



Improvement Cymru Academy Toolkit Guide



Data Collection

Introduction

Using measurement in quality improvement is essential to understanding the current status of your system, to determine whether your change idea has made an improvement and to understand whether your change idea is sustainable.

Data collection is the process of collecting measurements and gathering observations which will allow you to analyse and gain insight into your processes and systems. When collecting data, it is important that data is used for learning and not to judge individuals, departments, and organisations.

Types of data

There are two different types of data that you can collect. These are:

Quantitative data:

Quantitative data refers to information that is in numerical form.

Qualitative data:

Qualitative data is information that is not in numerical form, and is collected through observations, interviews, and experiences.

A famous quote from Albert Einstein was that *“Not everything that counts can be counted, and not everything that can be counted, counts.”* and is particularly relevant in healthcare. It emphasises that many critical aspects of patient care, such as empathy, trust, and the quality of the patient-provider relationship, cannot be easily quantified. Conversely, it reminds us that not all measurable metrics, like the number of procedures performed or the amount of medication prescribed, necessarily reflect the true quality of care. This perspective encourages healthcare professionals to value and prioritise the intangible elements that significantly impact patient well-being and outcomes.

Data sources

Primary Data

The primary collection of a data set is when the information is collected directly from the researcher or from the original source.

Primary data collection may include:

- Surveys and Questionnaires on a service or environment
- Interviews with a specific team or service
- Observations, examining and collecting data directly.
- Focus Groups to discuss opinions and share feedback on a service in an organised setting.

Secondary Data

Secondary data is gathered from previous research and used for a different purpose from the original intent (in comparison primary data collection involves collecting the data and progresses to analysis).

Sources of secondary data may include:

- Published sources such as books, journals or magazines
- Online databases such as research articles or statistical information
- Publicly available data such as public platforms or social media
- Past research studies to guide additional learning.

When using secondary sources, it is important to use trustworthy sources and the context in which the data was collected aligns with what you are trying to achieve from your analysis. The drawbacks of using data you haven't collected should be considered. Is the data accurate? Were there any rules or methods used in the data collection that could invalidate the data for use in your work? Is the data applicable?

Rationale

Data collection within improvement is important for several different reasons:

1. Informing Progress and tracking improvement

Collecting data can help inform the progress made during an improvement project by understanding the status of your current system, the impact of testing ideas and the sustainability of your project. Using the family of measures, you can track your improvement work to understand the progress you have made (See our Family of Measures Toolkit Guide [here](#) for more information).

2. Create Buy-in

Data collection plays a crucial role in creating buy-in for quality improvement efforts and can help with change management. Take a look at our Change Management Toolkit Guide [here](#). When data collection is shared transparently it can foster trust amongst stakeholders. People are more likely to support initiatives when they see evidence and understand the rationale behind decisions. Qualitative data can be important for healthcare quality improvement projects to help understand how patients, relatives, carers, and staff feel about services. Addressing the emotive side of healthcare, can help to create buy-in for staff.

3. Informed Decision- Making

Data-driven decision-making helps eliminate the potential of bias because it ensures that choices are made based on evidence rather than assumptions.

4. Evidence and Accountability

Data provides evidence of success, helps to address limitations, and demonstrates commitment to improvement. It also contributes to internal quality and safety which is important in Wales with Duty of Quality (See our 6 Domains of Quality Toolkit Guide [here](#) for more information). Collecting data holds people to account and encourages ownership and responsibility for outcomes.

5. Creating a Culture of Learning and Continuous Improvement

Data can offer insights to help you address gaps and identify trends in the quality and safety of services that are being delivered allowing everyone to learn and improve services.

When to use

You should use data throughout the whole of your improvement project.

- You start collecting data at the start of your improvement project. Understanding your current system is important for identifying areas for change. Baseline data of your current system can help inform your progress over time and refine change ideas.

- During your project rapid cycles of testing, inform learning. Data can provide insight into whether predictions or theories have had the desired impact by comparing data from testing to the baseline (See our Testing Changes Toolkit Guide [here](#) for more information).
- You should still collect data when your improvement project draws to a close to monitor long-term impact and to ensure improvements are sustained (See our Implementation Toolkit Guide [here](#) and Spread and Scale Toolkit Guide [here](#) for more information)

How to use?

There are several steps you need to think about when collecting data.

Step One: Defining your problem.

Firstly, you will need to identify your problem – what is the problem and the impact of the problem (See our Understanding your Problem Toolkit Guide [here](#) for more information). This assumption is based on knowledge gleaned from those who have a good understanding of the system. Data is used to confirm this assumption and provides evidence to facilitate the initiation of your improvement project.

Step two: Your Aim.

