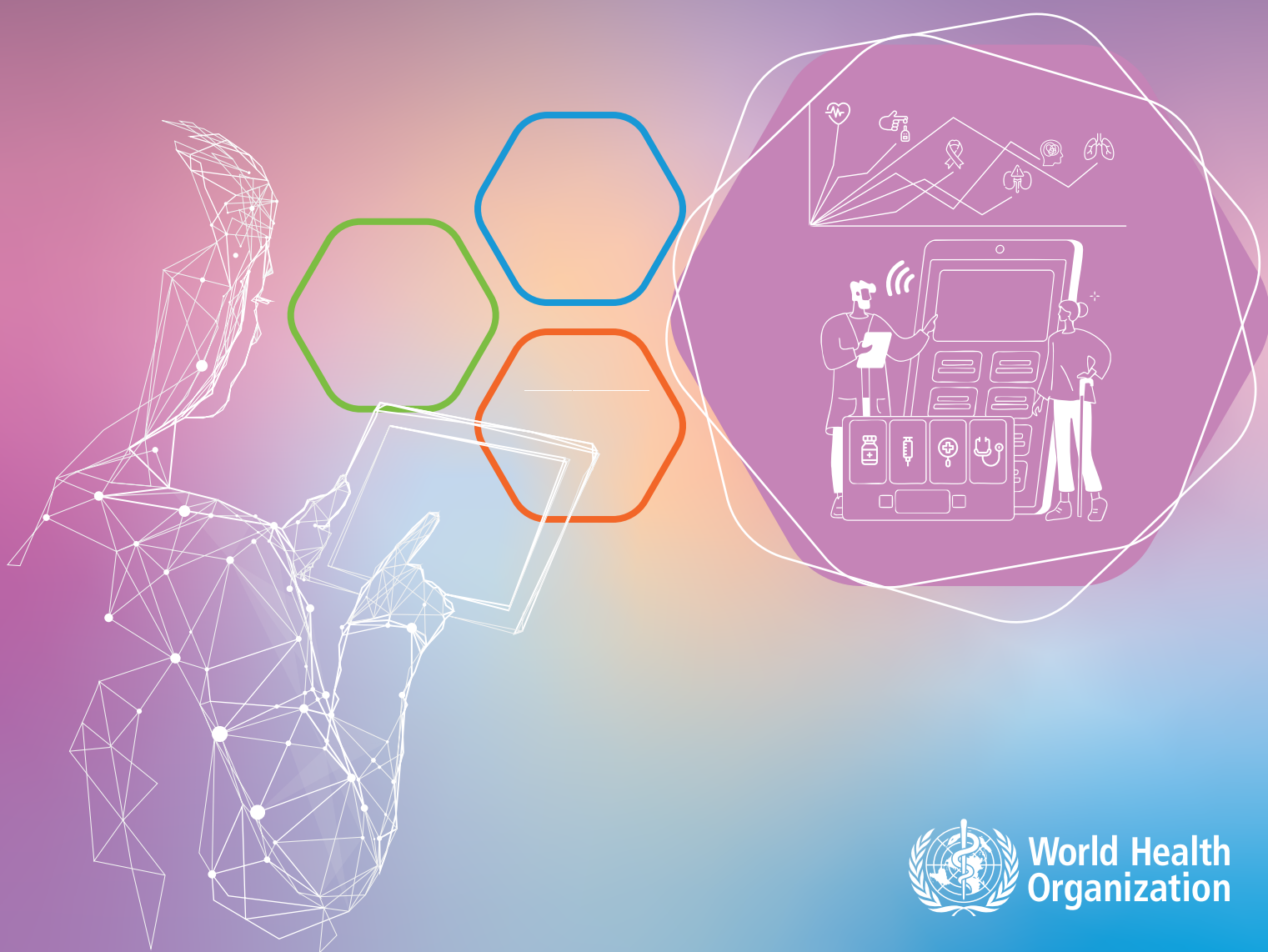


Toolkit for the analysis and use of facility-based data on noncommunicable diseases

Module 1

Surveillance tools and methodologies
in primary care settings



World Health
Organization

Toolkit for the analysis and use of facility-based data on noncommunicable diseases

Module **1**

Surveillance tools and methodologies
in primary care settings

Toolkit for the analysis and use of facility-based data on noncommunicable diseases. Module 1. Surveillance tools and methodologies in primary care settings

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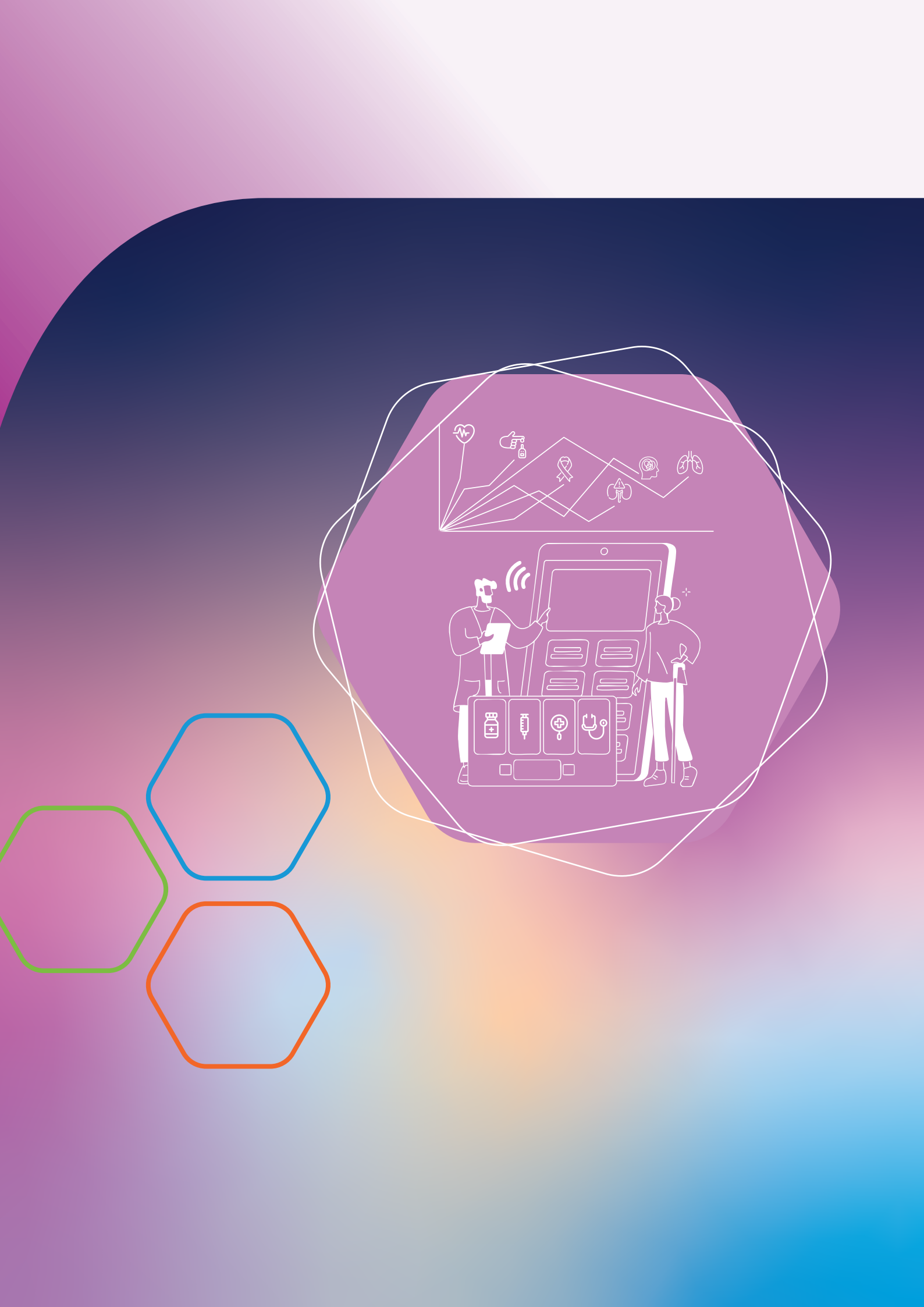
This document and the World Health Organization (WHO) *Toolkit for the analysis and use of facility-based data on noncommunicable diseases*, of which it is a part, have been developed by WHO.

Technical coordination and content development were led by Farshad Farzadfar (WHO Department of Noncommunicable Diseases and Mental Health), with support from Arlene Quiambao, Mohammad-Reza Malekpour and Neo Tapela. The overall process was supervised by Leanne Riley.

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Abbreviations

CRD	chronic respiratory disease
CVD	cardiovascular disease
D	denominator
DM	diabetes mellitus
HTN	hypertension
N	numerator
NCD	noncommunicable disease
PEN	WHO Package of essential noncommunicable disease interventions for primary health care
WHO	World Health Organization



1. Introduction

This guide is one of four resources that comprise the World Health Organization (WHO) *Toolkit for the analysis and use of facility-based data on noncommunicable diseases*. It is designed to help noncommunicable disease (NCD) programme managers and stakeholders strengthen their analysis and use of health facility data to better manage and monitor NCD services and has been developed within the framework of WHO's *Toolkit for routine health information systems data* (<https://www.who.int/data/data-collection-tools/health-service-data/toolkit-for-routine-health-information-system-data/>).



About this guide

The guide contains practical tools and methodologies for evaluating the detection, diagnosis, and treatment of NCDs such as cardiovascular diseases (CVDs), diabetes, and chronic respiratory diseases (CRDs), as well as the early diagnosis of cancers and cervical cancer screening at facility level (as outlined in WHO's *Noncommunicable disease facility-based monitoring guidance: framework, indicators and application* (<https://iris.who.int/bitstream/handle/10665/364379/9789240057067-eng.pdf?sequence=1>)).

The guide also emphasizes the importance of using reliable, high-quality data to track progress, address gaps, and improve health outcomes. It offers a structured, analytical model for service-delivery monitoring, and proposes essential criteria for developing facility-level dashboards. It also outlines approaches for ensuring data quality and sets out core and optional indicators (and practical advice on their analysis and interpretation) for monitoring NCD programme performance.



Audience and objectives

This guide is intended for use by stakeholders at different levels of the health system in both private and public sectors, including health workers who provide NCD essential services and collect individual or facility-level data; health facility managers in charge of optimizing facility resources; surveillance, monitoring and evaluation officers; health management information system managers.

Its key objectives are to:

- support NCD programme managers in assessing data quality, calculating key indicators, and translating data into actionable strategies;
- provide health facility managers with tools to optimize resource use and improve service delivery;
- assist health workers in using data to enhance individual patient care and adherence to treatment protocols;
- inform decision-making at district, subnational, and national levels by offering insights into trends, gaps, and resource needs;

- enable health-care facilities and programme managers to strengthen monitoring and evaluation processes for NCD interventions, ensuring alignment with global and regional health objectives while addressing local needs;
- equip users with strategies to create reports and advocacy materials that effectively communicate achievements and needs to policy-makers, donors, and other stakeholders.

Three further resources that comprise the *Toolkit for the analysis and use of facility-based data on noncommunicable diseases* are:

- *Toolkit for the analysis and use of facility-based data on noncommunicable diseases: Module 2. Companion training exercises.* Offers programme managers in health facilities and at national offices the opportunity to practice the analysis and manual calculation of NCD core indicators for routine reporting and programme improvement. Manual calculation provides insight into what happens on the back-end of automated indicator calculations, and is also useful in paper-based settings.
- *Toolkit for the analysis and use of facility-based data on noncommunicable diseases: Module 3. WHO District Health Information System 2 (DHIS2) user manual.* Guidance for deploying, configuring, and utilizing the District Health Information System 2 (DHIS2) platform for monitoring NCDs.
- *Toolkit for the analysis and use of facility-based data on noncommunicable diseases: Module 4. WHO E-registry user manual.* Guidance to support effective use of the NCD E-Registry platform, providing detailed instructions on data entry and accessing automatically calculated core indicators from WHO's *Noncommunicable disease facility-based monitoring guidance*.¹

NCDs covered by the toolkit

The toolkit relates to data collection and reporting on the following components from the *WHO Package of essential noncommunicable disease interventions for primary health care* (WHO PEN):

- Cardiovascular disease (CVD, including risk assessment and management, hypertension management); diabetes management.
- Chronic respiratory diseases (such as asthma and chronic obstructive pulmonary disease (COPD) and the management of related acute episodes.
- Early diagnosis of cancer (specifically cervical cancer) at primary health-care level, complemented by screening and diagnosis guidelines as outlined in the WHO PEN package for cervical cancer prevention and control programmes (1).

What is not covered in the toolkit

This first edition of the toolkit does not cover early diagnosis for breast cancer, childhood cancer, or other general cancers, but it does cover the evaluation of all related signs and symptoms among individuals attending the health-care facility, and the referral of those with suspected signs and symptoms. This toolkit also does not include the healthy lifestyle counseling, self-care, or palliative care components of WHO PEN.

