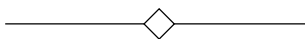


ARTICLES



An outcomes approach to population health at the local level in NSW: Practical problems and potential solutions

CHRIS RISSEL, JEANETTE WARD AND PETER SAINSBURY

Chris Rissel is an Epidemiologist with the Needs Assessment & Health Outcomes Unit of the Central Sydney Area Health Service. Jeanette Ward is the Director of the Unit.

Peter Sainsbury is the Director of the Division of Population Health, Central Sydney Area Health Service.

ABSTRACT

While a health outcomes approach has the potential to improve the health status of Australians as well as health service efficiency, such a policy will be successful only if practice at the local level follows suit. This paper briefly reviews the health outcomes approach and describes how the Central Sydney Area Health Service has established a Needs Assessment & Health Outcomes Unit to help improve health outcomes. The paper discusses issues in working with population health outcomes at the local level, such as the usefulness and limitations of routinely collected data for planning and managing health services, problems of small area data, gaps in the documentation of national health goals and targets, problems of attribution of improved outcomes to specific interventions and definition of responsibilities for action at the local level. It offers some potential solutions relevant at the local level.

Introduction

National goals and targets have the potential to assist health service managers to orient resources and services towards maximum, equitable health gain. (The definition of 'managers' here includes all health personnel who have the capacity to influence service direction and resource use, such as clinical professionals, administrators and service directors.) However, in our experience, nationally defined goals and targets are less easy to apply at the local level. The purpose of this paper is to describe and discuss the difficulties we encountered in applying the national goals and targets framework at the local level and to suggest some possible solutions.

Background

Until about 10 years ago the Australian health care system operated without explicit goals, quantifiable targets or systematic assessment of the outcomes of its interventions (Wise & Nutbeam 1994). Health service management seemed preoccupied, firstly, with reducing, or at most holding steady, expenditure and, secondly, with treating only those people who presented for care and for whom services could be offered. In 1985 the Better Health Commission was established as the first Australian response to the World Health Organization's 'Health For All by the year 2000' initiative. Since then the emphasis within the health system has evolved to focus on health outcomes of services and value for money (cost-effectiveness), not simply on staff activity levels and reduced costs.

Subsequently, several landmark reports have been produced which document the growing interest in using health outcomes to measure the need for and effectiveness of health services. Published in 1986, the three-volume report *Looking forward to better health* (Better Health Commission 1986) was the first to bring together the perspectives of health promotion and health care, and to identify goals and targets for cardiovascular disease, nutrition and injury. These issues were chosen to demonstrate the diverse range of strategies needed to improve health in areas of significant mortality and morbidity in Australia. The 1988 *Health for all Australians* report (Health Targets and Implementation Committee 1988) developed the first set of national goals and targets for Australia, based on experience in setting goals and targets in the United States (Department of Health and Human Services 1980) and by the World Health Organization (1985).

These documents consolidated the emerging links between health promotion and health (illness care) services which had previously appeared separate and perhaps in conflict. By bringing these two perspectives together, health promotion and health care providers assumed complementary roles in improving health by contributing somewhat different intermediate products.

Following the implementation and evaluation of the National Better Health Program, revised goals and targets were produced in 1993 (Nutbeam et al. 1993). This document outlined health targets for intermediate factors known to contribute to ill health in the longer term. From the many health issues identified in this report, the Commonwealth and States/Territories health ministers selected four leading causes of ill health – cardiovascular disease, cancer, injury and mental health – as priorities for action (Department of Human Services and Health 1994). All Australian States endorsed these four issues as priorities, with individual States identifying additional priorities. According to Pickering, Bennett and Ashpole (1994), the national goals and targets were intended to provide a way of focusing the health system on improving health by:

- addressing some of the underlying determinants of ill health
- monitoring and reviewing progress towards improved health outcomes
- assessing the effectiveness of a range of preventive measures and treatment interventions
- involving sectors other than health in health policy and planning.

