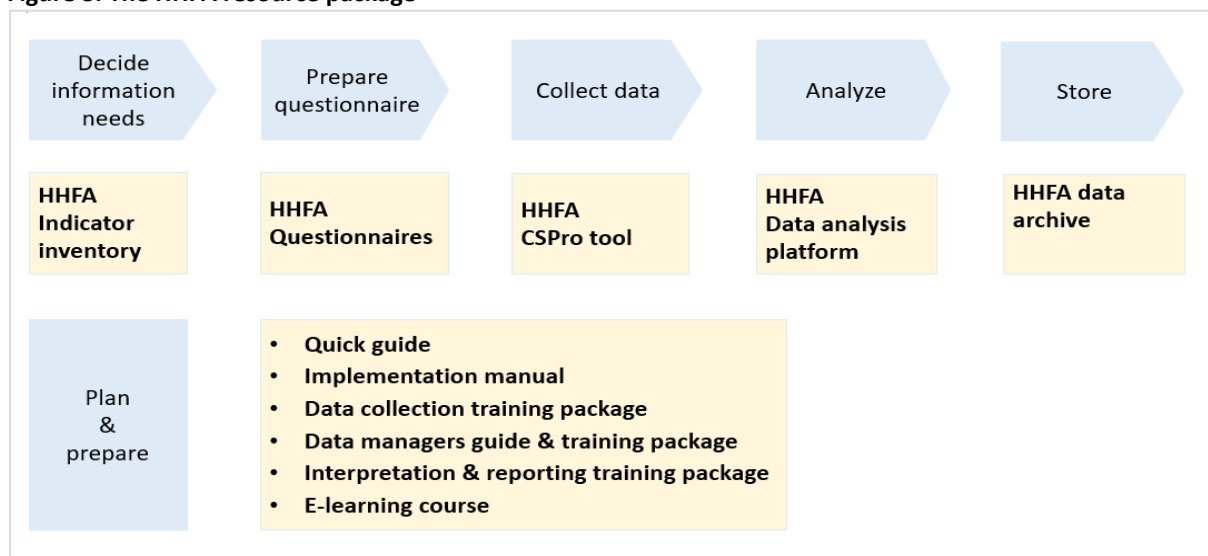
- **Quick guide:** The quick guide describes the HHFA background and introduces the HHFA concepts, tools and methodologies and well as survey planning and implementation processes.
- **Implementation guide:** The implementation guide provides step-by-step guidance for survey planning, implementation, data analysis, interpretation and dissemination of results¹.
- **Indicator inventory:** An online platform displays all the HHFA indicators, including the survey questions and code needed to calculate each indicator. The inventory can also be downloaded as an Excel document. An indicator tabulation plan can be generated from the indicator platform.

¹ The HHFA Implementation guide is currently in development. The SARA Implementation guide may be used in the interim. Service availability and readiness assessment (SARA): an annual monitoring system for service delivery: implementation guide, version 2.2. Geneva: World Health Organization; 2015. <https://apps.who.int/iris/handle/10665/183119>

1. HHFA SUMMARY

- **Questionnaires:** Questionnaires are available in “combined” and “stand-alone” formats. The “combined” questionnaire includes questions from multiple HHFA modules, integrated to facilitate data collection. “Stand-alone” questionnaires are also available for each module. The questionnaires are further categorised as Core, Core+Additional and Supplementary, based on the types of questions they contain.
- **CSPro electronic data collection tool:** This tool is a CSPro application containing all the HHFA questionnaires. The tool is flexible, enabling countries to select the questionnaires they want to implement and to adapt the tool to the country context.
- **Data manager guide:** The guide defines the data manager’s responsibilities in a HHFA and provides detailed explanations on how to adapt and use the CSPro tool.
- **Data analysis platform:** Data can be exported from the CSPro tool (or other data collection software) to a comprehensive data analysis platform that calculates the HHFA indicators and produces tables and charts in a standard report format. The data analysis platform can also be configured according to country needs.
- **Data archive:** Survey reports can be stored in a central data catalogue and made publicly available on the HHFA data archive. In addition, survey metadata and microdata can be securely stored and can be made accessible, where authorized by the country.
- **Training resources:** Various training resources support the training of HHFA data collectors, supervisors and data managers, as well as teams conducting data analysis, interpretation, report-writing and results dissemination.

Figure 3. The HHFA resource package



2 Background

2.1 Why assess health facility services?

Sound information on the supply and quality of health services is necessary for health systems planning, management, and monitoring. Health service monitoring should include regular assessment of the availability of services in both the public and private sectors, as well as facility capacity to deliver key interventions at required standards of quality.

Strengthening of health facility services is a critical part of country efforts toward achieving national health goals, UHC and the health-related SDGs. To support countries in attaining these goals, global health partnerships have scaled up interventions in various technical areas including reproductive, maternal and child health, communicable diseases, and noncommunicable diseases and conditions. These efforts have highlighted the need for strong country monitoring of health services. There are increasing demands for accountability and a need to demonstrate results at country, regional and global levels. Information is required for tracking how health services respond to increased inputs and improved processes over time, as well as the impacts of such inputs and processes on intervention coverage and health outcomes.

In recent years, the global increase in natural disasters, along with conflicts and migration, has strained or damaged health systems. In the wake of such events, reliable information is needed to support reconstruction of health services and can provide opportunities to “build back better”. Outbreaks of diseases such as Ebola have highlighted the critical role of front-line health services and, across the world, the Covid-19 pandemic has revealed the vulnerabilities of health service to external shocks. Comprehensive, updated information on the availability and capacities of health facility services is essential for building health system resilience and mobilising adequate, timely responses to such events.

Despite heightened investments in health systems and the need for agile responses to health threats, few countries have up-to-date information on the availability of health services that covers both public and private sectors. Fewer still have accurate, current information on the “readiness” of health facilities to provide quality services. The World Health Organization’s (WHO) 2020 SCORE Assessment² revealed that almost 50% of the countries assessed had limited capacity for systematic assessment of quality of care, with most of these being low-and middle-income countries.

Health facility data are needed for a comprehensive assessment of the functioning of health service delivery systems and the changes in these systems over time. Updated master facility lists (MFL) that include both public and private sector facilities are essential for comprehensive mapping of health service availability. External review through facility surveys provides reliable, objective information on the resources and systems that are in place to provide services at required standards of quality.

2.2 Concepts for assessing health facility services

Ensuring access to quality health services is one of the main functions of a health system. Service access includes multiple components: **service availability**, referring to the physical presence or reach of health facilities; **affordability**, referring to the ability of a client to pay for utilising services; and **acceptability**, referring to sociocultural aspects.

² SCORE for health data technical package: global report on health data systems and capacity, 2020. Geneva: World Health Organization; 2020 ([SCORE Documents - WHO](#))

2. HHFA BACKGROUND

Availability of services is not enough: facilities must have the capacities to provide the services at required standards of quality. **Service readiness** refers to the availability and functionality of key resources (infrastructure, trained staff, guidelines, equipment, diagnostic tests, medicines and commodities) needed for providing the services. Furthermore, appropriate facility-level **management systems** must be in place to plan, organize, support and monitor the delivery of the services.

Service availability, readiness and management systems are all prerequisites for service quality. However, they do not guarantee the delivery of a high-quality care process or a high-quality experience of care by the patient/client. **Quality of care** is a complex concept that includes multiple elements. It requires a health system that is able to ensure service availability, readiness and management, and includes the technical quality of care (which requires evidence-based practices, competent providers and appropriate implementation of the required practises) as well as the attitudes and behaviours of the providers, and patient/client perceptions of care.

Optimal functioning of all these elements contributes to the achievement of key health service outcomes: high coverage of key interventions, people-centred care (care which has considered the preferences and aspirations of individual service users and the cultures of their communities) and, ultimately, improved health outcomes.

2.3 Context of the HHFA

Global context

Building upon principles derived from the Paris Declaration on Aid Effectiveness and the International Health Partnership (IHP)³ and related initiatives, global partners and countries developed a general framework for the monitoring and evaluation (M&E) of health system strengthening.⁴ This framework centres on country health strategies and related M&E processes such as annual health sector reviews. At its core is a common monitoring and review platform to improve the availability, quality and use of data to inform health sector review processes and global monitoring.

Within this context, the HHFA was developed as a consolidated approach to facility surveys, building on previous and current approaches to assessing health facility services. These include existing internationally tested tools such as the United States Agency for International Development (USAID) Service Provision Assessment (SPA)⁵, the WHO Service Availability and Readiness Assessment (SARA)⁶, and the Service Delivery Indicators (SDI)⁷ survey, as well as key global indicator sets. **Table 1** summarizes differences between the SARA and the HHFA. The HHFA methodology and resource package also consider best practices and lessons learned from the many countries that have implemented facility surveys.

Health services monitoring context

The HHFA is not intended for provision of regular, individual facility information for supervision or management purposes. **Rather, the HHFA is designed to provide periodic, aggregate information across multiple facilities on service status in relation to standards, which should show whether systems and services are functioning as expected.** Where sample sizes permit, the performance of subnational areas can also be compared.

³ Transformed into UHC2030

⁴ Monitoring, evaluation and review of national health strategies: a country-led platform for information and accountability. Geneva: WHO; 2011 (<https://www.who.int/data/data-collection-tools/health-service-data>)

⁵ <https://dhsprogram.com/methodology/Survey-Types/SPA.cfm>

⁶ [https://www.who.int/data/data-collection-tools/service-availability-and-readiness-assessment-\(sara\)?ua=1](https://www.who.int/data/data-collection-tools/service-availability-and-readiness-assessment-(sara)?ua=1)

⁷ <https://www.sdindicators.org/>

Table 1. Differences between the SARA and the HHFA

	SARA	HHFA
Modules	<ul style="list-style-type: none"> • Availability • Readiness 	<ul style="list-style-type: none"> • Availability • Readiness • Quality of care • Management and finance
Indicators	<ul style="list-style-type: none"> • Core only • Printed indicator inventory 	<ul style="list-style-type: none"> • Core (expanded) and Additional • Indicator platform and Excel download
Questions	<ul style="list-style-type: none"> • Core only 	<ul style="list-style-type: none"> • Core (expanded) and Additional
Questionnaires	<ul style="list-style-type: none"> • Single core questionnaire 	<ul style="list-style-type: none"> • Stand-alone and combined questionnaires • Core; Core+Additional; Supplementary
Data collection methods	<ul style="list-style-type: none"> • Facility audit (observation and interviews) 	<ul style="list-style-type: none"> • Facility audit and other methods, e.g., record reviews
Electronic data collection tool	<ul style="list-style-type: none"> • CSPro application 	<ul style="list-style-type: none"> • CSPro application improved with additional features
Data analysis	<ul style="list-style-type: none"> • Excel chartbook 	<ul style="list-style-type: none"> • Data analysis platform: automated data analysis and report outline production
Data archive	<ul style="list-style-type: none"> • No central data repository 	<ul style="list-style-type: none"> • Data archive with capacity for countries to store reports and survey data in a central location

Health facility services should be based on defined standards and country policies and guidelines. WHO standards are developed through international consultation and adapted, where needed, by countries to the local context and needs. Adherence to these standards need to be monitored to ensure quality services. An ideal approach to monitoring adherence would include facility-specific accreditation or certification systems, integrated with routine monitoring and supervision systems, and complemented by regular facility surveys. However, many countries lack such well-developed systems.

in countries where accreditation or certification systems are not yet well-established, the HHFA provides an external assessment of facility adherence to standards and can serve as a precursor to an accreditation or certification system.

Health facilities regularly submit reports through the routine health information system (RHIS). A well-functioning RHIS provides information on facility activities and service quality that should be used to inform decision-making on a regular basis. However, much of the information required to assess the availability and functionality of resources and systems in facilities cannot be collected through the RHIS. Furthermore, as RHIS data is self-reported, it lacks the objectivity of an external assessment. Routine supervision systems may provide some of this information, but are frequently not implemented systematically. Lack of systematic processes for reviewing and using RHIS and supervision data may be a further limitation.

The data generated from a HHFA can fill important data gaps and may also be used to validate RHIS data and supervision reports. HHFAs therefore serve to complement these systems and successful use of HHFA findings should result in increased attention to effective, targeted supervision as well as monitoring based on RHIS data.

2.4 Rationale for the HHFA

Over the years, and particularly since the establishment of the Millennium Development Goals (MDGs), various national and international health facility survey tools were developed for assessing health system capacity to provide quality services. Multiple, uncoordinated facility surveys were at times implemented in a single country, often producing non-comparable results. Furthermore, such surveys often emphasized specific topics (e.g., malaria services or neonatal care) rather than providing a comprehensive, integrated assessment across all services. In addition, facility surveys were not consistently well-timed to coincide with country planning and review cycles.

In an effort to address these issues and to ensure a facility survey tool that would meet the measurement needs of the UHC and SDG era, a new harmonized, modular approach to facility surveys was developed: the HHFA. The HHFA is a comprehensive assessment of health facility service availability and quality, based on global service standards and using standardized indicators, questionnaires, methodologies and data analysis tools.

A critical aim of the HHFA is to align support among programmes and partners for a single system of high-quality facility surveys within a country. This would reduce redundancy and costs associated with multiple surveys in the same country and facilities and would also ensure that the surveys are implemented using globally established indicators, tools and methodologies.

Standardization promotes alignment among various health facility survey tools and enables comparability of results. Comparability is critical when monitoring an indicator over time and across locations. Experience has shown that non-harmonized surveys may use slight variations on a definition to measure the same item. The differences in definitions may be very small (e.g., calculating a result for the past three months versus the past four months) and the methods may also be similar. However, these variations may make large differences in the final calculated result. Such differences often result in invalid interpretations and comparisons across surveys.

The facility survey instruments implemented by various partners and countries may each have a specific focus, but often also include questions that are commonly used across various surveys. The HHFA aims to standardize a central set of questions and indicators that are common to multiple survey instruments. If, for example, a country chooses to implement a SPA in a particular year and then a HHFA two years later, comparisons between the two surveys would be possible for the set of common indicators.

Widespread adoption of the HHFA standards will facilitate the production of high-quality, comparable datasets. Such data will assist countries to reliably track progress in their service delivery systems as they work towards UHC and the SDGs.

2.5 HHFA development process

The HHFA was developed by WHO with inputs from the Health Data Collaborative (HDC)⁸. The HDC is an inclusive partnership of international agencies, governments, philanthropies, donors and academics, with the common aim of improving health data and tracking progress toward the health-related SDGs. The HDC leverages existing mechanisms to improve health data systems in countries and also supports existing collaborative networks, communities of practice and initiatives.

The HHFA development process began in 2014 with a multi-partner technical consultation, “Towards a harmonized approach for health facility assessments”. The consultation brought together focal

⁸ <https://www.healthdatacollaborative.org/>

points from technical agencies involved in the development, implementation and support of facility assessments. Participating agencies included WHO, The Global Fund, The World Bank, USAID, the Vaccine Alliance (GAVI), the President's Emergency Plan for AIDS Relief (PEPFAR), the Centers for Disease Control and Prevention (CDC), the United Nations Children's Fund (UNICEF), the United Nations Population Fund (UNFPA) and the United Nations Millennium Development Goal (MDG) Health Envoy.

Following the technical consultation, a time limited HDC facility assessment working group was established, comprising technical experts from partner organizations, countries, academia and civil society. This group worked collectively to develop the HHFA tools and resources, including standard indicators and measurement methods and draft questionnaires and analysis plans. Draft versions of the HHFA tools were tested in Kenya, Malawi and Burkina Faso.

As the HHFA is based on global service standards that are continuously evolving, the HHFA resource package will require regular updates. Furthermore, lessons learned from HHFA implementation in multiple countries over time, along with feedback from programmes and partners, will contribute to strengthening the tools. A feedback form is available on the HHFA website for submission of ongoing feedback and a structured process for regular review will be established for updating and improving the HHFA.

2.6 Timeline of HHFA implementation

Regular facility surveys should be an integral component of a country's health information system. The HHFA should be planned to coincide with national health sector planning cycles and annual review processes. Sample surveys should be implemented about three to six months in advance of an annual review or strategic planning process, so that the results are available to feed into the process.

The time needed to complete a HHFA depends on several factors including the size of the country, the sample size, the modules selected for implementation, and the number of data collection teams. The entire process generally requires three to six months from the time of country adaptation of the questionnaires to the production of the country report. Additional time may be needed if the country is conducting a facility survey for the first time or is implementing the survey as a census of all facilities.

The frequency at which HHFAs are conducted will depend on country needs and available resources. Ideally, a country would implement a census of the core availability module every five years. This would also serve as an opportunity to update or verify the national MFL. In addition, a nationally representative sample survey using selected modules may be conducted at intervals of one to three years. An option could be to alternate a sample survey of readiness (the most extensive module) with a sample survey of management and finance and quality of care. The modules selected should be those required to fill specific data gaps for country planning processes or to review specific service aspects that have previously shown weaknesses and for which corrective measures have been implemented. However, countries should adapt this cycle of assessments according to needs and feasibility.

3 HHFA overview

3.1 HHFA objectives

The HHFA is designed to provide reliable, objective information on the status of health facility services that can be used to measure progress in health system strengthening over time. The HHFA generates a set of indicators on key service inputs and processes that measure whether or not facilities meet the required conditions to support the provision of basic or specific services at accepted standards of quality. The indicators monitor changes over time using objective (externally validated) information that is reliable and comparable because it is collected using consistent methodologies and definitions.

HHFA indicators can be used to:

- provide information on the status of facility services as assessed against agreed-upon standards;
- detect changes and measure progress in facility services over time and among administrative/geographical areas;
- generate evidence for country health sector reviews to inform the development of strategic plans and to guide country and partner investments;
- support planning and management of facility services, e.g., to address gaps and to promote equitable distribution of services and resources;
- plan and monitor the scale-up of key interventions to achieve UHC and the SDGs, such as those to reduce child and maternal mortality, treat communicable diseases such as human immunodeficiency virus (HIV), tuberculosis (TB) and malaria, and respond to the increasing burden of noncommunicable diseases;
- assess the resilience of facilities to respond to unexpected events such as disease outbreaks or disasters;
- benchmark facility performance to support the development of quality improvement plans;
- provide evidence to motivate political support for improving service quality and, where needed, for increasing resources, targeting weak services components or areas, and/or strengthening internal supervision and monitoring systems;
- provide evidence to donors and other external supporting bodies that country reports are valid, and that the country's internal monitoring systems are implemented effectively or are improving.

