

COMMONWEALTH GRANTS COMMISSION

INDIGENOUS FUNDING INQUIRY

SUBMISSION

From: National Centre for Epidemiology and Population Health

Submission No.: IfI/SUB/0025

Date Received: 26/04/2000

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The Secretary
Commonwealth Grants Commission
5 Torrens Street
Braddon ACT 2612

Attention: Mr Malcolm Nicholas

Dear Sir,

As discussed at the Indigenous Funding Workshop on 14 April, I am pleased to forward a submission to the Commission's current Inquiry into Indigenous Funding by Dr Beverly Sibthorpe, Dr Ian Anderson and myself on behalf of the National Centre for Epidemiology and Population Health, the Australian National University.

John Deeble
Adjunct Professor of Economics.

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Indigenous Funding Inquiry

Health services

Background

(a) conceptual

*health services differ from some of the other areas included in the terms of reference because they vary in purpose and their outcomes are more difficult to define and measure; ie, public health services are designed to prevent illness whereas personal services are curative in intent, although they cannot always achieve it. Care is just as important as cure and fair access to any potentially beneficial service is seen as just as important as its objective effect on health.

* the 'need' for health services is driven by current health status but the link between specific services and measured health outcomes is tenuous, except perhaps in the very long term. Even then, improvements in living standards - and the preventive properties of better nutrition, better housing, better education and better social infrastructure - have contributed much more to health improvement than medical care alone. That has particular relevance for Indigenous people. However it does not reduce the argument that, in equity, ATSI people should be entitled to the same investment in health care services as other Australians with the same health status would receive.

* ideally, health care resources would be allocated according to the prevalence of illnesses and disability in a community, together with their consequences for people (the 'capacity to benefit' criterion); plus the ability of health services to improve them and people's access to those services. For public health these rules are broadly followed, though with much less than full information and knowledge. However most personal health care is not planned in this way. Almost all systems rely on individuals or their agents - usually doctors - expressing their needs by presenting themselves for treatment. Where most of the demand for this is either met or capable of being met, data from the health services can be *prima facie* indicators of the nature and extent of 'need'. Very few systems go beyond them. However when supply is for various reasons inadequate or individual demand fails to express the needs of communities as a whole, service-based data are misleading. That is certainly true for Indigenous people.

(b) factual

Some of the major findings of the 1998 Indigenous health expenditure study were:

* the relatively low proportion of health care outlays through programs specifically directed towards Indigenous people - on average, only about 20% of the estimated total. Four fifths were through the mainstream services of hospitals and community health centres (although some of the latter may have actually been more directed than their reporting implied). Not all of the mainstream services were fully used. Per person, outlays for ATSI people under the Medicare and Pharmaceutical Benefit schemes (which relate almost entirely to private providers) were only 26% of the average for non-Indigenous Australians. This was partly offset by the use of Aboriginal Medical Service (AMS) services although, in comparable terms, the volume of these was unknown. Interestingly, for Indigenous people who did see a doctor billing under Medicare the course of treatment appears to be have been very similar to that for non-Indigenous patients, except that referrals to private specialists were much lower and those to public hospitals much higher than the average.

* the very high age-standardised death rates for Indigenous people as compared with the non-Indigenous population. For SA, WA and the Northern Territory in 1992-94, they were about three times the non-Indigenous rate for people aged 15 to 24, nearly six times the rate for those aged between 25 and 64 and about twice the rate for people over 65 years of age. Because the non- Indigenous death rates to which they were standardised were very low for all but the over 65 age group, these figures can be misinterpreted - in 1998 the crude annual death rates for ATSI people were only 15% above the Australian average and that is the more immediate indicator of resource needs. However a difference of even this size has a considerable impact on life expectancy. In 1990, it was about 17 years less than the national average.

