Guidance on the analysis and use of routine health information systems

Rehabilitation module
Guidance on the analysis and use of routine health information systems: rehabilitation module

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1. Background

Global trends in health and ageing signal the need for a major scaling-up of rehabilitation services worldwide, particularly in low- and middle-income countries. Investment in rehabilitation allows people with a health condition to achieve and maintain optimal functioning by improving their health and increasing their participation in life. Strengthening rehabilitation in health systems is fundamental to responding to increasing demand and ensuring that rehabilitation is available and affordable for those who require it. As recommended in the WHO initiative, Rehabilitation 2030: a call for action (1), enhancing health information systems to collect data is key to strengthening rehabilitation.

Data on rehabilitation, collected through routine reporting of health facilities from both individual and service records, are used for defining rehabilitation targets and outcomes, clinical decision-making, estimates of service utilization, and quality management. Regular monitoring of rehabilitation services at national and subnational levels provides information on service availability and distribution which can inform measures taken to achieve universal health coverage (UHC). System-level rehabilitation data underpin decision-making for rehabilitation in health policy, management and clinical care. Information on functioning is essential since the goal of rehabilitation is to optimize functioning for people with impairments, injuries, and acute or chronic diseases.
2. **Purpose of this guidance document**

**What does this document cover?**

This guidance document supports the monitoring of rehabilitation services, programme management and system-level decision-making, through a proposed set of standard indicators; considerations for their analysis and use are also presented (referred to hereafter as the “analysis framework”).

The delivery of rehabilitation services covers a wide range of activities for various health conditions. Delivery is provided by a multidisciplinary workforce at all administrative levels of health care. Real-time monitoring of services thus requires identifying a standardized set of essential indicators that cover the common types of rehabilitation delivered, and their relevant features, for decision-making both at a system and health facility level. With full consideration of the potential burden of data collection in health facilities, this document adopts a general approach to service delivery and does not cover monitoring for selected rehabilitation interventions or features related to specific intervention types.

**Who is the document for?**

The standard indicator set informs programme planners, facility managers and service providers about the recommended data elements for collection. The information provided through routine data collection and reporting from rehabilitation health facilities then needs to be analysed and used. This typically involves the following:

- decision-makers in the Ministry of Health; these may include policy-makers for rehabilitation, programme managers, data managers and managers of health information systems;
- rehabilitation programme partners and programme planners;
- managers of health facilities for rehabilitation, or rehabilitation units; and
- research institutes involved with the assessment and improvement of rehabilitation data and information systems.
What are the expected outcomes?

The indicators guide the data collected and support the integration of rehabilitation into facility-level reporting.

The analysis framework supports decision-making for rehabilitation in the health sector and informs the teams responsible for analysis, monitoring and evaluation. It allows managers to assess the performance of the rehabilitation sector, including its integration into the health system; trends of health conditions and rehabilitation service utilization; patterns of quality features; and geographical differences in coverage of service delivery over time. The analysis framework can further help programme managers and health planners respond to monitoring and evaluation questions such as:

- Are rehabilitation services equipped with adequate resources, and where are the gaps?
- To what extent are rehabilitation services used and what are the features of utilization in relation to service capacity, user’s profile, and service delivery platform?
- How is rehabilitation contributing to UHC?
- How does the effectiveness of rehabilitation change over time?
- How well is rehabilitation service delivery integrated into the health system, and along the continuum of care?
- To what extent do people in need of longer-stay, high-intensive, multidisciplinary rehabilitation have access to quality care?
- What are trends of health conditions associated with rehabilitation need?
- Have improvement measures for the strengthening of the health system been effective?

Programme managers and planners can use the data for the establishment and follow-up of real-time measures regarding accessibility, availability, human resources, quality, and service outcome.

The proposed standard indicators may be used for monitoring operational and strategic planning for rehabilitation. The data are collected to track progress towards the objectives of a (national) strategic plan.
The WHO publication, *Rehabilitation in health systems - guide for action (2)* provides guidance for the strengthening of health systems. The guide includes a section on the monitoring of a rehabilitation strategic plan known as “FRAME” (Framework for Rehabilitation Monitoring and Evaluation), and a Rehabilitation Indicators Menu (RIM) with 40 indicators. RIM indicators using data provided primarily by health facilities form the basis of the facility indicators for rehabilitation that are recommended for routine collection by facilities and collated through District Health Management Information Systems (DHMIS).
3. Core rehabilitation facility indicators

The core indicators shown in Table 1 are organized according to the type of rehabilitation facility collecting the data. Although some data are collected at all facility types, others are collected only at primary care facilities* or at a dedicated rehabilitation ward*.

Table 1. Core facility indicators for rehabilitation

<table>
<thead>
<tr>
<th>Core indicator</th>
<th>Definition</th>
<th>Disaggregation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All facility types</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rehabilitation personnel density</td>
<td>Number of rehabilitation workers*/ Total population x 10 000</td>
<td>Administrative level*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rehabilitation occupational group</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Geographical region</td>
</tr>
<tr>
<td>Rehabilitation uptake</td>
<td>Number of rehabilitation sessions* provided/ Total population x 10 000</td>
<td>Administrative level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Health condition group*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rehabilitation occupational group</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inpatient and outpatient</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Geographical region</td>
</tr>
<tr>
<td>Rehabilitation service</td>
<td>Number of cases* that receive rehabilitation services/ Total population</td>
<td>Administrative level</td>
</tr>
<tr>
<td>utilization</td>
<td>x 10 000</td>
<td>Health condition group</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inpatient and outpatient</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sex</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Age (0–4 yrs; 5–17 yrs; ≥18 yrs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Geographical region</td>
</tr>
</tbody>
</table>