Goals, targets and indicators

The health outcomes approach is characterised by its primary focus on *the results of* activities by health services rather than on the activities themselves. A *health outcome* has been defined as a change in the health of an individual, a group of people or population which is attributable to an intervention or series of interventions (Australian Health Ministers' Advisory Council 1993). Net improvements in health outcomes should be the primary aim of health services. A *goal* is a general statement of intent and aspiration and an *indicator* is a specific measure for assessing progress towards a goal (d'Espaignet, Stevenson & Mathers 1994). For example, an indicator could be the age-adjusted death rate from coronary heart disease among men aged 25–74 years. A *target* is a specific and measurable achievement that

could reasonably be expected for a given population within a given time (d'Espaignet, Stevenson & Mathers 1994). It is usually a single numerical value of the indicator which will be regarded as a measure of progress towards the goal at a particular time. For example, the Australian target for coronary heart disease mortality in males aged 25–74 years is 110 per 100 000 persons per year by the year 2000 (Department of Human Services and Health 1994).

For national or State goals and targets to be achieved, managers will need to focus efforts on the priority issues and produce detectable improvements in health outcomes at the local level. In New South Wales, how each health area achieves these changes is not prescribed in national or, as yet, State policy documents; there is considerable scope for local flexibility so that areas can adapt the health outcomes framework to local conditions. (The term *health area* is used in New South Wales to describe a unit of administration of health services, defined by geographical boundaries. Other terms may apply in other States.)

In this context, the Central Sydney Area Health Service in 1994 established the first (and still the only) population-oriented health outcomes unit in the New South Wales health system. The Needs Assessment & Health Outcomes Unit helps clinicians and managers to realise a systematic health outcomes approach to health care in order to maximise population health gain and minimise ineffective or inefficient provision of health services. Strategic directions of the unit are to:

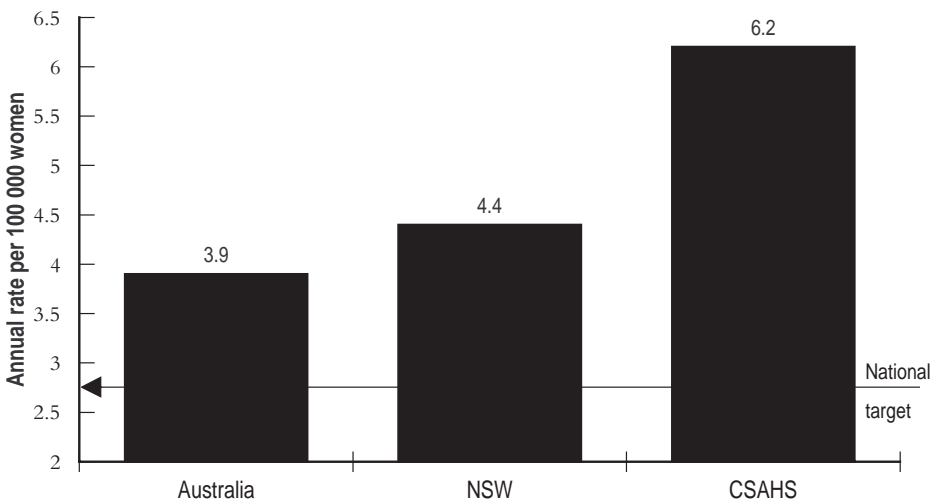
- assess needs to identify areas where health outcomes can be improved
- promote improved population health status as the ultimate outcome for health services provision in the Central Sydney Area Health Service
- encourage application of evidence-based interventions to achieve health outcomes
- undertake original research in priority areas where data are missing
- increase the capability of individual health service planners and providers, units and divisions to incorporate a systematic, broad and explicit outcomes approach to health care.

As one of its first tasks the unit has undertaken a systematic review of current health status for residents of the Central Sydney Area in the areas of coronary heart disease, cancer, injury and mental health, using the national goals and targets as a template (Rissel et al. 1995). This report

serves as a baseline for specific area health services which aim to improve specific health outcome indicators. Aside from one report attempting to organise and review existing data into a small area database compatible with the World Health Organization's 38 targets for *Health For All for the European Region* (Sainsbury 1989), we are aware of no earlier perspective on health goals and targets at the local level.

