Module 1.2
Indicator construction and Data sources

Trainers:.....

Module 1.2: Objectives

At the end of this module, participants will be able to:

1. Understand the importance of using appropriate denominators
2. Construct SMART indicators using data from routine sources to populate a PHC performance measurement framework
3. Identify sources of data to measure PHC performance in the district

Module outline

Sr. No.	Session name	Session format	Time
1	Indicator construction	• Facilitator led presentation and discussion-based activities	50 min
2	Health data sources in India	• Facilitator led presentation and discussion	20 min
3	Populating the identified themes (from module 1.1) with indicators and identifying data sources	• Group exercise	40 min

Session 1:
Constructing indicators

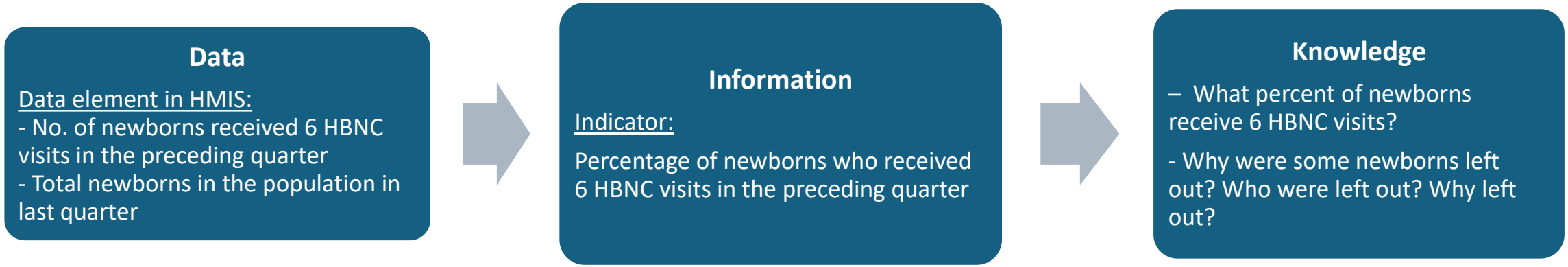
Duration: 50 min

Participant reflection

- What do you understand by the word “indicator”?

Basic concepts

- Data: It is the raw material in the form of numbers or characters.
- Information: It is a meaningful collection of facts/data with reference to a context.
- Knowledge: When information is analyzed, communicated, and acted-upon it becomes knowledge.



Source: Understanding health management information systems- Service provider's manual (2011), M&E Division MoHFW and HMIS Division NHSRC

Basic concepts (2)

- An indicator converts raw data into information that can be interpreted and used for decision-making.
  - ➢ More data collection does not necessarily mean more knowledge creation.
- Indicators help us understand a health system's or program's performance. It can be used to:
  - compare performance over time or across areas.
  - provide insight into what aspects of the program are performing well or not, and possible reasons behind this.

Source: Understanding health management information systems- Service provider's manual (2011), M&E Division MoHFW and HMIS Division NHSRC