* See: Annex 1. Data dictionary for an explanation of words marked with an asterisk.
<table>
<thead>
<tr>
<th>Core indicator</th>
<th>Definition</th>
<th>Disaggregation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assistive products uptake</td>
<td>Number of assistive products provided</td>
<td>Six categories of the WHO Assistive products Priority List (APL)*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inpatient and outpatient</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Age (0–4 yrs; 5–17 yrs; ≥18 yrs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Geographical region</td>
</tr>
<tr>
<td>Outreach programmes uptake</td>
<td>Number of rehabilitation sessions provided by outreach programmes</td>
<td>Administrative level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sex</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Age (0–4 yrs; 5–17 yrs; ≥18 yrs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Geographical region</td>
</tr>
<tr>
<td>Rehabilitation referral</td>
<td>Number of referrals* x 100/ Total number of new cases* accessing the facility</td>
<td>Administrative level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Service type (assistive product provision, and other rehabilitation services*)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inpatient and outpatient</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Geographical region</td>
</tr>
<tr>
<td>Waiting time for assistive</td>
<td>Number of days waiting for assistive product provision*/ Number of assistive</td>
<td>Administrative level</td>
</tr>
<tr>
<td>product provision</td>
<td>products provided</td>
<td>Six categories of the WHO APL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inpatient and outpatient</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Geographical region</td>
</tr>
<tr>
<td>Rehabilitation waiting time</td>
<td>Number of waiting days until first session*/ Number of new cases</td>
<td>Administrative level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rehabilitation occupational group</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Geographical region</td>
</tr>
</tbody>
</table>

**Primary care facilities**

<table>
<thead>
<tr>
<th>Essential Package availability</th>
<th>Number of facilities offering an Essential Package for rehabilitation x 100/ Total number of facilities</th>
<th>Geographical region</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Essential Package type*</td>
</tr>
</tbody>
</table>

* See: Annex 1, Data dictionary for an explanation of words marked with an asterisk.
<table>
<thead>
<tr>
<th>Core indicator</th>
<th>Definition</th>
<th>Disaggregation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dedicated rehabilitation ward</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rehabilitation bed density</td>
<td>Number of rehabilitation beds*/ Total population x 10 000.</td>
<td>Geographical region</td>
</tr>
<tr>
<td>Individualized care plan*</td>
<td>Number of new inpatients receiving an individualized care plan x 100/ Number of new inpatients</td>
<td>Geographical region</td>
</tr>
<tr>
<td>Length of stay</td>
<td>Number of days of inpatient stay for discharged clients */ Number of discharges</td>
<td>Health condition* Geographical region</td>
</tr>
<tr>
<td>Functioning change*</td>
<td>Difference between the average functioning assessment score at admission and at discharge</td>
<td>Health condition Geographical region</td>
</tr>
<tr>
<td>Coverage for people with acute and complex needs</td>
<td>Number of first-time admissions* for selected health conditions x 100/ Estimated number of new cases for selected health conditions</td>
<td>Health condition</td>
</tr>
<tr>
<td>Accessibility for people with acute and complex needs</td>
<td>Number of first-time admissions for selected health conditions</td>
<td>Health condition Geographical region</td>
</tr>
</tbody>
</table>

* See: Annex 1. Data dictionary for an explanation of words marked with an asterisk.
4. Data quality

Before conducting analysis and interpretation, the reported data should be checked and reviewed for quality. Sound decisions are based on sound data; therefore, it is essential to ensure that data are of good quality. Health-facilities constitute a primary source for data which assess the performance of the health sectors. Poor quality data affect different levels of the health system in different ways. For providers at the facility level, for example, incomplete or inconsistent information can impact patient care. For programme managers, poor quality data can lead to incorrect decisions that can be detrimental to the overall running of the programme, and ultimately to the health of the population; at the planning level, they can undermine evidence of progress towards the objectives of the health sector, and may hinder annual planning processes. Furthermore, when determining investments in the health sector, poor quality data can lead to poor targeting of resources.

There are different methods to review and assure the quality of data. Data quality should be reviewed both routinely, as a part of the data analysis process, and periodically through specific data quality review processes. WHO recommends using review metrics for routine data quality assurance and incorporating these into the programme reporting procedure (Table 2). Other methods recommended by WHO to review and identify issues relating to data quality should also be applied periodically or when an opportunity occurs.
Table 2. Routine data quality assurance

<table>
<thead>
<tr>
<th>Domains</th>
<th>Data quality metric</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completeness and timeliness</td>
<td>Completeness and timeliness of reporting (reporting form/data set completeness)</td>
<td>Monthly, annually</td>
</tr>
<tr>
<td></td>
<td>Completeness of indicator data (data element completeness)</td>
<td>Monthly, annually</td>
</tr>
<tr>
<td>Internal consistency</td>
<td>Presence of outliers</td>
<td>Monthly, annually</td>
</tr>
<tr>
<td></td>
<td>Consistency over time, i.e. plausibility of reported values compared to previous reporting</td>
<td>Monthly, annually</td>
</tr>
<tr>
<td></td>
<td>Consistency between indicators</td>
<td>Annually</td>
</tr>
<tr>
<td></td>
<td>Consistency between denominators, e.g. estimated number of new cases with selected health condition; estimated population at subnational level</td>
<td>Annually</td>
</tr>
<tr>
<td>External consistency with other data sources</td>
<td>Consistency between routinely-reported data and population-based surveys</td>
<td>Annual or Ad-hoc</td>
</tr>
<tr>
<td>External comparison of population data</td>
<td>Consistency between the population data used for calculating rehabilitation coverages and other sources of population estimates</td>
<td>Annually</td>
</tr>
</tbody>
</table>

To ensure data quality, WHO developed a Data Quality Assurance Toolkit for countries to assess the quality of their health facility data. WHO recommends that data quality should be reviewed routinely – at a minimum monthly – and across all reporting levels (facility, district, higher-level, and national), to align with the routine reporting cycle. Ultimately, however, each country should establish and follow their own standard operating procedures for data quality assurance.
The following key metrics are used for monthly checks on data quality and should be part of the routine cycle of data reporting:

- **Completeness and Timeliness:** The completeness of the data is assessed by measuring whether all entities for reporting actually do so. This applies to health-facilities reporting to the district level; district levels reporting to regional or provincial levels; and provincial levels reporting to the national level. Timeliness of data is assessed by measuring whether the entities submitting reports did so before a predefined deadline.