Box 1 provides examples of questions that can be answered through a HHFA.

Box 1. Examples of questions that can be answered through a HHFA

- What percentage of health facilities offer the country's basic package of essential health services?
- What is the availability of a specific service, e.g. antiretroviral therapy, among all facilities?
- Are basic resources and systems (amenities, equipment, diagnostics, medicines, standard precautions for infection prevention) for general health service delivery established, adequate, and functional?
- Are key resources (trained staff, guidelines, equipment, diagnostics, medicines and commodities) in place to provide a specific service at a required level of quality, e.g., for family planning, malaria diagnosis and treatment, hypertension management?
- Is there evidence that patients/clients have received appropriate care?
- Are appropriate facility management systems established, adequate, and functioning?
- Are quality assurance systems established, adequate, and functioning?
- What are the strengths and weaknesses of health facility services?
- Are there differences in service availability and quality between urban and rural areas, and among different facility levels?

3.2 HHFA modules

The HHFA contains four modules: 1) service availability, 2) service readiness, 3) quality of care, and 4) management and finance.

A **module** is defined as a set of questions that provide information about a main topical area. Countries may choose to implement all four HHFA modules or only selected modules. **Figure 4** summarizes the types of information collected within each module.

Figure 4. HHFA modules

Module 1 Service availability	Module 2 Service readiness	Module 3 Quality of care	Module 4 Management and finance
<ul style="list-style-type: none"> • Staff • Beds • Diagnostics • Building infrastructure • Availability of specific services 	Capacity to provide specific services according to defined standards: <ul style="list-style-type: none"> • Guidelines, trained staff equipment, commodities • Systems to support quality and safety • Provider competency 	<ul style="list-style-type: none"> • Adherence to standards in the patient care process • Patient experience 	Practices to support continuous service availability and quality: <ul style="list-style-type: none"> • Management • Finance • Quality assurance • Health worker absenteeism

Module 1: Service availability - *Are basic infrastructure and services available?*

Module 1 refers to the physical presence of services. It encompasses key facility resources (infrastructure, staff, beds) as well as the availability of specific services in facilities. (Note that this does not include other aspects of service access, such as geographical and social barriers, travel time and user behaviour, which require different data collection methods.)

Module 2: Service readiness - *Are the key pre-requisites for providing quality services in place?*

Module 2 measures the extent to which the conditions are in place to provide services according to defined minimum standards, including the presence and functionality of basic amenities, trained staff, guidelines, equipment, diagnostic capacity, and medicines and commodities. Facility-level systems to support quality and safety are also assessed. Readiness is assessed both for the overall capacity of the facility to provide basic services and for specific services. A provider competency assessment will also be included as a future development.

Module 3: Quality of care - *Are services delivered to patients according to required standards?*

Module 3 assesses whether patients have received appropriate care, measured by assessing provider adherence to standards in the care process as documented in patient records. As a future development, patient/client experiences of care will also be assessed. Note that while Module 2 looks for the presence of the pre-requisites for quality care, Module 3 assesses whether the care process has been implemented appropriately for individual patients.

Module 4 - Management and finance – *Are appropriate facility management structures in place to support continuous availability and quality of services?*

Module 4 assesses the various management systems and practices that are implemented in the facility, including facility governance, financial practices, management and support of staff, management of medicines and other commodities, health information systems, and quality assurance systems. A health worker absenteeism assessment will be incorporated in this module in the future.

Data quality review for routine health information systems (RHIS) data

3. HHFA OVERVIEW

A data quality review can be conducted in parallel with a HHFA to ascertain the quality of self-reported routine data submitted by facilities through the RHIS. The WHO Data Quality Assurance (DQA) toolkit⁹ provides tools to verify the quality of routinely reported data for selected key indicators and quantifies problems of data completeness, timeliness, accuracy and consistency. The DQA uses a methodology that is different from that of the HHFA and requires designated data collectors that have received specific training in use of the DQA tools.

3.3 HHFA questions and questionnaires

The HHFA aims to collect data that are comparable over time, within countries (across regions/provinces and/or districts), and across countries. To achieve this, a standardized set of HHFA questions was developed, consisting of core and additional questions. Typically, a country adopts the set of core questions, with some adaptations related to certain country-specific elements (e.g., types of facilities, managing authorities of facilities, staffing categories, national guidelines for services, national policies for medicines). Additional questions on selected topics may be included based on country priorities. The questions are organized into various questionnaires, based on the relevant module, the use of core and additional questions, and the data collection method required. **Figure 5** shows the questionnaires available within each module, as well as the combined questionnaire that includes the facility audit questions of the Availability, Readiness, and Management and finance modules.

Figure 5. HHFA modules and questionnaires

Module 1 Service availability	Module 2 Service readiness	Module 3 Quality of care	Module 4 Management and finance
<ul style="list-style-type: none"> Facility characteristics Staff Beds Diagnostics Availability of specific services 	Capacity to provide specific services according to defined standards: <ul style="list-style-type: none"> Guidelines, trained staff, equipment, commodities Systems to support quality and safety Provider competency 	<ul style="list-style-type: none"> Adherence to standards in patient care process Patient experience 	Practices to support continuous service availability and quality: <ul style="list-style-type: none"> Management Finance Quality assurance Health worker absenteeism
Questionnaires	Questionnaires	Questionnaires	Questionnaires
<ul style="list-style-type: none"> Availability: Core 	<ul style="list-style-type: none"> Readiness: Core 	<ul style="list-style-type: none"> Quality of care: Additional/Supplementary - Record review* 	<ul style="list-style-type: none"> Management and Finance: Core
<ul style="list-style-type: none"> Availability: Core+Additional 	<ul style="list-style-type: none"> Readiness: Additional/Supplementary - Provider competency† 	<ul style="list-style-type: none"> Quality of care: Additional/Supplementary - Patient experience† 	<ul style="list-style-type: none"> Management and Finance: Core+Additional
<ul style="list-style-type: none"> Availability: Additional/Supplementary - Building structure 			<ul style="list-style-type: none"> Management and Finance: Additional/Supplementary - Health worker absenteeism†
Combined questionnaire			
*Available 2022 †Future development			

⁹Data quality review: a toolkit for facility data quality assessment. Module 3: Data verification and system assessment. Geneva: World Health Organization; 2017. (<https://www.who.int/data/data-collection-tools/health-service-data/data-quality-assurance-dqa?ua=1>)

3.3.1 Understanding the questionnaires

The HHFA questionnaires are provided in two formats: stand-alone and combined.

Stand-alone questionnaires

Each of the four HHFA modules contains a set of stand-alone questionnaires that may be designated as “Core”, “Core+Additional” and/or “Supplementary”.

- A **Core** questionnaire contains only core questions.
- A **Core+Additional** questionnaire contains both core and additional questions.
- A **Supplementary** questionnaire does not include questions from other HHFA questionnaires. Along with the “Supplementary” designation, it is also designated “Core” or “Additional” based on the questions included, and may collect data through a different modality from the other questionnaires (e.g., record review, clinical vignette, client interview).

Combined questionnaire

- The **Combined Core** questionnaire contains ALL core questions from the three modules that require a facility audit methodology (Availability, Readiness, and Management and finance). Questions from the Supplementary questionnaires are not included.

Each questionnaire can be downloaded separately. The questionnaires are also programmed into the CPro electronic data collection tool.

Question labels

Within a questionnaire, each question has a unique number assigned to it. Each question also has a label specifying the module to which it belongs (A, R, Q or M) and its designation as Core or Additional (C or A). A further label (“S”) is included for questions in Supplementary questionnaires. The unique three-letter identification (ID) code(s) of the indicator(s) to which the question is linked, is also included in the question label. A single question may be linked to multiple indicators. **Table 2** shows the various question labels related to the module and the Core, Additional and Supplementary designations. **Figure 6** provides an example of a question and its labels as seen in a questionnaire.

Table 2. HHFA question labels showing module and questionnaire type

Label	Label meaning
A_C	Availability Core
A_A	Availability Additional
A_AS	Availability Additional / Supplementary
R_C	Readiness Core
R_CS	Readiness Core / Supplementary
Q_AS	Quality Additional / Supplementary
M_C	Management Core
M_A	Management Additional
M_AS	Management Additional / Supplementary
ALL	Question used in all modules
A_C, R_C	Availability Core, Readiness Core (question used in both Availability and Readiness modules)
R_C, M_C	Readiness Core, Management Core (question used in both Readiness and Management modules)

3. HHFA OVERVIEW

Figure 6. HHFA question showing question number and indicator labels

Module: Readiness				
Core question	Mod/Ind	No.	Question	Result
	R_C / APS, APT, APU, AQJ, NBL, NBM	2601	ASK TO SEE THE PLACE USED BY THE FACILITY FOR DISPOSAL OF SHARP WASTE AND INDICATE THE CONDITION OBSERVED. IF SHARP WASTE IS DISPOSED OFFSITE, OBSERVE THE SITE WHERE WASTE IS STORED PRIOR TO COLLECTION FOR OFFSITE DISPOSAL.	NO WASTE VISIBLE 1 WASTE VISIBLE BUT PROTECTED AREA 2 WASTE VISIBLE, NOT PROTECTED 3 WASTE SITE NOT INSPECTED..... 4

Unique indicator IDs Question number

In this example, there are six indicators linked to question 2601. The unique indicator IDs can be used to locate the indicators in the indicator inventory platform described in Section 3.5.

3.3.2 The Stand-alone questionnaires

Questionnaires
• Availability: Core
• Availability: Core+Additional
• Availability: Additional/Supplementary - Building structure

Module 1: Service availability

Module 1 includes a Core Availability questionnaire and a Core+Additional Availability questionnaire.

An Additional/Supplementary questionnaire is available for a detailed assessment of the condition of facility building structure.

Questionnaires
• Readiness: Core
• Readiness: Additional/Supplementary - Provider competency

Module 2: Service Readiness

Module 2 has an extensive Core Readiness questionnaire that assesses the basic prerequisites for service delivery in the facility as a whole, as well as the specific pre-requisites needed to provide specific services.

An Additional/Supplementary questionnaire to assess provider competency will be developed in the future.

Questionnaires
• Quality of care: Additional/Supplementary - Record review*
• Quality of care: Additional/Supplementary - Client experient

Module 3: Quality of care

An Additional/Supplementary questionnaire uses a record review methodology to assess patient care processes in a sample of individual patient records. A second Additional/Supplementary questionnaire, to be developed in the future, will use client interviews to assess client experiences of care. Module 3 does not contain any facility audit questions. Questions related to systems and commodities that support quality of care are integrated within the readiness and management and finance modules.

Questionnaires
• Management and Finance: Core
• Management and Finance: Core+Additional
• Management and Finance: Additional/Supplementary -Health worker absenteeism†

Module 4: Management and finance

Module 4 includes both a Core questionnaire as well as a Core+Additional questionnaire.

A Supplementary questionnaire containing additional questions will be made available in the future to assess health worker absenteeism.

3.3.3 The Combined questionnaire

Combined questionnaire

The Combined Core questionnaire contains all the questions from all three core questionnaires that use a facility audit data collection methodology (Availability, Readiness, and Management and finance). This is the “**master**” questionnaire. It is designed to ensure that, for a specific programme or technical area within a facility, the relevant data from across the various modules are collected in a coherent way. In addition, questions that may be duplicated across modules have been removed to achieve a streamlined, integrated questionnaire. From this “master” version, **various iterations of the Combined questionnaire can be generated**, according to country needs. For example, a country may want to implement the Core questions of the Availability, Readiness, and Management and finance modules, or only the Core questions of the Availability and Readiness modules.

If a country plans to implement a different combination of modules, the Combined questionnaire should be used as a starting point and adapted by removing the modules that are not applicable.

It is not recommended that a country implements all the core and additional questions during a single survey, as the questionnaire would be excessively long. It is recommended that countries implement the core and additional questions for only one module at a time, using the relevant Stand-alone Core+Additional questionnaire. However, countries implementing the Combined Core questionnaire may wish to review the additional questions in the stand-alone questionnaires and incorporate selected additional questionnaire into the Core Combined questionnaire as needed.

3.4 HHFA CSPro electronic data collection tool

The use of electronic data collection devices for field surveys has increased in popularity as a result of decreasing costs, increasing computational and functional capacity, and user-friendliness. Electronic data collection has many advantages. Data validation procedures, including skip patterns, range controls, standardized responses and mandatory question responses, can be programmed into an electronic device to facilitate the collection of accurate and reliable data. Furthermore, automatic progression of the questionnaire and standardized responses make it easy and relatively quick for interviewers to administer the survey. As the size and scope of a survey increases, so also do the benefits of electronic data collection. Large volumes of data are subject to the risk of increased data collection errors. Such errors can be minimized through the use of electronic data collection devices, in addition to the substantial time saved in data collection, data entry, data cleaning, data integration, and data dissemination.

For the HHFA, electronic data collection is carried out using the Census and Survey Processing System (CSPro) software. CSPro is a software package for entry, editing, tabulation, and dissemination of census and survey data. It is developed and maintained by the United States Census Bureau and partners. CSPro is available at no cost, may be distributed freely, and is available for download at: <https://www.census.gov/data/software/cspro.Download.html>

3. HHFA OVERVIEW

The HHFA CPro data collection tool is a **standard CPro application** that has been developed for the HHFA and contains the HHFA questionnaires. The HHFA application for data collection runs on any Android device (recommended), on a Windows 8 touch screen tablet or on a Windows laptop computer. The tool can be downloaded at: <https://csprowhfa.online/>

Key features of the HHFA CPro electronic data collection tool:

The HHFA CPro electronic data collection system has been designed to provide a robust mobile electronic data entry application with flexibility to enable country adaptation and mechanisms for collecting data in the field. Key features of the HHFA CPro data collection system include:

- the ability to establish survey parameters that enable selection of modules and questionnaires for implementation, with automated turning on or off of questions accordingly;
- simplified processes for loading facility sample, staff listing and administrative levels;
- a QR code for set-up of tablets;
- assignment of questionnaire sections to data collectors: this allows multiple data collectors to collect data for the same facility at the same time and provides them with additional flexibility in how they complete the questionnaire;
- merging of facility data from multiple data collectors at the team leader level and report generation to determine facility data completeness;
- data synchronization via Dropbox or CSWeb;
- when data collection is complete, the data are exported from the HHFA CPro application and can be transferred to the HHFA data analysis platform for indicator generation and analysis, or to a different statistical programme of choice.

The **HHFA Data manager guide** provides detailed information on adaptation of the HHFA CPro tool to the country context and its use for survey implementation.

3.5 HHFA indicators and indicator inventory

Any data collected through a health facility survey should be indicator-driven, with all questions linked to clearly defined indicators. HHFA indicators are designated as either Core or Additional and are derived from Core or Additional questions respectively. Core indicators represent key services, items and/or attributes needed to deliver services at agreed-upon standards. Additional indicators provide in-depth information on specific topics, according to country needs.

3.5.1 HHFA indicator types and tables

Most HHFA indicators are expressed as percentages. Indices (also called summary or composite indicators) are used to summarize and communicate information about multiple related indicators. **Table 3** describes the indicator types used in the HHFA. The calculation of HHFA indicators and indices is described in **Annex 1**. All HHFA indicators and indices are calculated automatically when HHFA data are uploaded into the HHFA data analysis platform, as described in section 3.6.

Table 3. HHFA indicator types

Indicator type	HHFA definition and description
Count	<p>Total NUMBER of ITEMS</p> <p>e.g., Number of maternity beds</p>
Median	<p>Median NUMBER of ITEMS</p> <p>In a set of values ordered from lowest to highest, the median is the value located at the midpoint of the set, with an equal number of values both above it and below it.</p> <p>e.g., Median number of available inpatient beds among facilities offering inpatient services</p>
Ratio	<p>NUMBER of ITEMS per population</p> <p>A ratio describes the relationship of the numerator to the denominator, where the numerator is not included in the denominator.</p> <p>The HHFA uses ratios for indicators of density of facility infrastructure and health workforce.</p> <p>e.g., Number of health facilities per 10 000 population Number of midwives per 10 000 population</p> <p>Density indicators can only be calculated using HHFA data if a census of all facilities has been conducted.</p>
Proportion	<p>A proportion describes the relationship of the numerator to the denominator, where the numerator is included in the denominator. A percentage is a type of proportion, where the denominator = 100.</p> <p>PERCENTAGE of facilities with an available CONDITION or PERCENTAGE of facilities with an available CONDITION among facilities offering service X</p> <p>“Condition” may be a service, an item, a system or evidence of the implementation of a requirement.</p> <p>Most HHFA indicators are percentages, where the denominator is one of two options:</p> <ul style="list-style-type: none"> • Denominator = All facilities (Indicators with this denominator usually describe availability.) e.g., Percentage of facilities offering facility planning services • Denominator = Facilities offering a specific service (Indicators with this denominator usually describe readiness.) e.g., Percentage of facilities offering family planning services with blood pressure apparatus
Mean	<p>An arithmetic mean is the average of a set of values (the sum of the set of values divided by the number of values in the set).</p> <p>The HHFA uses arithmetic means in two ways:</p> <ul style="list-style-type: none"> • To express the average of a set of indicators e.g., Mean percentage of family planning items available among facilities offering family planning services • To express the average of a set of values within a single indicator e.g., Among facilities offering outpatient services, availability of services by mean number of days per week <p>Most means in the HHFA are used to express the average of a set of indicators within a table, usually a readiness table. The mean provides the average percentage of items in the table that</p>

3. HHFA OVERVIEW

	are available among the facilities included in the denominator. In the HHFA, a mean used in this way is also called an index. (This is an unweighted index).
Index	<p>An index is summary or composite indicator that is used to summarize and communicate information about a selected group of indicators. Indices can help to provide an overall view of a situation by summarizing multiple pieces of information. In the HHFA, indices are useful for assessing changes over time or comparing subnational areas. However, indices also have limitations. If only presented with an index, it is difficult to understand the individual factors contributing to the index score; therefore, it is important to present information on the individual indicators within the index, in addition to the index score.</p> <p>The HHFA indicators include two types of indices:</p> <ul style="list-style-type: none"> ● An index that is a mean: <ul style="list-style-type: none"> – The mean of all the indicators in a table - the table index or score. e.g., Basic equipment in the main service area of the facility: mean percentage of items at facilities e.g., Family planning service readiness: mean percentage of all items at facilities – The mean of a sub-set (or domain) of indicators within a service-specific readiness table - the domain index or score. e.g., Family planning service readiness: mean percentage of medicines and commodities items at facilities – The mean of the scores of a number of tables - these are called “special tables” and require a more complex calculation. e.g., the general service availability index and the general service readiness index – Means within the clinical quality of care dimension (Refer to Section 3.5.5.) ● An index that is an “all” indicator: <ul style="list-style-type: none"> – Each service readiness table (and selected other tables) includes an “all” indicator, which describes the percentage of facilities that have available all the items in the table. e.g., Family planning service readiness: percentage of facilities with all items

HHFA indicator tables

All the indicators in a single table have the same denominator. For most tables, the denominator is either all the facilities surveyed, or all facilities offering service X. (Density indicator tables are an exception as they use population estimates as denominators.) In service-specific readiness tables, indicators are grouped into four domains, with a mean calculated for each domain. The mean of all the indicators in the readiness table is the readiness index (or score).