* the disparity between these health indicators and the level of health care outlays. In 1995-96 estimated spending per person for and by Indigenous people was only about 8% about the non-Indigenous average. For government expenditures it was much higher - about 1.5 times the national figure - but that was no more than people in the same income category (the lowest 20% of incomes) also received from public sources. The inference was that although Indigenous people may have been fairly treated in relation to their economic position, their poorer health status was not adequately reflected.

* the substantial differences between outlays per person across the States and Territories, from about 0.8 times the non-Indigenous average in the ACT to 3.34 times that figure in the Northern Territory. In general, the ratio was highest in the States/Territories where the Aboriginal proportion of the population was greatest but these were also the jurisdictions in which the largest proportion of them lived in remote areas. Some of the costs which were attributed to Aboriginality may thus have been due to remoteness but identification may have also played a part. It is always better the higher the proportion of Indigenous people in the population.

* the all-pervasive influence of identification, a problem which affects the numerators and denominators of both the Indigenous and non-Indigenous rates. Under-identification is widespread but there is no definitive answer to the question of by how much and it is hard to see how there could be while the criteria for Aboriginality rest on a combination of self-identification and community acceptance. Death certificates provide for indigenous recording but under-reporting is apparently high and the only mainstream service which tries to capture Indigenous status is the inpatient section of general hospitals. However there is a general reluctance to single out ATSI people as the only group to be asked about their racial origin. In all the other services, identification was inferred from surveys which were generally small and often not designed for the purpose. **There are no other health-related data bases which record race routinely.**

Application

* conceptually, the gold standard for assessing the health service needs of Indigenous people would be community surveys of the prevalence of illness and disability amongst them. For each condition, resource needs could then be estimated from the best evidence on aetiology (for preventive measures) and the efficacy of treatment. The standards could be either current 'best practice' or more realistically, the standards common to non-Indigenous people. However disguised, it is impossible to avoid that overall benchmark, even for

internal comparisons of need, although that does not imply that the optimal combination of services would or should be the same. Preventive measures would be expected to rank much more highly for Indigenous people than the hospital-based care which represents only the end point of the process.

* this would be a major task, although it could be much reduced by concentrating on certain sentinel conditions whose significance for Indigenous people is already known and /or on sentinel communities thought to be representative of the Indigenous population as a whole. However the difficulty can be overestimated because there are very few communities which have **no contact** with any of the health services and for which there is no evidence of health status at all. Much uncoordinated knowledge already exists and many local studies have been done but for research purposes rather than management. Both providers and Indigenous communities will differ over the ranking of areas of need and what the appropriate policy responses should be. But those are different questions. Any survey effort would require the support and participation of Aboriginal people and, paradoxically, would probably be easier for the remote and rural area populations than for urban dwellers. However it is hard to see how any objective assessment of need could proceed without better data of the underlying health conditions to be addressed.

* the cost should not be prohibitively large in comparison with the \$900+ million currently spent each year on health services for Indigenous people. However it may be thought impossible or unacceptable. Some indirect indicators would then be necessary. The AHMAC-endorsed National Aboriginal Health Performance Indicators report has listed 13 indicators based on mortality, 11 on morbidity (6 of which involve hospital separations), 9 on access to services, 8 on the impact of services and three involve health risk factors. **All of these are currently flawed by either data problems (almost always under-identification) or structural bias.** Eighteen of them could not be reported on at all in 1998 and in all but a few of those with some reported data, validity was limited to Western Australia, South Australia and the Northern Territory (and sometimes Queensland). Nearly all of the data for NSW, Victoria and Tasmania were judged unusable because of under-identification as were most of those for Queensland.

* in some cases it is possible to estimate the likely range of under-identification. The ABS has done so experimentally for deaths and in the health expenditure study overall hospital separation rates were used to test the plausibility of different assumptions about Indigenous identification in such data sets as the hospital morbidity statistics. For that purpose a range of results was acceptable. However for assessing 'needs' as distinct from outlays, even validly reported hospital admission statistics are biased by the excessive reliance on hospitalisation as the only effective way of delivering any specialised services in many cases and the only way of supervising any continuing care for others, particularly in remote areas. They are characteristics of the delivery system rather than indicators of underlying need.

