

**INDIGENOUS FERTILITY IN THE NORTHERN  
TERRITORY OF AUSTRALIA:  
STALLED DEMOGRAPHIC TRANSITION?**

A thesis submitted for the Degree of Doctor of Philosophy of  
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Except where otherwise indicated, this thesis is my own work

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Kim Johnstone

Dedicated to  
Lester Graham Robinson  
1953 – 2007

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## **Abstract**

This research explores contemporary features of Indigenous fertility in the Northern Territory of Australia, the country's third largest state with the smallest total population, but with the largest proportion comprised of Indigenous peoples. The research exploits births data from a range of sources to investigate whether Indigenous fertility trends in the Northern Territory over the past 20 years are a characteristic of stalled demographic transition. The research rests on three hypotheses: that Indigenous fertility trends in the Northern Territory were themselves an artefact of the data used to calculate the fertility rates; that there has been stalled demographic transition and the fertility declines documented for Northern Territory women during the 1960s and 1970s have not been maintained into the 21<sup>st</sup> century; and that contemporary Indigenous childbearing is characterised by universal, young mothering but not high parity.

A conceptual framework was developed that captures the myriad factors that affect Indigenous fertility outcomes to provide a context within which the research results can be understood. A three-stage approach was then used to examine Indigenous fertility trends. Firstly, a detailed analysis of the collection processes for the quantitative data available for this research was undertaken, with a particular focus on the two main births data sets, vital registrations and perinatal data. Second, standard demographic techniques were used to identify fertility trends, exploiting the two births data sets, census data and survey data from the DRUID Study, a Darwin-based epidemiological study of Indigenous people. Third, a range of views and experiences of Indigenous individuals were sought through interviews and focus groups.

The research showed that despite Indigenous population data in the Northern Territory being among Australia's most accurate, the use of these is constrained by issues of undercount and geographic coding of usual place of residence. Documentation of the investigation into data sources is an important contribution of this research. The stand out feature of contemporary fertility in the Northern Territory is the young age that Indigenous women have children. Teenage fertility rates are very high and peak childbearing is among women in their early 20s. There have been relatively stable total fertility rates (TFRs) among Indigenous women in the Northern Territory over a 20-year period, indicative of stalled demographic transition, but these belie complex geographic differences. There is evidence of fertility decline at the youngest ages in remote parts of the Northern Territory and indications of a small move to delayed childbearing. The

timing of this fertility decline corresponds to the introduction of Implanon as a reliable form of contraception. Education among women was shown to be associated with slightly delayed entry to childbearing and lower parity, and although the associations were significant the impact they had was not dramatic. Into the future, we can expect to see birth cohorts of increasingly large size even with stable or declining TFRs, a continued young profile for childbearing and different fertility rates between urban and rural-remote communities, all of which have serious implications for the delivery of social services and social policy implementation.



## Preface

Ethics approval for access to data held by the Northern Territory Department of Health and Families was received from the Human Research Ethics Committee of the NT Department of Health and Families and Menzies School of Health Research (Reference No. 08/24).

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Two chapters of this thesis are based on work published during my PhD candidature:

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# Table of Contents

Acknowledgements	v
Abstract	vii
Preface	ix
Table of Contents	xi
List of Tables	xiv
List of Figures	xvii
Acronyms	xx
CHAPTER ONE: INTRODUCTION	1
1.1: Purpose of the research	1
1.2: Defining the Indigenous population	5
1.3: Introducing the Northern Territory	7
1.4: Methodological	14
1.5: Organisation of the thesis	20
CHAPTER TWO: TOWARDS A CONCEPTUAL FRAMEWORK OF INDIGENOUS FERTILITY	23
2.1: Introduction	23
Determinants of fertility	24
2.2: Romaniuk's history-based explanatory framework	26
2.3: Conceptual framework for understanding contemporary Indigenous fertility in Australia	31
Proximate determinants of fertility outcomes	34
Perceived demand for children	34
Perceived supply of children	36
Perceived cost of fertility regulation	38
Exogenous and social influences on Indigenous fertility	41
Colonisation	41
Geography, gender and indigeneity	45
Health	49
Socio-economic status	51
2.4: From conception to praxis	53

CHAPTER THREE: INDIGENOUS DATA SOURCES – AVAILABILITY, RELIABILITY AND PLASTICITY	55
3.1: Introduction	55
3.2: Births data	56
A note on geography	67
Data used in this thesis	72
3.3: The denominator	73
Creating reverse projections	76
Taking account of migration	79
3.4: A question of age	81
3.5: Moulding the data	83
 CHAPTER FOUR: ALTERNATIVE PREGNANCY AND BIRTHS DATA	 85
4.1: Introduction	85
4.2: Children ever-born	85
4.3: Survey data	89
4.4: Termination of pregnancy (TOP) data	96
4.5: Summary	97
 CHAPTER FIVE: PLACE MATTERS – TOWN AND BUSH VARIATIONS IN NORTHERN TERRITORY FERTILITY	 99
5.1: Introduction	99
5.2: Number of children born to Indigenous women in the Northern Territory	99
Regional variations in total fertility rates	106
Migration effects	107
Regional variations in age-specific fertility rates	109
Migration effects	115
Regional variation in census data	117
5.3: The impact of induced abortion	119
5.4: Geography and socio-economic interactions	124
5.5: Discussion	128
 CHAPTER SIX: A PROFILE OF INDIGENOUS FERTILITY IN DARWIN	 131
6.1: Fertility patterns in Darwin	131
6.2: Influences on fertility outcomes in an urban setting	133

Ever being pregnant	133
Age at first birth	136
Parity	139
6.3: Overview	141
CHAPTER SEVEN: HAVING BABIES YOUNG – THE TERRITORY NORM	143
7.1: Introduction	143
7.2: Data effects on the youth profile of Indigenous fertility	144
7.3: Pregnancy and births	146
7.4: Timing and spacing	152
7.5: Socio-economic ‘predictors’ of teenage pregnancy and childbirth	159
7.6: Young mothers – observations and experiences from on the ground	165
7.7: Discussion	171
CHAPTER EIGHT: CONCLUSIONS	175
8.1: Indigenous fertility – stalled data transition?	175
8.2: Stalled demographic transition in the Northern Territory	178
8.3: Young motherhood	181
8.4: Research implications	182
8.5: Social and policy implications for the Northern Territory and Australia	185
Appendix A.1: Health districts, Department of Health, Northern Territory	189
References	191

## List of Tables

Table 1.1:	Number and per cent of the Indigenous population living in very remote areas by state/territory, 2006	9
Table 1.2:	Per cent of Indigenous population aged 15 years and over against selected socio-economic characteristics by state/territory, 2006	11
Table 3.1:	Usual residence population counts, total and Indigenous population, 2006	69
Table 3.2:	Information about the Northern Territory perinatal and vital registration data used in this research	73
Table 3.3:	Fertility measures used in this research	84
Table 4.1:	Formulae for Gray indices	88
Table 4.2:	Comparison of age distribution of females 15-44 years, DRUID participants (women's health questionnaire) and estimated resident population of the Yilli Rreung ATSIC Region 2004	91
Table 4.3:	Per cent Indigenous women who have ever had live birth by age at time of survey/census, Darwin Urban, 2004 and 2006	92
Table 4.4:	Pregnancy and abortion measures used in this research	97
Table 5.1:	Indigenous observed and tempo-adjusted total fertility rates, Northern Territory, 1986, 1995, 1996, 2005	105
Table 5.2:	Indigenous age-specific rates, Darwin Urban, Alice Springs Urban and NT Remainder usual place of residence, Northern Territory, 1988 and 2007	114
Table 5.3:	Average parity reported by Indigenous women aged 20-44 years, Darwin Urban, urban and rural-remote place of usual residence, Northern Territory, 1986, 1996, 2006	117
Table 5.4:	Indigenous child-women ratios, Darwin Urban, Alice Springs Urban and NT Remainder place of usual residence, Northern Territory, 2006	118

Table 5.5:	Reported children ever born by NT Indigenous women aged 15-34 years, Darwin Urban, urban and rural-remote place of usual residence, 1986, 1996, 2006	119
Table 5.6:	Reported children ever born by Indigenous women aged 15-34 years, education and employment status, Northern Territory, 1986, 1996, 2006	125
Table 5.7:	Gray indices for Northern Territory Indigenous women aged 15-34 years, place of usual residence, employment and education status, 1986, 1996, 2006	127
Table 6.1:	Number and per cent of DRUID Study women's health sample who reported being ever-pregnant by socio-economic and contraceptive use characteristics	134
Table 6.2:	Logistic regression coefficients – estimates of influence from socio-economic and contraceptive use characteristics on ever-being pregnant, Indigenous women 20-44 years, Darwin Urban region, 2003-2005	135
Table 6.3:	Multiple linear regression coefficients – estimates of influence from socio-economic and contraceptive use characteristics on age at first birth, Indigenous women 20-44 years, Darwin Urban region, 2003-2005	138
Table 6.4:	Multiple linear regression coefficients – estimates of influence from socio-economic and contraceptive use characteristics on number of children born, Indigenous women 20-44 years, Darwin Urban region, 2003-2005	140
Table 7.1:	Measures of early childbearing, Indigenous women, Darwin Urban and NT Remainder, selected years 1988 to 2007	150
Table 7.2:	Median age (years) of Indigenous mothers by order of birth, Northern Territory, 1986-2005 (four-year averages)	154
Table 7.3:	Period parity progression ratios, Indigenous women 15-49 years, Northern Territory, 1986-2005 (four-year averages)	157

Table 7.4:	Indigenous 15-19 year order-specific fertility rates and period parity progression ratios, Northern Territory, 1986-2005 (four-year averages)	158
Table 7.5:	Number and per cent of DRUID Study women's health sample who reported being pregnant or having a live birth before the age of 20 by socio-economic and contraceptive use characteristics	161
Table 7.6:	Logistic regression coefficients – estimates of influence from socio-economic and contraceptive use characteristics on being pregnant before the age of 20 years, Indigenous women 20-44 years, Darwin Urban region, 2003-2005	162
Table 7.7:	Logistic regression coefficients – estimates of influence from socio-economic and contraceptive use characteristics on having a baby born before the age of 20 years, Indigenous women 20-44 years, Darwin Urban region, 2003-2005	163



## List of Figures

Figure 1.1:	Map of the Northern Territory of Australia, including place names cited in this thesis	8
Figure 2.1:	Romaniuk's history-based explanatory framework for procreative behaviours of Aboriginal people (Canada)	28
Figure 2.2:	Conceptual framework for explaining contemporary Indigenous fertility in Australia	32
Figure 2.3:	Model for investigating Indigenous fertility in the Northern Territory	54
Figure 3.1:	Number of live births to Indigenous mothers usually resident in the NT recorded in the vital registration and perinatal data sets, 1988-2005	58
Figure 3.2:	Per cent difference in birth counts to Indigenous mothers between the vital registration and perinatal data sets, 1988-2005	66
Figure 3.3:	Indigenous general fertility rates, Northern Territory health districts, 1986-2005	71
Figure 3.4:	Lexis diagram showing relationship between period and cohort data	78
Figure 3.5:	Northern Territory Indigenous fertility rates, women 15-19 years, based on three data sources	79
Figure 3.6:	Net interstate migration, Northern Territory, Indigenous females, 1976-2006	80
Figure 4.1:	Intercensal Indigenous age-specific fertility rates (including and excluding Not Stated responses), Northern Territory, 1986-2006	87
Figure 5.1:	Northern Territory Indigenous total fertility rates, 1956-2007	100
Figure 5.2:	Total fertility rates and cohort size, births to Indigenous women in the Northern Territory, 1988-2007	101
Figure 5.3:	Indigenous age-specific fertility rates, Northern Territory, 1986-2007 (vital registration and perinatal data)	102
Figure 5.4:	Indigenous fertility rates and delayed childbearing, Northern Territory, 1986-2007 (vital registration and perinatal data)	104

Figure 5.5:	Indigenous total fertility rates, urban and rural-remote usual place of residence, Northern Territory, 1986-2007 (vital registration and perinatal data)	106
Figure 5.6:	Indigenous total fertility rates, Darwin Urban, Alice Springs Urban and NT Remainder usual place of residence, Northern Territory, 1988-2007)	107
Figure 5.7:	Indigenous total fertility rates using population denominator with migration assumption, urban and rural-remote usual place of residence, Northern Territory, 1986-2007 (vital registration and perinatal data)	108
Figure 5.8:	Indigenous age-specific fertility rates, urban and rural-remote place of usual residence, 1986-2007 (vital registration and perinatal data)	110
Figure 5.9:	Northern Territory Indigenous age-specific fertility rates, Darwin Urban, Alice Springs Urban and NT Remainder usual place of residence, 1988-2007	112
Figure 5.10:	Indigenous fertility rates and delayed childbearing, Darwin Urban, Alice Springs Urban and NT Remainder usual place of residence, 1988-2007	113
Figure 5.11:	Indigenous age-specific fertility rates using population denominator with net urbanisation migration assumption, urban and rural-remote place of usual residence, Northern Territory, 1986-2007 (vital registration and perinatal data)	116
Figure 5.12:	Indigenous general pregnancy rate, Northern Territory, 1992-2006	120
Figure 5.13:	Indigenous total pregnancy rates, urban and rural-remote usual place of residence, Northern Territory, 1992-2006	121
Figure 5.14:	Northern Territory Indigenous abortion rates and ratios, urban and rural-remote usual place of residence, 1992-2006	122
Figure 6.1:	Cumulative proportion of Indigenous women, 20-44 years, who had never been pregnant and never had a first birth, Darwin Urban 2003-2005	132
Figure 6.2:	Distribution of age at first live birth, Indigenous women, 20-44 years, Darwin Urban 2003-2005	137

Figure 6.3:	Distribution of number of children born to Indigenous women, 20-44 years, Darwin Urban 2003-2005	139
Figure 7.1:	Northern Territory Indigenous age-specific fertility rates, women aged 15-24 years, 1986-2007 (vital registration and perinatal data)	144
Figure 7.2:	Early force of childbearing, Northern Territory Indigenous women, 1986-2007 (vital registration and perinatal data)	145
Figure 7.3:	Indigenous age-specific fertility rates, women aged 15-24 years, Northern Territory and sub-regions, 1986-2007 (vital registration and perinatal data)	147
Figure 7.4:	Age-specific pregnancy rates, Indigenous women aged 15-24 years, urban and rural-remote regions, Northern Territory, 1992-2006	149
Figure 7.5:	Birth cohort age-specific fertility rates, Indigenous women born 1958 to 1992, by usual place of residence	151
Figure 7.6:	Age-specific first and second-order specific fertility rates, Indigenous women, Northern Territory, 1986-2005	153
Figure 7.7:	Median age childbearing begins and ends, Indigenous women, Northern Territory, 1986-2005	155
Figure 7.8:	Age-specific fourth and sixth or more-order specific fertility rates, Indigenous women, Northern Territory, 1986-2005	156
Figure 7.9:	Per cent distribution of births to Indigenous mothers by parity of mother, Northern Territory, 1986-2005	158
Figure 7.10:	Distribution of median age at first birth by parity, Indigenous women 35-44 years, Darwin Urban, 2003-2005	165

## Acronyms

ABS	Australian Bureau of Statistics
ACCHO	Aboriginal Community Controlled Health Organisation
AIHW	Australian Institute of Health and Welfare
AHW	Aboriginal Health Worker
ALO	Aboriginal Liaison Officer
AMSANT	Aboriginal Medical Services Alliance Northern Territory
ASFR	Age-specific fertility rate
ATSIC	Aboriginal and Torres Strait Islander Commission
CDEP	Community Development Employment Program
CDU	Charles Darwin University
CI	Confidence interval
DHAC	Department of Health and Aged Care
DRUID	Diabetes and related conditions in urban Indigenous people in the Darwin region
ERP	Estimated Resident Population
ETFR	Early force of childbearing, measured by proportion of the TFR contributed to by childbearing under the age of 20 years
FV/SA	Family violence/sexual assault
GFR	General fertility rate
ICD	International Classification of Diseases
IES	Indigenous Enumeration Strategy
IUD	Intrauterine device
LGA	Local Government Area
LNAC	Larrakia Nation Aboriginal Corporation
NATSIHS	National Aboriginal and Torres Strait Islander Health Survey
NATSISS	National Aboriginal and Torres Strait Islander Social Survey
NHMRC	National Health and Medical Research Council
NT	Northern Territory
NTER	Northern Territory Emergency Response
OECD	Organisation for Economic Co-operation and Development
O&G	Obstetrics and Gynaecology
OR	Odds ratio
PATS	Patient-assisted travel scheme
PES	Post-enumeration Survey

RSE	Relative standard error
SCRGSP	Steering Committee for the Review of Government Service Provision
STI	Sexually transmitted infection
TFR	Total fertility rate
TOP	Termination of pregnancy
UNFPA	United Nations Population Fund



## CHAPTER ONE: INTRODUCTION

### 1.1: Purpose of the research

In the Northern Territory of Australia, babies born to Aboriginal mothers have ensured the survival of Indigenous peoples for millennia. These babies form the basis of all families in towns and ‘out bush’, they are the building blocks for connection to country (land) and allow the maintenance of kin relationships. From the time of colonisation these babies have attracted the gaze and concern of the colonisers, from early assumptions that Indigenous peoples would die out (Arabena 2006, Flood 2006), to the forced removal of ‘half caste’ children to ensure assimilation with the dominant white colonisers (Commonwealth of Australia 1997, Kenny 2007). More recently, the nation state has shown concerns about the poor health and wellbeing of Indigenous babies and children, including neglect and abuse (Bamblett et al. 2010, Wild and Anderson 2007). Anthropological research has highlighted how much children are cherished within Indigenous families (Hamilton 1981, von Sturmer 1980) and the primacy of the family to Indigenous people’s sense of being (Bell 1983). Early demographic research documented a fertility decline for Indigenous Australians in the 1970s, attributed to the introduction of contraceptive services and microeconomic pressures brought about by having children (Gray 1983a). Yet despite this long-held interest in Indigenous babies, little is known about contemporary fertility trends in the Northern Territory of Australia.

The purpose of this research is primarily to explore contemporary features of Indigenous fertility in the Northern Territory of Australia. It exploits the availability of 20 years of births data from two different data sources to investigate trends over time in the quantum, timing and spacing of childbearing to Indigenous mothers. The research shows that the use of population data with Indigenous identifiers is complex and that all conclusions are constrained by issues of undercount and geographic coding of usual place of residence. The results of the investigation into data sources for this research are as important as the results of the fertility trends identified. While fertility decline is not shown to be a feature of the contemporary Indigenous demographic profile in the Northern Territory, age and geographic variability underlie an apparent stability. This research discusses whether patterns of continued, very young childbearing are a feature of delayed demographic transition, or reflective of a fertility model unique to Indigenous minority populations.

Demographic transition theory predicts a move from high mortality and fertility and low rates of natural increase, to decreasing mortality and continued high fertility leading to population growth, followed by declining fertility and a slowing of population growth. There are two main models – the ‘European’ model and the ‘Third World’ model (Pool 1991). In the European model, mortality and fertility declines occurred gradually over long periods beginning in the 18<sup>th</sup> and 19<sup>th</sup> centuries. The ‘Third World’ model is characterised by very rapid mortality and fertility declines during the 20<sup>th</sup> century, with fertility declines beginning in the 1960s. An underpinning assumption of demographic, and development, theory has been convergence of the two models and it has underpinned a massive body of empirical research (Lee 2003, McMichael et al. 2004, Wilson 2001). More recently, research in Africa has focussed on ‘fertility stall’, whereby a change from downward fertility trends to flat or even increasing fertility is seen (e.g. Bongaarts 2007, Ezeh et al. 2009, Garenne 2008, Shapiro and Gebreselassie 2008). The fertility stall seen by these observers is typically observed at high fertility levels, in regions where women have five or more children (Ezeh et al. 2009).

Our understanding of fertility change among Indigenous Australians up to the 1980s is largely attributable to the work of Len Smith (1980), particularly for patterns during the early part of last century, and Alan Gray (1983a), whose work documented fertility decline in the 1970s. The works of Smith and Gray relied on a wide range of sources, including the census. Checks came from smaller local or state-based data sources, the work of anthropologists, which tended to focus on whether the Indigenous population was dying out or not (e.g. Berndt and Berndt 1987, Yengoyan 1970), and medical researchers in the 1970s, who focused on how well contraception was being taken up (e.g. Forster and Cawte 1975, Kamien 1975a, 1975b, Reid 1979). By the 1980s, it was accepted that Indigenous fertility decline had begun. There were also consistent calls for the identification of Indigenous status in the official record (Gaminiratne and Tesfaghiorghis 1992, Gray 1983a, Jain 1989, Rowse 2006, Smith 1980). In the absence of vital registration data, the works of Gray (1983a, 1989a) and Jain (1989), which showed Indigenous fertility decline during the 1970s and 1980s, were used in Australian Bureau of Statistics (ABS) publications to show Indigenous fertility trends alongside those for Australia’s total population (ABS 1994). These results continue to be used for historical overviews (ABS 2007c) and are the mainstay of our understanding of Indigenous fertility from the 1960s to 1990s for Australia and the Northern Territory.



Since the establishment of birth registration data systems that include identification of Indigenous status for vital registration (alongside deaths and marriages) and for tracking perinatal outcomes, analysis has focused on annual reporting or short time frames of three to five years (for example ABS, Birth Catalogue No. 3301.0 various years, Day et al. 1999, Leeds et al. 2007). Baseline type studies have also been done to determine fertility levels at particular points in time (Kinfu 2005, Taylor et al. 2006) or for particular geographies (Khalidi 1989, Taylor 2004). These more recent analyses point to a stabilisation of Indigenous fertility, if not slight increases.

Thirty years after the historic 1967 ‘yes’ vote to end constitutional apartheid for Indigenous Australians, John Taylor (1997) provided a review of contemporary Indigenous demography which included a review of fertility change. He questioned whether the lack of a continued fertility decline reflected fertility behaviours, or an overestimate of fertility levels from earlier periods. He also noted that, given the lack of overall improvements in socioeconomic status for Indigenous people, expectations of further fertility decline were perhaps unwarranted (Taylor 1997). Remarkably, more than ten years on, the same questions remain. The 2002 National Aboriginal and Torres Strait Islander Social Survey found an adjusted total fertility rate of 2.6 for the Northern Territory, lower than the 2.8 published by ABS for 2002 (ABS 2003a, Kinfu 2005), raising questions about the accuracy of vital registrations data.

Births data by Indigenous status have only been available nationally from 1997 for vital registrations (ABS 1998), and from 1991 for perinatal data (Plunkett et al. 1996). In the Northern Territory, births data by Indigenous status and age of mother are available for longer periods, from 1986 for the perinatal data and from 1988 for the vital registrations. Despite the availability and recognised high quality of these data (Brown 2005) there has been little analysis of long-term trends, how the data sets themselves could contribute to the patterns being seen and whether there are important correlates of fertility change that warrant further exploration.

Gray (1990), using census data, showed three factors as having important influences on Indigenous fertility – age at leaving school, labour force status and income. While these are not surprising and are well-recognised correlates of fertility (Caldwell 2006, Carmichael and McDonald 2003, Mason 1997), they fail to explain why fertility has not declined as school retention rates and labour force participation rates have risen for

Indigenous women (SCRGSP 2007). Spatial differences in socio-economic wellbeing have been clearly identified (Mitchell et al. 2005, Taylor 2004, 2006), and while state/territory and local variation in fertility patterns have also been shown (Khalidi 1989, Taylor 2006), the inter-relation between the two has not been explored in detail<sup>1</sup>. There is still limited understanding of how Indigenous fertility correlates with standard variables (Tesfaghiorghis 1996). While Indigenous demography is recognised as politically constructed (Gray 1985), the impacts of colonialism on fertility, from first settlement to contemporary welfare structures, have not been looked at widely.

The research for this thesis rests on three hypotheses. The first is that Indigenous fertility rates, and in particular fertility trends, in the Northern Territory are themselves an artefact of the data used to calculate these rates. This is not intended to be a circular argument, but rather that beyond the data caveats expected with population research (e.g. Estee 2004, Rowland 2003), time series analyses of Indigenous fertility are particularly prone to issues of accuracy of birth and population counts, problems of mismatch between numerator and denominator populations, all complicated by changes to both counts and mismatch over time (Cunningham 1998, Jackson 1995).

The second hypothesis is that there has been a stall in the Indigenous demographic transition and the fertility declines documented for Indigenous women in the Northern Territory during the 1960s and 1970s have not been maintained into the 21<sup>st</sup> century. This hypothesis is well supported by the available analysis of Indigenous fertility in Australia, as already noted earlier, but warrants closer inspection by geographic region and for different age groups.

The lack of continued fertility decline supports a third hypothesis, that contemporary Indigenous childbearing is characterised by universal, young mothering but not high parity.

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<sup>1</sup> Kinfu and Taylor (2002) identified this same research gap.

## 1.2: Defining the Indigenous population

For this research, the term Indigenous<sup>2</sup> is used to include Aboriginal and Torres Strait Islander peoples. It is a contested term, rejected by many Indigenous people (Jordan 1985, Langton 1993). Indeed, many Indigenous people themselves do not describe themselves as Indigenous or Aboriginal, but describe themselves by the country they come from (Bin-Sallik 2008, Jordan 1985, Robinson et al. 2010). However, its use in this research is intentional for a two-fold reason.

The first is to reflect the international experience of Indigenous peoples. As Mick Dodson (1994:24-25) writes:

“We [Indigenous peoples] are united by common territories, cultures, traditions, histories, languages, institutions and beliefs. We share a sense of kinship and identity, a consciousness as distinct peoples and a political will to exist as distinct peoples”.

Smith (1999), a Māori researcher from New Zealand, uses the word indigenous to include diverse communities, language groups and nations within a single grouping. She also notes that, “Indigenous peoples' ... is a term that internationalizes the experiences, the issues and the struggles of some of the world's colonized peoples” (Smith 1999:7). Indigenous is thus a term that is used to define a group of people with a shared experience of inhabiting a country for thousands of years (Cunningham and Stanley 2003). Royal (2002:29) viewed Indigenous as referring to, “those cultures whose world views place special significance or weight behind the idea of the unification of the human community with the natural world”. Within Australia, use of the term Indigenous recognises that:

“although the poor and the rich Indigene, the cultural reviver and the quintessential cosmopolitan, the fair, dark, good, bad and disinterested may have little in common, they are nonetheless all equally but variously Indigenous” (Paradies 2006:363).