In the HHFA indicator inventory, the general service readiness and service-specific readiness dimensions contain tables with “auxiliary indicators”. These are indicators that are not part of a readiness index but are presented as supplementary information. Means are not calculated for auxiliary indicator tables.

3.5.4 HHFA indicator inventory

The HHFA indicators can be viewed in an online indicator inventory platform, accessible through the WHO HHFA webpages: <https://indicator-inventory.hhfa.online/>. An “instructions” tab in the platform provides explanations and short videos on how to use the platform.

The indicator inventory platform is easy to use and provides a quick way to gain an overview of the HHFA content, as well as providing detailed information on each indicator. Countries planning a HHFA

should firstly review the indicator inventory to identify the indicators they need, then select the relevant questionnaires and questions.

The platform displays all the HHFA indicators. Filter options are available to search for indicators. The complete indicator inventory can be downloaded from the platform as an Excel document. Users can also download a selection of indicators or a selection of data fields. An indicator tabulation plan can be generated from the indicator platform in pdf format, showing how the indicators should be tabulated and organized in the HHFA report.

The indicator inventory provides two views of the indicators: a “listing” view and a “tabulation” view. The “listing” view shows a simple list of the indicators. The “tabulation” view shows a “nested” list that groups the indicators according to the following hierarchy:

Service dimension → Service area → Service sub-area → Table → Indicators

There are five service dimensions that broadly correspond to the four HHFA modules:

- Dimension 1 - General service availability.
- Dimension 2 - General service readiness.
- Dimension 3 - Service-specific availability and readiness.
- Dimension 4 - Clinical quality of care.
- Dimension 5 - Management and finance support systems.

This system of indicator organization is also used in the HHFA data analysis platform and provides the structure for the HHFA report.

Figure 7 shows a screenshot of part of the indicator platform, illustrating the indicator organization. Clicking on a dimension will display the areas within the dimension. Clicking on an area will display sub-areas, clicking on a sub-area will display tables, and clicking on a table will display all the indicators in the table.

Figure 7. Indicator organization in HHFA indicator inventory platform

Dimension 1. General service availability
Dimension 2. General service readiness
Dimension 3. Service-specific availability and readiness
Area 3.1. Reproductive, maternal, newborn, child, and adolescent health
Area 3.2. Communicable diseases
Area 3.3. Noncommunicable diseases
Sub-Area 3.3.1. Cardiovascular disease
Table 3.3.1.1. Cardiovascular disease service availability
Indicator 3.3.1.1.1. Percentage of facilities offering any services for cardiovascular disease
Indicator 3.3.1.1.2. Percentage of facilities offering diagnosis and treatment of hypertension

Clicking on an individual indicator will display detailed metadata describing the indicator, as shown in **Figure 8**. This includes the indicator’s permanent, unique three-letter ID code (described in section 3.3.1) as well as information on the survey questions and code needed to calculate the indicator.

Figure 8. Example of indicator metadata as displayed in the HHFA indicator inventory platform

Percentage of facilities offering CVD services with blood pressure apparatus ✕

Permanent ID	BUN	
Dimension	3.	Service-specific availability and readiness
Area	3.3.	Noncommunicable diseases
Sub-Area	3.3.1.	Cardiovascular disease
Table	3.3.1.2.	Cardiovascular disease service readiness
Indicator	3.3.1.2.3.	Percentage of facilities offering CVD services with blood pressure apparatus

Modules

→ Readiness: Core

Domain

Equipment

Attributes

- ✓ SARA indicator
- ✓ PHC indicator

Numerator calculation code

Q6522A_2==1 & Q6522B_2==1

Q6522A_2 Eqmt in OPD, available: BP apparatus
Q6522B_2 Eqmt in OPD, functioning: BP apparatus

Denominator

Among facilities offering a service

Denominator calculation code

Q7100==1

Q7100 Do providers diagnose and/or manage cardiovascular diseases (CVDs)

Notes on indicator definition

Digital BP machine or manual sphygmomanometer with stethoscope

Notes on data collection

Observed and functional in service site

3.5.5 Understanding the HHFA service dimensions and indices

DIMENSION 1 - GENERAL SERVICE AVAILABILITY

This dimension refers to the physical presence of facility infrastructure, staff, and specific services. General service availability is summarized by an index using tracer indicators from health infrastructure and health workforce.

Service areas

- Health infrastructure
- Health workforce
- Services available
- Index scores

- **Health infrastructure:** contains facility density indicators and information on beds, building structure conditions, and accessibility for persons with mobility limitations.
- **Health workforce:** contains core health workforce density indicators as well as tables of additional density indicators for a detailed set of workforce cadres.
- **Services available:** contains information on general outpatient and inpatient services offered, specific services offered, and medical technologies available. (These indicators can also be included in Dimension 3. If a country implements the Availability module but not the Readiness module, the HHFA report produced by the data analysis platform will contain the Services available indicators as part of the General service availability section of the report. However, if both Availability and Readiness modules are implemented, the Services available indicators are integrated into the Service-specific availability and readiness section of the report.)

- **General service availability index:** An availability score is produced for health infrastructure and also for health workforce. Each score is a percentage that is determined by comparing the indicator value with a defined target. The mean of the two scores will produce the general service availability index. The density indicators and calculation methods of the availability indices are described in **Annex 1**.

NOTE: The availability indices use density indicators that require population estimates as denominators. Therefore, **these indices can only be calculated when the survey has involved a census of all facilities (public and private) in the country** OR if the total numbers of facilities, beds and human resources in the country can be obtained from other data sources, e.g., an updated MFL and health workforce accounts. If other data sources are used, the indices cannot be calculated through the HHFA data analysis platform and must be calculated separately. Reliable estimation of these indicators requires reliable population estimates.

DIMENSION 2 – GENERAL SERVICE READINESS

General service readiness refers to the overall capacity of facilities to provide basic, general health services, based on the availability and functionality of elements needed for providing the services. An index is generated for each of the five service areas, based on the number of elements present. An overall general readiness index is calculated based on the mean of the five service areas.

Service areas

- Basic amenities
- Basic equipment
- Standard precautions for infection prevention
- Basic diagnostic capacity (laboratory)
- Essential medicines
- General service readiness index

- **Basic amenities:** describes the availability of: power; improved water source; auditory and visual privacy for consultations; improved sanitation facilities; communications system; computer with internet; and emergency transportation system for patients.
- **Basic equipment:** describes the availability of: adult scale; child scale; infant scale; measuring tape; height board; thermometer; stethoscope; blood pressure apparatus; examination light; otoscope; ophthalmoscope; and pulse oximeter.
- **Standard precautions for infection prevention:** describes the availability of: key items needed for infection prevention and control. Refer to **Annex 1** for a detailed list of items. Auxiliary indicators provide information on personal protective equipment.
- **Basic diagnostic capacity (laboratory):** describes the availability of: haemoglobin testing; blood glucose testing; urine dipstick glucose testing; urine dipstick protein testing; urine dipstick ketones testing; urine test for pregnancy; malaria diagnostic testing; HIV diagnostic testing; syphilis rapid diagnostic testing.
- **Essential medicines:** describes the availability of a set of general essential medicines that corresponds to the basket of essential medicines for primary health care (PHC) related to SDG 3.8.1. Refer to **Annex 1** for a detailed list of medicines.
- **General service readiness index:** Each of the five service areas contains a table of indicators representing the availability of basic items. A mean is calculated for each table to provide the readiness index for each service area. This readiness index is the mean percentage of items available among all facilities. An “all” indicator is also provided for each service area table, indicating the percentage of facilities that have available all the items in the table. In addition, an overall general service readiness index is calculated as the mean of the five service area readiness indices. Calculation of the readiness indices is described in **Annex 1**.

DIMENSION 3 – SERVICE-SPECIFIC AVAILABILITY AND READINESS

This dimension describes whether health facilities offer a specific service and their capacities to provide that service based on the availability and functionality of tracer items in four domains: trained staff and guidelines, equipment, diagnostic capacity, and medicines and commodities.

Service areas

- Reproductive, maternal, newborn, child, and adolescent health
- Communicable diseases
- Noncommunicable diseases
- Surgical services
- Emergency services
- Palliative and rehabilitative care

Each service area contains one or more **service sub-areas** that represent a programme or a programme component. Each service sub-area contains one or more of the following types of **tables** of indicators:

- **Service-specific availability table:** shows the availability of the specific service or service component among all facilities surveyed. The denominator is all facilities.
- **Service-specific readiness table:** contains indicators for a set of items considered essential for the provision of quality care for the specific service. The denominator is the number of facilities offering the specific service. The items are grouped into the four domains: staff and guidelines; equipment; diagnostics; and medicines and commodities. A mean is calculated for each of the four domains and the mean of all the indicators in the readiness table provides the overall readiness index (or score) for the service. An “all” indicator is also produced for readiness tables, indicating the percentage of facilities that have available all the items in the table. **Annex 1** describes the calculation of the indices.
- **Auxiliary indicator tables:** There may be one or more auxiliary tables containing further indicators relevant to the programme. The denominator is the number of facilities offering the specific service. Indices are not calculated for auxiliary indicator tables.

Figure 9 shows the availability, readiness and auxiliary indicator tables for family planning services.

Figure 9. Tables for family planning service availability, readiness and auxiliary indicators

<p>Dimension 3. Service-specific availability and readiness</p> <p>Area 3.1. Reproductive, maternal, newborn, child, and adolescent health</p> <p>Sub-Area 3.1.1. Family planning</p> <p>Table 3.1.1.1. Family planning service availability</p> <p>Table 3.1.1.2. Family planning service readiness</p> <p>Table 3.1.1.3. Family planning auxiliary indicators</p>

Figure 10 shows the indicators in the malaria readiness table, including the score for each domain, the readiness index for the service, and the “all” indicator.

Figure 10. Malaria service readiness table

Table 3.2.1.2. Malaria service readiness	
Indicator 3.2.1.2.1.	Percentage of facilities offering malaria services with guidelines for diagnosis and treatment of malaria
Indicator 3.2.1.2.2.	Percentage of facilities offering malaria services with guidelines for IPTp
Indicator 3.2.1.2.3.	Percentage of facilities offering malaria services with staff trained in malaria diagnosis and treatment
Indicator 3.2.1.2.4.	Percentage of facilities offering malaria services with staff trained in IPTp
Indicator 3.2.1.2.5.	Percentage of facilities offering malaria services with malaria diagnostic capacity
Indicator 3.2.1.2.6.	Percentage of facilities offering malaria services with first-line antimalarials
Indicator 3.2.1.2.7.	Percentage of facilities offering malaria services with paracetamol capsule/tablet
Indicator 3.2.1.2.8.	Percentage of facilities offering malaria services with sulphadoxine-pyrimethamine (SP)
Indicator 3.2.1.2.9.	Percentage of facilities offering malaria services with ITN or vouchers for ITN
Indicator 3.2.1.2.10.	Malaria service readiness: mean percentage of staff and guidelines items at facilities
Indicator 3.2.1.2.11.	Malaria service readiness: mean percentage of diagnostics items at facilities
Indicator 3.2.1.2.12.	Malaria service readiness: mean percentage of medicines and commodities items at facilities
Indicator 3.2.1.2.13.	Malaria service readiness: mean percentage of all items at facilities ← Index: Service readiness
Indicator 3.2.1.2.14.	Malaria service readiness: percentage of facilities with all items ← Index: "All" indicator

DIMENSION 4 – CLINICAL QUALITY OF CARE

This dimension describes the provider’s adherence to standards in the patient care process, as documented in individual patient records. Clinical quality of care indicators are available for each of six¹⁰ service areas: antenatal care, HIV testing and counselling, antiretroviral therapy (ART), preventing mother-to-child transmission of HIV (PMTCT), malaria, and tuberculosis (TB).

Service areas

- Antenatal care
- HIV testing and counselling
- Antiretroviral therapy
- Preventing mother-to-child transmission of HIV
- Malaria
- Tuberculosis

The clinical quality of care dimension is different from the other dimensions in that the data are not collected through the HHFA facility audit methodology, but through a separate record review methodology, using a sample of individual patient/client records per service area. (Refer to section 4.4.2, the HHFA record review questionnaire, and the training materials for further details on the sampling process.)

For each service area, there are indicators representing various steps in the care process that can be used to inform quality improvement strategies. An index is also calculated for each individual patient to represent the complete care process (comprised of a package of assessment, diagnosis, and treatment). This enables assessment of the quality of a complete service, as well as the individual components of the care process. Finally, a facility average score or index is calculated for each service, based on the mean of the five individual patient indices. The record review analysis is based on the facility-level index, and not on the individual patient indices.

The clinical quality of care indicators were developed in collaboration with subject-matter experts and aligned with standards of care for each service area. Countries may need to adapt the indicators to

¹⁰ Record review questionnaires and indicators will be developed for additional service areas in the future.

3. HHFA OVERVIEW

ensure they align with the service packages used in the country. However, efforts should be made to maintain the standard HHFA indicator definitions and calculations, to facilitate interpretability of results as well as comparisons over time and across countries. If necessary, country-specific additional indicators can be added, rather than substantially modifying the standard HHFA indicators.

The sampling method for the HHFA record review was developed to provide a picture of the routine care process for a specific condition or service at the facility level. Analysis is carried out using the facility as the unit of measure¹¹. When using the facility as the unit of measure, facility averages for results are calculated, and subnational or national results represent the averages across facilities. The results are weighted so that the facility results are representative of the facility distribution in a country. (This weighting method is also used for the facility audit part of the HHFA.) This ensures that the practices in facilities with smaller caseloads (often remote and less-supervised facilities) are proportionally represented - an important consideration when working to ensure equitable access to quality services. Using the facility as the unit of measure may also provide information that helps to identify management and supervision related issues that are present across the service.

If a record review has been conducted in conjunction with a HHFA facility audit that measures service availability and readiness (i.e., Are trained staff, guidelines, essential equipment and commodities for the service available?), efforts should be made to combine the findings from both assessments to provide a more in-depth, meaningful analysis. If the record review reveals that certain processes have not been conducted (as evidenced by lack of recording in the patient record), it is important to know whether the items required to conduct the processes were available or not. For example, failure to conduct a malaria blood test may be the result of a provider not following protocols, but also may occur because the test is not available in the facility. Combining service availability, service readiness, and technical care process data provides a unique opportunity to deepen understanding of the challenges and potential intervention points for improving health service quality.

DIMENSION 5 – MANAGEMENT AND FINANCE SUPPORT SYSTEMS

This dimension describes the presence and implementation of facility-level systems and processes that support the continuous availability and quality of facility services. Indices are not calculated for this dimension.

Service areas:

- Facility governance and management
- Facility finances and accounting
- Systems to support staff
- Systems for staff and patient safety
- Quality monitoring systems
- Health information systems

- **Facility governance and management:** includes: facility management committees; various support services for routine facility functioning (e.g., staff transport, food services, laundry); and maintenance systems.
- **Facility finances and accounting:** includes: budgets; user fees (if relevant); and accountability systems.

¹¹ The HHFA uses the facility as the unit of measure (rather than the individual patient/client) for the following reasons: 1) Individual level analysis provides information on the quality of care received by the majority of patients/clients, but may mask issues in low volume facilities which are often isolated or under-resourced facilities; 2) Individual level analysis requires data on facility caseloads which would require a level of time and effort not feasible in the context of the HHFA; and 3) The HHFA aims to evaluate the care process and not individual service providers, as the care process is frequently influenced by factors other than provider expertise, such as availability of specific tools or commodities to provide a service and by service expectations of supervisors at facility or higher level. However, as a future development, WHO will also explore options for using the individual as the unit of analysis for an in-depth assessment.

- **Systems to support staff:** includes: staff credentials; supervision; training; well-being; and benefits.
- **Systems for staff and patient safety:** includes systems for: infection prevention and control; cleaning; and emergency preparedness.
- **Quality monitoring systems:** includes: quality assurance systems; and quality monitoring systems for inpatient care, prescribing, adverse reactions to medicines, immunization services, infection prevention and control, and laboratory services.
- **Health information systems:** includes: information management systems; unique identifiers; patient record systems; referral record systems; and systems for facility statistics.

3.6 HHFA data analysis platform

The HHFA data analysis platform is an online web application that can be used to undertake all the analysis required to produce a HHFA report. A country team can work collaboratively on the analysis of a HHFA dataset and report.

The platform can be accessed at <https://analysis-platform.hhfa.online>. Anyone with a WHO email address (@who.int), or who has already been given guest access to the WHO sign-in system, can access the platform by simply navigating to the website and clicking “Sign in”. Country team members who do not already have WHO guest access should contact the HHFA coordination team at hhfa@who.int to be given access. The coordination team will send an invitation to the team members which will grant them access to the platform through the WHO single sign-in system (Microsoft SSO). Once an invitation has been accepted and access has been granted, users can navigate to the website and click “Sign in” to start using the analysis platform.

