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Obstetrical outcomes of Aboriginal pregnancies at a major urban hospital

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Abstract: While a number of previous papers have documented the poor general health of Australia's Aboriginal population, relatively few have considered the health of Aborigines living in Australia's urban centres. In this latter instance, Aborigines have access to conventional medical services and they live in a physical environment that does not differ greatly from that experienced by the lower-class white population. Of course, racial, familial and economic differences may continue to influence differentially the perceived accessibility of services to Aborigines and their non-Aboriginal neighbours. This paper compares the pregnancy outcomes of Aboriginal women and non-Aboriginal women living in a major urban centre in Australia. The data indicate that urban Aboriginal women have adverse pregnancy outcomes at one and a half to two times the rate experienced by the non-Aboriginal population. Much of the difference can be attributed to Lifestyle variations in the groups being compared. (Aus J Public Health 1994, 18: 185-9)

There is clear evidence that Aborigines have the poorest health of any identifiable group in Australia; they carry a burden of ill-health and mortality far in excess of that expected from their proportion in the Australian population. This has been well documented on many occasions.¹⁻³

Despite improvements since the 1970s, Australian Aborigines have an overall death rate which is three to four times higher and a life expectancy substantially shorter than their non-Aboriginal counterparts. They have higher disease rates and use more hospital services for almost all disease categories. The causes of these health inequalities are varied and complex. They include social and economic inequalities, less adequate housing and related facilities and often poor access to high quality medical services, occasioned in part by their physical isolation from mainstream facilities and services.

The disproportionately high incidence of infant mortality in Australian Aborigines is associated with a greater propensity for child-bearing at a younger age,² but other factors of importance may include the mother's education, income levels and the type of community in which she lives. Risk factors for Aboriginal mothers include poorer nutritional status, less antenatal care and higher rates of cigarette and alcohol consumption. Of particular note is the high rate of perinatal and infant deaths in Aboriginal communities.² Aboriginal fertility rates have halved in the last decade,⁴ although the level of child-bearing still remains relatively high.

Much of the available data have come from Aborigines living in isolated and rural circumstances where the impact of lifestyle differences between Aborigines and non-Aborigines is confounded by differences in the medical care they receive. However, in many areas, Aborigines now live in urban centres, often in the most economically disadvantaged areas—but with access to the medical services which serve the adjacent non-Aboriginal community. Of course, the availability of sophisticated medical services does not mean that they are culturally appropriate and that all racial groups will find them accessible and supportive. Leaving aside the possibility that racist attitudes and practices may persist, there remains the probability that a

substantial proportion of the Aboriginal population will find that existing obstetrical services will conflict with their cultural expectations and preferences. Experience with the previous strategies of delivering 'culturally appropriate' obstetrical services to Aborigines in Australia suggests they may be more used and perceived as more accessible than existing obstetrical services.⁵

Previous studies of Aboriginal obstetrical outcomes

Age-specific fertility

The 1986 census reveals that Australian Aboriginal mothers bear larger numbers of children at young ages when compared to the overall Australian population. In the 15 to 19 age group, Aboriginal fertility is almost five times the Australian rate, in the 20 to 24 age category it is almost twice the Australian rate, and after 30 years of age. Aboriginal fertility is of the same magnitude as that of the Australian population.⁶ The data also show that the parity of Aboriginal women is considerably greater than that of their non-Aboriginal counterparts.² Aboriginal fertility rates have been declining and the decline is expected to continue.⁶ These two factors (age and parity) make a substantial contribution to the high rates of child mortality for Aboriginal mothers, and for the purposes of this study need to be statistically controlled when comparing the obstetrical outcomes of the Aboriginal and non-Aboriginal population.

