1. Background issues

While the broad profile of ill health and excess mortality among Indigenous Australians is well documented, research on determinants remains relatively undeveloped. Nonetheless, sufficient insight exists to place an emphasis in explanation on the compound effects of overall low socio-economic status, including low income. This is in line with theoretical trends generally in social epidemiology in which biological pathways between psychosocial stress and ill health are seen as explanatory (Berkman & Kawachi 2000; Kawachi, Kennedy & Wilkinson 1999; Marmot & Wilkinson 1999). Within this paradigm, persistently low levels of life expectancy among Indigenous Australians would be viewed as a product of their entrenched position at the bottom of the socio-economic hierarchy.[1]

One aspect of this focus in recent years has been to explore the linkages between Indigenous health and institutional arrangements for health care delivery and expenditure. Thus, in considering Indigenous health development, issues to do with interactions between minority Indigenous and majority non-Indigenous institutions are increasingly to the fore. Conceptually, these fall within a framework of what has been described as the 'new public health', which stresses the contribution of social justice, social action, power and access to resources as key components of Indigenous health outcomes.

To date, this redirection has generated insights at three levels. The first is at the scale of discrete communities where the focus has been on measuring the effects of improved environmental health infrastructure and identifying institutional impediments to achieving this (Torzillo & Kerr 1991). At a more macro-level, the consequences of control over health policy and its delivery have been explored in the context of Australian federalism, and at a comparative international scale (Bartlett & Legge 1994; Hogg 1992; Kunitz 1990). Finally, the consequences of low socio-economic status for health status are increasingly being examined at both the individual and group levels (Deeble et al. 1998; Gray & Broughton 2001; Hogg 1990; Hunter 1999, 2000a, 2001). The present analysis falls firmly within the last category, although some overlap with the first is also achieved through examination of the relationship between income and health expenditure using micro-level data.

Healthy expenditure?

Previous analysis of the amounts spent on health services for and by Aboriginal and Torres Strait Islander people found that the per capita level was about eight per cent higher than that spent for and by other Australians. Government health expenditure on Aboriginal and Torres Strait Islander people was found to be 47 per cent higher than on other Australians (Deeble et al. 1998). To assess whether this represented an equitable allocation, it was noted that relative expenditure fell well short of implied levels of Indigenous need, given that death rates for the Indigenous population were around three times the national average. By comparing government expenditure on Indigenous and other Australians in the lowest income group, the conclusion was drawn that Indigenous people were in receipt of expenditure equivalent to others in a similar economic position, but their worse health

status was not adequately reflected. In further pursuit of a 'needs-based' formula for resource allocation, comparative crude death rates have been applied as a proxy for morbidity to argue for an additional 27 per cent increase in total expenditures on Indigenous health (NCEPH 2000).

While excess mortality provides a rough indication of need, it offers no guidance as to the cost-effectiveness of resource allocation for treating differentially prevalent morbidity. Such an approach would focus on 'capacity to benefit' and, ideally, a formulation would be based on equal expenditures for the same medical conditions. However, as Deeble et al. (1998: 52) point out, while such a calculation should be possible, it would not be the only criterion for allocating government expenditures since equality by medical need would be sufficient only if all services were publicly provided to all people without charge. This is not the case.

The amount of money spent on the health of each individual is comprised of expenditure by government (public health expenditure) and private health expenditure. It is an observed fact that the balance of these expenditures on individuals varies such that a positive correlation exists between income levels and the proportion of the population with private health insurance (Deeble et al. 1998: 57). Furthermore, people with higher income tend to have more out-of-pocket payments through schemes like the Pharmaceutical Benefit Scheme (PBS). The significance of this observation is seen in the quite different income distributions of the Indigenous and non-Indigenous populations. In 1996, Indigenous family incomes were on average 32 per cent lower than non-Indigenous family incomes. *Ipso facto*, dependence on public expenditure for access to health services is greater among Indigenous people.

This report asks the question—what is the relationship between income, health expenditure and health status for the Indigenous and non-Indigenous populations? The analysis draws out differences in expenditure between the Indigenous and non-Indigenous population holding income level constant. This is important to the extent that income is seen as an indicator of ability to address the need for health expenditure.

Unlike the analysis for the Australian population as a whole presented in Deeble et al. (1998), changes in the questions on the 1995 NHS mean that it is not possible to separate expenditure into private and public components, and therefore the analysis in this report deals only with total health expenditure. In spite of this limitation, the analysis remains of policy value since there is no existing analysis of health expenditure by income for the Indigenous population.