* multiple measures may thus be unavoidable. However if a **single indicator** is required, the only health-related event about which there can be no real argument is death and although Indigenous under-identification is a problem there are ways of estimating its likely magnitude and the results are not biased in the same way as service-based statistics. The attached paper is an attempt to construct, very conservatively, an estimate of total outlays on health services for Indigenous people based on;

- (a) equal outlays for equal levels of morbidity in the Indigenous and non-Indigenous populations,
- (a) adjusted mortality rates as a proxy for morbidity rates,
- (b) some loadings for higher service costs based on area of residence.

The calculation is very broad and not intended as a definitive prescription. Some of its limiting assumptions are mentioned in the paper. It is deliberately conservative and would be applicable below the State/Territory level *only* if the methodology for estimating under-identification held good for smaller populations - which seems unlikely because all that methodology is State/Territory based. In any case, comparative death rates alone are too crude a proxy for the differential needs of local communities. However they may provide a framework within which other more specific indicators could be used.

Summary

(a) resource allocation

* because the prevalence of disease and disability must underlie the demand for health services, any assessment of relative need requires data on its distribution. Information from the existing health services will be flawed if needs are not being met, the structure of the services is biased (particularly in relation to hospital care) and users are not identified correctly. All of these conditions apply to Indigenous people.

* ideally, prevalence would be determined by community surveys and service needs and costs estimated from them on the basis of 'best practice' or 'Australian average' standards. That should not be prohibitively expensive for a group which represents only 2% of the Australian population. However in the meantime a great deal of unstructured knowledge already exists and the first priority should be to commission work which consolidated the data in a purposeful way. Gaps in knowledge could then be identified and programs devised to fill them.

* all of the indicators based on service data are affected by either identification problems or structural bias. Comparative mortality is the only unbiased indicator for which some adjustment for reporting error is also possible. It may not be reliable below the State/Territory level and any such global indicator of resource 'need' would have to be translated into specific services which are widely believed to be wrongly structured at present (ie, in the balance between primary, secondary and tertiary services) but for which no normative standards yet exist. However some combination of general and specific measures should be feasible.

(b) service delivery

* comparative studies of Indigenous health trends in such comparable countries as the United States, Canada and New Zealand suggest that Australia alone has not been able to demonstrate improvement. It is likely that a significant underlying factor has been the lack of a national infrastructure for the development of integrated Indigenous health care programs. The health transition which has occurred in western populations since the turn of the last century was not the result of planned programmatic interventions, rather the sequential consequence of separate but inter-related developments. The Indigenous health challenge is to incorporate these in programs which would provide a platform for health improvement.

* the Aboriginal health problem is well characterised from existing research literature and health information systems. However the latter are patchy and while it is possible to identify the mix of mortality and morbidities which need to be strategically addressed, it is not yet possible to show any simple gradient in health from remote to urban populations or any clear patterns of regional variation. Some of the apparent variations may reflect actual differences in disease prevalence but others may only be the consequence of different research methodologies and different data systems.

* current evidence suggests that effective primary health care, in particular, is critical to the improvement of many specific Indigenous health outcomes - for example, in terms of birth weights, the transmission of communicable diseases (such as sexually transmissible disease) and the prevention of complications of chronic illness (such as the development of renal failure or some of the causes of blindness). It can also be argued - although the evidence is less direct - that an adequate primary care infrastructure is critical to the development of local and regional responses to issues outside the direct influence of the health care sector - for example, in food supply programs.

* primary health is a system, not a single service, with a number of distinct institutional stakeholders (GPs, community health centres, Aboriginal community controlled organisations, the outpatient departments of public hospitals, etc.). In Indigenous health, lines of inter-governmental responsibility are less clear than for the mainstream population. A programmatic response in Indigenous primary care will require operational models specifically developed for Aboriginal health needs, population distribution and utilisation patterns. Currently, there are very mixed patterns of response and use which are not well captured by the quantitative data.