¹ Noncommunicable disease facility-based monitoring guidance: framework, indicators and application. Geneva: World Health Organization; 2022 (<https://iris.who.int/bitstream/handle/10665/364379/9789240057067-eng.pdf?sequence=>, accessed 26 April 2025).

2. Methods

This toolkit was developed through a collaborative and iterative process led by the WHO Department of Noncommunicable Diseases and Mental Health. The methodology involved a comprehensive review of existing WHO technical materials on routine health information systems, facility-based monitoring, and NCD service delivery. The content and structure are fully aligned with the *WHO Noncommunicable Disease Facility-Based Monitoring Guidance: Framework, Indicators and Application* in primary care settings, as well as with WHO PEN, HEARTS, and HEARTS-D implementation frameworks. The development process drew on field experiences from country-level implementation of these tools, including integration into digital platforms such as DHIS2. Drafts were reviewed and refined through expert consultations, with inputs from WHO regional and country offices and subject matter experts in NCD surveillance, data quality, and digital health.

Conflict of Interest Statement

All contributors to this toolkit were WHO staff members involved in the development and review process. As such, no additional declarations of interest were required in accordance with WHO's internal procedures for staff-led publications. No conflicts of interest were identified that could have influenced the content of this document.

3. Capturing health facility NCD data

To effectively prevent and control NCDs, countries must implement robust interventions that reduce risk factors at both population and individual levels, alongside facilitating early detection, diagnosis, and treatment of NCDs. WHO PEN interventions to address NCDs can be integrated into primary care to streamline these processes. By contrast, cancer diagnosis and treatment services may be implemented by countries at secondary and tertiary level facilities where trained health professionals/specialists are available, as well as necessary medical and laboratory equipment and supplies.

While services are available across levels of the health system for most NCDs (with the exception of cancer, for which services are mainly available only in secondary and tertiary settings), countries operate a variety of service-delivery models. In some countries, services may only be provided at selected health centres or at certain levels of the public health-care system, or only by private health-care providers. Early diagnosis and screening services for cancers such as cervical cancer may be provided regularly through an established cancer screening programme, or only opportunistically. Service delivery points for NCD patients may also include community outreach for NCDs, or via programmes related to, for example, tuberculosis, HIV, family planning, or sexually transmitted infection that may have integrated NCD services.



3.1 Patient and data flow

Whatever the service-delivery model, data collection is crucial to track patients across the continuum of care and monitor the resourcing of NCD programmes and their outcomes. Having access to complete and correct patient records in a timely manner enables service providers to correctly diagnose, treat and manage the long-term care of patients with NCDs. Patient data can also be used to evaluate the quality of care provided – such as whether patients are taking their medications as prescribed, attending scheduled follow-up visits, and being monitored for signs of organ damage. Furthermore, health workers need patient information to identify and remind patients who are at risk of dropping out of care. Health facility managers need pharmacy, laboratory and personnel registers to monitor levels of resources and take prompt action to ensure continuity of essential services.

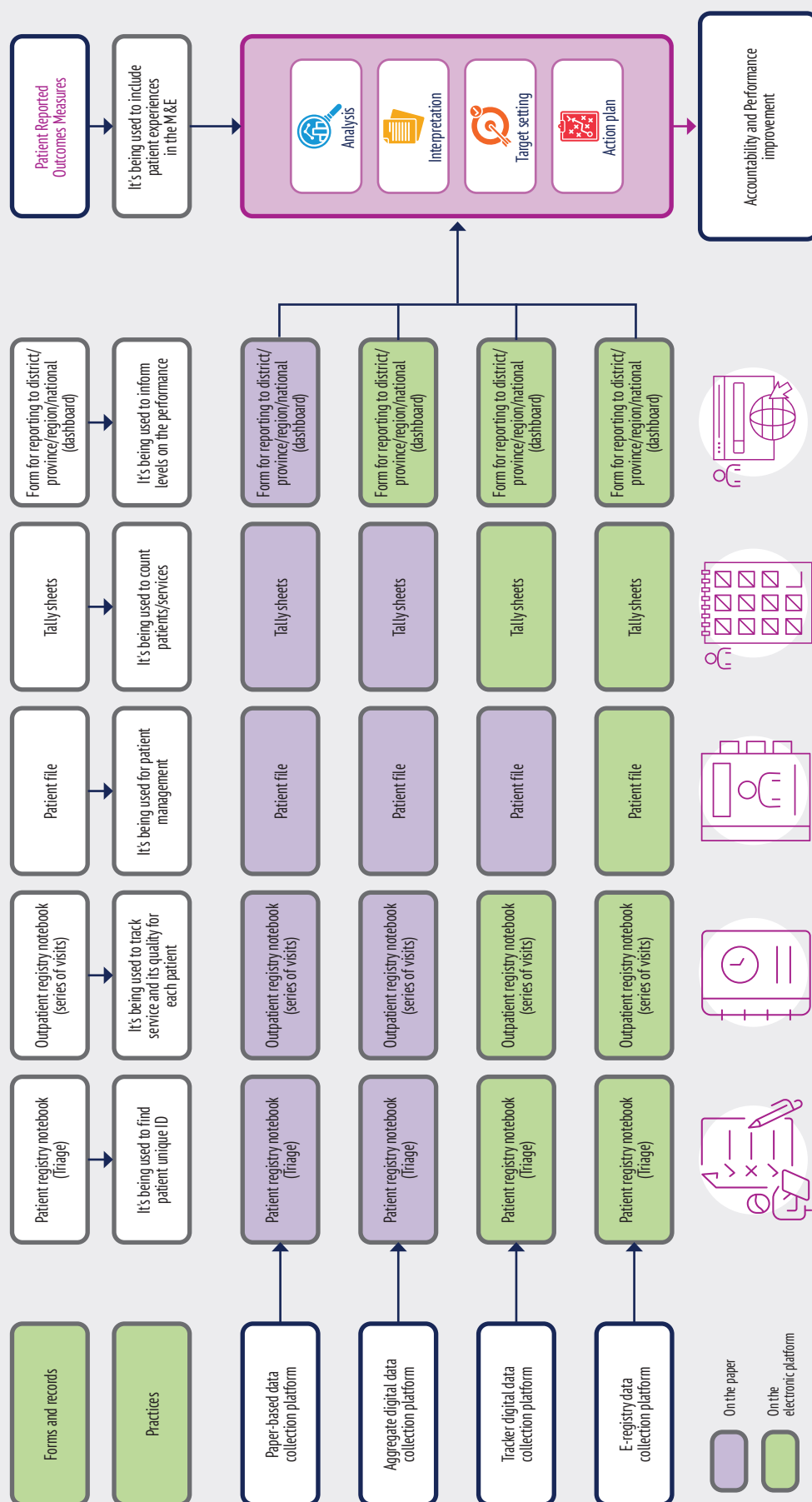
Different modes of health facility record-keeping are used, depending on resource availability. A completely paper-based system for maintaining individual health records, health facility registers and routine data reporting forms is common in low-resource settings, with electronic data aggregation and analysis happening only at district or subnational levels. A hybrid system of paper

forms and electronic registers can be carried out for facilities with available but limited computer and Internet infrastructure, where usually a health information officer would enter core patient or facility data into an offline or online desktop/mobile application, which is then submitted electronically to district level or aggregated automatically using an electronic health management information system platform.

The most sophisticated record-keeping involves a fully electronic health record system – only possible and effective with good Internet and computer technology infrastructure within and across health facilities – to enable service providers to get timely access to relevant patient data from other facilities. This system may also be linked to electronic logistics management systems for laboratory and pharmacy operations; and to an electronic health management information system that pulls routine data from different health facilities, laboratories and pharmacies to generate core indicators for reporting at district/subnational and national levels.

Fig. 1 illustrates the flow of patients and data in a primary health-care facility. Each health system may employ either paper-based or digital data collection methods, allowing for the aggregation or detailed recording of data at individual level. These data are accessible to health-care professionals at the facility or can be used at higher system levels.

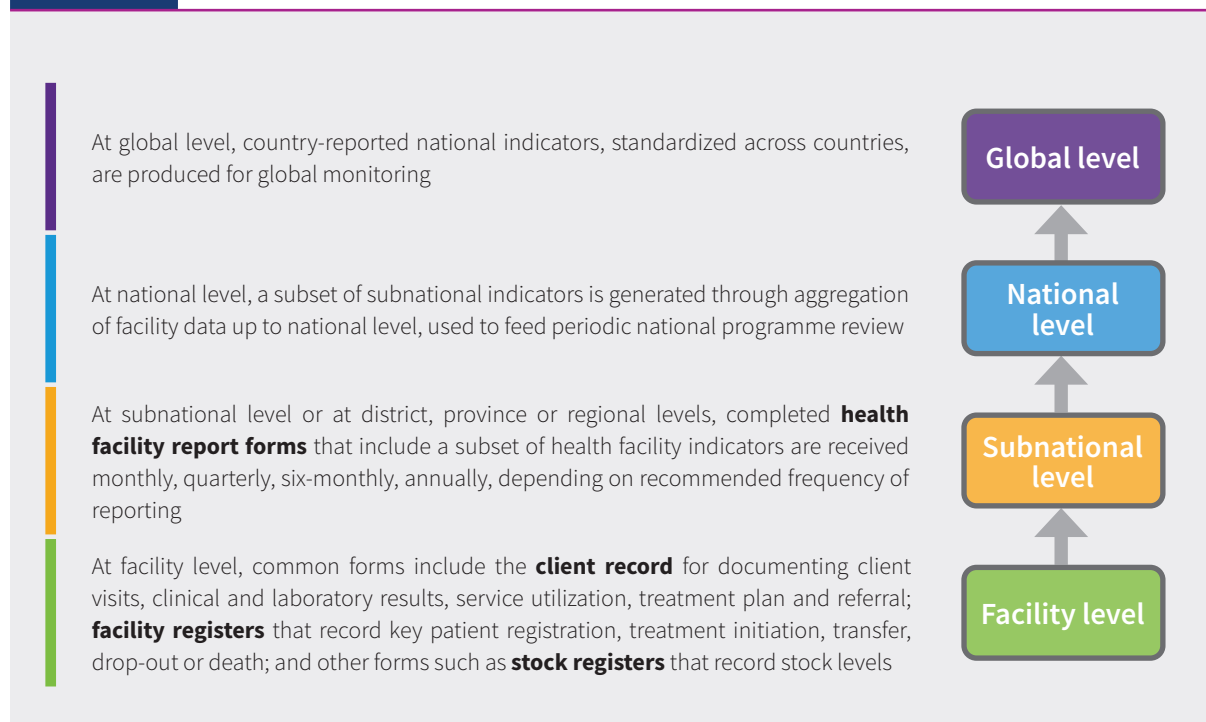
Fig. 1. Common tools and data flow for aggregation and reporting of NCD programme indicators at health-care facility level



Regardless of the collection method, the object is to collect at least core indicators and align with standard definitions to ensure data completeness and consistency for comparing indicators across all facilities and geographic or administrative levels. Fig. 2 shows common tools and data flow for aggregation and reporting of NCD programme indicators at different levels.

Fig. 2.

Common tools and data flow for aggregation and reporting of NCD programme indicators at different levels



3.2 Data-related challenges for NCD management

Effective NCD management relies heavily on the quality and utilization of data from Routine Health Information Systems (RHIS). At the grassroots level, health-care providers use RHIS data to manage chronic conditions daily, adjusting treatments based on patient records, following up on patients who miss their appointments, and trends within the data. However, challenges such as limited data literacy and inadequate training can restrict the effective use of this data for individual patient management.

At regional or national levels, RHIS data become crucial for shaping NCD policies and programmes. This data informs decisions on resource allocation, helps evaluate the impact of public health interventions, and facilitates monitoring of NCD trends and the effectiveness of prevention strategies. Enhanced analytical capabilities at these higher levels allow for more complex data analysis, leading to strategic actions aimed at reducing the NCD burden.

Despite its critical importance, the full potential of RHIS data in combating NCDs is often not realized because of issues such as data integrity, completeness, and the timeliness of data entries. Efforts to boost data utilization in NCD management include improving data quality, increasing training for health-care providers in data analysis, and promoting a culture of data-driven decision-making within health systems. These improvements, specifically in data quality, are vital for developing targeted, effective NCD interventions at all levels of health care.

4. Ensuring data quality

High-quality data that are complete, timely, reliable and accurate are the foundation for sound decisions at all levels of the health-care system. However, health facility data can be prone to data-entry mistakes, incompleteness, inconsistency or duplication, measurement inaccuracies, recall bias and other errors. Therefore data must be regularly reviewed to evaluate quality and to identify improvements, ensuring data meet the diverse decision-making needs of data users. Awareness of robust data quality assurance can boost confidence in the data, resulting in greater utilization among potential users – when health professionals trust the data, they are more likely to use it to make informed decisions.