The data analysis platform is designed to make it as easy and quick as possible to analyse a HHFA dataset. In an ideal scenario, a team uploads a cleaned dataset (cleaning has been done in CSpPro), configures a minimal set of options, runs all the analyses required to produce the default indicators, and generates a template report in Word (and PDF) within one or two hours. A dataset that has been collected using the official standard HHFA CSpPro package, and has been vetted and cleaned, should not require significant configuration on the platform. A dataset collected using a customized tool, or with renamed questions or variables, will require some additional configuration and extra time.

The platform runs fully online and does not require software to be downloaded or installed. The user can simply navigate to the website and start to use the tool.

Also, the platform does not require users to be familiar with any statistical software (R, Stata, SPSS, SAS, etc.). However, users will need a foundational understanding of descriptive statistics to be able to interpret and interrogate the platform’s analytical outputs, and to configure any required custom indicators.

3.6.1 How the HHFA data analysis platform works

The platform works by running analysis scripts that are auto-generated from indicator-specific code in the HHFA indicator inventory, and from information that the platform infers from the uploaded dataset. Using the pre-established code for each indicator’s numerator and denominator, and the list of questions and variables in the dataset, the platform internally creates an analysis script to produce individual tables and figures. These scripts are then run on the dataset, and the outputs are presented to the user in the form of tables and graphs. The basic process for using HHFA analysis platform is described in Box 2.

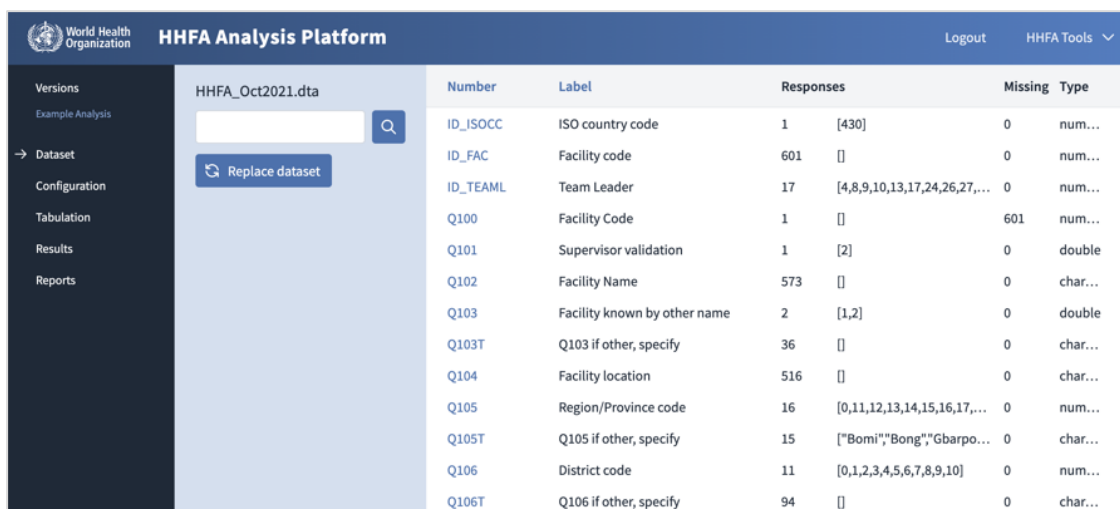
Box 2. How to use the data analysis platform

1. Login to the platform and create a “version” of the report that the team aims to prepare.
2. Upload a cleaned dataset.
3. View the dataset (e.g. **Figure 11**), checking that all variables exist as expected, and remap any variables that have different names to those used in the HHFA indicator inventory.
4. Choose the variables that you want to use as “stratifiers”, e.g. for Administrative region, Managing authority, urban/rural, Facility type (e.g. **Figure 12**). SHOULD CAPITALS for each term agree?
5. If the dataset represents a census, enter information on population numbers, to enable the platform to calculate density indicators.
6. Import the set of indicators (from the HHFA indicator inventory) that you want to calculate for your analysis and report, and that are appropriate for your dataset (depending on the core/additional modules that were used for data collection).
7. Add, remove, or customize indicators as needed (e.g. **Figure 13**).
8. “Run all” tables, or individually click “Run” for each table. Check that each table has run successfully and has been produced. You will be able to see the table on the screen and produce related charts and figures (e.g. **Figure 14 & 15**).
9. Once all tables have been produced, you have the option to generate a Word document,

For users who may want more control over the statistical analyses, there are options to view and check the indicator code and the underlying scripts, and to download the intermediate outputs that get created as part of the analyses (for example, indicators calculated at facility-level, before aggregation).

All the code for indicator calculation can be seen and edited within the platform. Users are encouraged to interrogate this code and ensure that it aligns with their dataset. Users are also able to download the auto-generated analysis scripts and run them offline, outside of the platform, using R or Stata.

Figure 11. Viewing the uploaded dataset



Number	Label	Responses	Missing	Type
ID_ISOCC	ISO country code	1 [430]	0	num...
ID_FAC	Facility code	601 []	0	num...
ID_TEAML	Team Leader	17 [4,8,9,10,13,17,24,26,27,...]	0	num...
Q100	Facility Code	1 []	601	num...
Q101	Supervisor validation	1 [2]	0	double
Q102	Facility Name	573 []	0	char...
Q103	Facility known by other name	2 [1,2]	0	double
Q103T	Q103 if other, specify	36 []	0	char...
Q104	Facility location	516 []	0	char...
Q105	Region/Province code	16 [0,11,12,13,14,15,16,17,...]	0	num...
Q105T	Q105 if other, specify	15 ["Bomi","Bong","Gbarpo...]	0	char...
Q106	District code	11 [0,1,2,3,4,5,6,7,8,9,10]	0	num...
Q106T	Q106 if other, specify	94 []	0	char...

Figure 12. Configure stratifier variables

The screenshot shows the 'HHFA Analysis Platform' interface. On the left is a navigation menu with options: Versions, Example Analysis, Dataset, Configuration (selected), Tabulation, Results, and Reports. The main content area is titled 'Stratifiers' and contains two sections:

- Q117:** A table with columns 'Value' and 'Value label'. It lists 'Urban/rural' with values 1 (Urban), 2 (Rural), and 3 (Urban). Below the table is a link 'Use populations for this stratifier' with a close icon.
- Q113:** A table with columns 'Value' and 'Value label'. It lists 'Facility type' with values 1 (Hospital), 2 (Health centre), 3 (Clinic), and 96 (Other). Below the table is a link 'Use populations for this stratifier' with a close icon.

Below the stratifiers, there is a 'Population totals' section:

National population	5,000,000
National pregnant women	100,000

At the bottom, there is a 'Variable for Facility ID' section with the value 'ID_FAC'.

Figure 13. Customize indicators

The screenshot shows a hierarchical tree structure for customizing indicators. Each level has a '+ New [level]' button. The structure is as follows:

- Dimensions:**
 - 1. General service availability
 - 2. General service readiness (highlighted)
 - 3. Service-specific availability and readiness
 - 4. Management and finance support systems
 - 5. Clinical quality of care
- Areas:**
 - 1. Basic amenities (highlighted)
 - 2. Basic equipment
 - 3. Standard precautions for infection prevention
 - 4. Basic diagnostic capacity (laboratory)
 - 5. Essential medicines and commodities
 - 6. General service readiness index
- Sub-areas:**
 - 1. Basic amenities for main service area of facility (highlighted)
 - 2. Basic water, sanitation, hygiene, health care waste management, and environmental cleaning [JMP indicators]
- Tables:**
 - 1. Basic amenities for main service area of facility (highlighted). A tooltip is visible: 'Table type: BINARY values for PROPORTION indicator. Denom: Among all facilities. Prefix: Percentage of facilities with. Index indicators: Yes. Use domains: No.'
- Indicators:**
 - 1. power
 - 2. an improved water source
 - 3. access to improved sanitation facilities for clients
 - 4. auditory and visual privacy for patient consultations
 - 5. communications system
 - 6. computer with internet
 - 7. emergency transportation system for patients

3. HHFA OVERVIEW

Figure 14. “Run” individual table analyses to see outputs

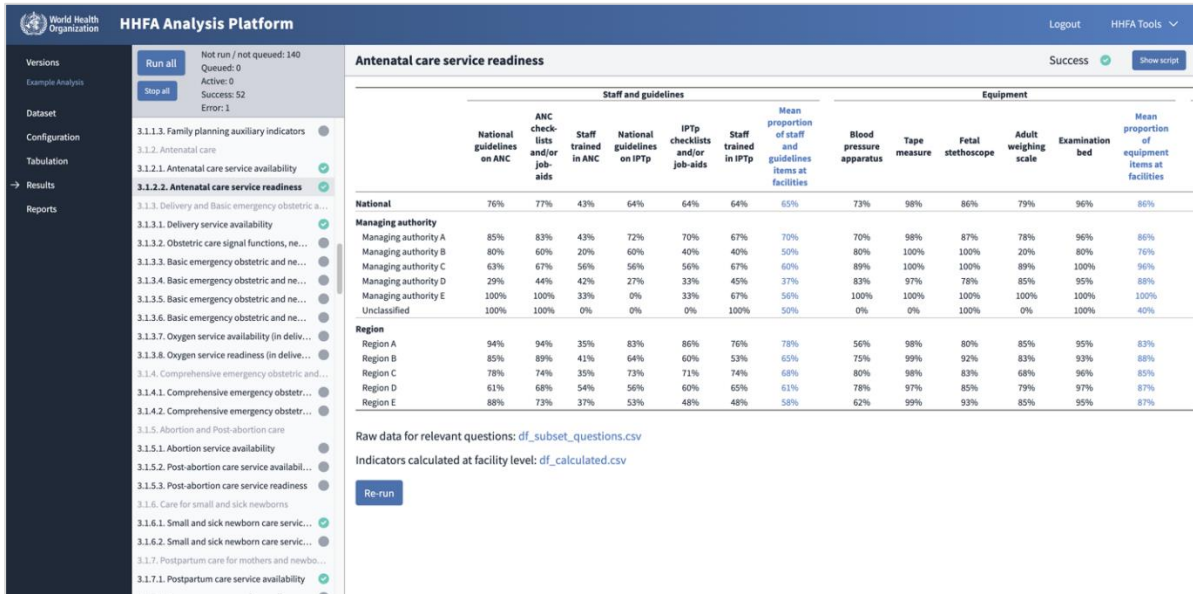
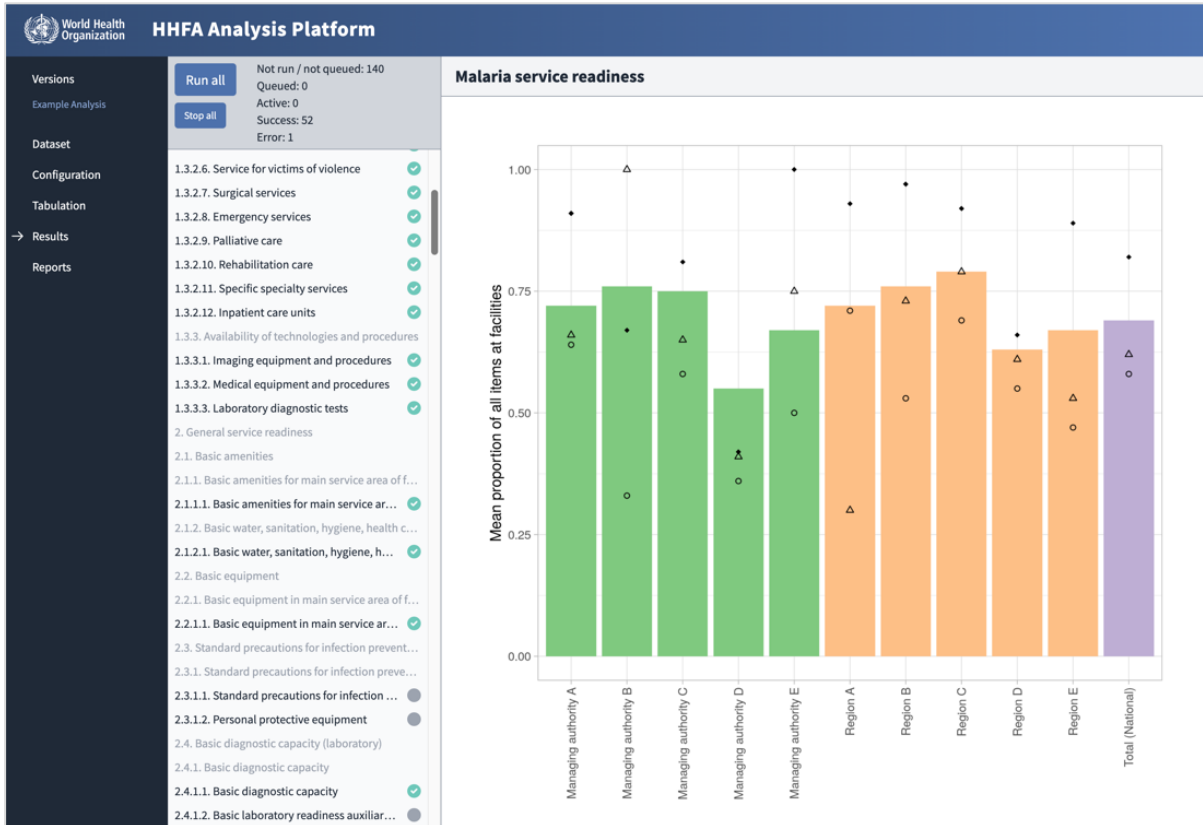


Figure 15. Options for customizable charts



4 HHFA methodology

4.1 Establishing a master facility list (MFL)

Regardless of the HHFA design methodology selected, a complete list of ALL the health facilities in the country is required. This is called the master facility list (MFL) or national facility registry. The MFL is a database that must include all health facilities in all sectors, including public sector, private-for-profit sector, nongovernmental organizations (NGO), faith-based organizations (FBO) and other sectors, e.g., military. It is strongly recommended that countries invest in establishing and maintaining a comprehensive MFL. WHO and partners have developed a guide to support countries in creating and strengthening a MFL¹². A facility census may be needed to establish the MFL. The MFL should be updated annually through facility self-reporting, with validation approximately every five years through a census.

During the HHFA planning phase, the existence and reliability of an official MFL must be assessed. Before the survey can be implemented, ALL health facilities in the country must be identified and all available health facility listings must be reconciled to create a single, comprehensive list that includes facilities in all sectors (public, private, other).

In some countries, an updated MFL with all the required information may be available. In many cases, however, this information is not readily available and must be compiled and updated. The ministry of health (MoH) generally maintains information on public sector facilities and sometimes also on NGO and FBO facilities. Additional efforts may be needed to retrieve information on the private sector and any other facilities.

The MFL assigns a unique identification (ID) code to each facility. A set of data must be gathered for the specific purpose of uniquely identifying each facility. This set of identifier data is called a "primary key" or a "unique key": a code uniquely identifying a row or column of a database. If a specific ID is not attached to each facility, there is a risk of duplicate data collection. In addition to reducing the risk of data duplication, facility ID fields also enable comparisons across different surveys and comparisons over time.

In the MFL, facilities are classified by level of service provision (from hospital at the highest level through to first level primary care facility at the lowest level) and by ownership (e.g., MoH, municipal, private-for-profit, FBO, NGO, military). Location information should be included in the MFL when available. The geographical coordinate collection method should also be recorded, i.e., global positioning system (GPS), digital place names, gazetteers, etc.

4.2 HHFA design methodology

4.2.1 Facility selection

Two potential design methodologies can be used for facility selection in a HHFA:

Facility census (assessment of all health facilities): A facility census aims to assess ALL health facilities (public, private and other providers) in the country. A census is needed to establish or update the national MFL and to establish baseline information on overall service availability in the country. Service availability data can then be updated annually through facility self-reporting and validated

¹² Master Facility List Resource Package: guidance for countries wanting to strengthen their Master Facility List. Facilitator Guide for the MFL Training. Geneva: World Health Organization; 2019. (<https://www.who.int/publications/i/item/9789241516495>)

4. HHFA METHODOLOGY

approximately every five years through a facility census. A census may also be used to establish baseline information on service readiness.

Sample survey (assessment of a representative sample of facilities): Sampling is done using probability selection methods to ensure that the findings are representative of the country or regions/districts in which the survey is conducted. The national MFL is used as the sampling frame. If the country does not have a comprehensive and updated MFL, the process of drawing a random sample of health facilities becomes complicated, if not impossible. Therefore, it is necessary to establish or update the MFL before implementing a sample survey. A sample survey is the recommended methodology for the service readiness, quality of care and management and finance modules, and can also provide an overview of service-specific availability. Refer to the SARA implementation guide¹³ for details on calculating the sample size and procedures for sample selection.

Choice between a facility census and a sample survey: This choice depends on a number of factors including the objectives of the survey, the resources available, the required time frame, and the availability of a valid MFL. For example, if the objective is to obtain national-level estimates, a sample survey that is representative at the national level would be appropriate. However, if the objective is to obtain subnational-level (e.g., provincial) estimates, the sampling methodology must be adjusted to use either a stratified sampling design (with an increased sample size) or, in some cases, a full census of all facilities. The large sample sizes needed for surveys designed to be representative at lower subnational levels have significant cost implications. Countries often use a sample survey to assess primary care facilities along with a census of all hospitals. Refer to section 5.1.5 for an overview of sampling options and cost implications.

4.2.2 Data collection methodologies in facilities

HHFA data collection methods include:

- facility audit (key informant interviews and observation)
- record review
- other methods (for future supplementary questionnaires, e.g., clinical vignette, client interview)

Facility audit

A facility audit assesses facility adherence to defined minimum standards for service availability, readiness, and management and finance. Facility audit methodologies used in the HHFA include observation of key items, and interviews with key informants. These methodologies are used in all the HHFA questionnaires currently available in the availability, readiness, and management and finance modules.

Record review

The HHFA quality of care module requires a record review methodology. A technical quality of care record review (also called a clinical audit) involves examining a sample of individual patient records to see if the provider followed the appropriate standards of care throughout the care process, based on the information recorded in the patient record.