The second reason for employing the term Indigenous is that it is deliberately used as a statistical marker to analyse population-level phenomena. While it can be argued that this does perpetuate Australia's history of identity construction for Indigenous peoples (Jordan 1985) the very nature of demography requires some method of creating, or

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<sup>2</sup> Linguistic norms in Australia are to use the proper noun, “Indigenous” to describe Aboriginal and Torres Strait Islander peoples (in the same way we would describe Warlpiri or Larrakia peoples). This convention is followed in this thesis, however, when indigenous is used as an adjective to describe indigenous populations generally in the international context then no capital is used. The same convention is used to describe Australian Aboriginal peoples as opposed to aboriginal populations from around the world.

estimating, a population that shares a common characteristic. The shared identity used in this research is the myriad of individuals who self identify, or are identified by others, as Aboriginal or Torres Strait Islander (or both) in population data sets.<sup>3</sup>

In Australia, the accepted Australian Government definition for Aboriginal and Torres Strait Islander peoples was formulated in the 1980s and is now widespread and accepted (Gardiner-Garden 2003). It states that an Aboriginal or Torres Strait Islander is a person of Aboriginal or Torres Strait Islander descent who identifies as such and is recognised as such by the community in which he (she) lives. For practical, population data collection purposes, anyone is able to ‘tick the box’ identifying themselves as Aboriginal or Torres Strait Islander. Robinson et al. (2010) write that someone who is not Aboriginal is unlikely to identify as such in official data collections. Detailed analysis of Māori identity in statistical collections from New Zealand shows that parental ethnic identity was a decisive factor in how the ethnicity of the child was reported (Kukutai 2003).

This homogenisation of great diversity among Indigenous peoples by the use of macro-population indicators has been criticised (Rigney 1997, 2001). However, as Walter (2008) concluded in an essay on the diversity of Indigenous and non-Indigenous experience across Australia based on 2006 Census results:

“Being an Indigenous person in Australia today is statistically related to a common position on the lowest rung of society’s socio-economic hierarchy. There is an Indigenous-specific location fundamentally related to poverty and exclusion. This is not an essentialist argument. The consistency of this pattern across place, time and Indigenous peoples, regardless of family, cultural, country and colonising history, demonstrates that this shared Indigenous place is located socially and economically. It is an Indigenous domain, an embedded hierarchical positioning of Indigenous peoples across Australian society, not a trait of individual Indigenous people or peoples” (p.29).

One of the challenges is not to “substitute demography for anthropology” (Langton 1981:20) and assume that those who identify as Indigenous have “particular phenotypical traits, certain forms of cultural alterity, specific ethico-moral beliefs/actions or a certain level of social disadvantage” (Paradies 2006:363). The aim is to use Indigenous categorisation critically to ensure contemporary understandings of population dynamics

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<sup>3</sup> Forms collecting population data typically require individuals to identify if they are of Aboriginal or Torres Strait Islander origin by ticking a box, with an instruction to tick both if the individual has both Aboriginal and Torres Strait Islander origins.

are as comprehensive as possible. Indeed, to not do so would be to perpetuate institutional racism and Australia's "frank failure of the statistical system" (Smith et al. 2008).

### **1.3: Introducing the Northern Territory**

The Northern Territory of Australia is the country's third largest state or territory<sup>4</sup> of eight, yet comprises only one per cent of the national population (see Figure 1.1). The Territory covers over 1,400,000 square kilometres from the tropical Top End in the north, to the deserts of Central Australia in the south.

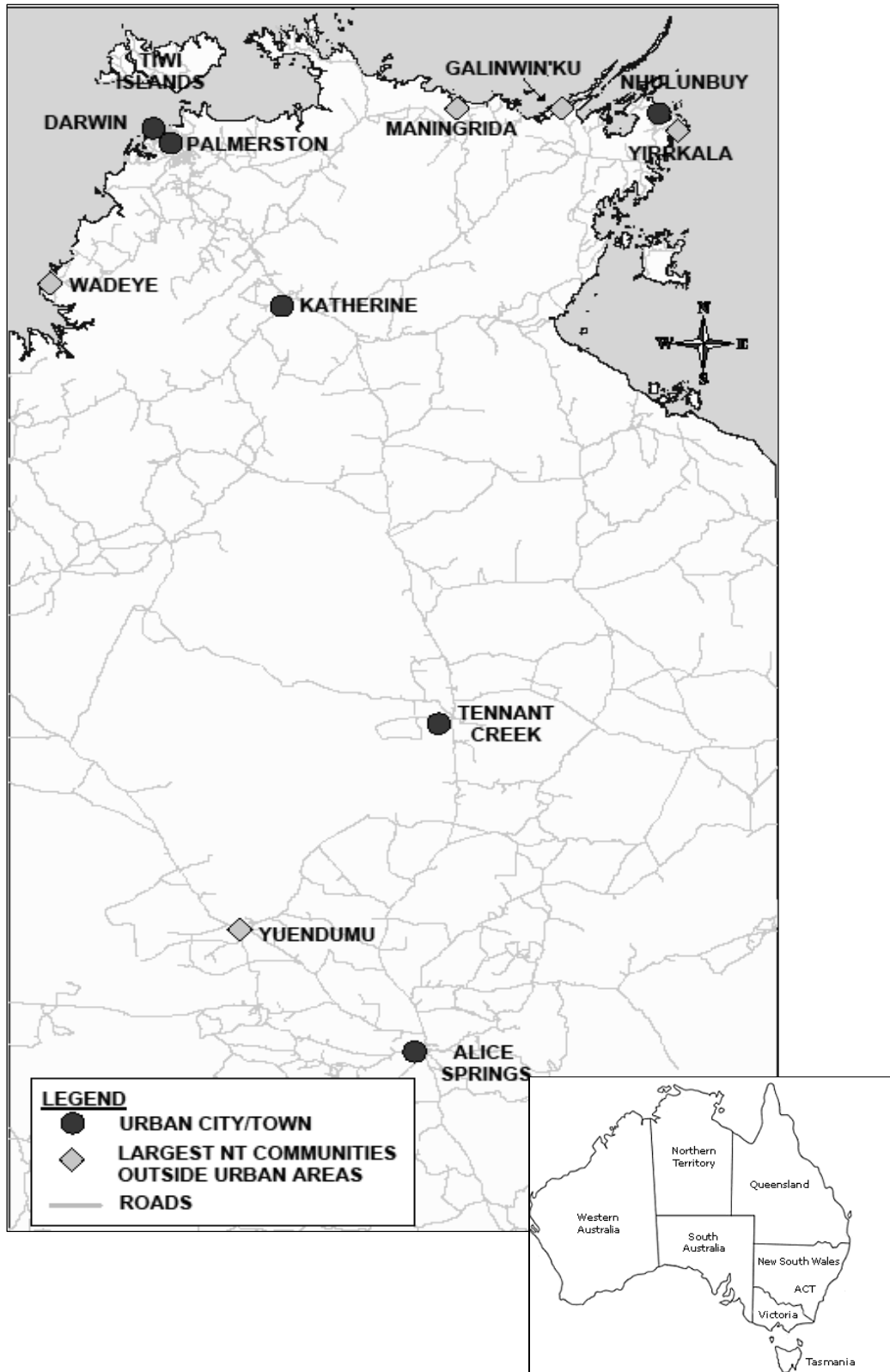
The Northern Territory's capital is Darwin in the north. There were 66,300 usual residents enumerated in the Local Government Area (LGA) on census night in 2006. Separated by 21 kilometres is the Northern Territory's next largest city, Palmerston, which had 24,000 usual residents at the time of the 2006 census. While each city has its own city council, Darwin is often used to refer to both cities as one. As is outlined in Chapter Three, a Northern Territory government administrative boundary for the Darwin Urban area includes both Darwin and Palmerston cities, and throughout this thesis references to Darwin, unless explicitly described as otherwise, include Darwin and Palmerston.

The 2006 Estimated Resident Population (ERP) for the Northern Territory was 210,700 persons, of which 32 per cent were Indigenous (ABS 2008c) (see Table 1.1). While the 67,000 Indigenous persons estimated to be living in the Northern Territory in 2006 was not the biggest Indigenous population in Australia, the large Indigenous presence within the total population marks the Northern Territory as different from other states. Across Australia, the Indigenous population comprises only a small proportion of the total population, from less than one per cent in Victoria to four per cent in the large states of Queensland and Western Australia. To the north of Queensland and Western Australia, the Indigenous population profile resembles that found in the Northern Territory (Biddle et al. 2008, Taylor 2006, Taylor et al. 2006), which has implications for the wider applicability of this research beyond Northern Territory borders. Undoubtedly, the

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<sup>4</sup> Australia is comprised of six states and two territories. The Constitution gives the Australian Government the power to pass laws on certain subjects, and allows the states to retain all other law-making rights. Any land within Australia's national border that is not claimed by one of the states is called a territory and under the Constitution, the Commonwealth makes the laws for the territories. The Northern Territory and the Australian Capital Territory, however, are self-governing territories, enabled by Acts of the national parliament.

**Figure 1.1: Map of the Northern Territory of Australia, including place names cited in this thesis**



highly visible Indigenous population, at least in demographic accounting terms, has contributed to the long-term commitment by Northern Territory government agencies to the collection of data by Indigenous status (Lea 2008, Robinson et al. 2010).

The Indigenous population of the Northern Territory is unique in other respects. It is the largest state or territory-based Indigenous population living in regions classified as remote or very remote according to the Australian Standard Geographical Classification<sup>5</sup> (ABS 2007a), both numerically and as a proportion of the total population (Table 1.1). Over half (56%) of Indigenous people resident in the Northern Territory live very remotely, with a further 23 per cent living in remote areas. The predominance of Indigenous people living remotely in the Northern Territory is not only distinctive among Indigenous populations across Australia, it is in stark contrast to non-Indigenous Territorians, of whom only eight per cent live very remotely.<sup>6</sup>

**Table 1.1: Number and per cent of the Indigenous population<sup>(1)</sup> living in very remote areas by state/territory, 2006**

State/Territory	Number		% of total living very remotely
	Very remote	Total	
New South Wales	1,198	148,178	1
Victoria	..	30,839	..
Queensland	19,991	146,429	14
South Australia	3,760	26,044	14
Western Australia	19,458	77,928	25
Tasmania	204	16,900	1
ACT	..	4,043	..
<i>Northern Territory</i>	<i>37,283</i>	<i>66,582</i>	<i>56</i>
<b>AUSTRALIA</b>	<b>81,914</b>	<b>517,174</b>	<b>16</b>

(1) Estimated Resident Population 2006.

Source: ABS (2008c) *Population Characteristics, Aboriginal and Torres Strait Islander Australians, 2006. Catalogue No.4713.0.*

The vast majority of Indigenous people living in remote and very remote areas of the Northern Territory live on Aboriginal freehold or leasehold land (Taylor 2003a). Forty per cent of the Northern Territory is legally-defined Aboriginal land (Geoscience

<sup>5</sup> The Australian Standard Geographical Classification Remoteness Structure comprises five levels of remoteness: Major Cities, Inner Regional, Outer Regional, Remote and Very Remote. These are based on the physical road distance to the nearest urban centre. In the Northern Territory, the capital Darwin is classified as Outer Regional and all other centres are in the Remote or Very Remote category (ABS 2007b). Issues of geography are discussed in detail in Chapter Three.

<sup>6</sup> Seventy per cent of the Northern Territory's non-Indigenous population lives in the region immediately surrounding the capital Darwin.

Australia 2010), that is land held by designated Indigenous communities, with special conditions attached to the titles<sup>7</sup> (it excludes private land ownership by Indigenous individuals). While some of this land has mineral resources beneath it, much of the land is not suitable for agricultural production or other modern commercial applications.<sup>8</sup>

The Indigenous population of the Northern Territory differs from those in other state/territory jurisdictions in other ways. Available data show that during the last decade Indigenous total fertility rates have generally been lower in South Australia, Victoria and New South Wales than in the Northern Territory (ABS 1998, 2008a) and in more recent years higher in Queensland and Western Australia (ABS 2009a). Life expectancy at birth is lower for Indigenous people in the Northern Territory compared to other jurisdictions. Life expectancy at birth for Indigenous Australia as a whole was 67.2 and 72.9 years for men and women respectively in 2005-2007, but only 61.5 and 69.2 years for Indigenous men and women in the Northern Territory (ABS 2009b). Biddle and Prout (2009) explored temporary mobility based on 2006 census data and showed that across Australia the lowest net Indigenous temporary mobility was found predominantly in Indigenous Areas<sup>9</sup> located in the Northern Territory. Taylor et al. (2006) have shown lower migration levels across all ages for Indigenous people in Australia compared to non-Indigenous people and lower migration in arid and savannah zones that cover the Northern Territory. Their reliance on census data for migration information (an issue discussed in Chapter Three) means the high levels of circular population movements in the same regions are not captured (Morphy 2008, Young and Doohan 1989).

The Indigenous population of the Northern Territory is also characterised by poor socio-economic status (Table 1.2). While the disadvantaged position of Indigenous Australians compared to other Australians is well-recognised (Glover et al. 2004, SCRGSP 2009, Walter 2008, Walter 2009, Walter and Siggers 2007), for Indigenous

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<sup>7</sup>Indigenous title to land in the Northern Territory was established under the *Aboriginal Land Rights (NT) Act 1976*. Significant changes have been made to native title and land rights since that time. In the Northern Territory these changes have centred on the ability to grant leases on Aboriginal land, including via compulsory acquisition by government (Calma 2009).

<sup>8</sup>This is not to imply that this land has no economic value. As James (2009) has shown, land and sea country are the essential base of marine turtle economy among the Yan-nhaṅu of the Crocodile Islands, off the coast from Galiwin'ku. Altman (2001, 2006) defines the confluence of free market, state and customary exchange of goods and services found in remote Indigenous communities as a hybrid economy.

<sup>9</sup>Indigenous Areas are a medium sized spatial unit within the Australian Indigenous Geographical Classification. It enables the production of detailed census statistics relating to Indigenous people while maintaining the confidentiality of individuals. They generally include around 300 Indigenous people (ABS 2007b).



people living in the Northern Territory, these indicators show even greater disadvantage compared to Indigenous populations elsewhere in the country (ABS 2008c). Taylor (2003a) has shown that over half of the Indigenous population in the Northern Territory receives income from non-employment (welfare) sources, with much higher levels of welfare dependency in remote rural communities. Most striking is that just one in five Indigenous persons aged 15 years and over in the Northern Territory are in paid employment, with an almost similar proportion working under the Community Development Employment Program (CDEP), an Indigenous-specific program which pays participants a small amount in addition to the unemployment benefit.

**Table 1.2: Per cent of Indigenous population<sup>(1)</sup> aged 15 years and over against selected socio-economic characteristics by state/territory, 2006**

State/Territory	% of total population		
	School to Year 9 and above	Paid employment (employed CDEP) <sup>(2)</sup>	Median individual income (\$ per week)
New South Wales	85	43 (1)	\$296
Victoria	85	48 (.)	\$332
Queensland	85	45 (6)	\$318
South Australia	82	39 (4)	\$263
Western Australia	83	36 (9)	\$254
Tasmania	91	52 (.)	\$323
ACT	92	62 (.)	\$514
<i>Northern Territory</i>	<i>55</i>	<i>21 (17)</i>	<i>\$215</i>
AUSTRALIA	81	41 (5)	\$278

(1) Usually resident population, 2006 census counts.

(2) CDEP = Community Development Employment Program.

Source: Australian Bureau of Statistics, Census 2006, various published tables.

The Northern Territory is also unique among all states and territories in having been administered by the Commonwealth Government since 1911. Even since self-government for the Northern Territory in 1978, Australian Government policy decisions have continued to have a significant impact on the lives of Indigenous peoples living in

the Northern Territory.<sup>10</sup> The remoteness of the Northern Territory and its sparse population have also contributed to a different experience of colonisation compared to the south-eastern states. Most notable is the later sustained contact between Indigenous peoples and the colonisers and a lesser encroachment on traditional lands (Langton 1993). (There are of course long histories of colonisation in some Northern Territory towns established on traditional lands, most notably in Darwin, Katherine and Alice Springs and linked to the establishment of the telegraph and the railway to Australia's more populous south). This relative isolation means the Indigenous population is in many places the majority.

The colonisation experience in the Northern Territory has contributed to the way health services have been established for Indigenous peoples, highlighted here because of the care provided by such services to women during the antenatal, birth and postnatal periods as well as for the provision of contraception and abortion. Historically, health services in the Northern Territory were established based on the needs of the non-Indigenous settler society. The current system of health service delivery has evolved from a two-tier system. In the early days of forced settlement, the colonised Indigenous peoples were dependent on traditional medicine if they still had access to their lands or on the colonising Europeans. Prior to 1913 the Northern Territory Medical Officer, who was also the Protector of Aborigines, confined his medical activities to the region around Darwin, with the main aim being to protect the health of the colonisers. From 1913, health care for Indigenous people was organised through the Police and general health services were only available to the non-Indigenous population. During the early part of the 20<sup>th</sup> century some separate Indigenous-specific services were established in Darwin, Alice Springs and some of the remote missions. During World War II the military took over administration of the NT hospitals and health services (Bartlett 1998).

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<sup>10</sup> For example, the *Aboriginal Land Rights (NT) Act 1976* and the *Aboriginal Councils and Associations Act 1976* enabling establishment of small town councils and incorporated commercial organisations; the *1989 Aboriginal and Torres Strait Island Commission (ATSIC) Act* and subsequent *1995 ATSIC Amendment Act* which aimed to establish a fund for acquisition and management of existing and newly acquired Indigenous land; the subsequent abolition of ATSIC in 2004; and more recently the 2007 Northern Territory National Emergency Response Bill, the Social Security and Other Legislation Amendment (Welfare Payment and Reform) Bill and Families, Community Services and Indigenous Affairs and Other Legislation Amendment (Northern Territory National Emergency Response and Other Measures) Bill providing for alcohol restrictions, bans on pornography, compulsory five year leases, quarantining of welfare payments to ensure money spent on clothes and food and changes to the permit system (among other things) (Griffiths, 2006; Hunter, 2007).

After World War II the Australian Government Department of Health resumed control of hospital services in Darwin, Katherine, Tennant Creek and Alice Springs and primary health services for non-Indigenous people (e.g. the provision of medical kits to farmers in isolated parts of Central Australia). They did not claim responsibility for health services to Indigenous peoples, nor for air medical services to remote communities. The Department of Native Welfare therefore began establishing nursing posts and small hospitals outside the centres of European settlement and these were mainly staffed by nurses, although most nurses worked without medical supervision and there was no nursing administration in the Northern Territory until 1973 (Bartlett 1998, Rosewarne et al. 2007).

Current health services are largely provided by the Northern Territory Government's Department of Health,<sup>11</sup> officially formed out of Australian Government precursors following self-government in 1978 (Lea 2008). The five largest towns in the Northern Territory each contain a public hospital, with Katherine, Gove (Nhulunbuy) and Tennant Creek Hospitals functioning as referral centres. Gove Hospital in recent years has established a well women's clinic, staffed by midwives and run from the antenatal clinic in the hospital. There are smaller primary health care services provided by the Northern Territory Government located in major townships and recognised communities, all generally spoken about as community clinics. At the time of writing these numbered 55 and varied in size from one permanent staff member to 15. Staff include resident nurses and Aboriginal Health Workers (AHWs) and for larger clinics resident general practitioners. Therapeutic and clinical services are generally provided by a range of visiting professionals who fly or drive to communities on a weekly, fortnightly or monthly basis depending on population size, location, ease of access and accommodation quality (Department of Health and Families 2010, Lea 2008, Young and Doohan 1989).

The other main providers of health services to Indigenous peoples living in the Northern Territory are Aboriginal community-controlled health services (ACCHOs). (Private health care through general practitioners is also available in the major centres. Very few

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<sup>11</sup> The Northern Territory Government's Department of Health has also been known as Territory Health Services, the Department of Health and Community Services and the Department of Health and Families.

services are available without incurring a fee-for-service<sup>12</sup>). There are 26 ACCHOs throughout the Northern Territory of varying size: four providing specialised services and the remainder providing primary health care (AMSANT 2010). Since 1995, funding for ACCHOs has been provided by the Australian Government Department of Health and Ageing.<sup>13</sup>

Using the Northern Territory as the primary focus of the research has practical and theoretical benefits. Most importantly for the demographer, there are 20 years of data on births disaggregated by Indigenous status and age of the mother from two different data sources. There are also earlier data sources which provide important clues to the demographic history of the Indigenous population in the Northern Territory and enable contemporary analysis to be placed in context. The isolation of the Northern Territory and the predominance of the Indigenous population, in combination with the time series of data available, allows for investigation of fertility in a way not possible in other parts of Australia.

#### **1.4: Methodological approach**

This research is based on the demography of Indigenous populations, and not of Indigenous peoples, a differentiation explored by Rowse (2009) in relation to contemporary official statistics in Australia and New Zealand and Taylor (2009) in relation to contemporary Australian public policy. The differentiation is important when using an aggregative approach to fertility change or stability as is done for this research, particularly when seeking explanations for change or stability in long-term trends. This research does not assume to identify the role of particular Indigenous peoples' knowledge systems and beliefs in fertility decisions, although their import is recognised at the outset (see for example James 2009, Musharbash 2008).

The methods available for understanding the demography of 'peoples' rather than populations are recognised as drawing on anthropological methods (Caldwell et al. 1987,

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<sup>12</sup> Medicare, a universal health care system introduced by the Australian Government in 1983, establishes set fees for consultations with health professionals and related services. Private health service providers, including general practitioners, are able to "bulk-bill" clients, receiving the Medicare rebate directly from the Australian Government. Alternatively, service providers charge a fee-for-service (generally higher than the Medicare rebate) and clients receive the Medicare rebate directly on presentation of an invoice for services received.

<sup>13</sup> Previously called the Department of Health and Aged Care (DHAC). Prior to funding from DHAC, funding was received from the Australian Government Department of Aboriginal Affairs and the regional Aboriginal and Torres Strait Islander Commission (ATSIC) (Rosewarne et al. 2007).

Caldwell and Hill 1985, Caldwell et al. 1984, Greenhalgh 1990, McNicoll 1980, Szeter et al. 2004a) and some small examples of excellent work in this area in Australia are provided by Morphy (2007a, 2010). The present research with its focus explicitly on population is not an example of anthropological demography but it is inspired by that approach. The critical review of data collection processes to determine how these influence the population fertility patterns under investigation arose from the recognition that the available data could not be used at face value (Kertzer and Arel 2002, Kraeger 2004, Riedman 1993). The contributions of anthropological demography also motivated the collection of individuals' observations and stories to enrich the analysis of quantitative data.

A three-stage approach was used to examine contemporary fertility trends among the Indigenous population of the Northern Territory:

1. A detailed analysis of the collection processes for the quantitative data available for this research,
2. Identification of population trends based on the quantitative data using standard demographic techniques, and
3. The collection of individuals' views and experiences using a range of qualitative methods.

In order to test the hypothesis that fertility trends in the Northern Territory are themselves an artefact of the data used, an extensive review of the literature surrounding Indigenous data collection in Australia was required and an investigation of differences between the two main sets of births data sets – vital registrations and perinatal data. In addition, interviews were held with key individuals responsible for data collection, data coding and data dissemination. These individuals worked for the Department of Health and Families, the Northern Territory Register of Births, Deaths and Marriages, and the Australian Bureau of Statistics. Interviews centred on seeking validation of documented processes for data collection and cleaning, identified through published and unpublished material (e.g. Markey et al. 1998, Northern Territory Treasury 2005). Respondents were also asked for their views on the differences between the main data sets, and to comment on the 20-year trends that emerged from the data. As the research progressed, other individuals working within the Northern Territory Department of Health and Families volunteered further information or views of the data collection processes and how these might influence results.

This research rests on standard demographic methods for measuring fertility, that is actual births. In popular parlance, fertility is often used to refer to a woman's ability to conceive, defined as fecundity by demographers, or the physiological capacity to reproduce (Estee 2004). This research does not focus on fecundity. Nor is this research an investigation of Indigenous births in the Northern Territory. It deliberately focuses only on babies born to Indigenous women and is a study of Indigenous fertility, strictly defined. Indigenous babies born to non-Indigenous mothers are thus excluded from the analysis. Published data show that throughout the period under analysis, five to eight per cent of all Indigenous babies in the Northern Territory were born to non-Indigenous mothers (ABS, *Births Australia, Catalogue 3301.0*, various years). The number of Indigenous babies born to non-Indigenous mothers ranged from a low of 68 in 1995 to a high of 119 in 2005. These babies are thus a factor for consideration in the growth of the Indigenous population. It is also possible that Indigenous girls born to non-Indigenous mothers may have a different fertility experience than Indigenous girls born to Indigenous mothers (Robitaille and Guimond 2003). This is not an issue able to be explored within the data, and the small numbers involved means any differences are unlikely to have affected the population-level trend.

The research is also not comparative. It is not an investigation of how fertility trends among Indigenous women in the Northern Territory compare to non-Indigenous fertility, nor how they compare to trends among Indigenous women in other Australian states/territories. While comparative work is necessary and worthwhile, its inclusion here would be at the expense of understanding what is happening within the Northern Territory and any diversity across its large landscape. Similar arguments have been made by Kukutai and Pool (2008) for Māori in New Zealand. Comparisons are drawn to place the Northern Territory Indigenous fertility trends in context, but the in-depth scrutiny of data sources that is germane to this research has not been done for non-Indigenous or interstate data sources.

The collection of the fertility experiences and views of Indigenous individuals was done using a variety of methods, with the main aim being to investigate whether the emerging trends identified in analysis of the quantitative data were reflected in individuals' own lives. Stark and Hope (2007), who carried out research on condom use in Central Australia, wrote:

“Research within Aboriginal populations is complex and difficult, with a myriad challenges [sic] to contend with. Establishing trust takes time and

managing the cross-cultural environment, including cultural differences in communication, is not easy” (p.237).