- **Outliers:** This examines if a data value in a series of values is extreme in relation to the other values in the series.

- **Consistency over time:** The plausibility of reported results for selected programme indicators is examined in terms of the history of reporting of the indicators. Trends are evaluated to determine whether reported values are extreme in relation to the other values reported during the year or over several years.

- **Consistency between indicators:** Programme indicators with a predictable relationship are examined to determine whether the relationship depicted in the reported data, is as anticipated. For example, the monthly uptake of rehabilitation services should be equal to or larger than the utilization of services during the same period of time.

Of the above four dimensions of data quality, completeness and timeliness, outliers, and internal consistency between indicators are those most frequently used in routine reporting procedures to ensure data are of acceptable quality before analysis. The external consistency and external comparisons of population data are part of the (annual) discrete data quality review where systematic data quality issues can be detected. Developing an improvement plan for data quality based on the findings is therefore recommended, as is implementing an annual or biannual desk review and inclusion of rehabilitation data in the health facility assessment and data verification.

If a routine reporting system for rehabilitation is established in countries that use DHIS2 (District Health Information System 2), creating a data quality dashboard is recommended to assist in quality assurance of the monthly data. The dashboard includes three data quality dimensions mentioned above (completeness and timeliness, outliers, and internal consistency between indicators);
indicators for internal consistency should be decided by programmes in consultation with the HMIS (Health Management Information System) and DHIS2 to ensure that data sources are consistent and that a standard operating procedure is in place to assist implementation.

Suggested indicators to be used for the data quality dashboard include:

A. Completeness and Timeliness

B. Internal consistency (outlier and coherence between data items)
   - Rehabilitation service utilization
   - Rehabilitation uptake
   - Assistive product uptake
   - Length of stay
   - Functioning change

In settings where DHIS2 is used, the following interventions for rehabilitation have been configured as part of the data quality assurance system: validation rules; clarity of data point definition and analysis; and clarity of use of population estimates. These measures should be included in national standard operating procedures for rehabilitation reporting, analysis, and use in countries.

In addition, a DHIS2 application (the WHO data quality app) can be downloaded and installed in the national DHIS2 platform to assist the discrete data quality review. This app automatically generates findings on the app's dashboard that relate to issues with data quality.

Guidance and training materials to assist district level facilities in using the routine data quality assurance in DHIS2 are also available online.
5. Analysis framework

For purposes of analysis, the core facility indicators for rehabilitation and corresponding dashboard visuals are organized into categories that broadly relate to the rehabilitation results chain (Figure 1). The results chain explains the logical order of Input, Output and Outcome domains that lead eventually to an Impact for rehabilitation; the chain also provides an overview of components to be assessed when strengthening the health system for rehabilitation.

Figure 1. Rehabilitation results chain

While the indicators *rehabilitation bed density* and *personnel density* are capturing information for the Input domain of the results chain, data for *essential package availability*, *rehabilitation uptake* and *utilization*, and quality indicators such as *individualized care plan* and *length of stay*, feed into the Output domain. For the Outcome domain, three indicators are proposed: *rehabilitation coverage*; *accessibility for people with acute and complex needs*; and *functioning change*. The integration of rehabilitation along the continuum of care, as a feature of health system efficiency, is assessed through *rehabilitation referral* and *waiting time* indicators.

Rehabilitation input data

**Purpose:** The two indicators, *rehabilitation bed density* and *personnel density*, are selected to represent the Input domain as they provide basic information about the availability of core resources needed for the provision of essential rehabilitation services. They indirectly assess the quality of the service delivery system through the skill set of human resources available in the facilities.
Information on bed and personnel density is needed both by facility programme managers and health system managers for monitoring, planning and coordination, and to ensure a correct distribution of rehabilitation beds and health-care workers across health facilities and programmes to meet target population needs.

**Dashboard and considerations for interpretation:**

Currently, there is no global recommended standard for inpatient rehabilitation beds in relation to total population; recommendations are made based on population needs at a national level. Hospitals whose mandate is to provide inpatient rehabilitation services should ensure an allocation of beds. National programme managers are advised to compare their data periodically with countries which have a similar socioeconomic background or health outcome level. A disaggregation by subnational region helps to inform equal distribution, based on evidence of needs (v1).

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3 The dashboard visuals presented in this document have been developed with “dummy” data and are not intended to show real-time country data. Screenshots of visuals that have been taken from the DHIS2 development instance contain the naming of fictional regions (e.g. cat district, fruit district, animal region, food region, trainingland). Screenshots taken from the DHIS2 demo instance contain a map of Lao People’s Democratic Republic, reproduced with kind permission from the Ministry of Health.
Globally, the density of all health workers who deliver rehabilitation is far below the threshold required for providing adequate services. The required density of rehabilitation workers is highly dependent on context, and a country estimate would be based on workforce needs estimates to adequately staff facilities or based on epidemiological data such as the prevalence of rehabilitation-relevant health conditions. The WHO GROWE\(^4\) tool has been developed specifically to provide country estimates of workforce needs for the different rehabilitation occupational groups. The dashboard enables assessment of overall density of personnel as well as density of different occupational groups, nationally and by subnational region (v1 and v2).

v2 Personnel density for different occupational groups, subnational, 2021

The distribution of rehabilitation workers should be assessed by populations of a catchment area, by level of health care, and by needs specific to the region. Equity of rehabilitation workforce deployment remains a challenge in many countries, with a concentration in urban areas. When assessing geographical equity and comparing with workforce density for different subnational regions (v2), the best

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\(^4\) GROWE: Guide for Rehabilitation Workforce Evaluation.
practice is to disaggregate by facility level. While the number of rehabilitation staff may be higher at tertiary care level, WHO recommends integrated rehabilitation across all levels of health care in accordance with population needs (v3).