Sampling occurs in two stages. First, facilities are sampled. Second, at each facility visited, client records are sampled for inclusion in the record review. The procedures for the first stage of sampling (selection of facilities), are the same as those for selecting the sample of facilities for the facility audit

¹³ Service availability and readiness assessment (SARA): an annual monitoring system for service delivery: implementation guide, version 2.2. Geneva: World Health Organization; 2015. (<https://apps.who.int/iris/handle/10665/183119>)

part of the HHFA. Once at the facility, a sample of five¹⁴ eligible patient records are identified and reviewed for each targeted service area. (Further details on the process for identifying the sample of patient records are available in the HHFA Quality of care record review questionnaire and in the HHFA data collector training materials.)

There are recognized limitations to the record review methodology, including:

- A record does not necessarily prove that a service was provided, and conversely, a lack of-record does not necessarily mean that a service was not provided.
- Record review relies on service providers knowing what aspects of patient care are expected to be recorded.
- There must be a register or other database that provides the information for selecting a sample, and patient information (either in individual patient records or in registers) must be available.

Quality of care can also be assessed through various other methodologies including direct observation, gold standard reassessment, health worker vignettes and client simulations. However, the record review methodology was selected for the HHFA for the following reasons:

- Record review does not depend on patients with a specific condition being present on the day of the facility assessment. Records can be identified for patients that have received services for a specific condition, regardless of when the services were provided.
- It is possible to assess the care process over time for patients requiring follow-up for care (e.g., tuberculosis, antiretroviral therapy, antenatal care), since the details from all visits should be documented in their individual records.
- Knowledge that quality of care will be assessed using recorded evidence may improve documentation by providers, as well as reinforcement by management of the expectation for documentation.
- Record review is less resource-intensive than other methods for assessing technical quality of care.

4.3 Selecting HHFA modules and questionnaires for implementation

The HHFA is designed to provide flexibility for countries to implement the survey according to their needs. Countries can select the modules and questionnaires they plan to implement, based on the objectives of the survey, the need to address existing data gaps for policy and planning purposes and implementation feasibility.

Countries may choose to implement a **single HHFA module**. In this case, the relevant **Stand-alone questionnaire** within the module is used for data collection. For example, a country may only need information on service availability and may decide that only the core indicators are needed. The Availability Core questionnaire will then be used.

Within a single HHFA module, EITHER the Core OR the Core+Additional questionnaire should be selected, as the Core+Additional questionnaire includes all the questions in the Core questionnaire as well as the additional questions. A Supplementary questionnaire can be used along with a Core or a Core+Additional questionnaire, or may be implemented on its own.

¹⁴ A sample of five records per facility is used for reasons of feasibility. Refer to: Turner AG, Angeles G, Tsui AO, Wilkinson M, Magnani R. Sampling Manual for Facility Surveys for Population, Maternal Health, Child Health and STD Programs in Developing Countries. MEASURE Evaluation Manual Series, No. 3. MEASURE Evaluation. Carolina Population Center, University of North Carolina at Chapel Hill. July 2001. Pages 59 and 60.
(https://www.measureevaluation.org/resources/publications/ms-01-03/at_download/document)

4. HHFA METHODOLOGY

Some countries may choose to implement **multiple HHFA modules**. In this case, it may be helpful to refer to the stand-alone questionnaires to review content. However, whenever more than one module will be implemented, the **Combined Core questionnaire** should be used for questionnaire adaptation and survey implementation. The Combined questionnaire is designed to ensure that, for a specific programme or technical area within a facility, the relevant data from across the various modules are collected in an integrated way to avoid returning multiple times to the same key informant. In addition, the Combined questionnaire has removed duplicates of questions that occur in more than one module.

If the Combined questionnaire is selected, the questions related to any modules that will not be implemented, must be deleted. In the questionnaire, alongside each question, there is information that shows to which module the question belongs, whether it is core or additional, and the unique ID(s) of the indicator(s) linked the question. (Refer to section 3.3.1.) The process of removing unwanted questions can therefore be conducted relatively quickly. However, once the unwanted questions have been removed, it is important to check the resulting skip patterns to ensure that the questionnaire progression remains logical.

The HHFA contains a large number of questions which are time-consuming to implement. Therefore, **if a country chooses to implement all three facility audit modules (Availability, Readiness, and Management and finance), it is recommended that only the Combined Core questionnaire is used**. The Core+Additional and Supplementary questionnaires are best used when implementing only one or two modules.

For example, if the key need is to establish baseline information on the availability of infrastructure and services in all facilities in the country, the Availability module may be implemented alone as a facility census. If high-level information is needed across a range of service aspects to inform policy decisions, a nationally-representative sample of facilities using core questions of several modules, may be appropriate. If the need is to compare service delivery capacities among regions/districts, the core Availability and Readiness modules may be implemented using a sample that is representative at regional/district level. If in-depth information is needed related to a specific module, the stand-alone Core+Additional questionnaire and/or the Additional/Supplementary questionnaire may be implemented for the specific module.

4.4 Adapting the questionnaire to the country context

Questionnaire adaptation involves making a limited number of changes to the questionnaire, based on practices and terms used in the country and on country needs.

The HHFA provides standard questionnaires of which a stand-alone or combined version should be selected as described in Section 4.3. However, certain adaptations will be needed for each country context. Questionnaire adaptation is conducted by a HHFA core technical team, in close collaboration with national stakeholders and the key resource persons from the appropriate technical units.

It is essential that questionnaire adaptation is done very thoroughly:

- to ensure that the questions and terms used in the questionnaire reflect the country context and are understood by local health workers;
- to avoid confusion or controversy during data collector training; and,
- to minimize the risks of inconsistent data collection and poor-quality data.

The adaptations should initially be made on the paper questionnaire **in track changes**. Once the adaptations are finalized on the paper questionnaire, the CSPro tool can be adapted accordingly by the data manager/CSPro expert.

Adaptations to reflect the specificities of the healthcare system in the country:

Countries typically require adaptations for some or all of the following components:

- cover page and facility identifiers
- consent forms
- types of facilities
- managing authorities of facilities
- health worker categories/qualifications
- national guidelines for services
- national policies for medicines (e.g., for HIV, TB)
- immunization schedules
- treatment regimens

The above components are highlighted in the questionnaires in red font and often include the term “COUNTRY ADAPT”. However, during the questionnaire adaptation process, all questions should be reviewed to see if additional country adaptation may be needed.

Adding questions

Countries may choose to include additional country-specific questions. The recommended way to number these specific country questions is to use the country ISO.2 code. For example:

SL_01: where SL corresponds to the ISO.2 code for Sierra Leone. The new questions are numbered sequentially.

For a list of country ISO codes please refer to:

http://www.iso.org/iso/country_codes/iso_3166_code_lists/country_names_and_code_elements.htm

Before adding a question, check that it does not already exist in a different part of the questionnaire. If adding a question to a Core questionnaire, also check to see if the question already exists as an additional question in the Core+Additional questionnaire. Any new question should also be considered in terms of the analysis outputs. Before a question is added, the related indicator(s) should be developed and it should be made clear how the indicators will be included in the tables of the analysis platform.

Deleting questions

It is possible that certain questions might not be relevant to a country. In this case a question can be removed from the questionnaire. Both the question and the question number should be deleted. A single question may be linked to multiple indicators in the data analysis platform. Therefore, before deleting a question, always first check the indicators to which it is linked.

Do not re-use the deleted question number and do not re-number the subsequent questions. Each question number is linked to a specific indicator in the data analysis platform, so if the question numbers are changed, the analysis platform will not work properly.

Important tips for questionnaire adaptation

- **Track changes:** Always use and keep a questionnaire version with track changes.
- **Order of questions:** Do not change the order of the questions.
- **Numbering:** Do not change the question numbering; the original numbering structure of the standard questionnaire should be kept. Changing the numbering will affect links to the existing tools for automated data processing and results production.
- **Skip patterns:** Adding or deleting a question may require changes to skip patterns. Always check the skips and adapt if needed.
- **Modifying questions:** Question text should not be replaced by other question text. Clarification can be added in parenthesis to help the respondent understand the question if needed. It is very

4. HHFA METHODOLOGY

important to keep each question with its original numbering, therefore do not change the content of existing questions. It is preferable to add a new question, rather than substantially modifying an existing question.

- It is also recommended to **maintain the standard HHFA indicator definitions and calculations**, to facilitate interpretability of results as well as comparisons over time and across countries. If necessary, country-specific additional indicators can be added, rather than substantially modifying the standard HHFA indicators.
- Remember that changes to the questionnaire will require **modification of the CSPro tool** – sufficient time should be allocated to this process.
- New questions will require **new indicators** to be created and added to the **data analysis platform**.
- It is important to remember that the HHFA focuses on providing information on key items that should be available in health facilities. It is not intended to provide comprehensive data on all aspects of health system functioning. It is important not to stray from this HHFA concept by adding a long list of additional questions.
- It is also important to remember that the HHFA questionnaires are extensive and that adding questions will increase the time needed for the training, the data collection and the data analysis.

5 HHFA planning and implementation steps

This chapter summarizes the steps required for planning and implementing a HHFA. For further details, refer to the relevant HHFA resources and the SARA implementation guide.

5.1 Summary of survey planning and implementation steps

1. Pre-survey planning and preparation
<ol style="list-style-type: none">1. Define the survey objectives.2. Determine the scope and design methodology of the survey (sample or census).3. Define the geographical area and the timeframe of the survey.4. Select modules and questionnaires for implementation.5. Prepare a survey proposal and secure funding.6. Establish a survey coordinating group of country stakeholders.7. Define key roles and responsibilities to oversee and facilitate the survey.8. Establish or update the national master facility list (including country facility registry codes).9. Prepare a detailed survey implementation plan (protocol).10. Prepare a survey schedule.11. Adapt the questionnaire to the country-specific context and needs (in track changes).12. If implementing a record review, adapt the instructions to the country context.13. Configure the HHFA CSPro tool, adapt based on the questionnaire adaptation, and set up the server and synchronization method.14. Recruit survey personnel.15. Identify and map the survey sites: select the sample of health facilities (if sampling methodology is used).16. Procure and organize logistics, including equipment and transport.17. Prepare for and conduct training of data collectors (including preparation of tablets to use during the training and the pilot test).18. Pilot test the survey in selected facilities, review the experience and amend the questionnaire if needed.
2. Data collection
<ol style="list-style-type: none">1. Plan the data collection visits in collaboration with local authorities (prepare letter of introduction, contact each site, prepare schedule of visits).2. Arrange for transport and regular communication during fieldwork.3. Prepare materials and tools for data collectors.4. Confirm appointments with health facilities.5. Team leader assigns questionnaire sections to data collectors.6. Data collection teams visit health facilities and collect HHFA data.7. Data collectors transfer electronic files to team leader at the end of each day.8. Supervisors oversee data collection and conduct data validation checks.
3. Data processing and analysis
<ol style="list-style-type: none">1. Edit, validate and clean the data set within CSPro.2. Export the data set to the HHFA data analysis platform.3. Prepare the HHFA data analysis platform according to country needs.4. Conduct data analysis, using the standard HHFA indicators plus any country-specific indicators of interest.
4. Data interpretation, dissemination, and archiving
<ol style="list-style-type: none">1. Conduct initial data review and interpretation.2. Engage relevant experts for in-depth review of specific sections of the analysis outputs.3. Conduct a HHFA data review and interpretation workshop.4. Prepare the final HHFA report.5. Plan and implement dissemination activities as soon as possible.6. Document and archive the survey using metadata standards.

5.2 Pre-survey planning and preparation

5.2.1 Define the survey objectives

The survey objectives should be determined by the MoH's key information needs for planning and monitoring the health facility service delivery system. For example: Is the key need to establish baseline information on facility infrastructure and availability of services in all facilities in the country? Is high-level information needed across a broad range of service areas to inform policy decisions? Is there a need to compare service delivery capacities among subnational areas (e.g., regions/provinces)? Is detailed information needed on the availability and functionality of resources and systems related to specific service components? Is there a need to assess the quality of the patient care process? Is information needed on facility management and finance systems?

When defining the survey objectives, it is important that the high-level decision makers requesting the survey have a solid understanding of the types of information that can and cannot be obtained through a HHFA, and how the survey results can be used. The survey objectives will guide decisions on the modules and questionnaires to be implemented and will influence the scope of the survey.

5.2.2 Determine the scope and design methodology of the survey (sample or census)

Decide whether the survey will involve a census of all facilities or a representative sample. The survey objectives, the timeframe, and the available budget will influence decisions on the scope of the survey. If a sample will be used, decide whether the results should be representative at national or at subnational levels and calculate the sample size. Surveys that are representative at subnational levels (e.g., province/region or district) require a larger sample size which has significant cost implications. The number of modules to be implemented and the choice of questionnaires (Core only or Core+Additional) will impact the number of data collectors and time needed to complete the survey at each facility. These factors should be considered when determining the scope of the survey.

Determining the sample size and then selecting the sample of facilities is a complex subject. There will be considerable variation among different surveys, depending on the desired precision and type of estimates required, as well as the number of facilities in the country and the objectives of the survey. For example, a HHFA conducted to produce national-level estimates will require a much smaller sample size than if district-level estimates are desired. To ensure that the sample is representative, a sampling expert or a statistician should be involved to select an appropriate sampling methodology.

Table 4 presents various HHFA sampling options. The most common sampling strategy is Option 1 - a nationally representative sample obtained by taking a simple random sample of facilities within each stratum (facility type and managing authority) at the national level, with a census or oversampling of hospitals.

The table provides a rough cost estimate, based on \$1 000 per facility for a national level estimate. Depending on the country context and the number of modules implemented, the budget is estimated at \$1 000 to \$2 000 per facility. When planning for a nationally representative sample of 200 to 250 facilities, budgeting for around \$1000 per facility is a good general estimate. However, as the sample size increases for a large survey, the cost per facility is expected to decrease.

Table 4. Sampling options to conduct a HHFA

Domains of estimation	Sampling method	Sample size ¹⁵ (estimate)	Approximate cost
Option 1: National estimates only National-level estimates with disaggregation by facility type (3 levels) and managing authority (public/private)	Small country Stratification by facility type and managing authority, simple/systematic random sampling within each stratum with census or oversampling of hospitals (design effect (deff) = 1)	150 – 250 facilities	\$150K-250K
	Medium country Blend of list and area sampling: list sampling for large health facilities, and area sampling for small facilities (census of facilities in the sampled area PSUs ¹⁶) (deff = 1.2)	250 – 500 facilities	\$250K-500K
Option 2: Subnational estimates Regional and national estimates with disaggregation by facility type (3 levels) and managing authority (public/private)	Small country Stratification by region, facility type and managing authority, simple/systematic random sampling within each stratum, with census or oversampling of hospitals (deff = 1)	5 regions: 250 – 500 facilities 10 regions: 500 – 800 facilities	\$250K-350K \$350K-460K
	Medium/large country Blend of list and area sampling: list sampling for large health facilities, and area sampling for small facilities (census of facilities in sampled area primary sampling units PSUs) (deff = 1.2)	Medium country 4 regions: 300 – 500 facilities Large country 4 regions: 400 – 800 facilities	\$120K-200K \$300K-500K \$400K-800K
Option 3: Subnational estimates Regional estimates for a subset of regions, with disaggregation by facility type (3 levels) and managing authority (public/private) for selected regions; no national estimates	Large country Purposive sample of regions, simple/systematic random sample with oversampling of hospitals for each region	4 regions (150 facilities per region): 600 facilities	\$150K per region
Option 4: District sample District estimates for sampled districts; national estimates if sufficiently many facilities are sampled	Small, medium and large countries List sampling for regional and national hospitals plus sampling of districts (two-level cluster sample: selection of districts as first level, selection of facilities within these districts as the second level) (deff = 2)	Small country 300-500 facilities (10-30 districts ¹⁷)	\$250K-500K
		Medium country 400-800 facilities (20+ districts)	\$400K-800K
		Large country 600-1000 facilities (30+ districts)	\$600K-1000K
Option 5: Facility census All possible domains of estimation	Small, medium and large countries Census of all facilities		Very expensive

Small country: 50–100 hospitals, 1000 – 2000 health facilities total, 10–80 districts (e.g., Sierra Leone, Togo, Burkina Faso)

Medium country: 100-500 hospitals, 2000–5000 health facilities total, 80–500 districts (e.g., Uganda, Tanzania)

Large country: 500–1000 hospitals, 5000–10000 health facilities total, 50–1000 districts (e.g., DRC, Nigeria)

¹⁵ Sample size estimates assume a margin of error of 0.1 and 95% level of confidence.

¹⁶ Administrative units that form the PSUs (Primary Sampling Units) for the area sample should contain approximately 1-5 health facilities each (communes, sub-counties, villages).

¹⁷ The number of districts in the sample depends on the number of facilities per district.

5.2.3 Define the geographical area and the timeframe of the survey

Defining the geographical area of the survey involves decisions on whether the survey will be implemented country-wide or will only cover a selected geographic area. Completion of the entire survey process generally requires three to six months, including survey preparation, data collection, data analysis, and report writing. Further time should be allotted for dissemination and follow-up activities. As the information produced from the HHFA should be used to inform decision-making, it is important that data collection is conducted rapidly, and that the report is generated as soon as possible once data collection is complete. This will ensure that the survey results are relevant and informative for decision-makers. Seasonal issues that may affect implementation, such as rainy seasons or holiday periods, should be considered when establishing the timeframe.

5.2.4 Select modules and questionnaires for implementation

The selection of modules, indicators and questionnaires should be guided by the survey objectives and should be considered along with decisions on the scope of the survey. Review of the indicators in the HHFA indicatory inventory will inform the decisions on which modules to implement and which indicators are needed. Decisions on the module(s) for implementation are followed by decisions on the need for core indicators only, versus also needing the additional indicators. It is important that the HHFA content selection is driven by information needs (i.e., indicators) rather than questions. Questions are then selected based on the indicator needs. (Refer to Section 4.3 for further details.)

5.2.5 Prepare a survey proposal and secure funding

The survey proposal should include a short description of the rationale, general objectives, proposed methodology, timeframe, and preliminary budget. It is essential to ensure that the items in Table 5 are included in the budget. (A sample budget template is available in the SARA Implementation guide.) The proposal should be submitted to the relevant authorities within the MoH for approval and, if necessary, to external agencies to secure funding.