This research shared these same constraints identified by Stark and Hope. Time limitations precluded the use of ethnographic observations recommended by Caldwell (1985), Levine and Scrimshaw (1983), and Greenhalgh (1990) among others. Time constraints also precluded developing the relationships that would enable asking those questions pertinent to a study of fertility (e.g. age at first intercourse, use of contraception). As Gray (1983a:189-190) found when doing situation surveys in five Indigenous communities, objections were made to the questions about knowledge and practice of contraceptive use. He also found there were objections to the collection of information about miscellaneous sociological characteristics of respondents and their households because their relevance to the research topic was not clear and this led to refusal to participate by several eligible respondents. To overcome these constraints an Indigenous Advisory Group was established for the current research, the members of which provided advice on the methods to be used, recruitment of women and the appropriateness of the questions being asked. The focus of this third phase of the research was individual’s views of whether fertility change had occurred in their own families, and the reasons for this, basic birth histories, and exploration of whether having children is an active decision for women.

Initial views were gathered via a short interview administered in 2009 over the telephone and face-to-face with 28 Indigenous adults who had been born in Darwin and were residing in Darwin at the time of the interviews. Larrakia Nation Aboriginal Corporation (LNAC), who administered the questionnaire, required that the questions be restricted to two only. They were:

- Do you think your children/young people are having the same number of children as in the past, or more or less and why do you think this is so?
- Do you think your children/young people start to have children older or younger than you did, or your grandparents, and why do you think this is so?

The questions were asked by Indigenous research staff who transcribed individuals’ answers. Respondents ranged in age from 20 to over 70 years, and only eight were men. Although the research staff had established formal and informal links with everyone approached to answer the questionnaire and despite the questionnaire being limited to two questions, LNAC staff reported that it was extremely difficult finding people who

were willing to participate. There were also constraints with this type of short interview, with respondents unwilling to elaborate on their answers.

A short focus group was held with eight young women participating in the Pandanus Program, an antenatal education and support program for young mothers (under the age of 25 years) run by Anglicare (Darwin). Participants included both Indigenous and non-Indigenous women. Individual quotes from Indigenous women only are reported throughout the research, but group views of consensus are reported without differentiating by ethnicity. Permission to hold the focus group during an education session was granted by the Program convenors and participants, with 20 minutes allocated for the discussion. The young women themselves wished to focus the discussion on attitudes towards young mothers and much of the discussion revolved around findings from the short questionnaire administered by LNAC research staff.<sup>14</sup> This group comprised of young, pregnant women was somewhat biased in terms of their views on early pregnancy because of the women's own pregnancies at a young age and their decision not to use induced abortion.

Finally, longer one-on-one interviews took place during 2009 and 2010 with ten women who identified as Aboriginal or Torres Strait Islander and who were living in Darwin at the time of the interview. Women were recruited using informal networks of the researcher and the Indigenous Advisory Group, advertising in school and childcare newsletters, and through attendance at an outreach service provided to homeless people. Women were paid in the form of a supermarket gift voucher for participation in the interview which lasted 30 minutes to an hour.

Among the women who were interviewed, all were over the age of 40 years. One woman had had no children, and three did not speak English as a first language. Interviews took place in a variety of settings, including work places, bushland, and peoples' home. Half of the interviews were recorded then transcribed, with detailed notes taken during the remaining interviews (recording was at the discretion of the respondent). Two women requested copies of the interview transcript and provided feedback or corrections.

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<sup>14</sup> A report based on the focus group was prepared for Anglicare (Darwin) and distributed to all women who participated ("Myths and Stereotypes About Young Mothers"). It identified advocacy issues for Anglicare to ensure appropriate services to young, pregnant women, and a draft factsheet to refute some of the myths about young mothers.



It was extremely difficult to find women willing to participate. Some women agreed to participate but failed to meet at agreed times or places for an interview. If a woman did not appear three times in a row, attempts to reschedule a meeting time were abandoned. A member of the Indigenous Advisory Group was offered payment for recruitment of women to an interview or to a focus group and for conducting the interview or co-facilitating the focus group with the principal researcher. She also was unable to garner any interest in participation. The reasons for this resistance appear twofold. The first is time pressures – women were busy with family commitments and/or work and could not find time to participate (all women were offered an interview time which suited them, and at a place of their choosing). The second is research fatigue by Indigenous people. One person who agreed to be interviewed asked, “*What’s your one on?*”. Another woman who agreed to an interview said she took part because she knew how hard it was to find Indigenous people who would agree to participate. Linked to this is the concurrent timing of this research with implementation and subsequent monitoring and evaluation of the Northern Territory Emergency Response (the ‘Intervention’), the main focus of which was the wellbeing of children, albeit with far-reaching consequences for Indigenous persons of all ages. The Intervention was developed and implemented by mostly non-Indigenous agencies and individuals. For a non-Indigenous researcher to be asking questions of Indigenous individuals about children at the same time was problematic.

These difficulties recruiting Indigenous participants for this research should not be viewed as surprising. Stark and Hope (2007) noted that despite living in a community and knowing the women, when they sought to interview women about their knowledge of sexually transmitted infection and condom use, more women refused to participate than agreed. Cunningham et al. (2006) also noted how difficult it was to recruit Indigenous participants to a large survey-based health study (the DRUID study, detailed in Chapter Four), despite widespread support for the research. Notwithstanding the problems recruiting Indigenous participants for this research, interviews and a focus group were held and the men and women who shared their views and stories provide a valuable source of information that enriches the research. The views and experiences of Indigenous people living in Darwin gathered using this variety of qualitative methods are presented throughout this thesis, with a particular focus on young mothering reported in Chapter Seven.

## 1.5: Organisation of the thesis

Chapter Two of this thesis establishes an analytical framework for exploring Indigenous fertility in the Northern Territory. It explores the main theoretical approaches to understanding fertility among Indigenous populations where colonisation has been a major structuring force. While a complex interplay of place, institutions and social roles, with differential impacts of colonisation are shown to be important influences on fertility, only education, employment and income are able to be operationalised.

Chapters Three and Four concentrate on the Indigenous data sources used in this research. These chapters detail the data that are available and provide a critique of those sources for our understanding of contemporary Indigenous fertility in the Northern Territory. Chapter Three focuses on the numerator (births) and denominator (population) data required for the estimation of standard fertility measures (particularly age-specific and total fertility rates). The explication of Indigenous births data for the Northern Territory comprises important results for this research in their own right, including the methods used to render the data into a useable format. Chapter Four centres on additional data sources that contribute to our understanding of contemporary birth patterns among Indigenous women in the Northern Territory. Specifically, these are data from the census on the number of children ever born, termination of pregnancy data, and survey data.

Chapters Five, Six and Seven present the substantive results based on analysis of the available data. Not only do they highlight trends for the Northern Territory and its geographic sub-regions, they also show how data issues raised in Chapters Three and Four can influence results. Geographic differences are the focal point of Chapter Five, where it is shown that Territory level trends are clearly driven by rural and remote events. Most intriguing is that the higher rural fertility one might expect compared to urban centres is not necessarily in evidence. Chapter Six explores fertility outcomes and key socio-economic and contraceptive use predictors for the Greater Darwin region. Chapter Seven focuses on the overwhelmingly young age that women enter motherhood, and explores timing and spacing of births to Indigenous mothers. Together, the results from Chapters Five, Six and Seven point to remarkably little change during the 20-year period for which data are available and indicate stalled demographic transition is a contemporary feature of Indigenous fertility in the Northern Territory. The results contradict Gray's (1983a) early predictions of continued fertility decline among

## CHAPTER ONE: INTRODUCTION

Indigenous Australians, but there is some evidence of deferred childbearing from very young ages. The results also show that young childbearing is not necessarily associated with high fertility.

Chapter Eight concludes the thesis by considering the implications of results from Chapters Five, Six and Seven in light of the analytical framework developed in Chapter Two and the data shortcomings identified in Chapters Three and Four. It explores the implications of contemporary fertility patterns in the Northern Territory for the current and future Indigenous population, and the related policy issues these raise. It also suggests that while these patterns may reflect a stall in a downward trend they may also be indicative of a new transition unique to Indigenous minorities.



## CHAPTER TWO: TOWARDS A CONCEPTUAL FRAMEWORK OF INDIGENOUS FERTILITY

### 2.1: Introduction

Indigenous populations in the developed world have long been recognised as having distinct demographic profiles (Caldwell 2002, Johnstone et al. 2011, Kunitz 1994, Pool 1986, Robitaille and Choinière 1987, Taylor and Bell 1996). In Australia, New Zealand, Canada and the United States, indigenous populations all show an onset of fertility decline during the 1960s and 1970s. This is almost a century later than the start of fertility declines that took place among the immigrant colonising population (Caldwell 2001, 2002:160).

The timing of fertility (and mortality) declines by indigenous, minority populations means demographic transition theory as applied to developing countries is often used to understand the determinants of indigenous population change and their expected future prospects (Blackwood 1981, Pool 1991). The concurrent timing of fertility decline among minority, colonised indigenous populations and the populations of developing countries has also been used to indicate a “globalization of fertility behaviour” (Caldwell 2001:93). Certainly it is agreed by demographers that fertility transition is universal and that once the fertility transition has begun it is inescapable (Caldwell 1996, Kirk 1996). These premises held by demographers often lead to assumptions of convergence of fertility behaviour between different populations (Ram 2004). While evidence indicates convergence may not be an unreasonable assumption (Caldwell et al. 1992, Kinfu 2000), convergence of summary fertility measures may hide important differences by age (Jackson et al. 1994) and create conflict between tradition and change (Taylor 2009). Moreover, a slowing of fertility decline at any levels above replacement (more than 2.1 births per woman) are assumed to be stalls in fertility (Bongaarts 2007, Kirk 1996, Romaniuk 2008).

This chapter considers the applicability of explanations of fertility change to contemporary Australian Indigenous fertility. The failure of most demographic theory

to account for the impacts of colonisation (Smith 1980),<sup>15</sup> or the relative stability of Indigenous fertility in the Northern Territory during the past 20 years (Johnstone 2010) means alternative conceptual models are explored. As will be made clear in Chapters Three and Four, which focus on data availability and limitations, there are severe constraints to operationalising any models that seek to understand and explain Indigenous fertility. The frameworks outlined in this chapter enable the data issues and the results presented in Chapters Five, Six and Seven to be understood within the social context of Indigenous peoples' lives in the Northern Territory.

### ***Determinants of fertility***

Demographers' understanding of fertility change is rooted in demographic transition theory. The original theory was inspired by slow population change in Europe and the 'overseas Europe' (including colonial, non-Indigenous Australia) over two to four centuries, but was applied to all populations, with high fertility viewed as irrational (Notestein 1945, van de Kaa 1996). Fertility at below-replacement levels was viewed as the natural outcome of the transition (Coale 1973), with major differences between European populations and other non-European populations being timing of transition onset and the speed of the transition.

While the appropriateness of the demographic transition model (as a theory and as an explanatory framework) has been questioned (e.g. Cleland and Wilson 1987, Coale 1973, Riedman 1993, Schneider and Schneider 1995), and numerous theories about fertility change have been developed (see van de Kaa 1996 for an overview of 50 years of research and theoretical developments relating to the determinants of fertility), demographic transition theory has persisted (Mason 1997, Weeks 2005). It is generally agreed by all theorists that once fertility decline has started it will continue (Kirk 1996), albeit to differing levels and through differing mechanisms (Mason 1997, Pool et al. 1999).

One of the earliest explanatory frameworks developed to explain how different societies could have the same fertility levels, and similar societies different fertility, was the important work by Davis and Blake (1956). Their framework, possibly one of the most

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<sup>15</sup> A key critique of the application of demographic transition theory as used in developing countries to Australia's Indigenous population is that following colonisation there was a dramatic decline in population numbers prior to recuperation and high growth (Smith 1980). While this was a common phenomenon among indigenous minorities under colonisation (Pool 1986) it was not a feature in developing countries (Lucas 2003).

widely recognised and used frameworks for understanding fertility change (e.g. Morgan et al. 1984, Pool et al. 1999, Pool and Sceats 1981, Rainwater 1965, Weeks 2005), showed how 11 intermediate variables filtered social and cultural factors to influence fertility behaviours. These were arranged into three groups:

- i) Factors affecting exposure to the risk of intercourse;
- ii) Factors affecting exposure to the risk of conception; and
- iii) Factors affecting gestation (Davis and Blake 1956).

Work carried out to refine how social institutions, medical conditions and cultural norms influenced these factors has focused on measures that are viewed as proxies for a particular behaviour, most notably the use of marriage as a proxy for exposure to intercourse (Bongaarts 1978). Bongaarts more recently (1993) has concluded that it is changes in demand and preferences for children that are most important and Mason has posited that the proximate determinants of fertility work through *perceptions* of child survival (supply), child costs and benefits (demand) and costs of pre- and postnatal contraception (Mason 1997, 2001). This is an important idea that is explored in further detail later in this chapter.

Demographic theories which aim to understand the complexity of fertility decisions have drawn complaint from anthropologist and feminist scholars because of assumptions about gender relations, and the overlooking of heterogeneity among population groups in attempts to understand macro-level movements (Fricke 1997, Greenhalgh 1990, Townsend 1997). Particular scorn has been poured on the demographic methods used to measure complex social phenomena that rely on proxy variables such as education levels or marriage (Riedman 1993).

These critiques of demographic theory and method appear particularly pertinent if we are to understand the complexity of contemporary Indigenous fertility in Australia. Morphy (2007a) has highlighted the inability of standard demographic methods to capture the reality of Indigenous peoples' family and household networks, or even where people live. For Indigenous fertility then, an analytical perspective is needed that responds to "a complex web of change" (Gray 1983a:11). Gray's approach to the analysis of Indigenous fertility in Australia was to place the mechanisms of fertility change, especially the role of factors affecting exposure to the risk of conception, centrally among the components of analysis. Societal variables, intermediate variables,

influences from non-Aboriginal society, and fertility itself were viewed as causes, effects and mechanisms of change. None of these were considered to be the end point of the analysis (Gray 1983a:12). But this approach does not offer strong explanatory power for why Indigenous fertility decline has not continued in some parts of Australia, particularly the Northern Territory, an assumption of Gray's work (Gray 1983a). There is an obvious need for an explicit framework that allows the complexity of influences on Indigenous fertility outcomes to be understood, and in particular, the influences of colonisation.

Romaniuk<sup>16</sup> (2008), based on the experience of the Aboriginal population in Canada, also concluded that contemporary fertility could only be understood in light of the history of colonisation. It is the only published framework for understanding fertility change that explicitly prioritises the experience of a minority, colonised population. This is not to suggest that demographers have ignored the impact of colonisation on indigenous populations (see for example Douglas 1977, Kunitz 1994, 2000, Pool 1991, Smith 1980). Rather, there are too few examples of explicit analytical frameworks that allow systematic investigation of how and why demographic change has occurred in a way that is different to other populations. Romaniuk's framework is detailed below, because of its unique place in the demographic literature. Its use in this research is ultimately rejected because it is based on an assumption of fertility decisions being made "between two worlds" (Romaniuk 2008), an assumption that does not recognise the decision-making space found at the intersection of two cultures (Merlan 2005, Musharbash 2008). A new model is therefore proposed based on research evidence from Australia alongside a range of fertility theories. Presentation of this conceptual framework is used as a means of placing the data issues and fertility trends shown in this thesis in context. Operationalising the framework is difficult, however, because of data constraints and the chapter closes with a more restricted model that is limited to those facets of the explanatory framework that can be measured.

## **2.2: Romaniuk's history-based explanatory framework**

Romaniuk's (2008) 'History-based Explanatory Framework for Procreative Behaviour of Aboriginal People of Canada' was developed to explain the childbearing behaviour of the indigenous population of Canada as it evolved from first contact with Europeans to the present. Romaniuk developed his framework in response to the inability of

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<sup>16</sup> Note that Anatole Romaniuk's publications have appeared as both Romaniuk and Romaniuc.



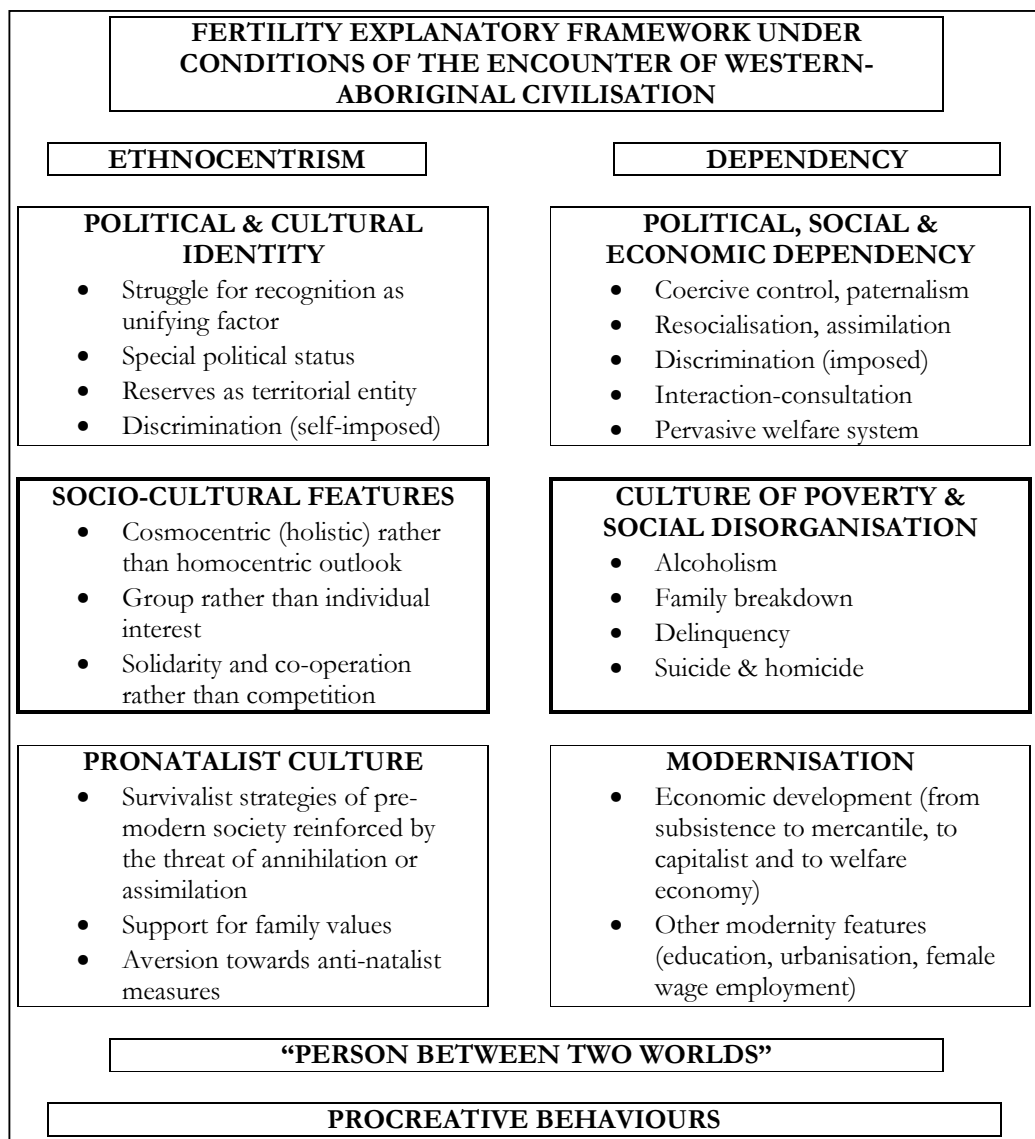
demographic transition theory to account for “the power of cultural resistance to modernity” (Romaniuk 2008:171), so-labelled because of the stalling of the Canadian aboriginal fertility decline.

Romaniuk’s framework, shown in Figure 2.1, is based on ‘native ethnocentrism’ and ‘dependency’ as the dominant dimensions of indigenous Canadians’ relationship to the state and the dominant, colonising society. He argues that it is a combination of these two basic features that have resulted in a duality of indigenous identity. Individuals who live ‘between two worlds’ have childbearing behaviour that results from a competition between modern norms of limited childbearing and traditional values and structures associated with pro-natalist ideologies. Romaniuk proposes three pairs of features, one half of each pair under the ethnocentrism or dependency dimension.

The first pair is ‘political and cultural identity’, under the ethnocentrism dimension, and ‘political, social and economic dependency’ under the dependency dimension. Romaniuk identifies Indian Reservations to be of paramount importance for political and cultural identity because of their self-government arrangements and territorial integrity. Reservations have enabled a preservation of traditional life styles and structures, a ‘longing to reconnect with the past’, and provided a rallying point for political advocacy. Aboriginal Canadians are also subject to protective legislative measures that set them apart from other ethnic groups in Canada.

The dependency component of the framework is recognised as having developed over time “from direct coercive control to much milder forms of control including various integrative and consultative processes that increasingly define relationships between Aboriginals and Canadian governments” (Romaniuk 2008:176). Key to this dependency in Canada is the welfare system which creates economic dependence, and is particularly pertinent to childbearing behaviours because benefits are, to some extent, determined by the size of the family. Romaniuk also notes research from the United States (Kunitz and Tsianco 1981) that concluded that among the Navajo dependency on government also affected kinship.

**Figure 2.1: Romaniuk’s history-based explanatory framework for procreative behaviours of Aboriginal people (Canada)**



Source: Romaniuk (2008) in *Canadian Studies in Population*, 30(1):173.

The second pair in the framework, ‘socio-cultural features’, under ethnocentrism, and ‘culture of poverty and social disorganisation’, under dependency, is highlighted by Romaniuk as important by his use of bold lines around each component (reproduced in Figure 2.1) (Romaniuk 2008:173). Key socio-cultural factors identified as setting aboriginal Canadians apart are holistic views centred on the world around them rather than on people, group interests prioritised over individual interests, and an emphasis on the present rather than the future. Romaniuk posits that cooperation rather than competition means the desire for parents to move their children up the social ladder by having fewer children (and thus having more resources to enable each child to have

education and so forth) may not be embraced. Next to these socio-cultural features of ethnocentrism, Romaniuk proposes features of poverty and social disorganisation (dependency), as evidenced by high rates of alcoholism, delinquency, violence, homicide and suicide.

The final pair of the history-based framework is pronatalist culture (ethnocentrism) and modernisation (dependency). Romaniuk notes that placing modernity under dependency is done for simplicity, but comments that modernisation is triggered and sustained by the dominant society so is well placed here. Pronatalist strategies are viewed as survivalist strategies, understood as the maintenance of normative behaviours that lead to having more children and opposing efforts to limit families in any way. Social and economic conditions may also lead to women having more children if the children provide support in old age.

The modernisation part of Romaniuk's framework includes developmental factors such as education, urbanisation, and female employment, as well as the 'spill-over' effect from the dominant majority to the aboriginal minority (e.g. the contraceptive revolution of the pill and IUD in the 1960s). Romaniuk writes that the modernisation component of the framework is most puzzling because of the recent stalling of fertility rates, following a very rapid decline, among aboriginal Canadians.

Romaniuk proposes that the merging of ethnocentricity and dependency produces "an aboriginal person, whom we may call 'person-between-two-worlds'", resulting from, "a society wrestling with the tensions between self-preservation as a cultural and political entity, and the forces of assimilation into mainstream society" (Romaniuk 2008:180).

Romaniuk posits that the history-based explanatory framework might be applicable to a broad collection of indigenous peoples worldwide, but noted that it was a tentative one. The framework does have significant resonance with the Australian experience.<sup>17</sup> Among the Yolŋu of Arnhem Land (in the north east of the Northern Territory), for example, Trudgen (2000) has identified the stress of living between two cultures as a key contributor to drinking, violence, depression and ill-health. Recognition of differences

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<sup>17</sup> Many of the features of Romaniuk's framework have also been reported on for Indigenous peoples of Australia. For example, Indigenous Australians being subject to specific legislation (Calma 2009, Griffiths 2006), kin concerns taking precedence over individual priorities (Musharbash 2008, Young 1995), the negative impact of alcohol (Stark and Hope 2007, Wild and Anderson 2007) and a high level of welfare dependency (Pearson 2007a, Sanders 2009, Trudgen 2000).

between Aboriginal and Western cultures in Australia are also evident in the development of two-way learning in education (Gientzotis 2006, Hooley 2002) and two-way partnerships for governance (Fletcher 2009). ‘Two-way’ approaches, however, are not necessarily about Indigenous peoples being in a struggle between two worlds, but rather about people benefiting from two cultures, and the dominant culture also learning from Aboriginal peoples.

While the ‘person between two worlds’ concept based on notions of intercultural spheres is well recognised (Merlan 2005:169; Riches 1990:72), by presenting the influences on fertility as dialectic between ethnocentrism and dependency Romaniuk’s framework fails to recognise the new social sphere for peoples’ lived realities that is created by the intersection of two cultures (Merlan 2005). It also fails to capture the evolving nature of peoples’ ‘life projects’<sup>18</sup> (Blaser 2004). Sahlins (1999) characterised this common dialectic of two conflicting world views as contradictory, and claimed that it rendered cultural diversity to “one indeterminate meaning” (Sahlins 1999:vi). Anthropologists in Australia have recognised the increasing entanglement of “Indigenous and non-Indigenous life worlds” (Hinkson and Smith 2005:157) and some have identified the need to:

“...shift analysis of the ‘intercultural’ away from an emphasis on an ‘interface’ between separately conceived domains, and towards an approach that considers Indigenous and non-Indigenous social forms to be necessarily relational, and to occupy a single socio-cultural field” (Hinkson and Smith 2005:158).

This echoes Roseberry’s conclusion from over 20 years ago that anthropological political economy places anthropological subjects at the intersections of local and global histories (Roseberry 1988). As Musharbash eloquently showed for Yuendumu<sup>19</sup> (in the central desert region of the Northern Territory) Indigenous people in that settlement do not live in between, or negotiate, two worlds. Rather, Indigenous people accommodate the intersection between the two ways of being, continually dealing with the reverberations and contradictions of this intersection (Musharbash 2008:154-155). Merlan (1998) when writing about Aborigines in Katherine (the Northern Territory’s third largest urban centre) identified the need for an intercultural ethnography. The idea of new social

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<sup>18</sup> ‘Life projects’ is a term used in a volume by Blaser et al. (2004) focusing on Indigenous people and development. Life projects are used as a counterpoint to development projects and described as being “embedded in local histories; they encompass visions of the world and the future that are distinct from those embodied by the state and market” (Blaser 2004:26).