* we are optimistic about the possibility of using current data and methodologies to develop some broadly needs-based funding formulae for Indigenous Australians as a whole; and in ensuring that resources are better directed towards the provision of effective primary health care. However we are not so optimistic about their present adequacy for addressing regional or local communities, particularly in relation to the distribution of resources within Aboriginal populations at, say, the ATSI jurisdictional level.

John Deeble, Ian Anderson and Beverly Siphthorpe

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Expenditures an Aboriginal and Torres Strait Islander health

1 The Association has sought my views on the possible derivation of a 'needs based' formula for allocating resources to health services for Aboriginal and Torres Strait Islander people. The request was in the context of an AMA submission to the Commonwealth government advocating a substantial increase in expenditures over time. There is uniform agreement that the health of Indigenous people is much worse than that of non-Indigenous Australians, although the precise extent is difficult to measure. The life expectancy of Aboriginal people is about 17 years (or about 22%) less than for other Australians. Their age-adjusted mortality rates are about three times the average non-indigenous figures and are very much higher than that for some specific conditions. The resources devoted to their health care are not known with certainty but the only comprehensive study suggested that, in 1995-96, total expenditures per person were only about 8% above the non-indigenous average. That was partly because, like other low income people, they spent relatively little on health care themselves. It was to some extent made up by greater government expenditures - public spending per ATSI person was about 1.5 times the broader population average. However this was no more than was spent by governments on other Australians in the same income category. The inference was that although Indigenous people may have been treated fairly with respect to their economic position, their worse health status was not reflected adequately.

2 Turning this into a needs-based financing formula is by no means easy however, firstly because 'need' is hard to define and even more difficult to measure and secondly because in health care equity and efficiency cannot easily be separated in the way that many people suppose. The report on Aboriginal and Torres Strait Islander Health Expenditures defined the 'ideal' formula as one which took into account not only the prevalence of illness but also its impact on sufferers, the efficacy of treatment or prevention and any barriers to accessing those measures for different groups of people (pp. 50-51). Comparing people in the same economic position partly removes one of the more obvious access variables, but it leaves the questions of prevalence, impact and optimal response unanswered. Methodologically, the only sound approach would combine widespread community prevalence surveys with rigorous data on the effectiveness of both prevention and treatment. The relative position of Aboriginal and Torres Strait Islander people could then be compared, objectively, with others. Equity would require an equal response in all four aspects, not just a simple equality of outlays per person.

3 We are clearly far from that position. There are a number of surveys of the prevalence / incidence of specific diseases in the ATSI peoples but they have been based mainly on rural and remote areas for which the institutional data from *presenting* patients are scarce. Very little has been gathered for urban dwellers. Conversely, almost all of the relevant data for non-Indigenous people comes from the health services themselves and they can be compared with similar data for ATSI people only on the (invalid) assumption that, for any given condition, contact rates are the same and Aboriginal patients are correctly identified. Conceptually, an exception is the self-reported information contained in the periodic National Health Surveys but as the Expenditure Report showed, cultural and other differences make the results doubtful. The only health-related event about which there can be no real argument is death but until very recently the identification of Indigenous people on death certificates was so uncertain that the only check on probable under-recording was to apply a life table approach to estimating total population changes and to infer from that the level of under-reported deaths.

4 However mortality is still the most promising approach and in the calculations which follow I have used comparative death rates, adjusted for estimated under-reporting but not for age structure, as a proxy for morbidity and hence the need for care. In summary, I believe that, at the least, a very defensible case can be made for an increase of about 27% in total expenditures on Aboriginal health (which would lift their per capita spending to 36% above the non-indigenous figure) but since all of this would have to come from governments, the government expenditure ratio would rise to about twice the non-indigenous average (\$2,828 per person compared with \$1,467 in 1995-96 values). The total increase would be about \$230 million per year in 1995-96 values or \$ 245 million currently.

