Understanding Research

A Study Guide

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Contents

Introduction

Wardliparingga Aboriginal Research Unit has produced a series of master classes designed to increase the awareness of healthcare providers and administrators about the use of research to improve healthcare for Aboriginal and Torres Strait Islander peoples. In particular, participants in this master class entitled "Understanding Research" will gain a basic understanding of:

- research concepts and terminology;
- how research can help improve health services;
- how to find and assess existing research evidence;
- what to consider when commissioning a new study; and
- how to ensure that research findings make a practical difference for Aboriginal and Torres Strait Islander peoples.

This study guide is designed to complement learning activities by providing an easy reference guide to the information discussed within the master class. In addition, this study guide provides a number of examples which will be discussed within the master class, as well as easily accessible tools and resources that can be accessed free of charge, at a later date.

Chapter One – Understanding Research Design and How It Can Help Improve the Health of Aboriginal and Torres Strait Islander Peoples

1.1 Introduction

This first chapter will provide a broad overview of what research is and how it can assist to improve primary healthcare services. In addition, chapter one will also define some of the more common, yet often confusing, terms that researchers use.

1.2 How Can Research Help to Improve Healthcare Services?

There are a number of benefits which can result from collaborating with researchers, providing the research is conducted appropriately with a specific focus on the needs of Aboriginal and Torres Strait Islander peoples and/or their healthcare services. In particular, research may provide an opportunity to identify answers to questions about how to improve the delivery of care and/or health outcomes. Recently, research relevant to the provision of primary healthcare services to Aboriginal and Torres Strait Islander populations has been used to:

- assess the burden and determinants of cardiovascular and metabolic risk [1];
- examine the scope to which antenatal emotional wellbeing assessments are undertaken [2];
- understand the extent to which traditional medical practice is being utilised [3];
- identify the reasons why children attend primary healthcare centres [4];
- examine the impacts and outcomes of diabetes care [5]; and
- measure the factors which contribute to continuous quality improvement programs [6].

Depending on the type of research conducted, other opportunities may arise from being involved in collaborating with researchers which may include [7]:

- providing access to novel and emerging health interventions and technologies;
- deepening the understandings about how healthcare services operate;
- affording opportunities for healthcare providers to reflect on and learn from others; and
- identifying what does not work, as well as what does.

1.2.1 Some Words of Caution before We Start

Undertaking research or even participating in a research collaboration can be a resource-intensive and costly undertaking, often requiring additional infrastructure and a significant time commitment from healthcare providers, as well as other, often limited, resources. It is therefore important to ensure that any research conducted is of real and practical benefit to your organisation.

It should also be remembered that research does not, in and of itself, necessarily lead to change for the better. The provision of healthcare services exists within a complex environment and, therefore, real and practical outcomes depend not only on identifying

opportunities for improvement but also on the implementation of research findings that will be influenced by socioeconomic factors, economic cycles and demographic trends. To add to this complexity, improving the delivery of services and/or health outcomes will always depend on relationships between the community and healthcare providers, as well as the availability of resources both within the community and the larger healthcare system [7]. While Chapter Four provides more detail in regard to translating the research findings into practice, another primary consideration will also be the current policy context [8].

Finally, in some cases, research involves the implementation of new interventions which are often only funded for the study period. While this may be beneficial in the short-term, healthcare providers and community members may become disenfranchised when the study and, therefore, the intervention ceases. Careful consideration needs to be given about sustainability, including how expectations will be managed and whether, on balance, there is a real benefit from participating in the proposed type of research.

1.3 So What Is Research?

There is no single definition of research. However, many people would agree that it is primarily about a *systematic process* which is designed to *create knowledge* with a *specific purpose* or aim in mind – although, at times, the aim or purpose may simply be to explore possibilities.

> Research is defined as the creation of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts, methodologies and understandings. This could include synthesis and analysis of previous research to the extent that it leads to new and creative outcomes [9, p. 7].

In our context, we would suggest adding:

> Research is defined as the creation of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts, methodologies and understandings. This could include synthesis and analysis of previous research to the extent that it leads to new and creative outcomes [8, p. 7] **…..in order to improve Aboriginal and Torres Strait Islander health outcomes.**

While there are always exceptions to the rule, the majority of studies undertaken will include the following activities:
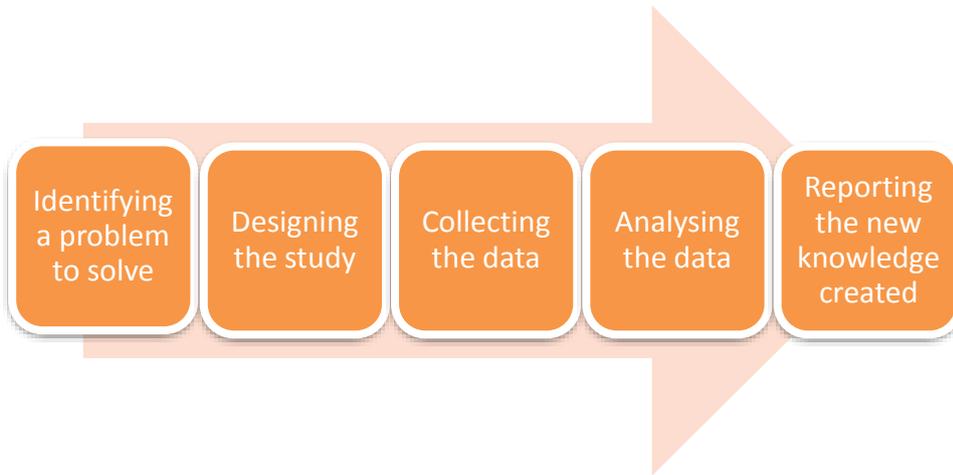
Figure 1.1: Steps which are usually followed when undertaking a research study

We would suggested an important seventh step:

Figure 1.2: Steps which should be followed when undertaking a research study

Broadly speaking, there are two types of research methods - *quantitative* and *qualitative*. Each has its own specific purpose, assumptions and processes.

Table 1.1: Comparison of quantitative and qualitative research

	Quantitative Research	Qualitative Research
Purpose	Quantifies or measures a phenomenon of interest or identifies a cause and effect relationship (i.e. Does smoking lead to lung cancer?).	Describes and/or deepens the understanding of a phenomenon (i.e. How do Aboriginal and Torres Strait Islander people assess well-being?).
The question or hypothesis	A clear question or hypothesis is specified prior to starting.	Broad questions are identified before commencing but the direction can change as the study develops.
Ways in which participants are chosen	A sample of participants is chosen to represent a larger population (i.e. medical records from five different health centres).	Individuals and/or groups chosen may shed light on other groups but findings are not necessarily generalizable (i.e. people may be chosen from one or two communities).
Types of data Collected	Objective measures which are quantifiable (i.e. the percentage of people who have completed an adult health check).	Subjective assessments (i.e. people's understanding and experiences of their well-being).
Examples of ways in which data is collected	Collecting biological samples, surveys and medical records.	Performing interviews, focus groups and observations.
How is quality of the study defined?	Statistical tests for reliability and validity. 'Reliability' refers to the ability to replicate the results, whereas 'validity' refers to whether the results are correct and whether they can be generalised to other contexts.	Quality is established by using multiple sources of evidence, referred to as 'triangulation.' May be particularly interested in credibility and trustworthiness (i.e. Do the findings represent a true picture?).

1.3.1 Quantitative Research

Quantitative methods are primarily used to establish or answer questions that relate to "when," "where," "how many," "how often" and "how much." Following are examples of two questions and one hypothesis that lend themselves to quantitative methodologies:

- **How many people in my healthcare service have been diagnosed with hypertension?**

- **Does the new transport service improve the number of people who attend appointments at our healthcare service?**

- **Aboriginal and Torres Strait Islander people over the age of 30 are less likely than non-Indigenous people to have completed an Adult Health Check in the last 12 months.**

Quantitative methods aim to gather data that are usually numerical or statistical, and that can be counted in order to generalise findings across a group or groups of people represented by a sample of the population. Quantitative research generally follows a linear path, beginning with a testable question or hypothesis and ending with an answer, or with the rejection or acceptance of the hypothesis (Figure 1.3).

Broad Aim → Hypothesis or Question → Data Collection → Analysis of Results → Reporting New Knowledge → Translating Findings into Practice

Figure 1.3: Quantitative study design

1.3.2 Qualitative Research

Qualitative methods are used to answer research questions that pertain to understanding people, their experiences, and the contexts in which experiences occur. The following example question, which was first introduced in the section above, lends itself to qualitative methodologies:

- **How can we improve the care provided to Aboriginal and Torres Strait Islander people in our community?**

Qualitative research methods aim to gather data that are non-numerical and embedded in their context. This type of research is usually less structured and may not be linear. While a defined aim or broad question should be identified at the start of the study, qualitative researchers will often use the findings from the initial data collection to guide the specific direction of the questions they ask later in the data collection. Investigation of qualitative data is often used to reveal themes and patterns, which lead to insights and explanations, which can then assist in understanding the how and/or why of a particular phenomenon (Figure 1.4).
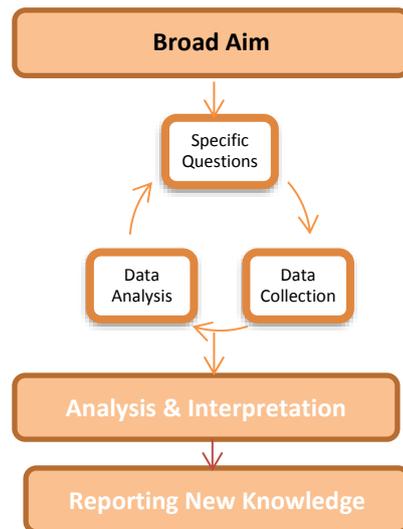
Figure 1.4: Qualitative study design

1.4 How Can Research Help Me?

Motivation for research in healthcare practice often comes from our own experience of providing clinical care, not infrequently because of our frustration with the difficulty of providing what we think would be the best possible healthcare. Our motivation gives us energy for research. However, our first step should be to examine our motivations carefully, as they will shape our future research. This includes considering why we want to do research on this issue at this time and in this place [10, p. 25].