Table 5. HHFA resource requirements

Human resources:	
<ul style="list-style-type: none"> • Survey manager • Technical advisory/quality assurance entity • Area supervisors 	<ul style="list-style-type: none"> • Data collectors • Data managers / CSPro experts • Data analysts
Technical resources:	
<ul style="list-style-type: none"> • Mobile electronic data collection devices (EDCs) e.g., cell phones, tablets (one for each data collector) or laptop computers (one for each data collection team) • Chargers for EDCs • Memory cards for EDC 	<ul style="list-style-type: none"> • GPS devices (if used): one per data collection team • Batteries for GPS devices • Computer(s) for data analysis • Internet access • Server and data synchronization method
Training:	
<ul style="list-style-type: none"> • Training venue • Daily allowance (accommodation, meals, transport) • Equipment (projectors, screens, microphones, etc.) 	<ul style="list-style-type: none"> • Printing (e.g., participant guide, paper questionnaires) • Expenses related to pilot testing
Data collection and validation:	
<ul style="list-style-type: none"> • Daily field allowance and accommodation for data collectors and area supervisors • Transport 	<ul style="list-style-type: none"> • Materials (e.g., notebooks, pens) • Communication (e.g., telephone/internet charges)
Analysis and dissemination:	
<ul style="list-style-type: none"> • Data cleaning, processing and analysis • Meetings of the survey coordinating group • Data analysis workshop 	<ul style="list-style-type: none"> • Report production and dissemination • Advocacy and communications • Overheads
Contingency	
<ul style="list-style-type: none"> • Unforeseen events / expenses 	

5.2.6 Establish a survey coordinating group of country stakeholders

Bringing partners together and mobilizing them around the survey is a key initial step. The survey coordinating group, led by the MoH, should include national institutes and other key stakeholders in the health services sector. This core group provides leadership and oversight throughout the survey process. The roles of the survey coordinating group include:

- clarifying the objectives of the survey;
- supporting the survey manager in planning and implementing the survey;
- advising on any matters that arise during survey preparation, fieldwork and data analysis;
- assisting in interpreting data and developing policy recommendations;
- promoting the findings of the survey and advocating for appropriate policy recommendations.

It is important that the survey coordinating group meets regularly throughout the survey process.

5.2.7 Define key roles and responsibilities to oversee and facilitate the survey

The survey is usually undertaken under the overall leadership and coordination of the Ministry of Health. The following section briefly outlines the roles and responsibilities of the key parties involved in the implementation of the HHFA, in addition to the survey coordination group.

Ministry of Health: The MoH has overall responsibility for coordination of the survey, obtains permission to conduct data collection and informs district authorities and facilities of the survey, defines the survey objectives, helps to coordinate data analysis and interpretation, coordinates results dissemination meetings by inviting all appropriate stakeholders, and promotes use of the data for policymaking and planning.

Implementation agency: Once the coordinating group is established, it is important to define an entity that will be in charge of the survey field implementation. It is recommended to identify a national institute (e.g., National Statistical Office, School of Public Health, etc.) or other entity that has experience in conducting such surveys. The implementation agency may be the MoH or may be an external organization working in collaboration with the MoH. The selection is done in agreement with the MoH. The implementation agency works closely with the coordination group and is responsible for planning and conducting data collection and for supporting data cleaning, analysis, report writing, and results dissemination.

Agency providing quality assurance and technical support: Involvement of an independent party such as an independent consultant or national institute is recommended. This agency provides technical assistance to the implementing agency and provides quality assurance for the implementation process to ensure due processes are followed during training, data collection, cleaning, and analysis (including validation visits in 10% of the facilities). The agency also provides technical support for development of the HHFA report.

5.2.8 Establish or update the national master facility list

Obtain a list of all health facility sites (public, private, NGO, FBO, and any others), including country facility registry codes. (Refer to Section 4.1) Update the list if necessary, in advance of the HHFA. This list serves as the HHFA sampling frame.

5.2.9 Prepare a detailed survey implementation plan

A well-developed implementation plan (or protocol) is key to ensuring the success of the survey. The implementation plan is a detailed document that expands upon the survey proposal document. The plan defines the reasons for the survey and is developed based on the objectives, intended scope and design methodology. It also provides a comprehensive outline of the operational aspects and budget. (The design methodology will drive much of the operational planning and budget.) The implementation plan serves as the binding reference on all aspects of how the survey will be carried out and overseen

to ensure that it will be completed according to appropriate quality standards, on time, and within budget.

5.2.10 Prepare a survey schedule

The survey process generally requires three to six months to complete. A survey schedule (e.g., Gantt chart) should be developed, detailing the amount of time allotted for each step in the survey process, and should serve as a timeline for all survey activities. The schedule should be consulted regularly to ensure that activities are proceeding according to plan.

5.2.11 Adapt questionnaire to the country-specific context and needs

The questionnaire is adapted based on practices and terms used in the country and on country needs. Refer to Section 4.4 for further details. Changes are finalized in track changes in the paper questionnaire before modifying the CSPro tool.

5.2.12 If implementing a record review, adapt the instructions to the country context

The HHFA quality of care record review questionnaire contains basic instructions for obtaining a sample of patient records to review. However, different countries and different programmes may have different systems of patient lists/registers and patient records. Therefore, the instructions for obtaining the sample and the individual patient information should be adapted according to the country context and should be adequately addressed during the data collector training.

5.2.13 Configure the CSPro tool, adapt based on the questionnaire adaptation, and set up the server and synchronization method

The HHFA CSPro application must be configured for the country before it can be used. This includes: defining the administrative areas that will be used when defining the locations of health facilities; defining and assign roles to the individuals that will have access the HHFA data collection application; and defining the facilities for which data will be collected. All the HHFA questionnaires have been programmed into the CSPro tool. The tool allows selection of the modules and questionnaires (Core, Core+Additional, Supplementary) to be implemented by the country. Individual questions can also be turned on or off as required and country-specific questions can be added. After country-specific adaptation of the paper questionnaire has been finalized, the CSPro tool is adapted accordingly.

Survey preparation also involves setting up of a server and a method for synchronizing to the server the data that is collected on all the data collection devices. The HHFA CSPro tool allows synchronization of data using either CSWeb or Dropbox. Each survey implementation should select the most appropriate option for the context and then the data manager proceeds with the configuration steps for the selected synchronization method. (Refer to the HHFA Data manager guide for further details.)

5.2.14 Recruit survey personnel

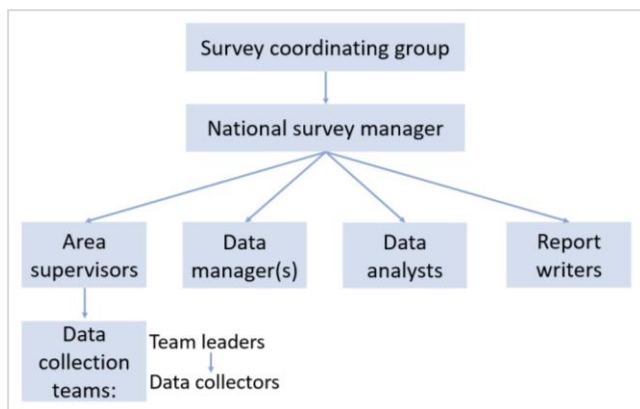
Key survey personnel include a national survey manager, area supervisors, data collectors, data managers/CSPro experts, data analysts, and report writers.

Survey manager: The survey manager plans and coordinates the survey at central (national) level. This includes planning the technical and logistical aspects, recruiting and training survey personnel, supervising data collection, conducting data quality assurance and data analysis, interpreting results, preparing a survey report and communicating findings. Wherever possible, the survey manager should have experience in conducting surveys and should be very familiar with the health-care system. The survey manager should be familiar with basic statistics and interpreting data.

Area supervisors: An area supervisor oversees several teams, including all aspects of data collection in a specified geographical area. It is recommended to designate an area supervisor for each geographical

area that will be surveyed. The number of area supervisors depends on the sample size, the geography of the country and survey timeframe. Area supervisors have a crucial role to play in ensuring data quality. They should be experienced in data collection, familiar with health terminology and, if possible, familiar with the health system in the survey area for which they are responsible.

Figure 16. Survey personnel



Data collectors: Data collectors visit facilities to collect the HHFA data. The number of data collectors depends on the sample size, the survey time frame and the modules/questionnaires to be implemented. They should preferably have a health qualification (nurse, midwife, doctor or medical student) and familiarity with the organization and functioning of health facilities as well as the local language. It is preferable to have a smaller number of better qualified data collectors than a large team where some data collectors lack the necessary skills.

Data collector team leaders: In each data collection team, one of the data collectors is assigned the role of team leader. The team leader also collects data but has additional responsibilities including assigning sections of the questionnaire to team members, receiving the completed sections from team members, ensuring that all required sections have been completed, combining the different questionnaire sections for each facility, and synchronizing the completed questionnaire to the server.

Data managers/CSPPro experts: The data manager configures and adapts the CSPPro tool to country needs, sets up the server and data synchronization method, ensures the set-up of the CSPPro tool on the data collection devices, supports the training of the data collectors, supports the field teams during data collection, assesses data for completeness and quality, addresses quality issues where needed, and conducts data cleaning to prepare the dataset for the analysis phase. Once all data collection is complete and the data have been cleaned, the data set is transferred to the data analysis team.

Data analysis team: The data analysis team consists of a small number of individuals that analyse the data and prepare the key analysis outputs and preliminary interpretation in preparation for the data analysis workshop. The team must include an analyst that has advanced knowledge of the HHFA data analysis platform (or other analysis software that the country chooses to use). This analyst adapts the analysis platform to country needs, inspects the completed data set, uploads the data to the data analysis platform and runs the analysis. The team must also include senior-level individuals with strong analytical skills, technical knowledge of health service delivery resources and processes, and knowledge of the country's health system and overall context.

Survey report writer(s): The report writer(s) may be the survey manager or a member of the analysis team. The writer(s) uses the report template and analysis outputs from the analysis platform and compiles the interpretation content provided by the data analysis workshop to produce the final survey report.

5.2.15 Identify and map the survey sites: select the sample of health facilities

The sample of facilities is selected using the updated MFL as the sampling frame (if sampling methodology is used). Selecting the survey sample is a complex task and should be conducted with the involvement of a statistician. Refer to the SARA implementation guide¹⁸ for further details on sampling.

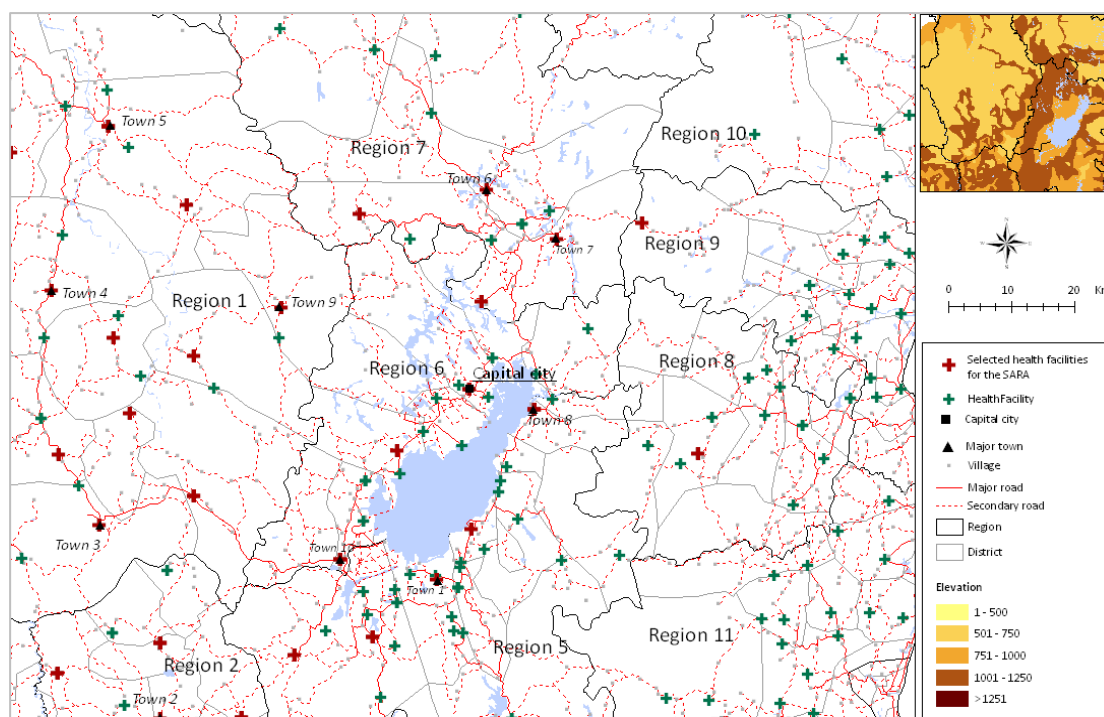
5.2.16 Procure and organise logistics, including equipment and transport

Planning for data collection requires consideration of the logistics needs for data collection teams as well as the hardware and software needs for data collection. Equipment is needed centrally as well as for fieldwork, and for operations as well as for training. A guiding principle when compiling equipment for the field is to have backup components and a contingency plan in case equipment fails or is lost. All equipment should have one or more backups, depending on the equipment type and survey requirements. If feasible, paper forms and printing capabilities can provide a viable contingency plan for the worst-case scenario of mobile device failure.

Assigning facilities to teams

Mapping of all facilities in the survey sample is recommended to facilitate the planning of logistics for data collection. This map can be made on paper or electronically. The map should include information useful for gaining familiarity with the survey areas, such as roads, topography, basic geographical features, elevation and location of health facilities. Teams should be assigned to facilities based on the geographical distribution of the selected facilities. **Figure 17** provides an example of a map that would be useful for HHFA logistics planning.

Figure 17. Health Facility Assessment Example Map



Time required per facility

If the three core facility audit modules (Availability, Readiness, and Management and finance) are implemented, approximately three to four hours are needed for a team of two data collectors to complete data collection in one medium-sized primary health care (PHC) facility. A team of four data

¹⁸ Service availability and readiness assessment (SARA): an annual monitoring system for service delivery: implementation guide, version 2.2. Geneva: World Health Organization; 2015. (<https://apps.who.int/iris/handle/10665/183119>)

collectors requires approximately one to three working days to complete data collection in a hospital, depending on the size of the hospital and the services offered. Additional time is needed for travel, briefing of facility staff, checking of questionnaire sections, etc.

Survey team requirements

The duration of the survey depends on the availability of resources, the number of teams, the number of facilities to be visited, and the size of the country and population. The estimated duration of the survey is calculated during the planning phase and is unique to the needs and resources available in each country. For all surveys, logistics planning must consider the following:

- car hire and fuel for the duration of the survey
- per diem for the driver(s)
- per diem for the data collectors and area supervisors

Equipment requirements

Equipment requirements are determined according to country-specific needs, as well as the availability of resources and budget. An electronic data collection device (tablet or mobile phone) is required for each data collector, with at least one back-up device available for each team. Data collection teams and area supervisors require internet access for regular upload to a server of the completed data for each facility. Data collection teams and area supervisors require mobile phone connectivity. The data manager and survey manager require a reliable, continuous internet connection.

The following examples show some of the planning that is required for a HHFA.

Example 1. A small country wants to implement the three HHFA facility audit modules (Availability, Readiness, Management and finance), using the Core questionnaire. The country has 20 districts with an average of 30 PHC facilities (health centers, health posts, and clinics) per district. The country also has 12 hospitals. The survey is intended to be representative at national level for PHC facilities, using a sample of 156 PHC facilities. A census will be conducted of all 12 hospitals.

One team of 2 data collectors can complete 2 PHC facilities per day. Using 6 teams for PHC facilities, they can complete 12 facilities per day. Therefore, $156 / 12 = 13$ working days are needed to complete data collection in the PHC facilities*.

One team of 4 data collectors can complete 1 hospital in 2 days. Three 4-person teams can complete data collection in all hospitals in 8 working days.* Alternatively, two 4-person teams can complete all hospitals in 12 working days.

*excluding travel time between districts/facilities and other potential time constraints

Example 2. A HHFA will be implemented in one rural district with 5 hospitals and 96 PHC facilities. Only 2 modules (Availability and Readiness) will be implemented but resources are limited so only 3 teams of 4 data collectors are available.

Using 2 teams of 4 data collectors, 8 PHC facilities can be completed per day. However, as they are implementing only 2 modules, the teams could potentially complete more than 2 facilities per day, which reduces the time needed for survey completion. However, travel time between facilities must be considered. PHC facilities could possibly be completed in 12-14 working days. The remaining team of 4 can survey the hospitals, which could take as little as 5 days, but will probably take longer due to distances between hospitals in rural areas. The entire survey could potentially be completed in 2 to 3 weeks.

However, if fewer teams are used, the implementation will not only take longer due to the reduced number of facilities that can be surveyed per day, but also due to the travel time between facilities. These tradeoffs in number of teams, team size and geographic spread between districts or other relevant administrative units, must be considered carefully according to country-specific factors such as data needs, data collector availability and budget limitations.

5.2.17 Prepare for and conduct training of data collectors and area supervisors

The quality of HHFA data collection is controlled at several points in the data collection process. The first point of quality control is the thorough training of data collectors and area supervisors and the exclusion from fieldwork of any trainees that do not exhibit competency in using the questionnaires by the end of training. It is essential to allow sufficient time for thorough training on all sections of the questionnaire. Depending on the modules and questionnaires selected for implementation, eight to ten days of training (including pilot testing of the questionnaire) may be required. It is also recommended to conduct a training-of-trainers workshop prior to the data collectors training, to ensure that all trainers have a thorough and consistent understanding of the questionnaire. As the data collectors will be trained on use of the CSPro tool, it is essential that the tool is configured on all the data collection devices in advance of the training and that a device is available to for each data collector during the training.

Data collectors and supervisors are trained on:

- an overview of data collection processes;
- general guidance on interviewing practices and techniques;
- questionnaire structure and content, ensuring that terms and questions are well understood;
- identification of medical devices, commodities and other items for which direct observation is required;
- use of the CSPro tool.

Area supervisors receive additional training based on their responsibilities. Refer to the HHFA data collector training materials for further details.