Methodology

5 Because it is well understood and was used in the expenditure study, the basic methodology involves comparing the indigenous and non-indigenous populations. The equity assumption is that for a given level of 'need' the health care resources available to ATSI people should be no less than those now employed by other Australians. As is emphasised in the later summary, this is a relatively weak requirement but one which should not be widely disputed.

6 In the absence of reliable community-based survey data, crude death rates per 1000 population are taken as a proxy for relative morbidity levels in the two populations. Note that this is for comparative purposes only. The quantitative relationships between morbidity and mortality are unknown for either population, involving as they do both the nature and distribution of disease and disability and the case fatality rates for each condition. The only assumption is that, whatever these relationships are, they are the same for indigenous and non-indigenous people. That may not be true in practice but the direction of any error is unknown.

7 On a current population basis, crude death rates are the appropriate measure of comparative morbidity for resource allocation purposes, not the age-standardised rates commonly used in epidemiological studies. Standardised Mortality Ratios (SMRs) are used in the regional allocation formulae of some other countries and several Australian states; and provided that the age structures of the relevant populations are not too different the errors are not material. However when they differ as much as in indigenous - non-indigenous split, the results are grossly misleading. Appendix 1 explains why.

8 Estimates of 'resource need' based on comparative mortality rates would be equivalent to 'expenditure need' if the costs of delivering equivalent services to the two populations were the same. However that is clearly untrue. Apart from all of the cultural and other differences which make service delivery to Aboriginal people more expensive, place of residence is a major determinant and the geographic distribution of Indigenous people is quite different to other Australians. They live in almost equal numbers in metropolitan areas, rural areas not defined as 'remote' and in the most remote rural locations, often in very small communities. In contrast, 70% of the non-indigenous population live in the major cities and only 3% are in remote areas. Data supplied by several States suggest excess costs of around 8% to 10% in non-remote areas and 15% to 20% in 'remote' locations and these are conservative figures based mainly on hospital services rather than primary care programs where the penalties are (or would be) much greater. For Aboriginal people, I have applied cost loadings of 10% for rural residents and 17% for those in remote communities. Both factors are probably underestimated. Figures in the expenditure report show that about \$40 million or 5% of all indigenous health expenditures were in 'excess' outlays for transport and administration alone - that is, payments in excess of the per capita spending on non-indigenous people. Nearly half were in the Northern Territory where both the proportion of ATSI people in the population and the proportion living in remote areas were highest. None of these outlays yielded any additional health services *per se*.

Calculations

Mortality ratios

9 Because of under-identification, the official figures for ATSI deaths in 1995-96 were clearly understated. However a number of States, including NSW and Queensland with the largest indigenous populations, have since introduced new notification forms with a significant increase in reported ATSI mortality. The 1998 rates have therefore been applied to the 1995-96 population. However under-reporting remains a problem. Using the Preston-Hill methodology, the ABS has estimated it as up to 39% in 1998 but there are a number of qualifications to that conclusion. First the 'life table' approach to estimating total population assumes a uniform ATSI demography across the country, which is probably wrong. Second, it depends on the age distribution of the ATSI population in the census, which may also contain reporting errors. The apparent non-identification is certainly high compared to estimates of under-reporting elsewhere. In the expenditure study we estimated it for both hospital and medical services at about 20% nationally (though at least 33% in NSW) and on the medical side the resulting rates of doctor contacts were very similar to those reported in the later, and much larger, BEACH study. However on the hospital side later work suggests that in the 'gold standard' states of the Northern Territory and Western Australia the assumption of 100% identification should be reduced by about six to eight percent. Since their utilisation data were the reference point for estimation in the other states, an upward adjustment would then flow through to most of the other states' figures. However in-hospital identification may well be better than in death certificates generally. Taking both sets of information into account, the mortality under-identification factor used here is 35%, which implies a 54% expansion of the reported deaths for ATSI people.