As long as it is designed and constructed with specific purposes in mind, research can be used to improve the quality and safety of healthcare services for Aboriginal and Torres Strait Islander peoples. For example, research can be used:

- **To answer a specific question**

  For example:

  How many Aboriginal and Torres Strait Islander peoples in my healthcare service have been diagnosed with hypertension?

- **To explore a topic of interest**

  For example:

  How can we improve access to care for Aboriginal and Torres Strait Islander people in my community?

- **To understand whether a new intervention is beneficial**

> **For example:**
>
> *Is the new transport system improving the number of people who attend appointments at our healthcare service?*

- **To test out a hypothesis or assumption**

> **For example:**
>
> *Aboriginal and Torres Strait Islander people over the age of 30 are less likely to have completed an Adult Health Check compared to Aboriginal and Torres Strait Islander people ≤30 years of age, in the last 12 months.*

Step One: Identify who should determine the aim of the study and what specific question or hypothesis should be addressed. For many years, the questions that researchers posed have been privileged above the particular needs and wishes of the healthcare organisations and the communities they serve. More recently, it has been acknowledged that to ensure research outcomes are relevant and practical, healthcare practitioners and Aboriginal and Torres Strait Islander peoples should together drive the research agenda.

Step Two: Identify the aim of the study. Start out by ensuring that a broad aim or objective for the research is identified. Consider what problem requires a solution, or what broad issue needs to be addressed.

Step Three: Identify the question or hypothesis. Once a broad aim has been agreed upon, a question or hypothesis should then be developed.

1.4.1 Knowing Your Research Question

Research questions need to contain specific information. To make this easier it may be helpful to dissect the question into different parts or components.

Research questions which aim to **compare the effectiveness of one procedure or intervention with another** are generally quantitative in nature and will be comprised of the following four important components [11, 12]:

1. **Population of interest** – the individuals you wish to include in the study, including their important characteristics such as age, sex and/or disease type.
2. **Intervention or treatment** – this can be a treatment, procedure, diagnostic test and/or a risk factor.
3. **Control or comparator** – your comparison intervention treatment, placebo or standard care.
4. **Outcome** – the difference between the intervention/treatment and the control. It is important to remember that this must be quantifiable, specific, valid, reproducible and appropriate.

Research questions which aim to **identify or quantify what is currently occurring** are also generally quantitative in nature and will usually have the following three important components:

1. **Population of interest** – the individuals you wish to focus on in this particular study, including important characteristics such as age, sex and/or disease type.
2. **Factor of interest** – these include a treatment, a procedure, a diagnosis, a test and/or any other quantifiable factor of interest.
3. **Outcome** – the measurement of the factor of interest. Must be quantifiable, specific, valid, reproducible and appropriate.

Research questions which aim to better **understand how or why things happen** are generally qualitative in nature and will usually consist of the following three important components:

1. **Population of interest** – the individuals to be included within the study, including important characteristics such as age, sex and/or disease type.
2. **Phenomena of interest** – the experience or phenomenon that you are interested in understanding.

3. **Context** – factors such as geographic location, cultural factors, and details about the setting.

Example of a research question with clearly-defined terms and measures:
How do Aboriginal and Torres Strait Islander people in the community believe that access to care can be improved?

5. **Population of interest:** Aboriginal and Torres Strait Islander people.
6. **Phenomena of interest:** Perceptions of the population of interest about how access to care could be improved.
7. **Context:** The community encompasses all people who reside in [name of community] as at 1st December 2014.

1.4.2 A Realistic Research Question

A research question also needs to be realistic in its design. At a minimum you will need to consider the following four criteria [11], details of which are expanded in other chapters of this manual:

1. **Novel** – One of the primary questions you need to ask yourself is whether the answer has already been identified. If this is the case, you may not need to repeat the exercise. How to find out if someone else has already found the answer to your question is covered in **Chapter Two** of this manual.
2. **Ethical** – Ensuring your research meets ethical standards at all times is essential. An overview of these responsibilities is provided in **Chapter Three** of this manual.
3. **Feasible** – Feasibility speaks to whether you have, or are able to find, the resources to undertake your research. How you might engage or collaborate with researchers to answer your question is also covered in **Chapter Three**.
4. **Relevant** – Making sure that your research makes a difference to healthcare practice is an important part of the research process. **Chapter Four** covers the translation of findings into practice.

1.5 Key Messages from Chapter One

1) Research has been defined as the creation of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts, methodologies and understandings.

2) There are a number of benefits that can result from research, providing it focuses on the specific needs of Aboriginal and Torres Strait Islander peoples and/or their healthcare services.

3) Undertaking research can be resource-intensive and a costly undertaking.

4) The following four basic steps should be addressed prior to beginning any study:
   a. **Step One:** Identify who should determine the aim of the study and what specific question or hypothesis should be addressed.
   b. **Step Two:** Clearly define the aim of the study.
   c. **Step Three:** Articulate the question or hypothesis.

5) There are a number of essential components to a research question. What components are necessary will depend on the aim of the research.

6) Research questions must be novel, ethical, feasible and relevant.

1.6 Resources Relating to Chapter One

1.6.1 Developing a Research Question

A step-by-step guide to developing a research question:
http://twp.duke.edu/uploads/media_items/research-questions.original.pdf

1.6.2 Quantitative and Qualitative Research

A more detailed description of both quantitative and qualitative research methods, including how to construct a research question or a hypothesis, and a description of how data is collected and analysed can be found at:
http://www.socialresearchmethods.net/kb/contents.php

For general information about matters relating to the health of Aboriginal and Torres Strait Islander peoples, including alerts about research literature and reports, tools, resources and funding opportunities, try:
http://www.healthinfonet.ecu.edu.au/?gclid=CI6GutX84rgCFUhapQodB2YALQ

For general information about primary healthcare research and to receive regular alerts about completed studies, upcoming research funding opportunities, as well as new resources and research tools for research, try:
http://www.phcris.org.au/index.php?page=home

Chapter Two – Has the Question Already Been Answered?

2.1 Introduction

Once the aim of the research and the specific question or hypothesis has been clearly defined, the next step is to see if an answer already exists. There may not necessarily be a need to undertake additional research as others may have already completed the work for you. Details about finding and reviewing journal articles, study reports and other types of publications that may hold the key to answering your question or questions are provided in this chapter. Additionally, the chapter will also identify basic techniques for assessing the quality of any literature you find so that you know whether to trust the information that it contains.

2.2 Types of Literature You May Find Helpful

You don't have to only rely on journal articles or research reports to inform your question. There is a plethora of different types of literature which could potentially contribute to answering your question or testing your hypothesis (Figure 2.1).

Journal Articles, Research Reports, Issue Papers, Conference Proceedings, Theses and Dissertations, Working Papers, Fact Sheets, Briefing Papers, Webpages, etc.

Figure 2.1: Examples of scientific literature

However, not all of these types of literature are considered to be of equal quality. The following chart demonstrates the hierarchy of evidence that exists (Figure 2.2):

Hierarchy of Literature

1. **Primary Source,** including research reports and published articles written by the researcher.

2. **Secondary Source,** including review articles written by someone other than the researcher.

3. **Anecdotal Pieces,** including views and opinions.

Figure 2.2: The hierarchy of literature

Many people distinguish between **peer-reviewed** and **grey literature**. Peer-reviewed literature involves a review by the researcher's peers prior to publishing. Be careful. Just because literature is published in a journal does not mean it is peer-reviewed. It could be what is known as "grey literature," which is literature that is not controlled by a commercial publisher and is often published on websites, in newsletters, and/or as a study report.

2.3 Using Publication Databases and Search Engines

Publication databases are a great tool for finding peer-reviewed and, in some cases, grey literature. They are helpful because they allow you to search and download articles from a number of journals at the same time.

Though databases are particularly helpful as an online tool for identifying literature that may be useful, there are some downsides. First, there are many different types of databases and it is sometimes difficult to work out which one you should use. Second, in many cases you need to pay a subscription fee to use a database. However, if you haven't subscribed to a database and don't have easy access to a research librarian, we suggest you may like to try some of the databases which don't require a subscription for a basic level of use (Table 2.1).

Table 2.1: Databases and search engines which provide access to some free text literature

Free Publication Databases	Details	Link
PubMed	Over 22 million primarily peer-reviewed biomedical citations, some with links to free full-text.	http://www.ncbi.nlm.nih.gov/pubmed
Cochrane Database of Systematic Reviews	Peer-reviewed free full-text systematic reviews that have been prepared and supervised by a Cochrane Review Group.	http://onlinelibrary.wiley.com/cochranelibrary/search/
Google Scholar	Peer-reviewed and grey literature including journal articles, reports, theses and opinion papers. Some include links to free full-text.	http://scholar.google.com.au/
Google	Primarily used to search for grey literature, including websites of interest and links to reports and opinion papers.	http://www.google.com.au/advanced_search
MedNar	Primarily used to search for grey literature, including commercial databases, medical societies, National Institute of Health, and government resources and patents.	http://mednar.com/mednar/desktop/en/green/search.html
World Health Organisation	Contains links to World Health Organization projects, initiatives, activities, information, and contacts organised by health and development topics.	http://www.who.int/topics/en/

Unfortunately, just because you can access these databases and search their content doesn't necessarily mean you will be able to see the full-text of every article, report and/or other types of literature for free. In some cases, you may only be able to see the title, authors, and a short abstract or summary of the article before being directed to a fee-for-service webpage. However, a number of articles are provided free of charge and, in other cases, short summaries or abstracts of the article can be helpful. If you are really interested

in readying the full text and it is not available, try emailing one of the authors as they will generally be happy to send out a full-text of the article upon request.

2.4 Building Your Search

Rather than not finding enough literature, you may be faced with too much. The way to manage the billions of articles which could pertain to your question or hypothesis is to develop a search strategy which focuses what your search looks for. To do this you need to:

Step One: Identify the key concepts in your question or hypothesis.

Step Two: Identify any alternative terms which could exist for these concepts.

Step Three: Decide whether you want to restrict your search in any way. For example, you could restrict your search to:

- a certain population or group;

- a specific age group; and/or

- a particular type of literature (e.g. journal article or book).