**Visual 4 (v4)** shows a country map with facilities for rehabilitation; the number of staff working in the facilities informs about availability at different levels of health care and in regions with needs specific to the region.
The dashboard also provides information about the percentage of facilities (from the rehabilitation master facility list*) that have rehabilitation workers per occupational group, and for the different levels of health care; this shows the efficiency of distribution of staff across the levels of health care. Efficiency of distribution can be viewed over time and provide information on the evolution of service availability at facilities reporting on rehabilitation, in relation to interventions delivered by different occupational groups. Programme planners should gradually plan for overall availability of all occupational groups at all levels of health care (v5).
The spectrum of rehabilitation needs within a country’s population often calls for a wide range of competencies typically represented across the rehabilitation core occupational groups. WHO recommends building a multidisciplinary workforce, defined as having at least three different occupational groups (although this number should not be interpreted as the desired standard). While there is variability in scopes of practice between countries, similar rehabilitation needs exist at all levels of the health system. Therefore, the multidisciplinary composition should persist from primary to tertiary level of health care (v3).

The correlation between rehabilitation bed density and personnel density is an indication of how the supply needs for rehabilitation workers align with infrastructural investments, and vice versa (v1). Policy-makers and programme managers should set standards across programmes in geographical regions based on population needs; collecting the relevant data helps to set a baseline for the future. It is fundamental for facility-managers to identify discrepancies in the number of staff and beds based on these standards, and to align investments. The dashboard provides a time trend of both bed density and occupational group density in geographical regions (including national) to monitor efforts towards
equal distribution. National managers should identify regions that are lagging behind and the underlying cause, and act accordingly. This information is particularly relevant for countries with a strategic plan for rehabilitation that includes activities to increase personnel and bed density (v6 and v7).
Input data relating to density of rehabilitation beds and personnel are also helpful to inform readiness for changing rehabilitation needs, especially in disaster-prone countries that need current and rapidly-accessible data to inform surge capacity for a preparedness and response plan.
Rehabilitation output data

This section on rehabilitation output data comprises three subsections: Essential Package availability; Rehabilitation service utilization; and Rehabilitation service quality.

**Essential package availability**

**Purpose:** WHO recommends the availability of an essential package for rehabilitation at primary care level for the achievement of UHC (3). This indicator measures the percentage of primary health care facilities offering a basic rehabilitation package as part of their essential health service package and provides information on the status of implementation in countries. The indicator lists all facilities offering an essential package; countries can disaggregate further on type.

**Dashboard and considerations for interpretation:**

Visuas of the data provide an overview of availability of the essential package for rehabilitation at primary care level for geographical regions such as districts; this informs equal distribution across the country. National managers should know whether the essential package is available to the population. This information can be used for mid- to long-term service planning (v8).
The dashboard shows the availability of the essential package for rehabilitation over time for geographical regions. Programme planners can use these data for monitoring the percentage of health facilities that offer an essential package as a response to capacity-building initiatives for rehabilitation (v9).

Timeline of primary care facilities (%) offering an essential package, subnational, 2016–2020
A map and pivot table (v10, v11) show the relationship between the availability of an essential package at primary care level and outpatient utilization data for the district. Availability should correspond to utilization data at this level of care. Where districts have high availability of an essential package, and data show rehabilitation utilization (e.g. new outpatients) as being relatively high for the district hospital, it is possible that the package is not being used as a first entry rehabilitation service as intended. In such cases the data analyst may need to compare the utilization data of primary care facilities that offer an essential package and those that do not.

v10 Map of primary care facilities offering an essential package, 2021
The capacity for providing an essential package for rehabilitation is demonstrated with a disaggregation by the type being offered (WHO basic rehabilitation package or national guidance package). This informs accessibility to rehabilitation service types at primary care level and can be used for mid- to long-term service planning (v12).
Rehabilitation service utilization

**Purpose:** Rehabilitation service utilization is indicative of the availability, accessibility, and public awareness of rehabilitation. This part of the indicator set measures the number of rehabilitation sessions and cases by preset health condition group and per 10 000 population, the number of assistive products issued, and the number of rehabilitation sessions provided through outreach programmes.

**Dashboard and considerations for interpretation:**

The number of rehabilitation sessions provided, both at facilities and through outreach programmes, reflects the needs of the population and the capacity of the programme to respond. Disaggregating uptake data by geographical region informs issues relating to regional capacity for both inpatient and outpatient facility-based and community outreach service delivery (v13 and v14). For many countries, outreach programmes are crucial to reduce the barriers to rehabilitation and therefore increase accessibility. The reasons for low numbers of sessions provided by outreach programmes should be explored; these are commonly caused by lack of availability of required staff and staff transport. This information can be used for mid- to long-term service planning that involves capacity-building measures.
Facility-based rehabilitation uptake: inpatient and outpatient, subnational, 2nd quarter, 2021

Outreach programme sessions per age group, subnational, 2nd quarter, 2021
An essential component of rehabilitation service delivery is the provision of assistive products. Data for uptake of assistive products issued, disaggregated for the six different categories of the WHO Assistive products Priority List, provide information on the capacity to deliver for the different categories. When disaggregating by geographical region, the analyst is informed about the capacity of the rehabilitation sector to procure and deliver all categories of assistive products across the country (v15). This information can be used for mid- to long-term service planning that involves capacity-building measures.