Infant mortality

Infant survival can be measured by comparing 1986 census data on the number of children ever born with the number of those surviving. While the mother's age and parity are two of the most influential factors in infant mortality, social and economic factors also reveal interesting results. Those mothers leaving school before the age of 14, from a low-income household, and living in rural settlements, are more likely to have an infant die.²

Infant mortality rates, being relatively easy to obtain, are commonly used in the comparison of health standards in the community. The rate for Aborigines has improved dramatically over the last two decades, but in 1982 it was still approximately three times the non-Aboriginal rate. In the 1986 Australian census the Aboriginal figure of 28 deaths per 1000 births was almost twice that of non-Aboriginal (15 per 1000) births.² Recently released figures from the Australian Institute of Health and Welfare point to substantial differences between Australian states in their infant and perinatal mortality rates. In 1990, Aborigines living in the Northern Territory had infant and perinatal mortality rates about three times, and those living in Queensland communities about twice, that of the Australian population overall.⁷

Obstetrical outcomes

The National Aboriginal Health Strategy Working Party reported in 1989 that Aboriginal pregnancies were more likely to result in preterm delivery, low birth weight or (in metropolitan areas) termination.⁴ The document cited data from Western Australia (1983—1985) and from the Northern Territory (1986), revealing that between 13 per cent and 15 per cent of Aboriginal babies were of low birth weight (< 2500 grams). Babies with low birth weight are at greater risk of neonatal and postneonatal illness or death. The proportion of Aboriginal babies having low birth weight is more than double the proportion for non-Aborigines (6 per cent). Differences between Aboriginal and non-Aboriginal birth weights were also documented in the Murray River Study where the relative frequency of Aboriginal

infants with low birthweight was twice that of local non-Aboriginal infants born over the same period. The study also revealed that 21 per cent of infants born were small for their gestational age, which was twice the expected proportion based upon non-Aboriginal rates. Seward and Stanley noted a similar pattern in their own study of Aboriginal infants in Western Australia.⁹

Low birth weight may be the result of an adverse intrauterine environment caused by poor nutrition, excessive smoking or drinking and poor social circumstances.¹⁰ Research shows in many instances that Aboriginal mothers are overrepresented in these risk groups^{2,8,12}

Aboriginal obstetrical outcomes after obstetrical care from a tertiary facility in a large city

Very little has been written about Aboriginal obstetrical outcomes in major urban centres. Early research reported that Aborigines living in urban areas were a high risk group with regard to reproduction, with a perinatal mortality rate twice that of their equivalent non-Aboriginal counterparts in a major West Australian hospital. In addition, a disproportionately high incidence of infants with low birth weight, fetal distress, stillbirths, neonatal deaths and major congenital abnormalities was revealed.¹³

Nationally, the 1986 census data showed little variation in the incidence of Aboriginal infant loss with respect to whether the mother lived in a rural or urban location. The variation became slightly more marked when more geographic detail was added. Differences between the towns and rural areas of the Northern Territory suggest that variations in environmental health still determine much of the infant and child mortality in the area, despite health programs designed to alleviate them.² The Northern Territory finding appears to confirm Cox's Queensland study which reported that, among Aborigines, the most urbanised Aborigines had the highest average birth weights.¹⁴ This study also showed that, as the number of antenatal visits decreased, the mean birth weights decreased. It follows that for areas where increased antenatal care is available, the distribution of birth weights can be expected to improve.

Hewitt and Newnham document an increase in the number of very low-birth-weight babies of Aboriginal mothers delivered at King Edward Memorial hospital in Perth.¹⁵ The number of very low-birth-weight babies of non-Aboriginal origin increased by a small percentage from 1980 to 1985, while those of Aboriginal origin increased by many times. This may in part reflect the increased use of services and survival of high-risk babies occurring over this period.

This paper reports on findings from a longitudinal study of factors influencing the outcomes of pregnancies in a large urban sample of pregnant women, the Mater University Study of Pregnancy (MUSP). It is concerned specifically with whether Aboriginal women who were receiving what would be conventionally considered high quality obstetrical care at a major tertiary hospital, have pregnancy outcomes inferior to those of their non-Aboriginal counterparts.