<sup>19</sup> Place names referred to throughout this thesis are shown in the map in Figure 1.1 on page 8.

spheres being created by the meeting of Indigenous and colonising cultures and societies is also found in Altman's 'hybrid economy', a term used to describe remote, Indigenous Australia (Altman 2001, 2004, 2006).

The strength of Romaniuk's argument that procreative behaviours result from a person being 'between two worlds' is thus not supported by contemporary research, and is rejected by Indigenous people themselves (Paradies 2006). While its innovation as an indigenous-specific framework which prioritises the importance of colonisation history is recognised, a new framework that captures the contemporary, Australian experience is presented in the following section.

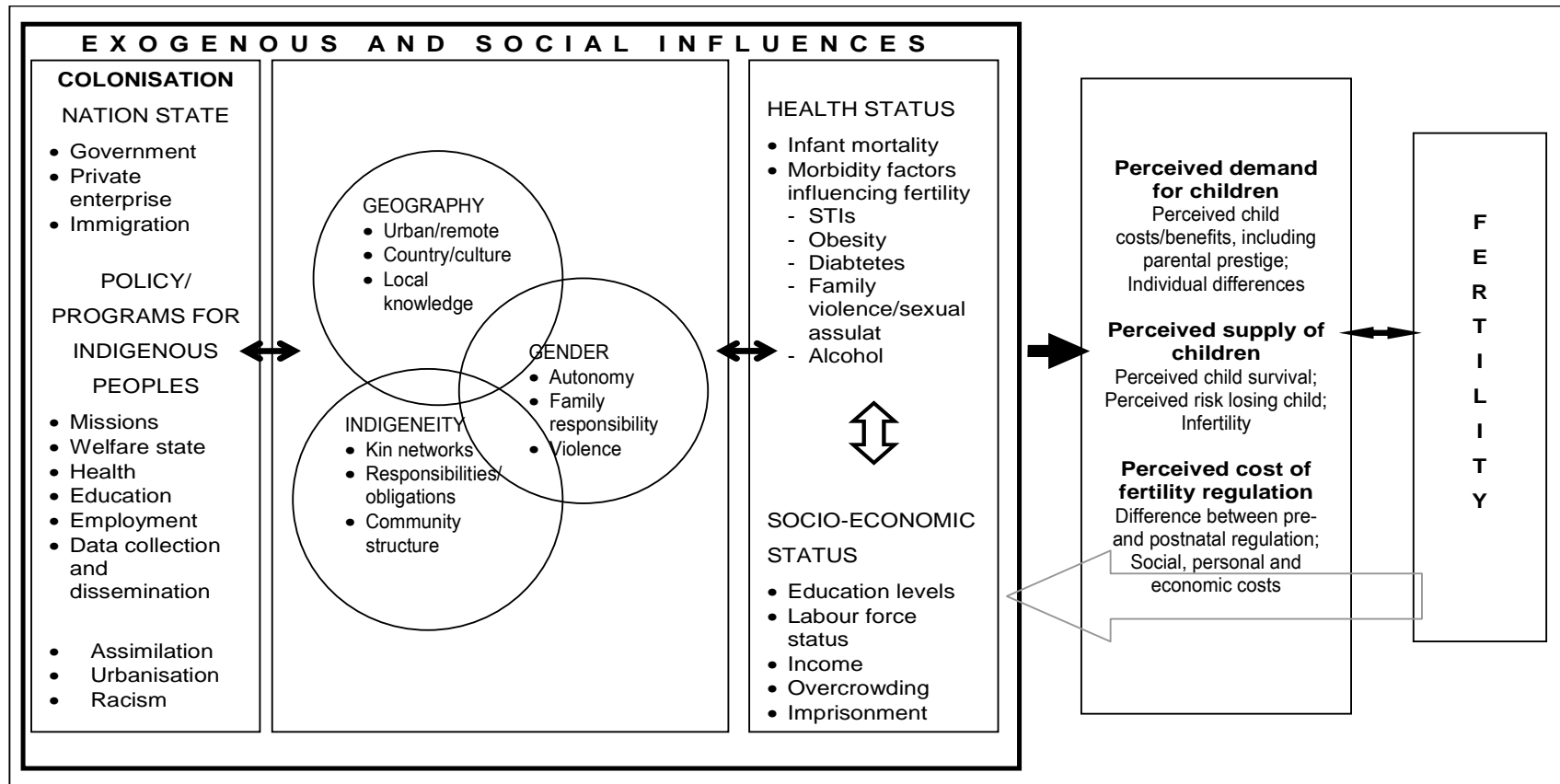
### **2.3: Conceptual framework for understanding contemporary Indigenous fertility in Australia**

Gray (1985) identified that Aboriginal demography in Australia would only be sustainable as 'political demography', focusing on the interplay between the institutions of two populations. This interplay is reflected in the conceptual framework presented here. The framework is conceptually complex in order to capture the myriad factors that affect fertility outcomes but in ways that may differ across time and space. It includes many factors that cannot be measured by this research, but their inclusion provides a context within which the results of the ensuing chapters can be understood. While the focus of this research is the Northern Territory, this framework has been developed with a national focus, to reflect the full scope of evidence available, and to address the gap in this area.

The framework, outlined in Figure 2.2, shows fertility to be the outcome of three proximate determinants that are affected by a set of exogenous and social influences, each of which is interactive. The proximate determinants of the framework are:

- perceived demand for children;
- perceived supply of children; and
- perceived cost of fertility regulation.

Figure 2.2: Conceptual framework for explaining contemporary Indigenous fertility in Australia



These proximate determinants were proposed by Mason (1997) when she suggested a perceptual, interactive approach to explaining fertility transitions was needed. They reflect the proximate determinants originally proposed by Easterlin<sup>20</sup> (1975) but go beyond the economic costs of having children and fertility regulation. These proximate determinants are also broader than those identified by Davis and Blake (1956).

The Davis and Blake framework as a model for explaining Indigenous fertility patterns is rejected for this research, as it was by Gray (1983a). In addition to their industrial and pre-industrial models being inappropriate for Indigenous peoples in Australia the reasons are twofold:

- i) The 11 intermediate variables identified by Davis and Blake are captured by the proximate determinants of perceived demand for children, perceived supply of children and perceived cost of fertility regulation. For example, Davis and Blake identify unions broken by the death of a husband or involuntary abstinence as affecting exposure to intercourse (Davis and Blake 1956). In this framework, such factors are identified as affecting perceived supply of children.
- ii) While Davis and Blake developed the framework to explain the causal relationship between institutions and fertility, it is a clumsy tool for explaining the impact of history on current fertility. The Davis-Blake framework was also developed to focus on “factors affecting fertility strictly defined” (Davis and Blake 1956:213) and excluded child care and kin networks, both of which have been shown to influence fertility outcomes (Kaufman et al. 2001, McDonald 2000a, 2000b). Given the importance of history and kin networks to contemporary Indigenous peoples’ lives, these exclusions make the framework problematic.

The framework has been developed to reflect the political economy of fertility (Greenhalgh 1990). It aims to enable explanation of contemporary fertility patterns among Indigenous Australians that reflect social, economic, political, historical and cultural realities and respond to the call for more anthropological insights into the study of population processes (Caldwell et al. 1987, Caldwell and Hill 1985, Kertzner and Fricke 1997). While the results from this research may be limited by data constraints, the results need to be understood within the broader context provided by this framework.

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<sup>20</sup> Easterlin proposed that the determinants of fertility are seen as working through one or more of the following: the demand for children, the number of surviving children parents would want if fertility were costless; the potential output of children, the number of surviving children parents would have if they did not deliberately limit fertility; and the costs of fertility regulation, including subjective and objective costs, the time and money required to learn about and use specific techniques (Easterlin 1975:55).

The framework is built on theoretical contributions, but it eschews one particular theory. Rather, it has been built from a range of theories and evidence. It reflects, in parts, women's own stories gathered through interviews and a focus group for this research.

There are three distinguishing features to the framework. Firstly, fertility itself is interactive. Fertility is both an outcome of determinants in its own right and a determinant of exogenous influences, and future fertility outcomes (Wood et al. 1998). Secondly, as already noted, the proximate determinants work through perceptions (Mason 1997). Lastly, colonisation generally, and through the institutions of the nation state and its policies and programs, is an explicit and pervasive influence on identified exogenous and social influences. The remainder of the chapter looks at the components of the framework in detail.

### ***Proximate determinants of fertility outcomes***

As already noted, the proximate determinants of this framework for understanding Indigenous Australian fertility change are ideational and interactive. They work through changing perceptions of demand for and supply of children and of the perceived cost of fertility regulation, all of which may change at a different rate than the reality with which they are concerned (Day 1977, Mason 1997).

#### Perceived demand for children

Demand for children works through two sets of perceptions: the perceived child costs and benefits, including economic costs and the status that accompanies being a parent; and the perceived roles of men and women in relation to childbearing. The two are closely linked. As McDonald has shown, perceptions of women's role as family orientated with majority responsibility for raising children in modern capitalist economies raises the costs of having children in terms of impact on career, income and life style (McDonald 2002:16). In Indigenous families, the care giving role is normally the responsibility of the whole (extended) family, with women having primary responsibility (Kitaoji 1976, Penman 2006, Smith et al. 2003), which has clear implications for the perceived child care costs associated with having children.

For Indigenous Australians, several factors will influence the perceived costs and benefits of having children. In a welfare state, with freely available health and education systems (albeit with contentious levels of services), some of the economic costs of



having children are mitigated. Social welfare payments linked to having children means there may be perceived economic benefits to having children. Moreover, in Australia's recent past, Indigenous women were actively encouraged by white administrators to render themselves dependent on the state so the state could better progress its assimilation policies (Collmann 1979). This is not an argument claiming that current welfare benefits are the reason women have children.<sup>21</sup> A short focus group with young, pregnant women showed that many of them were not aware of their entitlements, and they were all dismissive of the idea that the Baby Bonus<sup>22</sup> was the reason for their pregnancy. The women were aware, however, of being entitled to state support.

Among Indigenous Australians who are over-represented among measures of social disadvantage, and who have experienced discrimination for themselves and their family members, becoming a parent offers status. In many communities, becoming a parent is also an important step to achieving social maturity and achieving full adult rights (Taylor 2004). There are thus high perceived benefits to having children. Being a parent offers status both within one's own community (Musharbash 2008) and in the wider society (Geronimus 1997). As Kaplan has shown for the United States, having a child young is viewed by young Black women living in the ghettos as a way to have love, and to achieve status. These benefits, however, may dissipate as the babies grow older.

Mason (2001) noted that when gender or family systems prevent women from working, pressures for fertility decline will be relatively low as there are few perceived costs associated with having children. Whether women are prevented from working because of family or because jobs are simply not available (because of geography, government policy, education levels or any other combination of exogenous factors), the impact on perceived demand for children is similar.

Some of the perceived demand for children may also come from needing to ensure lineage (Merlan 1991, Robinson 1997). Daughters, for example, offer direct family connections in ways that sons do not for some Aboriginal and Torres Strait Islander

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<sup>21</sup> It is ironic though that within the space of 40 years, government administration has moved from actively discouraging dependence on family for support to imposing detailed scrutiny of spending and family support systems for those reliant on welfare income.

<sup>22</sup> The Baby Bonus was introduced in 2004 as a lump sum payment paid to a mother following the live birth of a child. The payment was \$3,000 when first introduced and rose to just over \$5,000 in 2010. In 2008, payment changed from one lump sum to 13 equal fortnightly payments and started to be means tested based on parental income for the six months following the birth.

peoples. During interviews with women living in the long grass<sup>23</sup> in Darwin, three older women, who were asked how many children they had had, gave initial answers that only included daughters. It was only with subsequent discussion that the number of sons each had was elicited. Daughters' children are more salient as grandchildren than sons' children are, and are distinguished from them terminologically in Aboriginal kinship systems. In certain family systems, a daughter's children have certain 'caretaker' responsibilities for the 'grandmothers' clan whereas a son's children do not (Frances Morphy, personal communication).

Mason (2001) has argued that in lineage-based family systems fertility will decline later than among non-lineage-based family systems. If family members who are economically more fortunate face pressures to share their wealth, having only a few high quality children becomes less possible than in family systems that limit economic obligations to the immediate families. The expectations of wealth sharing among Indigenous families in Australia has been well documented (Musharbash 2008, Senior et al. 2002, von Sturmer 1980).

Demand for children is also influenced by hopes and expectations for the future, which are based on immediately perceived options as well as information about the wider world (McNicoll 2001b). These expectations include individuals taking account of how they anticipate others will decide. Musharbash (2008) has shown how having children young has become a norm in Yuendumu and young women who do not have their own children spend their time with women who do have children. Children beyond infancy are also largely accorded autonomy in many Aboriginal groups, regarded as equivalent to adults (Hamilton 1981, Merlan 1991, Penman 2006). Children perceived as autonomous, rather than dependent, will have different cost-benefit perceptions attached to them. Moreover, children themselves are encouraged to help with the care of younger family members, thus further affecting cost-benefit perceptions of having children.

#### ~~Perceived supply of children~~

Supply of children is affected by voluntary and involuntary control of fertility (Davis and Blake 1956). There are significant indicators of high levels of infertility (primary and secondary) among Indigenous women. Documented high levels of STIs and pelvic inflammatory disease (Kildea and Bowden 2000, Skov et al. 2000) require consideration

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<sup>23</sup> Living or staying in the long grass is the local reference for living rough or homelessness.

of whether fertility levels are in part dictated by fecundity, rather than choice. Moreover, morbid conditions known to have high prevalence among Indigenous populations in Australia (AIHW 2008) may affect fecundity (Boyle 2010). If difficulty having children is common, then women may choose to try to get pregnant early as a response, either because of real difficulties falling pregnant or perceived difficulties.

Mason (1997) has noted that it is social systems that influence the value of surviving children to parents and the extent to which families can accommodate different numbers of surviving children. Not only are there perceptions about an ideal number of surviving children (demand), there are also perceptions about how many children born will survive.

The significant, and well-publicised, difference between Indigenous and non-Indigenous child mortality figures (Tew and Zhang 2010) undoubtedly affects contemporary perceptions of child survival. While infant mortality decline among Indigenous Australians during the 1970s and into the 21<sup>st</sup> Century is well documented (ABS 2009c, Gray 1983a, Zhang et al. 2010), across Australia and in the Northern Territory Indigenous perinatal death<sup>24</sup> and infant death<sup>25</sup> rates have consistently exceeded non-Indigenous death rates (ABS 2009c, Zhang et al. 2010). Despite continued declines in the Indigenous perinatal and infant death rates, they remain two to three times as high as the non-Indigenous death rates.<sup>26</sup> As the quote below from the late Dr Arnold “Puggy” Hunter<sup>27</sup> illustrates, high mortality rates do influence how Indigenous people in Australia think about childbearing:

“We’re trying to keep ourselves going so we have to breed up. The rate of young people dying, and more so Aboriginal men, has to [mean more kids per family than] just the normal two and a half kids” (Hunter, cited in Hunt 2007:195).

In Australia, Indigenous parents’ perceptions of how many children would survive have been accompanied by perceptions of how many children would remain in the family’s care. The state-sponsored removal of children up until the 1970s was the same outcome for parents as their children dying and many ‘stolen generations’ children were mourned

<sup>24</sup> A perinatal death is defined as the death of an infant within 28 days of birth or of an unborn child that weighs at least 400 grams or that is of a gestational age of at least 20 weeks.

<sup>25</sup> An infant death is defined as death of an infant between live birth and exactly one year of age.

<sup>26</sup> In 2006 in the Northern Territory, there were 28 Indigenous perinatal deaths per 1,000 births compared to nine non-Indigenous perinatal deaths per 1,000 births (Tew and Zhang 2010). The Indigenous infant death rate in 2006-2008 was 14 deaths per 1,000 births, over three times as high as the non-Indigenous rate of four deaths per 1,000 births (ABS 2009b).

<sup>27</sup> Dr Arnold “Puggy” Hunter was a highly respected leader in Aboriginal health nationally and a central figure in the Kimberley region of Western Australia.

as dead for lifetimes by kin (Kenny 2007). The removal of children undoubtedly had similar effects as infant mortality on the determinants of fertility and a story from a woman interviewed for this research illustrates this point:

*“...and then we have heard stories that my great grandmother, my maternal great grandmother had 22 children ... but her children continued to be taken away, so my grandmother and sister were two of her children that we know about who were taken away at the same time ... We have now started to find others who were taken away ... so there’s talk that she possibly had 22, but in fact they kept getting taken away from her, it’s not like she had 22 kids that she was looking after” [woman aged in her 40s with two children].*

While policies of taking children to assimilate them into the dominant white culture ceased during the 1970s, children are still removed from families when health treatment is needed outside the community of residence, child safety is an issue or if children are disciplined through the juvenile justice system (Commonwealth of Australia 1997). Stolen Generations’ history continues to have an impact on perceptions of whether children will be lost to their parents. Participants in a recent yarning circle in Queensland talked about the fear of having their children taken, as exemplified by the following woman:

“I live in constant fear that one day it will happen to me. I fear that I might make the most innocent mistake. But it will be enough for them to justify taking my babies, simply because I made a mistake. They will put me under notification without telling me first. That is happening to our young mothers these days” (Robertson et al. 2005:41).

One woman fostered as a baby in the 1960s said in confidential evidence to the National Inquiry into the Separation of Aboriginal and Torres Strait Islander Children from Their Families:

“I don’t want to have kids, not in this society. ‘Cause I reckon it’s cruel to have a child in this society. If I was taken away, my mother must have been taken away from her mother, and if I was taken away from my mother, of course my child would be taken away from me” (Commonwealth of Australia 1997: confidential evidence 166).

#### Perceived cost of fertility regulation

Mason (1997) has suggested that a key difference between high and low fertility regimes is the use of postnatal and prenatal fertility controls respectively. For this reason, the perceived cost (economic and social) of postnatal versus prenatal controls is a key fertility determinant. That said, it is extremely difficult ascertaining contraceptive use

prevalence among Indigenous women because of a lack of data.<sup>28</sup> The National Aboriginal and Torres Strait Islander Health Survey (2004-2005) found that among Indigenous women aged 18-49 years across Australia, 42 per cent of remote women and 55 per cent of non-remote women were using the oral contraceptive pill, condoms, Depo Provera (contraceptive injectable) or Implanon (contraceptive implant) (ABS 2006a). A case file audit of a medical clinic in a remote Northern Territory community found 54 per cent of women were using contraception, including tubal ligation (Kildea and Bowden 2000). Data from a 2003-2005 Darwin-based survey of Indigenous women (the DRUID Study, see Chapter Four for more detail) found 22 per cent of women aged 20-44 years were using either the oral contraceptive pill, Depo Provera or Implanon at the time of the survey. A limitation of all these data sources is they each fail to capture all methods of contraception women might use. They do indicate, however, use of modern, efficient contraceptives among Indigenous women at some stages of their reproductive lives.

Postnatal fertility controls identified by Mason (1997) include infanticide, abandonment, giving children to the care of others, sending older children into service or to other settlements/countries as migrants. Activities such as these do not result in significant changes to the number of live births. In the modern era with access to modern contraceptives, postnatal controls could be conceptualised to include prenatal fertility regulation for any subsequent births to the first (parity-specific postnatal fertility controls). The social and personal costs of using contraception may be too great for women who are nulliparous but either diminish, or be less than the costs associated with having more children, once a woman has had a child or children (Senior and Chenhall 2008).

The social and personal costs associated with fertility regulation may be complex. Interviews with Indigenous women aged 18 to 35 years from a remote community in central Australia (n=24) showed that just over half did not want to get pregnant, but only one used a condom 'most of the time' and one 'all of the time'. Half of the women had not talked about condom use with their most recent partner. The most common reason for not talking about condoms with sexual partners was that it was a 'shame job'. Traditional Aboriginal culture and gender norms prevented women from speaking about

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<sup>28</sup> Jones et al. (2005) in a health status report on Northern Territory women reported a rate of 0.09 prescriptions per woman in the Northern Territory aged 15-49 years, much lower than the national rate of 0.21. These data were based on prescriptions and could not be disaggregated by Indigenous status.

things associated with men's genitals and sexual intercourse. Moreover, the overwhelming majority of women (22/24) did not know where to get condoms in the community, and because of the shame associated with talking about them would not ask for them (Stark and Hope 2007).

Social costs of fertility regulation may also be linked to contraceptive method. In communities where overcrowding is endemic, where people may not sleep in the same place every night, or have a space to store personal effects (Musharbash 2008) the practicalities of being able to take the pill every day, or having access to condoms when needed, are complex. Fertility regulation methods are thus more likely to be those that are permanent or requiring minimal maintenance. As already noted, Kildea and Bowden (2000) reported that among Aboriginal women aged 20 to 45 years included in a case note audit for a remote Northern Territory community, half were using depot steroidal contraception or tubal ligation, but a further 46 per cent were using no contraception. There has also been anecdotal evidence of a large uptake of Implanon over the past several years since its registration on the Australian Register of Therapeutic Goods in 2000<sup>29</sup> in remote Northern Territory Indigenous communities (Desley Williams, personal communication). The practicality of access to and use of non-permanent methods of contraception is thus an important influence on the perceived cost of parity-specific pre- and postnatal fertility regulation.

Economic costs associated with fertility regulation are more straightforward. In remote communities, health services, including medications, are provided free by the health clinic (if there is one). Not all clinics have staff trained to provide the breadth of contraceptive choices that are available (e.g. IUDs, diaphragms or Implanon). Aboriginal Controlled Community Health Services also provide services free of charge and distribute medicines. Other services may be accessed free through Medicare bulk-billing or on a fee-for-service basis from the primary health care system (including general practitioners and family planning services).

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<sup>29</sup> Implanon was approved for use by the Therapeutic Goods Authority in 1999 and registered on the Australian Register of Therapeutic Goods in 2000.

The economic costs of termination of pregnancy are more complex. Termination services are available free from Royal Darwin Hospital and Alice Springs Hospital<sup>30</sup> (the Territory's two largest public hospitals), but may be difficult to access because of travel requirements. Patients from remote communities are entitled to assisted travel and a small per diem payment under the Patient-Assisted Travel Scheme (PATS), although this may not cover all costs, and anonymity of reason for travel is not always guaranteed (Dr Suzanne Belton, personal communication). Terminations are also available on a fee-for-service basis at the Darwin Private Hospital.

### ***Exogenous and social influences on Indigenous fertility***

In the framework presented here, exogenous and social influences are a set of interacting factors that work through the proximate determinants to affect fertility outcomes. This grouping enables identification of how individual factors can affect fertility outcomes directly, or through interaction with other factors. For example, imprisonment of Indigenous men can have a direct impact on the supply of children (by not being present to enable conception). Imprisonment does not happen in a vacuum, however, and in Australia, overrepresentation of Indigenous men in prisons<sup>31</sup> has been attributed to institutional racism within the criminal justice system, and alienation from land and kin networks (among other factors) (Johnston 1991, Walker and McDonald 1995). Each of the factors identified as an exogenous influence on fertility is explained in detail in the following sections and evidence for each factor's inclusion is presented.

#### Colonisation

That colonisation has affected the demography of Indigenous Australians is almost self-evident (Caldwell 2002, Kunitz 2000, Smith, McCalman et al. 2008). This framework recognises continued inequitable power relations between Indigenous peoples and colonisers and marginalisation from the dominant society (Altman 2006, Taylor and Bell 2004a), and recognises the continued impost of history on the present (Pearson 2007a, Trudgen 2000). To quote Riches (1990:84), “[h]uman social action may not be dictated by the past, but it is certainly a predator on it”.

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<sup>30</sup> Informal discussion with an anaesthetist raised the possibility of terminations of pregnancy being carried out at Katherine Hospital but no corroborating evidence has been found. Terminations of pregnancy may have taken place at some time in the past but were not being carried out at the time of writing.

<sup>31</sup> In 2009 in the Northern Territory, Indigenous prisoners comprised 82 per cent of all prisoners (ABS 2009d). This is significantly higher than the almost one-third representation of Indigenous persons in the total Territory population (ABS 2008c).

The importance accorded to colonisation reflects the continued impact of historical forces on contemporary demographic regimes (Greenhalgh 1990). These can be both positive and negative. Including colonisation as an explicitly identified component of this framework reflects the differing impact of colonisation on peoples' lives and social structures, as well as the new intercultural or hybrid spaces created throughout Australia.

Colonisation is used as shorthand to encompass facets of the nation state, including social and economic institutions, and specific policies and programs targeting Indigenous peoples. McNicoll has presented a strong case for adequate attention being paid to the institutional determinants of fertility change (McNicoll 1980, 1994, 2001a, 2001b). McDonald's (2000a, 2000b) gender theory also posits that the state cannot *not* influence fertility. More recently, Presser et al. (2006) have shown how essential state support is for fertility decline to take place in the era of modern contraceptives and medical procedures. Reports from the 1970s show how important the provision of family planning services was to the uptake of modern contraceptives among remote Indigenous women (Kamien 1975b), but also that culturally inappropriate services were a strong barrier to contraceptive use (Reid 1979). These issues remain salient today, with Australian and state/territory-funded health services responsible for much of the provision of contraceptive services to Indigenous women (Armstrong 2009, Jones et al. 2005), but with these same services having institutional and cultural barriers to contraceptive use because of the way services are provided (Bartlett 1998, Devitt et al. 2001, Haikerwal 2007, Smith 2002).

The regulation and restriction of Indigenous peoples that followed colonisation in Australia are well documented (Altman and Sanders 1995, Drakakis-Smith 1980a, Flood 2006, Muecke and Shoemaker 2004, Onus 2007). Historically there were direct state controls on family size outcomes, with Police Superintendents or Protectors responsible for deciding who could live where, who could marry, and which children were made wards of the state (Broome 1982, Kidd 1997). Contemporary examples of state actions that influence fertility outcomes include: the delivery of publicly funded sexual and reproductive services (Commonwealth of Australia and Northern Territory 2004); the public provision of education, housing and income affecting the private cost of having children (Fletcher 1999, Walter 2008); compulsory income management for mothers



under the age of 25 years<sup>32</sup> (Department of Families, Housing, Community Services and Indigenous Affairs 2010) and receipt of the Baby Bonus for each child born (McDonald 2000a).