Now that you have evidence of your problem you will need to formulate your aim statement that needs to be SMART (Specific, Measurable, Achievable, Realistic/Relevant, and Time-bound) to define accurately and precisely what you and your project team will be doing for your improvement project (See our SMART Aim Toolkit Guide [here](#) for more information).

Step Three: Planning your Data Collection process.

There are several factors to consider when developing a data collection plan. Thinking through what you need to measure is important and the Family of Measures Toolkit Guide can help you identify this.

There should be a standard way of collecting data to enable consistent practise. In data collection we use an operational definition to do this. See our Family of Measures Toolkit Guide [here](#) for more information.

Operational definitions describe what, how, when, who, where for data collection. You should think about who will be involved in collecting data, when you will collect the data e.g. daily, weekly etc... and how/with what will you collect the data e.g. using a Microsoft Forms for surveys, using a computer system such as Welsh Patient Administration system (WPAS).

To plan successfully, you will need to decide what type of data you will be collecting. For improvement, you will need quantitative data, but you can also collect qualitative data in the form of surveys, interviews, and patient stories. Qualitative data can be turned into quantitative data when using tools like Likert scales. The richness of this data should be retained as it provides more than simply numbers. Quantitative and qualitative data can be from both primary and secondary sources.

There are several additional questions that you will need to consider when collecting data:

How much do you need to collect?

In quality improvement, you are looking for just enough to understand what you need to understand. If you ask for too much or that is too difficult to find/collect, you may find it hard to get and keep people on board.

Small sequential samples to best represent and be meaningful to improving the service area works well (ideally this should be regularly over a period). This will be dependent on how you choose to collect and analyse your data.

Where should you store your information?

Somewhere accessible, where everyone knows – this should be recorded somewhere for sustainability. Are there any General Data Protection Regulation (GDPR) rules that you need to comply with.

How should you format your data?

Collecting your data in a way that will be easy to analyse is crucial. Some considerations include:

- What is the smallest unit are you interested in?
- What level of data are you looking for? E.g *per person, per visit, per test, per day, per week, per month*
- Think carefully about what you need to know, anything not collected will result in the prevention of exploring the data further when analysing.
- When collecting each unit of data it should be recorded in a new row, E.g. for each entity, person or collection a new row is started. Additional information for that entry should be stored in the columns, e.g. demographics, time taken, team.

What is the integrity of your data?

To help protect the integrity and validity of results when collecting data two strategies are adopted:

Quality Control

This involves ensuring that the level of performance of a system or process remains stable or within set control limits. This takes place both during and after data collection.

Quality Assurance

This is used to prevent the accuracy of the data collected, being influenced in any way. This looks at protocols adopted to reduce the validity of the data before data gathering starts.

Data accuracy, consistency, and reliability are crucial for making informed decisions. It is essential that the same consistent data is used throughout the scope of the project. There can be caveats to this such as “Oh the numbers are like that because we don’t do X, or the numbers are like this because actually we do things this way”, and these should be noted when analysing information. This creates dialogue and opens discussion; this can lead to understanding and learning more about the system as you progress.

Step Three: Data Collection

In step three, you will need to gather data based on your data collection plan.

Step Four: Analysis

Analyse your data- the collection of data is only valuable if it is utilised to derive meaningful insights. Regularly reviewing and analysing the information gathered is essential for identifying opportunities for improvement and driving informed decision-making.

Helpful Tips

Here are some helpful tips that can alleviate some of the challenges of collecting data:

- Data should be structured and collected in a way to avoid any misinterpretation of data. Collection of ambiguous data may lead to confusion where the question was answered with a different interpretation.
- When combining or collating data, care should be taken to ensure that data is not duplicated as this may increase bias and reduce the reliability when analysing the data.
- Excess amounts of data may become problematic if the amount or volume of data collected becomes unmanageable. Only the data that is needed should be collected.
- Inconsistency in data should be identified and resolved to avoid incorrect assumptions and insights being drawn from the data. For example, if a ward was closed for a short period of time, it may be beneficial to remove this data from the analysis.
- Human error and variability in a systems or procedures may result in inaccurate data being produced. This should be considered, and any unexpected variabilities investigated further.

What Next?

Deciding on the data to collect is an important part of the data collection process. The reason for each item of data should be decided before collection starts, and a measurement plan can help with this (see our Measurement plan Toolkit Guide [here](#) for more information).

Additional resources

If you would like to learn more about making improvement to your workplace take a look at our website for what we offer you [Improvement Cymru Academy - Public Health Wales \(nhs.wales\)](#) or email us improvementcymruacademy@wales.nhs.uk to find about the improvement courses we can offer.

References

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