**v15**

Uptake of assistive products for inpatients and outpatients per assistive product category, subnational, 3rd quarter, 2021
Overall, underutilization of rehabilitation services is reported, even in high-income countries where workforce densities are several times higher than in low- and middle-income countries (4). Low utilization is usually indicative of poor access, availability and/or quality of services. Service outputs, such as utilization data, should therefore be reviewed in relation to input data, such as personnel density. The dashboard map shows regions with higher personnel density and lower utilization data (v16). When utilization data in a given geographical area are low in comparison with the availability of rehabilitation workers, measures can be taken to improve awareness of rehabilitation and remove constraints to its use. The analyst should be aware that access to health services involves a range of often complex factors, including distance, transport, financial barriers, sociocultural factors, referral mechanisms, provider behaviours and patient references.

The dashboard facilitates a comparison between the number of rehabilitation sessions provided (uptake) and the number of rehabilitation cases (utilization), in total (v17) or by health condition group.
Rehabilitation uptake (total) and service utilization (total), subnational, 1st quarter, 2021

The proportion of all rehabilitation sessions provided may vary over time and for health condition group. A large number of sessions for a health condition group, and a low number of cases may suggest: i) a large proportion of the population has poor access, but some have good access; or ii) rehabilitation uptake is high for some groups, which reflects their ability to complete the full recommended rehabilitation episode (v18).

To assess the availability and uptake of types of rehabilitation services, the analyst can compare utilization rates between health condition groups in a selected region, or for the same health condition group across regions (v19). Programme planners should remove constraints to using rehabilitation services for health condition groups with a higher number of sessions and a lower number of cases (v18). However, the analyst should be aware that within the same health condition group, rehabilitation needs may vary depending on the health conditions that have been included. For example, in the group for musculoskeletal conditions, people with a fracture have different rehabilitation needs than people with osteoarthritis.
Rehabilitation uptake and service utilization, by health condition group (HCG), national, 2nd quarter, 2021

Rehabilitation uptake and service utilization for musculoskeletal health condition group (HCG), subnational, 2nd quarter, 2021
Rehabilitation should be accessible for all, irrespective of sex and age. In many countries, rehabilitation for children is underdeveloped, and issues in gender-based accessibility persist. The dashboard provides an assessment of rehabilitation utilization for different age groups, both for specific health condition groups and for outreach programmes (v14 and v20).

Facility-based and district managers should assess the data for rehabilitation uptake for both inpatients and outpatients. A low inpatient uptake suggests limited access to inpatient services, whereas inpatient uptake that is high can indicate overall poor accessibility or poor quality of care for conditions that can be rehabilitated through outpatient care. All hospitals delivering inpatient services for several clinical domains (e.g. mother and child health, surgery), should provide inpatient rehabilitation activities, demonstrating that rehabilitation is well integrated into the healthcare system. This should be reflected by a low to moderate rate of rehabilitation uptake for inpatients (v13). For district managers, these data also give an indication of the levels of rehabilitation service delivery provided in the region, which can be compared with other service types.
The extent to which people can access and use rehabilitation services affects the coverage of interventions. Utilization data for specific health condition groups inform the accessibility to dedicated rehabilitation programmes across the country, which should then be compared with rehabilitation input data such as density and distribution of personnel. For example, the number of patients accessing rehabilitation for mental health conditions indicates the availability of rehabilitation services for this population group. These findings will inform the distribution of services for programme planners, and can be used for short- to medium-term service planning (such as for worker requirements) to reach equitable access across programmes and regions. Geographical comparisons allow managers to assess which programmes have achieved gains and where progress is lacking (v21 and v22).

<table>
<thead>
<tr>
<th>v21</th>
<th>Rehabilitation utilization per health condition group (HCG), subnational, 1st quarter, 2021</th>
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![Graph showing rehabilitation utilization per health condition group (HCG), subnational, 1st quarter, 2021.](image)
Data for rehabilitation uptake are essential for workforce planning both at facility and (sub)national level. The workload of rehabilitation workers is estimated by the number of sessions provided, whereas the number of clients receiving services is better used for the assessment of service availability. To assess the workload of the rehabilitation workforce, analysts may want to look at a visual with the number of sessions provided per rehabilitation occupational group member in a given geographical region (v23). Occupational groups that have higher ratios have higher demands and should be considered when deploying additional workers.
When planning rehabilitation programmes over time, changes in rehabilitation uptake for different health condition groups provide insights into changing practice and needs, as long-term health trends may be affecting service use. Programme planners need to monitor these trends in order to invest for increasing designated staff and infrastructure requirements (v24).
**Rehabilitation service quality**

**Purpose:** Measures of quality for dedicated inpatient rehabilitation services are of particular interest to managers. An *individualized care plan* contributes to better rehabilitation outcomes for clients, and the *length of a rehabilitation stay* informs assessment of effectiveness and efficiency.