This process involves systematic verification procedures that include data audits, cross-validation with other data sources, and feedback mechanisms from data users. Implementing these measures enhances data reliability, which is crucial for effective health planning and policy-making. Increased use of high-quality data leads to better patient-management strategies, especially for chronic conditions like diabetes or hypertension, where continuous monitoring and adjustment of treatment plans are vital. Furthermore, the active use of data contributes to its quality. As health professionals consistently engage with data systems, they can identify discrepancies, trends, and areas needing improvement. This feedback loop not only improves data accuracy and relevance over time but also ensures that the data evolve to meet the changing needs of health-care provision, ultimately fostering a more robust and responsive health system.

Moreover, well-maintained health information systems that provide high-quality data can support the identification of disease patterns and risk factors at community level, enabling preventative measures and strategic resource allocation. This is particularly relevant in the context of NCDs such as diabetes and hypertension, where early detection and regular monitoring can significantly alter disease outcomes and reduce health-care costs. Strengthening these systems requires collaboration among health-care providers, policy-makers, and technology developers to ensure data accuracy, accessibility, and actionability.

Thus, investment in data quality assurance processes is essential for strengthening the health system's capacity to respond to both current health needs and future challenges, thereby improving overall public health. The four most important dimensions of data quality are completeness and timeliness; internal consistency of reported data; external comparisons/cross checks (with other data sources); and consistency of population data (2). Table 1 sets out these dimensions, with their related metrics and NCD-specific indicators.



4.1 Completeness and timeliness of data

To evaluate the completeness of health data for NCDs, the following three metrics are used.

- “Completeness and timeliness of reporting” measures the percentage of health facilities that submit complete and timely reports on various NCD indicators, such as those for hypertension or cancer.
- “Completeness of indicator data” assesses the percentage of facilities that report without missing values for critical NCDs integrated in primary health-care settings.
- “Consistency of reporting completeness” looks at the trend in the percentage of facilities that consistently submit complete and timely reports on NCDs such as respiratory diseases and diabetes, across different time periods.

These metrics help ensure that NCD data collection and reporting practices are effective and provide reliable information for policy development and health-care management. Using these indicators, health facilities can define a threshold (minimum acceptable level) or target (desired level) for each indicator. If a facility fails to meet these “completeness” metrics, health professionals and health information officers need to review the indicators and provide an action plan to address the issue within specified time periods – ranging from 1–12 months. The effectiveness of these action plans should be evaluated in subsequent review meetings, adjusting the action plan as necessary to ensure continual improvement.



4.2 Internal consistency of reported data

To further enhance the quality of health-data reporting, the following four consistency checks are crucial.

- “Internal consistency of reported data” looks for the presence of outliers by identifying reported NCD person-level indicators that are 2–3 standard deviations from the mean.
- “Consistency over time” compares reported NCD core person-level indicators for the current year with the average of preceding years to detect any significant inconsistencies or changes over time.
- “Consistency between related indicators” evaluates the consistency of data quality by comparing the number of people living with hypertension who are receiving treatment with the number of people living with hypertension who are receiving treatment and have their condition under control. In high-quality data, the number of people receiving treatment should always be greater than or equal to the number of people receiving treatment with controlled hypertension. This ensures that related health indicators align appropriately and helps identify potential data discrepancies.

- “Consistency between recorded and reported data” assesses the percentage agreement between health reports and person-level health records on clinical evaluations for cancer-related signs and symptoms.

These consistency metrics are vital for verifying the reliability and accuracy of health data, supporting effective NCD monitoring and management.



4.3 External comparisons/ cross-checks (with other data sources)

To further enhance the quality of health-data reporting, external comparisons or cross-checks with other data sources are essential to validate facility reports against independent external data sources, thereby strengthening the reliability of health data used for strategic planning and operational adjustments in health-care management.

- “Consistency between health facility data and other data sources” may, for example, compare health facility records on the availability of NCD core medicines, testing, and devices, with regional logistics information systems to help identify discrepancies and improve data accuracy. Additionally, cross-checking health facility records against cancer registries, particularly for conditions like cervical cancer, may help ensure comprehensive case capture across primary, secondary, and tertiary care levels. Another example of using external data sources to evaluate consistency is comparing facility records of treated cases with insurance claims data or the facility’s pharmacy dispensing records.

By incorporating these external comparisons, health-care systems can ensure data integrity, enhance resource allocation and improve overall service delivery.



4.4 Consistency of population data

Ensuring the accuracy of health-data reporting, particularly for population-based health initiatives, means establishing consistency of population data. This involves evaluating consistency between estimated population figures and the actual number of individuals registered at the facility, which are used as denominators in data calculations. A specific example of this is the ratio of registered women to estimated women within the target age group for cervical cancer screening. Several conditions must be met when making such comparisons. First, the coverage of NCD care in primary settings must be evaluated – either ensuring that 100% of care is delivered by the public health-care system or that data are collected comprehensively from both public and private sectors. If this condition is not met, data interpretation must be treated with caution.

Second, it is essential to evaluate the age and sex structure of patients registered at the facility and compare this with the age and sex structure of the population. For any meaningful comparison, age and sex standardization should be conducted first to ensure accuracy. Finally, when comparing population-level estimates with corresponding facility-level indicators, it is critical to recognize and address potential barriers that might be introduced because of the nature of the disease and the model of care. For example, if the model of care is centralized and exclusively provided through the public health-care delivery system for infectious diseases, it is more straightforward to compare population-level and facility-level indicators. However, in a decentralized model of care where both public and private sectors are involved (as is common with NCD management), more complex calculations are required. These often require additional background studies to ensure accuracy and reliability. If these conditions and considerations are appropriately addressed, the comparison becomes more reliable and can effectively inform decisions about health services, resource allocation, and programme adjustments.

This metric remains essential for understanding the coverage of health programmes and for making informed, evidence-based decisions to align services with population needs.

Table 1. Four key dimensions of data quality, with associated metrics and NCD-specific data

Dimension	Metric	Examples of NCD-specific data
Completeness of data	Completeness and timeliness of reporting	% of health facilities that submitted complete and timely reports on hypertension indicators
	Completeness of indicator data	% of health facilities without missing values on diabetes indicators
	Consistency of reporting completeness	Trend in % of health facilities that submitted complete and timely reports on asthma and COPD indicators across quarters and years
Internal consistency of reported data	Internal consistency of reported data	Reported NCD person-level indicators with values that are 2–3 standard deviations from the mean
	Consistency over time	Reported NCD core person-level indicators of current year compared with average of preceding years
	Consistency between related indicators	% of women screened for cervical cancer agrees with number of women screened for cervical cancer with high-performance test
	Consistency between recorded and reported data	% agreement between health reports and person-level health records on clinical evaluation for cancer-related signs and symptoms

continues

Table 1 *continued*

Dimension	Metric	Examples of NCD-specific data
External comparisons/cross-checks (with other data sources)	Consistency between health facility data and other data sources	Reported % availability of NCD core medicines, testing and devices in facilities consistent with regional logistic information system reports
Consistency of population data	Consistency between estimated population and registered individuals within the facility used as denominators (This comparison can be considered reliable only if key conditions are met, including: a similar age and sex distribution between the estimated population and the individuals registered at the facility; comprehensive registration of the target population within the catchment area; inclusion of both public and private sector data (if applicable); and clear documentation of population movement or migration patterns. If these conditions are not met, interpretation of coverage indicators should be done with caution.)	Ratio of registered to estimated number of women within the target age group for cervical cancer screening

WHO's *Data quality assurance toolkit* (<https://www.who.int/data/data-collection-tools/health-service-data/data-quality-assurance-dqa>) provides practical guidance to countries for assessing and improving the quality of routine data collected in health facilities.

5. Specifying core facility indicators

Every patient interaction and every resource utilized within the facility generates a substantial amount of health service data. Specifying core facility indicators can help the efficient and effective use of health facility data.

Tables 2–5 outline the core facility indicators (grouped according to the four main types of NCD) used to assess the availability of essential medicines and technology, including functional devices, tests, and instruments, screening, early detection, treatment, complication assessment, and outcomes at the individual and health-care facility.

Table 2. Hypertension and cardiovascular disease indicators

Core facility indicators	Definition	Disaggregation
Availability of hypertension core medicines	Proportion of health facilities that have hypertension core medicines based on WHO and national treatment guidelines Numerator (N): Number of health facilities reporting “no stock-out” of hypertension core medicines in the reporting period Denominator (D): Total number of health facilities	Health facility, provider ownership type (public/private), facility location type (urban/rural)
Availability of CVD core medicines	Proportion of health facilities that have CVD core medicines based on WHO or national guidelines N: Number of health facilities reporting “no stock-out” of CVD core medicines D: Total number of health facilities	Health facility, provider ownership type (public/private), facility location type (urban/rural)
Availability of a functional blood pressure measuring device	Proportion of health facilities that have access to a functional (validated and if applicable, calibrated) blood pressure measuring device (BPMD) N: Number of health facilities that have access to a functional (validated and if applicable, calibrated) BPMD D: Total number of health facilities	Health facility, provider ownership type (public/private), facility location type (urban/rural)
Blood pressure (BP) control among people with hypertension	Proportion of people registered for hypertension treatment in the facility with controlled BP based on WHO or national treatment guidelines N: Number of people registered for hypertension treatment in the facility whose BP was controlled at the last clinical visit in the reporting period, excluding those who were newly diagnosed with under 3 months of treatment D: Total number of people registered for hypertension treatment in the facility, excluding those who were newly diagnosed with under 3 months of treatment	Where possible and applicable, stratify by health facility, provider ownership type (public/private), and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (urban/rural), and health insurance type

Table 3. Diabetes indicators

Core indicators	Definition	Disaggregation
Availability of diabetes core medicines	Proportion of health facilities that have diabetes core medicines based on WHO or national treatment guidelines N: Number of health facilities reporting “no stock-out” of diabetes core medicines in the reporting period D: Total number of health facilities	Health facility, provider ownership type (public/private), facility location type (urban/rural)
Availability of plasma glucose testing	Proportion of health facilities that have capability of laboratory or point-of-care plasma glucose (PG) testing N: Number of health facilities reporting capability of performing either laboratory or point-of-care PG tests in the reporting period D: Total number of health facilities	Health facility, provider ownership type (public/private), facility location type (urban/rural), PG testing site (point-of-care or laboratory)
Availability of HbA1c testing	Proportion of health facilities reporting capability of HbA1c testing N: Number of health facilities reporting capability of performing either laboratory or point-of-care HbA1c tests in the reporting period D: Total number of health facilities	Health facility, provider ownership type (public/private), facility location type (urban/rural), HbA1c testing site (point-of-care or laboratory)
Glycaemic control among people with diabetes	Proportion of people with diabetes with good glycaemic control based on the global target of HbA1c <8% (64mmol/mol) in the last clinical visit N: Number of people with diabetes registered in the facility with HbA1c <8% (64 mmol/mol) at the last clinical visit in the reporting period, excluding those who were newly diagnosed with under 3 months of treatment D: Total number of people with diabetes registered in the facility, excluding those who were newly diagnosed with under 3 months of treatment	Where possible and applicable, stratify by health facility, provider ownership type (public/private), and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (urban/rural), and health insurance type

Table 4. Chronic respiratory disease indicators

Core indicators	Definition	Disaggregation
Availability of asthma core medicines	Proportion of health facilities that have asthma core medicines based on WHO or national treatment guidelines N: Number of health facilities reporting “no stock-out” of asthma core medicines in the reporting period D: Total number of health facilities	Health facility, provider ownership type (public/private), facility location type (urban/rural)
Availability of chronic obstructive pulmonary disease (COPD) core medicines	Proportion of health facilities that have COPD core medicines based on WHO or national treatment guidelines N: Number of health facilities reporting “no stock-out” of COPD core medicines in the reporting period D: Total number of health facilities	Health facility, provider ownership type (public/private), facility location type (urban/rural)
Asthma control	Proportion of people registered for treatment of asthma with controlled asthma N: Number of people registered for treatment of asthma with controlled asthma at the last clinical visit in the reporting period, excluding those who were newly diagnosed with under 6 months of treatment D: Total number of people registered for treatment of asthma, excluding those who were newly diagnosed with under 6 months of treatment	Where possible and applicable, stratify by patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (urban/rural), and health insurance type
COPD control	Proportion of people registered for treatment of COPD with controlled COPD in the last visit N: Number of people registered for treatment of COPD with controlled COPD at the last clinical visit in the reporting period, excluding those who were newly diagnosed with under 6 months of treatment D: Total number of people registered for treatment of COPD, excluding those who were newly diagnosed with under 6 months of treatment	Where possible and applicable, stratify by patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (urban/rural), and health insurance type

