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Applying Science to Strengthen and Improve Systems

Tips and Tools for Learning Improvement

Measurement for Improvement

Why is it important to measure improvement?

After developing a good aim statement, one may proceed with defining measure(s) (also called indicators) for improvement. Through good measures you can answer the question: "How do I know that a change is an improvement?"

Meaningful performance measures are essential for your improvement team to analyze current systems and processes, guide improvement efforts, and sustain optimal performance. Measures will tell you performance over time, including whether it is improving, declining or staying the same.

How do you measure improvement?

The rule in improvement is to measure on a regular basis and plot data on a time series chart to see how the changes being tested are affecting performance. To measure improvement, the following types of indicators are usually used: process and outcome.

Process indicator: Measures "processes of care" or the actions of providers during the care of patients. Processes of care may influence either immediate or future health outcomes. For example, to make sure that HIV-positive patients on antiretroviral therapy (ART) have good clinical status, we may want to make sure that all ART patients are screened for tuberculosis (TB) during their ART appointments, that they receive nutrition counseling or support, or that they are adhering to their ART regimen. An example of a process indicator could be: % of patients on ART who were screened for TB per protocol at their last ART appointment.

Outcome indicator: Measures how a system is performing with respect to the health or social status of a defined population or individual. For example, if we are trying to make sure that newborns remain infection free by improving safe and clean deliveries, a way we can measure that would be: % of newborns with sepsis on the 7th day of life.

How do you develop measures?

To develop measures, you need to start by looking at the aim statement you developed for your improvement work and determine what measure(s) would tell you whether you have reached that aim. Developing aim statements are covered in the Tips and Tools for Learning Improvement handout "Aim Statements". The example below describes how an aim statement leads to a process and outcome measure.

Example: Developing a measure

A health facility has problems with a high rate of post-partum hemorrhage, which it believes results from not all women receiving timely oxytocin (a uterotonic known to reduce post-partum hemorrhage). To address this gap, the improvement team developed the following improvement aim: Increase the percentage of women receiving oxytocin immediately after birth from 59% to 95% within 6 months.

Process indicator example: Percentage of women who were treated with oxytocin immediately after delivery of the baby at the health facility.

Outcome indicator example: Percentage of women with postpartum hemorrhage at the health facility.

Source: Improving Care of Mothers and Babies: A Guide for Improvement Teams. American Academy of Pediatrics and University Research Co., LLC. 2016

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Numerator → Group who receive service out of those eligible

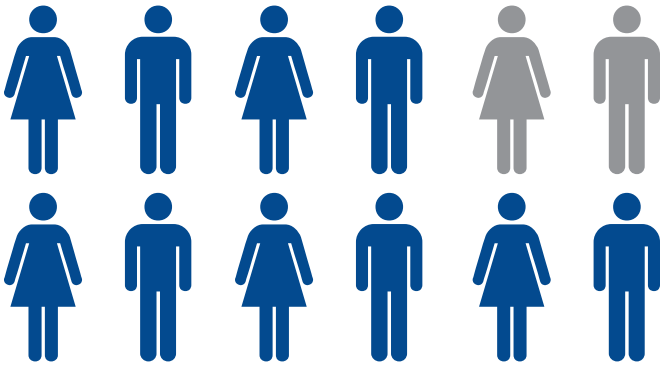
Denominator → Group who are eligible for service

Example of numerator and denominator

Percentage of children who have received all recommended vaccines

Numerator – # of children who have received all recommended vaccines by age 5 (blue kids)

Denominator - total # of children (all blue and grey kids)



For each indicator, you will need to define the denominator, numerator, and data sources. For example:

- The **denominator** represents the number of people who were eligible for a particular service during a defined period of time
- The **numerator** represents those who actually received the appropriate service in that same period of time
- **Data sources** could be patient registers, medical records, interviews, direct observations of a process of care, etc.

In addition, you will need to decide **who will collect the data and how often the data will be collected** (e.g., daily, weekly, monthly, quarterly). You should then do a test collection of the indicator to determine how easily the data can be accessed and whether there are any uncertainties (i.e., who is or isn't included in a denominator). For example, you may need to clarify whether stillbirths are included in the denominator of a newborn care indicator.

It is important to not overwhelm teams with too much data collection. Indicators should be limited to only the key information that is needed. Collecting too much data can easily overwhelm a new improvement team and slow down action. Indicators might be collected with different frequency over time—more frequently early in an improvement effort to make sure improvement is occurring and then less frequently later to monitor whether the desired performance is maintained.

Example: Defining a measure

To continue the example from above, please see how the process indicator was measured.

Process indicator: Describe what you are measuring.	Percentage of women who were treated with oxytocin immediately after delivery of the baby at the health care facility
Numerator: Who actually received the service?	Number of women who were treated with oxytocin immediately after delivery of the baby at the health care facility
Denominator: Who should receive the service which you are focusing on?	Number of women giving birth at the health care facility
Data source: Where are you getting your data from?	Delivery register
Frequency: How often will data be collected?	Weekly during period of testing changes, followed by monthly to monitor that improvement is sustained
Responsible person: Individual who will ensure that the data is collected and maintained.	Nurses-in-charge

When an indicator is expressed as a percentage, you would divide the numerator by the denominator and multiply by 100.

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100 = \text{Percentage}$$

Exercise 1: Understanding measures

True or False

1. An outcome indicator measures how a system is performing with respect to the health or social status of a defined population or individual.

   A. True

   B. False

2. A process indicator measures the long-term results of what we are trying to improve.

   A. True

   B. False

Exercise 2: Defining a measure

For the following indicators, please fill in the numerator and denominator

Indicator	Numerator	Denominator
% of pregnant women tested for HIV during ANC visits daily		
% of circumcised males experiencing at least one moderate or severe adverse event during or in three days following surgery per week		
% of vulnerable children as defined by PEPFAR in village 1 sleeping under bed nets the previous night		
% of babies born in the facility who received skin-to-skin care		

Exercise 3: Creating a measure

A health team in Uganda decided that their overall goal was to improve the nutritional status of HIV positive patients. The first step in improving the nutritional status of HIV positive patients was to integrate regular monitoring of nutritional status into HIV services to better understand who is moderately or severely malnourished. The previous practice was ad hoc, with staff addressing nutrition issues only if the patients looked thin. The improvement aim the health center improvement team adopted for this process was: "Improve the nutritional status of HIV clients by assessing nutritional status using mid-upper arm circumference (MUAC) of 90% of HIV clients within 6 months." The team will have the registration officer and patient volunteer test out different options for assessing nutritional status using MUAC, and the data clerk will help aggregate the information from patient records.

Please fill out the table below:

Process indicator: Describe what you are measuring.	
Numerator: Who actually received the service?	
Denominator: Who should receive the service which you are focusing on?	
Data source: Where are you getting your data from?	
Frequency: How often will data be collected?	
Responsible person: Individual who will ensure that the data is collected and maintained.	