PART

I

Limbering Up

CHAPTER

1

Turning Your General Aim Into a Specific Question

THE BEGINNING

Most people have a pretty good idea of the general area in which they want to research. A useful starting point is to ask yourself, 'What interests me about my own area and why?' You should keep this thought in mind as you plan your research – otherwise there is a real risk of getting drawn into doing something because it is feasible, or because somebody else wants you to, rather than because it answers your own questions.

WHAT ARE YOUR AIMS?

The next task is to start framing a *question* – to begin with in quite general terms. For example, suppose you are interested in the observation that not everybody goes to a doctor as soon as they have symptoms suggesting cancer. Your question might be: why is that? What are the personal, social and clinical factors that influence time to presentation of cancer? Or you might ask: does it matter? Do people who present quickly with symptoms do better than people who present late? And if so, why? Or you might decide you know enough about the answers to these questions, and you want to do something to reduce late presentations with cancer. So your question is: what could we do to reduce the time it takes for people to present symptoms to a doctor?

These general questions can be restated as the AIM or AIMS of a project. Aims are typically expressed as statements, such as this:

> *To determine whether a public education campaign reduces rates of late presentation with symptoms of bowel cancer.*

Typically a study should have only *one* main or primary aim. It may have a couple of subsidiary or secondary aims. A good rule is that the smaller your study the fewer aims you should have. Most studies that have more than three or four aims do not achieve any of them.

WHAT IS YOUR QUESTION?

Once you have decided on your main aim, you need to frame one or more specific questions related to it. We will give an example a little later, but first a word about hypotheses.

Getting Started in Health Research, First Edition. David Bowers, Allan House and David Owens.

Hypothesis is a Greek word that refers to a scientific proposition. For example, a hypothesis might be a theory put forward to explain a number of experimental observations. For our current purposes, we can think of it as a proposition about the likely findings of a piece of research. For example, we might hypothesize 'People who present late with symptoms suggestive of bowel cancer are less likely to have a relative who has had bowel cancer than are people who present early with symptoms.'

There used to be a vogue for expressing all hypotheses in the negative, the so-called 'null hypothesis', even when it was pretty obviously not what the investigator thought. Thus, 'People who present late with symptoms of cancer do no worse than people who present early.'

The reason for this convention is that certain statistical tests are designed to prove something *isn't* the case – typically that two groups of people or measurements have not come from the same population (for more on this you could do worse than look at Chapter 21 in *Understanding Clinical Papers* by we three authors (Bowers, House and Owens, 2006)). However, the null hypothesis convention does not make for easy reading and can lead to some pretty absurd-sounding propositions.

Not all hypotheses are tested by the use of statistics that refute a null hypothesis, and not all research questions are hypotheses. So the simplest way to proceed is always to think of your research as being designed to answer a simple and unambiguous question.

Sometimes researchers talk about aims and objectives rather than aims and hypotheses. This makes sense when what you are doing is just as well put as a statement. Here are some examples of research objectives:

- *To determine the prevalence of obesity among children entering secondary education at the age of 11 years.*
- *To determine the accuracy of prostate specific antigen (PSA) as a test for cancer among men seen in primary care, as part of a population-based screening programme.*

In the next section we want to introduce you to Dinesh and Anna, two (fictitious) characters, who are also about to start doing some research for the first time. We will use their research stories to illustrate, step by step, the tasks and challenges – and their solutions – which are commonly encountered by inexperienced (indeed by all) researchers.

GETTING THE QUESTION CLEAR

This is a two-stage process. Step 1 involves linking your aim to a *starter question*. Then Step 2 involves clarifying the meaning of every term in your starter question. As an example we can see how Dinesh and Anna got started with their research questions. We'll start with Dinesh.