Data sources

This report presents an analysis of per-capita health expenditure by income for Indigenous and non-Indigenous Australians based on the utilisation of a range of health services as set out by questions asked in the 1995 NHS. This survey was conducted on a multi-stage area sample of private dwellings and a list sample of non-private dwellings (hotels, motels etc.). Hospitals, nursing homes and convalescent homes were excluded from the survey, as were prisons, reformatories and single quarters of military establishments. A base sample

size approximating one-third of one per cent of the population was initially chosen. Inclusion of the Indigenous status question on the survey form yielded a total of 1100 Indigenous persons. To enhance the reliability of data for the Indigenous population an additional 1100 Indigenous respondents were sought. In doing this, the ABS used a sampling methodology which ensured that Indigenous respondents were representative of the population from which they were drawn. Thus, the total NHS sample included 2168 people who identified as being of Aboriginal or Torres Strait Islander origin.

It is important to note that, due to concerns about the quality of some of the responses from Indigenous participants who do not speak English at home, NHS estimates exclude Indigenous and non-Indigenous people living in those areas identified by the ABS as being sparsely settled, as in these areas non-English speakers predominate.[2] In total, 539 records from survey participants in such areas were excluded, of which 461 were Indigenous. The final Indigenous sample for this report is based on 1536 Indigenous respondents in non-sparsely settled areas for whom there were valid data on household income. The weighted estimates for 1995 show that this Indigenous sample was representative of 82 per cent of the Australia-wide Indigenous population (ABS 2000c: 34).

The utilisation data from the NHS include 'out-of-hospital visits to general practitioners or medical specialists', 'other health professionals', 'admitted hospital patients', 'non-admitted hospital patients', 'prescription medications', and 'over-the-counter medications'. In establishing expenditures based on these data, consideration was given to the age and sex patterns of utilisation which were found to vary significantly. It should be noted that changes to NHS questions on the utilisation of health services mean that the estimates of hospital utilisation are very unreliable for the Indigenous population. In the 1990 NHS, hospital utilisation was measured over the 12 months prior to the survey, whereas in the 1995 NHS the reference period was only the prior two weeks. Given the small size of the Indigenous sample and the low frequency of hospital visits, there are insufficient cases to ensure statistical reliability. Note that when converting these utilisation data to estimates of national expenditure, the amounts spent on each health service reported in the NHS were obtained from AIHW using a composite of administrative and supplementary survey data aggregated across different sources for varying geographic levels.

A caveat

By estimating health expenditure via the utilisation of health services as reported in the NHS, an important, and often overlooked, element of public health expenditure is excluded from the analysis—spending on the provision of environmental health infrastructure. Despite a well-established link in the international public health literature between living conditions and population health, few Australian studies have detailed the relationship between specific environmental problems and particular illnesses among Indigenous Australians. One pioneering study in this field is based on identifying nine healthy living practices for one community in the Anangu Pitjantjatjara lands (Pholeros et al. 1993). While this research indicated that improvements in environmental infrastructure can lead to specific improvements in health status, the key finding showed that this depends on ensuring that appropriate institutional arrangements are in place.

In particular, it is essential that budgets make adequate provision for planning, design, supervision and maintenance of infrastructure, and that these actually occur. Among the reasons for a lack of such arrangements in the past, confusion over myriad responsibilities for service delivery and marginalisation of environmental health issues in the policy system has been highlighted.

The major government response to such inadequacies developed out of the National Aboriginal Health Strategy (NAHS) in 1990, which recognised an essential linkage between improved health outcomes and the provision of housing and infrastructure to acceptable minimum standards. Accordingly, funding allocations in the initial years of the NAHS primary health and environmental health programs included amounts directed at housing and infrastructure services within Aboriginal and Torres Strait Islander Commission's (ATSIC) Community Housing and Infrastructure Program (CHIP). However, a review of CHIP in 1994 identified a range of problems including a failure to address housing and infrastructure needs in a holistic way. Allied to this was the short-term nature of the program-based approach to funding, which required communities to structure housing needs to the CHIP program rather than the other way around.

Such criticism led to the establishment, in the same year, of the Health Infrastructure Priority Projects (HIPP) program to pilot new program delivery arrangements for the construction of Indigenous community housing and infrastructure in 58 sites. This has subsequently expanded, and in 1998–99 a total of $103 million was allocated via NAHS/HIPP initiatives. Notwithstanding this environmental health expenditure, the 1999 Community Housing and Infrastructure Needs Survey (CHINS) found that fully one-third of the housing stock administered by Indigenous housing organisations in discrete communities remained in need of major repair or replacement (ABS 2000b:3). While part of the difficulty here is catch-up—given the legacy of previous neglect—the question of equity in regard to the adequacy of this public expenditure remains open.