**Dashboard and considerations for interpretation:**
A high percentage of patients receiving an individualized rehabilitation care plan suggests high quality inpatient care. A visual of this indicator over time provides information of gains made towards implementation of these plans for all clients, which can be compared across hospitals and regions (v25).
The length of an inpatient episode provides information on a mean of rehabilitation service use. Rehabilitation service managers should aim for shorter lengths of stay while respecting the client’s progress in terms of their functioning improvement. Benchmarking for a length of stay is difficult as many factors may influence the duration of hospital stay, and variations may occur based on such issues as the complexity of rehabilitation needs within the same health condition, personal factors, level of caregiver support, secondary complications, and health insurance coverage. An assessment of length of stay for a specific health condition over a period of time informs about progress made in the effectiveness of rehabilitation services for the particular health condition; progress may result from interventions such as training on goal-directed rehabilitation, the implementation of clinical practice guidelines, and collaboration with stepdown services. The analysis enables comparison across hospitals and regions (v26).
An analysis of the length of stay, in combination with functioning change, gives an overview of the quality of services provided for a specific health condition. Service providers and managers should aim for an optimal combination of increased functioning change and reduced length of stay. However, a shortened length of stay should not be at the expense of a gain in functioning (v27), and the availability of post-discharge rehabilitation services should be taken into account. This analysis can be conducted either for a selected health condition at different facilities, which enables comparison of quality and effectiveness of services across facilities (v27), or for a selection of health conditions at (sub)national level, which enables assessment of the national average length of stay for different health conditions and their functioning change (v28). Regarding the latter, it is important to know that the ratio of functioning change/length of stay cannot be compared between health conditions as, generally, different functioning assessment measures are used. This issue could be overcome when using the same functioning measure across health conditions.
Functioning change and length of stay for stroke, by dedicated ward, February-July, 2021

Functioning change and length of stay, by health condition, national, February-July, 2021
A time trend of length of stay, in combination with functioning change for a specific health condition, provide useful information for facility managers in assessing the effectiveness of measures taken for the improvement of service quality (v29). The analyst should be aware that some functioning measures have lower scores for lower functioning levels and others have higher scores for lower functioning levels.

v29 Timeline of functioning change and length of stay for stroke, for selected dedicated ward, 2017–2021
Rehabilitation outcome data

This section on Rehabilitation outcome data contains two subsections: Rehabilitation service coverage; and Functioning change.

Rehabilitation service coverage

**Purpose:** Coverage is measured by the percentage of people with acute and complex rehabilitation needs who access quality rehabilitation services. Good clinical practice prescribes inpatient multidisciplinary rehabilitation in a dedicated ward for the effective rehabilitation of people who have a group of health conditions with such needs. The choice of health condition to be measured should be based on national priorities and the availability of the denominator (estimated number of new cases). For reasons of the reliability of the denominator, coverage will be captured at (sub)national level only. If the denominator is unavailable, the analyst can still make use of the indicator *Accessibility for people with acute and complex needs* as a proxy; this assesses the number of first-time admissions for a selected health condition with acute and complex needs at the dedicated rehabilitation ward.

**Remark:** In most countries the data source for the denominator will need to be established. This may be a national estimate from International Classification of Diseases coding; or countries may calculate the country denominator by using the incidence rates for the region. The denominator will need to be adjusted for every reporting year.

**Dashboard and considerations for interpretation:**
For planning and programme management, it is crucial to know the extent to which selected health conditions with acute and complex needs are covered by quality rehabilitation services. High levels of coverage reflect good access to services, whereas low levels may indicate access problems and/or poor perceptions of service quality. If coverage is low, areas such as availability of rehabilitation beds across geographical regions, effectiveness of referral practices, and acceptability of services should be assessed, and responded to accordingly. When data are available for multiple health conditions, a disaggregation by health condition is recommended. These disaggregated data will inform coverage for a specific health condition in comparison to others. Where there is pronounced inequality, the underlying reasons for lower accessibility should be examined (v30).
Coverage data should be viewed over a period of time (e.g. 3–5 years) so that interventions taken to improve accessibility can be monitored (v31).
The accessibility of rehabilitation for all people with acute and complex needs can be assessed using a map that shows the locations of specialized facilities with dedicated wards, comparing their overall utilization data and bed density (v32). This analysis may also be conducted for specific health conditions. While some facilities may be accountable for the coverage of a subspecialty of rehabilitation service delivery in a country, others may not be in a position to do this due to a lack of equipment or adequately trained staff (v32). Accessibility data for specific health conditions may be available for different regions and provide evidence of geographical differences (v33). National programme planners should strive for an equal distribution of facilities that provide rehabilitation services for people with acute and complex needs.

v32 Map with dedicated wards, accessibility for people with acute and complex needs, and bed density, 2020
A time trend of accessibility data for a geographical region can be used to monitor subnational changes resulting from measures that aim to improve the situation, such as an increased bed availability in the region, awareness raising campaigns about adequate referral, and the removal of accessibility barriers such as financial and transportation constraints (v34).
Functioning change

**Purpose:** Scoring the average *functioning change* over a rehabilitation episode (series of sessions) for a defined health condition produces a measure of the outcome of the episode. A gain in functioning reflects an increased ability for independent living and societal participation, which is the overall aim of rehabilitation.

**Dashboard and considerations for interpretation:** Changes in the level of a client’s functioning indicate the overall clinical outcomes of rehabilitation and further inform policy-makers about the results of rehabilitation (v35).

Although the average of change in functioning for the same health condition will vary across facilities based on, among other factors, the numbers of patients who have been rehabilitated, the dashboard gives an overview of functioning changes per health condition at different facilities. Major differences may become apparent which will inform assessment of quality assurance and provide programme planners with a source of evidence for planning measures for improvement (v35).
Monitoring changes in functioning over a period of time enables policy-makers to evaluate the impact of measures taken to improve quality. Impact can be evaluated for one health condition across facilities (v36) or for different health conditions at a selected facility.
Displaying the average functioning score for a selected health condition at admission and discharge provides facility managers and clinicians with important insights into rehabilitation goals that can be achieved. After several years of data collection, an estimate of change in functioning based on the mean can be established for individuals admitted to the rehabilitation ward. This time trend also allows an assessment of the evolution of the functioning level. If there is a trend of lower levels of functioning at admission, facility managers should advocate for appropriate resources as the intensity and complexity of care will increase accordingly.
Rehabilitation continuum of care

**Purpose:** The integration of rehabilitation along the continuum of care, as a feature of the efficiency of a health system, can be assessed through indicators for rehabilitation referral and waiting time. Rehabilitation is commonly part of a continuum of care and a strong continuum results in better health outcomes. Rehabilitation referral practice, rehabilitation waiting time and waiting time for assistive product provision are indicative of effective use of the continuum of care. Well-functioning referral processes occur in both directions across health-care levels. Timely delivery of rehabilitation contributes to its effectiveness and the overall quality of care.