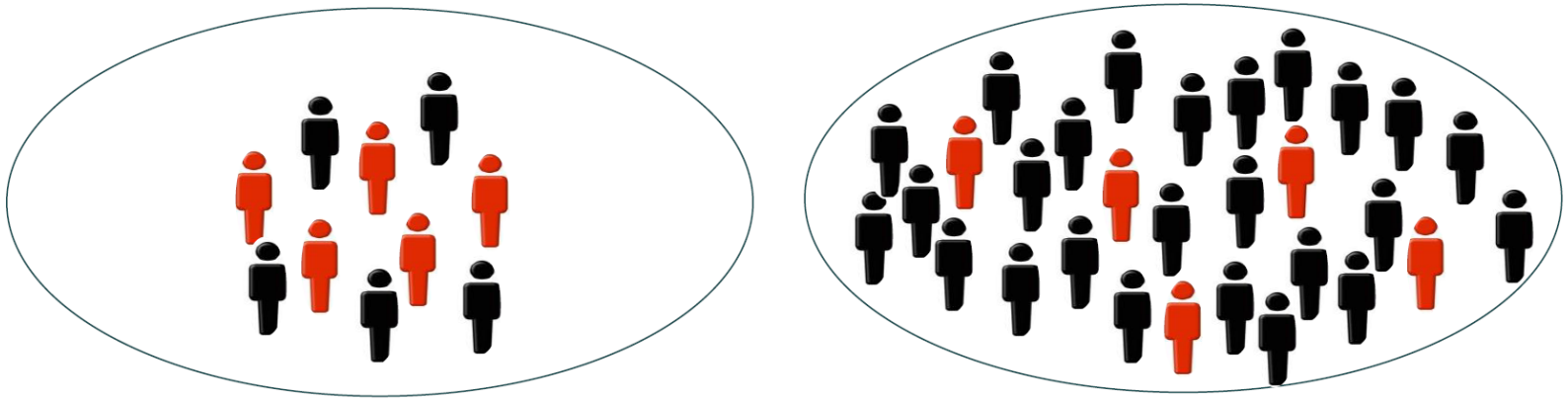
Constructing an indicator

- What are different elements of an indicator?

- Example: Percentage of individuals 30 years and above screened for hypertension in the past year.

  - Numerator
  - Denominator
  - Time period
  - Any other?

Importance of denominators



- The circle represents an area.
- Each person is represented by a figure.
- Red figures are people with health problems

Whether area A and B have similar level of health problem?

Do area A and B still have similar level of health problem?

Person with health problem

Note: Icons in circle represent the entire population in the area

- **Same no. of people have health problems in Area A and B.**
- **However, lower proportion of people have health problem in area B.**

Which blocks have higher malaria incidence in the district?

Figure A: Number of malaria samples found positive in Kalahandi in Jan-Mar 2025

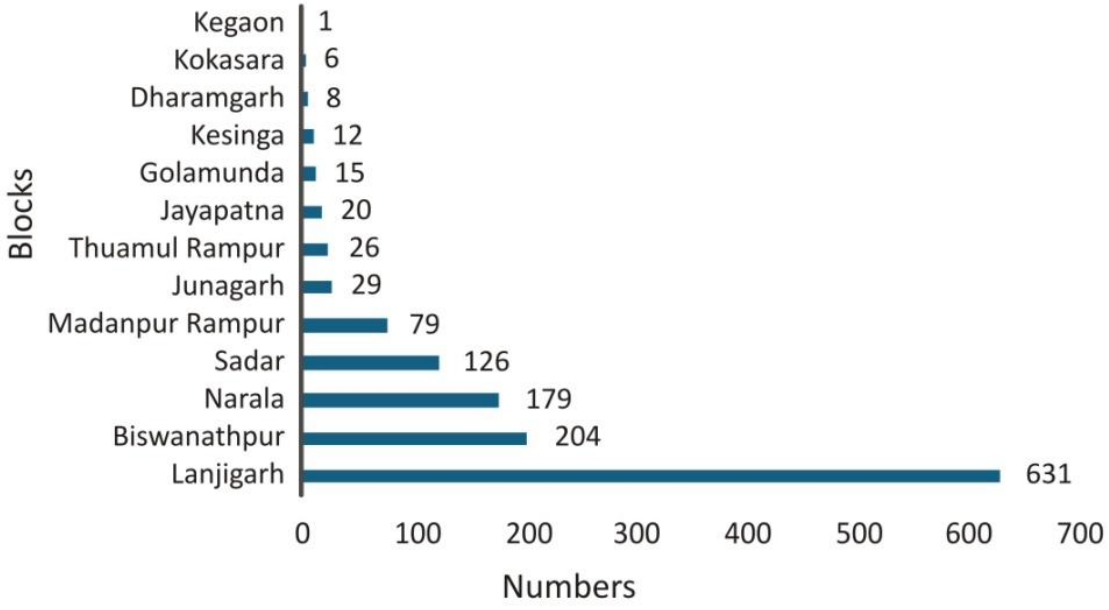
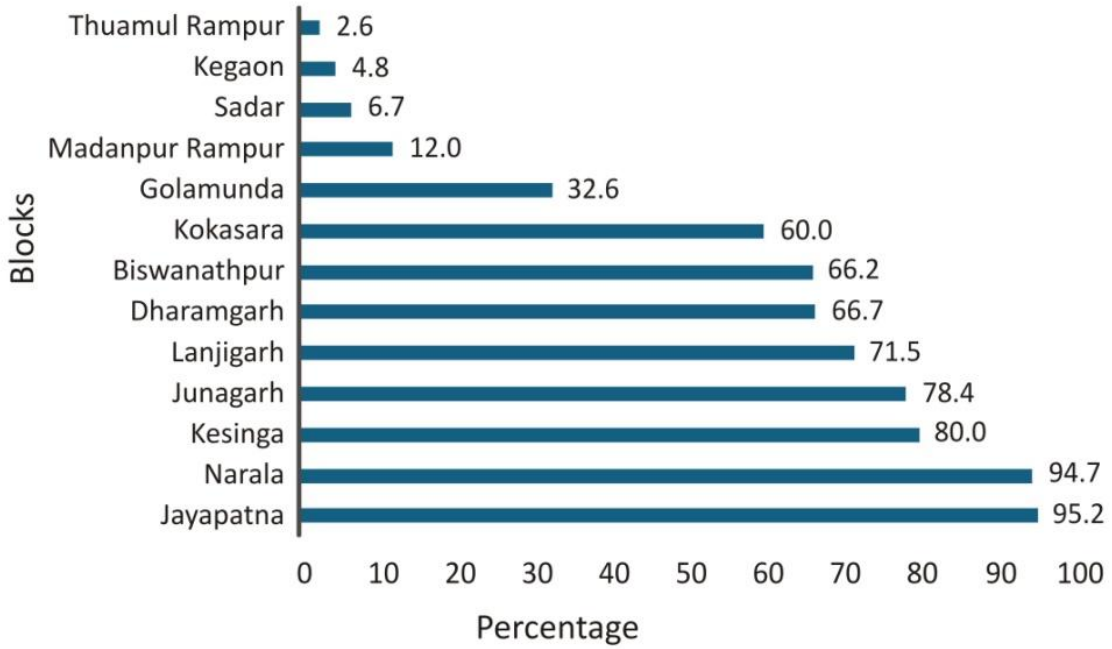