Equity issues: comparing like with like

The ability of income to translate into better health depends, among other things, on the extent to which spending affects various family members and the amount of resources left over after various expenditures. For example, if spending (either in health or other expenditure) enhances the well-being of all family members, then expenditure can be said to provide 'public goods' within the family. Alternatively, expenditure may provide purely private benefits for a particular family member. Obviously, the relationship between income and expenditure depends crucially upon the proportion of public goods in household spending. Equivalent income measures control for the extent of consumption of public goods, which may vary with family size and composition. This was a feature of the previous analysis of Indigenous health expenditure which applied the Henderson measure of equivalent income to account for such issues (Deeble et al. 1998).

In testing for equity in health expenditure, it is necessary to compare observed health expenditures for Indigenous people with outlays on health for other Australians in the same income group. One constraint on establishing a precise comparison in the Deeble et

al. (1998) analysis was the lack of data consistency. The problem was that information on Indigenous incomes was drawn from the 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS), while data on non-Indigenous incomes were derived from the 1990 NHS.

In the present study, estimates of both Indigenous and non-Indigenous income and health service utilisation are derived using data from the same source. This is possible for the first time because the 1995 NHS included a question on Indigenous status. The availability of a common source of data ensures that the following analysis has a higher level of methodological consistency than was previously possible. Perhaps, most importantly, the availability of Indigenous utilisation data from the 1995 NHS provides for the calculation of standard errors on the estimates, thereby enabling the significance of differences in expenditure by income to be tested. Once again, this represents an advance on previous analysis of expenditure by income.

The 1995 NHS data also provide income data adjusted using the ABS's version of the simplified Henderson equivalence scales. Since any one of a number of equally plausible equivalence scales may be chosen, it is necessary to consider whether our results are affected by using alternative scales. The equivalence scales used in this report therefore cover the full range of possibilities from all expenditure being on public goods (raw income) to the other extreme where all expenditure is on private goods (per capita income).

Expenditure, income and health status

A further advantage of the 1995 NHS data is the capacity they provide to extend the analysis of the relationship between income status and expenditure, and to explore the links between these factors and health status for both the Indigenous and non-Indigenous populations. While such analysis is desirable, legitimate concerns surround the extent to which a suitable measure of health status is available from the NHS to enable meaningful comparison between Indigenous and non-Indigenous populations. In effect, the exclusion of sparsely settled areas from the NHS sample partly resolves this issue, as argued below.

This same dilemma regarding the potential usefulness of self-assessed health status was raised and extensively investigated subsequent to the release of results from the 1994 NATSIS (Cunningham, Sibthorpe & Anderson 1997). This survey (as well as the 1995 NHS) asked a global question on self-assessed health status as follows:

> In general, would you say that your health is excellent, very good, good, fair or poor?

Given objective evidence of higher Indigenous morbidity and mortality, an apparent similarity in self-reported rates of poor to fair health among the Indigenous and non-Indigenous respondents in the NATSIS (around 17 per cent each) suggests that differential thresholds for reporting poor or fair health were being applied. If this were so, it would potentially undermine the utility of data on self-assessed health status as a proxy for comparison of health needs between groups. However, as Cunningham, Sibthorpe & Anderson (1997: 26) have pointed out, expected differences in self-assessed health status were evident between the two populations after accounting for age structure. This

variation was sufficient to suggest that the limitations of the data did not override their utility for comparative purposes. Further evidence from the NATSIS also supports the utility of responses to the global question on self-assessed health status. This is drawn from the fact that individuals who reported that they had a long-term health condition were significantly more likely to report poor or fair health than those who indicated that they had no long-term condition (Cunningham, Sibthorpe & Anderson 1997: 18).

While, in principle, the utility of the global question may be accepted, one concern remains to be overcome. This is based on the observations that the level of reported poor or fair health in the NATSIS was markedly lower for people who indicated that they did not speak English as their main language, and that other estimates for this group also displayed a large degree of response error (Cunningham, Sibthorpe & Anderson 1997: 19–21). Similar error among Indigenous respondents whose main language was not English was found in the ABS evaluation of Indigenous data quality issues in the 1995 NHS (Gray 1997). Indeed, it was concern over data quality for this group that led to their exclusion from the calculation of final published estimates. Thus, by focusing the sample on respondents from non-sparsely settled areas, residual doubt about the utility of the global question on self-assessed health status is largely overcome.