Two key institutions of colonisation, assimilation and racism, are important influences on other components of this framework. Assimilation and racism are linked to the social processes of domination, and have been overt government policy in Australia. While the legislative and policy frameworks of these institutions may have changed, the impact reverberates today (McCoy 2007, Peterson 2004, Robertson et al. 2005, Walter 2009).

Racism permeates all aspects of everyday life for Indigenous Australians (Holmes and McRae-Williams 2009, Paradies 2006, 2008, Paradies and Cunningham 2009). Racism can have direct impacts on fertility outcomes. For example, two women interviewed as part of this research, one in her 30s and one in her 40s, spoke of delaying having children because of racism.

*“I wanted children when I finished school. I really wanted children. And then, the older I got, the less I wanted children ... Because I thought ... after I left school, I decided that I didn't like the way people treated me, like, they treated me differently, they were racist towards me. And I thought, if I have a child, they're going to get the same kind of treatment and I couldn't protect them and they would only be children, and I don't want them to suffer the same kind of treatments that I did”* [Woman aged in her 40s with two children].

*“Lots of young Indigenous kids were having babies and it wasn't something I wanted to do. I have non-Indigenous friends and they said, 'oh you'll just get pregnant' ... I wanted to show them that I wouldn't just get pregnant”* [Woman aged in her 30s with no children].

Pearson has claimed that racism not only inflicts external harm, it can become an internalised acceptance of racist beliefs as destiny which then becomes an excuse for alcohol abuse, violence, unemployment and so forth (Pearson 2007a:54). Langton (2007) wrote of how fear of racism can silence criticism against Aboriginal people or their culture and thus perpetuate the idea that Indigenous people are helpless victims with no

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<sup>32</sup> During 2010, the Australian government introduced income management across Australia for those in receipt of social welfare payments. Young people under the age of 25 years in receipt of parenting payments (single or couple) for 13 out of the previous 26 weeks are labelled “disengaged youth” and are placed under income management (Department of Families, Housing, Community Services and Indigenous Affairs 2010).

responsibility for their actions. Racism then may not only have direct impacts on fertility decisions, but can influence other exogenous factors such as unemployment or violence.

Policies of assimilation likewise have explicit antecedents, most notably with the removal of 'half caste' children from their parents (Flood 2006). Assimilation discourse and expectation also reverberates through the contemporary public sphere. Sanders (2009) has argued that current Australian Indigenous Affairs are based on a guardianship principle (a return to programs of the 1920s). Proposals for reforms to remote Indigenous communities such as those proposed by Hughes and Warin (2005), which advocate the removal of communal land rights, the conversion of public housing to private housing, the introduction of internet cafes and the privatisation of the health care system, have been labelled as assimilation by some commentators (Mooney 2005).

Demographers have been accused of contributing to the assimilation discourse with certain population characteristics described as measures of assimilation or integration, particularly urban classifications as a proxy for integration (Langton 1981). Birrell and Hirst (2002), for example, provided an analysis of "Aboriginal couples at the 2001 census" which argued that intermix (marriage between Aboriginal and non-Aboriginal peoples) was a measure of integration. Langton challenged the notion of urban Aborigines as assimilated and wrote of "the 'Aboriginality' of adjustments to city life" (Langton 1981:17). For this framework the point of interest is how assimilation assumptions and ideas permeate the nation state and its policies and programs, and to make explicit how assimilation ideas can influence fertility outcomes. While urbanisation is expected to influence fertility, this is not necessarily because of integration *per se*, but rather because of increased participation in education or employment, or access to a wider range of health services.

In Australia, Indigenous populations are affected not only by policies and programs targeting Indigenous peoples, but also by policies and programs aimed at the larger, dominant, colonising population. Jackson has shown for both New Zealand (1998) and Australia (2008) that where the dominant population has an older age structure, the young, minority population experiences structural disadvantage. She proposes that the productive and reproductive dimensions of human existence are fundamentally interdependent. This means:

“Where different ethnic groups have differing relationships with economic production, their demographic regimes are also likely to be different, and vice versa. This is because the different demographic characteristics of contemporary ethnic groups, such as the micro-level factors of family size and timing of family formation, and their macro-level analogue of age structure, cohort size and intergenerational period, encounter the political-economic environment and its opportunity structure and policies simultaneously. This confluence may be advantageous or disadvantageous, at either or both micro- and macro-levels, but it is unlikely to have the same effect on all ethnic groups because any differences will be multiplied by the relative proportions at each age.

The population dynamics which are likely to have the most influence over competition for resources, and may indeed have largely determined socio-economic conditions at any historical point, are likely to be those of the numerically dominant population, and possibly even the numerically dominant cohort(s) within that population” (Jackson 1998:50).

For this framework, this means being cognisant of what can be called ‘demographic colonisation’ – colonisation through continued immigration and growth of the non-Indigenous population, and colonisation through capture of resources aimed at population issues of the dominant majority (in particular population ageing, but also sub-replacement fertility and older parenting).

#### Geography, gender and indigeneity

The very focus of this research on the Northern Territory specifically shows that geography matters. A framework developed by Stafford Smith and Huigen (2009) to explain how deserts function, both physically and socially, highlighted causal links between a range of desert drivers: climate, scarce resources and capital, limited livelihoods, sparse population, remoteness, local knowledge and cultural differences. These interactions lead to social uncertainty and contribute to ongoing scarce capital and limited livelihoods. The notion that ‘desert drivers’ can affect population (Stafford Smith and Huigen 2009) has been adapted to reflect diversity across different geographic and social spaces. The interactions of geography, gender and indigeneity are highlighted as especially important. Not only is there difference between locations, the history that led to Indigenous people living in a particular place at a particular time is also important to understanding contemporary population profiles (Walter 2008). In Canada, for example, Choinière and Robitaille (1998) proposed that the sedentary lifestyle introduced to the nomadic Inuit in the north resulted in earlier marital partnering than previously and could have been a contributing factor to rising fertility during the 1940s and 1950s.

The interactions between regions within the nation state are also important influences, particularly in the Northern Territory, which has a long history of being administered by the Commonwealth government and which today is still subject to Commonwealth powers because of its status as a Territory. Just as “[p]roblems arise when urban norms are enforced on the desert context” (Stafford Smith and Huigen 2009:11), population dynamics in the Northern Territory will be affected by the imposition of national policy, norms and/or expectations, or the expectation of homogeneity across a large land mass and diverse cultures.

Where people live and travel to influences access to resources, be it social capital (Brough, et al. 2006), employment (Biddle 2009), housing (Birdsall-Jones and Christensen 2007, Peterson and Taylor 2002) or health services (Brady 2003, Phillips 2009). Geography influences both health and socio-economic status, but also the proximate determinants of fertility outcomes. For example, perceived child costs or benefits may differ between urban, rural or remote locations, influenced by the availability of a place to live, formal childcare, or the availability of kin and friendship networks to help care for children, and the cost of living.

As already noted, urban and rural differences are not included as a comment on culture or social integration, a problematic dichotomy (Langton 1981, Rowse 2000). There is also significant diversity among Indigenous urban populations that may be less apparent in rural-remote settings. Many Indigenous urban dwellers in Darwin, for example, live lives akin to Indigenous people who live remotely (Coulehan 1995), albeit with closer proximity to services but also greater daily contact with racism and discrimination (Holmes and McRae-Williams 2009).

Geography also interacts with gender roles. Writing about Yolŋu (from Arnhem Land) who live in Darwin Coulehan wrote:

“While Yolŋu women have complex and various reasons for choosing to live in Darwin, for many women and girls a common factor is that they seek more personal autonomy outside the contemporary practice of Yolŋu marriage and in the city” (Coulehan 1995:128).

Taylor and Carson (2009a) concluded there was a feminisation of migration and mobility within the Northern Territory based on census data from 1996 to 2006. Elsewhere they posited that changing sex ratios between regions were indicative of ‘female flight’ to urban centres and represented changing gender roles (Taylor and Carson 2009b). This is

reminiscent of observations by Gale (1970) and Collmann (1979) that urban living and the concomitant interactions with the colonising majority significantly changed the relationships between Indigenous men and women. More recent research in Kuranda (Queensland), however, found that while women were materially advantaged by welfare benefits in the town, cultural ideals about gender roles did not lead to matriarchal power or autonomy (Finlayson 1991). That the feminisation of census migration counts are indicative of 'female flight' is not supported by the work of Coulehan (1995) and Taylor and Bell (2004b) who provide compelling evidence for population flows both in and out of urban centres.

Perhaps the starkest evidence of different gender roles by geography is in the experience of violence by women at the hands of men. The National Aboriginal and Torres Strait Islander Social Survey (2002) found that sexual assault was a neighbourhood/community problem among 17 per cent of remote Indigenous people and five per cent of non-remote Indigenous people across Australia (ABS 2004a). A report based on data from 1987-1988 showed that Aboriginal women in the Northern Territory were more likely to experience a reported incident of violence in urban areas than rural areas (Bolger 1991). More recent data from 2002-2004 for the Northern Territory, but not disaggregated by Indigenous status, showed that women living in Central Australia were more likely to be victims of reported assault related to domestic violence than women living elsewhere in the Territory (Jones et al. 2005). Among Indigenous women, violence has been identified as widespread (Bessarab 2003, Bolger 1991) and as having a direct influence on women's sexual activity and their use of contraception or other protective measures (Holmes and McRae-Williams 2009, Senior and Chenhall 2008, Stark and Hope 2007).

The most important gender role is, of course, women's ability to have children. As Robinson writes for the Tiwi Islands, which lie to the north of Darwin in the Northern Territory:

"Tiwi society is in many ways a baby-centred society in which female fertility is highly valued; babies are an important focus for the cohesion and sociability of relationships within extended family life" (Robinson 1997:312).

Robinson (1997) and Merlan (1991) have written of having children as an act of service to a husband or partner and his lineage, and the contemporary difficulties of sustaining that conceptualisation in an individual-focused, welfare-based, monetary economy. Merlan (1991) noted that use of the term, 'having kid for [name]', had changed from an

expression of long-term contribution to a marriage to a more ambivalent meaning, particularly with younger fathers and where paternity was sometimes problematic. Merlan observed less stability in marriage patterns than in the past, which had changed the social value of children. Robinson (1997) also wrote of changing marriage patterns for the people of the Tiwi Islands, from polygamy to monogamy, and from betrothal before birth to youth negotiating their own sexual relations. He noted that pregnancy, including “seemingly accidental pregnancy”, was a tool used to perpetuate the informal continuity of family patterns (Robinson 1997:311-12).

Merlan also observed that women overtly and frequently claimed credit for ‘rearing up kid’, whether they were the biological mothers or not. In these instances the child was the beneficiary of the service (not the husband or partner) and women were making claim to future security and support. Highly gendered roles related to child-bearing, social relations and the monetary economy mean obligations to provide for children by women are significant (Merlan 1991).

Including a gender perspective in this framework reflects the inter-relations between women and men, society, economy and the state and the way these influence fertility outcomes (Tazi-Preve 2005). As Merlan (1991) and Musharbash (2008) have shown, Indigenous gender roles are highly structured. They interact with other exogenous and social influences in important ways to affect the proximate determinants of fertility.

Indigeneity is the term used to describe kin networks, responsibilities and obligations, community structures and partnership/marriage structures. It reflects the lived, heterogenous experience of being Indigenous, regardless of where people live, the language they speak, other identities they may acknowledge, or what they look like (Kurtzer 2003, Paradies 2006, Williams 2000). It is included in recognition of Indigenous Australians unique place as the original inhabitants, and to reflect the way that certain identities are formed within the context of colonial relations (Walter 2009). It portrays the cultural dynamism of Indigenous peoples, rather than a static traditional norm. Indigeneity refers to what Sahlins (1999:ix) called, “indigenous adaptations to the global juggernaut”, or “the indigenization of modernity” (Sahlins 1999:x). It is inextricably linked to gender roles (*cf* Robinson 1997) and geography (*cf* Morphy 2008).

The ever-changing nature of Indigenous roles and kin systems can be illustrated by changes to marriage as an institution (Musharbash 2003, Robinson 1997). There have been two important changes in marriage patterns. Firstly, women are much more likely to marry men closer to them in age.<sup>33</sup> In the past women married young but were ‘promised’ to older men, with the women often widowed because of the age difference and then usually going on to marry again. A young age at marriage for both spouses seems to contribute to contemporary serial monogamy, with people being married for a second or third time by their twenties, often with a child or children from each marriage.

Indigenous roles are also a key site of change for colonisation. The historical record includes many examples of attempts to control indigeneity, both who is Indigenous and what being Indigenous means (Collmann 1979, Hollinsworth 1992, Jordan 1985, Kidd 1997, Smith, McCalman et al. 2008). Indigeneity is not a fixed status, however, it is fluid and enduring. To paraphrase Sahlins (1999), Aborigines are still Aborigines (although people from different country would say they are still Warlpiri, or Yan-nhanju, or Larrakia, or any country to which people belong).

This research does not aim to define what being Indigenous means<sup>34</sup> or to determine a list of what aspects of indigeneity might influence fertility outcomes. The framework simply recognises that being Indigenous is an important influence on the proximate determinants of fertility. This is not to argue that being Indigenous is in itself a fertility determinant, but rather that being Indigenous means being exposed to a set of historical and contemporary circumstances that do influence fertility outcomes (Walter 2008, 2009). The explicit inclusion of indigeneity in this framework means fertility analysis cannot overlook the unique history and place of Indigenous people in Australia and must recognise the impact of the lived experience of being Indigenous on individual and group life chances and life options (Walter 2009).

### Health

Health influences the proximate determinants of fertility in two ways – through the impact of child survival on perceived ‘supply’ of children and through the health status

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<sup>33</sup> Marriage in this context is not legal marriage in the Western tradition. Meggit noted in 1962 in Yuendumu that a woman walking through the camp to her husband's dwelling constituted marriage. This aspect of marriages has not changed at all for the Warlpiri people (the traditional owners) living in Yuendumu. A marriage today is announced by the public moving of swags from one spouse's former residence to the residence of the other spouse. It is not always the new wife moving in with her husband, it may be the other way around (Musharbash 2003:71).

<sup>34</sup> It is neither desirable nor appropriate for this researcher, a Pākehā immigrant to Australia.

of potential parents, and their ability to conceive as well as perceptions of how well they will be able to provide care. A decline in infant mortality is recognised as a key precondition for any fertility decline (Caldwell 2002, Gray 1983a, Mason 1997, Pool 1991). Indigenous infant mortality declined in the Northern Territory from 143 per 1,000 live births in 1971 to below 40 per 1,000 by the end of the 1970s (Gray 1983a:97). If both infant mortality and child removal are considered, it can be estimated, conservatively, that the extent of children lost to their parents through mortality and removal is probably in the order of 250 to 300 (possibly higher) per 1,000 live births.<sup>35</sup> This makes the impact of the 1970s infant mortality decline even more significant.

Some indicators of ill-health among Indigenous men and women also have obvious impacts on fertility outcomes. Indigenous rates of sexually transmitted infections (STIs) are extremely high in the Northern Territory compared to the non-Indigenous population (Department of Health and Families 2009). Case note audits of remote health clinics in the Northern Territory have found STI infection rates among women of up to 46 per cent and a history of pelvic inflammatory disease among 30-32 per cent of women (Kildea and Bowden 2000, Skov et al. 2000). One of the case note audits in 1996 identified a 26 per cent infertility rate among women aged 20-45 years, with 18 per cent attributed to secondary infertility (Kildea and Bowden 2000). Research with Indigenous youth (15-19 years, n=131) living in remote north Queensland, which is akin to the Top End of the Northern Territory, found very poor levels of understanding about STIs despite high reported levels of bacterial STIs in the region (Fagan and McDonnell 2010). The research showed very high rates of sexual activity among young people (82 per cent of the sample) and 49 per cent of the sample reported having three or more sexual partners in the previous 12 months.

Other morbid conditions also have an effect on fertility – obesity, diabetes, malnutrition, alcohol consumption and cigarette smoking (Boyle 2010, Healy et al. 1994). These are all documented as being extremely high among the Indigenous population (AIHW 2008) and, indeed, health status in general is poor among Indigenous peoples (Anderson et al. 2006, Fredericks 2007, Glover et al. 2004, Gracey and King 2009, Pulver et al. 2007).

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<sup>35</sup> Eighteen per cent of Indigenous children were in government care in 1967-68 in the Northern Territory. The National Inquiry into the Separation of Aboriginal and Torres Strait Islander Children from Their Families concluded that between one in three and one in ten Indigenous children were removed from their families and communities in the period from approximately 1910 until 1970 (Commonwealth of Australia 1997:31).



While poor health can have recognised consequences for suppressing fertility (inhibiting the ability to have intercourse, conceive or carry a pregnancy to term), poor health could also promote early childbearing. Geronimus (1997), writing about poor, urban African Americans in the United States, has argued that having children young is a logical response to uncertain socio-economic circumstances where families experience poor health. If women want children, having them at a young age will maximise the potential for support from extended kin networks (mothers, aunts and grandmothers), and allow a greater chance of the children being older when the mother herself begins to experience ill health. She argues that:

“...teenage childbearing represents trade offs made in order to maximize children’s well-being in hard circumstances [and] may also explain why early childbearing has persisted in extremely disadvantaged communities” (Geronimus 1997:426).

Childbirth itself can also contribute to health status. Being pregnant and giving birth puts strain on the body (Bass 2008) and can be the cause of gestational diabetes (Ross 2006). Also, experiences in the hospital can cause Indigenous women not to seek treatment in the future for ill health after a traumatic experience linked to giving birth (Fredericks 2007, Ireland 2009).

### Socio-economic status

Socio-economic status as an influence on the proximate determinants of fertility is undoubtedly one of the most researched correlates of childbirth outcomes (e.g. Halli 1990, Murphy and Carr 2007, Snipp 1996). This is undoubtedly partly due to the demographic transition theory’s links to modernisation but also to the relative ease of collecting relevant data with which to investigate the links. There can be little contention that higher levels of education and participation in the paid labour force are both linked with lower levels of fertility (Angeles et al. 2005, Caldwell 2006, Graff 1979, Gray 1989a, Joshi 2002) and these correlations have been shown for Indigenous Australians (Gray 1983a, Khalidi 1989). The causal links may not be straightforward. Rowse, for example, questioned the assumption of Aboriginal employment meaning greater independence for the workers compared to those on welfare benefits (Rowse 1992). He pointed out that people collecting welfare benefits can choose how to spend time, are not beholden to an employer, and can devote time to projects which are rewarding in themselves particularly the maintenance of connections among kin and friends. This includes pursuit of relationships that result in children and involve the care of children. Likewise, Coulehan (1995) has shown that teenage fertility can be the key to gaining autonomy through

access to parenting welfare payments, prioritisation for housing (in Darwin but not in remote communities), and assistance with schooling (Coulehan 1995).

Indigenous Australians are disadvantaged compared to other Australians on all measures of socio-economic status (ABS 2008c, SCRGSP 2009, Walter 2009, Walter and Sagger 2007). Socio-economic status for Indigenous Australians is intricately linked with each of the exogenous and social influences identified in this framework – colonisation and the welfare state (Pearson 2007a, Senior et al. 2002), geography (Drakakis-Smith 1980b, Taylor 2006), gender (Langton and Barry 1998), and indigeneity (Biddle 2009, Pearson 2007a). Overcrowding, for example, is directly related to the availability of housing, itself linked to complex issues of Indigenous land ownership, government-sponsored housing and maintenance, public housing systems, and private house ownership (Birdsall-Jones and Christensen 2007, Lea 1984). Overcrowding is also related to kin networks and responsibilities, activities located around houses, and traditional practices for governing sleeping arrangements (Musharbash 2008). Overcrowding also influences the proximate determinants of fertility. In overcrowded houses, the ability of women to say no to men's sexual demands is more limited and the perceived social cost of doing so may be too great, even while the perceived cost of having a child in overcrowded housing may also be high (Senior and Chenhall 2008).

Intermarriage between Indigenous peoples and non-Indigenous peoples also reflects the interaction of socio-economic status with other exogenous influences on fertility. Several commentators have shown that intermarriage between Aboriginal and non-Aboriginal peoples resulted in economic advantage compared to couples who were both Indigenous (Birrell and Hirst 2002, Heard et al. 2009, Peterson and Taylor 2002). Moreover, intermarriage can influence Indigenous population counts. In Canada, Robitaille et al. (2010:162) showed that ethnic identity of a child corresponds most often to that of the Indigenous parent.

Imprisonment is another important socio-economic indicator that influences the proximate determinants. The high level of imprisonment among Indigenous males (ABS 2009d) represents the removal of potential fathers from the social milieu. This undoubtedly could be a contributor to forms of serial monogamy and have an impact on exposure to intercourse (Eames and Keeling 2004).

Socio-economic status may not always operate in expected ways in relation to the proximate determinants. Research from the United States with young Black teenage mothers showed that motherhood provided young women with a way to gain control over their lives and provided them with status as a mother when they had few other options (Kaplan 1996). This echoes Geronimus' thesis of young mothering as a logical response to poor life circumstances.

## **2.4: From conception to praxis**

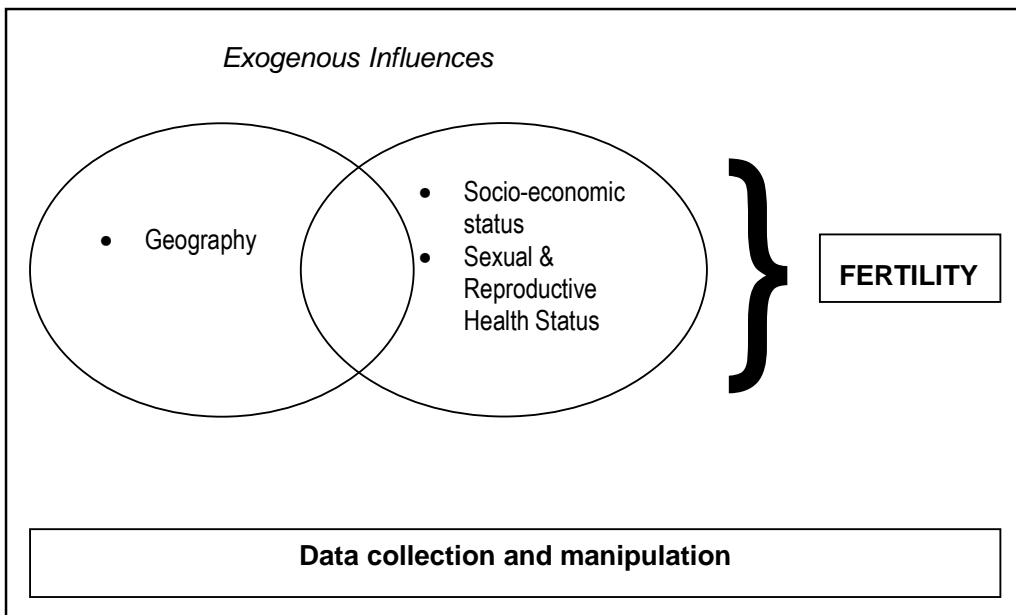
The aim of the conceptual framework, presented above, is to provide a lens through which Indigenous fertility trends and correlates presented in the forthcoming chapters can be understood. But the complexity of the conceptual framework is difficult to operationalise. Data constraints play an important role in determining what can be investigated in relation to Indigenous fertility in the Northern Territory. This chapter therefore closes with a restricted model (Figure 2.3), capturing facets of the conceptual framework that are able to be measured.

This model reflects two important facets of analysis of Indigenous fertility in the Northern Territory. First, that the exogenous factors identified as influencing fertility outcomes, such as geography or socio-economic status, cannot be measured and analysed as causes of fertility outcomes, rather the relationship can only be measured as a correlation. Second, the data available to measure fertility and its correlates can affect fertility outcomes because of how it is collected and cleaned, and any analysis must take these factors into account. Indeed, understanding the data effects on fertility outcomes are just as important as understanding social or environmental influences. To paraphrase Jones (1977:37), the framework helps describe and understand what happens, but leaves many unanswered questions as to *why* it happens. It is for this reason that analysis based on this limited model needs to be cognisant of the myriad of influences identified in the conceptual framework.

The exogenous influences identified in the model used throughout this thesis are geography, socio-economic status and sexual and reproductive health status. As the next two chapters show, data availability and data constraints of those sources that are available limit the range of measures able to be looked at here. Socio-economic correlates are restricted to education, employment and income, with some exploration of

how these differ by geography. Sexual and reproductive health correlates include parity and ever-use of contraception, although analysis by geography is restricted.

**Figure 2.3: Model for investigating Indigenous fertility in the Northern Territory**



The next chapter investigates data sources for the basic calculation of fertility rates for Indigenous women in the Northern Territory. Not only does it provide a description of the data themselves, it shows how geographic boundaries and data collection and manipulation methods combine to influence our understanding of Indigenous fertility trends in the Northern Territory.

## CHAPTER THREE: INDIGENOUS DATA SOURCES – AVAILABILITY, RELIABILITY AND PLASTICITY<sup>36</sup>

### 3.1: Introduction

Indigenous demography is a specialised form of demography, recognised in postcolonial settler societies as an essential component of public policy making (Kukutai 2004, Kukutai and Pool 2008, Taylor 2009). A unique feature of Indigenous demography is the focus of defining who belongs to the Indigenous group (Eschbach 1995, Kukutai 2003, Pool 1986, Pool 1991, Snipp 1986) and what membership of that group as identified in population data sets means for demographic analysis (Guimond et al. 2004, Guimond et al. 2003, Jackson 1995, Robitaille et al. 2010). Any research of this nature therefore requires an understanding of the data sources, and of the impact those sources have on the subsequent analysis.