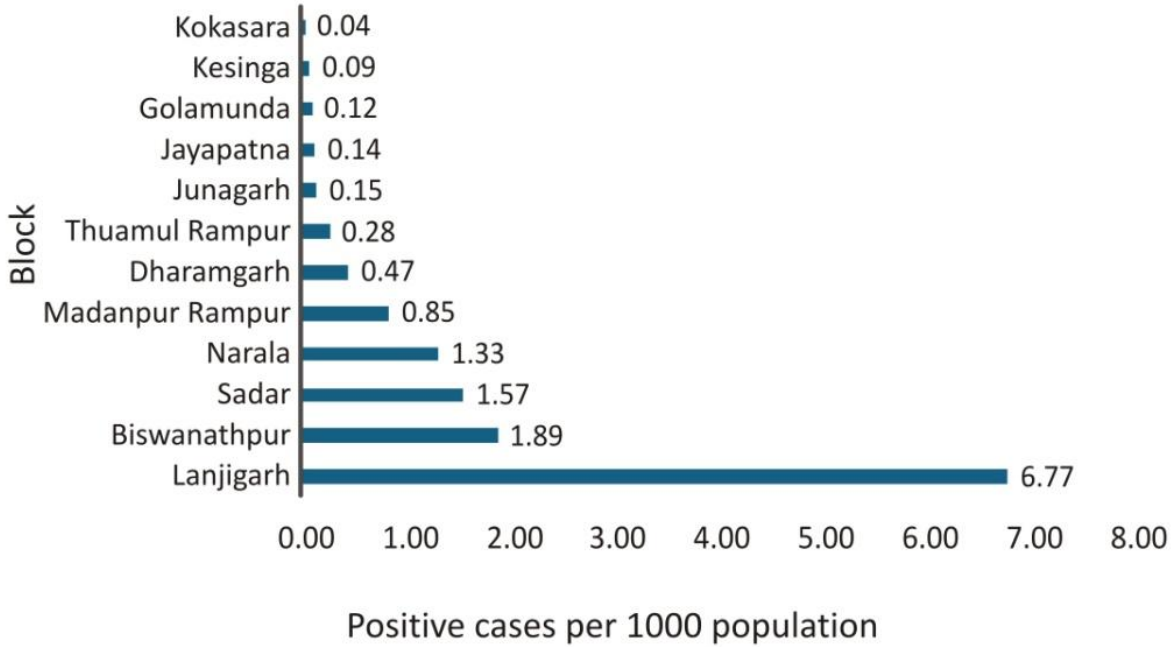
Figure B: Percentage of malaria samples found positive in Kalahandi in Jan-Mar 2025



Source: IHIP- Consolidated disease summary_L form (1 Jan- 31 Mar 2025), Kalahandi

Which blocks have higher malaria incidence in the district?