5.2.18 Pilot test the questionnaire in selected health facilities, review the experience, and amend the questionnaire if needed

The final part of data collector training involves pilot testing of the questionnaire. During the pilot test, data collection teams visit local health facilities and collect data in the same way they would during the actual survey. This exercise serves to identify any misunderstandings of instructions, and to highlight aspects of the questionnaire that may require revision. The pilot test also tests field logistics, supervisory capacity and the CSPro functionality. Based on the pilot test experience, if necessary, the survey manager revises the paper questionnaire and provides the updated version to the data manager/CSPro expert for updating of the CSPro tool. The survey implementation plan should include sufficient time between the pilot and the start of data collection, to enable completion of any revisions.

5.3 Data collection

It is recommended that data collection should start as soon as possible after the data collector training has been completed and the questionnaire has been finalized. Data collection requires careful planning and preparation, involving the following activities:

5.3.1 Plan the data collection visits in collaboration with local authorities

The survey manager prepares the list of sampled health facilities to be surveyed in each geographical area. A data collection team is assigned to each geographical area. The number of days required to collect the data is estimated based on of the number of data collection teams, the number of facilities to be visited in each geographical area, the distances between them and the mode of transport available. Before data collection starts, the survey manager prepares a **written schedule of facility visits for each data collection team**. The survey manager prepares a **letter of introduction** that is circulated by the MoH through the various administrative levels (regional offices, district offices, facilities) so that facilities are aware that an assessment will take place. Team leaders call the

facility in-charges in advance of visiting the facilities to establish an appointment for the date of the data collection visit.

5.3.2 Arrange for transport and regular communication during fieldwork

After preparing the schedule of visits, the survey manager arranges transport according to the number of sites to be visited, the number of teams involved, and the number of people per team. The area supervisor ensures regular communication with teams in the field and should be available to provide advice to data collectors and for troubleshooting. Teams should meet at the end of each day to discuss the data collection process, resolve any problems and transfer completed data files to the team leader for synchronization.

5.3.3 Prepare materials and tools for data collectors

After the questionnaire has been finalized, the final CSPro data collection tool is set up on all the electronic data collection devices (mobile phones, tablets). The survey manager and area supervisors ensure that all data collectors receive the following:

- Official identification document with photograph
- Electronic data collection device with finalized CSPro tool
- Back-up device for each team
- Mobile phone and credit for each team
- Data collector's guide
- Electronic copy of the final paper questionnaire for reference
- Schedule of facilities to be visited
- Contact details of area supervisor and facilities to be surveyed
- Notebook and pen to record any significant events, findings or challenges

5.3.4 Confirm appointments with health facilities.

The team leader telephones each health facility the day before the scheduled data collection visit to confirm the appointment.

5.3.5 Team leader assigns questionnaire sections to data collectors

Before visiting the facility, the team leader assigns the different sections of the questionnaire for that facility to the data collectors. This is done in the CSPro tool through an internet or Bluetooth connection. The data collectors then confirm that they have received their section assignments. (Refer to the HHFA Data manager guide for further details.)

5.3.6 Data collection teams visit health facilities and collect HHFA data

On arrival at the health facility, the data collectors introduce themselves to the facility in-charge and explain the purpose of the visit. After obtaining consent to conduct the survey, the data collectors complete the survey based on the questionnaire sections assigned to each data collector. Before leaving the facility, each data collector uses the "View reports" feature in the CSPro tool to check that all the sections of the questionnaire assigned to them have been completed and to resolve any missing or incomplete sections.

5.3.7 Data collectors transfer electronic files to team leader at the end of each day

At the end of each day, the completed questionnaire sections are transferred from each data collector to the team leader. The team leader then creates a complete facility record by combining the files from all the data collectors. (This process is often called data concatenation and is automated within the CSPro tool.) The team leader checks that the data for the facility are complete and ensures synchronization of the data to the server. If the data are incomplete, the team should return to the facility the following day to complete the questionnaire. It is also particularly important to check that

the facility ID items such as facility number, name, location, type and managing authority have been entered correctly, and that there are no inconsistent or missing data. (This information can be checked against the list of sampled facilities provided by the survey manager.) While data collection remains ongoing, all edits to the data must be made on the tablet used to originally collect the data. Wherever possible, any data quality problems should be addressed while the data collectors are still in the field.

5.3.8 Area supervisors oversee data collection and conduct data validation checks

Area supervisors are responsible for ensuring the accuracy and reliability of data collection. They support their data collection teams through regular communication and by resolving issues that may arise in the field. They should visit the health facilities regularly with the data collection teams to ensure that the agreed procedures are being followed. They can use the CSPro “View reports” function to track the progress and completeness of data collection across their teams. Area supervisors also validate data collection by repeating the survey in about 10% of the surveyed facilities. (The validation can also be conducted by the entity in charge of survey quality assurance.) Facilities visited for validation should be selected at random. Ideally, the validation should be done soon after the data collectors (within the same week) to avoid changes in the availability of items at the facility. The supervisor’s results are checked against those of the data collectors using the CSPro Compare Data tool. (Refer to the HHFA Data manager guide for further details.)

5.4 Data processing and analysis

5.4.1 Edit, validate, and clean the data set within CSPro

Ensuring high quality data requires reviewing and editing data in real time during data collection as well as after data collection is complete. Data are reviewed by data collectors, team leaders, area supervisors and the data manager throughout the data collection process. Edits can be made by data collectors during the data collection process with ongoing synchronization of completed facility data. Once all data collection is complete, further data edits can be made to the combined dataset by the data manager, using a batch edit application. The HHFA data set must be checked and cleaned within CSPro before exporting for analysis. It is good practice to always preserve an unedited copy of the data set and to document in detail the data editing process.

Data managers use a tracking sheet to track the progress across all teams towards completing the data collection for all facilities. They are also responsible throughout the data collection process for recording information on facilities that are missing, inaccessible, closed, replaced, etc. After all the data collection is complete, the data manager should sync data from all tablets one final time as the tablets are returned from the field.

The CSPro tool’s data manager menu includes a reporting function to generate information on the completeness of facility records in the final combined dataset. Using the tracking sheet, the data manager also identifies and resolves any potential duplicate records.

The CSPro tool was designed with built-in functionality to minimize the risk of data quality problems. However, the last step in the data management process is to undertake a review of key variables in the final combined dataset. This involves downloading the dataset, reviewing key fields, and creating a list of any errors or inconsistencies that should be corrected in the final combined dataset that will be used for analysis. Key variables for review include: consent; final result code; facility type; managing authority; urban/rural; administrative areas; GPS coordinates; and “Other” response options.

After the data have been reviewed and all necessary edits have been identified, the final combined dataset can be edited. A CSPro batch application (HFA_Edit.bch) enables edits to the dataset in CSPro. If a sample survey has been conducted, sampling weights should be calculated and a weight variable generated using the CSPro batch application for editing the HHFA dataset.

5.4.2 Export the data set to the HHFA data analysis platform

CSPro has a built-in “Export Data” tool that allows quick and easy export of data in a variety of formats. The exported data can then be imported into different software program according to need. In order to be able to use the HHFA data analysis platform, the data can be in several file formats (.csv, .xls, .dta). The preferred dataset format for the HHFA analysis platform is .dta.

5.4.3 Prepare HHFA data analysis platform according to country needs

The HHFA data analysis platform calculates all the HHFA indicators and produces standard indicator tables and graphs as well as a standard HHFA report outline. The modules and questionnaires implemented by the country are selected within the analysis platform and indicators can also be turned on or off as required. The platform also allows countries to adapt the tables and reports according to their needs, and to create additional country-specific indicators if needed. The platform is prepared according to country needs, including the addition of country-specific indicators and tables. (Refer to Section 3.6 and the instructions tab in the data analysis platform for further details.)

5.4.4 Conduct analyses of the HHFA data, using the standard HHFA indicators as well as any country-specific indicators of interest

Once the data have been verified, data analysis can begin. Many different types of results (analysis outputs) can be obtained from surveys. The types of analysis used depend to a large extent on the design determined in the planning phase of the HHFA survey (e.g., national level versus subnational level analysis). The HHFA data analysis platform produces a standard set of indicators, tables and charts that can be made available in a standard report outline format. The country may also have defined additional country-specific indicators within the analysis platform. It is important to start by conducting a complete analysis of all the survey data, generating the full range of survey results, to ensure that important findings have not been overlooked.

As discussed in the following section, data analysis and interpretation represent an iterative cycle. Based on the initial set of results from the standard analyses, there may be a need for further analysis in areas of interest. For example, unexpected patterns of data and relationships between variables can emerge that may provide new insights and generate new questions requiring further exploration of the data. These additional analyses can be generated within the data analysis platform.

5.5 Data interpretation, report-writing, dissemination, and archiving

The data interpretation and report-writing process is led by the data analysis team, supported by the survey coordination group, and with inputs from programme-specific experts and other stakeholders. The data analysis team draws upon their analytical skills and pre-existing knowledge of the service delivery system and the country context to understand the HHFA findings and guide the interpretation process. Where relevant, the analysts may also gather data from other sources (e.g., routine health information systems, population-based surveys, health system reviews, programme-specific assessments, special studies) to help in contextualizing and interpreting the HHFA findings.

The report outline format produced by the data analysis platform contains boxes where analysts can insert the interpretation text within the relevant section.

What is interpretation?

Data interpretation is a crucial but often neglected part of the survey process. It is often reduced to a simple description of the data through summary statistics (means, frequencies, etc.) that are presented in tables and graphs. This is not enough. Interpretation aims to “make sense of the data”. It involves knowing what the HHFA data are saying about the status of health facility services,

5. HHFA PLANNING AND IMPLEMENTATION STEPS

understanding what the data mean within the country context, and identifying the most important issues to inform decisions and policies.

Interpretation should identify the most critical issues affecting service delivery, explore their underlying causes, and make relevant and realistic recommendations for improvements. For example, the findings of a HHFA may show that several essential items for service delivery (equipment, laboratory reagents, tracer medicines) are lacking in a high proportion of health facilities. Mere reporting of these findings is not enough, given their importance for service delivery: it is crucial to understand the causes. Contextual information might point to inadequate procurement and logistic systems, which should be strengthened. Other explanations might include a devaluation of the local currency that has impaired international procurement, or the withdrawal of important aid agencies, which would require re-programming available resources.

The overall process of interpretation usually involves an iterative cycle of analysis and interpretation, with several rounds of data exploration, interspersed with reviews by knowledgeable people of the insights gained at each stage. It may involve going back to the raw data, developing new analyses, supplementing the data with contextual information, and using prior knowledge and experience to understand findings and to ask new questions.

The volume of data produced by a HHFA is extremely rich but can also be overwhelming. It is therefore important to approach the interpretation process systematically. Broadly, the process involves a comprehensive initial exploration of the results by the data analysis team, followed by in-depth programme-specific reviews, and a data interpretation workshop that brings together multiple stakeholders for final review of the findings and recommendations.

Interpretation perspectives: comprehensive overview plus in-depth programme-specific

It is important that the interpretation process includes both detailed programme-specific perspectives as well as a comprehensive overview perspective.

The insights of programme experts are essential for achieving a thorough understanding and contextualization of programme-specific data. However, focusing only on specific indicators and programmes, in isolation from the other components of health services, can result in important patterns in the data being missed, and relationships between indicators of different service areas being overlooked. Furthermore, common problems that require a unified strategy may be missed. The resulting picture risks being narrow or even distorted. For example, analysts who focus only on malaria will not understand the issues that are common to other service areas (e.g., a weak supply system, lack of in-service training, poor measures of infection prevention and control, etc.).

Health services are the result of the dynamic interactions of interconnected skills, resources, procedures, and systems: the workforce, infrastructure, equipment, medicines, management systems, etc. Maintaining an overview of all the dimensions of the survey is therefore crucial to achieving a solid understanding what the data can reveal. For example, management and finance indicators may provide insights into performance in the service readiness dimensions. Service readiness performance may help to explain results within the quality-of-care dimension. There may be significant differences in performance among different programmes, or problems common to multiple programmes. A comprehensive overview can help to highlight and prioritize issues for the attention of managers and policy makers.

5.5.1 Conduct initial data review and interpretation

Before proceeding with the initial review of the HHFA data, it is important for the data analysis team to understand the general structure of the analysis platform outputs: the indicator tables and the way they are organized in the report outline. This can be achieved quickly by reviewing the five service dimensions within the indicator inventory platform.

In the initial phase of the interpretation process, the analysis team should review ALL the standard tables and charts produced by the analysis platform. It is important that the scope of this initial phase is comprehensive, to avoid that any important findings are overlooked.

The initial review phase has several purposes:

- to provide a preliminary overview of the major findings across the survey;
- to identify any data quality issues that may not have been identified during data cleaning in CSPro;
- to identify any ‘weird’ data, e.g., outliers, inconsistent data, seemingly unlikely findings; (such ‘weird’ data that should be treated with caution and, if related to important health services’ aspects, the survey report should include recommendations for further assessments and studies, to confirm or correct the findings); and
- to identify issues that should be highlighted to specific programme or management experts in the next phase of the review.

5.5.2 Engage relevant experts for in-depth review of specific analysis outputs

Ideally, this phase involves an in-depth exploration of specific sections of the analysis outputs by specific groups of programme/technical experts. The analysis team prepares the specific sections of the analysis outputs for each expert group, highlighting key initial findings. The expert group reviews and interprets the findings. The analysis team then engages in discussions with individual expert groups to refine the analysis and interpretation, and to develop recommendations. This process may require several rounds of discussion and further analysis, including the review of information from various sources to help explain the findings. If it is not feasible to engage with individual expert groups in this way, this phase could also take place during the data interpretation workshop.

5.5.3 Conduct a data interpretation workshop

The data interpretation workshop brings together representatives of the various technical programmes as well as other relevant stakeholders. The participants are given an overview of the HHFA process and an introduction to the HHFA data analysis and interpretation concepts. The data analysis team present the initial findings, highlighting useful information and guiding workshop participants in the process of reaching conclusions and developing recommendations that will support decision-making. Participants then work in programme/technical groups to review the HHFA findings, provide further programme-specific interpretation and recommendations, and develop key messages. The outputs of these group discussions will form the basis of the survey recommendations and report.

5.5.4 Prepare the final HHFA report

Based on the outputs of the data interpretation workshop, the analysis team (or a designated individual) prepares the final survey report. The final report is submitted to the survey coordinating group and the MoH for approval.

The report should focus on communicating the most important and relevant findings, along with recommendations for action. In addition to addressing new findings, the report should also address the objectives of the survey, i.e., the questions to which the data should provide answers.

The data analysis platform produces a very large number of tables and graphs. While all of these analysis outputs should be reviewed as discussed, it is not necessary to include the full set of outputs in the main body of the final survey report. Therefore, the data analysis team, in collaboration with the survey coordinating group, should select a subset of key tables and graphs to include in the report. The complete set of analysis outputs should be made available as an annex. Additional, detailed programme-specific reports may also be developed, containing the full set of outputs relevant to the programme.

5.5.5 Plan and implement dissemination activities as soon as possible

Dissemination of results is key to the successful implementation of a survey. The survey results will be useful only if data are received in a timely manner by their intended recipients and their strengths, potential uses and limitations are well understood by the target audience.

The purpose of dissemination is to ensure that the right people receive survey results in a format that is targeted specifically to their needs. Target audiences for the HHFA are usually decision-makers at national, district and facility levels.

The survey manager plans meetings to present the HHFA results to key stakeholders within the MoH and among key donors and implementing partners. After the report is finally approved, it should be circulated among key stakeholders and be made available on the MOH website.

Any of the following activities may be undertaken in order to disseminate the HHFA results:

- national and/or regional dissemination workshops;
- annual health sector review;
- web dissemination e.g., MoH web site, country observatory, etc.;
- publication of reports, presentations and brochures.

5.5.6 Document and archive the survey using metadata standards

It is important that a country's final HHFA dataset is stored in a secure location where it can be accessed by authorized users for further analysis and for comparison with future HHFA datasets. Fully documenting and archiving data sets helps ensure that important survey data (microdata¹⁹) and data documentation (metadata²⁰) are preserved for future reference and analysis. Data archiving includes the acquisition, preservation, documentation, cataloguing and dissemination of metadata and microdata.

Metadata helps researchers and other audiences to find the data, understand what the data are measuring and assess the quality of the data. Metadata included the following information:

- **Finding the data:** Names, abstracts, keywords and other important metadata elements help individuals and organizations locate the data sets and variables that meet their needs.
- **Understanding what the data are measuring:** Descriptions of the survey design and the methods used when collecting and processing the data, allow users to fully comprehend the context of the data.
- **Assessing the quality of the data:** Information about the data collection standards, as well as any deviations from the planned standards, is important for gauging whether the data are useful for specific uses.

CSPPro has a built-in Export Data tool that enables quick and easy export of data in a variety of formats. The exported data can then be imported into different software programs depending on user needs.

WHO is developing a global SARA/HHFA data archive where countries may choose to store their survey reports and metadata. The archive applies the Dublin Core / Data Documentation Initiative (DDI) metadata standards for describing the data produced by the surveys.

¹⁹ Microdata refers to data on the characteristics of units of a population, such as individuals, households, facilities, or establishments, collected by census, survey or experiment.

²⁰ Metadata are data that provide information about other data.

Annex. Calculating HHFA indices

A2.1 General service readiness domain scores and index

General service readiness is described by the following five domains of tracer indicators:

- Basic amenities;
- Basic equipment;
- Standard precautions for infection prevention;
- Diagnostic capacity (laboratory);
- Essential medicines.