The report of the Needs Assessment & Health Outcomes Unit presents tabulated data for nominated national, State and local outcomes and represents a first step in comprehensive health status monitoring. For example, figure 1 shows the national, New South Wales and Central Sydney Area Health Service annual age-standardised cervical cancer mortality rate and the national target for the year 2000 proposed by the Department of Human Services and Health (1994). Its immediate message that cervical cancer rates are unacceptably high in the Central Sydney Area has prompted immediate local response. The next section of this paper describes our experiences in compiling such a snapshot using existing data sets compatible with the national health outcome priorities.

Figure 1: Annual age-standardised cervical cancer mortality rate per 100 000 women in Australia, New South Wales and the Central Sydney Area Health Service, 1985–1989



Problems in the local application of national health outcomes

Routinely collected morbidity and mortality data

Epidemiological data sets that are available locally tend to be those that are in operation statewide. These systems collect information on the notification of disease (particularly infections, occupational diseases and newly diagnosed cancers) or events, such as death or separation from a medical institution. An example of such a data set is the New South Wales Inpatient Statistics Collection. Periodic national surveys, such as the National Health Survey (Australian Bureau of Statistics 1992), and quasi-national surveys like those conducted by the National Heart Foundation (Bennett & Magnus 1994), can provide only limited additional local information about health behaviour.

Systems capacity

Much of this information exists in an electronic format ready for statistical analysis, although the extraction of information from large data sets requires adequate computer hardware and specific technical expertise. If equipment or skills are not available, they will need to be obtained. Familiarity with, and understanding of, the limitations of the data also are necessary to interpret the results correctly.

Lag-time in outcomes

For managers needing to make decisions about allocating resources, indicators that are sensitive to short and medium-term changes in health service performance are very useful. Information currently collected routinely across the State or nation is not necessarily helpful in managing local health services over the short term, however. For example, annual death rates from cardiovascular disease or cancer, or cardiac-related hospital admissions, do not change enough over two or three years to detect improvements due to health interventions.

It is acceptable and relatively common to use risk factors as intermediate health outcome indicators because of the time frames involved in changing mortality incidence rates. Rather than look solely at changes in coronary mortality over five to ten years, changes in the prevalence of smoking or high serum cholesterol can be used as health outcome indicators. Point prevalences among the population or subpopulations can be significantly

reduced over two or three years as a result of health interventions (Pierce et al. 1986; James et al. 1989). Different components of the health system, such as groups concerned with prevention or with rehabilitation, can contribute different intermediate products.

Limited choice of indicators routinely collected

Selection of useful indicators which are sensitive to change and causally linked to the outcome of interest is critical, but such data are not routinely collected for all health issues. Pilot work to ensure that new indicators will be useful to managers is also critical, utility being one of the main standards for evaluation, along with feasibility, ethical acceptability and accuracy (Joint Committee on Standards for Educational Evaluation 1994). Ideally, the pilot work could include some preliminary evidence that the changes in health status indicators are associated with a health intervention.

Small absolute number of local health events

Even for topics such as heart disease risk factors where considerable information already exists, samples from large surveys in any one health area are usually too small to be representative of the population in the area or to use as a stable baseline for evaluating intervention programs. For example, in the most recent National Heart Foundation Risk Factor Survey (1989) only 177 persons from within the geographic boundaries of the Central Sydney Area Health Service were included (from a sample of 9279 people from all Australian State capital cities). Prevalence estimates with this sample size are very imprecise (with wide confidence intervals). Further, outcomes of health promotion interventions are usually fairly small in the short term and with small samples there is the risk of a type II statistical error (that is no statistically significant effect is detected but a real effect is present) (Chey et al. 1992).

Problems of small area data

Although there are advantages to small area analysis (such as more homogeneous populations than in larger and more widespread areas and the ability to identify target groups within specific populations), there are also problems. These include the difficulties in obtaining a reliable population count (that is, denominator) for calculating rates, and differences in the age structure of populations in specific neighbourhoods.

Non-standard populations

Confounding due to age and sex structures may be quite variable at a small area level (Kempton 1991). For example, a neighbourhood might seem to have an especially high rate of morbidity from falls until an examination reveals that there is a relatively high proportion of older people living in this neighbourhood. Another difficulty with applying a national health outcomes policy at the local level is that routinely collected mortality and morbidity data often are imprecise (that is, have wide confidence intervals) because of the relatively small number of mortality and morbidity events at the small area level.

