

Original Research Paper

The role of sentinel networks in general practice research in New Zealand and internationally

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INTRODUCTION

The term "research network" has been coined to describe research involving more than one practice, and often more than one project. Over the last few decades the phenomenon of sentinel networks has developed to accommodate the need to integrate rigour in research with research methods that respect the nature of general practice.

The Dutch Sentinel Practice Network and the network formed by the Royal College of General Practitioners in the UK, both founded in the 1950s, are generally regarded as the earliest examples of groups of GPs formally collaborating to collect data for research in an ongoing manner. In the last two decades the number of such networks throughout the world has multiplied, with the recognition of general practice as a distinct academic discipline needing its own research base. Green et al. (1993) now estimate that there are at least 30 general practice sentinel networks in existence.

What are sentinel networks?

Each country has approached the development of sentinel practice research networks in different ways, and New Zealand is no exception. However, there are some common principles which all have adopted.

1 Sentinel networks reflect their local environments

Sentinel networks work within the constraints of their local environments and capitalise on their strengths. In New Zealand we have a problem with geography. We have a widely dispersed population, so getting groups of GPs to meet in order to collaborate in research is problematic.

We have an advantage over many other countries, however, in that we have a relatively computer literate general practice workforce. We also have no legal requirements to maintain paper patient records in addition to those on the computer. This means that, if computers are used to store general practice records at all, they are more often used comprehensively than in other countries.

In 1989 the RNZCGP Computer Research Network was conceived as a tool for general practice research in New Zealand. Early participation in the network was limited by the requirement that practice computers should (i) hold all consultation records and (ii) be used to generate prescriptions and investigation request forms. This is now no longer the case, although participation in each project is naturally limited to network participants who regularly record the relevant data.

2 Sentinel practice networks share a common philosophy

All general practice sentinel networks start from a philosophical base that celebrates diversity (general practice). All therefore have to deal with the tensions between scientific rigour, and protecting a picture of general practices' diversity in their research.

In New Zealand, we specifically aimed to develop a practical, ethical, long term means of undertaking research in general practice by adjusting research methods to the everyday practices of general practice teams, rather than asking doctors and nurses to change the way they recorded care to accommodate research requirements. This meant that we constrained ourselves to working with the medical records general practices maintain for their own (mainly clinical) uses.

This was not an easy decision. As researchers, we would have liked to have more control over our data. We were particularly tempted to ease our research tasks by requiring participating general practices to use classification and coding systems, as others have done.

This has caused problems for others, however. The RNZCGP Computer Network started before classification systems were routinely included in New Zealand medical software packages so, although we are not opposed to their use, neither are we reliant upon them. Clinical notes made by practice staff were and still are the main source of research data for studies investigating clinical conditions. In 1995, Read codes were introduced. However codes are currently only used to support the free text from the clinical notes.

It is worth noting that even though Read codes are widely available in New Zealand, they appear to be used too infrequently to support research.

3 Sentinel practice networks have to demonstrate their scientific rigour

Sentinel practice networks are an obvious showpiece of general practice research and as such they are subject to intensive scrutiny by other researchers. In New Zealand, we faced criticism for the fact that participants in the network were not randomly selected. This fact was often interpreted as a fatal flaw – one that negated the value of all network research. As in every other general practice sentinel network in the world, GPs who contribute to the New Zealand network are a self-selected group.

An earlier network in New Zealand had attempted to accommodate this concern of epidemiologists by enrolling a random selection of GPs. It foundered.

Others have suggested that the critical personal characteristics that make involvement in research successful are not to be found in any random selection. This may be one of the reasons for the inability of that network to continue (although other reasons, such as inadequate funding, may also have played a part). Our collaboration is with self-selected doctors who are enthusiastic to contribute to general practice research and committed to accurately recording information about patients on their computers.