The calculations are then as follows;

ATSI population

(1) reported deaths, 1998	2,114
(2) est. deaths, adj. for under-reporting, 1998	3,256
(3) est. population, 1998	402,404
(4) est. crude death rate per 1000 pop.	80.9
(4) est. deaths, 1996	2,976

Non-indigenous population

(1) reported deaths, 1996	127,413
(2) est. deaths, adj. for over-reporting, 1996	125,743
(3) est. crude death rate per 1000 pop.	70.6

Mortality rate ratio, Indigenous / non-indigenous people 1.15: 1

Cost loadings

Area	Cost factors	Residence		
		ATSI %	Non ATSI %	Cost Weighted ATSI %
Metropolitan	1.00	33	70	33
Rural	1.10	32	27	36
Remote	1.17	35	3	41
Total		100	100	110

Mortality plus cost, rate ratios

	<u>ATSI</u>	<u>non-ATSI</u>
Mortality	1.15	1.00
Cost	1.10	1.00
Total	1.27	1.00

Expenditures

	\$m
(a) total	
Est. ATSI expenditures, 1995-96, total	853
'Need' adjustment	+27%
'Need adjusted' total	1083
Increase	230

	\$m
(b) by governments	
Est. ATSI expenditures, 1995-96, government	810
'Need' adjustment	+28%
'Need adjusted' government	1040
Increase	230

(c) per person	ATSI (\$)	non-ATSI (\$)	Ratio
Total	2945	2163	1.36: 1
Government	2828	1467	1.93: 1

Application

10 The figures above reflect a per capita allocation of resources to the health care of Aboriginal and Torres Strait Islander people which is the same as that consumed by other Australians with similar levels of health and socio-economic 'need'. Comparative mortality rates are used as measures of health care need and the expenditures required to provide equivalent service volumes are adjusted for the extra cost of providing such services in the areas in which Indigenous people live. And because Aboriginal people have neither the means nor, in many cases, the opportunity to use privately provided services, 95% of their health care funding must come from governments. No allowance has been made for cultural or other differences. Nor is there any provision for a purposeful reduction in the present mortality/morbidity differential between Indigenous and non-Indigenous people. Conceptually, the extra allocation is entirely reactive - those ATSI people who currently fall sick are simply credited with the same entitlements to care as other Australians. For mortality at least, it would presumably have *some* effect on reducing the differentials, but that would depend on the reasons for the difference and how any additional funds were used. For the conventional curative services any impact could be very long delayed.

11 The use of funds is therefore a quite separate matter. As the Expenditure Report pointed out, only a small proportion of the current outlays are through programs directed specifically to Indigenous people. Most are through such mainstream State and Commonwealth-funded services as hospitals, community health services and the Medicare and Pharmaceutical Benefit schemes. Almost all of these services are personal and demand-driven, which presumes that the special needs of Indigenous people can be adequately expressed through the conventional channels of individual demand. That seems to be extremely doubtful. ATSI service use is skewed towards high-cost hospital treatment partly because it is the only practical way of providing any but the simplest care in many situations but also because the primary health services are either unavailable or not well used by Indigenous people. No-one would suggest that any new resources should be expended in the currently unstructured way.

John Deeble

Appendix 1

Mortality rates and resource allocation formula

1 The argument in this paper is that for any given level of 'need' the resources allocated to the Indigenous and non-Indigenous populations should be the same; and that in the absence of specific morbidity data, mortality can be used as an indicator of relative 'need' on the assumption that the relationships between mortality and morbidity are the same for the two groups of people. The question then arises as how community mortality should be measured and compared. I have specified the Crude Mortality Rate (CMR), which is simply the total number of deaths per thousand population per year, as the appropriate measure and have argued that resources should be allocated in accordance with the CMRs for Indigenous and non-Indigenous people. However there are several other ways of comparing mortality. Age Standardised Rate Ratios and Standardised Mortality Ratios (SMRs) are commonly quoted indicators of 'excess' Indigenous mortality. Both suggest rates of around three times the non-Indigenous level, compared with the 15% difference in Crude Death Rates used here. However intuition alone would say that the standardised figures cannot represent the population's actual experience - if all Aboriginal people died at three times the rate of non-Indigenous Australians their life expectancy would be very much less than it now is. Given their widespread use, it is therefore important to understand what the various indicators mean.