When so few events occur in a local area, and standardised local rates are then compared with State or national rates, it is difficult to interpret any differences. Statistical significance may be unlikely when the events are relatively few or the sample size is small. To complicate this situation further, standardised rates do not always use the same standard population to facilitate comparison.

Inconsistent data categories

A further difficulty in applying the national health outcomes framework at the local level is the simple and practical problem of making direct comparisons with the national indicators using the data available at the local level. For example, when the national goals and targets were reported, data were sometimes presented in specific age groups, for example, the incidence of breast cancer in women aged 50–74 years (Department of Human Services and Health 1994). In order to make direct comparisons, local data must be collected using the same age categories, or with the ability to analyse the data using these categories, which may not have been planned for. As another example, the cancer section of the *Better Health Outcomes for Australians* report (Department of Human Services and Health 1994) discussed colorectal cancer. However, in readily available reports from the New South Wales Cancer Council (Coates et al. 1993) this cancer is listed separately as colon cancer and rectal cancer. Direct comparisons of standardised rates cannot be made.

Local data collection

Most area health services will need to supplement the routinely collected mortality and morbidity data with the collection of original local data which are specific to the local population (for example, a community survey) or local clinical services (for example, a clinical cohort study). Where there is reason to assume the population of an area health service is distinctly different from the population of other areas or the State or nation as a whole, health areas might consider conducting a community survey. However, management may underestimate the cost of a community survey to establish baselines and monitor health outcomes. For example, a 20-minute telephone survey of 2000 respondents conducted by a commercial data collection agency can be expected to cost approximately \$30 per completed interview (including data entry, data analysis, quality control measures and questionnaire formatting) (Chey et al. 1992). Such expenditure can be justified when the results are likely to have the following effects.

- Indicate that the existing State or national data cannot be relied upon to plan or evaluate local services. For example, typically 33 per cent of the State's men smoke tobacco. However, other data also indicate that men in certain migrant population or socioeconomic groups tend to be heavy smokers. If a local area has a high number of these men, then it would be unreliable to use the smoking prevalence figure for the State at the local level.
- Help to identify problems in, and plan services for, particular subgroups of the local population.
- Stimulate local interest and action because they are locally specific rather than general. It is one thing to be told that 'smoking is the most common preventable cause of ill health in Australia' and another to be informed that smoking rates in the local area cause 500 premature deaths each year.

Monitoring cohorts of patients from admission to some months after discharge from clinical care (using risk-adjusted profiles and serial measurements of health indicators) is another outcomes review model especially applicable for clinical services which area health services may need to undertake.

Intervention development

For area health services, an important consequence and real lesson of an outcomes-focused approach is not only the focus on outcomes per se, but also the shift in thinking about health interventions that is required. Interventions that achieve measurable improvements in population health outcomes need not only to be focused on issues that will 'make a difference', but also to be of such a size and scale that the improvements are detectable at the population or target group level. Increasing the size and scale of an intervention will typically increase its cost.

Absence of published clinical outcomes

Interventions which achieve measurable improvements at an intermediate level, or improve specific clinical outcomes, are conventionally the preoccupation of health services. There are many levels at which clinical outcome indicators can be measured. However, few clinical outcomes contained in the national report have published local data. For example, while there are published local data for breast cancer incidence and mortality, no published data exist for local five-year survival rates or the proportion of women treated for breast cancer reporting satisfaction with their treatment, despite these being national targets.

Partitioning of attribution and accountability

A key aspect of health outcomes is changes to health status *as a result of* interventions. Ideally, compelling evidence of attribution should exist before the widespread institutionalisation of new technologies, services or treatments. Levels of evidence have been categorised according to a hierarchical taxonomy (United States Preventive Services Task Force 1989). Specifically, randomised controlled trials provide the strongest scientific evidence of causality (Elwood 1988). Less rigorous research designs, including non-generalisable case series or clinical impressions, are relatively poor methods to attribute causality. In the past, evidence from weaker research designs often has been sufficient to introduce and institutionalise new health services, particularly if lobbying has been strenuous. In contrast, it now is argued that health service initiatives proposed to improve outcomes should not be introduced on a widespread basis unless substantial evidence for attribution of causality has accumulated and has been assessed

in a systematic manner (Laupacis, Sackett & Roberts 1988). This principle applies for health promotion and public health interventions as much as for clinical treatments (Woolf et al. 1990). Where a systematic review of the best available evidence fails to provide a convincing argument that the proposed intervention causes improved health outcomes, abandonment of the proposed intervention or further research should be the next step (Advisory Committee on Cancer Control 1994).