Table 5. Cancer indicators

Core indicators	Definition	Disaggregation
Clinical breast evaluation for early diagnosis of breast cancer among women aged 30–49 years with signs and/or symptoms associated with breast cancer	Proportion of women aged 30–49 years with signs and/or symptoms associated with breast cancer who underwent an appropriate clinical breast evaluation for early diagnosis of signs and symptoms associated with breast cancer based on WHO or national guidelines N: Number of women aged 30–49 years with signs and/or symptoms associated with breast cancer who underwent a clinical breast evaluation for breast cancer early diagnosis in the last year D: Total number of women aged 30–49 years with signs and/or symptoms associated with breast cancer who attended the facility in the last year	Where possible and applicable, stratify by health facility, provider ownership type (public/private), and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (urban/rural), and health insurance type
Timeliness of referral for breast cancer diagnosis among women aged 30–49 years with signs and/or symptoms associated with breast cancer who had suspicious findings from clinical breast evaluation	Proportion of women aged 30–49 years with signs and/or symptoms associated with breast cancer who had suspicious findings from clinical breast evaluation conducted at the facility and were referred to a facility with capacity for diagnosis of cancer within a month of clinical breast evaluation N: Number of women aged 30–49 years with associated signs and/or symptoms of breast cancer who had suspicious findings from clinical breast evaluation conducted at the facility and were referred to a facility with capacity for diagnosis of cancer within a month of the clinical breast evaluation D: Total number of women aged 30–49 years with associated signs and/or symptoms of breast cancer who had suspicious findings from clinical breast evaluation conducted at the facility	Where possible and applicable, stratify by health facility, provider ownership type (public/private), and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (urban/rural), and health insurance type
Availability of human papillomavirus (HPV) testing	Proportion of health facilities reporting availability of HPV testing among facilities designated to provide a screening test or sampling kit N: Number of health facilities reporting availability of HPV testing among facilities designated to provide screening test or sampling kit D: Total number of health facilities designated to provide screening test or sampling kit	Health facility, provider ownership type (public/private), facility location type (urban/rural)

continues

Table 5 *continued*

Core indicators	Definition	Disaggregation
Cervical cancer screening with high performance test among women aged 30–49 years	Proportion of women aged 30–49 years who were screened for cervical cancer with a high-performance test (a test which would have performance characteristics similar to or better than a HPV DNA test) For women with HIV, the target age group for screening is 25–49 years N1: Number of women aged 30–49 years who attended the health facility in the last year and had no history of cervical cancer screening with HPV test in the last 10 years and received HPV test or submitted a sample for HPV test N2: Number of women with HIV aged 25–49 years who attended the health facility in the last year and had no history of cervical cancer screening with HPV test in the last 5 years and received HPV test or submitted a sample for HPV test D1: Total number of women aged 30–49 years who attended the health facility in the last year and had no history of cervical cancer screening with HPV test in last 10 years D2: Total number of women aged 25–49 years who attended the health facility in the last year and had no history of cervical cancer screening with HPV test in last 5 years	Where possible and applicable, stratify by health facility, provider ownership type (public/private), and patient characteristics such as age, sex, race/ethnicity, comorbidity status, HIV status, other high-risk groups, socioeconomic status, residence type (urban/rural), and health insurance type

continues

Table 5 *continued*

Core indicators	Definition	Disaggregation
Cervical cancer screening among women aged 30–49 years	Proportion of women aged 30–49 years who were screened for cervical cancer using any cervical cancer screening test For women with HIV, the target age group for screening is 25–49 years N1: Number of women aged 30–49 years who attended the health facility in the last year, had no history of cervical cancer screening in the last 10 years and were screened for cervical cancer N2: Number of women with HIV aged 25–49 years who attended the health facility in the last year, had no history of cervical cancer screening in the last 5 years and were screened for cervical cancer D1: Total number of women aged 30–49 years who attended the health facility in the last year and had no history of cervical cancer screening in the last 10 years D2: Total number of women with HIV aged 25–49 years who attended the health facility in the last year and had no history of cervical cancer screening in the last 5 years	Where possible and applicable, stratify by health facility, provider ownership type (public/private), and patient characteristics such as age, sex, race/ethnicity, comorbidity status, HIV status, other high-risk groups, socioeconomic status, residence type (urban/rural), and health insurance type
Cervical cancer screening test positivity among women aged 30–49 years	Proportion of screened women aged 30–49 years with a positive screening result in the previous 12-month period using any of these methods: • Visual inspection with acetic acid/vinegar (VIA) • Pap smear • HPV test For women with HIV, the target age group for screening is 25–49 years N1: Number of screened women aged 30–49 years with a positive cervical cancer screening result in the last year N2: Number of screened women with HIV aged 25–49 years with a positive cervical cancer screening result in the last year D1: Total number of screened women aged 30–49 years screened for cervical cancer in the last year D2: Total number of screened women with HIV aged 25–49 years screened for cervical cancer in the last year	Where possible and applicable, stratify by health facility, provider ownership type (public/private), and patient characteristics such as age, sex, race/ethnicity, comorbidity status, HIV status, other high-risk groups, socioeconomic status, residence type (urban/rural), and health insurance type

continues

Table 5 *continued*

Core indicators	Definition	Disaggregation
Clinical evaluation for early diagnosis of childhood cancer among children with signs and/or symptoms associated with cancer	Proportion of children who attended the facility with signs and/or symptoms associated with childhood cancers and underwent appropriate clinical evaluation for early diagnosis based on WHO or national guidelines N: Number of children who attended the facility with signs and/or symptoms associated with childhood cancers and underwent appropriate clinical evaluation for early diagnosis D: Total number of children who attended the facility and had signs and/or symptoms associated with childhood cancers	Where possible and applicable, stratify by health facility, provider ownership type (public/private), and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (urban/rural), and health insurance type
Timeliness of referral for childhood cancer diagnosis among children with associated signs and/or symptoms of childhood cancer who had suspicious findings from clinical evaluation	Proportion of children with signs and/or symptoms associated with childhood cancer who had suspicious findings from clinical evaluation conducted at the facility and were referred to a centre with capacity for diagnosis of cancer within a month of clinical evaluation N: Number of children with signs and/or symptoms associated with cancer who had suspicious findings from clinical evaluation conducted at the facility and were referred to a centre with capacity for diagnosis of cancer within a month of clinical evaluation D: Total number of children with signs and/or symptoms associated with childhood cancer who had suspicious findings from clinical evaluation conducted at the facility	Where possible and applicable, stratify by health facility, provider ownership type (public/private), and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (urban/rural), health insurance type
Clinical evaluation for early cancer diagnosis among people with signs and/or symptoms associated with cancer	Proportion of people who attended the facility with common signs and/or symptoms associated with cancers and underwent appropriate clinical evaluation for early diagnosis based on WHO or national guidelines N: Number of people who attended the facility with common signs and/or symptoms associated with cancers and underwent appropriate clinical evaluation for early diagnosis D: Total number of people who attended the facility and had signs and/or symptoms associated with cancers	Where possible and applicable, stratify by health facility, provider ownership type (public/private), and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (urban/rural), health insurance type

continues

Table 5 *continued*

Core indicators	Definition	Disaggregation
Timely referral for cancer diagnosis among people with associated signs and/or symptoms of cancer who had suspicious findings from clinical evaluation	Proportion of people with signs and/or symptoms associated with cancer who had suspicious findings from clinical evaluation conducted at the facility and were referred to a centre with capacity for diagnosis of cancer within a month of clinical evaluation N: Number of people with signs and/or symptoms associated with cancer who had suspicious findings from clinical evaluation conducted at the facility and were referred to a centre with capacity for diagnosis of cancer within a month of clinical evaluation D: Total number of people with signs and/or symptoms associated with cancer who had suspicious findings from clinical evaluation conducted at the facility	Where possible and applicable, stratify by health facility, provider ownership type (public/private), and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (urban/rural), health insurance type

6. Analysing core facility indicators

Analysis of core facility indicators can offer valuable strategic insights help make decisions when implementing NCD interventions across all health-system levels, from health worker, facility, and district/subnational levels, to national level. It is imperative to plan, design and perform the analysis according to the information requirements of the intended users, i.e., the objectives of the analysis. These may include:

- monitoring performance and progress towards specified targets;
- identifying gaps in service delivery;
- using data to support logistics and capacity-building processes and to forecast needs and demands;
- using data to support decisions at clinical, programme and policy levels;
- evaluating equity in service delivery using disaggregated variables.



6.1 Analytical model for monitoring service delivery

An analytical model for service delivery provides a structured framework to evaluate and improve health-care processes and outcomes at facility level. It systematically links service availability, delivery outputs, and ultimate health outcomes, thereby offering a comprehensive approach to understanding the factors influencing service performance. By identifying gaps and analysing indicators at each level, this model helps achieve the five objectives listed above. Table 6 presents a list of core indicators for all NCDs covered by WHO PEN, categorized into three domains: service delivery determinants, service delivery outputs, and service delivery outcomes.

Table 6. NCD facility-based core indicators grouped by inputs, outputs and outcomes

Inputs – service delivery determinants	Outputs – service delivery outputs	Outcomes – service delivery
• Availability of hypertension core medicines • Availability of CVD core medicines • Availability of a functional blood pressure measuring device • Availability of diabetes core medicines • Availability of plasma glucose testing • Availability of HbA1c testing • Availability of asthma core medicines • Availability of COPD core medicines • Availability of HPV testing	• Women aged 30-49 years old • Cervical cancer screening with high performance test • Cervical cancer screening • Cervical cancer screening test positivity • Clinical breast evaluation for early diagnosis of breast cancer • Timeliness of referral for breast cancer diagnosis • Children aged under 18 years • Clinical evaluation for early diagnosis of childhood cancer • Timeliness of referral for childhood cancer diagnosis • Adults aged 18 years and above • Clinical evaluation for early diagnosis of cancer • Timeliness of referral for cancer diagnosis	• Blood pressure control among people with hypertension • Glycaemic control among people with diabetes • Asthma control • COPD control

An analytical framework for implementing, analysing and evaluating facility-based service delivery indicators based on these interconnected domains is set out in Fig. 3. This model ensures that resources and interventions are strategically allocated, enabling data-driven decisions to enhance health outcomes and achieve system-level goals.

The model is guided by two directional arrows that illustrate complementary aspects of service delivery and evaluation. The bottom grey arrow represents the service delivery pathway, beginning with the availability of essential resources—such as trained staff, core medicines, diagnostic tools, and clinical guidelines. It then progresses through service readiness and utilization, culminating in desirable service delivery outcomes, such as improved disease control, reduced morbidity, and decreased mortality.

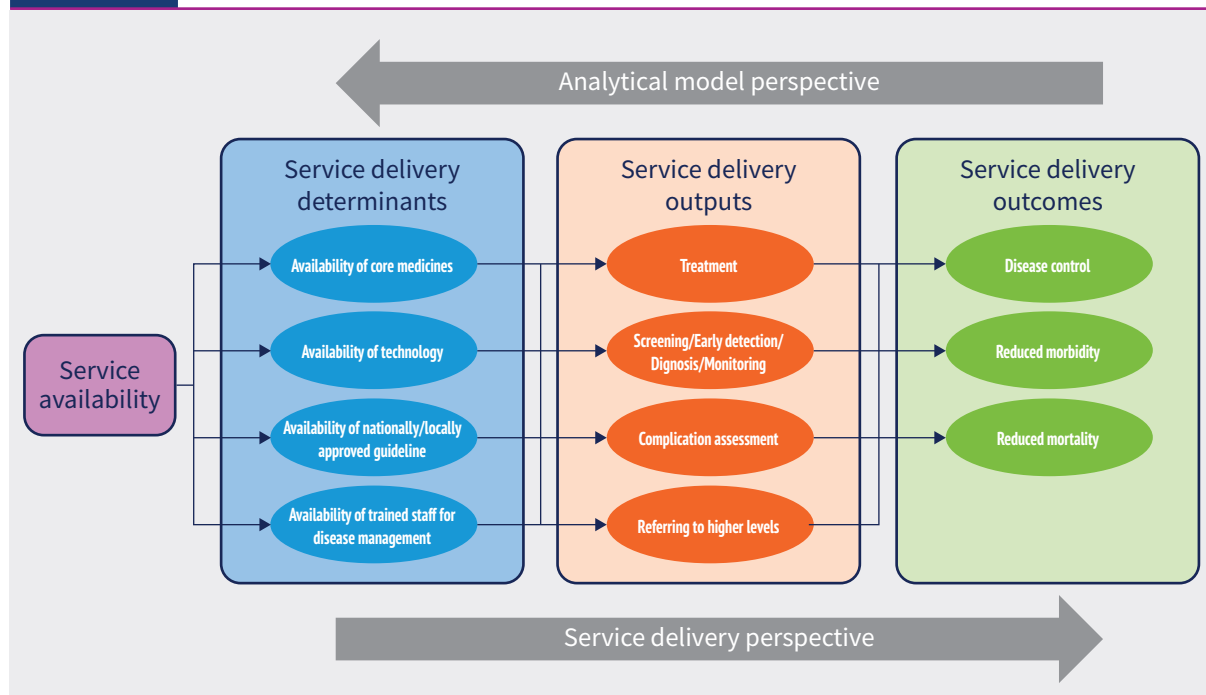
The top grey arrow illustrates the comprehensive evaluation process. This process starts by reviewing service delivery outcomes to assess whether the health system is achieving its intended public health goals. If these outcomes meet predefined targets, further evaluation may not be necessary. However, if performance falls short, the analysis shifts to the service delivery outputs domain, which includes intermediate indicators such as screening coverage, treatment adherence, complication management, and referral efficiency. This stage helps identify bottlenecks that may be hindering progress.