You may find that it helps to clarify your thinking if you use **a logic grid**, in which you group related concepts or synonyms.

Examples of a logic grid for a research question:

1. **How <u>prevalent</u> is <u>rheumatic heart disease</u> in <u>Aboriginal and Torres Strait Islander populations</u>?**

Measure	Condition	Population
Prevalence	Rheumatic heart disease	Aboriginal
Rate	RHD	Torres Strait Islander
Incidence		Indigenous Australian
Risk		

2. **How acceptable are <u>outreach visits</u> to <u>Aboriginal and Torres Strait Islander peoples</u> living with <u>chronic disease</u>?**

As there are three distinct concepts involved in this search (underlined above), we will use three columns.

Label each column with a concept and then list all of the terms under each which could be used to describe the concept.

Intervention	Population	Condition
Out-reach	Aboriginal	Chronic disease
Out reach	Torres Strait Islander	Cardiovascular disease
Home visits	Indigenous Australian	Diabetes
		Respiratory disease
		Depression

3. **Aboriginal and Torres Strait Islander peoples** who live in **urban locations** are less likely to have an adult health check than those in **rural or remote areas.**

As there are three distinct concepts involved in this search (underlined above), we will use three columns.

Label each column with a concept and then list all of the terms under each which could be used to describe the concept.

1. Population	2. Location	3. Intervention
Aboriginal	Rural	Adult health check
Torres Strait Islander	Remote	Adult health screen
Indigenous Australian	Urban	MBS Item number
	Metropolitan	

2.5 Searching in Pub Med

Unfortunately, not all databases are the same. Each has its own tools and rules set up for searching. The following provides some examples of how to build your search in PubMed.

First you need to decide how broad you want your search to be. In PubMed, you will be able to select where the database looks for your search terms from a large number of different options. However, as a start, we suggest choosing the following three possibilities:

- **Anywhere within the title.** This narrows the search significantly.

- **Anywhere within the abstract or summary.** Please note: there is not always an abstract or a summary. This broadens the search slightly and is probably a relatively safe option.

- **Anywhere within the entire text.** This broadens the search significantly and will generally result in an increase in the number of items returned.

The next stage is to type in your search terms. In PubMed there are a number of different steps to this:

Step One: Search for each term within a column separately.

Step Two: Combine the three searches into one, using the # tag. For example:

Example of the above search set up in PubMed:

How prevalent is rheumatic heart disease in Aboriginal and Torres Strait Islander populations?

Create three separate searches:

1.   Prevalence **OR** rate **OR** incidence **OR** risk **in title/abstract.**
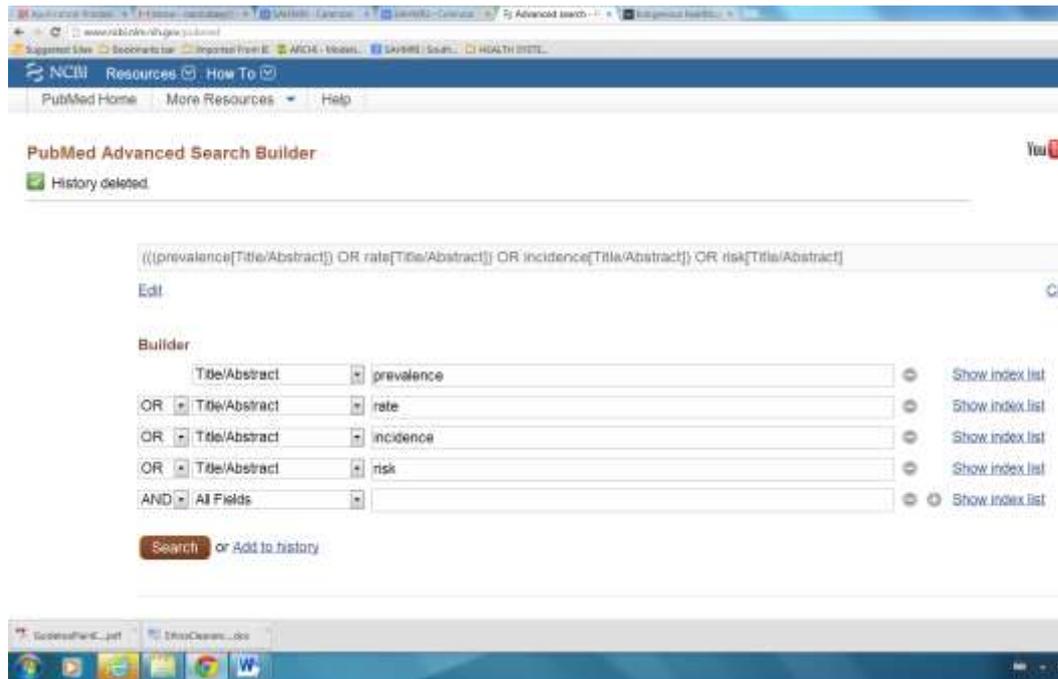
Then search:
2.   Rheumatic Heart Disease **OR** RHD **in title/abstract.**
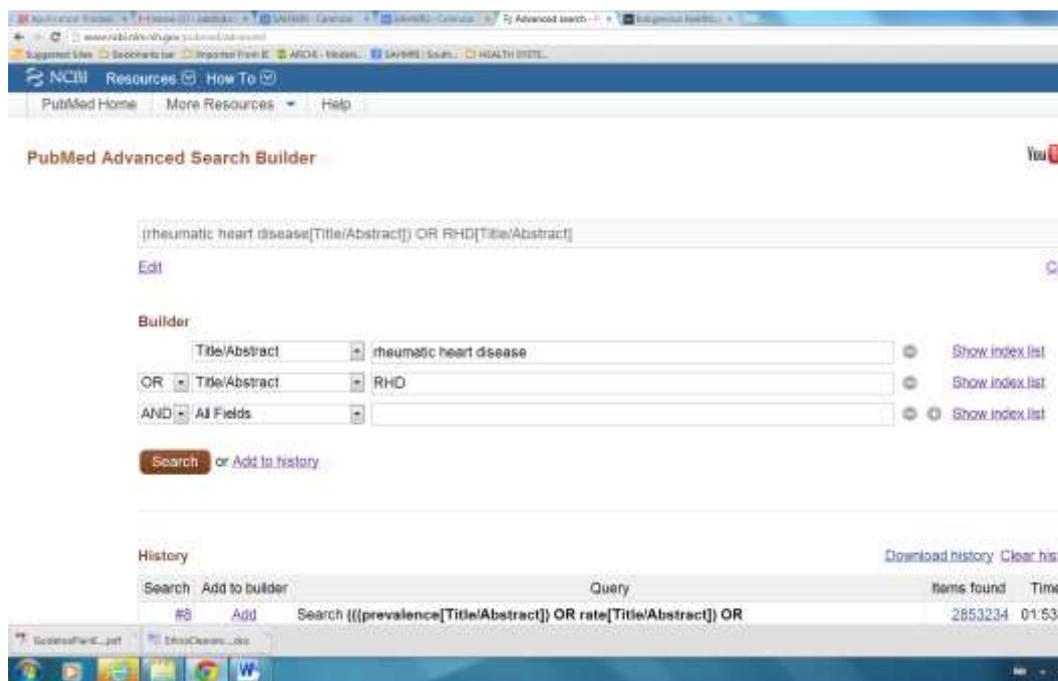
Then search:

3. Aboriginal **OR** Torres Strait Islander **OR** Indigenous Australian **in title/abstract**.

Then combine the two searches:

4. #1 **AND** #2 **AND** #3

In this example, 23 articles match the search terms used.
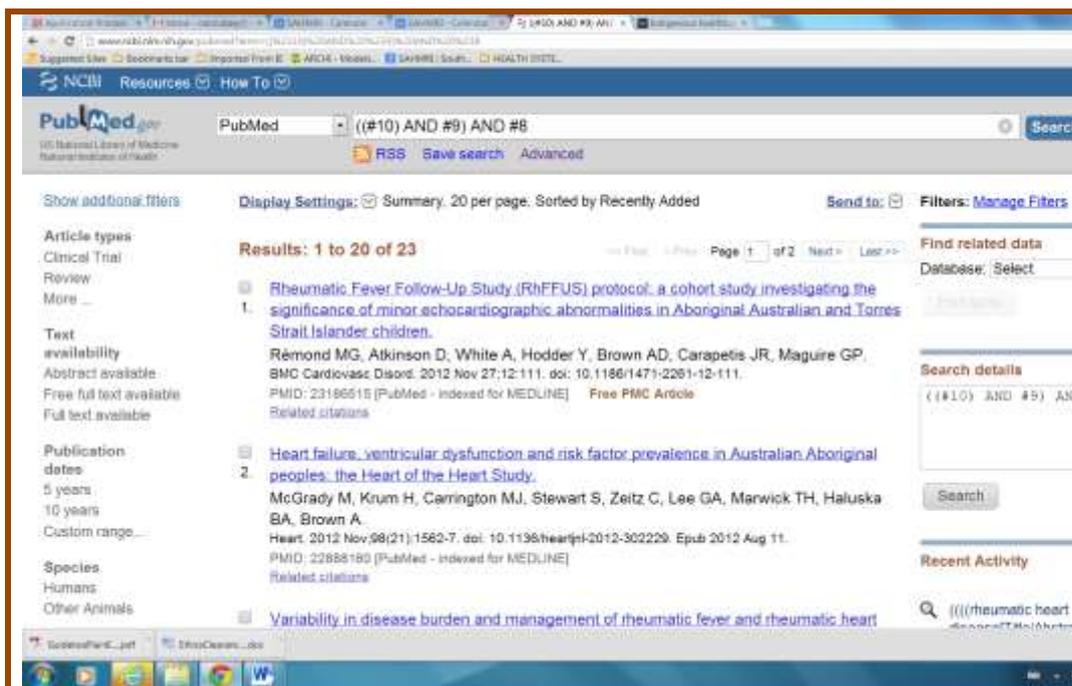
By clicking on the blue link you will be able to see the abstract or summary of the article. For example, the following is an abstract for the third article in the list.