Dinesh

Dinesh works as a nurse in the emergency department of a big inner-city hospital. He notices a problem with people who come to the department after they have harmed themselves, for example by cutting their arms or taking an overdose. Communication between these people and staff may be tense or difficult, and it is clear that both sides find the encounter unsatisfactory. One day he is talking to a friend who works in a health centre for asylum seekers where there is an advocacy service and the friend tells him how helpful it is.

Dinesh decides to plan a project. His *aim* is to establish the benefits of an advocacy service in his department. He decides his research question is as shown in Figure 1.1.

Does providing an advocacy service lead to better outcomes for people who attend an emergency department after an act of self-harm?

FIGURE 1.1 Dinesh's first version of his 'starter' research question.

This seems a good start, but then he discusses his idea with another friend who is training to be an eye surgeon. This friend has no idea either what an advocacy service consists of or what constitutes good outcomes after an episode of self-harm. During their talk Dinesh scribbles some notes on his question (Figure 1.2).

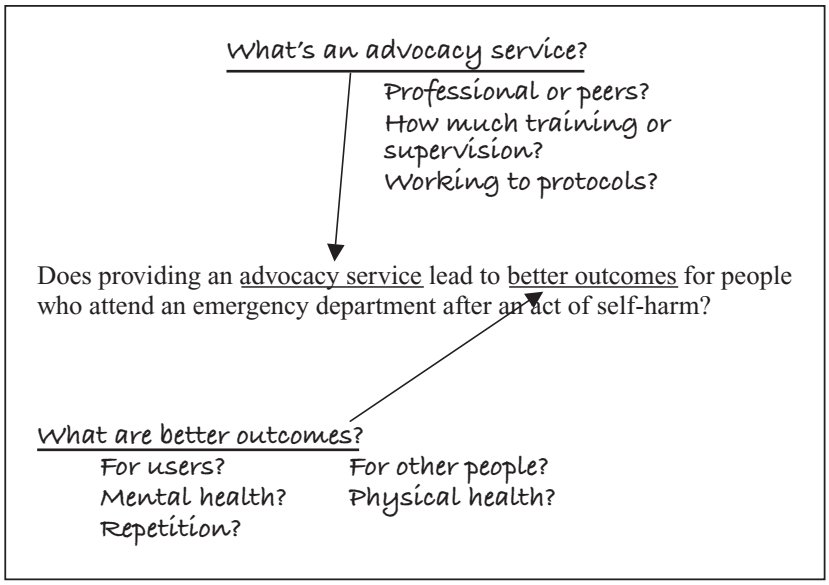

FIGURE 1.2 Dinesh realises that he needs to define some of the terms in his starter question – his proposed intervention and his desired outcome.

Next he goes to talk to his head of department, who asks some more questions. Who exactly might be offered this advocacy service? And at what stage in their journey through the department? So Dinesh does some more scribbling (Figure 1.3).

Dinesh's next step is a coffee with one of the more friendly psychiatrists who visits his department. The psychiatrist tells him that in his experience self-harm is quite diverse, so that Dinesh will need to decide what counts as an act of self-harm. And he also points out that delivering treatments can be a bit hit and miss, so that Dinesh needs to decide how much advocacy is enough to give it a fair trial. This is a bit like deciding what is a fair trial of physiotherapy after stroke. Dinesh has another go (Figure 1.4).