Data and methods

Sampling and research design

Data analysed in this paper were gathered as part of a longitudinal study of 8556 pregnancies at one of the two major obstetric hospitals in Brisbane. The hospital involved in the study receives regular referrals of women of Aboriginal background for obstetric care. The local Aboriginal and Islander health service provides such

referrals and, in turn, may receive referrals for regular antenatal observation. Further, the hospital has a high-risk clinic to which women believed to warrant extra care are sent. The hospital has significant obstetrical, neonatal and paediatric tertiary care facilities. This allows for the management of high-risk pregnancies and for retrieving cases for which smaller hospitals may not be equipped.

Data were obtained in two phases and from three sources. Women were initially enrolled in the study at their first antenatal clinic visit (Phase 1) and they completed a second questionnaire three to five days after the birth of their babies (Phase 2). Data were also extracted from the clinical record of the birth. Basic data analysis was undertaken with SAS;¹⁶ logistic regression was carried out using the epidemiological package EGRET.¹⁷ Details of sampling, questionnaires and response rates are in Keeping et al.¹⁸

Results

Table 1 shows the attrition rate for the main comparison groups in the study. Details of the respondent's background were derived from a category in the self-report questionnaire which required the respondent to place a tick next to the item which reflected her background. Consequently the categories reflect a respondent's perception that she belongs to a particular group rather than biological or legal considerations. The majority of respondents were residents of Brisbane, but a small number of Aboriginal women came from substantial distances to have their children in Brisbane. Attrition rates over the follow-up period were low, with between 9 per cent and 14 per cent of women being lost to follow-up. Only women who delivered at the study hospital (n = 7420) and who had responded to the first-phase question on background were considered in the analyses which follow.

Table 1: Number of study participant and sample attrition (%) from first clinic visit to delivery

	First clinic visit n	Delivery n	Attrition %
<i>Maternal background, first clinic visit</i>			
Aboriginal	202	173	14.4
Non-Aboriginal	7957	7247	8.9
Maori/Islander	160	141	11.9
Asian	314	281	10.5
Other	7483	6825	8.8
No answer	299	269	10.0
Completed phase	8458	7689	9.1
Did not complete phase	98	769	
Total eligible for phase	8556	8458	

Table 2: Percentages of Aboriginal and non-Aboriginal mothers with various demographic characteristics

	Aboriginal		Non-Aboriginal	
	%	N	%	N
Age < 20 years at phase 1	28.9	173	16.5	7247
Age ≥ 30 years at phase 1	13.3	173	17.3	7247
No previous live births	41.6	173	41.8	7247
≥ 4 previous live births	3.5	173	4.0	7247
< 3 years secondary education	30.2	172	18.5	7202
Annual family income < \$5 200	19.3	150	9.1	6813
Single	26.5	170	10.6	7211
Relationship < 1 year	27.9	140	17.0	6742

Note:

(a) N less than 173 for Aboriginal mothers and N less than 7247 for non-Aboriginal mothers will occur because of nonresponse to the corresponding item.

Aboriginal mothers were, on average, younger, less educated, of lower income, less likely to be married and more likely to have had a short relationship with their partners (Table 2).

Table 3 compares Aboriginal and non-Aboriginal mothers on two lifestyle variables relevant to their pregnancy outcomes, namely self-reported smoking and alcohol consumption at the first clinic visit (usually in the first trimester). Aboriginal mothers consistently reported higher rates of smoking during pregnancy and also had the highest proportion of binge drinkers (five or more glasses per session).

Table 4 examines two indicators of the adequacy of antenatal care, namely the proportion attending less than half the expected antenatal visits and the proportion who had their first antenatal visit at 31 weeks gestation or later. Data here are taken from the medical record of the pregnancy. Aboriginal mothers were three times more likely not to attend for the recommended number of antenatal visits, or to begin their antenatal care in the third trimester. Adjusting for the mother's education, age and parity does not materially change these estimates.