If output-level analysis reveals persistent issues, the next step is to examine service delivery determinants, such as the availability of medicines and technologies, presence of approved

guidelines, and staff training levels. These factors are foundational to delivering effective care, and identifying gaps in this domain enables facilities to formulate targeted corrective actions.

Together, the two arrows demonstrate how facility-level indicators are not only useful for routine monitoring but also essential for building a structured feedback loop. This loop supports corrective action, continuous improvement, and stronger health system performance over time.

Fig. 3. Analytical model for monitoring service delivery



6.2 Data visualization and interpretation

Transforming raw data into intuitive visual formats (visualization) can help health professionals at facility level identify gaps and prioritize interventions, monitor key indicators (such as resource availability, patient outcomes, and service utilization), and facilitate immediate decision-making and operational improvements. A key benefit of visualization is its role in “benchmarking” – allowing comparisons between facilities, districts, or regions to highlight best practices and pinpoint underperforming areas.

While primarily designed to support facility-level analysis, visualization also offers valuable insights for national and subnational stakeholders, assisting alignment with broader health system objectives, specifically with global, regional, or national targets, as well as the availability of medicines and technology. Through systematic interpretation of visualized data, health-care facilities can drive data-informed actions to improve service delivery, enhance patient outcomes, and contribute to overarching health system goals.



6.3 Recommended criteria for a facility-level NCD dashboard

Recommended criteria for a practical and impactful facility-level dashboard include:

6.3.1 Comprehensive indicator coverage

The dashboard should track a comprehensive set of indicators relevant to facility-level operations. These include patient outcomes (e.g. morbidity, mortality rates); service coverage (e.g. number of patients treated); and operational metrics (e.g. stock levels of essential medicines, availability of equipment). Indicators should be tailored to reflect facility priorities while ensuring alignment with national and global health objectives. WHO has already introduced a set of indicators that are completely aligned with global and regional targets.

6.3.2 Real-time insights

The dashboard should provide live data updates, enabling health-care professionals to promptly identify and address issues. Real-time tracking can help prevent delays in critical interventions, ensuring that service delivery is efficient and responsive to patient needs.

6.3.3 Benchmarking

The dashboard should facilitate comparisons across facilities or districts, offering benchmarks that highlight performance variations. This allows facilities to identify “best practices” and address performance gaps, fostering continuous improvement and equitable service delivery.

6.3.4 Scalability and integration

The dashboard should be designed to scale beyond the facility level, integrating seamlessly with national and subnational dashboards and health-care delivery programmes for other chronic conditions. This ensures data coherence and supports broader health system evaluations, enabling policy-makers to aggregate and analyse data across levels.

6.3.5 User-friendliness

Intuitive design is essential to ensure health-care professionals can easily navigate the dashboard and interpret data effectively. Visualizations should simplify complex information, making insights accessible for a diverse range of users with technical expertise. One effective method to evaluate the user-friendliness of a dashboard is through a “health-care professional review” (also known as “end user testing”). This involves presenting a sample of health-care professionals who will use the dashboard with real-life scenarios and specific questions, and assessing how well they understand and utilize the dashboard to make decisions.

6.3.6 Customization and flexibility

Facilities should be able to customize dashboards to focus on locally relevant indicators while maintaining a standardized core set of metrics for comparison. This flexibility ensures that the dashboard remains useful across diverse contexts and changing priorities.



6.4 Essential visualizations for monitoring

Effective monitoring of health-care performance relies on clear and concise visualizations that simplify complex data into intuitive formats and provide actionable insights. Essential visualizations for monitoring include key tools such as benchmark-adjusted performance charts, heat maps, target achievement charts etc. These help health professionals easily evaluate facility-level data, track progress against targets, and identify areas for improvement and facilitate data-driven decision-making to enhance service delivery and achieve health system goals.

6.4.1 Benchmark-adjusted performance chart

The “standardized indicator graph” visualizes patient-level core indicators (X-axis) and their dispersion (Y-axis) relative to the normalized mean of the selected benchmark level (district, provincial, or national) (examples shown in Fig. 4 and Fig. 5). The Y-axis represents the standard deviation of each indicator above or below the mean. The straight horizontal line represents the normalized mean for all indicators, serving as a reference point. Indicators deviating significantly from this line, based on their standard deviation, highlight areas of over- or underperformance, providing insights into variability within the facility’s performance.

Fig. 4.

Example benchmark-adjusted performance chart for disease control at health-care facility level

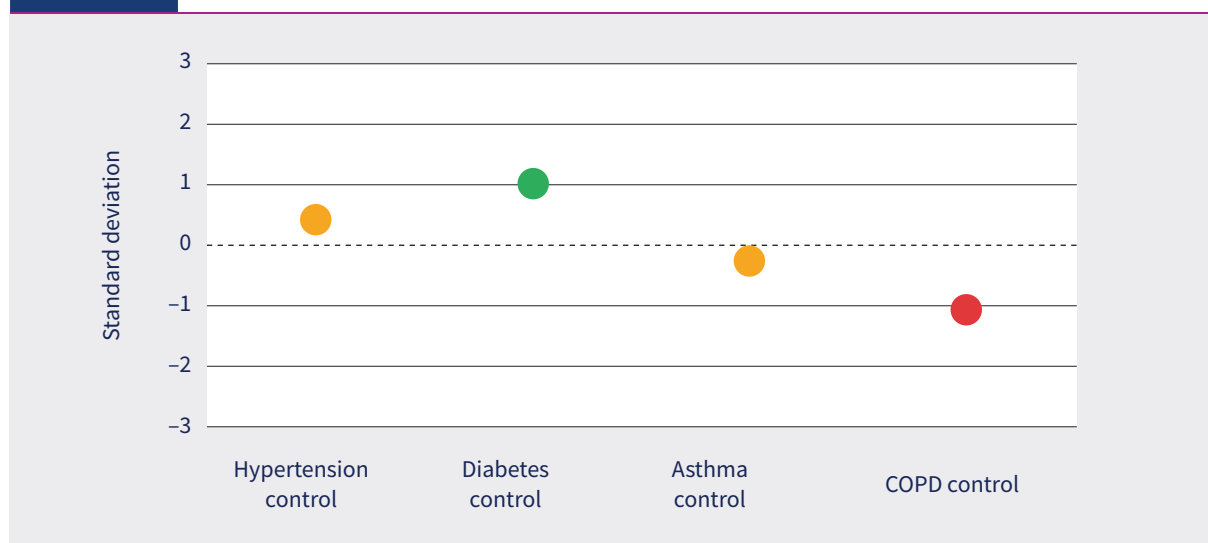
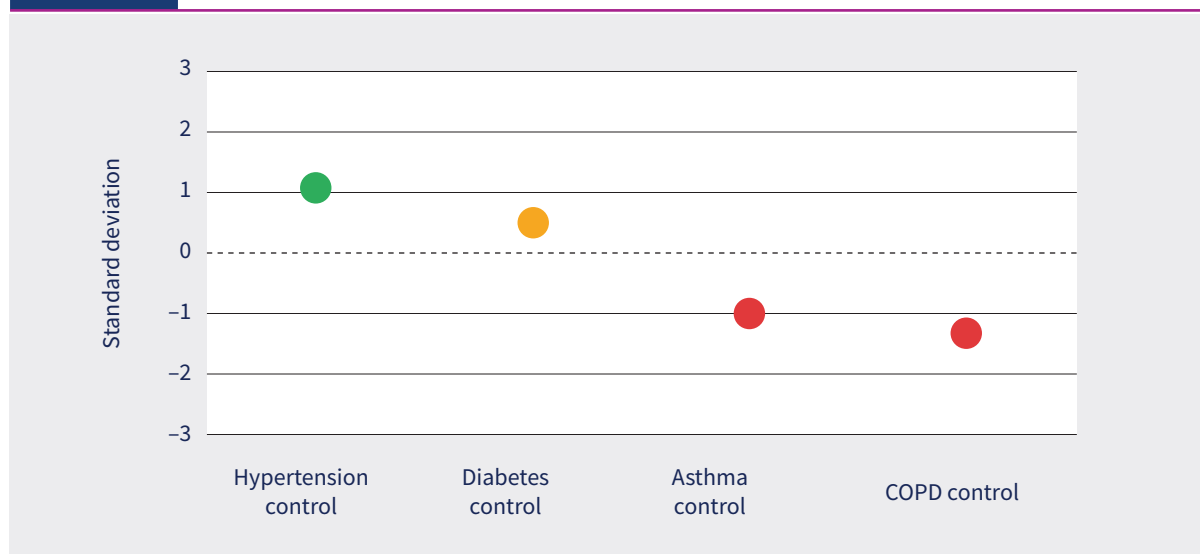
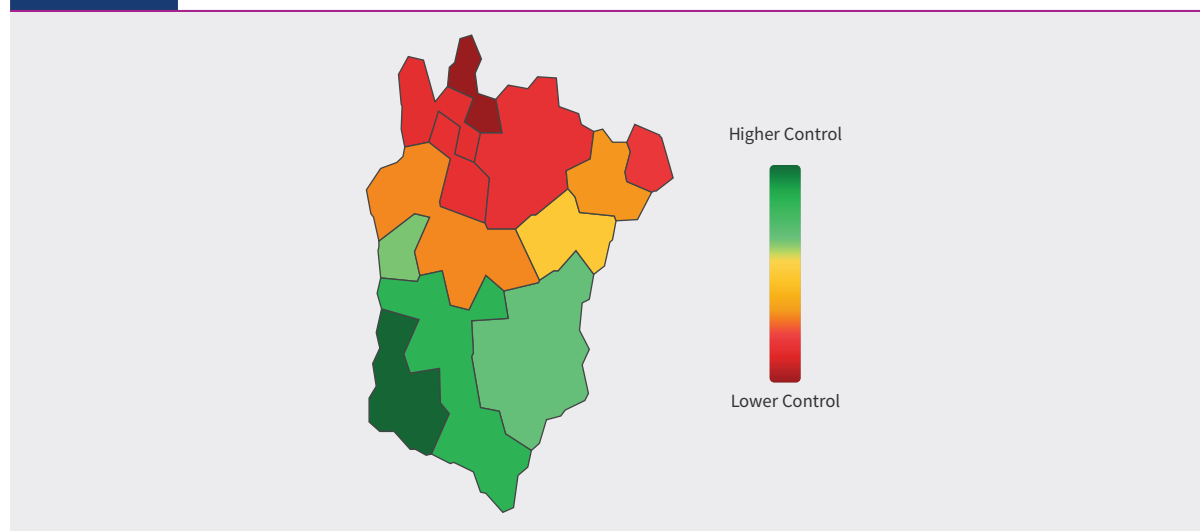


Fig. 5.**Example benchmark-adjusted performance chart for disease control at the subnational level**

Graphs such as those in Fig. 4 and Fig. 5 are powerful visual tools for benchmarking facility-level performance against broader reference points. Facilities can use this information to target interventions where performance is suboptimal and replicate practices that contribute to positive deviations.

“Heatmaps” are another powerful visualization tool. Fig. 6 is a heatmap illustrating hypertension control across various districts at the national level, using a colour-coded system to depict varying control rates, with green indicating higher rates of control and red indicating lower rates. When included in an NCD dashboard, visual tools such as heatmaps help spotlight disparities, pinpoint areas in need, and enable effective distribution of resources through targeted interventions. They can also support the monitoring and evaluation of health policies and guide the development of tailored policies and programmes to enhance hypertension management regionally.