As the model for investigating Indigenous fertility in the Northern Territory outlined in the previous chapter shows, the data sources themselves can influence our understanding of fertility outcomes. In Australia, anthropological method has raised serious doubt over the ability to accurately capture even basic population data about Aboriginal and Torres Strait Islander peoples using standard demographic tools (Brooks and Kral 2008, Martin et al. 2002, Morphy 2007b). This chapter therefore provides an overview of the data sources required to understand the most basic of fertility measures, population-based fertility rates. The description of available data and those used for this research represents the first important results of this thesis in their own right. As is shown throughout the thesis, data influences all demographic analysis and can lead to different conclusions if the mechanisms of data capture and cleaning are not well understood.

When Alan Gray undertook his investigation of Indigenous fertility decline in Australia he wrote:

“The logical starting point for a study of Aboriginal fertility decline would be to consult official publications giving details over time of Aboriginal births throughout Australia, preferably classified by characteristics of the mothers

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<sup>36</sup> This chapter is drawn from: Johnstone, K. 2009 “Indigenous birth rates – how reliable are they?” *People and Place*, 17(4):29-39.

such as their age, the number of children they had borne previously, geographical location and so on. There are no such official publications. Worse, the data which they should contain simply do not exist except in isolated fragments” (Gray 1983a:24).

A quarter of a century later the paucity of Indigenous population data was seen as, “a frank failure of the statistical system” (Smith et al. 2008). While the genesis of this research was in part due to the availability of a 20-year time series of births’ data disaggregated by Indigenous status, this does not enable the research to rest on the consultation of official publications as envisioned by Gray over a quarter of a century ago. As has been raised in an earlier paper (Johnstone 2009), Indigenous birth rates in the Northern Territory must be viewed with caution due to the suspect quality of available official data.

### **3.2: Births data**

Births data for the Northern Territory are available from two sources – vital registrations from the Registrar of Births, Deaths and Marriages which are managed by the Australian Bureau of Statistics (ABS), and perinatal data from the Northern Territory Department of Health and Families NT Midwives’ Data Collection.

Vital registrations by Indigenous status of the mother, father and child are available for the Northern Territory from 1988.<sup>37</sup> The vital registrations are for all births registered to mothers who are usually resident in the Northern Territory, and are available by year that the birth was registered rather than year that the birth took place.<sup>38</sup> Data for the Northern Territory as a whole have been published from 1993 (data are only available from 1988 by purchase), with numbers of births by age and Indigenous status of mother readily available (ABS 1994). Earlier data must be purchased and if requests include small cell sizes the data are suppressed, or larger aggregations used (e.g. larger age groups).

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<sup>37</sup> Data are available from the ABS on an annual basis, with the most recent data being for the previous calendar year.

<sup>38</sup> Birth registration data are available by year of birth rather than year of registration on request from the ABS. They are generally not released, however, for more recent years when data are deemed incomplete because of late registrations. Annual publications of birth registrations are for births registered in the reference year of the publication.

Perinatal data by Indigenous status of the mother are available from 1986.<sup>39</sup> The NT Midwives' Collection includes information on all births of at least 20 weeks' gestation (established from the mothers last reported date of menstruation or from ultrasound) or of 400 grams or above birth weight that take place in the Northern Territory. Perinatal data are available according to the date of the birth. These data are acquired on request from the Northern Territory Department of Health and Families with all requests, including de-identified cross-tabulations, requiring ethics approval from the Menzies School of Health Research and Department of Health and Families Human Research Ethics Committee, as well as approval from an internal data custodian. Several publications report on the perinatal data, most recently a 20-year report for 1986-2005 (Zhang et al. 2010), a 10-year report for 1986-1995 (Markey et al. 1998), a three-year report for 2000-2002 (Stewart and Li 2005) and annual reports for the remaining years to 2006<sup>40</sup> (Carnegie et al. 1999, d'Espaignet et al. 1999, Gladigau et al. 2000, NT Perinatal Information Management Group 2002, Tew and Zhang 2010, Zhang et al. 2009a, Zhang et al. 2009b, Zhang and Johnstone 2009). Data are presented differently between these reports and the publications do not provide the information in a format needed to establish a time series of fertility change.

Both vital registrations and the perinatal data measure live births, albeit in different ways (by date of registration and date of birth respectively). As Figure 3.1 shows, the perinatal data from the NT Midwives' Collection consistently counts fewer births to Indigenous women each year than vital registrations. For the period for which both data sets are available, there are on average 98 more births to Indigenous mothers registered each year than are recorded in the NT Midwives' Collection. This is anomalous with the rest of Australia. In most states perinatal data sets record higher numbers of births than vital registrations (ABS 2007c). This difference between the two data sets has been reported as incomplete recording of births in the NT Midwives' Collection in the past (Condon et al. 2004, Markey et al. 1998). Staff currently responsible for the perinatal data claim that they are complete. Thus, the different mechanisms of data capture warrant closer examination to determine the accuracy of each data set. There are two issues to be explored: firstly, whether the data collection systems capture all births and, secondly,

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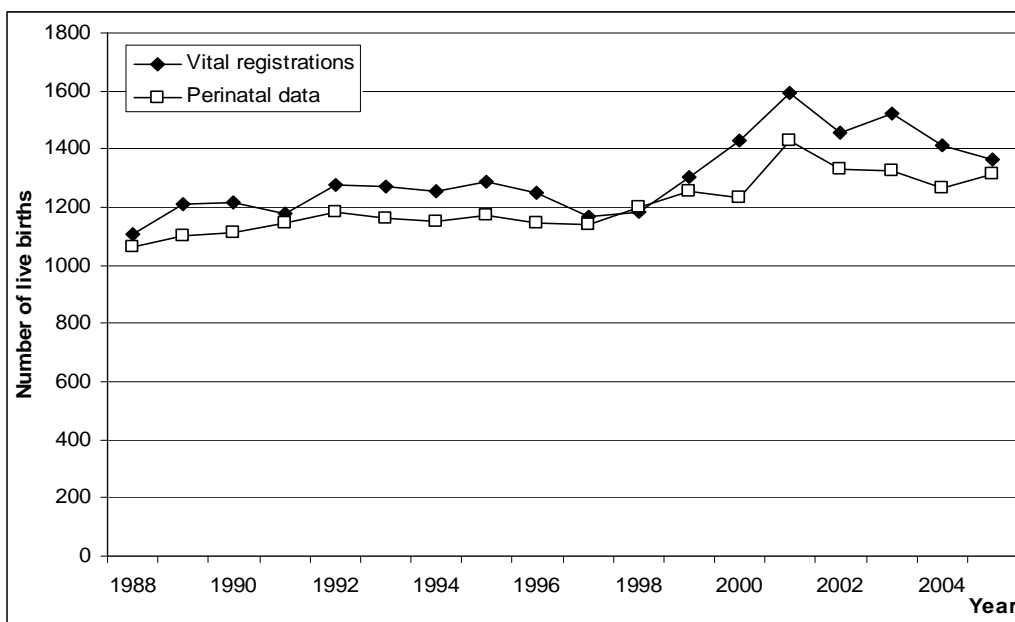
<sup>39</sup> At the time of writing data were available for a 20-year period 1986-2005.

<sup>40</sup> The 2006 report has only recently been released (Tew and Zhang 2010). There have been long time delays between the year data were captured and the public release of information (e.g. 2003 data were published in 2009 (Zhang et al. 2009a), and not available for request before publication). Data from 2006 were not made available for this research.

whether the data collection systems record characteristics of the mothers and babies correctly.

The NT Midwives' Collection is a population-based census of all births that take place in the Northern Territory.<sup>41</sup> Government policy in the Northern Territory is for all women to birth in hospital, except for a small homebirth service in Darwin and Alice Springs. For women living outside one of the four centres with a hospital providing maternity services (Darwin, Nhulunbuy, Katherine and Alice Springs), this means transfer into town for 'sit down'<sup>42</sup> at 38 weeks' gestation, or earlier, if the pregnancy is deemed high risk (Banscott Health Consulting 2007, Ireland 2009, Kildea 1999).

**Figure 3.1: Number of live births to Indigenous mothers usually resident in the NT recorded in the vital registration and perinatal data sets, 1988-2005**



Sources: Customised tables from Australian Bureau of Statistics and NT Department of Health and Families.

<sup>41</sup> Darwin Private Hospital (the Northern Territory's only private hospital) started obstetric services in 1987 but did not consistently report data until 1990 (Markey et al. 1998). Data from the NT Midwives' Collection for 1987-1989 are thus incomplete; however, this does not greatly affect data for Indigenous mothers. From 1990-2005 an average of only 12 Indigenous women each year gave birth in Darwin Private Hospital (Carnegie et al. 1999; d'Espaignet et al. 1999; Gladigau et al. 2000; NT Perinatal Information Management Group 2002; Stewart and Li 2005; Zhang et al. 2009a; Zhang et al. 2009b; Zhang and Johnstone 2009).

<sup>42</sup> 'Sit down' is a multivalent term used in a number of contexts. Prevalent where Creol is spoken it refers to being in situ, to 'sit down' on country, and to confer in an appropriate way, to 'sit down' with countrymen and countrywomen. Its use when linked to maternity services reflects women seeking out fellow countrywomen to 'sit down' with when in town (see Coulehan 1995). Since the 1970s a more pejorative usage has gained currency in 'sit down money', describing government transfers to Indigenous peoples (Dr Bentley James, personal communication).



From 1996, most of the information about births has been captured electronically (Markey et al. 1998). In the public sector, midwives enter data shortly after the birth of a baby via the hospital information system (CareSys). Births in the Darwin Private Hospital and planned home births are entered via the NT Midwives' Collection intranet site. Births in health centres that do not involve admittance to hospital are submitted in paper form and entered by the perinatal data manager (Zhang and Johnstone 2009). Most Indigenous women birth in one of the Northern Territory's five public hospitals (over 90 per cent during 1986- 2005), thus information about the birth is automatically captured electronically.<sup>43</sup> Extensive checking of health clinic records is also done by the perinatal data manager to ensure that data are complete. If the perinatal births are an undercount, this means that ABS data show up to 200 Indigenous women a year who are pregnant and give birth without her or her baby being recorded in the perinatal data collection. This raises questions about whether women and their babies are coming into contact with the public health system at all, and also for data collection systems if women are using the public health system.

Some mothers who live remotely avoid health clinics in order to avoid being transferred to town (Ireland 2009), however, the number of identified births taking place in these communities and not in hospitals is small (Ireland 2009, Zhang and Johnstone 2009). A 2007 review of maternity services in the Northern Territory did find that the various components of maternity services had different patient information systems, none of which were linked to provide for data sharing (Banscott Health Consulting 2007). The review focused on information sharing of clinical care outcomes (e.g. infection rates and adverse incident rates) and did not identify that different information systems led to births being excluded from the official counts altogether, but nor was counting births the investigation's focus.

Steenkamp et al. (2011, under review) have shown that in two remote communities in the Top End of the Northern Territory there were also lower counts of births to usual residents in the perinatal data set compared to the vital registrations, consistent with the Territory-level pattern. They also showed that the number of births recorded in the health clinics of each community was higher than either the perinatal or vital registration data. When births to temporary residents (those with no permanent link to the

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<sup>43</sup> Tennant Creek Hospital does not provide maternity services but some women give birth there if they go into labour and have not moved to Alice Springs for 'sit down'.

community) were excluded from the community health clinic birth records, vital registration birth counts were close to birth counts from community health records. Using baptismal register information for Wadeye, Taylor (2010) found the average number of baptisms was higher than the average number of births recorded in Community Health Centre records (Ireland 2009) and posited that because not every child was baptised these records too were likely to be an undercount. O'Grady (2008) found that a birth cohort for 1 April 1997 to 28 February 2005 constructed from the Northern Territory Hospital Discharge Dataset and the Northern Territory Child Immunisation Register contained 257 more infants than recorded by vital registrations and 391 more infants than recorded in the perinatal data. There are thus serious concerns about completeness of all data sets on which this research relies.

It is possible that this difference between data sets in the number of births to Indigenous mothers is due to variable identification of who is Indigenous. Vital registrations are self-identified, whereas health service providers may assume Indigenous status (or not) on behalf of women when information is collected for the NT Midwives' Collection. While different identification of Indigenous status may affect birth numbers to Indigenous mothers, the higher number of births recorded via vital registrations compared to perinatal data is evident for all births. (In 2005, for example, 3,659 births were registered to Northern Territory mothers, and 3,555 births were recorded as being born to Northern Territory women in the NT Midwives' Data Collection).<sup>44</sup> This is not to suggest that Indigenous status will always be recorded in the same way across different data sets. Northern Territory hospital audits from 1997 and 2008 found 94 and 97 per cent agreement respectively between patient admission details and self-reported Indigenous status recorded in an interview (Condon et al. 1998, Tew et al. 2008). Informal discussions with midwives at Royal Darwin Hospital suggest that Indigenous status is rarely checked in patient files during antenatal check ups and it is likely similar levels of misreporting of Indigenous status will be present in the NT Midwives' Collection as the hospital admissions data. It is also important to remember that individuals may make different decisions at different times and when confronted with different data collection processes about whether to self-identify as Aboriginal or Torres

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<sup>44</sup> Zhang et al. (2010) compared Indigenous status of live born babies between the perinatal and vital registration collection to argue that the difference in counts between the two data sets was because of Indigenous babies born to non-Indigenous mothers. As has been shown, however, this difference still exists when only births to Indigenous mothers are looked at.

Strait Islander. A woman interviewed for this research noted that whether she identified as Aboriginal or Torres Strait Islander or not depended on how safe she felt doing so:

*“I would [tick the box]. I always, if I don’t get discriminated against I would. If I get discriminated against, you know, I won’t. But if I feel strong enough to tackle that person about their racist behaviour I would. And if I don’t, I won’t. It’s about a safety issue”.*

It is likely that the systems used to collect births’ data affect the number of births that are recorded and the way in which people are identified as Indigenous. The NT Midwives’ Data Collection is an epidemiological data set for the purpose of monitoring pregnancy outcomes and its maintenance is the responsibility of health professionals and health bureaucrats. Vital registrations, on the other hand, are the means of proving that a birth has taken place, whilst also providing a child with an official identity recognised by the state. Registering a birth in the Northern Territory is a two-fold responsibility. The hospital or health clinic provides a ‘Notification of Birth’ to the Registrar of Births, Deaths and Marriages within ten days of a birth taking place.<sup>45</sup> A ‘Birth Registration Statement’ is a form completed for every child by the child’s parents, which must be submitted to the Registrar within 60 days of the birth (Northern Territory Treasury 2005).

A number of processes surround the collection of vital registrations that could explain the different birth counts compared to the perinatal data. The five public hospitals in the Northern Territory provide a weekly notification to the Registrar of births that have taken place in the previous week. Information is derived from CareSys and includes information on mother’s name, date of birth, place of usual residence and Indigenous status. This is the same information system used to inform the NT Midwives’ Data Collection.

Mothers are provided with the Birth Registration Statement form following the birth of their child. This usually takes place in the hospital before the mother is discharged. Forms are also available at community health clinics for women who birth in their community or from attending midwives for women who give birth at home. In the five Northern Territory public hospitals, Aboriginal Health Workers and Social Workers are available to assist mothers who don’t understand the form. Often these workers will fill the form in on behalf of mothers and the mothers then sign it. In Royal Darwin

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<sup>45</sup> Homebirth midwives must also report births which they are present for to the Registrar of Births, Deaths and Marriages.

Hospital (where the largest number of Indigenous births take place every year), Aboriginal Liaison Officers (ALOs) help all Indigenous mothers fill in birth registration forms. ALOs submit registration forms to the Registrar as well as relevant forms to Centrelink (for Medicare, parenting payments, and so forth). At Alice Springs Hospital, a staff member from the Office of the Registrar of Births, Deaths and Marriages visits twice a week to collect forms and help women fill them in if required. The Aboriginal Liaison Officers in Alice Springs also work as translators when necessary to help women complete the form. These processes mean that the significant under-registration of Indigenous births that is observed in other jurisdictions such as Victoria (Gerber 2009a, Gerber 2009b, Orenstein 2008) and New South Wales (ABC News 2008) is much less likely to occur in the Northern Territory.

Once the Birth Registration Statement is received by the Office of the Registrar of Births, Deaths and Marriages, it is checked against the Notification of Birth. If there is any difference between the information about the parents or child from the Notification of Birth and what is recorded on the Birth Registration Statement, it is the information on the Birth Registration Statement that is entered into the vital registrations database (e.g. Indigenous status of parent, place of usual residence, name). It is assumed that Birth Registration Statement information is more likely to be correct because the form has been signed as correct by the parent(s).

Incomplete registrations occur when the child has no name, or only a partially completed Birth Registration Statement is provided. If no Birth Registration Statement is received within 60 days following the birth, and the Birth Clerk believes it can be obtained, a variety of mechanisms are used to find the mother and ensure a form is completed. If the mother is unable to be found, the birth is registered based on the information from the Notification of Birth. Statistically, an incomplete registration is the same as a full registration. If the birth is registered at a later date, it is linked to the original Notification of Birth to avoid duplication. If no Notification of Birth is received from a hospital, health clinic or midwife, which is a very rare situation, then the birth cannot be registered.

Given that the number of births for the NT Midwives' Data Collection and the vital registrations have their genesis in the same information system (CareSys), the different counts that emerge are puzzling. One explanation offered anecdotally is the use of

different names among Indigenous mothers and their children. Indigenous babies are often given several names and the possibility of one baby being registered under two different names is often raised. Staff at the Office of the Registrar of Births, Deaths and Marriages, have said that this is not a problem they have identified in matching the Birth Registration Statement with hospital Notification of Birth information. Furthermore, the processes in place for registration mean that it is information about the birth such as date, time and place of birth, birthweight and parents' address, that allows matching of records to take place, not the baby's name (Wendy Endenburg and Yvonne Killalea, Office of the Registrar, personal communication). Moreover, a birth would not be able to be registered if a Notification of Birth had not been received, and efforts to obtain such a Notification are likely to identify if it is a birth already recorded under a different name.

Another possible explanation for the different birth counts between the two systems is the impact of women's interstate travel to give birth (a partial explanation offered by Zhang et al. 2010). Both the vital registration and perinatal data systems record place of usual residence for the mother. The notion of a 'place of usual residence' has been identified as conceptually problematic for mobile Indigenous populations (Condon et al. 1998, Morphy 2002, Morphy 2007c, Morphy et al. 2007a) and it is an issue for birth statistics within the Northern Territory boundary because Alice Springs is an important service centre providing hospital care for communities across the Australian centre, including communities in South Australia and Western Australia (Taylor 2002). Since each data system deals with interstate births in different ways, this could contribute to the different birth counts.

While the NT Midwives' Data Collection includes information on all births that occur in the Northern Territory, mothers who normally reside interstate are identified separately. Birth rates (and most other measures established using the dataset) are based on births to usually-resident Northern Territory mothers who gave birth in the Territory (Zhang and Johnstone 2009). Vital registrations are derived from the Birth Registration Statement, which must be submitted in the state or territory where the birth takes place. When vital registrations data are published or purchased based on usual place of residence of mother (in this case, the Northern Territory), births to mothers who usually live in the

Territory that took place interstate are also included, but they are not differentially identified.<sup>46</sup>

Interstate travel to give birth could therefore affect the data in two ways. Firstly, women who usually live interstate, but birth in the Northern Territory, could have the birth registered in the Northern Territory as a Northern Territory resident, particularly if they have come into town for 'sit down' from a remote community. Thus, vital registrations could be high because they include both Northern Territory usual residents who birth in the Northern Territory and interstate, as well as interstate residents who birth in the Territory. While it is not unreasonable to assume some interstate women might be recorded as being Northern Territory residents, it seems unlikely that usual place of residence for interstate women would be consistently identified correctly in the NT Midwives' Collection, but not for births' registrations. This is what would have to happen to cause the difference in counts. A second possible effect of interstate travel is that of Northern Territory women giving birth interstate, the numbers for which are able to be captured by vital registrations but not the NT Midwives' Collection. The Australian Institute of Health and Welfare National Perinatal Statistics Unit published information on interstate births for the first time in a report of 2004 data, but not disaggregated by Indigenous status (Laws et al. 2006). This report showed in 2004 that 138 Northern Territory women (Indigenous and non-Indigenous) gave birth interstate, yet the difference in Indigenous birth counts between the two data collection systems in that year was 151.

Alice Springs Hospital is where state-based confusion about place of usual residence would be most likely to occur because of its proximity to state boundaries. A 2008 audit of patient demographic data at Northern Territory public hospitals found that miscoding of usual state of residence was only found for patients incorrectly identified as usually living in Alice Springs Urban or Alice Springs Rural health districts and the numbers were small (Tew et al. 2008). If the difference in counts between the vital registration and perinatal datasets is because of different counts of interstate births (both in and out of the collections), then it is likely to be concentrated around Alice Springs. This would mean that some of those births recorded to mothers in the Alice Springs Urban and

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<sup>46</sup> A summary table of state or territory of usual residence of mother and state or territory of registration is included in the annual *Births Australia* publications produced by the ABS, but the information is not disaggregated by Indigenous status. In 2005, for example, 92 women from interstate registered a birth in the Northern Territory and 106 Northern Territory women registered a birth elsewhere.

Alice Springs Rural health districts were actually births to interstate mothers. Such miscoding would affect both data sets, but there is no evidence to suggest that it is more prevalent among vital registrations than among the perinatal data.

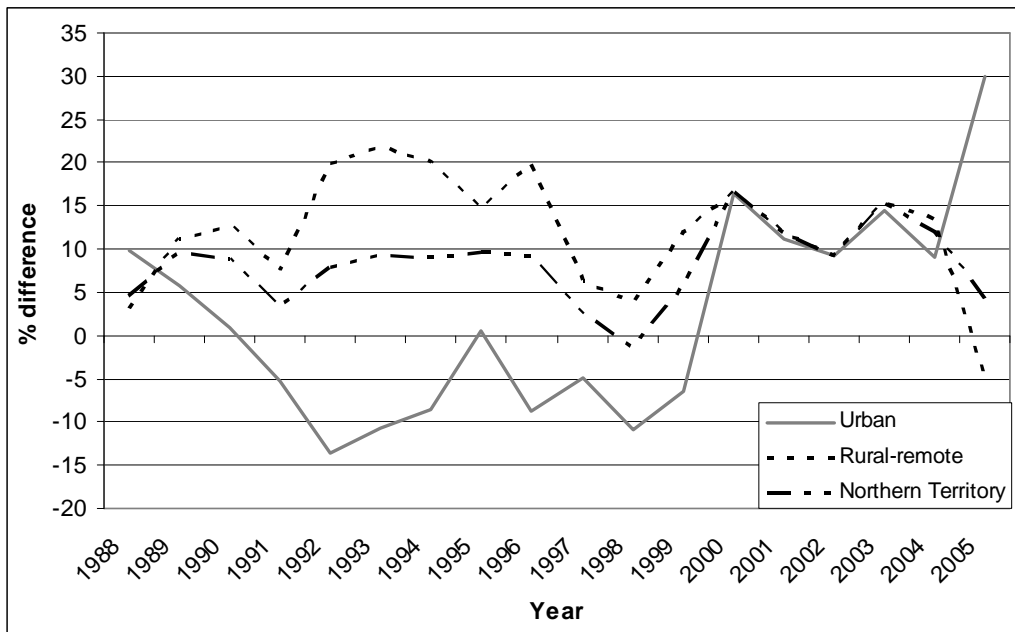
There are certainly geographic differences in the disparity between the two datasets. Numerically, the difference is greater in rural and remote parts of the Northern Territory, as would be expected with more births taking place outside urban centres (but see the next section for an overview of regional boundaries in the Territory and problems associated with these). In urban areas, however, births counted by vital registrations are not always greater than those counted by the perinatal data, and this is partly attributable to the difficulties in measuring ‘usual place of residence’ (Morphy 2007b). When the per cent difference between the two data sets is examined by urban and rural-remote location, three things are clear (see Figure 3.2). First, the higher count of births derived from vital registrations compared to perinatal counts has been a rural-remote phenomenon since the inception of the NT Midwives’ Collection. Second, the higher birth counts based on vital registrations have been a consistent urban phenomenon since the turn of the 21<sup>st</sup> century. Third, the Northern Territory trends tend to mirror rural-remote patterns. Undoubtedly some of this difference is due to movement between remote communities and towns to receive antenatal care and to give birth with women being recorded as urban in one data set but remote in the other. As will become clear in the following chapters, these differences in birth counts, compounded by differing magnitudes of difference for different geographies, have subtle impacts on the fertility trends from these two data sets.

As shown in Chapter Five, the difference between the two data sets affects the age-specific fertility rates on which they are based most notably in the 35-49 year age group. This is not a reflection of the largest difference in counts between data sets being found at these ages. There is no one age group which consistently records more births in the vital registration system compared to the perinatal collection.

Aside from all the issues outlined above, a perfect match between the datasets is unlikely because of the way in which births are reported – by year of occurrence in the NT Midwives’ Data Collection and by year of registration for the vital registrations. In the Northern Territory, most births to Indigenous mothers are registered within three months of occurring, and delays in registration are likely to be balanced by delays from

other years. In 2005 and 2006, only 0.3 per cent of births registered to Indigenous mothers usually resident in the Northern Territory were for births that occurred over a year prior to registration (ABS 2007c). Discussions with staff at the Registry of Births, Deaths and Marriages did not reveal any major delays in data entry due to natural disasters during previous years. The Northern Territory is also not prone to lengthy delays in registration due to resource limitations as reported in other jurisdictions (ABS 2006b) or because of parents delaying birth registration (ABC News 2008, ABS 2007c).

**Figure 3.2: Per cent difference<sup>(1)</sup> in birth counts to Indigenous mothers between the vital registration and perinatal data sets, 1988-2005**



(1)  $(\text{Vital registrations} - \text{perinatal data}) / \text{perinatal data} * 100$ . Positive result shows greater vital registration birth counts than perinatal data birth counts, and vice versa for negative results.

Sources: Author’s calculations using customised tables from Australian Bureau of Statistics and NT Department of Health and Families.

While a perfect match may be unlikely, this relatively quick registration from time of birth indicates that any differences between vital registrations and the perinatal data should be fairly small, but this is clearly not the case. A more detailed investigation of both data sets than is possible within the scope of this research is needed to determine exactly where these differences arise. Future research needs to focus on matching of records, investigation of data migration processes between different data systems, close observation of the data collection, data entry and data cleaning processes, and investigation of interstate births to Indigenous mothers.