**Dashboard and considerations for interpretation:** A high proportion of new rehabilitation cases that have been referred from a different level of health care can be used as a proxy indication for effective referral practice. This should be used for all levels of care. Understanding referral practices across levels of care in different geographical regions is important for establishing or improving a referral system for rehabilitation, as well as for awareness-raising and training purposes. According to a country's
service organization, a high proportion of referred patients at tertiary (or quaternary) level may indicate effective referral for people with complex rehabilitation needs, whereas a high proportion of referrals at primary level for chronic conditions demonstrates continued rehabilitation and follow-up closer to the community (v38). Referral indicator results therefore need to be compared with service availability and the organization of health systems for rehabilitation in a country. For example, if no rehabilitation services are available at primary care level, a high referral at secondary care level demonstrates good referral practice to the next level. The analyst should also take into account that if the proportion of new cases referred from another level of health care is low, the majority may have had access to the facility from the same level of health care or from within the facility.

v38 Rehabilitation referral (percentage) for administrative levels, by subnational region, 2021
The analyst may also want to look at the proportion of referrals by type of service. The dashboard allows policy-makers and programme planners to review referrals for: i) the provision of assistive products; or ii) other types of rehabilitation services. This is recommended to be evaluated for administrative levels of care while taking into account their availability. If provision of services is centralized at a higher level of care and referrals are low, the majority of cases entering the health-care system at a decentralized level will have no access to required services (v39).

| v39 | Rehabilitation referral numbers (total) and referral numbers for assistive product (AP) provision and other rehabilitation services, per administrative level, national, 2021 |

In order to further evaluate the continuum of care, it is useful to compare referral data with utilization data at each level of care. Whereas referral data provide information about the number of new cases being referred, utilization data provide information of all cases accessing the different levels of health care; this contributes to an assessment of the integration of rehabilitation into the health care system. Services should be provided at all levels of care; a higher number of patients accessing primary care is an indication of the effective use of the first entry point to rehabilitation service delivery (v40).
Extended waiting time for rehabilitation services is a common issue in many countries and data provide an estimate of unmet need. An average of days spent waiting informs assessment of timely service delivery: for example, is a person waiting for an “acceptable” time (e.g. <10 days); a “manageable” time (e.g. 10–30 days); or a “hindering” time (e.g. >30 days)? The dashboard shows the waiting time for rehabilitation per occupational group for the different levels of health care. This allows policy-makers and programme planners to identify the need for investments regarding workforce availability across the levels of health care. For regions with higher waiting times, managers should use the information for reporting and advocacy in order to take measures for its reduction (e.g. worker requirements) (v41). Facility-based managers might want to compare their data with other facilities at the same level of health care, and act accordingly.
Through use of a timeline, the dashboard provides a comparison of referrals and waiting times for rehabilitation for a selected level of health care in a geographical region. An increase in the number of referrals for rehabilitation should not affect waiting time. By observing changes in referral numbers and waiting times across different occupational groups, (sub)national programme planners and managers can monitor movements along the continuum of care and assess the capacity of rehabilitation service delivery to respond to those movements. A timeline for both rehabilitation referral and waiting time helps to monitor the impact of interventions aimed at improving continuum of care (v42).
The provision of assistive products is often delayed and waiting times for the delivery of different categories in the WHO APL may vary. Although delays may result from poor capacity for service delivery, most often they are caused by problems with procurement processes. National programme planners need to look at waiting times for a selected subnational region, identify WHO APL categories that show a delay, and monitor changes over time in order to evaluate improvement measures (v43). Facility-based managers may want to make assessments of product provision and compare data with other facilities at the same level of health care.
Timeline of waiting times for assistive product (AP) provision (outpatients) per AP list category, for selected subnational region, 2016–2020
References


Annex. Data dictionary

**Administrative level of health care:** Levels of health care should be agreed upon and used consistently at a national level for reporting purposes. The levels of care commonly include:

- **Primary health care.** This refers to services delivered by health professionals who act as a first point of consultation. Adherence to treatment plans and client progress occur at the primary health care level. Where needed, primary health care may be linked to more specialized care; it is usually based at the local level and provided in a range of settings.

- **Secondary health care.** This is health care provided by medical specialists and other health professionals at a level beyond first entry point (consultation) to health services. It is usually based at the district or regional level and provided in a range of hospital and clinic settings. Hospital settings are often those with 5–10 clinical specialties; with a size range of 200–800 beds; and are often referred to as provincial, general or regional hospitals.

- **Tertiary health care.** This is considered as more specialized and consultative health care. Tertiary care is usually based at the national level and provided in hospital settings that offer highly specialized care and may have teaching facilities. Hospitals typically have a range of 300–1500 beds and are often referred to as national, central, or teaching hospitals.

**Dedicated rehabilitation ward:** A dedicated rehabilitation ward (centre/unit) is where inpatient multidisciplinary rehabilitation is provided. The need for admission to a dedicated ward is defined by the need for longer-stay, high-intensive, multidisciplinary rehabilitation. Usually clients are admitted following an acute onset of disease with a critical functional decline.