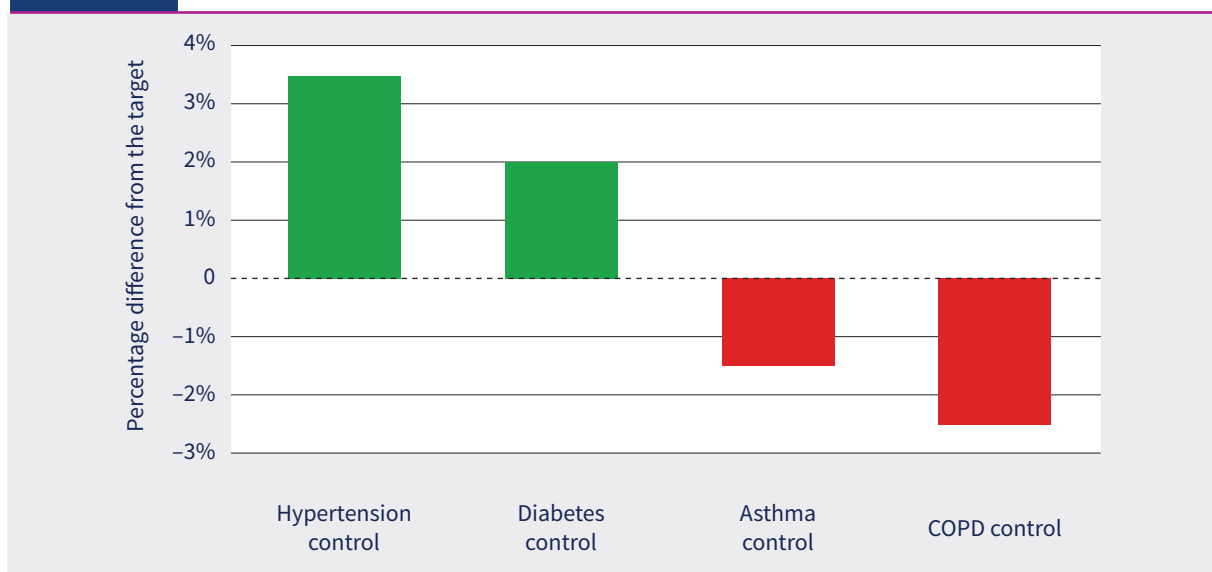
Fig. 6.**Example heat map adjusted for benchmarks showing hypertension control across all districts in a region**

6.4.2 Target achievement chart

Visualization tools such as “target achievement charts” (Fig. 7) can be used to illustrate the performance of facility-level indicators as a percentage difference from their respective targets. The X-axis represents the indicators, while the Y-axis shows the deviation of the current performance from the target, expressed as a percentage. Positive values on the Y-axis indicate the extent to which the current performance exceeds the target, while negative values reflect how much it falls short. This visualization highlights how closely each indicator aligns with its desired target, offering a clear view of areas requiring improvement or demonstrating excellence.

Charts such as this provide actionable insights for health-care professionals by identifying how well indicator targets are being met or missed. Facilities can use this information to prioritize interventions, strategically allocate resources and celebrate areas of success in a long-term action plan (from 1 to 2 years). By visualizing progress as a percentage of target achievement, the chart simplifies complex data, enabling informed decisions that align with facility-level, district, or national health objectives.

Fig. 7. Target achievement chart for disease control at the health-care facility level



6.4.3 Service performance metrics table

A “service performance metrics table” should feature a comprehensive list of all selected indicators in order to assess health-care service utilization and outcomes at patient level. It should include metrics such as treatment adherence rates, patient follow-up efficacy, and management of chronic conditions across all health-care levels – from national to facility-specific. This design will allow for a nuanced evaluation of health-care delivery effectiveness (Fig. 8).

Interpretation of these indicators should be facilitated by visual cues, such as arrows indicating trends in data changes since the last reporting period. These indicators can act as a critical tool for health-care administrators and policy-makers to swiftly identify trends, adapt strategies, and enhance overall health-care quality and efficiency.

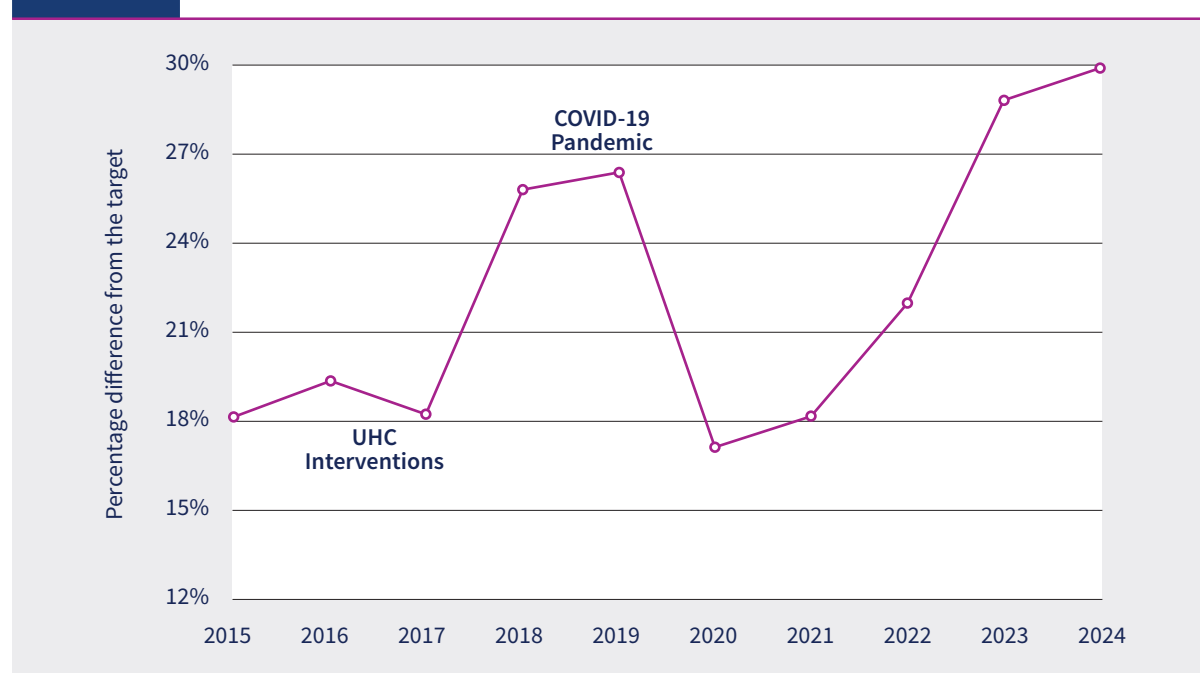
Fig. 8.**Service performance metrics for disease control at health-care facility level****Indicator values**

Value of disease control indicators with percent change compared to the previous report

Indicator	Facility	Subnational	National
Hypertension control	26.4 (↗2.8%)	24.2 (↘-1.8%)	27.1 (↗1.2%)
Diabetes control	40.9 (↗1.4%)	33.2 (↗0.3%)	38.7 (↘-1.9%)
Asthma control	42.8 (↘-3.1%)	44.7 (↘-0.5%)	41.0 (↘-1.4%)
COPD control	60.1 (↘-2.4%)	33.2 (↗4.1%)	38.7 (↗0.9%)

6.4.4 Service performance trend graph

“Service performance trend graphs” can be used to illustrate national-level trends – Fig. 9 shows example trends in hypertension control from 2015 to 2024, highlighting significant impacts from universal health coverage (UHC) interventions, the COVID-19 pandemic, and the post-pandemic recovery phase. Where featured in an NCD dashboard, a service performance trend graph can help visualize progress and challenges over time, evaluate the effectiveness of health policies, assist in strategic resource allocation, and support evidence-based decision-making to enhance NCD management.

Fig. 9.**Service performance trend chart for disease control at health-care facility level**

6.4.5 Resource availability metrics

“Resource availability metrics” should be carefully designed to offer an in-depth analysis of health-care resources by tracking the availability of medicines, medical technology, and the presence of trained health-care staff. Detailed metrics should capture not only the quantity of available resources but also the functionality of devices and tests, as well as workforce knowledgeability.

The interpretation of these metrics should use advanced visualization tools such as detailed graphs and color-coded indicators. These tools should clearly distinguish between various resource types – medicines, devices, and other technologies—as well as the availability of trained staff across different programmes. This approach provides stakeholders with actionable insights to optimize resource distribution and enhance staff training programmes, ensuring that health-care facilities are both well-equipped and adequately staffed to meet patient needs effectively (Fig. 10 and Fig. 11).

Fig. 10. Resource availability metrics for core medicine and technology availability at health-care facility level

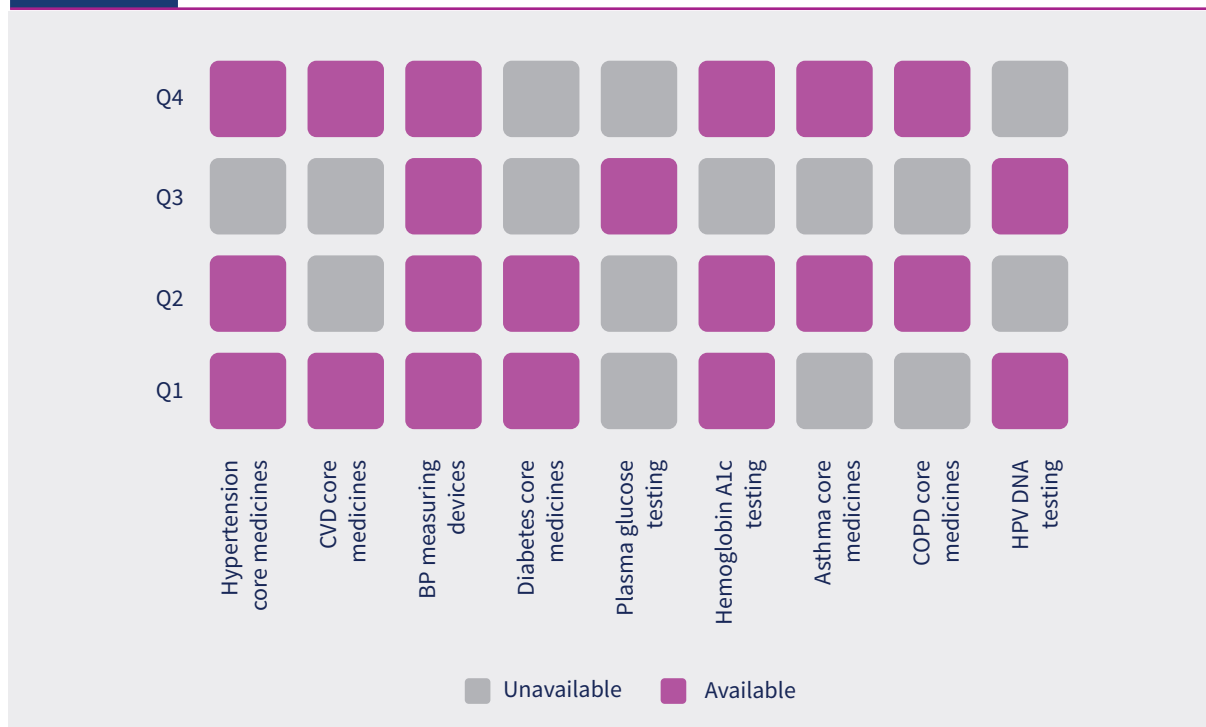
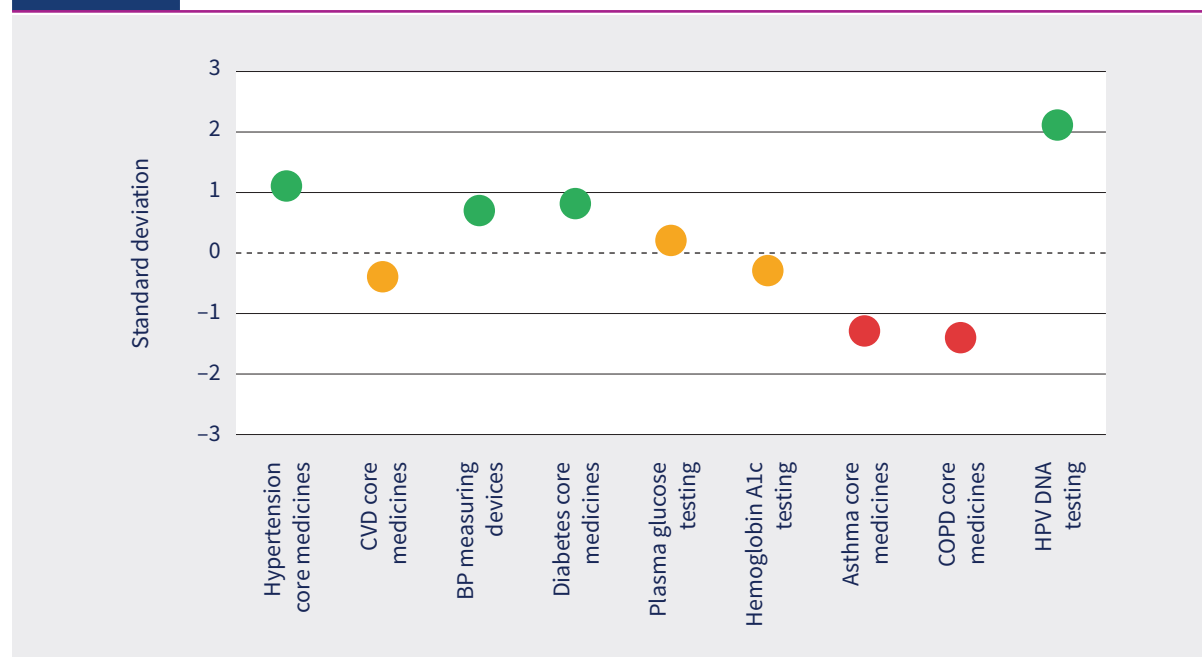


Fig. 11. Resource availability metrics for core medicine and technology availability at the district level



7. Operationalizing NCD monitoring in health-care facilities

Implementation of the NCD Routine Health Information System (RHIS) at the health-care facility (as illustrated in Fig. 12) is a multi-phase approach to enhancing NCD monitoring and management at such facilities. This systematic process is designed to ensure effective data collection, evaluation, and use to improve patient outcomes and system efficiency.