Notes:
1. There is a box on the far right-hand side of the screen which suggests that you would be able to download a copy of the full-text free of charge.
2. Also on the right-hand side of the screen is some related literature. By clicking on the titles you will also be able to view these abstracts.

The above explains how to search in PubMed. However, each database will have its own unique rules and tools to find the literature that you want. Therefore, before starting your

search it is a good idea to have a look at the link to the help page in the database (Table 2.2).

Table 2.2: Help pages for each of the previous suggested databases and search engines.

Free Publication Databases	Link to Online Help
PubMed	http://www.ncbi.nlm.nih.gov/books/NBK3827/
Cochrane Database of Systematic Reviews	http://olabout.wiley.com/WileyCDA/Section/id-390244.html
Google Scholar	http://www.google.com/intl/en/scholar/help.html#overview
Google	http://searchengineland.com/guide/how-to-use-google-to-search
MedNar	http://mednar.com/mednar/desktop/en/green/help.html

2.6 Assessing the Quality of the Literature

As previously mentioned, just because something is published doesn't necessarily mean that the information it contains is reliable or trustworthy. It is, therefore, important to consider the quality of the literature you have found prior to relying on its presented findings. In doing so, there are a number of factors you should consider which differ, depending on whether you are looking at quantitative or qualitative studies, systematic reviews, or web sites.

2.6.1 Quantitative Studies

As discussed in Chapter One, there are several types of quantitative studies. Not all are considered to be equal. Instead, there is a hierarchy of evidence (Figure 2.3).
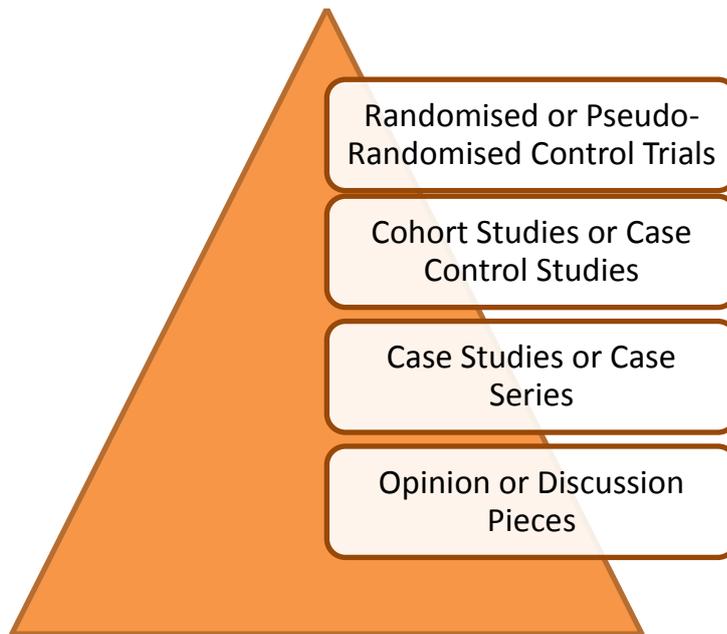
Figure 2.3: The hierarchy of evidence

While randomised controlled trials are considered to be of the highest standard, it is important to note that they may not always be appropriate because either the research question or the research context, or both, don't lend themselves to this type of research. Therefore, studies using other types of quantitative methods should not be ignored.

There is, however, more to assessing the quality of evidence than just identifying the type of study that was undertaken. You may also need to consider the following questions when deciding if you will trust the evidence presented:

- Was the study based on a random or pseudo-random sample?
- Were the criteria for inclusion in the sample clearly defined?
- Were confounding factors identified and strategies to deal with them stated?
- Were outcomes assessed using objective criteria?
- If comparisons were made, was there sufficient description of the groups?
- Was follow up carried out over a sufficient time period?

2.6.2 Qualitative Literature

There are a number of ways in which the quality of qualitative research can be assessed. One way is to consider the validity and the relevancy of the study.

Validity: "Validity" refers to how legitimate or valid the findings are. The types of questions that should be considered when assessing validity are:

- Have the findings been corroborated either through the use of multiple data collection methods and/or data sources? For example, did observations support the findings from key informant interviews and/or were a range of different participant perspectives considered?
- Have the findings been reviewed by the participants to establish whether they reflect the participants' views?

- Has the method of data collection, analysis and interpretation been clearly explained?
- Did the researcher/s reflect on how their own views and values may have influenced data collection, analysis and/or interpretation?

Relevance: "Relevance" refers to the extent to which the study findings can be applied to situations beyond the immediate study. The types of questions that could be considered when assessing relevance are:

- How well does the study add to, or increase the confidence of current knowledge about the topic?
- Could the findings be applied to contexts and/or situations beyond what was considered in the original study?

Authenticity: "Authenticity" relates to whether there is a consensus of agreement as to what is considered to be true. This does not mean there is only one truth or reality but, rather, that the findings reflect the truth in all its complexity and inconsistency.

2.6.3 Systematic Reviews

It has been suggested that in order for health practitioners to keep abreast of the relevant literature, they would need to read, on average, about 17 – 20 articles every day. Therefore, using systematic reviews which apply rigorous methods to identifying, assessing and interpreting literature related to a specific topic or question makes a lot of sense. However, just as you have learned the importance of reviewing quantitative and qualitative literature, it is also important to assess the quality of the systematic literature review before you decide to apply the findings contained in it.

You may wish to start by asking the following questions [13]:

- Was there evidence that the systematic review was designed prior to beginning the review? (i.e. Was the protocol or methodology published prior to commencing?)
- Was the search comprehensive? (i.e. Do you think they include all of the possible terms in the search?)
- Did two independent reviewers select and extract the data? (And did they then compare and discuss any discrepancies?)
- Was a list of studies and characteristics for each provided in the literature? (i.e. type of participants, any interventions and outcomes for each study.)
- Was the scientific quality of the included studies assessed and documented? (i.e. Were they assessed for quality in a similar way to that discussed in section 2.8.2 above)
- Were the methods used to combine the extracted findings appropriate? (i.e. Were the studies combined in a sensible way?)
- Was the possibility of a conflict of interest acknowledged? (i.e. Did the authors state any support received or, alternatively, clearly identify that there was no conflict of interest?)

2.6.4 Grey Literature

While it is a little more difficult to assess the quality of grey literature, particularly if presented online by an unknown or obscure source [14], there are still some questions that can be asked to identify whether you can rely on the information provided.

- Whose website is it? (i.e. You may be more inclined to trust information contained on the World Health Organization website than information provided by a private for-profit company.)
- Who has authored the information? (i.e. You may be more inclined to trust the information if it is authored by an expert in that particular field.)
- When was it produced? (i.e. You may be more inclined to trust the information if it was produced recently rather than 10 or 20 years ago.)
- Why was it produced? (i.e. You may be more inclined to trust the information if it was specifically produced for use by health practitioners rather than if it is information intended for general consumption)

2.7 Key Messages from Chapter Two

1) Reviewing the literature will help you to find out if your research question has already been answered.

2) In addition to journal articles, you may also consider reviewing the following: Research Reports, Issue Papers, Conference Proceedings, Theses and Dissertations, Working Papers, Fact Sheets, Briefing Papers and Webpages.

3) In order to lessen the amount of work that can be involved in a literature review, you should develop a search strategy based on the following three steps:

   Step One: Identify the key concepts in your question or hypothesis.

   Step Two: Identify any alternative terms which could exist for these concepts.

   Step Three: Decide whether you want to restrict your search in any way. For example, you could restrict your search to a certain population or group, a specific age group, and/or a particular type of literature (e.g. journal articles or books).

4) Just because something is published doesn't necessarily mean that the information it contains is always reliable or trustworthy. Therefore, a careful analysis of not only the content but also the source should be undertaken before the contents are utilised.

2.8 Resources Relating to Chapter Two

2.8.1 Searching databases

Tutorials on how to search PubMed can be found at:
http://www.nlm.nih.gov/bsd/disted/pubmedtutorial/cover.html

Primary Healthcare Research Information Service provides an overview and guide to searching for grey literature at: http://www.phcris.org.au/guides/grey_literature.php

Some detailed information about searching PubMed and tips on constructing searches specific to Aboriginal Health can be found on this University of Adelaide webpage:
http://libguides.adelaide.edu.au/content.php?pid=279714&sid=2337683

Lowitja provides predefined search terms and a filter which focuses on Aboriginal and Torres Strait healthcare research in PubMed at: http://www.lowitja.org.au/litsearch

Primary Healthcare Research Information Service provides predefined search terms and filters which focus on primary healthcare research in PubMed that can be found at:
http://www.phcris.org.au/phcsearchfilter/index.php?page=phcSearchFilter

2.8.2 How to assess quality

This YouTube clip provides a basic five minute overview on searching databases:
http://www.youtube.com/watch?v=Estp65h1nVE#action=share

More information from the British Medical Journal on how to read and evaluate systematic reviews, as well as a range of both quantitative and qualitative papers:
http://www.bmj.com/about-bmj/resources-readers/publications/how-read-paper

A guide to assessing online information:
http://www.lib.berkeley.edu/TeachingLib/Guides/Internet/Evaluate.html

Maureen Bell is a senior research librarian at the University of Adelaide. Her web pages provide advice and links to tools for searching and evaluating public health literature. The link below specifically focuses on evaluating evidence. The tabs at the top of the page also provide links to help you search for literature and find relevant public health organisation sites: http://libguides.adelaide.edu.au/content.php?pid=279714&sid=2828585

2.8.2   Critical Appraisal Tools

This site contains a list of links to critical appraisal tools which help to establish the quality of any literature you are considering using. In addition, this site provides a link to an online tutorial that provides an overview about how to conduct a critical appraisal:
http://www.unisa.edu.au/research/sansom-institute-for-health-research/research-at-the-sansom/research-concentrations/allied-health-evidence/resources/cat/

Chapter Three - Effective Research Collaborations

If you can't find a satisfactory and reliable answer within the peer-reviewed or grey literature, you may wish to commission research to be undertaken on your behalf. Chapter Three discusses some important values and ethical considerations which should be considered when working with a research partner. This chapter also identifies the type of issues which may need to be addressed within formal agreements between you and the researcher or the researcher's organisation prior to beginning the collaboration.