Figure C: Number of new positive malaria cases per 1000 population



Numerator: Number of malaria samples found positive		
Figures	**Denominator**	**Interpretation**
Fig. A	No denominator	Reported malaria positive cases
Fig. B	Total samples tested for malaria (~suspected cases)	Test positivity
Fig. C	Total population	Incidence

- **Not using a denominator or using an incorrect denominator will mis-represent the findings**

Challenges with denominators

- What if we don't have denominators? For example- population above 30 years of age in the district
- **Not knowing the denominator is not a problem; however not using it is a problem**
  - ➢ Use a proxy, or estimate the denominator (more details in module 3.1)

- What are challenges with denominators?
  1. Absence of population data
  2. Absence of recent population data
  3. Data quality

Make your own indicator!

- You are asked by your supervisor to provide first quarter (FY 2025-26) progress report on the hypertension screening activity in the district.
- Write down the definition of indicator that you will use for this report in the polling link.

- Divide in the 5 groups as before.
- Record one response per group.

Discussion on responses

- Does the indicator convey all required aspects for monitoring the mentioned activity?

Criteria for selecting indicators: SMART

- **S**pecific: specific and clearly defined, with a clear meaning and scope.
- **M**easurable: Indicators should be quantifiable and measurable, so that progress towards the goal can be tracked over time. Indicator should have a clear unit of measurement, such as percentages, numbers, or rates.
- **A**chievable: Indicators should be achievable and realistic, meaning that they can be realistically measured given the available resources and data.
- **R**elevant: Indicators should be relevant to the goals and objectives of the program or project.
- **T**ime-bound: Indicators should be time-bound, with a clear timeframe for measurement.

Example: SMART indicator

Percentage of children under five in Village X with a mid-upper arm circumference (MUAC) above the malnutrition threshold after six months of the intervention.

- Specific: Clearly defines the aspect that will be measured - mid-upper arm circumference (MUAC) above the malnutrition threshold instead of vague definition of improvement in nutrition status/ children's health
- Measurable: Provides a quantifiable way to calculate the indicator, based on available data sources
- Achievable: In a study setting, collecting this data should be feasible.
- Relevant: The indicator should provide information on the desired health outcomes. MUAC is an appropriate measure for understanding change in malnutrition status.
- Time-bound: A time-frame has been included.

Activity: Identify the SMART indicators

- You are asked to present the ANC coverage status of a block (“X”) for a year
- Go through each indicator and select which criteria are met by the indicator
- Discuss why certain criteria were met and why others were not met for each indicator.

	Potential indicator	Specific	Measurable	Achievable	Relevant	Time-bound
1	Proportion of pregnant women who received mandated ANC visits					
2	Proportion of pregnant women who received 4 ANC visits out of the total registered pregnancies	✓	✓	✓	✓	
3	Proportion of pregnant women who received 4 ANC visits out of the total registered pregnancies in last year in X block					
4	Proportion of pregnant women who received IFA tablets and TD vaccines out of total registered pregnancies					

Activity: Constructing an indicator

- You are asked by your supervisor to provide the first quarter (FY 2025-26) progress report on the hypertension screening activity in a block.

Objective	To measure hypertension screening coverage in X block from Apr-Jun 2025
Indicator type	Output
Numerator	Number of 30 and above individuals screened for hypertension in the duration Apr-Jun 2025
Denominator	Total number of individuals who are 30 and above in X block
Unit of measurement	Percentage

➢ Indicator definition: Percentage of 30 and above individuals screened for hypertension out of total 30 and above population in X block for period of Apr-Jun 2025

Reflections on the activity

- Does this indicator convey information on performance of NCD program in a block?
- What would be other key aspects for commenting on NCD program performance?
  - Any indicator will give only a very specific and limited perspective of a wider situation.
  - Indicators should be used in sets, each measuring an important but different aspect of the system (example- logic model framework)

Source: NHSRC (2011), Principles Of Rationalization Of Data Collection &The Process Of Crafting And Validating Indicators

Key takeaways- Constructing indicators

- An indicator converts raw data into information that can be interpreted and used for decision-making.
- While constructing an indicator, using an appropriate denominator is important. Not using a denominator or using an incorrect denominator will mis-represent the findings.
- SMART criteria help in constructing indicators that are clear, meaningful, and help in effective monitoring of the program