An outcomes approach is not driven primarily to *prove* attribution. Rather, evidence for attribution must be built up over time from earlier research and evaluation. Outcomes evaluation functions to monitor the achievements of the current health system when health and medical interventions known to be efficacious under research conditions are institutionalised as routine practice.

Resource allocation on the basis of achieved or potential health gain is as yet a poorly applied discipline. If previous research and evaluation does not establish causal links between a costed health intervention and a health gain, cost-effectiveness is speculative and cannot be used to underpin resource allocation. Again, best available evidence (possibly also flawed) might be used to make such decisions, but an ideal response might be to undertake appropriate and sound economic research. Without a positive and patient approach to the steady accumulation of empirical evidence to understand how to change outcomes and the resources required, the inherent flaws of the current system, in which resources have been allocated on an historical basis rather than on critical appraisals of evidence for attribution and cost-effectiveness, will persist. At the very least, health managers and governments must refrain from widespread funding of new technologies, treatments or public health interventions unless sound evidence exists for improved health outcomes causally related to the intervention and cost-effectiveness. Resolve also is needed to permit disinvestment from unproven interventions that were prematurely institutionalised when a less rigorous approach to evidence-based health care was characteristic of the health system.

Inconsistencies in the 'Better Health Outcomes' for Australians report

One of the more helpful notations by the authors of this report was the inclusion of International Classification of Disease (ICD) codes. This obviously facilitates comparisons at the local level, although reasons for using certain ICD codes and not others is unclear. For example, on p 225 the ICD-9 E codes for burns and scalds are given as 800-899 and 924. However, most people would use only 924, with 800-899 including motor vehicle crashes and other transport-related problems.

Although the health outcomes approach is still evolving, some inconsistencies in the choice of indicators emerge on close scrutiny of the report and basic typographical errors cause problems. For example:

- (i) the incidence of melanoma (ICD-9 172) was confusingly defined as non-melanocytic skin cancer ICD-9 173 (Department of Human Services and Health 1994, p 141)
- (ii) for the national indicator for teenage (15-year-old) smoking prevalence, Victorian data were given, but not broken down by sex, and an incomplete reference was given (p 134).

Only by examining other documents, such as the 1993 *Goals and Targets for Australia's Health in the Year 2000 and Beyond* (Nutbeam et al. 1993), can it be seen that the prevalence is the same for boys and girls at 26 per cent, with some rounding, and that this figure is based on data from 16-year-olds in 1987 (Nutbeam et al. 1993, p 123).

Gaps in identified needs

One advantage of using the national health outcome priorities and indicators is to focus collective efforts on achieving measurable change for a limited number of key health issues. However, an obvious problem is that not all important needs at the local level will be included in such a list of national priorities. Clearly, there must be flexibility at the local level to set goals and develop relevant indicators rather than simply adopt national or State goals and targets. For example, area health services with a high proportion of farmers using heavy machinery ought probably to have a series of goals specifically related to the injury needs of this population subgroup. However, for a country with a high urban population, farm injuries are unlikely to be a national priority, even though it will be a local priority in specific regions.

Ideally, the process and criteria to identify local priorities and goals should be clear to all stakeholders. There will inevitably be disagreement about what issue is a priority; agreement on the criteria to be used to decide may avoid some conflict. Care should also be taken that the process of identifying priority needs does not consume all the resources available for implementing strategies to improve health outcomes (Rissel 1991). In the Central Sydney Area, 10 major clinical service groupings have been formed, with each being responsible for developing their own service plans with assistance from area planners. The integration of strategies to improve health outcomes proposed at national, State and local levels is a difficult one to resolve at the local level. In the Central Sydney Area, key stakeholders and service providers are developing local service plans in each of the State priority areas. These plans are intended to identify common issues and recommend those strategies best suited to local conditions.