3.1 Choosing to Collaborate with a Research Partner

Choosing the right research partner is never easy, particularly as there is a number of universities, private research organisations and consultants who have previously, or are currently, undertaking research in the area of Aboriginal and Torres Strait Islander health. The organisation you choose to partner with will have implications for the way in which the research will be conducted and the types of agreements that you may enter into. For example, not all consultants will be required to seek ethics approval. Different organisations also have different agreements in regard to who owns the intellectual property that is used in, and/or created by, the research that is undertaken.

Primary healthcare services are also often approached by researchers with invitations to participate in research collaborations. As this can be resource-intensive and a costly undertaking for healthcare services, often requiring additional infrastructure and a time commitment from you and your colleagues, it is important to assess the request in detail.

It is important to remember that healthcare services may:

- choose not to collaborate with researchers;
- decide to discontinue the collaboration at any time, for any reason; and/or
- seek advice from an ethics committee if they are not satisfied with the conduct or outcome of the research.

3.1.1 Who Sets the Agenda?

Researchers have a particular set of priorities which are important to the development of their academic careers. These include the amount of grant funding that is awarded to them and the number of peer-reviewed journal articles that they publish. Sometimes, the needs of the participants or healthcare services are forgotten or downgraded in an attempt to meet these academic responsibilities. It is therefore important from the very beginning of any collaboration to ensure that healthcare services and the communities they serve play a significant role within the governance structure and that they are able to drive the research agenda.

One way of identifying researchers who would make good partners is to ask them about the way in which they have previously worked, and the values they have and continue to apply to the research they undertake.

3.1.2 Ethical Values and Standards

Not all researchers will be obliged to seek ethics approval from a human ethics committee. While universities and most research institutes usually have strict guidelines around

seeking approval from not only their internal ethics approval committees but also, where appropriate, from Aboriginal and Torres Strait Islander-specific committees before commencing the research, consultants may not always adhere to the same requirements. We suggest that these approval processes are essential and necessary in all instances to ensure that the rights of the participants and your rights, as a collaborating party, are protected.

Rather than relying on one set of ethical values, research involving Aboriginal and Torres Strait Islander people needs to consider a range of issues which could be thought of as a hierarchy (Figure 3.1).
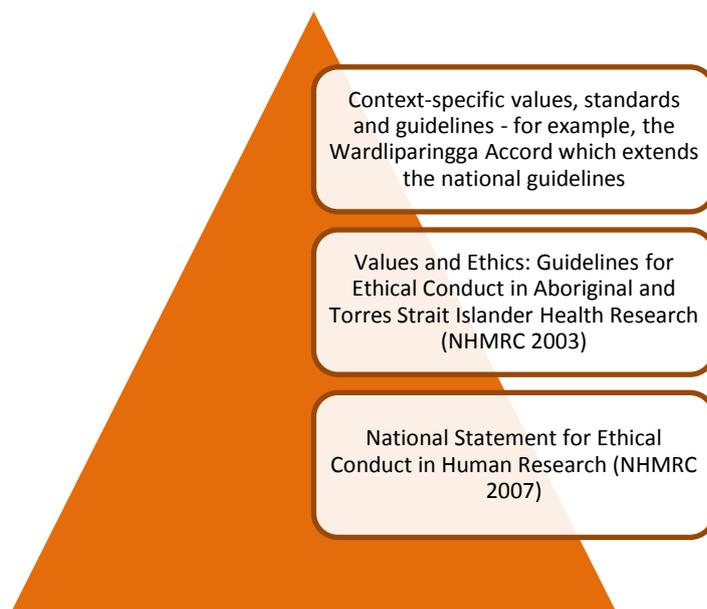
Figure 3.1: Hierarchy of ethical considerations when conducting research

At a minimum, the National Health and Medical Research Council (NHMRC) has developed the "*National Statement for Ethical Conduct in Human Research*" [15], which includes a set of core values that must be considered and addressed **when conducting all research** involving human participants (Table 3.1).

Table 3.1 – National Statement for Ethical Conduct in Human Research [15, pp. 12-13]

> **Research Merit and Integrity**
> This value includes ensuring that the research methods are appropriate, are based on a thorough study of the current literature, and are designed to ensure respect for the participants. Research should also be conducted by appropriately qualified and experienced researchers and use facilities and resources appropriate for the research. Importantly, researchers must be committed to searching for knowledge and understanding, following recognised principles, conducting research honestly, and disseminating and communicating results

Justice
This value includes ensuring that the inclusion of participants, the process of recruiting, and the distribution of benefits is fair. In addition, there should not be an unfair burden on participation.

Beneficence
This value includes ensuring that the benefit of the research justifies the risks of harm to participants and, where there is no benefit, that the risks to the participants should be lower than what would be ethically acceptable. In addition, researchers are responsible for designing the study to minimise harm, telling participants about both the benefits and risks and ensuring the welfare of participants.

Respect
This value includes respect for human beings for their intrinsic value and respect for the individual's right to confidentiality and privacy.

The "*Values and Ethics: Guidelines for Ethical Conduct in Aboriginal and Torres Strait Islander Health Research*" [16] and the companion document *"Keeping research on track. A Guide for Aboriginal and Torres Strait Islander peoples about health research ethics"* [17] provide the next important level in the hierarchy of ethical values and standards. These two documents, which were developed in collaboration with Aboriginal and Torres Strait Islander communities, identify six core values that Aboriginal and Torres Strait Islander societies see as essential for conducting research involving Aboriginal and Torres Strait Islander peoples (Figure 3.2).

Figure: 3.2 Keeping research on track [17, p. 8]

These values are not separate to, but rather inform the way in which the NHMRC values should implemented (Table 3.2).

Table 3.2: Keeping research on track. [17, pp. 8-9]

Following is how the Aboriginal and Torres Strait Islander communities, who developed the six core values, interpret them:

Spirit and Integrity
This is the most important value that joins all our Aboriginal and Torres Strait Islander peoples' values together. The first part, 'Spirit,' is about the on-going connection (continuity) between our past, current and future generations. The second part, 'Integrity,' is about the respectful and honourable behaviours that hold Aboriginal and Torres Strait Islander values and cultures together.

Reciprocity
Our way of shared responsibility and obligation is based on our complex kinship networks. This process in our communities keeps our ways of living and family relationships strong. These responsibilities also extend to the care of the land, animals and country, and involve sharing benefits from the air, land and sea, redistribution of income, and sharing food and housing.

Respect
Respect for each other's dignity and individual ways of living is the basis of how Aboriginal and Torres Strait Islander peoples live. Within our cultures, respect strengthens dignity, and dignity strengthens respect. A respectful relationship encourages trust and co-operation. Strong culture is built on respect and trust, and a strong culture encourages dignity and recognition, and provides a caring and sharing environment.

Equality
Aboriginal and Torres Strait Islander peoples recognise the equal value of all individuals. One of the ways that this is shown is in our commitment to fairness and justice. Equality affirms and recognises Aboriginal and Torres Strait Islander peoples' right to be different.

Survival and protection
We continue to protect our Aboriginal and Torres Strait Islander cultures, languages and identity. Recognition of our shared cultural identity, which is based on our shared values, is a significant strength.

Responsibility
All Aboriginal and Torres Strait Islander communities recognise the same most important (core) responsibilities. These responsibilities involve country, kinship bonds, caring for others, and the maintenance of cultural and spiritual awareness. The main responsibility is to do no harm to any person, or any place. Sometimes these responsibilities may be shared so that others may also be held accountable.

There are also values and guidelines developed at state, regional and/or local levels. You could check with the state peak Aboriginal Community Controlled Organisation or the

National Aboriginal Community Controlled Organisation to find out what could apply in your particular context. For example, in response to a call from Aboriginal communities and researchers within South Australia, Wardliparingga Aboriginal Research Unit has developed a set of the following nine principles based on national and international best practice frameworks and guidelines for conducting research with Indigenous peoples:.

1. **PRIORITIES:** Research should be conducted on priorities arising from and endorsed by the Aboriginal community to enhance acceptability, relevance and accountability.
2. **INVOLVEMENT:** The involvement of Aboriginal people and organisations is essential in developing, implementing and translating research.
3. **PARTNERSHIP:** Research should be based on the establishment of mutual trust, and equivalent partnerships, and the ability to work competently across cultures.
4. **RESPECT:** Researchers must demonstrate respect for Aboriginal knowledge, Aboriginal knowledge systems and custodianship of that knowledge.
5. **COMMUNICATION:** Communication must be culturally and community relevant and involve a willingness to listen and learn.
6. **RECIPROCITY:** Research should deliver tangible benefits to Aboriginal communities. These benefits should be determined by Aboriginal people themselves and consider outcomes and processes during, and as a result of, the research.
7. **OWNERSHIP:** Researchers should acknowledge, respect, and protect Aboriginal intellectual property rights and the transparent negotiation of intellectual property use and benefit sharing should be ensured.
8. **CONTROL:** Researchers must ensure the respectful and culturally appropriate management of all biological and non-biological research materials.
9. **KNOWLEDGE TRANSLATION:** Sharing and translation of knowledge generated through research must be integrated into all elements of the research process to maximise impact on policy and practice.

3.2 Developing a Research Agreement

Regardless of which research organisation you choose to collaborate with, it will be important to clearly identify what you expect from your research partner and what your research partner expects from you. Often this starts with an open and frank discussion. We would also suggest that general points discussed be outlined in writing. The agreed principles should then be formalised within a Research Agreement, addressing issues included in the remainder of this chapter.

3.2.1 Identifying the Roles and Responsibilities

Roles and responsibilities of each party should be clearly identified within both the discussion document and the Memorandum of Understanding. In particular, your level of involvement in the study (Figure 3.3) should be agreed upon.