Session 2:
Health data sources in India

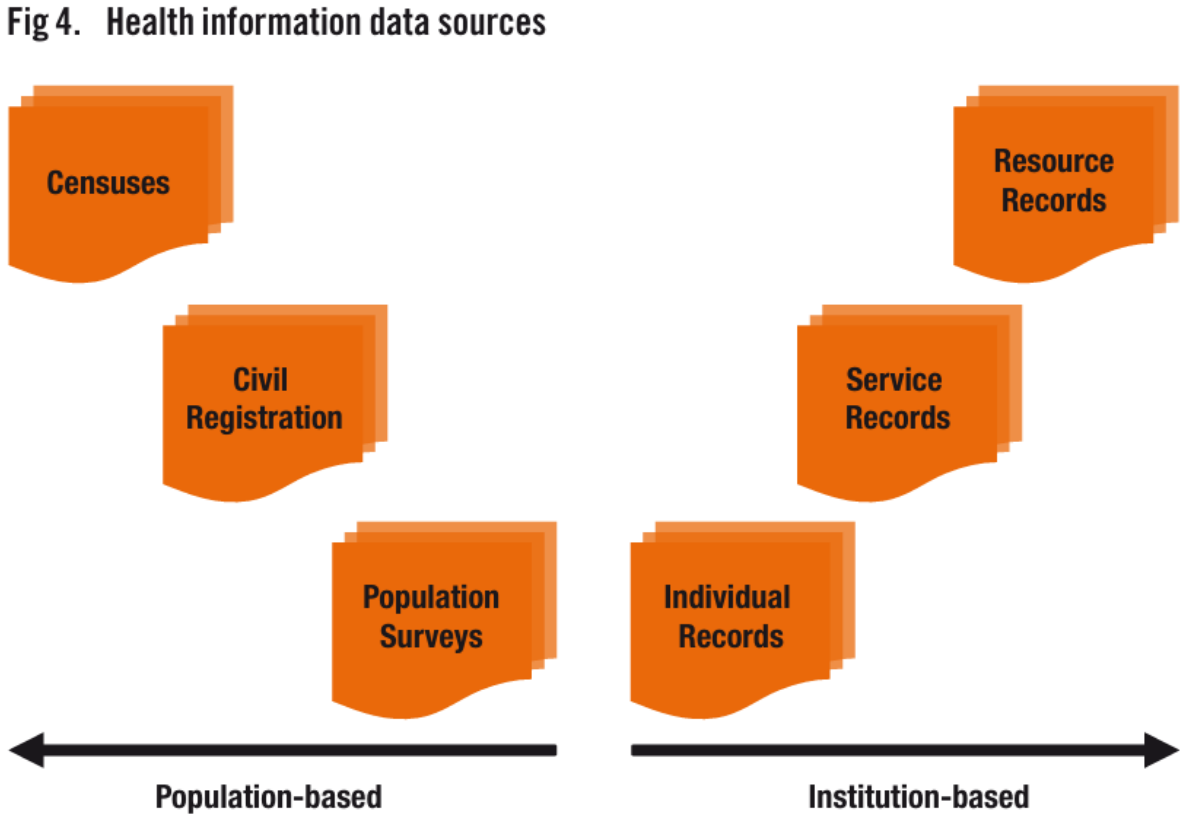
Duration: 20 min

Activity: Commonly used data sources

- What are the commonly used data sources to measure PHC performance in your district?
- On sticky notes, write down the names of data sources you commonly use to monitor PHC performance. Only write the name of one data source on each sticky note. Keep them with you till the end of the session.