Table 3: Percentages, odds ratios and adjusted odds ratios of mothers smoking cigarettes and consuming alcohol during pregnancy, by maternal Aboriginality

	Number	Percentage	Odds ratio	95% CI ^a	Adjusted odds ratio ^b	95% CI ^a
<i>Smoking during early pregnancy (N=7321)</i>						
Aboriginal	168	53.0	1.8	1.3 to 2.5	1.5	1.1 to 2.1
Non-Aboriginal	7153	38.4	1		1	
<i>Smoking 20+ cigarettes per day (N=7321)</i>						
Aboriginal	168	16.1	2.0	1.3 to 3.0	1.7	1.1 to 2.5
Non-Aboriginal	7153	8.9	1		1	
<i>Consuming alcohol in early pregnancy (N=7341)</i>						
Aboriginal	170	18.8	1.2	0.8 to 1.7	1.3	0.9 to 2.0
Non-Aboriginal	7171	16.5	1		1	
<i>Consuming >5 glasses alcohol in early pregnancy (N=7328)^c</i>						
Aboriginal	166	9.6	6.4	3.7 to 11.1	5.4	3.1 to 9.4
Non-Aboriginal	7162	1.6	1		1	

Notes: (a) CI=confidence interval. (b) Adjusted for maternal education, age and parity. (c) This differs from that used for consumption of alcohol as some alcohol consumers failed to quantify their consumption.

Table 4: Percentages, odds ratios and adjusted odds ratios of extent of antenatal care by maternal Aboriginality

	Number	Percentage	Odds ratio	95% CI ^a	Adjusted odds ratio ^b	95% CI ^a
<i>Attending less than 50% of visits (N=7341)</i>						
Aboriginal	171	13.5	3.3	2.1 to 5.1	3.0	1.9 to 4.8
Non-Aboriginal	7170	4.6	1		1	
<i>Attending later than 31 weeks (N=7337)</i>						
Aboriginal	168	10.1	2.8	1.7 to 4.7	2.3	1.4 to 4.0
Non-Aboriginal	7169	3.9	1		1	

Notes: (a) CI=confidence interval. (b) Adjusted for maternal education, age and parity.

Finally, Table 5 compares the groups on their pregnancy outcomes. Aboriginal women had poorer pregnancy outcomes, and while many of the estimates of adverse pregnancy outcomes are statistically unstable, owing to small numbers, there is a consistent trend indicating that adverse outcomes occur in urban Aborigines at about one and a half times to twice the rate as in the urban non-Aboriginal community. Thus, the low Apgar scores at five minutes, time to establish respiration, the need to use mechanical resuscitation and the rate of low birthweight all point to a consistent trend. Adjusting for the lifestyle factors and extent of antenatal care reduces the estimate of the strength of association between the mother's race and pregnancy outcomes. This suggests that at least part of the observed effects are attributable to lifestyle differences between the mothers.

The study also considered the number of neonatal deaths by Aboriginality. Non-Aboriginal mothers had 104 deaths in 7247 births (14.4 per 1000) and Aboriginal mothers had 5 deaths from 173 births (28.9 per 1000 births). Thus, children of Aboriginal mothers had a twofold increase in risk of neonatal death, compared to non-Aboriginal mothers. This difference approached statistical significance using a Fisher's exact test ($P = 0.11$).

Table 5: Percentages, odds ratios and adjusted odds ratios for each obstetric outcome by maternal Aboriginality

	Number	Percentage	Odds ratio	95% CI ^a	Adjusted odds ratio ^b	95% CI ^a
Gestation < 38 weeks (N=7283)						
Aboriginal	165	14.6	1.5	0.9 to 2.3	1.3	0.8 to 2.0
Non-Aboriginal	7118	10.4	1		1	
Birth weight < 2500 g (N=7279)						
Aboriginal	165	7.9	1.6	0.9 to 2.8	1.3	0.7 to 2.3
Non-Aboriginal	7114	5.2	1		1	
Below first weight decile (N=7280)						
Aboriginal	165	9.1	0.8	0.5 to 1.4	0.7	0.4 to 1.2
Non-Aboriginal	7115	10.9	1		1	
> 3 minutes to respiration (N=6939)						
Aboriginal	161	6.8	1.6	0.9 to 3.0	1.6	0.8 to 2.9
Non-Aboriginal	6778	4.3	1		1	
Apgar ≤6 at 5 minutes (N=6851)						
Aboriginal	161	7.5	2.3	1.2 to 4.1	2.1	1.1 to 3.8
Non-Aboriginal	6690	3.4	1		1	
Mechanical resuscitation used (N=6484)						
Aboriginal	153	7.2	1.7	1.0 to 3.3	1.6	0.8 to 2.9
Non-Aboriginal	6331	4.5	1		1	