In sum, two possibilities explain the different counts – the NT Midwives' Data Collection is missing births, or the vital registrations are counting some births twice. Laws et al. (2007) view the perinatal data as more accurate than vital registrations, and the Northern Territory Government has based its population projections on fertility levels from the NT Midwives' Data Collection (Northern Territory Treasury 2009). At a national level, it is vital registrations that are used for population estimates and projections (ABS 2007d). Vital registrations are also available in a much more timely fashion. (In the Northern Territory, 2003-2005 perinatal data became available in 2009, whereas vital registrations were available for 2007 in October 2008). The legal requirements for no birth to be registered unless a notification of birth has been received mean the likelihood of double counting is small. On this basis, the observation by Markey et al. (1998) that the smaller number of births recorded in the perinatal data set compared to the vital registrations represents births for which a NT Midwives' Collection form [or electronic entry] was not completed appears valid.

### ***A note on geography***

Over the 20-year period covered by both the vital registration and perinatal data sets the number of Indigenous births recorded in any one year has never exceeded 1,600 births. Once disaggregated by age, the number of births can become particularly small. Neither the Northern Territory Department of Health and Families nor the Australian Bureau of Statistics will release births data if the number of births associated with particular characteristics is small (e.g. number of births to Indigenous women aged 35-39 years). Because of the small number of births recorded for the Northern Territory as a whole, there are issues then for investigating regional variation in fertility trends.

There are strong imperatives for investigating regional Indigenous fertility patterns in the Northern Territory. Gray (1983a) showed significant difference between fertility rates of different Northern Territory Indigenous language groups between 1952 and 1976, which when grouped by location show higher total fertility rates in the Northern Territory's Top End compared to the Centre (4.4 and 3.6 births per woman respectively in 1972-1976).<sup>47</sup> This reflects more recent work by Brown et al. (2008) that showed for 2001 lower Indigenous fertility in the large arid region of Australia (2.5 births per woman)

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<sup>47</sup> These are simply an average of total fertility rates provided by Gray (1983:145) based on language groups identified in the Northern Territory Aboriginal Population Record. It excludes 'other' and 'unknown' languages. The split between Top End and Central languages is based on a geographic split used by the Australian Institute of Aboriginal and Torres Strait Islander Studies (<http://www1.aiatsis.gov.au/ASEDA/>).

compared to the semi-arid region (2.9 births per woman). Total fertility rates (TFRs) for seven health districts<sup>48</sup> were published from the NT Midwives' Collection for 1996-1999 (Carnegie et al. 1999, d'Espaignet et al. 1999, Gladigau et al. 2000, NT Perinatal Information Management Group 2002) and 2003-2005 (Zhang et al. 2009a, Zhang et al. 2009b, Zhang and Johnstone 2009). These showed consistently lower fertility in the Darwin Urban region compared to other health regions and in recent years low TFRs in the Alice Springs Rural region. Age-specific fertility rates published for 1996-1999 showed lower teenage fertility rates in Darwin Urban and Alice Springs Urban compared to elsewhere. A study for the Thamarrur region (to the north-west of the Northern Territory and containing Wadeye as its major community) indicated higher fertility again than that shown both by official statistics or for the Northern Territory as a whole (Taylor 2010).

While the need for geographic disaggregation is clear, the parameters within which it can be done are murky. There are practical questions in terms of needing to identify regions that ensure the number of events is sufficiently large to enable data access and questions of logical groupings of like regions so that any results can be understood in a meaningful way. Bearing in mind such issues, data for this research are available for different geographies.

The Northern Territory Department of Health and Families has used an urban and rural-remote geography for its most recent reports from the NT Midwives' Collection which classify as urban all residents of the five towns with a public hospital (Tew and Zhang 2010, Zhang et al. 2009a, Zhang et al. 2009b, Zhang and Johnstone 2009). Usual resident counts from the 2006 Census are shown in Table 3.1 and indicate that the towns with public hospitals (Darwin, Alice Springs, Katherine, Nhulunbuy and Tennant Creek) are also the largest, and range in size from 106,000 to 3,000 persons (ABS 2007e). Indigenous populations in these towns range in size from 235 to 10,000 people (Nhulunbuy and Darwin respectively). Table 3.1 shows population data for the five centres classified as urban and the next three largest communities in the Northern Territory. Two points stand out. First, the inclusion of a centre as urban because of the presence of a hospital appears somewhat arbitrary and not necessarily related to population size, with Tennant Creek differing in size from Maningrida by less than 1,000 people. Second, the five urban centres are characterised by low representation of

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<sup>48</sup> See Appendix A.1 for map of the districts.

Indigenous people in the usual residency counts compared to the next largest communities.

**Table 3.1: Usual residence population counts, total and Indigenous population, 2006**

	Usual resident population counts		% population
	Total	Indigenous	Indigenous
<b>Centres comprising urban area</b>			
Darwin <sup>(1)</sup>	105,990	10,260	9.7
Alice Springs <sup>(2)</sup>	23,890	4,495	18.8
Katherine <sup>(2)</sup>	8,192	1,982	24.2
Nhulunbuy <sup>(2)</sup>	4,111	235	5.7
Tennant Creek <sup>(2)</sup>	2,920	1,424	48.8
<b>Largest NT communities outside urban area</b>			
Maningrida <sup>(3)</sup>	2,068	1,904	92.1
Galiwin'ku <sup>(3)</sup>	1,698	1,573	92.6
Wadeye <sup>(3)</sup>	1,627	1,489	91.5

(1) Statistical Region Sector, encompassing Darwin City, Palmerston City and geographically close communities on the outskirts of Palmerston including Virginia-Bees Creek, Howard Springs, Humpty Doo and McMinns Lagoon.

(2) Statistical Local Area.

(3) Indigenous Location.

Source: ABS 2007e, *2006 Census Community Profile Series. Catalogue No. 2001.0.*

This urban/rural-remote grouping differs from the remoteness classification used by the Australian Bureau of Statistics, which is based on five classifications: major cities, inner regional, outer regional, remote and very remote (ABS 2003b). In the Northern Territory, Darwin is classified as outer regional, Katherine, Alice Springs, Litchfield and Coomalie (the outer surrounds of Darwin) are classified as remote, and the remainder of the Territory is very remote. The urban/rural-remote grouping is also not comparable to the health districts used in the Northern Territory (Chondur and Guthridge 2006), which comprise seven districts (see Appendix A.1):

- Darwin Urban
- Darwin Rural
- Katherine
- East Arnhem
- Barkly
- Alice Springs Urban
- Alice Springs Rural

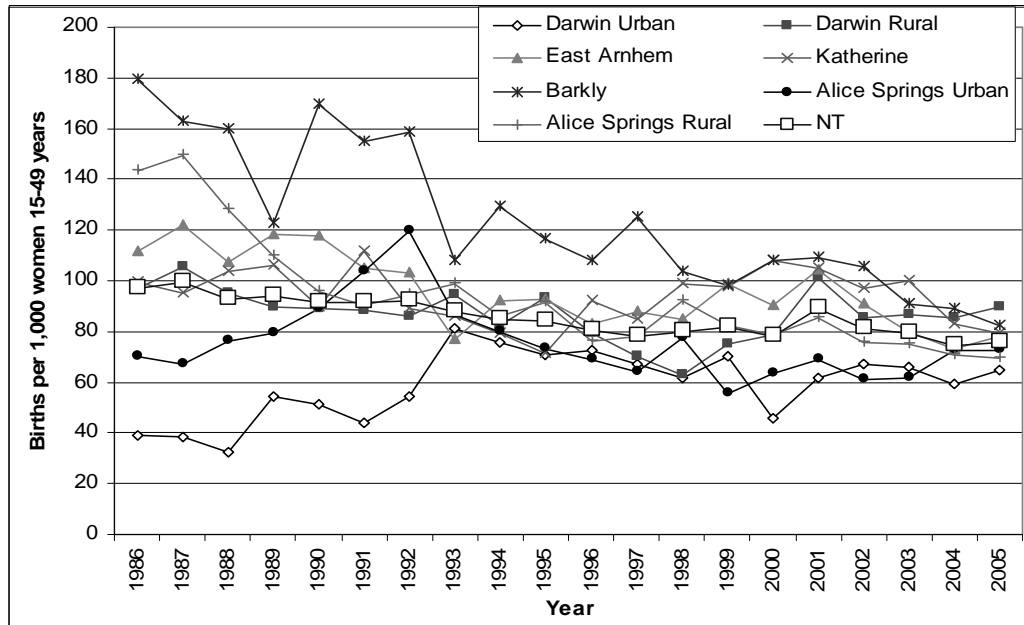
Perinatal data by health district are not available disaggregated by age of the mother for confidentiality reasons. The total numbers of births by Indigenous status of the mother

are available. Pragmatic reasons thus drove initial requests for data using the Northern Territory Department of Health and Families' urban classification of the five largest centres with a public hospital, both for the perinatal data and the vital registrations.

Using this classification, initial calculations of age-specific and total fertility rates using the 2006 provisional estimated resident population showed higher fertility in urban areas than in rural and remote areas. Not only was this counter-intuitive, it contradicted other Australian fertility studies (Barnes 2001, Strong et al. 1998), and previous analyses of Indigenous fertility (Taylor 2004, Taylor et al. 2006). Because this apparent anomaly appeared to be a recent pattern an investigation of data collection and coding practices was instigated and discussions were held with key staff responsible for helping pregnant women and new mothers complete forms, as well as with those responsible for data cleaning and processing. While it is generally acknowledged that there is some room for error in the recording of usual place of residence because of women having to move into town to give birth, there were no major changes in practice over recent years to indicate that miscoding of rural and remote women as town women had increased. Indeed, there was great awareness of the impact of 'sit down' on collecting usual residence information and great attention was paid to collecting correct information. The inconclusive nature of these investigations led to an analysis of general fertility rates over the 20-year period for the health districts (Figure 3.3). This analysis indicated that fertility was consistently lowest in Darwin Urban and Alice Springs Urban and raised issues of concern about how well the urban/rural-remote geography enabled identification of geographic influences on fertility outcomes.

Requests to the Northern Territory Department of Health and Families for perinatal data specific to mothers usually resident in Darwin, and if possible Alice Springs, were not met. However, a geographic split of the vital registration data based on Darwin Urban, Alice Springs Urban and the remainder of the Northern Territory did generate adequate cell sizes for the purchase of vital registration data from the Australian Bureau of Statistics. Thus, data used for analysis refer to varying geographies and the range is outlined in the next section.

**Figure 3.3: Indigenous general fertility rates, Northern Territory health districts, 1986-2005**



Source: Author’s calculations using customised tables from the NT Department of Health and Families.

As is made clear in Chapter Five, defining an urban area based on whether the town has a hospital or not does not necessarily enable a good understanding of the geography of demographic change in the Northern Territory. This is particularly true for the urban category which encompasses small towns with distinct Aboriginal spheres (Merlan 1998). Even though Katherine, Tennant Creek and particularly Nhulunbuy may have small enumerated Indigenous populations, they are the service centres for surrounding Indigenous homeland communities. These towns have sizeable Indigenous communities on the outskirts of the town boundaries (town camps or communities such as Yirrkala close to Nhulunbuy) which mean the towns have notable and distinct Aboriginal realms.

Alice Springs and Darwin (including Darwin and Palmerston) are also service centres for surrounding communities. Alice Springs is more akin to the smaller towns in terms of size, its highly visible Indigenous sphere, and dependence on the Federal and Territory governments for employment. Darwin also has a significant proportion of the population dependent on the government for employment, but the population’s larger size also means greater diversity of employers. The minority status of the Indigenous population makes it much less visible than in other centres, with Indigenous people in public spaces often viewed as problematic (Holmes and McRae-Williams 2009). Darwin’s larger size makes it qualitatively different to other places in the Territory – it

contains half of the Territory's entire population, has more services and is the focus of much of the Territory's capital expansion.<sup>49</sup> Any results based on this urban grouping of the Territory's very different service centres must therefore be viewed with caution and it provides an excellent example of how the choice of geographic categories might influence our understanding of fertility patterns. The problems associated with defining geographic spaces as urban or not also demonstrates the limitations of geographic classification as an independent variable (Hugo 2007).

### ***Data used in this thesis***

Despite the difference between the perinatal and vital registration birth counts both data sets are used in this thesis. The perinatal data provide the only source of parity data available for this research. Parity data are incomplete for the vital registrations as historically only previous births to the current relationship have been collected (Corr and Kippen 2006).<sup>50</sup> Details of the data sets used and the available variables are outlined in Table 3.2. The dual record method (which links data between two sets of records and uses this to estimate undercount in a primary data source) is not applied here because the two data sets cannot be linked as has been done, for example, in more controlled circumstances in Central Australia (Khalidi 1989).

Both data sets contain some 'unknown' data for age of mother, Indigenous status and usual place of residence. In each case, unknown variables were redistributed for age, then Indigenous status, and lastly, usual place of residence using proration. Quite simply, this means the per cent distributions for known age, Indigenous status and usual place of residence were applied to the unknown data for inclusion in the birth counts (Judson and Popoff 2004, Rowland 2003). The data from the perinatal dataset had only four records of unknown Indigenous status over the whole 20-year period. Because of these very small numbers, these births were simply reassigned as Indigenous. For the parity data, unknown parity was redistributed before age and usual place of residence.

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<sup>49</sup> Outside of Darwin (even in Palmerston a mere 21 kilometre south of Darwin) there is constant complaint about the 'Berrimah line', located between Darwin and Palmerston, below which politicians, government agencies and private enterprise allegedly do not provide adequate services.

<sup>50</sup> Moreover, data for previous births were only included in historical counts where paternity of the birth being registered was acknowledged (ABS 1995). Parity data for all previous births are available from 2007 (ABS 2008a).

**Table 3.2: Information about the Northern Territory perinatal and vital registration data used in this research**

<b>Aspect</b>	<b>Perinatal data<sup>(1)</sup></b>	<b>Vital registration data<sup>(2)</sup></b>
Inclusion criteria	All births of at least 400 grams birth weight or at least 20 weeks gestation. Live births only are included in two of the data sets provided for this research (identified under variables).	All live births
Reporting	Year of birth	Year of registration
Time series	1986-2005	1988-2007
Variables <sup>(3)</sup>	<ul style="list-style-type: none"> <li>• Live births by Indigenous status of mother by age of mother by urban/rural-remote usual place of residence</li> <li>• Live births by Indigenous status of mother by health district usual place of residence</li> <li>• All births by Indigenous status of mother by age of mother by parity of mother</li> </ul>	<ul style="list-style-type: none"> <li>• Live births by Indigenous status of mother by age of mother by urban/rural-remote usual place of residence</li> <li>• Live births by Indigenous status of mother by age of mother by Darwin/Alice Springs/NT Remainder usual place of residence</li> </ul>

(1) Perinatal data provided by the Northern Territory Department of Health and Families based on ethics approval from the Menzies School of Health Research and Department of Health and Families Human Research Ethics Committee (Protocol Number 08/24).

(2) Vital registration data purchased from the Australian Bureau of Statistics.

(3) Age of mother data were provided using five year age groups from 15-19 years. Births to mothers under the age of 15 were included in the 15-19 year age group. Because of small numbers, births to women over the age of 35 years were provided as a 35 and over category for the perinatal data, and a 35-49 years category for the vital registration data.

### 3.3: The denominator

Establishing fertility patterns for a population requires more than just births data. Births must be related to a population. In Australia, population data are derived from the five-yearly census, with counts of the Indigenous population available from 1961 (although official counts of a self-identified population were not published until 1971) (Ross 1999,

Smith 1980). A characteristic of Indigenous census counts is the increase in counts from census to census beyond the growth that would be expected from births and deaths alone, a common phenomenon among minority, indigenous populations in the developed world (Guimond et al. 2004, Guimond et al. 2003, Passel 1996, Pool 1991, Robitaille and Choinière 1987).

An analysis of the increase in the Indigenous population from 1991 to 1996 concluded that the balance between the explainable increase and the census counts was affected by different undercounts of the Indigenous population at each census, changes in non-response to the Indigenous status question, and changes in the way Indigenous people answer the Indigenous status question (Ross 1999). The birth of Indigenous babies to non-Indigenous women, labelled intergenerational ethnic mobility by Robitaille et al. (2010), is also a contributing factor (Taylor and Biddle 2008). This issue of who is counted adds a temporal component to the data that undoubtedly reflects shifting administrative practice and social change in attitudes (both towards Indigenous people, and among Indigenous people themselves), and gives rise to complex reasons why population measures based on these data may change.

While there is a well-documented phenomenon of higher than expected Indigenous counts between most census counts from 1971, equally important is the issue of undercounts. Since 1981, the Australian Bureau of Statistics has had an Indigenous Enumeration Strategy (IES), the aim of which is to improve the enumeration of Indigenous people (ABS 2005). Detailed observations of the IES implementation in the Northern Territory for the 2001 and 2006 censuses showed that despite increasing attention and funding to ensure that people are counted, many Indigenous people remain excluded from the census count (Martin et al. 2002, Morphy 2007b). Taylor and Biddle (2008:18) concluded that, "...in many parts of Australia ... undercounting of the Indigenous population in 2006 has reduced the census to the role of a large sample survey".

In 2006, the Post-Enumeration Survey (PES), carried out one month after census night and used to determine how many people were missed in the census, included remote areas of Australia and discrete Aboriginal communities for the first time. It showed that across Australia the Indigenous population net undercount rate was 11.5 per cent but in the Northern Territory it was 19.2 per cent (ABS 2007d).



In response to this undercount, the Australian Bureau of Statistics creates an Estimated Resident Population (ERP). In addition to the undercount, the ERP takes account of individuals who were counted but for whom Indigenous status was not collected. Census records with unknown Indigenous status are allocated as either Indigenous or non-Indigenous according to the distribution of stated responses within each age group, sex, census form type and geographic area (ABS 2008c).

While technically the 2006 ERP is “probably the best estimate yet of the nation’s Indigenous population” (Wilson and Barnes 2007:19), its calculation is not straightforward. It requires, “constructing an ‘Indigenous population’ ... out of Indigenous ‘peoples’” (Taylor 2009:117). For 2006, this population construction led to a Northern Territory Indigenous ERP that was 19.3 per cent larger than the population counted by the census (ABS 2009e).

If the 2006 ERP is Australia’s ‘best estimate yet’ of the Indigenous population, then it raises concerns about what population time series to use to look at changes over time. The ABS does not attempt to make Indigenous ERPs based on different censuses consistent. Rather, it produces a new ERP, creating a population estimate based on reverse cohort survival techniques (a reverse projection) usually for no longer than 10 years, although in 2009 estimates for 1986-2006 were released. Wilson and Barnes (2007) have shown how these reverse projections have been higher than census year Indigenous ERPs in every state and territory across Australia. The creation of reverse projected Indigenous populations for the Northern Territory based on the 2006 ERP show larger Indigenous populations than counted in all censuses prior to 2006. As the Northern Territory Department of Health and Families has shown, larger populations based on reverse cohort survival demonstrates the need to reassess all historical rates for Indigenous Territorians created using census-based population denominators (Chondur et al. 2008). Reverse projections enable historical undercounts to be addressed and they provide population estimates that are consistent over time. They include an assumption that ethnic mobility from a non-Indigenous identity to an Indigenous one is permanent back through time.

### **Creating reverse projections**

To understand Indigenous fertility in the Northern Territory requires an understanding of the data used to calculate fertility rates. While the data story is, in itself, an interesting one which has not previously been documented, a technical aside is needed to understand the complexity of determining a denominator, and the impact that this has on the resultant rates. Three sets of reverse projections<sup>51</sup> are used in this research, each using the 2006 Indigenous ERP as its base:

- i) Reverse projections to 1986 for the Northern Territory, urban and rural-remote regions, with a zero migration assumption;
- ii) Reverse projections for the urban and rural-remote regions to 1986, including net urbanisation assumptions; and
- iii) Reverse projections to 1986 for the Northern Territory and the seven health districts, with a zero migration assumption.

The first two sets of reverse projections were developed by the author specifically for this research using registered deaths data purchased from the Australian Bureau of Statistics. The third set was created by the Northern Territory Department of Health and Families based on an internally held database of Northern Territory deaths' notifications (Chondur et al. 2008).

The method applied for creating reverse projections for this research was simply a standard reverse cohort survival of the population from its 2006 base (Condon et al. 2004, Wilson and Condon 2006). Going backwards in time, the people entering the population between time  $t$  and  $t-5$  are those who died in the period  $t-5:t$ . Because both population and deaths data by five-year age groups were used, the reverse projected population at time  $t-5$  is:

$$P_{x:x+5}^{t-5} = P_{x+5:x+10}^t + D_{x:x+10}^{t-5:t}$$

Population estimates for 1986-2006 required assigning each death to the relevant period of death and the relevant birth cohort of the deceased (Figure 3.4). To ensure confidentiality ABS released data aggregated for five-year periods using large age groups

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<sup>51</sup> Strictly defined, reverse projections are population estimates based on reverse cohort survival techniques. Shryock and Siegel (1973:826-827) use the term reverse projections to describe the process. Other terms commonly used to describe the method include backcasting, back projections and inverse projections (Lee 1985, McCaa 2001, Wilson and Condon 2006).

to age 40 years (0-9 years, 10-29 years, 30-39 years), five year age groups from 40 to 74 years, and a category of 75 years and over. To convert these period data to cohort data, deaths by five-year groupings were required as assuming equal distribution of deaths over larger age groups would have been erroneous. Access to the Northern Territory Indigenous demographic database,<sup>52</sup> which included deaths by period-cohort from 1966-1971 to 1996-2001, enabled calculation of an average distribution of deaths by birth cohort for the 1966-2001 period. These distributions were applied to the deaths data provided by ABS to create period-cohort data by five-year age group. An even distribution of deaths within the five year age groups was assumed. Thus half of all deaths for each five year age group (represented by each square in Figure 3.4) were assigned to different birth cohorts (half of the number of deaths into each triangle within the Figure 3.4 squares). As Figure 3.4 shows, there are no issues with an open-ended older age group (Lee 1985) because population data are only needed for the reproductive ages (15-49 years), which are able to be reverse projected from 2006 to 1986 from the 65-69 year age group.

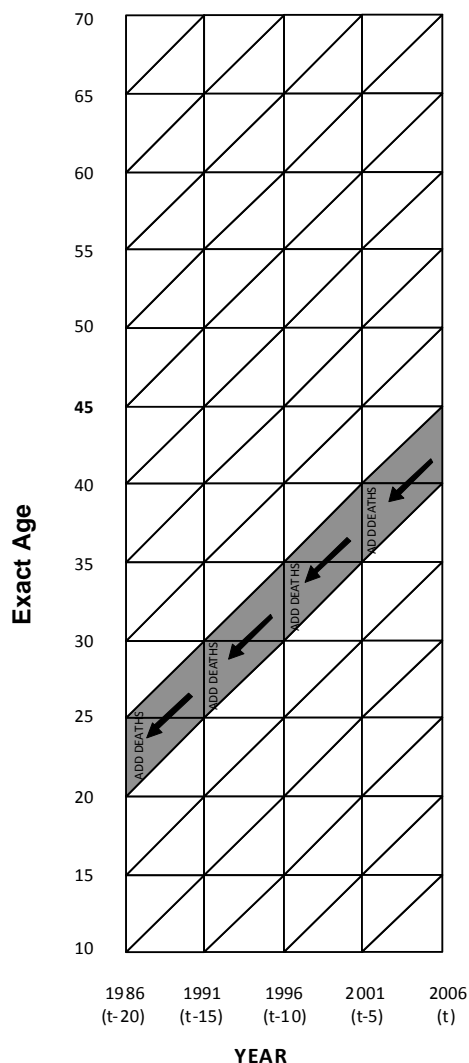
This distribution of deaths from the Northern Territory Indigenous demographic database was applied equally to deaths of urban usual residents and rural-remote usual residents. While there is some evidence of different mortality rates across health districts in the Northern Territory (Li and Guthridge 2004, Zhao et al. 2009) there are no readily accessible data for age-specific mortality at the regional level that are able to be used in this reverse projection.

A comparison of the reverse projection estimates used for this research with other estimates created from the 2006 ERP-base (ABS 2009e, Chondur et al. 2008) shows that this is a valid approach. While there are slight differences between the databases in the numbers in each age group back to 1986, this has no discernable effect on the resultant fertility rates. In order to ensure consistency in estimates for the Northern Territory, urban and rural-remote populations, this method was applied throughout. (Reverse projected estimates from the Northern Territory Department of Health and Families were only used to calculate the general fertility rates shown in Figure 3.3).

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<sup>52</sup> The Northern Territory Indigenous Demographic Database was created by Associate Professor John Condon at Menzies School of Health Research to estimate demographic characteristics and trends of the NT Indigenous population from 1966 to 2001 (Condon et al. 2004; Wilson and Condon 2006). Indigenous deaths prior to 1988 were inferred from death registrations based on a variety of factors (see Condon et al. 2004:13), and from 1988 identification of Indigenous deaths was recognised as close to complete in the deaths registrations (ABS 2002).