HMIS	RCH portal	Census
NFHS	NCD portal	Block level reports

Health information data sources



Population based sources

- generate data on all individuals within defined populations

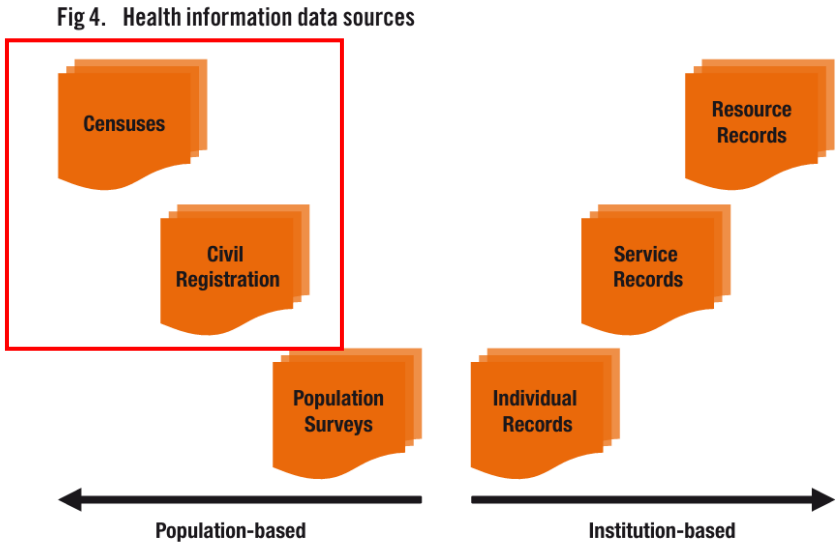
Institution based sources

- generate data as a result of administrative and operational activities

Source: World Health Organization, Health Metrics Network. (2012). Framework and standards for country health information systems. Second edition.

Population based sources- Census and civil registration

Broad description	Use	Limitations
• Census: Provides population statistics, demographics, social and economic characteristics, housing and household details. • Civil Registration System (CRVS): Registration of births, deaths, and still births	Provide population statistics, which facilitates computation of ***population-based health indicators (outcome, impact)*** such as infant mortality rate	Long intervals between 2 rounds of census; data analysis and dissemination of census information is often time consuming



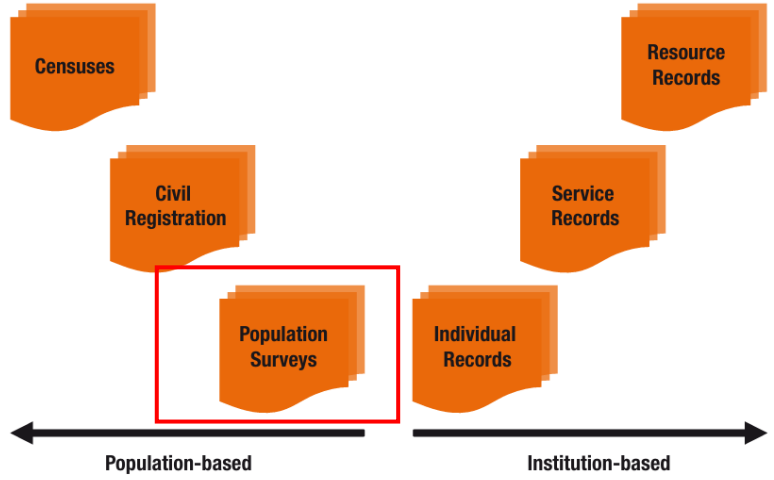
Population based sources- Population surveys

National family health survey (NFHS)		
Broad description	Use	Limitations
• Provides estimates of-fertility, infant and child mortality, family planning, maternal and child health, reproductive health, nutrition, anemia, utilization and quality of health and family planning services. • NFHS policy tracker for districts: https://geographicinsights.iq.harvard.edu/nfhs-tracker-districts	• Provides essential data on ***outcome and health impact*** measures pertaining to family planning, maternal and child health, reproductive health, nutrition, anemia, which is needed by the MoHFW and other agencies for policy and programme purposes • Provides information on ***outputs*** such as quality of care and service delivery and utilization	• Due to smaller samples, district estimates are available for only select indicators for NFHS • Surveys are conducted irregularly

Other examples that do not provide district level estimates

- Sample registration system (SRS)
- National sample survey (NSSO 75th round)
- Global adults tobacco survey (GATS)

Fig 4. Health information data sources



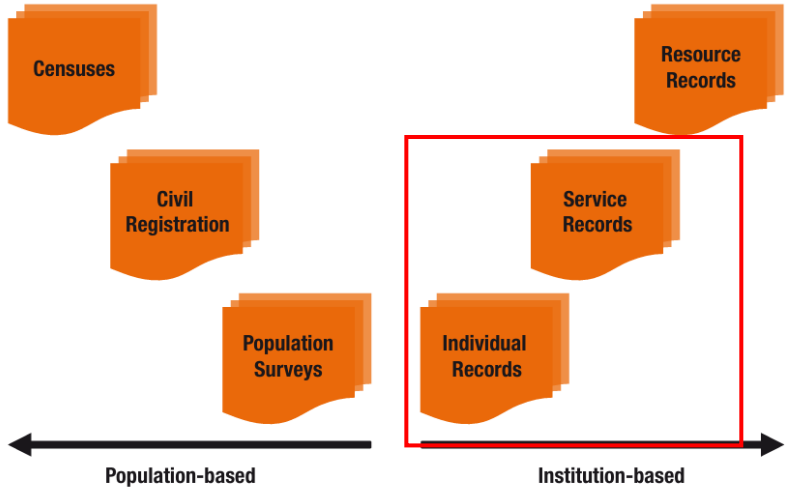
Institution based sources- Routine data sources (individual and service records)