The development of interventions targeting health priorities is another aspect of implementing a health outcomes approach, albeit one which has received scant attention. In New South Wales the policy has been one of decentralised decision-making, where each health area decides its own mix of strategies. However, if available evidence indicates that some strategies are better than others, then clearly the most effective strategies should be implemented. Dissemination of well-conducted research using a high standard of evidence, and the adoption of these findings by other health areas, will need to be addressed in the future.

Potential solutions at the local level

There are many ways to apply health outcomes at the local level. From our experience in matching local Central Sydney Area Health Service data with indicators for national goals, the following thoughts are offered.

- Local original research in area health services is inevitable. Health service areas will need to collect original data, and new information and data collection systems must be put in place. There should be systematic data collection across a number of health service areas to achieve economies of scale. Surveys could include a core module of questions to allow comparability across areas, with some option for additional questions by specific areas, such as was done with the New South Wales Health Promotion Survey (Hunter Centre for Health Advancement 1993).

- Sufficiently large samples need to be obtained for statistical precision, using methods that allow reasonable cost and efficiency of data collection, for meaningful changes to be detected.
- Robust debate about important outcomes that should be measured locally must occur so that the final list of outcome indicators will have maximum acceptance by key stakeholders.
- Where reliable and valid indicators do not exist, methodological work to develop such indicators should occur. This work should include piloting data collection mechanisms.
- When data are compiled, accurate sources and criteria for inclusion and exclusion (such as specific ICD codes) should be supplied to enhance replicability and comparison.
- Age-standardisation should be done using a standard population, for example, the 1991 Australian population as defined by the 1991 census. The Australian Institute of Health and Welfare is now recommending the use of the 1991 Australian population as the standard population for adjustment for age (d'Espaignet, Stevenson & Mathers 1994).
- The measurement of intermediate indicators represents a ready solution to the problem of choosing what level of outcome to assess, providing that there is a strong relationship between the intermediate product and the longer term or larger scale outcome indicator.
- Managers, planners and clinicians must become familiar with the concept of graded levels of evidence regarding the specific improvements in health status that can be attributed to specific interventions.
- Managers, planners and clinicians must work together locally to identify priorities and develop strategies for action.
- Valid and reliable measures of health status for people from non-English-speaking backgrounds will need to be developed, because of the high proportion of migrants in some health service areas. Some work in this direction has been completed in Western Sydney (Cardona et al. 1995).
- Follow-up observation and monitoring of health outcomes in cohorts of patients managed for specific health problems should be a routine aspect of clinical practice.

Conclusion

The national goals and targets policy has the potential to improve population health outcomes if local health areas support the initiative. Local health areas will need to identify their own priorities and targets, compare current achievements against agreed targets, and ensure that appropriate indicators are chosen to monitor progress. New data collection systems to collect local data will be necessary, and cautious use of existing data sets is recommended.

Acknowledgement

Thanks to two anonymous reviewers who made insightful suggestions when reviewing the submitted manuscript.

References

- Advisory Committee on Cancer Control 1994, 'Bridging research to action: A framework and decision-making process for cancer control', *Canadian Medical Association Journal*, vol 151, pp 1141–6.
- Australian Bureau of Statistics 1992, *1989–90 National Health Survey, Smoking, Australia*, ABS cat no 4382.0.
- Australian Health Ministers' Advisory Council 1993, *Sunshine Statement*, AHMAC Health Outcomes Seminar, 3 and 4 February.
- Bennett S & Magnus P 1994, 'Trends in cardiovascular risk factors in Australia – Results from the National Heart Foundation's Risk Factor Prevalence Study, 1980–1989', *Medical Journal of Australia*, vol 161, pp 519–27.
- Better Health Commission 1986, *Looking forward to better health, volumes 1–3*, Australian Government Publishing Service, Canberra.
- Cardona M, Jorm L, Williamson M et al. 1995, *The Blacktown health survey of people from non-English-speaking background*, Western Sector Public Health Unit, Parramatta.
- Chey T, Smith WT, Jaludin B et al. 1992, *Surveillance of health status using telephone survey methodology: a feasibility study*, Western Sector Public Health Unit, Parramatta.

