GUIDE: An Introduction to Information and Data Collection and Synthesis

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PURPOSE

Purpose of this guide

Collecting and analysing data are central to the function of any health service.

The purpose of this guide is to assist learners to understand the role of information and data and to apply some basic techniques for using data to support decision making and program development. The principles in this guide focus on analysing and interpreting data to identify issues and community needs and prioritise action accordingly.

Trainers may choose to provide this resource as additional supplementary information to support learners understanding of data collection and analysis principles and completion of relevant assessments.

Units of Competency

This resource supports learning and completion of assessments for the following units of competency:
- HLTPOP503C Plan a population health project
- HLTPOP504C Evaluate a population health project
- CHCAD603B Provide Systems Advocacy Services

Acknowledgement

This resource has been adapted from a range of existing resources of which have been referenced at the end of this guide.

INTRODUCTION

The role of data

Data is the raw material from which information is constructed through analysis and interpretation. This information in turn provides knowledge on which decisions and actions are based.

Data	Information	Knowledge	Decision	Action
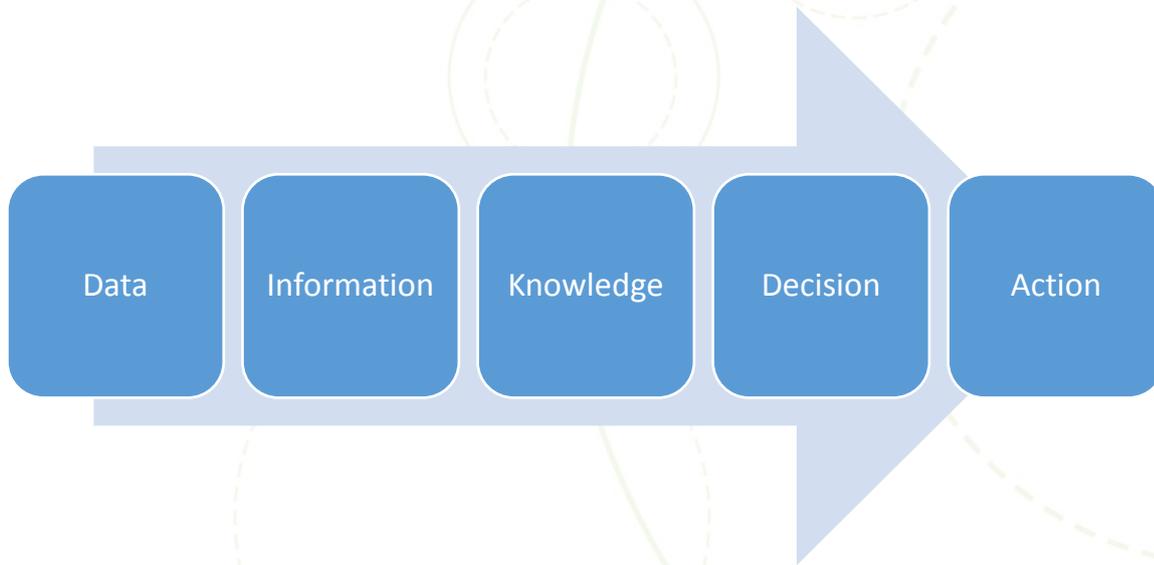
Health organisations are complex and making changes to improve health can therefore be a complex business. It requires us as health care providers to understand what is happening in the delivery of our health services, what factors affect delivery, what the community needs and issues might be and how we can influence change to achieve improvement. In such a complex system, solid evidence is what we need to support decision making and action.

For example, if you wanted to design a project to support health eating within the community, you might have some original ideas about how this might work, but to ensure your project is successful you would want to find out the following:

- What the community needs and issues are
- What others have done in the past to address this and what worked well and not so well
- Talk to the community to find out what the facilitators and barriers are to health eating

There is a huge amount of data and information out there. It makes sense to gather as much of it as possible to analyse and interpret the information, incorporate elements into your design and get new ideas based on what has already been done.

With good data we can:

- Assessment current activities, performance and identify gaps.
- Establish a clear case for the need.
- Understand needs and opinions of the community and key stakeholders.
- Prioritise issues and activities.
- Establish overall aims and objectives.
- Identify barriers and enablers to change.

WHAT IS GOOD DATA?

Good data is information that accurate, reliable and reflects what is really happening in the service, the issue you are studying or within the community itself.

Good data is reliable

For data to be useful, you need to be confident in its reliability. Reliability is the ability to get repeatable results with subsequent measurements of the same thing. With reliable measurements, you can be confident that what you are observing is the true situation. Unreliable results can come from using unreliable tools such as a poorly designed survey.

Good data is valid

Validity is another important attribute of a good measurement tool. Validity means that the tool measures what it is supposed to measure. Testing validity is a complex however important process especially when we are looking at variables such as 'quality of life'. The definition of quality of life may differ from person to person and therefore different instruments may result in different answers.