The first step in establishing an NCD RHIS at the primary health-care level is to standardize indicators, metadata, and forms according to WHO guidance (1, 3). This standardization ensures that data collected across different platforms and facilities are comparable and reliable.

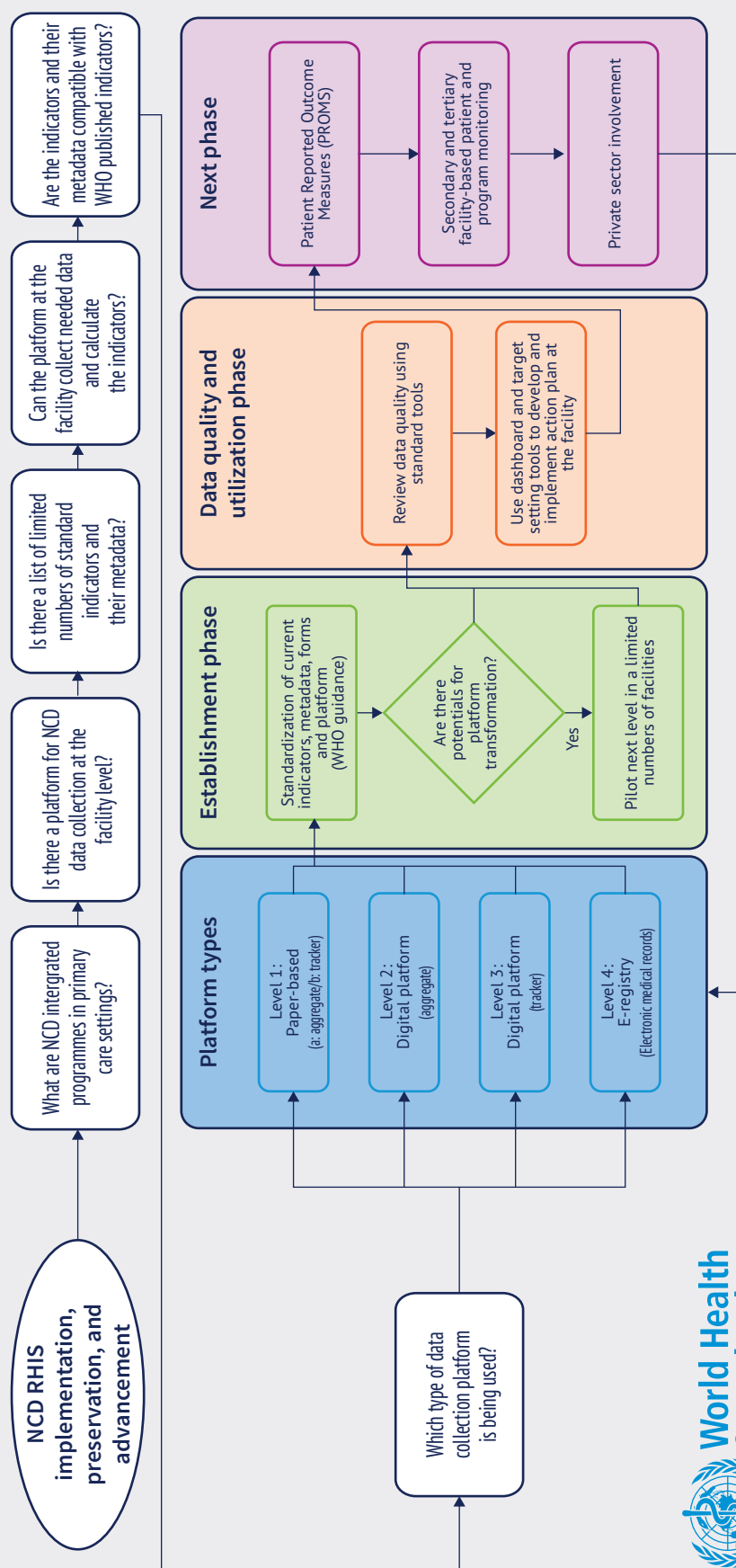
Establishing or developing a data collection platform at facility level is the next step. Several countries employ a specific type of data collection platform for managing NCD routine health information, ranging from Level 1 (basic paper-based systems) to Level 4 (advanced electronic medical records – EMRs). Each level aligns with facility capabilities and the required complexity of data management. Nonetheless, numerous countries have adopted a hybrid model of data collection, influenced by varying maturity levels of health programmes, as well as the available financial resources and capacities.

Transitioning from manual to digital systems enhances data accuracy and enables real-time tracking of patient information, which is vital for effective NCD management. However, a “healthcare professional review” (see page 34) is necessary for any newly designed data collection platform before it is piloted to make sure it is compatible with patient and data flow in the particular setting.

After the platform is established and standardized (using use indicators that have been introduced globally, have standard metadata and are used on an interoperable digital platform), the next crucial step is to ensure the integrity and usefulness of the data collected. This phase involves rigorous quality reviews using standardized tools and techniques to validate and correct data. Furthermore, health-care facilities are encouraged to use targeted dashboards and target-setting tools to develop and implement action plans based on the data, thus fostering a proactive approach to health-care management (4, 5, 6).

Fig. 12. Roadmap for implementation or upgrading NCD facility-based monitoring at national and subnational levels

Implementation steps



8. Future directions and expansion

Looking ahead, incorporating Patient Reported Outcome Measures (PROMs) and expanding monitoring to secondary and tertiary levels of care are further crucial steps. This expansion aims to capture a more comprehensive view of patient health and treatment efficacy. Moreover, involving the private sector is suggested to leverage additional resources and innovative solutions to enhance the reach and effectiveness of NCD care.

In conclusion, by carefully designing and executing each phase, the potential to significantly improve NCD management and patient outcomes on a broad scale is immense. This systematic methodology not only ensures data accuracy and usability but also fosters a scalable and adaptable health-care environment conducive to addressing the complexities of NCD care.

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Annex

Annex 1: Optional indicators

Optional indicator	Definition	Disaggregation
Assessment of CVD risk among people aged over 40 years	Proportion of people aged over 40 years who attended the facility and were assessed for CVD risk using WHO CVD risk charts N: Number of people aged over 40 years who attended the facility and were assessed for CVD risk using WHO CVD risk charts D: Total number of people aged over 40 years who attended the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Screening for hypertension among adults as part of routine service	Proportion of people aged 18 years and over who visited the facility and were screened for hypertension based on WHO or national guidelines N: Number of people aged 18 years and over who visited the facility and were screened for hypertension in the reporting period D: Total of people aged 18 years and over who visited the facility in the reporting period	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Hypertension detection from opportunistic screening	Proportion of people aged 18 years and over who were diagnosed with hypertension among those who were screened for hypertension in the facility based on WHO or national guidelines Hypertension is diagnosed if, on two visits on different days: systolic blood pressure on both days is ≥ 140 mmHg and/or diastolic blood pressure on both days is ≥ 90 mmHg N: Number of people aged 18 years and over who were diagnosed with hypertension among those who were screened for hypertension at the facility in the reporting period D: Total number of people aged 18 years and over who were screened for hypertension at the facility in the reporting period	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type

continues

ANNEX 1 *continued*

Optional indicator	Definition	Disaggregation
Assessment for chronic kidney disease among people with hypertension at diagnosis	Proportion of people with hypertension who were assessed for chronic kidney disease (CKD) at diagnosis through • albumin/ creatinine in spot urine sample and/or • with estimated glomerular filtration rate (eGFR) using serum creatinine N: Number of people newly diagnosed with hypertension at the facility who were assessed for CKD in their first year of diagnosis in the reporting period D: Total number of people newly diagnosed with hypertension at the facility in the reporting period	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Blood pressure control among people with hypertension (follow-up)	Proportion of people newly diagnosed with hypertension with controlled blood pressure at 3 or 6 months after treatment initiation Based on WHO guidelines, blood pressure is considered controlled when • systolic blood pressure (SBP) < 140 mmHg and diastolic blood pressure (DBP) < 90 mmHg • SBP < 130 mmHg among people with history of CVD • SBP < 130 mmHg among high-risk people with hypertension, i.e. those with high CVD risk, diabetes mellitus, chronic kidney disease Blood pressure control criteria may be based on national guidelines. N: Number of people newly diagnosed with hypertension with controlled blood pressure at 3 or 6 months after treatment initiation D: Total number of people newly diagnosed with hypertension registered for treatment in the quarter that ended 3 or 6 months previously	Where possible and applicable, stratify by patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type

continues

ANNEX 1 *continued*

Optional indicator	Definition	Disaggregation
Availability of trained staff who are providing services for hypertension management	Proportion of health facilities in which staff have been trained in the latest WHO or national guidelines on hypertension clinical management N: Number of health facilities in which all related staff have been trained in WHO or national guidelines on hypertension clinical management Related staff refers to physicians or nationally authorized health professionals for hypertension management D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)
Completeness and timeliness of reporting of health facilities	Proportion of health facilities that submitted complete and timely reports Health facility reports containing mandatory data that were reported to a higher level within the prescribed submission period by the national programme are considered complete and timely reports N: Number of health facilities that submitted complete and timely reports on hypertension indicators D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)
Facilities receiving supervisory visit	Proportion of health facilities receiving a supervisory visit in the last reporting period N: Number of health facilities receiving a supervisory visit in the last reporting period D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)
Loss to follow-up	Proportion of people with hypertension who were lost to follow-up N: Number of people with hypertension who were lost to follow-up (unknown status for a year) D: Total number of people with hypertension registered in the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type

continues

ANNEX 1 *continued*

Optional indicator	Definition	Disaggregation
Pharmacological treatment among people with diabetes	Proportion of people with diabetes who are receiving hypoglycaemic agent for diabetes treatment in the reporting period N: Number of people with diabetes registered in the facility who are receiving hypoglycaemic agent for diabetes treatment in the reporting period D: Total number of people with diabetes registered in the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Statin therapy among people with diabetes	Proportion of people with diabetes who are receiving statin therapy based on WHO or national treatment guidelines N: Number of people with diabetes registered in the facility who are receiving statin therapy based on WHO or national treatment guidelines D: Total number of people with diabetes registered in the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Pharmacological treatment for chronic kidney disease (CKD) among people with diabetes	Proportion of people with diabetes and CKD who are receiving treatment for CKD based on WHO or national treatment guidelines N: Number of people with diabetes and CKD registered in the facility who are receiving treatment for CKD in the reporting period D: Total number of people with diabetes and CKD registered in the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Pharmacological treatment for hypertension among people with diabetes	Proportion of people with diabetes and hypertension who are receiving treatment for hypertension Hypertension treatment for people with diabetes may follow WHO or national treatment guidelines. Hypertension treatment is indicated in people with diabetes when systolic blood pressure ≥ 130 mmHg or diastolic blood pressure ≥ 80 mmHg based on WHO guidelines. N: Number of people with diabetes and hypertension registered in the facility who are receiving treatment for hypertension in the reporting period D: Total number of people with diabetes and hypertension registered in the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type

continues

ANNEX 1 *continued*

Optional indicator	Definition	Disaggregation
Assessment for diabetic CKD among people with diabetes	Proportion of patients who were assessed for diabetic kidney disease through • albumin/ creatinine in spot urine sample and/or • estimated glomerular filtration rate (eGFR) using serum creatinine N: Number of people with diabetes registered in the facility who were assessed for diabetic chronic kidney disease D: Total number of people with diabetes registered in the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Assessment for diabetic foot among people with diabetes	Proportion of people with diabetes who were clinically assessed for diabetic foot using foot assessment method based on WHO or national guidelines N: Number of people with diabetes registered in the facility who were clinically assessed for diabetic foot in the last visit D: Total number of people with diabetes registered in the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Referral for retinopathy screening among people with diabetes	Proportion of people with diabetes who were referred for screening for diabetic retinopathy involving • visual acuity • direct/indirect ophthalmoscopy (dilated pupils) or retinal fundus photography N: Number of people with diabetes registered in the facility due for biennial screening for diabetic retinopathy that were referred for diabetic retinopathy D: Total number of people with diabetes registered in the facility who were due for biennial screening for diabetic retinopathy	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type