Level of participation	Role of consumers and community members	Explanation and examples
HIGH	Initiates the research	The community identifies the research needs and sets the appropriate research agenda
	Has full control	The researcher asks a community to identify a problem and to make all key decisions on goals and means. The researcher is willing to help the community at each step to accomplish goals
	Defined level of control	Researchers identify the research needed and present the problem to the community, define the limits, and ask the community to make decisions
	Plan jointly	Researchers present a tentative plan to the consumers and the community. The plan is open change (slight or substantial) by those affected
	Are consulted	Researchers try to promote a plan. They seek to develop support or facilitate acceptance of the plan
LOW	Receive information	Researchers make a plan and announce it. The community is convened for information purposes. If relevant to the research, participation in invited under conditions specified by Ethics Committee
	None	Community not involved

Figure 3.3: Levels of participation

As you can see from figure 3.3 [18], levels of participation can range from almost no input to a level whereby the health service or the community sets the agenda and is highly involved in the study. At a minimum, you may consider setting up a Reference Group at the beginning of the planning stage in order to review and agree upon the questions to be addressed, the way in which the study will be conducted, as well as how advice and guidance around the interpretation of research findings will be provided. This Reference Group could also oversee the dissemination of study findings, as well as assist in developing policies and making decisions concerning any future use of the data collected.

3.2.2 Collaborating to Strengthen Capacity

One of the benefits of being highly involved with community members and embedding them into the study team with you and your colleagues is that the research capacity of your organisation is strengthened. This type of collaboration is also of benefit to the researchers as community members. Healthcare staff will contribute to this process by:

- providing a deeper understanding of the cultural norms, beliefs and attitudes of the participants [19];
- facilitating a greater acceptance of the researcher within the research setting while also contributing to a shared understanding of perspectives [20]; and
- achieving a deeper awareness of contextual issues and, ultimately, a more informed body of research [21].

Any agreement to include either healthcare providers or community members as researchers in the study should be articulated in the research agreement together with appropriate rates of pay.

It is also important to ensure that the contributions made by healthcare services as a whole, individual healthcare providers, and community members involved in the research are appropriately acknowledged in other ways. For example, it may be appropriate for healthcare providers to be authors on any publications that are produced as a result of the research and funded to present at conferences. In addition, you may wish to ensure that the healthcare service is able to have direct input or to provide feedback on a final report prior to dissemination.

3.2.3 Establishing Ownership of All Intellectual Property

The Research Agreement should also define the ownership of any intellectual property collected and/or developed through the research partnership. This can include, but may not be limited to, the data as well as study outcomes. The following quote highlights one of the many problems that Aboriginal and Torres Strait Islander people continue to face when participating in research:

> When Aboriginal and Torres Strait Islander people participate in research projects and share their knowledge with researchers, then their ideas, cultural information, words, language and stories are written down or recorded. In these situations Aboriginal and Torres Strait Islander people should make sure their rights in their intellectual property are protected [22].

Unfortunately, intellectual property law only protects products or tangible outcomes that people produce, such as paintings and sculptures. Stories and other cultural knowledge are not protected until they are written down. Therefore, it is important to think about what type of intangible objects will be shared with researchers as the study progresses and to clearly define who will own and be entitled to determine how they will be used after they are turned into tangible products in the form of reports, papers and books.

3.2.4 Ensuring the Application of Values and Ethical Responsibility

At a minimum, two types of documents need to be developed before the study begins. The first is the "Study Plan," sometimes referred to as a "research protocol". This should define in practical terms how the values applicable to your study will be addressed throughout the study. In addition, the Study Plan will also outline:

- who will undertake the research, including any health centre staff and/or community members;
- who will participate in the research; and
- how the research will be conducted.

An Ethics Application is also required when undertaking any research involving human participants. Applying for ethics approval forces researchers to think about the ethical obligations involved in doing the research to ensure that the outcome is ethically sound. In particular, many of the Aboriginal and Torres Strait Islander Research Human Research Ethics Committees will want the researcher to have considered the values raised in section 3.1. Depending on where and with whom the research is conducted, approval may be required from a number of ethics committees, many of whom will have their own ethics application. All ethics approvals will need to be received in writing prior to commencing the study.

You may not wish to be involved with writing either the Study Plan or the Ethics Applications. However, you should be given the opportunity to review all of these documents in order to ensure that they incorporate the values and meet the ethical standards that your organisation requires. We recommend that your right of review is specifically articulated within the Discussion Document and the Memorandum of Understanding.

3.2.5 Ensuring Quality Research Outcomes
An established system which ensures that appropriate processes and procedures are in place to manage the research process is essential. **Good Clinical Practice** (GCP) is one of the many internationally recognised quality guidelines for researchers. Implementing and then complying with the GCP guidelines ensures that the rights, safety, and well-being of participants are protected and that the findings of research are both reliable and credible.

While GCP standards are primarily written for large randomised control trials and cohort studies, the Wardliparingga Aboriginal Research Unit has adapted them for use in small quantitative and qualitative studies involving Aboriginal and Torres Strait Islander peoples. In addition to providing standards of research practice, this document also includes practical advice on how to ensure that many of the values mentioned above (section 3.1) are adhered to. Again, we recommend that the Memorandum of Understanding include information on the types of processes and procedures that the researchers will apply to ensure that the rights, safety and well-being of participants are protected and that the findings are reliable, credible and transparent.

3.3 Key Messages from Chapter Three

1) There are a number of different organisations that you can collaborate with to undertake research. Choosing the right one is important.

2) The needs of the participants and the healthcare service must be considered first and foremost prior to, during, and after completion of the research.

3) Although not required by all organisations, we believe that approval from all appropriate Aboriginal and Torres Strait Islander human research ethics committees is an essential pre-requisite to any research project.

4) Developing an MOU followed by a formal agreement with the organisation with which you are collaborating should be established and clearly state:

   a. Roles and responsibilities of each party, including who is responsible for the provision of the resources required.

   b. Capacity-strengthening opportunities for community members and healthcare providers who are involved in the research.

   c. Ownership of any pre-existing as well as any newly-developed intellectual property.

   d. Details of how the research will be conducted and how the quality of the research will be ensured.

3.4 Resources Relating to Chapter Three

3.4.1 Australian Human Research Ethics Committees
A list of all human research ethics committees that are registered with the National Human Research Council can be found at:
http://www.nhmrc.gov.au/health-ethics/human-research-ethics-committees-hrecs/list-human-research-ethics-committees#nt

3.4.2 Ethical Values and Standards
National Statement on Ethical Conduct in Human Research 2007 - Updated May 2013:
http://www.nhmrc.gov.au/guidelines/publications/e72

Values and Ethics - Guidelines for Ethical Conduct in Aboriginal and Torres Strait Islander Health Research:
http://www.nhmrc.gov.au/guidelines/publications/e52

Guidelines for Ethical Research in Australian Indigenous Studies:
http://aiatsis.gov.au/sites/default/files/docs/research-and-guides/ethics/gerais.pdf

Keeping research on track: a guide for Aboriginal and Torres Strait Islander peoples about health research ethics:
http://www.nhmrc.gov.au/guidelines/publications/e65

An interview with Alwin Chong and Diane Walker on Researching Indigenous Health in The Wire, 18 July 2011:
http://www.lowitja.org.au/resources-researchers#sthash.o4OyIGrY.dpuf

3.4.3 Intellectual Property
Desert Knowledge Cooperative Research Centre Aboriginal Knowledge and Intellectual Property Protocol Community Guide:
http://www.griffith.edu.au/__data/assets/pdf_file/0007/282850/DKCRC-Aboriginal-Knowledge-and-IP-Protocol-Community-Guide.pdf

3.4.4 Engaging Community in Research
A toolkit for engaging Aboriginal and Torres Strait Islander peoples, including a listing of various national cultural events, media types, and issues that must be considered during consultation:
https://www.humanrights.gov.au/publications/reconciliation-action-plan-2012-book

3.4.5 Capacity Strengthening
A short video on the exchange of knowledge within the research process:
http://www.lowitja.org.au/knowledge-exchange

Links to short case studies about researchers and non-researchers working together:
http://www.lowitja.org.au/case-stories-researchers

Chapter Four – Ensuring that Research Informs Policy and Practice

Ensuring that research is used to inform policy and practice improvements, a process referred to more generally as "knowledge translation" is the most important outcome and should be considered as soon as the aim of the research is identified. If you have decided to commission a new study, the best time to think about how you will utilise the new knowledge is when you are developing the protocol. Even if you plan to apply the knowledge you find from a review of the literature, you should still consider the best way to utilise this knowledge. Chapter Four will provide you with some tips about how to do this.

4.1 Research, Policy and Practice
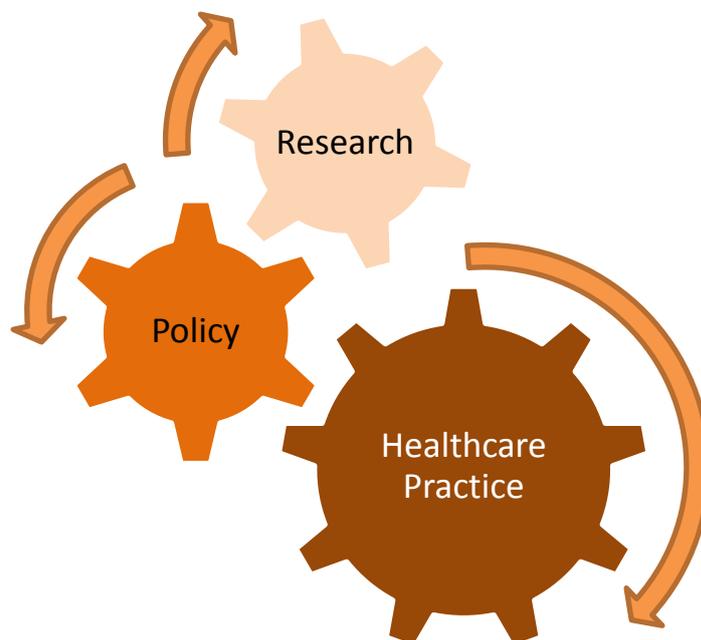
Figure 4.1: Research, Policy and Practice

The diagram in figure 4.1 exemplifies several important lessons for researchers, policy makers and practitioners alike.

- Healthcare practice must be the primary focus.
- Healthcare practice can and should drive research and policy, as much as research and policy can and should drive practice change.
- Small changes to research have the potential to result in big changes to health practice, both positive and negative.