Notes: (a) CI=confidence interval. (b) Adjusted for maternal education, age, parity, smoking and alcohol consumption in early pregnancy, and antenatal care.

Discussion

Previous reports have consistently indicated that mothers of Aboriginal descent have higher rates of adverse pregnancy outcomes. The explanations of the inequalities have included: the recognition of their poorer environmental conditions, particularly for Aborigines living in rural areas; lifestyle differences which include higher levels of cigarette and alcohol consumption by Aboriginal mothers; and less adequate medical care services which may result from either a lack of services or an unwillingness to use available services, sometimes because they are felt to be culturally inappropriate. This study confirms that Aboriginal mothers receiving their obstetric care from a large, sophisticated city facility manifest a less healthy lifestyle which is likely to produce less favourable pregnancy outcomes. These lifestyle differences reflect, to some extent, the low mean age, low levels of education and high levels of poverty experienced by Aboriginal mothers. Indeed, both the demographic and the lifestyle characteristics of Aboriginal mothers lead one to anticipate that Aboriginal mothers would be expected to have a higher likelihood of a complicated pregnancy. Although overall the data indicate that most Aboriginal women give birth without complications to a child of approximately normal weight and gestation, there is the suggestion that Aboriginal women have an adverse outcome some 1.5 to 2.3 times that of non-Aboriginal women. This seems to be somewhat below most previous estimates of the rates of Aboriginal perinatal mortality which, for rural groups, are generally two to three times the estimated rate of non-Aboriginal perinatal mortality. The apparently smaller mortality differential for urban Aborigines occurs in a context where all racial groups are receiving what appears to be a good quality of obstetric care.

There is reason to interpret the results with caution. It may be that the 29 Aboriginal mothers lost to follow-up had poorer pregnancy outcomes than the 710 non-

Aboriginal mothers lost to follow-up. Most such losses reflect people who have moved residence from the area served by the hospital and, in one sense, they are not salient to this study. Further, while the past obstetric histories and medical records of these women are likely to contain errors, there is little reason to believe these are systematic and such that they could produce biased conclusions. The adjustment for smoking, alcohol, age and parity tended to reduce the estimate of the differences between the non-Aboriginal and Aboriginal rates of advent pregnancy outcomes. This indicates that a large part of the differences in pregnancy outcome may be a function of racial differences in lifestyle. However, additional adjustment for such potential confounders as marital status and frequency of antenatal care was not possible because of the low frequencies of many of the adverse outcomes.

Differences between the pregnancy outcomes of the Aboriginal and non-Aboriginal samples compared in this study fall into two broad areas. Firstly, there is clear evidence of higher rates of risk behaviours (cigarette and alcohol use) in the Aboriginal sample. Although there is an urgent need for prevention programs to address these behavioural differences, it must be noted that such behaviours reflect the social, political and economic context in which the Aboriginal population lives. Excessive cigarette and alcohol use (as well as other health problems such as accidents and violence) reflect the high levels of unemployment, poverty, marital dissolution and racial discrimination experienced by Australia's Aboriginal population. Prevention programs can have only a minimal impact on the unhealthy lifestyle of Aborigines while the structural basis of this lifestyle remains in place. Secondly, it is clear that Aborigines do not use the available antenatal services at the same level as the non-Aboriginal population. Traditionally in Australia, obstetric services have been built in major cities where it is possible to locate both the required sophisticated technology and expertise. Obstetric services are available to those who seek them. From the point of view of Aboriginal mothers, such services are sought 'too little and too late'. There is clearly a need for an outreach from obstetric services to locate and provide a wider range of services to Aboriginal mothers. If Aboriginal mothers' reluctance to use these services reflects dissatisfaction with the manner or style with which they are delivered, then alternative methods of delivering such services need to be found. To the extent that we continue to deliver services which are not being used adequately, the health system can be considered a contributing cause of the higher rates of morbidity and mortality in the Aboriginal community.