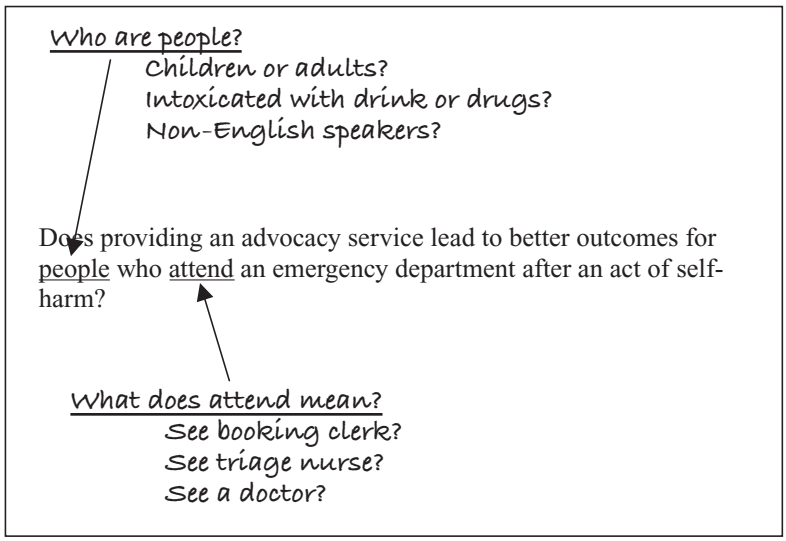

FIGURE 1.3 Dinesh defines who the participants in his research will be.

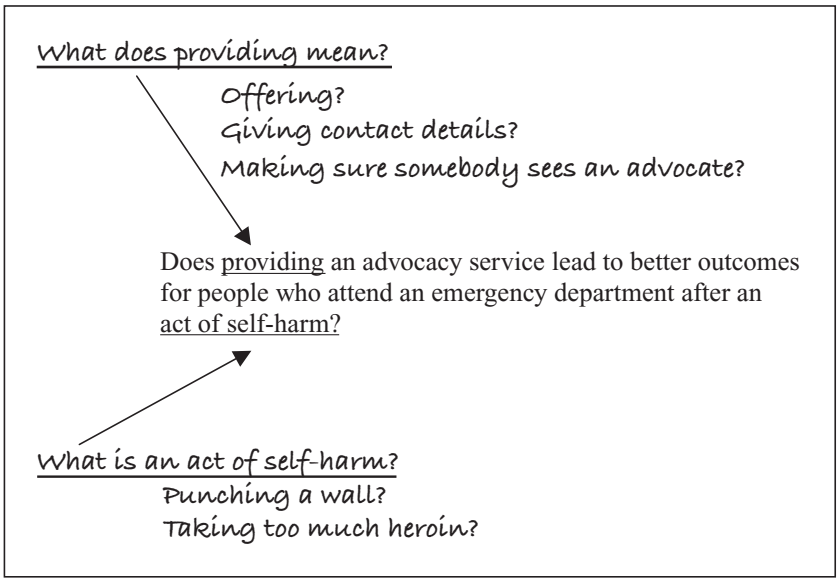

FIGURE 1.4 Dinesh looks at two terms in his question and tries to clarify what they mean.

Now Dinesh is in a position to state his question much more clearly and specifically – exactly what he means by advocacy, who it's for, how it's going to be delivered, and what outcomes he is interested in. This basic starter question may not change much, but Dinesh will spell out its meaning as he subsequently describes the methods of his study (see Chapter 6 onwards).

Anna

Anna is a general practitioner. She has a particular concern about the low take up of the MMR vaccine in her practice. In this she includes not only parents who won't bring their children at all, but also those who ask to have the components as individual jabs. She would like to find some way of improving the MMR take-up rate. She has tried writing to parents who have not brought their child for the jab, and has put posters up in the waiting area, and in all of the consulting rooms. She has also discussed the issue with those parents asking for separate jabs. But there has been no discernible increase in the MMR take-up rate. She realises that she needs to investigate further, and decides to carry out a research project. Anna's starter research question is shown in Figure 1.5.

> What would persuade reluctant parents to change their minds and bring their child to have the MMR jab?

FIGURE 1.5 Anna's first version of her 'starter' research question.

Anna thinks that she could use the patients in her own group practice to answer this question.

After discussing her project with colleagues in the practice and with a friend who works in public health, Anna realises that she does not know enough about why parents are reluctant – beyond being aware of a recent unfortunate scare campaign in the national press. She therefore modifies her question as shown in Figure 1.6.

> Why are parents reluctant to bring their children for MMR vaccination when advised by their GP that it's for the best?

FIGURE 1.6 Anna modifies her research question.