Each domain consists of a set of tracer items. **Table 6** lists the tracer items for each domain and shows the calculation for the domain score. In the HHFA indicator inventory platform, each item is presented as a percentage. The domain score is presented at the end of the list of indicators in each readiness table, as the mean percentage of items available across all facilities. Note that the lists of tracer items in the HHFA are updated versions of the SARA lists. The essential medicines list has been updated for consistency with the basket of essential medicines for PHC related to SDG 3.8.1²¹

Table 6. General service readiness tracer items, domain scores and general readiness index

General service domains	Tracer items	Domain score (mean percentage of items available)
(a) Basic amenities	• Power	$n / 7 \times 100$, where n is the total number of items available in the domain
	• Improved water source facility premises	
	• Room with auditory and visual privacy for patient consultations	
	• Access to improved sanitation facilities for clients	
	• Communication system (phone or short-wave radio)	
	• Access to computer with internet	
	• Emergency transportation system for patient	
(b) Basic equipment	• Adult weighing scale	$n / 12 \times 100$ where n is the total number of items available in the domain
	• Child scale	
	• Infant scale	
	• Height board / stadiometer	
	• Measuring tape	
	• Thermometer	
	• Stethoscope	
	• Blood pressure apparatus	
	• Examination light	
	• Otoscope	
	• Ophthalmoscope	
	• Pulse oximeter	

²¹ <https://unstats.un.org/sdgs/metadata/?Text=&Goal=3&Target=3.8>

General service domains	Tracer items	Domain score (mean percentage of items available)
(c) Standard precautions for infection prevention	<ul style="list-style-type: none"> • Safe final disposal of sharps • Safe final disposal of non-sharp infectious wastes • Appropriate storage of sharps waste (sharp container) • Appropriate storage of non-sharp infectious waste (waste receptacle with lid and plastic bin liner) • Environmental disinfectant • Single-use, standard disposable or auto-disable syringes • Hand hygiene items (soap and running water or alcohol-based hand rub) • Latex gloves • Guidelines for standard precautions • Guidelines for health care waste management • Staff trained in health care waste management • Sterilization equipment in facility or system for sending items outside for sterilization 	$n / 12 \times 100$ where n is the total number of items available in the domain
(d) Diagnostic capacity	<ul style="list-style-type: none"> • Haemoglobin • Blood glucose • Urine dipstick – glucose • Urine dipstick – protein • Urine dipstick – ketones • Urine pregnancy test • Malaria diagnostic capacity • HIV diagnostic capacity • Syphilis rapid diagnostic test (RDT) 	$n / 9 \times 100$ where n is the total number of items available in the domain
(e) Essential medicines	<ul style="list-style-type: none"> • Salbutamol inhaler • Beclomethasone or other corticosteroid inhaler • Gliclazide or other sulphonyl urea oral • Metformin tab/cap • Insulin - regular injection • Any two of the following oral anti-hypertensives: beta blocker, calcium channel blocker, thiazide-like diuretic, ACE inhibitor • Simvastatin or other statin tab/cap • Furosemide oral or injectable • Aspirin tab/cap • Ibuprofen tab/cap • Paracetamol tab/cap • Morphine (oral or injection) • Fluoxetine or other SSRI tab/cap • Phenytoin or carbamazepine tab/cap • Gentamicin injection • Ceftriaxone injection • Amoxicillin tab/cap • Procaine penicillin or benzathine penicillin injection • Hormonal contraceptives (oral, injection and/or implants) • Oral rehydration salts (ORS) • Zinc sulphate tab/cap • Oxytocin injection • Magnesium sulphate injection • Folic acid tab/cap 	$n / 30 \times 100$ where n is the total number of items available in the domain

ANNEX. CALCULATING HHFA INDICATORS

	<ul style="list-style-type: none"> • Artemisinin-based combination therapy (ACT) tab/cap • Artesunate (injection or suppository) • Antiretrovirals (ARVs) for first line combination treatment regimen • Chlorhexidine • Ready-to-use therapeutic food (RUTF) • Combination therapy for tuberculosis 	
General service readiness index		Mean score of the five domains: (a + b + c + d + e) / 5

Figure 18. Example of general readiness index calculations

Service area	Indicator table	Readiness index per service area	General service readiness index
Basic amenities	Basic amenities for main service area of the facility	90%	70%
Basic equipment	Basic equipment in the main service area of the facility	70%	
Standard precautions for infection prevention	Standard precautions for infection prevention	80%	
Basic diagnostic capacity (laboratory)	Basic diagnostic capacity	50%	
Essential medicines	WHO essential medicines	60%	

A2.2 Service-specific readiness domain scores and indices

For each specific service that is assessed in the HHFA, there is a readiness table containing indicators that show the availability of tracer items within each of four domains:

- Staff and guidelines
- Equipment
- Diagnostics
- Medicines and commodities.

Table 7 provides an example of a service-specific readiness table for diabetes services. In the HHFA indicator inventory platform, each item is presented as a percentage. In service-specific readiness tables, the denominator is the number of facilities offering the specific service. The indicators are therefore expressed as “Percentage of facilities offering diabetes services with...”

The score for each domain as well as the overall readiness index are presented as “mean” indicators at the end of the list of indicators in each readiness table. Note that the number of items per domain varies among different services. For some services, some of the domains may not be represented.

Table 7. Diabetes service readiness indicators, domain scores and index

Service specific domains	Tracer items	Domain score (mean percentage of items available)
(a) Trained staff and guidelines	• a1) Guidelines for diabetes diagnosis and treatment	$n / 2 \times 100$, where n is the total number of items available in the domain
	• a2) Staff trained in diabetes diagnosis and treatment	
(b) Equipment	• b1) Blood pressure apparatus	$n / 3 \times 100$ where n is the total number of items available in the domain
	• b2) Adult weighing scale	
	• b3) Measuring tape	
(c) Diagnostics	• c1) Blood glucose test	$n / 3 \times 100$ where n is the total number of items available in the domain
	• c2) Urine dipstick – protein	
	• c3) Urine dipstick – ketones	
(d) Medicines and commodities	• d1) Metformin oral	$n / 3 \times 100$ where n is the total number of items available in the domain
	• d2) Glibenclamide, gliclazide or other oral sulphonyl urea	
	• d3) Insulin regular injectable	
Service-specific readiness index		Mean score of all the items: $(a1 + a2 + b1 + b2 + b3 + c1 + c2 + c3 + d1 + d2 + d3) / 11$

Figure 19 shows the diabetes service readiness table in the HHFA indicator inventory platform.

Figure 19. Diabetes service readiness table.

Table 3.3.2.2. Diabetes service readiness

Indicator 3.3.2.2.1.	Percentage of facilities offering diabetes services with guidelines for diabetes diagnosis and treatment	Domain scores
Indicator 3.3.2.2.2.	Percentage of facilities offering diabetes services with staff trained in diabetes diagnosis and treatment	
Indicator 3.3.2.2.3.	Percentage of facilities offering diabetes services with blood pressure apparatus	
Indicator 3.3.2.2.4.	Percentage of facilities offering diabetes services with adult weighing scale	
Indicator 3.3.2.2.5.	Percentage of facilities offering diabetes services with measuring tape	
Indicator 3.3.2.2.6.	Percentage of facilities offering diabetes services with blood glucose test	
Indicator 3.3.2.2.7.	Percentage of facilities offering diabetes services with urine dipstick - protein	
Indicator 3.3.2.2.8.	Percentage of facilities offering diabetes services with urine dipstick - ketones	
Indicator 3.3.2.2.9.	Percentage of facilities offering diabetes services with metformin cap/tab	
Indicator 3.3.2.2.10.	Percentage of facilities offering diabetes services with glibenclamide cap/tab	
Indicator 3.3.2.2.11.	Percentage of facilities offering diabetes services with gliclazide or other sulphonylurea	
Indicator 3.3.2.2.12.	Percentage of facilities offering diabetes services with insulin regular injectable	
Indicator 3.3.2.2.13.	Percentage of facilities offering diabetes services with glucose 50% injectable	
Indicator 3.3.2.2.14.	Diabetes service readiness: mean percentage of staff and guidelines items at facilities	
Indicator 3.3.2.2.15.	Diabetes service readiness: mean percentage of equipment items at facilities	
Indicator 3.3.2.2.16.	Diabetes service readiness: mean percentage of diagnostics items at facilities	
Indicator 3.3.2.2.17.	Diabetes service readiness: mean percentage of medicines and commodities items at facilities	
Indicator 3.3.2.2.18.	Diabetes service readiness: mean percentage of all items at facilities ← Readiness index	
Indicator 3.3.2.2.19.	Diabetes service readiness: percentage of facilities with all items	

A2.3 Calculating service availability indicators and indices

Important note concerning the infrastructure and workforce density indicators and the service availability indices: although the data for these indicators are collected through the HHFA questionnaire, these indicators should not be calculated for a sample of facilities. **Data must be available for ALL facilities in an administrative unit in order to calculate the density indicators and availability indices.** These indicators require a population size as the denominator. In a sample survey, it is not possible to use a population denominator.

If the HHFA is implemented as a census of all facilities, the HHFA data can be used to calculate density indicators and availability indices. However, the data needed to calculate these indicators can also be gathered from other sources, such as a national master facility list or the routine health information system. This information can be used to calculate the density indicators and service availability indices separately from the HHFA data.

General service availability is summarized by two domains of tracer indicators: health infrastructure and health workforce. **Table 8** shows the required information and potential data sources for calculating service availability.

Table 8. Data sources

Information needed	Potential data source
List of all health facilities	HHFA, Master facility list
Health workforce data	HHFA, Human resources information system (HRIS)
Inpatient and maternity beds data	HHFA, Routine health information system (RHIS), Varies by country
Population data (national and regional/district depending on how results will be reported)	National Bureau of Statistics

Health infrastructure density indicators

- **Facility density (number per 10 000 population):** the facility density is used as a crude indicator of outpatient service access.
- **Inpatient bed density (number per 10 000 population):** inpatient bed density provides an indicator of the inpatient services access. Paediatric beds (cots) are included, but maternity beds are excluded.
- **Maternity bed density (number per 1000 pregnant women):** maternity bed density provides an indicator of access to delivery services. Data on maternity beds can be used calculate the density of maternal beds per 1000 pregnant women per year. The denominator is estimated from the population data. The indicator does not include delivery beds.

Health workforce density indicator

- **Health workforce density (number per 10 000 population):** the health workforce density is the number of core medical professionals per 10 000 population: physicians, non-physician clinicians, registered nurses and midwives. This includes part-time physicians who are given the value of 0.5 in the scoring.

These indicators must be expressed as a percentage score compared with a target or benchmark. **Table 9** shows the target and calculation of each indicator. If the tracer indicator score exceeds the target, it is scored as 100%.

Table 9 Service availability indicators

Domain		Indicator	Target	Score (%) (n / target, maximum)
Health infrastructure				
<i>a</i>	Facility density	Number per 10 000 population (<i>n</i>)	2	$n / 2 \times 100$
<i>b</i>	Inpatient bed density	Number per 10 000 population (<i>n</i>)	25	$n / 25 \times 100$
<i>c</i>	Maternity bed density	Number per 1000 pregnant women (<i>n</i>)	10	$n / 10 \times 100$
Health workforce				
<i>d</i>	Core health workforce density	Number per 10 000 population (<i>n</i>)	23	$n / 23 \times 100$

Health infrastructure targets and scores

Facility density (a): For the HHFA, a target of at least 2 facilities per 10 000 population is used. The indicator is scored as $n / 2 \times 100\%$ (maximum 100), where *n* is the number of facilities per 10 000 population. A major limitation of this indicator is that it does not consider the size of the facilities.

Inpatient bed density (b): For the HHFA, a benchmark of 25 beds per 10 000 is used. The indicator is scored as $n / 25 \times 100\%$ (maximum 100), where *n* is the number of inpatient beds per 10 000 population. **Table 10** shows recent global estimates of average inpatient bed densities by World Bank income group.

Table 10. Estimated inpatient bed densities by World Bank income group²²

Income group	Inpatient beds per 10 000 population
Low-income countries	12.8
Lower middle-income countries	17.7
Higher middle-income countries	26.3
High income countries	46.8

Maternity bed density (c): Based on the assumption that there should be sufficient beds for all pregnant women at an occupancy rate of 80% (to account for the uneven spread of demand over time) and an average length of stay of 3 days, the target is $(1000 / 0.8) \times (3 / 365) = 10$ per 1000 pregnant women. The indicator is scored as $n / 10 \times 100\%$ (maximum 100), where *n* is the number of maternity beds per 1000 pregnant women.

An estimation for the number of pregnant women in the population can be derived from the crude birth rate (CBR) for the country of interest and the following equations²³:

- *A* = estimated number of live births = (CBR per 1000 × total population)
- *B* = estimated live births expected per month = (*A* / 12)
- *C* = estimated number of pregnancies ending in stillbirths or miscarriages = (*A* × 0.15)
- *D* = estimated pregnancies expected in the year = (*A* + *C*)
- *E* = estimated number of women pregnant in a given month = (0.70 × *D*)
- *F* = estimated % of total population who are pregnant at a given period = (*E* / total population × 100).

²² Walker PEG, Whittaker C, Watson O, et al. The impact of COVID-19 and strategies for mitigation and suppression in low- and middle-income countries. *Science* 369, 413–422 (2020) 24 July 2020

²³ Interagency Working Group on Reproductive Health in Crisis. Inter-agency Field Manual on Reproductive Health in Humanitarian settings. 2010 Revision for Field Review. (<https://reliefweb.int/report/world/inter-agency-field-manual-reproductive-health-humanitarian-settings-2010-revision-field>)

Health workforce target and score

Health worker density (d): The SDG indicative index threshold for core health worker density is 44.5 per 10 000 population²⁴. However, as this value seems unrealistically high for most low- and middle-income countries (LMICs) at present, the HHFA continues to use the previous threshold published by WHO in 2006: 23 per 10 000 population²⁵. The indicator is scored as $n / 23 \times 100\%$ (maximum 100), where n is the number of core health workers per 10 000 population.

Note: The targets for the above indicators are intended to be only broadly indicative and must be used with caution. Targets should be adapted to needs and feasibility within the country context. Countries may wish to use their own targets to calculate this indicator, and track progress over time. The HHFA data analysis platform allows countries to insert their own targets. Furthermore, overall density values may mask important subnational differences.

The general service availability index

The general service availability index is calculated using the four above mentioned indicators. First, indices are calculated for health services infrastructure and health workforce. The calculations for creating those indices are shown in **Table 11**. (Please refer **Table 9** for the definitions of indicators a – d). The general service availability index is the unweighted average of the two areas: health infrastructure and health workforce: $[(a + b + c) / 3] + d / 2$ and is a percentage score.

Table 11. Service availability indices

Index	Indicator	Target	Score
Health infrastructure index	Average score of the three indicators: facility density, inpatient bed density, maternity bed density	100	$(a + b + c) / 3$
Health workforce index	Core health worker density	100	d
General service availability index	Unweighted average of the two areas: health infrastructure and	100	$[(a + b + c) / 3] + d / 2$

Example calculation

Table 12 shows the data used for this example.

Table 12. Example data

Data item	Value
Number of facilities	400
Number of inpatient beds	5500
Number of maternity beds	800
Number of core health workers	4600
Population	3 000 000
Crude birth rate (CBR)	40

There are three main steps to calculate the service availability index.

Step 1. Calculate service availability indicators

²⁴ Global strategy on human resources for health: workforce 2030. Geneva: World Health Organization; 2016. (<https://apps.who.int/iris/handle/10665/250368>)

²⁵ The world health report 2006: working together for health. Geneva: World Health Organization; 2006. (https://www.who.int/workforcealliance/knowledge/resources/whreport_2006/en/)

The first step is to calculate the four service availability indicators. The following example (**Table 13**) shows the equations used to calculate each of the four indicators using the example data values.

Table 13. Calculating the indicators

Indicator	Value
Facility density (number per 10 000 population)	number of facilities / population = $n / 10\,000$ $400 / 3\,000\,000 = n / 10\,000$ $n = 1.33$
Inpatient bed density (number per 10 000 population)	number of inpatient beds / population = $n / 10\,000$ $5500 / 3\,000\,000 = n / 10\,000$ $n = 18.33$
Maternity bed density (number per 1000 pregnant women)	number of maternity beds / pregnant population* = $n / 1000$ $800 / 96\,600 = n / 1000$ $n = 8.28$ *see Table 14 for how to calculate number of pregnant women
Health workforce density (number per 10 000 population)	number of core health workers / population = $n / 10\,000$ $4600 / 3\,000\,000 = n / 10\,000$ $n = 15.33$

Table 14. Calculating the number of pregnant women

A = Estimated number of live births = (CBR per 1000 × total population)	$(40 / 1000) \times 3\,000\,000 = 120\,000$
B = Estimated live births expected per month = (A / 12)	$120\,000 / 12 = 10\,000$
C = Estimated number of pregnancies ending in stillbirths or miscarriages = (A × 0.15)	$120\,000 \times 0.15 = 18\,000$
D = Estimated pregnancies expected in the year = (A + C)	$120\,000 + 18\,000 = 138\,000$
E = Estimated number of women pregnant in a given month = (0.70 × D)	$0.7 \times 138\,000 = 96\,600$
F = Estimated % of total population who are pregnant at a given period = (E / total population × 100)	$(96\,600 / 3\,000\,000) \times 100 = 3.22$

Step 2. Calculate service availability indicator scores

Next, use the values obtained from step one to calculate the service availability indicator scores. The scores compare the indicator to a target and are expressed as a percentage. **Table 15** shows the calculations for each of the four service availability indicator scores.

Table 15. Calculating the service availability indicator scores

Domain	<i>n</i>	Target	Score (%) (<i>n</i> / target) x 100 (maximum 100)
Health infrastructure			
<i>a</i> Facility density	1.33	2	(1.33 / 2) x 100 = 66.5
<i>b</i> Inpatient bed density	18.33	25	(18.33 / 25) x 100 = 73.3
<i>c</i> Maternity bed density	8.28	10	(8.28 / 10) x 100 = 82.8
Health workforce			
<i>d</i> Core health workforce density	15.33	23	(15.33 / 23) x 100 = 66.7

Step 3. Calculate service availability indices

Lastly, use the service availability indicator scores to create the health infrastructure index, the health workforce index, and the overall service availability index. **Table 16** shows these three index calculations using the example data.

Table 16. Calculating the service availability index

Index	Indicator	Score (%)
Health infrastructure index	Average score of the three indicators: facility density, inpatient bed density, maternity bed density	$(a + b + c) / 3$ (66.5 + 73.3 + 82.8) / 3 = 74.2
Health workforce index	Core health worker density	<i>d</i> 66.7
General service availability index	Unweighted average of the two areas: infrastructure and workforce	$[(a + b + c)/3 + d] / 2$ (74.2 + 66.7) / 2 = 70.5

World Health Organization
20 Avenue Appia
1211 Geneva 27
Switzerland
hhfa@who.int