**Essential Package for rehabilitation type:** This is a basic rehabilitation package that is part of essential health service packages for primary health care and could include the WHO Basic Rehabilitation Package or a package selected from national guidance. The rehabilitation workers should have received training on the package of essential rehabilitation services and protocols. Ideally, the training includes national certification.
**First-time admissions:** This includes all first-time inpatient admissions to the rehabilitation ward for clients with a selected health condition. This category excludes re-admissions.

**Functioning change:** This is the average change in functioning from admission to discharge for patients with the same health condition. For comparisons and aggregation across facilities, the same assessment measure per health condition should be used. The analyst should be aware that some functioning measures have lower scores for lower functioning levels and some have higher scores for lower functioning levels.

**Health condition (groups):** This indicator set often disaggregates for health conditions and health condition groups.

- For disaggregation of service utilization data, health condition groups (HCG) are used. Groups are generally defined by the main clinical domains requiring rehabilitation: musculoskeletal, neurological, pulmonary, cardiovascular, mental, and those relating to vision, hearing, or cancer. As all utilization data are disaggregated by age, a paediatric group is unnecessary. Acknowledging that many rehabilitation service users have comorbidities, patients are assigned a health condition group based on the primary underlying condition that requires rehabilitation (for example a child with cerebral palsy who has vision impairment would be assigned to the neurological group; a stroke patient with shoulder pain would be assigned to the neurological group; a client with a psychiatric disorder with low back pain would be assigned to the mental group).

- For indicators that apply to a dedicated rehabilitation ward and that measure “Length of stay”, “Functioning change” and “Coverage/Accessibility for people with acute and complex needs”, the list of health conditions (HC) is defined by the need for longer-stay, high-intensive, multidisciplinary rehabilitation. These health conditions may include spinal cord injury (SCI), traumatic brain injury (TBI), burns, multiple major trauma (MMT), amputation, stroke, and new onset functional decline of chronic neurological conditions such as cerebral palsy or multiple sclerosis. The choice of health conditions measured needs to be based on national priorities.
**Individualized care plan:** An individualized rehabilitation care plan should be developed for every client admitted at a dedicated ward and should include: i) a functioning assessment at the start of the rehabilitation episode; ii) a person-centred goal-setting method; and iii) an intervention plan.

**Number of cases:** A case is defined as any person who presents with a rehabilitation need. The number of clients who receive rehabilitation services in a reporting period includes both “old” cases (i.e. clients who have been receiving rehabilitation services in a previous reporting period) and “new” cases (clients who are starting to receive services in the reporting period). Whether “old” or “new”, a client can be counted only as a single case and not as multiple cases.

**Number of days of inpatient stay:** The total number of days of inpatient stay is calculated for clients who have been discharged during the reporting period only. It includes all inpatient days from admission to discharge.

**Number of new cases:** A new case is defined as a person who presents with a newly identified rehabilitation need; this may be either a first-time rehabilitation user or a client already known to the department. Generally this new need results from a newly developed condition and consequently a new rehabilitation treatment plan is established. Occasionally a client may be counted as being more than one case if they develop a new rehabilitation need in the same reporting period and require further treatment. This category excludes numbers of cases in follow-up or cases receiving additional sessions based on a previously identified rehabilitation need.

**Number of waiting days for AP provision:** This includes all waiting days, including weekends and holidays, for inpatients and outpatients from the time of first contact with the AP provider to the actual provision of the product. This includes provision of APs that are intended for temporary use. Extra days needed for additional fitting or repairs are not counted as waiting days. For inpatients the waiting time for AP provision may exceed time of inpatient stay.

**Number of waiting days for first session:** This includes all waiting days, including weekends and holidays, for new outpatients from the time of contact in arranging an appointment (whether made in-
person, by telephone or online) to the first encounter with a rehabilitation health-care worker. This category relates to all rehabilitation occupational groups that receive the client.

**Referrals:** Number of new inpatient and outpatient cases referred for rehabilitation from another level of health care, regardless of the source. Referrals may be written or verbal; self-referrals are excluded.

**Referral types:** Referrals for rehabilitation are disaggregated by those made specifically for the provision of an AP or for any other rehabilitation service. The latter could include continued rehabilitation guidance that may or may not include provision of an AP.

**Rehabilitation beds:** Rehabilitation beds are reserved specifically for clients in dedicated wards. They are commonly in rehabilitation hospitals, centres, and units, and used for people requiring more intensive and specialized rehabilitation care. Rehabilitation beds are generally used for physical rehabilitation, but in some specialist facilities they may be used by people with mental health and other conditions. The category excludes hospital beds in other wards (e.g. neurology and orthopedic surgery wards) where intensive rehabilitation may also be provided.

**Rehabilitation master facility list:** This list is developed by teams working for the national health information system and contains all participating facilities reporting on rehabilitation.

**Rehabilitation sessions:** A rehabilitation session is defined by national guidance.

**Rehabilitation workers and occupational groups:** Rehabilitation workers usually include rehabilitation doctors, rehabilitation nurses, physiotherapists, occupational therapists, speech and language therapists, prosthetists and orthotists, and psychologists. Other rehabilitation workers relevant to the country may also be included, for example audiologists, social workers and mid-level rehabilitation occupational groups, as well as hospital rehabilitation workers not working for the rehabilitation department. A plan for a national health workforce typically includes a list of occupational groups for the country; consulting this list is recommended when establishing a country reporting system.
**WHO APL categories:** The WHO Assistive Products Priority List (APL) includes 50 priority assistive products. Their selection is based on widespread need and impact on a person's life. The list has six categories: Mobility, Vision, Hearing, Communication, Cognition and Self-care.