Validating a data collection tool or scale is the process by which we determine the confidence with which we make judgements about people based on the scale. Although validating data collection tools is beyond the scope of this guide, it is important to wherever possible utilise validated tools when undertaking data collection. When selecting a data collection tool, ask yourself if the tool has been test against the 'gold standard' or other accepted measurement tools.

Good data is unbiased

Biased data occurred when a tool over or under measures the true result. This leads to an invalid result. For example, bias can occur when a survey question leads participants to respond in a certain way or when researchers know the treatment being used and their expectations influence their observations. Bias can also occur when the sample population does not represent the broader population.

INFORMATION GATHERING AND DATA SYNTHESIS

What is information gathering and data synthesis?

Information gathering is about collecting data and information about the issue you are trying to address and ways in which other organisations have used it in the past.

There are many sources of information and they vary depending on what you are researching. There are a range of existing sources of information such as published material or statistical and demographic information from a range of organisations. Other sources of information include actual programs, case studies or interventions developed and implemented within the community that have addressed the same issue. Studying these can provide critical information on what worked well and what didn't work so well.

> **The more information you have about the issue and how it's been approached in the past, the more likely you are to devise an effective program.**

Synthesis refers to the putting together of something out of two or more different sources. For examples, synthetic fabrics are called that because they're constructed from a number of different materials.

In relation to information and data, data synthesis refers to analysing what you've learned from your information gathering, and making a decision, constructing a program, policy or approach based on the information analysed. In other words data synthesis about taking ideas from a number of sources and putting them together to create something new that meets the needs of the community and population you're working with.

Why is data synthesis important?

If you are in the process of developing a program to address a particular community issue, gathering information beforehand and putting together what you've learnt could be the most important thing you do to ensure your program is effective. There are many reasons why data synthesis is important such as:

- *Avoids reinventing the wheel.* A number of organisations may have approached this issue in the past. Some of these programs may have worked well and some not so well. All previously implemented programs have something to share and you don't have to make the same mistakes someone else did. You also don't need to spend time developing a new idea if there is an existing model that has worked in the past.

- *It will help you gain a deeper understanding of the issue so you can address it effectively.* The better you understand an issue and how it impacts on the community, the more likely you are to determine how to approach it.

- *Most approaches aren't a one size fits all.* The more information you gather, the greater the variety of approaches, methods and frameworks you'll have to choose from.

- *It can help you ensure your program is culturally sensitive.* The better you understand the community you are working with, the more likely you are to develop an approach that will be understood and valued by the community. Even more importantly, you can learn to avoid mistakes that could be impossible to repair such as community relationships and partnerships.

GATHERING AND SYTHESISING DATA AND INFORMATION – THE PROCESS

How do you gather and synthesise data and information?

There are a number of steps involved in in gathering and synthesising data and information. The actual tasks for each step can be undertaken by specific individuals or in a team.

1. Determine information sources

- Collecting data from scratch can take a lot of time and effort, so investigate all possible sources of existing information before you initiate any new data collection processes.
- Existing internal and external sources such as publications, academic research, published studies, scientific articles, reports, academic books, national statistical data, organisational information and data etc.
- Actual real life examples of current or previously implemented initiatives, existing internal experience, consulation with the community, feedback from key informants etc.
- If you find you need to collect new data, there are a wide range of methods and tools available. Some methods, such as brainstorming, process mapping and focus groups, collect qualitative data about the nature of the issue and feedback on possible approaches to address the problem.

2. Devise a plan for collecting data

- When devising a plan for collecting data you will need to consider:
  - who will gather what information?
  - how the information will be gathered?
  - what is the timeline for gathering the information?
  - Is there any internal training required to support data collection?

3. Collect information

- Once the plan is developed, you will need to put it into pratice.
- Ensure any required training is undertaken and all tasks are allocated appropriately.
- You may also seet up regular meetings to monitor progress and report on findings.

4. Synthesise: Take it apart

- This step involves breaking the information down into it's component parts. There are usually three areas that need to bhe considered:
  - What is known about the issue itself.
  - The community context of the issue.
  - Successfule and unseccussful attempts to address the issue.

5. Synthesise: Put it together

- This steps involves sifting through the components to determine which would be appropriate for the situation and the target group and then integrating them into an approach that is likely to work in your community.
- Consider what has been used previously, can it be adapted, what's missing and if there are factors in your particular situation that make the issue substantially different for you and your target group.

6. Keep at it

- Information gathering and synthesis should continue throughout the life of the program.
- You may not have the results of an initial evaluation until the completion of a program however you should always be looking for improvements and better approaches.

SYTHESISING DATA AND INFORMATION

Methods for synthesising data

There are a number of methods that help you to organise and synthesise your data and information in order to support your decision making and program development. These methods assist you to:

- Describe what is happening in your community or target group.
- Identify relationships between variables. Variable is another term used to describe a value or type of data e.g. height, age, gender or country of birth.
- Identify if there have been improvements or changes.
- Monitor improvements or changes over time.
- Communicate your conclusions effectively.