2 The answer is of course that they measure very different things. Standardisation is necessary when age composition may be a confounding factor in the interpretation of differential death rates as between, say, experimental and control groups or those from different countries or times. There are two methods of removing its effects. In Direct Standardisation age-specific death rates are calculated for each population and combined by weighting in accordance with the population composition of some *other* reference population, real or hypothetical (a common reference is the WHO's European Standard Population). The difference between the standardised results is then expressed as a 'standardised rate ratio'. Indirect Standardisation uses the age distribution of the study population as a base and for each age group applies the mortality experience of the defined reference group. The outcome is the number of deaths which would be predicted if the study population (in this case, Indigenous people) had the same age specific mortality rates as the reference group (the non-Indigenous population). The ratio of actual deaths in the study population and those predicted from the 'standardised' reference group is then used as a measure of mortality differences alone (the Standardised Mortality Ratio or SMR). It is calculated as follows;

$$SMR = \frac{\sum d^i}{\sum R^i p^i} \quad \text{where}$$

$i =$ age group,
 $d =$ deaths in the study population
 (Indigenous people),
 $R =$ death rate in the reference population
 (other Australians),
 $p =$ numbers in the study population
 (Indigenous people).

3 Direct standardisation is generally regarded as the more accurate procedure but in policy related work the relevance of the reference population is often obscure. 'Indirect' standardisation generally *appears* more relevant but when differences in age distribution are large, its results can be misleading. That is because it weights the comparative mortality experience at different ages quite differently. In the Indigenous/non-Indigenous comparison that is important. About 80% of all the deaths of non-indigenous people occur in people aged 65 years or older, whereas only 20% of the Indigenous population die at similar ages. But because only about 5% of Indigenous people currently survive to that age, the period of highest mortality for non-indigenous people is given very little weight. Conversely the high death rates amongst Aboriginal children contribute much more because over 14% of the Indigenous population are less than five years old, twice the proportion of other Australians. Indirect standardisation thus tends to exaggerate the differences, which why the textbooks all caution against its use when the variation in age composition is large.

3 However these technical issues are not the main concern. The major problem is that neither standardisation method compares the relevant populations directly. Both measure deviations from theoretically constructed norms. In the Indigenous case, no group with the age distribution of ATSI people and the mortality experience of the non-Indigenous population either exists or could ever exist, given the interaction between those two factors. Deviations from its predicted outcome therefore have no real-world parallel, however useful they may be for description and analysis. If a resource allocation formula is to be (a) population based and (b) reflective of the relative quantum of mortality/morbidity in the current Indigenous and non-Indigenous populations, the only indicators which are both valid and available are their unstandardised death rates. A case could of course be made for margins in favour of indigenous people which were greater than the mortality/morbidity relativities, on the ground that higher expenditures might reduce their present disadvantage. However that is an empirical question about causality and the effectiveness of treatment. It has nothing to do with how the differences are measured.

Appendix 2

Sources

Australian Bureau of Statistics, 1998, Deaths 1998, Cat. 3231.0

Australian Bureau of Statistics, 1999, Experimental projections of the Aboriginal and Torres Strait Islander population, Cat 3302.0

Australian Institute of Health and Welfare, 1998. Australia's Health 1998, pp 7, 8, 28, 41. Note that the geographic distribution of the Indigenous and non-Indigenous populations used in this paper follows the RRMA classification by zone of residence in Box 3.2 of Australia's Health (p 41), although the presentation in another AIHW report is different (The Health and Welfare of Aboriginal and Torres Strait Islander People, 1999, p 14).

Deeble J, Mathers C, et al, Expenditures of Health Services for Aboriginal and Torres Strait Islander People, Department of Health and Family Services, 1998, pp. 6, 12, 13, 57, 63