- Coates M, Smith D, Taylor R et al. 1993, *Cancer incidence and mortality by local government area and health region, New South Wales 1985–1989*, Cancer Epidemiology Research Unit, New South Wales Central Cancer Registry, New South Wales Cancer Council, Sydney.
- Department of Health and Human Services 1980, *Promoting health/preventing disease: Objectives for the nation*, United States Government Printing Office, Washington DC.
- Department of Human Services and Health 1994, *Better health outcomes for Australians: National goals, targets and strategies for better health outcomes into the next century*, Australian Government Publishing Service, Canberra.
- d'Espaignet ET, Stevenson CE & Mathers C 1994, 'Monitoring national health targets – the perspective of the Australian Institute of Health and Welfare', *Health Promotion Journal of Australia*, vol 4, no 3, pp 14–18.
- Elwood JM 1988, *Causal relationships in medicine: A practical system for critical appraisal*, OUP, Oxford.
- Health Targets and Implementation (Health for All) Committee 1988, *Health for all Australians. Report to the Australian Health Ministers' Advisory Council and the Australian Health Ministers' Conference*, Australian Government Publishing Service, Canberra.
- Hunter Centre for Health Advancement 1993, *NSW Health Promotion Survey – Pilot study full report*, The Hunter Valley Research Foundation and Newstat – University of Newcastle, Newcastle.
- James R, Tyler C, Van Beurden E et al. 1989, 'Implementing a public health cholesterol screening campaign: The North Coast experience', *Community Health Studies*, vol 13, no 2, pp 130–9.
- Joint Committee on Standards for Educational Evaluation 1994, *The program evaluation standards*, 2nd edn, Sage, Thousand Oaks.
- Kempton A 1991, 'A socio-epidemiological study of social indicators: Small area analysis of health outcomes and social indicators in the Central Sydney Health Service Area'. Unpublished Master of Public Health treatise, University of Sydney.

- Laupacis A, Sackett D & Roberts R 1988, 'An assessment of clinically useful measures of the consequences of treatment', *New England Journal of Medicine*, vol 318, pp 1728–33.
- Nutbeam D, Wise M, Bauman A et al. 1993, *Goals and targets for Australia's Health in the year 2000 and beyond. Report to the Commonwealth Department of Health, Housing, Local Government and Community Services*, Australian Government Publishing Service, Canberra.
- Pickering S, Bennett J & Ashpole K 1994, 'National health goals and targets – the Commonwealth Government's approach to achieving better health outcomes for all Australians', *Health Promotion Journal of Australia*, vol 4, no 3, pp 5–8.
- Pierce JP, Dwyer T, Frape G et al. 1986, 'Evaluation of the Sydney "Quit. For Life" anti-smoking campaign', *Medical Journal of Australia*, vol 144, pp 341–4.
- Rissel C 1991, 'The tyranny of needs assessment in health promotion', *Evaluation Journal of Australasia*, vol 3, no 1, pp 26–31.
- Rissel C, Winchester L, Ward J et al. 1995, *Population health outcomes for residents of the Central Sydney Area*, Needs Assessment & Health Outcomes Unit, Central Sydney Area Health Service, Camperdown.
- Sainsbury P 1989, *Croxteth Health Action Area: Developing a small area database*, Liverpool Healthy Cities Research Consortium, Liverpool.
- United States Preventive Services Task Force 1989, *Guide to clinical preventive services*, Williams & Wilkins, Baltimore.
- Wise M & Nutbeam D 1994, 'National health goals and targets – an historical perspective', *Health Promotion Journal of Australia*, vol 4, no 3, pp 9–13.
- Woolf S, Battista R, Anderson G, Logan A, Wang E & the Canadian Task Force on the Periodic Health Examination 1990, 'Assessing the clinical effectiveness of preventive manoeuvres: Analytic principles and systematic methods in reviewing evidence and developing clinical practice recommendations', *Journal of Clinical Epidemiology*, vol 43, pp 891–905.
- World Health Organization 1985, *Targets for Health for All*, World Health Organization, Copenhagen.