We could not afford to neglect this concern though. We had to find a way to demonstrate the generaliseability of the results of our network's research so that we could access funding. The central concern relates to biases in selected data collections. We tried to identify and understand the direction of these biases in a study where we compared data from a group of randomly selected doctors. We found no significant differences in the data collected from the two groups.

The study confirmed what we suspected, but provided strong enough evidence to reassure funding bodies that the network was a valuable research tool for the type of research it is used for. We have seen no other reports of sentinel practice networks having to justify their existence in the way we have had to in New Zealand. The "bias" study was an expensive exercise that logically would have to be repeated at regular, frequent intervals to continue to provide reassurance. Fortunately, research from the network has sufficient credibility and face validity to make this process unnecessary.

4 Sentinel practice networks have to be concerned with ethical issues

All research should be guided by ethical principles and sentinel practice research is no exception. The rules change slightly from country to country, but the overall concepts are the same.

Addressing the ethical principles governing the processes for research by our network has been a major and ongoing challenge. Before the RNZCGP network started, we asked for ethics committee review and comment on the concept. Each subsequent research proposal has had ethical review and been approved before data gathering or analysis has started.

"Informed consent" is a critical issue. The RNZCGP Computer Research Network accesses the records of over half a million people. The prospect of gaining written informed consent from all patients whose records were or might be used was daunting.

In 1989, and on several subsequent occasions, the ethics committee ruled that network research could proceed if data were anonymous. So the National Health Index number (NHI) is used, rather than names. This has made it possible to individualise records without identifying patients.

NHI codes are now in widespread general practice use in some parts of New Zealand although prior to our research in 1990 no person had such a code without having had a secondary care contact. Now, there is debate about the value of the NHI as a protector of patients' identities. Encrypted NHI codes will be used from 1999, to ensure that confidentiality continues to be given highest protection.

5 Sentinel practice networks consist of general practice staff and their patients

This may seem an obvious statement, but it is central to the concept of sentinel networks, and deserves consideration because all general practice staff and patients are different, and the populations of doctors, nurses, administrators, and other general practice staff and patients who comprise sentinel networks may also be "different". In New Zealand, network general practice staff are clearly "different" because they use computers comprehensively in their practices. However, there is no difference between network and other general practices either in the patients they see or in the care they provide.

6 Sentinel practice networks have a structure

Sentinel practice networks are a general practice research tool. All have some sort

of structure. This structure is usually explicit: most are supported by dedicated staff, and many are founded on a legal framework.

The RNZCGP Computer Research Network has a structure but little infrastructure. There are no managerial layers, no fees, and no network board of directors. Apart from their own practice organisation, there is no hierarchy among the 450 independent GPs and their staff, who comprise the network. Practices may nominate a network representative, or staff within a practice may elect to individually interact with the network.

7 Sentinel practice networks produce research outputs

The purpose of sentinel practice networks is, of course, to produce research outputs that will answer the questions that GPs ask. For this reason, a diversity of research designs and analytic methods are used. The term "sentinel" refers to the longitudinal monitoring function of these networks.

Most projects are quantitative and data are collected over an extended time period (sometimes years). The whole range of epidemiological designs is used, although it is unusual for randomised clinical trials to be undertaken by sentinel networks. Certainly case control studies and other descriptive epidemiological designs are common.

All forms of analysis, including even some kinds of qualitative approaches such as content analysis can be used. In the RNZCGP Computer Network, economic analytic techniques are frequently used.

CONCLUSION

Research is a core activity of general practice and only with general practice-based research will we truly understand what is required to provide high quality care to our patients.

Practice-based research can occur in solo practices, group practices, or through sentinel practice networks. Sentinel practice networks are one of the ways general practice has developed to find evidence of best practice. They are a unique general practice contribution to medical research techniques, and for that reason they deserve special consideration.

New Zealand has a productive, efficient sentinel practice network that leads the world in many of its approaches. It provides a tool for developing general practice research in the future, and should never be constrained to fulfilling outdated research requisites more appropriate to other research paradigms than those of the discipline of general practice.

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