Anna decides she needs to think about this question further and she starts by thinking about the people involved (Figure 1.7).

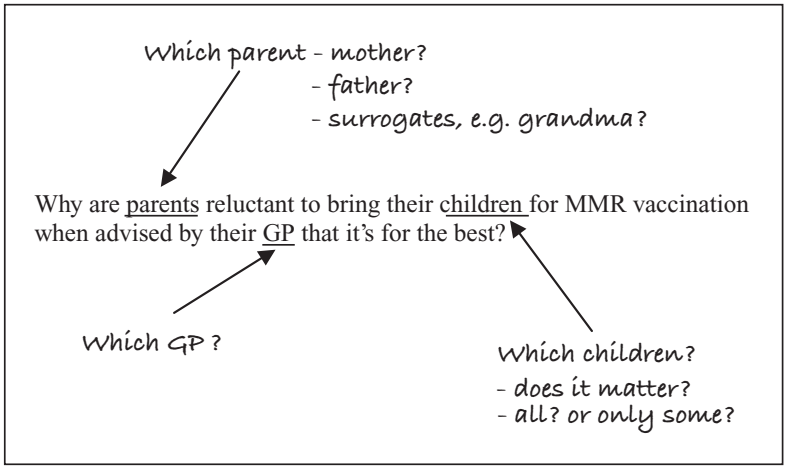

FIGURE 1.7 Anna notes that she needs to define some of the terms in her research question – exactly which people will be involved in her research?

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Anna soon realises, however, that there are other components of her question that she needs to pick apart. She has another try (see Figure 1.8).

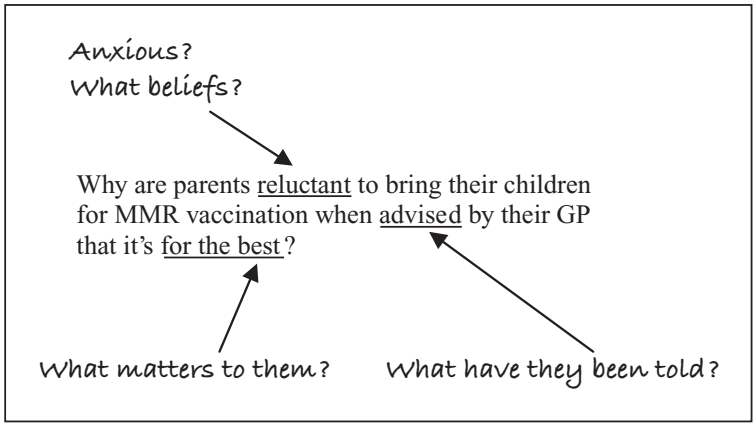

FIGURE 1.8 Anna also needs to define what she wants to learn from her study.

Anna now feels ready to state her question more clearly and to start thinking – about whom to interview and what questions to ask.

This approach to question setting will be familiar to anybody who has ever sat an essay exam because it is exactly the same as the approach to question answering. It helps you make sure you have not forgotten anything and it's an extremely useful way of helping with planning the next stage – in our case, deciding on a design, subjects, measures, and so on. We will return to Dinesh and Anna in later chapters.

FINAL CHECKS

If you have followed this approach for your own project, you should by now have three statements:

- an outline of a general area of interest, with a statement about *why* it is interesting;
- a statement of the general aim or aims (caution!) of your research project;
- an unambiguous and specific research question.

The commonest mistakes people make at this stage are:

- making vague restatements of the area of interest – with the question couched in such terms as 'exploring issues' or 'identifying associations';
- posing multiple questions – either explicitly as a long list, or in a more covert way by posing a small number of compound or composite questions;
- using unclear terminology.

If you are confident that you have not made these mistakes – you are ready to move on. However, before you expend any more time and effort fruitlessly, you need to see if any other researcher has already tackled your proposed area of research. You can begin with a quick look at what's already been done – the subject of the next chapter.