Conclusion

The results of this paper suggest that the less favourable pregnancy outcomes resulting from certain sociodemographic and lifestyle characteristics of Aboriginal mothers can, to a modest extent, be overcome by providing these women with modern obstetric care. However, even the provision of sophisticated obstetric services does not eliminate inequalities in Aboriginal and non-Aboriginal pregnancy outcomes. The data point to the need for initiatives which would directly influence the life circumstances of Aboriginal women. The study suggests that the provision of sophisticated medical services is likely to represent only part of the solution for the large number of Aboriginal women living outside urban areas.

References

1. Australian Bureau of Statistics. (1990). *Aboriginal people in the Northern Territory*. Canberra: Government Printer of the Northern Territory.

2. Gray A. (1988). Aboriginal child survival. *An analysis of results from the 1986 census of population and housing*. Canberra: Australian Bureau of Statistics, Australian Government Printing Office.
3. Department of Health (1980). Aboriginal Health Bulletin, Aboriginal vital statistics: an analysis of trends. Canberra: Australian Government Publishing Service.
4. *National Aboriginal Health Strategy*. (1989). Canberra: Australian Government Publishing Service.
5. Abbott L, Carter E. (1989). The Congress Alukura pilot health programme. *Aboriginal Health Information Bull*, Canberra, 11: 23-6.
6. Gray A. (1988). Aboriginal fertility: trends and prospects. *Working paper no. 6*. Canberra: National Centre for Epidemiology and Population Health.
7. Hogg R, Thompson N. (1992). *Fertility and mortality of Aborigines Living in Queensland Aboriginal communities 1972—1990*. Canberra: Australian Government Publishing Service.
8. Cameron FJ, DeBelle GD. (1986). Nutrition of Aboriginal infants and children in the Murray Valley. *Med J Aus*; 144(suppl):55—8.
9. Seward JF, Stanley FJ. (1981). Comparison of births to Aboriginal and Caucasian mothers in Western Australia. *Med J Aus*, 2: 80—4.
10. McCormick MC, Brooks-Gunn J, Shorter T, Holmes JH, et al. (1990). Factors associated with smoking in low income pregnant women: relationship to birth weight, stressful life events, social support, health behaviour and mental distress. *J Clin Epidemiol*; 43: 441—8.
11. Newman NM (1987). The enigma of pre-term birth. *Med J Aus* 1987; 149: 230-1.
12. Gracey M, Spargo RM. 'The state of health of Aborigines in the Kimberley region. *Med J Aus*; 146: 200—4.
13. Momson, J (1968). The obstetrical performance of urban Aborigines. *Aust NZ J Obstet Gynaecol*; 8; 95.
14. Cost JW. (1978). The Effect of racial origin, geographical location and antenatal care on an infants birth weight. *Aust Paediatr J*; 14: 165—8.
15. Hewitt SC, Newnham JP. (1988). A review of the obstetric and medical complications leading to the delivery of infants of very low birth weight. *Med J Aus*; 149: 234—42.
16. SAS Institute Inc. (1985). *SAS user's guide*. 5th edition. Cary, NC: SAS Institute inc.
17. Statistical and Epidemiology Research Corporation. (1990). *EGRET*. Seattle: SERC.
18. Keeping JD, Najman JM, Morrison J, Western JS, et al. (1989). A prospective longitudinal study of social, psychological and demographic characteristics of the 8555 respondents. *Br J Gynaecol*; 96: 289—97.