Importantly, all research evidence is context specific [23]. Therefore, if you are relying on research conducted in another context, judgements about the applicability of the findings to your specific primary health care service will need to be made. In particular, factors such

as the beliefs and values of the community, the abilities and skills of your staff, and the resources and systems available within the health service must be considered.

4.2 Supporting Sustainable Changes

Ensuring that research informs improvements to both policy and healthcare practice is one of the most important challenges for public health this century [24]. In the past, researchers have tended to rely on presentations and peer-reviewed publications to distribute research findings. The consequence of these passive translation methods was that research findings either didn't make a difference or, alternatively, took so long to inform healthcare policy or practice that that they were no longer relevant. **This is no longer acceptable.** There is now a greater focus on proactive ways of transferring research findings [25, 26].

Often referred to as "knowledge translation," this process is described as follows [26, pp 2-3]:

- includes all steps between the creation of new knowledge and its application;
- needs multidirectional communications;
- is an interactive process;
- requires ongoing collaborations among relevant parties;
- includes multiple activities;
- is a nonlinear process;
- emphasizes the use of research-generated knowledge (that may be used in conjunction with other types of knowledge);
- involves diverse knowledge-user groups;
- is user- and context-specific;
- is impact-orientated; and
- is an interdisciplinary process.

When thinking about proactive knowledge translation, the following four areas need to be considered:

1. policy and decision makers
2. healthcare providers
3. healthcare systems
4. communities

4.2.1 Translating Research into Policy

Not every research finding will require a change at the Commonwealth or state-government level. When they do, however, there is an art to providing the right message in the right way so that policy makers can utilise the evidence when required. Policy briefs are currently thought to be the best avenues for communicating with policy makers, people who are usually time-poor and tend not to read long documents. Policy briefs, therefore, must be clear and concise, containing the following essential elements:

- A brief title
- A short executive summary
- A statement of the problem

- Essential background information or context
- A note of any pre-existing policies
- Policy recommendations
- An argument for why the recommendations should be considered

Policy briefs can, however, be supported by a range of other material tailored to 1) policy advisors who may have more time to consider and advocate for the recommendations, and 2) administrators, who may be asked to consider implementing the recommendations at a later stage. The 1/3/25 approach is a widely accepted suite of documents which, together, provide information to all of these diverse audiences [27].

Document Length	Audience	Purpose
One Pager	Time-poor policy and decision makers	An overview of the problem, context and recommendations
Three Pager	Policy advisors who are interested in more detail	A more detailed executive summary with brief details about resources required for implementation
Twenty-Five Pager	Administrators	A scientific paper or synthesis of the findings, including discussion pertaining to implementation of recommendations

4.2.2 Capacity-Strengthening as a Knowledge Translation Exercise

Strengthening the capacity of individuals is an important first step in translating research findings into practice. Depending on the changes that are required, informal, rather than formal, professional development sessions may be sufficient. In order to implement any changes you will need to consider these factors:

- What do staff already know?
- What additional information do they require?
- What new skills may be needed?
- How can we effectively and appropriately communicate the information needed and provide the skills required?

Another way of supporting the translation of research findings into health practice is to involve the staff in the knowledge translation process. This should be an interactive process whereby the staff are involved in order that they help develop, own, and are responsible for the changes that need to be made [24]. Involving staff in the knowledge translation process has the added benefit of ensuring that contextual factors specific to the primary health care service are considered before changes are made. Together, the health service team could:

- consider what changes are required;
- identify how these changes could be made;
- develop plans for resourcing the changes; and
- assist with embedding the changes into existing plans, processes and procedures.

4.2.3 Engaging Communities

What is sometimes overlooked is that changes to healthcare services usually also affect the community. Consequently, it is necessary to ensure that community members are consulted before changes to their primary healthcare service are made. Involving community members in the knowledge translation process has the added benefit of ensuring that contextual factors specific to the community are considered. Informing and seeking feedback from communities can be achieved by:

- engaging with community elders;
- organising a community forum; and/or
- talking to patients the next time they access the health service.

Consulting with community members prior to, as well as throughout, the research process will assist with these conversations. Undertaking research in collaboration with community members will ensure that translating research findings into practice is a lot easier.

4.2.4 Sustainable System Change

So far, we have discussed ways in which healthcare organisations, their staff and community members can be informed about, as well as contribute to, knowledge translation. However, in order to ensure sustainability, it will be necessary to institutionalise any changes.

Institutionalising the change involves three stages [28]:

Stage One: Staff and community members are consulted; additional resources, including staff training needs, are identified; and healthcare service structures, processes and procedures are changed.

Stage Two: Changes are routinely reinforced through both formal and informal processes in order to ensure that they become a habit. Leaders are key to the success of this stage.

Stage Three: The new ways of thinking or acting become routine. Any changes are seen as an integral part of the way in which individuals think and act.

4.3 Monitoring and Evaluating the Outcomes

Monitoring and evaluating is one way of further embedding change, while at the same time providing valuable information about what is really happening. Therefore, rather than leaving the evaluation to the end, monitoring and evaluation plans should be considered even before any changes are implemented [23]. This will ensure that you are proactively (rather than retrospectively) collecting the data you need.

4.3.1 Is There a Difference between Monitoring and Evaluating?

Monitoring activities track the key elements on a regular and often ongoing basis. For example, in a healthcare service, the number of patients being treated is usually monitored. Likewise, the number of new cases of chickenpox may be monitored if healthcare providers are worried about new outbreaks of the disease.

Key Indicators or targets that you wish to monitor need to be **SMART** [29, p.1]:

- **Specific** (to the ultimate health goal to be pursued);
- **Measurable** (able to be monitored with data that either exists or can be collected);
- **Accurate** (in order to know whether the target has been hit);
- **Realistic** (challenging but actually achievable); and
- **Time-bound** (time taken to achieve the target should be specified).

In comparison, **evaluation** occurs less consistently, usually intermittently at pre-defined points in time in order to assess processes, impacts or outputs. In practice, **monitoring and evaluation** work hand in hand to identify whether changes based on research findings are having, or are likely to have, desired outcomes.

4.3.2 What Should I Monitor and Evaluate When Implementing Research Findings?

While there are many different types, you may be particularly interested in evaluating the processes you use to make the changes, the immediate impacts these changes make, as well as some longer term outcomes (Figure 4.2).

Figure 4.2: The Evaluation Hierarchy
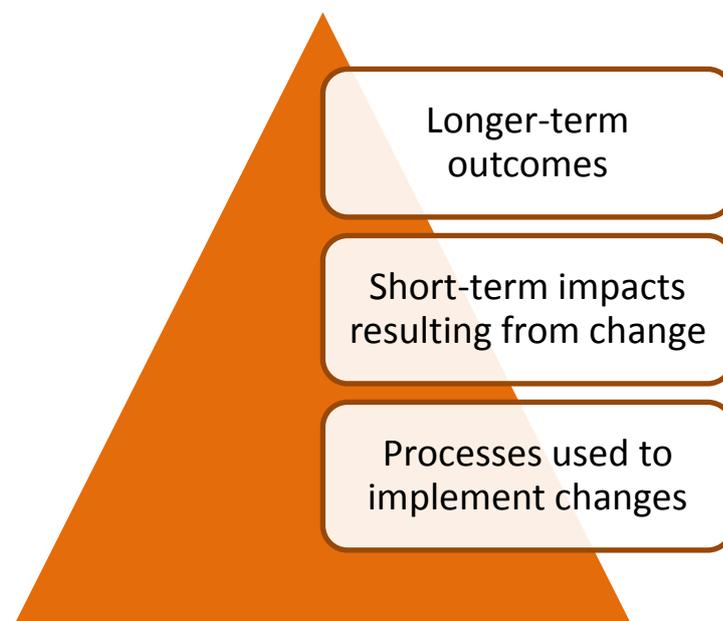
Process evaluations measure activities undertaken in order to bring about the change [30].

An Example of a Process Evaluation

School nutrition guidelines: overview of the implementation and evaluation.

OBJECTIVE: To holistically evaluate the extent of implementation of dietary guidelines in schools and present various monitoring systems.

DESIGN: The study is comprised of three methods: (i) a cross-sectional survey (process evaluation); (ii) an indicator-based evaluation (menu quality); and (iii) a 5 d weighed food record of school lunches (output evaluation).

SUBJECTS: A total of 234 food-service managers from 488 schools completed a self-administered questionnaire for process evaluation; 177 out of 194 randomly selected schools provided menus for menu quality evaluation; and 120 school lunches from 24 schools were measured and nutritionally analysed for output evaluation.

RESULTS: The survey of food-service managers revealed high levels of implementation at almost all process evaluation areas of the guidelines. An even more successful implementation of these guidelines was found in relation to organization and cultural issues, as compared with technical issues. Differences found in some process evaluation areas were related to location, size and socio-economic characteristics of schools. Evaluation of school menu quality demonstrated that score values followed a normal distribution. Higher (better) nutrition scores were found in bigger schools and corresponding municipalities with higher socio-economic status. School lunches did not meet minimum recommendations for energy, carbohydrates or dietary fibre intake, nor for six vitamins and three (macro, micro and trace) elements.

CONCLUSIONS: The implementation of the guidelines was achieved differently at distinct levels. The presented multilevel evaluation suggests that varying degrees of success in implementation might be attributed to different characteristics of individual schools. System changes might also be needed to support and improve the implementation of the guidelines [31].

This article is available at:
http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=9547909&fileId=S1368980014003310

Impact evaluations, on the other hand, are used to measure the immediate effect of the program in order to see if the shorter term program objectives are being met [30].

An Example of Impact Evaluation

Background: For health promotion to be effective in Aboriginal and Torres Strait Islander communities, interventions (and their evaluation) need to work within a complex social environment and be informed by respect for Indigenous knowledge, culture and social systems. At present, there is a lack of culturally appropriate evaluation methods that are capable of capturing this complexity available to practitioners. As an initial response to this problem, we used two non-invasive methods to evaluate a community-directed health promotion program that aimed to improve nutrition and physical activity for members of the Aboriginal community of the Goulburn-Murray region of northern Victoria, Australia. The study addressed two main questions: First, for members of an Aboriginal sporting club, what changes were made to the nutrition environment in which they meet and how was this related to national guidelines for minimising the risk of chronic disease? Second, to what degree was the overall health promotion program aligned with an ecological model of health promotion that addresses physical, social and policy environments, as well as individual knowledge and behaviour?