Broad description	Use	Limitations
Data sources routinely managed by service providers providing service delivery data at individual or facility level (aggregated). Some of the sources also provide facility infrastructure, logistics related data	• Provide a substantial source of continuous information relevant to ***PHC performance outputs*** at individual and facility levels, including service utilization, service delivery, safety and efficiency, service coverage, and morbidity and mortality data. • Allows assessment of ***inputs***, physical infrastructure, staff, medicines, diagnostics • Facilitate ***outbreak investigation*** • Provide continuous data for ***facility and logistic management***	• Time consuming: Requires trained staff with knowledge of each data element and use of the application • Large number of data elements- challenges with data utilization • Technical challenges with portals

Examples:

- Individual records: NCD, RCH portal, e-Nikshay
- Service records: HMIS, IHIP, AAM portal, e-VIN, DVDMS

Fig 4. Health information data sources



Other data sources

- Resource records- Administrative records on the availability of health service inputs
  - National Identification Number to Health Facilities (NIN Portal)
  - ABDM (ABHA, Health facility registry, Provider registry)

- Studies and MoHFW publications
  - National health profile
  - Rural health statistics (RHS)
  - National health accounts (NHA)
  - Global burden of disease (GBD) study

Reflection: Commonly used data sources

- Take out the sticky notes on which you had written the data sources.
- Discussion points:
  - Were there any data sources that were not included in the lecture?
  - Were there any data sources that you missed while listing?
  - Which category of data sources are more useful for day-to-day monitoring?
  - Which category of data sources would be useful for PIP planning?

References

1. M&E Division MoHFW and HMIS Division NHSRC (2011) Understanding health management information systems- Service provider's manual.
2. NHSRC (2011), Principles Of Rationalization Of Data Collection &The Process Of Crafting And Validating Indicators
3. World Health Organization, Health Metrics Network. (2012). Framework and standards for country health information systems. Second edition.
4. Mishra, A., Mokashi, T., Nair, A., & Chokshi, M. (2022). Mapping healthcare data sources in India. Journal of Health Management, 24(1), 146-159.
5. Ministry of Health and Family Welfare, Govt. of India. (2020). An e-Booklet on IT initiatives of National Health Mission

Break

Duration: 10 min

Group exercise: Develop indicators for monitoring an existing PHC program in the district

Duration: 40 min

Instructions

- Start from where you left off in Module 1.1
- For each sub-domain, **identify and list out no more than 2 indicators** that can be used to measure that sub-domain performance. You may also need to revise the sub-domains as you start identifying indicators.
- Define the indicator clearly keeping in mind the SMART criteria.
- For each indicator, identify the data source.
- Remember, this is a district level framework. So, your indicators must be measuring the sub-domain at the district level.

Template

Domain	Sub-Domain	Indicators	Indicator definition	Data source
Inputs	Human resources	Indicator 1	Numerator Denominator	Numerator- Denominator-
		Indicator 2		
	Infrastructure			
	Medicines …..			
Processes	Sub-domain1 Sub-domain 2…..			
Outputs	Sub-domain1 Sub-domain 2…..			
Outcomes	Sub-domain1 Sub-domain 2…..			
Impact	Sub-domain1 Sub-domain 2…..			

Key takeaways- Indicator construction

- What is an indicator?
  - An indicator converts raw data into information that can be interpreted and used for decision-making.
- Use of appropriate denominators
  - Not using a denominator or using an incorrect denominator will mis-represent the findings.
- SMART criteria for indicator construction
  - Make indicator clear, meaningful, and help in effective monitoring of the program

Key takeaways: Commonly used health data sources

- There are different types of data sources that report information-
  - at varying frequencies
  - at different levels of health system, and
  - on different parameters such as service delivery, infrastructure, human resources, and population health.
- Appropriate data sources should be identified based on the purpose- routine monitoring, planning and resource allocation, etc.
- Each data source has certain strengths and limitations that need to be taken in to account while using the data.

Thank You