Synthesising numerical data

Raw numerical data is often hard to interpret, therefore basic statistics are used to organise and summarise the information. There are a number of different techniques for summarising and comparing data as outlined below:

| Counts and sums	• Counts: a count of how many items or observations in your sample. • Sums: Adding up the numbers in each set of observations.
Ratios, rates and percentages	• Help you to standardise your data so that it is expressed in a meaningful way that can be easily compared with other data. • Ratio : fraction that describes two groups relative to one another. • Rate: ratio that describes one quantity in relation to a certain unit. e.g. 4 per 100 people were discharged. • Ratios and rates can also be expressed as percentages such as 60% of females.
Measures of centre (mean, average, median)	• Most common way of summarising and comparing numerical data is to decribe where the 'centre' is (e.g. mean, average, median). • This is an idea of what the most common, normal or representative results might be.
Measures of variability and spread (e.g. range)	• Knowing the variability will help you develop appropriate intervention strategies and will also help you to demonstrate the success of your strategies. • Variability is best demonstrated using box plots, but histograms and time charts can also be useful. • Range: Commonly used measure of variability. It is defi ned by the minimum or lowest observation and the maximum or highest observation.
Making comparisons	• Much of data analysis is aimed at identifying if initiatives have resulted in improvement or change and whether it is of significance. • A common process in making comparisons involves estimating the size of the difference between sample observations (such as by comparing population means or proportions).

INTERPRETING DATA AND INFORMATION

Interpreting data and information is a complex process

Once you have collected and synthesised your data, you will need to involve your stakeholders to seek input around the meaning of your data in the context of your organisations, your community, your project design and implementation.

Clear communication of your findings at each phase is important. This might include organising and presenting your data to key stakeholders and informants. Your presentation should include the following:

- Your original objectives.
- A description of the data collection strategy including your sample population, existing data sources, supporting literature and any new data collected.
- A description of your analysis strategy.
- A summary of your findings presented in a simple, easy to interpret way through tables, graphs and other statistics that summarise your findings.

This information can then be considered in light of what else is happening both internally and in the external environment and agreed actions can be determines.

"*I'll pause for a moment so you can let this information sink in.*"
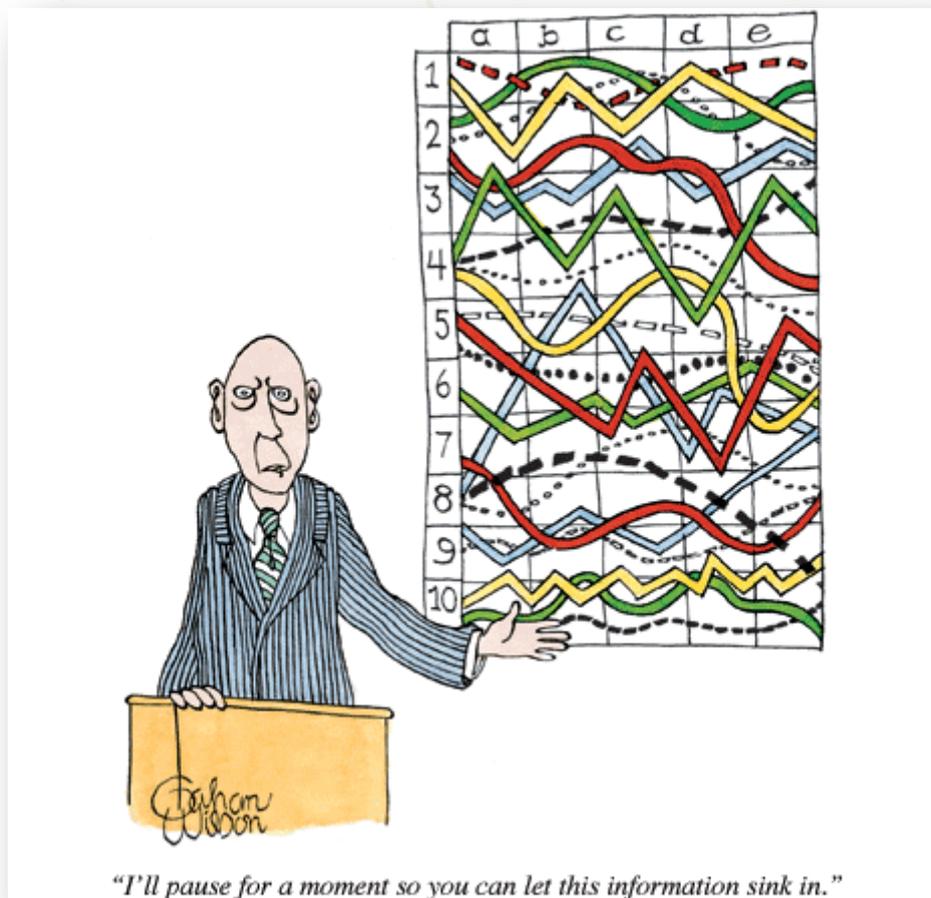
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