Methods: Rather than monitoring individual outcomes, evaluation methods reported on here assessed change in the nutrition environment (sports club food supply) as a facilitator of dietary change and the "ecological" nature of the overall program (that is, its complexity with respect to the number of targets, settings and strategies).

Results: There were favourable changes towards the provision of a food supply consistent with Australian guidelines at the sports club. The ecological analysis indicated that the design and implementation of the program were consistent with an ecological model of health promotion.

Conclusions: The evaluation was useful for assessing the impact of the program on the nutrition environment and for understanding the ecological nature of program activities [32].
This article is available free of charge at http://www.biomedcentral.com/1471-2458/11/749

Outcome evaluations measure the longer term effects [30].

An Example of a Study Which Involved All Three Evaluation Types

Evaluation of a New Zealand indigenous community injury prevention project.

Objective : To evaluate the Turanganui-a-kiwa Community Injury Prevention Project, based in a provincial town on the North Island of New Zealand with an extensive indigenous population (Maori).

Method : The evaluation design was quasi-experimental and included process, impact and outcome measures.

Results : Process evaluation findings indicated that adopting an holistic lifespan approach to injury prevention was successful in this Maori community. The three main areas of activities were: child road safety; safer alcohol use in the road, sporting and home environments for young people and adults; and fire safety for older people. Significant increases in awareness of injury prevention initiatives were found among Turanganui-a-kiwa whanau (families) (p < 0.001). A large increase in the take-up of car restraints among Maori young children was demonstrated (pre 10%, post 74%). The safe alcohol dual message approach also resulted in significant increases in the number of respondents wearing protective equipment for sports (p < 0.05).The result of the fire safety initiative was that 120 kaumatua homes now have correctly installed smoke alarms and there is now a commitment from the Fire Service to maintain these alarms. Outcome evaluation findings showed that there was a significant decrease in hospitalization injury rates across the lifespan in Turanganui-a-kiwa (p < 0.05).

Conclusion: Despite the challenges associated with conducting community injury prevention projects, the conduct of this evaluation provides previously unknown information on an indigenous (Maori) injury prevention programme. The success of the programme appears to be due to the fact that the project was perceived as an intervention for Maori operating within a Maori framework which addressed Maori aspirations. Implications : As so little is known about injury prevention initiatives in indigenous populations, the findings presented in this article will provide important information for the future development of other work [33].

4.3.3   How Can I Incorporate the Views of People Outside of My Organisation?

In addition to internally focused monitoring and evaluation, horizontal evaluation can be used to simultaneously gather views from a range of people that may be impacted by or involved in the change [34]. Horizontal evaluation also has the additional benefits of providing enhanced information and learning opportunities for all participants, and an opportunity to garner the broader views of both internal and external stakeholders at the same time. Originally developed for use in agricultural research, horizontal evaluation brings stakeholders such as health providers and community members together in order to identify what they perceive to be both the benefits and problems associated with the change.

An Example of an Evaluation Capturing the Views of Multiple Stakeholders

Training in three Indigenous health care settings in north Queensland

Abstract

Objective: To evaluate the pilot phase of a tobacco brief intervention program in three Indigenous health care settings in rural and remote north Queensland.

Methods: A combination of in-depth interviews with health staff and managers and focus groups with health staff and consumers.

Results: The tobacco brief intervention initiative resulted in changes in clinical practice among health care workers in all three sites. Although health workers had reported routinely raising the issue of smoking in a variety of settings prior to the intervention, the training provided them with an additional opportunity to become more aware of new approaches to smoking cessation. Indigenous health workers, in particular, reported that their own attempts to give up smoking following the training had given them confidence and empathy in offering smoking-cessation advice. However, the study found no evidence that anybody had actually given up smoking at six months following the intervention. Integration of brief intervention into routine clinical practice was constrained by organisational, interpersonal, and other factors in the broader socio-environmental context.

Conclusions/implications: While modest health gains may be possible through brief intervention, the potential effectiveness in Indigenous settings will be limited in the absence of broader strategies aimed at tackling community-identified health priorities such as alcohol misuse, violence, employment and education. Tobacco and other forms of lifestyle brief intervention need to be part of multi-level health strategies. Training in tobacco brief intervention should address both the Indigenous context and the needs of Indigenous health care workers [35].

The abstract of this is available free of charge by going to:
http://onlinelibrary.wiley.com/doi/10.1111/j.1467-842X.2002.tb00342.x/abstract

4.4 Key Messages from Chapter Four

1) The best time to think about how research findings will improve service delivery and/or health outcomes is when you are planning the research.
2) Not all research findings will require a change in policy for implementation. However, when necessary, it is important to provide the right message in the right way so that policy makers understand the implications.
3) Strengthening the capacity of healthcare providers is often an important first step in translating research findings into practice.
4) Involving community members in the knowledge translation process has the added benefit of ensuring that contextual factors are considered before changes are made.
5) In order to bring about sustained change, it will also be necessary to institutionalise the change by:
   a. Ensuring there are resources in place to support the required changes in the short and long term.
   b. Changing policies, procedures and/or processes to reflect the new way of doing things.
6) Monitoring and evaluating change as it happens not only provides information about its effectiveness and an opportunity to implement any improvements, but also further embeds the changes throughout the health service.

4.5 Resources Relating to Chapter Four:

Glossary of key terms relating to research utilisation:
http://www.k4health.org/sites/default/files/RU_Glossary_2011.pdf

4.5.1 Models of Knowledge Translation

The Canadian Institute of Health Research has written an extensive guide in order to lead people through a process of translating research findings into practice:
http://www.cihr-irsc.gc.ca/e/documents/kt_lm_ktplan-en.pdf

The World Health Organization provides an overview of the Knowledge-to-Action Process Framework [36] which involves knowledge inquiry, knowledge synthesis and the development of knowledge tool/products:
http://www.who.int/reproductivehealth/topics/best_practices/greatproject_KTAframework/en/

The Promoting Action on Research Implementation in Health Services (PARIHS) model describes the implementation of research in practice as a function of the interplay between the evidence to be used, the context in which it is to be placed and the method for implementation:
 http://qualitysafety.bmj.com/content/7/3/149.full.pdf+html

4.5.2 Preparing Policy Briefs

These guides are intended for those people responsible for preparing and supporting the use of policy briefs to ensure that decisions about health systems are well-informed by research evidence:
http://global.evipnet.org/SURE-Guides/

Interesting fact sheet from PHCRIS:
http://www.phcris.org.au/phplib/filedownload.php?file=/elib/lib/downloaded_files/publications/pdfs/phcris_pub_362.pdf

4.5.3 Applying Evidence in Your Health Service

A step-by-step guide to utilising the evidence: http://www.cihr-irsc.gc.ca/e/documents/kt_in_health_care_chapter_3.1_e.pdf

Knowledge Management Toolkit, including resources that help you develop and implement a knowledge management strategy within a health organisation:

http://www.k4health.org/toolkits/km

4.5.4 Evaluation

The Planning and Evaluation Wizard (PEW) is designed to allow you simple access to planning and evaluation tools that are relevant to your project stage:
http://www.flinders.edu.au/medicine/sites/sachru/tools/

A figure depicting Conner's conceptual model for research utilization evaluation [37]:
http://www.ktdrr.org/ktlibrary/articles_pubs/ktmodels/#fig6

An evaluation framework that has already proven successful was developed by the Aboriginal Allied Health Assistant Project. This framework, together with other useful links and tips, can be found at:

http://www.wacountry.health.wa.gov.au/fileadmin/sections/allied_health/WACHS_P_AAHAProjectEvalFramework.pdf

The Evaluation Toolbox provides a range of tools and resources specific to sustainable community engagement:

http://evaluationtoolbox.net.au/index.php?option=com_content&view=article&id=11&Itemid=17

Glossary of Key Terms

- **Citations** –references to published scientific literature
- **Data** – information collected by the study in order to answer a research question or test a hypothesis
- **Evaluation** – a structured process for assessing and reflecting on how successful an intervention, a project and/or a program has been in meeting its aims and goals at a particular point in time [38, 39]
- **Guidelines** – a course of action or a way of practicing which are not in any way mandatory or legally enforceable
- **Grey Literature** – scientific literature which has not been peer-reviewed, often provided in the form of a report or a webpage
- **Intellectual Property** –original ideas, thoughts and/or inventions which have been recorded in writing (reports or books, etc.), in pictures or sound, and/or through the creation of something new and distinct
- **Knowledge** – understandings, facts, information, descriptions and skills that individuals (and communities) have acquired through experience, interactions and/or education [40]
- **Knowledge Translation** - the synthesis, exchange, and application of knowledge [41]
- **Memorandum of Agreement** – an intent or general understanding between two or more parties that is in no way legally binding
- **Methods** - the strategic plan of action, process or design used to answer a research question or test a hypothesis [42]
- **Monitoring** – the regular collection of information in order to systematically and routinely assess the success of an intervention, a project and/or a program in the progression towards meeting their aims and goals [39]
- **Peer-Reviewed Literature** – scientific literature which has been reviewed or evaluated by one or more people with similar skills, knowledge and experience
- **Policy** – a statement of intent or a principle adopted by government, organisations, and individuals that guides decisions and directs outcomes [43]
- **Qualitative Research** –the study of phenomena in their natural setting that aims to make sense of, or understand, the meanings that people bring to them [42]
- **Quantitative Research** –the study of numeric data for the purpose of describing or assessing the prevalence of a particular condition or the magnitude of relationships between phenomena
- **Research Question** – the specific areas or topics to be studied, posed as a question [42]
- **Research Hypothesis** – the specific areas or topics to be studied, posed as an assumption or a formal statement which is tested by the study [44]
- **Sample** - a selected number of individual cases, records, or research participants, drawn from a larger population to answer a research question or test a hypothesis [45]
- **Scientific Literature** – publications, including journal articles, reports, books, and theses which contain and discuss information about research methodology and/or findings

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