continues

ANNEX 1 *continued*

Optional indicator	Definition	Disaggregation
Glycaemic control among people with diabetes (follow-up)	Proportion of people with diabetes with good glycaemic control at every 3 or 6-month follow-up visit in the facility Glycaemic control is achieved when • HbA1c < 7% (53 mmol/mol) [or fasting plasma glucose < 7.0 mmol/l or < 126 mg/dl] • HbA1c < 8% in people with frequent severe hypoglycaemia, severe complications and low life-expectancy N: Number of people with diabetes registered in the facility with good glycaemic control at 3 or 6-month follow-up visit, excluding those newly diagnosed with less than 3 or 6 months of treatment D: Total number of people with diabetes registered in the facility excluding those newly diagnosed with less than 3 or 6 months of treatment	Where possible and applicable, stratify by patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Chronic kidney disease (CKD) among people with diabetes	Proportion of people with diabetes who were newly diagnosed with CKD based on WHO or national guidelines N: Number of people with diabetes registered in the facility who were newly diagnosed with CKD in the last reporting period D: Total number of people with diabetes registered in the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Lower-limb amputation among people with diabetes	Proportion of people with diabetes who newly underwent lower-limb amputation N: Number of people with diabetes registered in the facility who newly underwent lower-limb amputation because of diabetic foot in the last reporting period D: Total number of people with diabetes registered in the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type

continues

ANNEX 1 *continued*

Optional indicator	Definition	Disaggregation
Blindness among people with diabetes	Proportion of people with diabetes who newly experienced blindness in the last year based on WHO or national guidelines N: Number of people with diabetes registered in the facility who newly experienced blindness in the last reporting period D: Total number of people with diabetes registered in the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Availability of trained staff who are providing services for diabetes management	Proportion of health facilities in which staff have been trained in the latest WHO or national guidelines on diabetes clinical management N: Number of health facilities in which staff have been trained in the latest WHO or national guidelines on diabetes clinical management “Staff” refers to physicians or nationally authorized health professionals for diabetes management D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)
Completeness and timeliness of reporting of health facilities	Proportion of health facilities that submitted complete and timely reports Health facility reports containing mandatory data that were reported to a higher level within the prescribed submission period by the national programme are considered complete and timely reports N: Number of health facilities that submitted complete and timely reports on diabetes indicators D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)
Facilities receiving supervisory visit	Proportion of health facilities receiving a supervisory visit in the last reporting period N: Number of health facilities receiving a supervisory visit in the last reporting period D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)

continues

ANNEX 1 *continued*

Optional indicator	Definition	Disaggregation
Loss to follow-up	Proportion of people with diabetes who were lost to follow-up N: Number of people with diabetes who were lost to follow-up (unknown status for a year) D: Total number of people with diabetes registered in the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Referral for mammography screening among women aged 50–69 years	Proportion of women aged 50–69 years without a breast cancer screening in the last 2 years who attended the facility and were referred for mammography to facilities with capacity for mammography screening in the last year N: Number of women aged 50–69 years without a breast cancer screening in the last 2 years who attended the facility and were referred for mammography screening to facilities with capacity for mammography screening in the last year D: Total number of women aged 50–69 years without a breast cancer screening in the last 2 years who attended the facility in the last year	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Timeliness of breast cancer confirmatory diagnosis among women aged 30–49 years with suspicious findings from clinical breast evaluation	Proportion of women aged 30–49 years with signs and/or symptoms associated with breast cancer who had suspicious findings from clinical breast evaluation conducted at the primary care facility and who received confirmatory diagnosis of breast cancer within 2 months of clinical breast evaluation at the facility with capacity for diagnosis N: Number of women aged 30–49 years with signs and/or symptoms associated with breast cancer who had suspicious findings from clinical breast evaluation conducted at the primary care facility and who received confirmatory diagnosis of breast cancer within 2 months of clinical breast evaluation at the facility with capacity for diagnosis D: Total number of women aged 30–49 years with signs and/or symptoms associated with breast cancer who had suspicious findings from clinical breast evaluation conducted at the primary care facility and who received confirmatory diagnosis of breast cancer at the facility with capacity for diagnosis	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type

continues

ANNEX 1 *continued*

Optional indicator	Definition	Disaggregation
Timeliness of breast cancer treatment among women aged 30–49 years with suspicious findings from clinical breast evaluation	Proportion of women aged 30–49 years with signs and/or symptoms associated with breast cancer who had suspicious findings from clinical breast evaluation conducted at the primary care facility and who received treatment for breast cancer at the facility with capacity for treatment within 3 months of clinical breast evaluation N: Number of women aged 30–49 years with signs and/or symptoms associated with breast cancer who had suspicious findings from clinical breast evaluation conducted at the primary care facility and who received treatment for breast cancer at the facility with capacity for treatment within 3 months of clinical breast evaluation D: Total number of women aged 30–49 years with signs and/or symptoms associated with breast cancer who had suspicious findings from clinical breast evaluation conducted at the primary care facility and who received confirmatory diagnosis of breast cancer	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Availability of trained staff who are providing clinical breast evaluation services	Proportion of health facilities in which staff have been trained in the latest WHO or national guidelines on clinical evaluation of breast abnormalities including the use of clinical breast examination N: Number of health facilities in which staff have been trained in the latest WHO or national guidelines on clinical evaluation of breast abnormalities including the use of clinical breast examination “Staff” refers to physicians or nationally authorized health professionals for clinical breast evaluation services D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)

continues

ANNEX 1 *continued*

Optional indicator	Definition	Disaggregation
Completeness and timeliness of reporting of health facilities	Proportion of health facilities that submitted complete and timely reports Health facility reports containing mandatory data that were reported to a higher level within the prescribed submission period by the national programme are considered complete and timely reports N: Number of health facilities that submitted complete and timely reports on breast cancer indicators D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)
Facilities receiving supervisory visit	Proportion of health facilities receiving a supervisory visit in the last reporting period N: Number of health facilities receiving a supervisory visit in the last reporting period D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)
Loss to follow-up	Proportion of women with a known breast cancer diagnosis who were receiving survivorship care who were lost to follow-up (unknown status for a year) N: Number of women with a known breast cancer diagnosis who were receiving survivorship care at the facility who were lost to follow-up D: Total number of women with a known breast cancer diagnosis who were receiving survivorship care at the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Availability of pap smear testing	Proportion of health facilities that have capability of pap smear testing A facility is considered to have capability of pap smear testing if collection of sample for pap smear testing can be done at the facility N: Number of health facilities reporting capability of performing pap smear testing D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)
Availability of visual inspection with acetic acid (VIA) testing	Proportion of health facilities that have capability of VIA testing N: Number of health facilities reporting capability of performing VIA testing D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)

continues

ANNEX 1 *continued*

Optional indicator	Definition	Disaggregation
Cervical cancer rescreening among women aged 30–49 years	Proportion of women aged 30–49 years who were rescreened for cervical cancer, 3 to 5 years after their last screening For women with HIV, rescreening should be done after 3 years N: Number of women aged 30–49 years who attended the health facility in the last year who were rescreened for cervical cancer, 3 to 5 years after their last screening For women with HIV, 25–49 a cervical cancer screening test 3 years after first screening is recommended D: Total number of women aged 30–49 years who attended the health facility in the last year and had their last screening more than 3 to 5 years ago	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, HIV status, other high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Pre-invasive cervical disease treatment among women aged 30–49 years	Proportion of women aged 30–49 years with positive HPV test, eligible for treatment of pre-invasive cervical disease who were treated in the facility in the last year Treatment options include thermal ablation, cryotherapy and excision treatment including Large Loop Excision of the Transformation Zone therapy N: Number of women aged 30–49 years with positive HPV test, eligible for treatment of pre-invasive cervical disease who were treated in the facility in the last year D: Total number of women aged 30–49 years with positive HPV test eligible for treatment of pre-invasive cervical disease in the facility in the last year	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, HIV status, other high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type

continues

ANNEX 1 *continued*

Optional indicator	Definition	Disaggregation
Timeliness of referral for cervical cancer diagnosis among women aged 30–49 years with suspicious findings from cervical cancer screening	Proportion of women aged 30–49 years with suspicious findings from cervical cancer screening conducted at the facility who were referred to a centre with capacity for diagnosis and management of cancer within a month of screening N: Number of women aged 30–49 years with suspicious findings from cervical cancer screening conducted at the facility who were referred to a centre with capacity for diagnosis and management of cancer within a month of screening D: Total number of women aged 30–49 years with suspicious findings from cervical cancer screening conducted at the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, race/ethnicity, comorbidity status, HIV status, other high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Availability of trained staff who are providing cervical cancer screening services	Proportion of health facilities in which staff have been trained in the latest WHO or national guidelines on cervical cancer screening N: Number of health facilities in which staff have been trained in the latest WHO or national guidelines on cervical cancer screening “Staff” refers to physicians or nationally authorized health professionals for cervical cancer screening services D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)
Completeness and timeliness of reporting of health facilities	Proportion of health facilities that submitted complete and timely reports Health facility reports containing mandatory data that were reported to a higher level within the prescribed submission period by the national programme are considered complete and timely reports N: Number of health facilities that submitted complete and timely reports on cervical cancer indicators D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)

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ANNEX 1 *continued*

Optional indicator	Definition	Disaggregation
Facilities receiving supervisory visit	Proportion of health facilities receiving a supervisory visit in the last reporting period N: Number of health facilities receiving a supervisory visit in the last reporting period D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)
Loss to follow-up	Proportion of women who tested positive for cervical cancer screening or with a known cervical cancer diagnosis who were receiving survivorship care, who were lost to follow-up (unknown status for a year) N: Number of women who tested positive for cervical cancer screening or with a known cervical cancer diagnosis who were receiving survivorship care at the facility who were lost to follow-up D: Total number of women who tested positive for cervical cancer screening or with a known cervical cancer diagnosis who were receiving survivorship care at the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, comorbidity status, HIV status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Availability of trained staff who are providing services for early diagnosis of childhood cancers	Proportion of health facilities in which staff have been trained in the latest WHO or national guidelines on early diagnosis of childhood cancers N: Number of health facilities in which staff have been trained in the latest WHO or national guidelines on early diagnosis of childhood cancers “Staff” refers to physicians or nationally authorized health professionals for early diagnosis of childhood cancers D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)
Completeness and timeliness of reporting of health facilities	Proportion of health facilities that submitted complete and timely reports Health facility reports containing mandatory data that were reported to a higher level within the prescribed submission period by the national programme are considered complete and timely reports N: Number of health facilities that submitted complete and timely reports on childhood cancer indicators D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)

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ANNEX 1 *continued*

Optional indicator	Definition	Disaggregation
Facilities receiving supervisory visit	Proportion of health facilities receiving a supervisory visit in the last reporting period N: Number of health facilities receiving a supervisory visit in the last reporting period D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)
Loss to follow-up	Proportion of children with a known diagnosis of cancer who were receiving follow-up care who were lost to follow-up (unknown status for a year) N: Number of children with a known diagnosis of cancer who were receiving follow-up care at the facility who were lost to follow-up D: Total number of children with a known diagnosis of cancer who were receiving follow-up care at the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type
Availability of trained staff who are providing services for early diagnosis of cancers	Proportion of health facilities in which staff have been trained in the latest WHO or national guidelines on early diagnosis of cancers N: Number of health facilities in which staff have been trained in the latest WHO or national guidelines on early diagnosis of cancers “Staff” refers to physicians or nationally authorized health professionals for early diagnosis of cancers D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)
Completeness and timeliness of reporting of health facilities	Proportion of health facilities that submitted complete and timely reports Health facility reports containing mandatory data that were reported to a higher level within the prescribed submission period by the national programme are considered complete and timely reports N: Number of health facilities that submitted complete and timely reports on cancer indicators D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)

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ANNEX 1 *continued*

Optional indicator	Definition	Disaggregation
Facilities receiving supervisory visit	Proportion of health facilities receiving a supervisory visit in the last reporting period N: Number of health facilities receiving a supervisory visit in the last reporting period D: Total number of health facilities	Health facility, provider ownership type (public-private), facility location type (rural-urban)
Loss to follow-up	Proportion of people with a known cancer diagnosis who were receiving survivorship care, who were lost to follow-up N: Number of health facilities that submitted complete and timely reports on cancer indicators D: Total number of people with a known cancer diagnosis who were receiving survivorship care at the facility	Where possible and applicable, stratify by health facility, provider ownership type (private-public) and patient characteristics such as age, sex, comorbidity status, high-risk groups, socioeconomic status, residence type (rural-urban), health insurance type