**Figure 3.4: Lexis diagram showing relationship between period and cohort data**

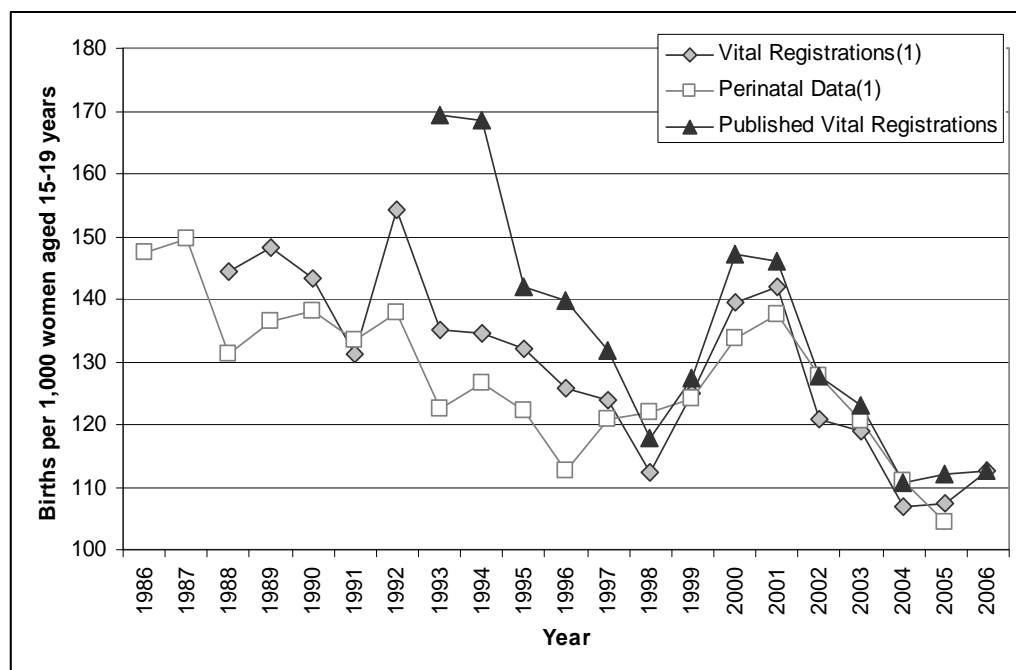


The impact of creating reverse projections for the purposes of fertility analysis in the Northern Territory is shown in Figure 3.5, which has teenage fertility rates calculated in three ways: rates published in the ABS annual *Births Australia* publications, based on ERPs for the year of publication; rates based on vital registrations using a reverse projected population denominator; and rates based on perinatal data using a reverse projected population denominator. In addition to the fertility rates being exceptionally high,<sup>53</sup> four things stand out: each of the data sets produce the same general pattern of fertility change, namely overall decline with fluctuations; the higher birth counts for vital

<sup>53</sup> For a point of comparison, the teenage fertility rate for Australia as a whole in 2006 was 15.3 births per 1,000 women aged 15-19 years (ABS, 2007a).

registrations compared to perinatal data are not evident in every year for this age group; published rates are consistently higher than those calculated using a reverse projected population because they are based on the smaller ERPs of the time; and the further back in time the comparison, the greater the difference between published rates and those calculated for this research.

**Figure 3.5: Northern Territory Indigenous fertility rates, women 15-19 years, based on three data sources**



(1) Rates calculated using a reverse projected population based on the 2006 Northern Territory ERP.

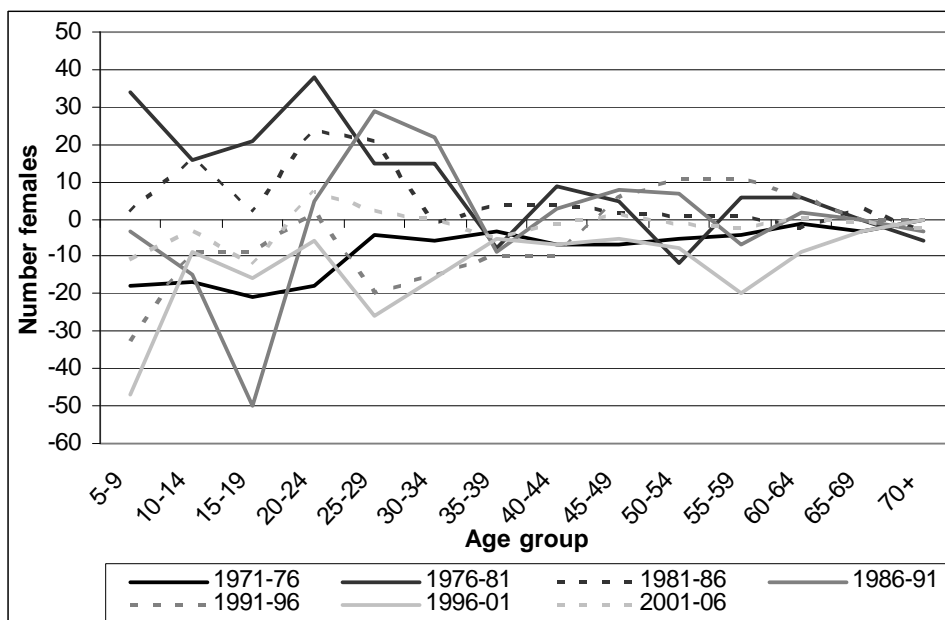
Sources: ABS, *Births Australia, Cat No. 3301.0*, various years. Author's calculations using data from the Australian Bureau of Statistics and the Department of Health and Families.

#### Taking account of migration

As already noted, an assumption of zero net interstate migration has been used for the reverse projections used in this research. This is an assumption shared by the ABS for its estimates of the Northern Territory's Indigenous population from 2006 back to 1986 (ABS 2009e) and by the Northern Territory Department of Health and Families for its reverse projections to 1971 (Chondur et al. 2008). Net interstate migration flows based on the census question on usual residence five years ago indicates this to be a reasonable assumption in the Northern Territory (see Figure 3.6). Morphy et al. (2007b) found that data based on usual residence now, one and five years ago enumerated through the Indigenous Enumeration Strategy "cannot be interpreted as a reliable reflection of

mobility patterns” (p.163) and in the absence of other data or studies contradicting the assumption of zero net interstate migration, the assumption stands.

**Figure 3.6: Net interstate migration Northern Territory, Indigenous females, 1976-2006**



Source: Beneforti et al. 2008. Paper presented at the Australian Population Association 14th Biennial Conference 30 June – 3 July 2008.

Within the Northern Territory, however, an assumption of zero migration between regions is more difficult to support. At the very least, the impact of movement between urban and rural-remote regions must be explored. Despite the caveats of census data reliability, they remain the only migration data available. For Australia as a whole, remote and very remote regions experienced a net population loss of 7.1 per cent between 2001 and 2006 (ABS 2008c). Taylor (2006) has shown that from 1991 Darwin has long been a net recipient of Indigenous population flows.

The inclusion of a net migration assumption in the reverse projections for the Northern Territory’s urban and rural-remote populations is constrained by data availability. Census data on usual residence in 2006 and 2001 were acquired by age, sex, Indigenous status and according to the urban/rural-remote geography used for the births data. These provided a net number of women who were counted as part of the urban population in 2006 but who were living in rural-remote parts of the Northern Territory in 2001 ( $NM^{t-5:t}$ ). These numbers were incorporated into the reverse projections for both the urban and rural-remote populations in the following way:

$$P_{x:x+5}^{t-5} = P_{x+5:x+10}^t + D_{x:x+10}^{t-5:t} + NM_{x:x+10}^{t-5:t}$$

In order to create a time series that extended back to 1986, age-specific net Indigenous urbanisation rates for Darwin 1996-2001 (Taylor 2006) were applied to the population data to estimate  $NM^{t-5:t}$  for 2001, 1996 and 1991. Results from 2006 using this method compared to the actual net internal migration counts show that while there are differences between actual and estimated counts, the magnitude of difference was small.

Not surprisingly, the impact of including a net internal migration assumption in the reverse projection creates larger rural and remote populations than when a zero migration assumption is used. This effectively makes fertility rates higher over time in urban areas and lower in rural-remote areas. Given there are questions about the accuracy of usual place of residence in population and births data, determining which reverse projection estimate is most accurate is not a priority for this research. The impact of net internal migration on fertility rates is explored in Chapter Five and raises questions about how geographic differences in fertility are understood. However, the urban/rural-remote geographic split is not the only one used in this research and concerns about its ability to reflect the Northern Territory's urban population have already been raised. Because deaths data are not available for the other geographies used in this research, migration assumptions have not been calculated for the Northern Territory health districts or the Darwin, Alice Springs and NT Remainder regions.

### 3.4: A question of age

One of the most fundamental population characteristics for fertility analysis is age, and an investigation of data sources would be incomplete without comment on the accuracy of Indigenous population age data. The difficulties obtaining age or date of birth information from some Indigenous people were highlighted during the interviews undertaken for this research. Two women who did not speak English as a first language were unable to say how old they were, and another gave an age and date of birth that were different. The difficulties associated with asking about age were exacerbated when trying to ascertain the approximate age ranges of some respondents' children or grandchildren. Two grandchildren, for example, were described as '*big ones*', but attempts to understand if this meant a big child, an adolescent or an adult were unsuccessful. These difficulties were not unexpected as problems associated with asking about age

have been observed during collection of census data in 2001 and 2006 under the Indigenous Enumeration Strategy (Morphy 2002, Morphy et al. 2007b). For census collection it was observed that offered ages were usually guesses, and when a date of birth was known it was usually only the year that was used to estimate age, not the day or month.

The identified problems asking about age from Indigenous peoples in Australia are not a question of language or translation for those people who do not speak English. There are not really any meaningful ways of asking a person's age in any Indigenous language when calendar age is not a cultural concern. Most Indigenous languages have a vocabulary for stages of maturation, but these are not necessarily age related (Frances Morphy, personal communication, and see Taylor 2004).

These issues for accuracy of age will recur in all data sets where Indigenous individuals in the Northern Territory need to provide a date of birth or age. For vital registrations, if a mother was born in the Northern Territory records may be able to confirm the accuracy of a mother's date of birth, but checking of records has not been carried out to ascertain the accuracy of mothers (and fathers) reported age. The perinatal data are likely to suffer age inaccuracies based on results from an audit of patient demographic data in Northern Territory public hospitals carried out from November 2007 to January 2008 (Tew et al. 2008). The audit included interviews with 439 Indigenous patients whose responses were checked against hospital records. Twenty three per cent (99 individuals) were unable to provide a complete date of birth. Of these, 33 were able to give an age or partial date of birth. Among those Indigenous patients who could provide some indicator of their date of birth, 10 per cent did not have their date of birth accurately recorded. Among these people with inaccurately recorded age over half had a record that was one to four years different from their actual age, and for some the differences were greater than 10 years (the direction of these differences to younger or older ages were not reported). Clearly then, there are likely some inaccuracies in the perinatal data which uses the same hospital data systems as the in-patient records under audit.

For this research the extent of age misreporting is unable to be identified and thus any impacts on fertility rates can only be guessed at. As will be shown in Chapter Seven, there are different youth age profiles between the vital registration and perinatal data sets and age (mis)reporting could be a factor here.



### **3.5: Moulding the data**

As has been shown, a significant amount of work is needed to create clean births and population data to undertake Indigenous fertility trend analysis in the Northern Territory. The full extent of the data issues underlying Indigenous fertility rates are not always well understood or well elucidated (e.g. Northern Territory Treasury 2009) and this research represents the first investigation and documentation of the data issues surrounding Indigenous fertility in the Northern Territory. These findings in relation to the data are thus as important as the results reported in subsequent chapters.

Because of the data constraints, the approach taken to understanding fertility trends is not to determine ‘true’ or ‘real’ fertility levels, but to view the results as indicative of the parameters of contemporary Indigenous fertility in the Northern Territory. Data are used to calculate a range of fertility measures (shown in Table 3.3), most of them standard for demographic analysis. Results are presented alongside explanations of data constraints. This aim of this research is not just to investigate Indigenous fertility trends, but also to make clear the nature of the data problems and how they affect results.

Births registration data are not the only source available for understanding a population’s fertility patterns (Pullum 2004). Other data and methods are available (Dharmalingam 2004, Pullum 2004) and these have been used in Australia in the past to investigate Indigenous fertility trends (e.g. Jain 1989, Kinfu 2002). Chapter Four explores alternative data sets and their suitability for this research.

**Table 3.3: Fertility measures used in this research**

Measure	Formula
General fertility rate (GFR)	$(B/P_{15-49}) \times 1,000$ <p>Where B = annual live births born to Indigenous mothers, P = Indigenous female population 15-49 years.</p>
Age-specific fertility rate (ASFR)	$(B_x/P_x) \times 1,000$ <p>Where <math>B_x</math> = annual live births born to Indigenous mothers aged <math>x</math>, <math>P_x</math> = Indigenous female population aged <math>x</math>.</p>
Age-order-specific fertility rate (ASFR <sup>i</sup> )	$(B_x^i/P_x) \times 1,000$ <p>Where <math>B_x^i</math> = annual live births of a given birth order <math>i</math> born to Indigenous mothers aged <math>x</math>, <math>P_x</math> = Indigenous female population aged <math>x</math>.</p>
Total fertility rate (TFR)	$\frac{\sum_{a=15-19}^{a=30-34} ASFR_a + (15 * ASFR_{35-49})}{1,000}$ <p>Where <math>ASFR_a</math> = ASFR for age groups 15-19 to 30-34 years and <math>ASFR_{35-49}</math> = ASFR for age group 35-49 years.</p>
Tempo-adjusted total fertility rate (TFR <sub>adj</sub> )	$\sum_{i=1}^n TFR_{adj}^i$ <p>Where <math>TFR_{adj}^i = TFR^i / (1-r_i)</math>  <math>i</math> = given birth order  <math>r_i = (MAC_{i,t} - MAC_{i,t-n}) / n</math>                      Where <math>MAC_{i,t}</math> = mean age at childbearing for birth order <math>i</math> at end period <math>t</math>, <math>MAC_{i,t-n}</math> = mean age at childbearing for birth order <math>i</math> for the initial period <math>t-n</math>, and <math>n</math> = number of years between initial and end periods.</p>
Early force of childbearing (ETFR)	$((5 * ASFR_{15-19}) / 1,000) / TFR * 100$
Period parity progression ratio	$B_{i+1} / B_i$ <p>Where <math>B_i</math> = births of a given order in some year and <math>B_{i+1}</math> = births of the next higher order in the same year.</p>

Sources: Estee (2004) and Dharmalingam (2004) in *The Methods and Materials of Demography*, and Jackson et al. (1994) in *New Zealand Population Review*, 20(1&2):35.

## CHAPTER FOUR: ALTERNATIVE PREGNANCY AND BIRTHS DATA

### 4.1: Introduction

In addition to evidence about Indigenous fertility in the Northern Territory based on vital registration and perinatal data, other sources of information are available that warrant exploration, particularly in light of the caution with which the data sources investigated in Chapter Three must be used. This chapter provides an overview of census, survey and termination of pregnancy data available for Indigenous women in the Northern Territory and explores their utility for investigating contemporary fertility patterns. As is shown in this chapter, while several methods of fertility estimation exist in the absence of birth registration data (Popoff and Judson 2004), the ability to calculate alternative rates to ‘test’ the rates based on vital registration and perinatal data is severely limited.

### 4.2: Children ever-born

Census data on children ever-born alive to Indigenous mothers were acquired for the urban, rural-remote and Darwin Urban geographic units identified in the previous chapter for the census years 1986, 1996 and 2006. While children ever-born data by Indigenous status have been used from 1966 to 1976 in earlier research (Gray 1983a), during that period Australian censuses only elicited information about number of children ever-born from ever-married women or currently-married women. This was deemed inadequate for this research based on the small proportion of Indigenous women in the Northern Territory who have been reported as legally married in the vital registration data (ABS, *Births Australia*, various years from 1993). The census data, however, must be viewed with caution.

The “own-child” method has also been developed to estimate fertility from census household data (Cho et al. 1986). It requires matching of children to a likely mother in the household. Census data for Indigenous households are highly problematic in terms of enumeration, and how enumerated data are then coded to create household and family data (Morphy 2007a). Research in Australia that used this method to estimate Indigenous fertility rates relied on high levels of imputations where mother-child matches were unable to be made (Jain 1989). These required imputations alongside the

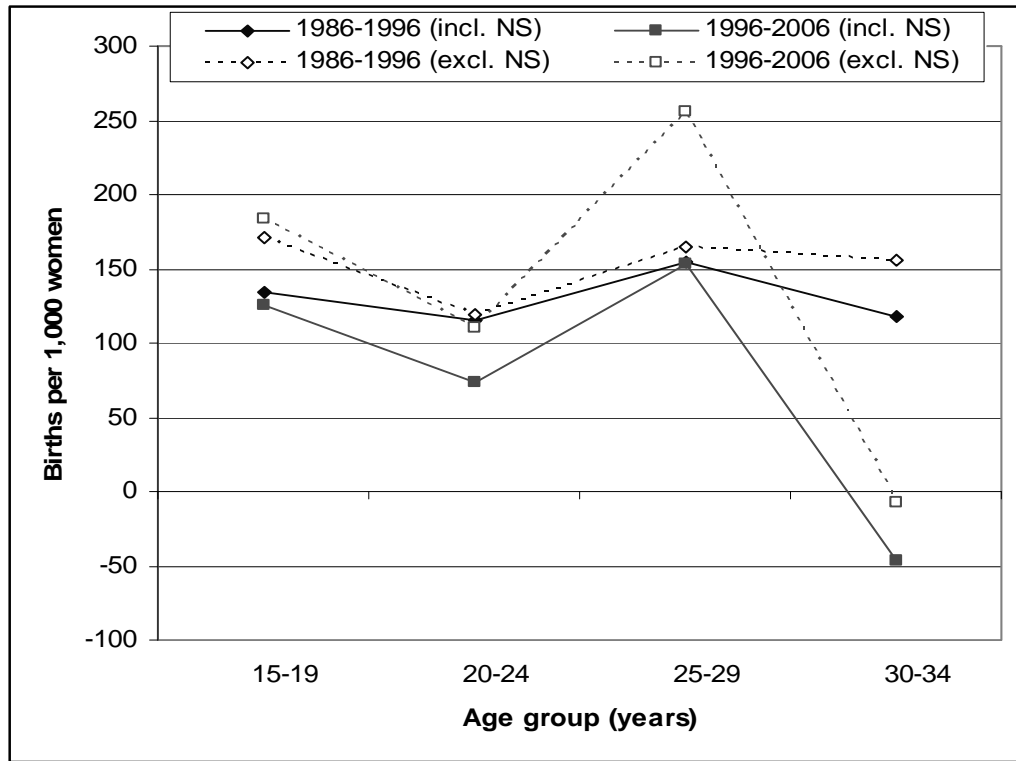
inability of census coding to adequately measure Indigenous households or families led to rejection of this method for this research.

On top of the undercount of the Indigenous population (as already noted, the Northern Territory Indigenous ERP for 2006 was 19.3 per cent larger than the population counted by the census, ABS 2009e), there are high levels of non-response to the question on children ever born to Indigenous mothers. In 1986 the non-response rate was 18 per cent, in 1996 it was 11 per cent and in 2006 it was 16 per cent, with the highest levels of non-response in each year being for women aged 15-19 years and remarkably little difference among other age groups. Moreover, observations of census data collection in remote Indigenous communities found that often only currently living children were counted when census forms were filled in (Morphy et al. 2007b).

Calculation of fertility rates for the Northern Territory based on census data therefore requires a decision about what to do with women who had not stated responses for number of children ever born. Not stated responses introduce 'zero error' by over-estimating the number of women who have had no children and thus under-estimating average parity. Their exclusion has the opposite effect because some of the not stated responses will include women with no children. The impact on fertility rates is shown in Figure 4.1. Fertility rates that include not stated responses are consistently lower than rates that exclude not stated responses. The El-Badry (1961) method, developed to overcome this issue of non response, is not able to be applied to the Northern Territory data. Redistribution of some not stated responses to zero parity is not possible because of a poor linear relationship between the non-response and zero parity responses, a relationship that violates the underpinning assumption of the method (El-Badry 1961).

The reliability of Indigenous fertility estimates for the Northern Territory derived from the census (United Nations 1983, Zlotnik and Hill 1981) is severely compromised by results that contradict all other sources and historical patterns (Figure 4.1). While there are further imputation methods available to refine estimates that do not appear reasonable (Popoff and Judson 2004), their pursuit is not warranted for this research when more reliable measures are available from the registration data.

**Figure 4.1: Intercensal Indigenous age-specific fertility rates (including and excluding Not Stated responses), Northern Territory, 1986-2006**



NS = Number of children ‘not stated’.

Source: Author’s calculations using customised tables from the Australian Bureau of Statistics.

Children ever-born data from the census can be used, however, for understanding how reported fertility is correlated with particular socio-economic characteristics of Indigenous women. While there are issues of differing undercount and non-response from census to census, the problem of matching numerators and denominators from different data sources is avoided.

The census data are used to construct Gray’s Childlessness Index and Index of Maternal Fertility (Gray 1989a). These are indirectly-age-standardised indices of the number of women who reported they had not had children and of the average number of children ever born to mothers respectively. The Childlessness Index measures the tempo of fertility and is equal to 100 when the reported proportion of women without children in a given category of women is equal to the proportion among all Indigenous women aged 15-34, after allowance for differences in age distribution. The index is greater than 100 when the category contains a relatively high number of women without children. The Index of Maternal Fertility is a measure of the intensity of childbearing by women aged 15-34 who reported they were mothers. A level higher than 100 indicates greater

intensity of childbearing (formulae are shown in Table 4.1). The Gray indices allow for some investigation of spatial variation since the necessary data are available for the urban/rural-remote split outlined in Chapter Three, and also for Darwin Urban and NT Remainder (the number of responses was too small for Alice Springs to be separately identified). The Gray indices also enable scrutiny of the influences of education and participation in the paid workforce on fertility outcomes in the Northern Territory and its regions.

**Table 4.1: Formulae for Gray indices**

Childlessness Index	Index of Maternal Fertility
$CF / \sum c_{x,s} \times P_{x,i}$	$C / \sum c_{x,s} \times P_{x,i}$
Where $c_{x,s} = CF_{x,s} / P_{x,s}$ and CF = number women childless aged 15-34	Where $c_{x,s} = C_{x,s} / P_{x,s}$ and C = number of children born to women aged 15-34
P = female population aged 15-34, s = standard population (NT Indigenous female population for year being observed), i = population in specified category	

Participation in the paid workforce was looked at using employment status. The employment measure includes all women who were in paid employment for at least one hour per week, including employment through the Community Development Employment Program (CDEP). Not in paid employment includes women who were unemployed, that is not being paid for work and actively seeking paid employment and women who were not in the labour force, that is not actively seeking paid employment. Two indicators have been used for education: age at leaving school, and whether a woman has a post-school qualification. In 1986 and 1996 census respondents were asked how old they were when they left school. Data were requested to differentiate women who had left school aged 16 years and over and those who had left school before the age of 16 years. In 2006, however, this question was not asked and respondents were asked the highest year (or equivalent) they had attended school. Data for 2006 were thus requested for those women who had completed Years 10 to 12, and those who had completed Years 9 and below. For time series comparisons, women who completed Years 10-12 were assumed to have left school aged 16 years or older. This category, however, will also include women who returned to secondary school as an adult student. There will also be women who completed school to Year 9 or below but who left school after the age of 16 years.

### 4.3: Survey data

Three surveys have collected information related to Indigenous women's fertility in the Northern Territory: the National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) 2004-05; the National Aboriginal and Torres Strait Islander Social Survey (NATSISS) 2002; and the DRUID Study (Diabetes and Related conditions in Urban Indigenous people in the Darwin region).

The NATSIHS includes a women's health questionnaire which asks women if they have ever had any babies (but does not ask for number of births) and asks about current contraceptive methods being used and ever-use of oral contraceptive pills. The number of women aged 18-49 years who responded to these questions from within the Northern Territory is relatively small (n=445). Data disaggregated by age and all contraceptive types results in very large Relative Standard Errors (RSE) and in most cases weighted estimates would be based on sample numbers less than 10 (Mal MacDonald, ABS, personal communication). Under these circumstances data are only available with no age or geographic breakdown and no breakdown of contraceptive type. None of these options benefit this research and NATSIHS data are therefore not included.

The NATSISS 2002 included a question for women respondents asking how many children they had ever had born alive. (This question was not repeated in the NATSISS 2008). As with the NATSIHS, the relatively small sample from the Northern Territory means detailed analyses were not possible based on the available data.

The DRUID Study<sup>54</sup> was designed to provide an accurate assessment of the burden of diabetes, diabetic complications and associated chronic diseases in an adult, urban Indigenous population (those who had lived in and around Darwin for six months or more). The DRUID Study included a women's health questionnaire as one of its measurement tools. It was carried out by the Menzies School of Health Research in partnership with a range of other organisations.<sup>55</sup> The study was approved by the

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<sup>54</sup> The DRUID Study was funded by NHMRC Grant #236207 with additional support from the Australian Government Department of Employment and Workplace Relations, the Clive and Vera Ramaciotti Foundation, the Vincent Fairfax Family Foundation, the Australia at Risk Partnership in Type 2 Diabetes and Bayer HealthCare.

<sup>55</sup> DRUID Study Partner Organisations were: Menzies School of Health Research, Northern Territory Department of Health and Community Services (now called Department of Health), Danila Dilba Health Service, International Diabetes Institute, Cooperative Research Centre for Aboriginal Health, the now defunct Yilli Rreung ATSIC Regional Council (covering Darwin and Palmerston), Diabetes Australia NT, Top End Division of General Practice, and National Heart Foundation (NT).

Human Research Ethics Committee of the Northern Territory Department of Health and Community Services and Menzies School of Health Research (the Aboriginal subcommittee and the main committee). The study's governance structure included an Indigenous Steering Group and partnerships with key Indigenous organisations. Access to the de-identified women's health data for this research was approved by the DRUID Editorial Committee.

Baseline data were collected during 2003-2005 (for details of the study protocol see Cunningham et al. 2006) and included health assessments and questionnaire administration. Participants were recruited at a wide variety of settings, including workplaces, secondary schools, discrete Indigenous communities, health services, and booths at social, health and sporting events and at shopping centres. Recruitment methods included advertising and features on radio, television, newspapers and newsletters, door-to-door knocking, telephone calls to persons known to staff members, using the study's Indigenous Steering Group members and word of mouth (Cunningham et al. 2006). The DRUID Study collected 1,009 consent forms from eligible participants, of whom 1,004 provided at least one measurement. From this sample, 441 women under the age of 45 years answered the women's health questionnaire with approximately 79 per cent of respondents self-administering it and the remainder providing responses via interview (Cunningham et al. 2006). Almost all of these women also completed questionnaires covering general medical history, risk factors and psychosocial factors.<sup>56</sup> Although the exact number of people eligible to participate in the DRUID Study was not known, it has been estimated that participants represented just over 14 per cent of the target population (Cunningham et al. 2006).

While the total DRUID sample is notably older than the estimated resident population (ERP) of the Yilli Rreung Aboriginal and Torres Strait Islander Commission (ATSIC) region (whose boundaries are similar to those of the Darwin Urban region) in 2004 (Cunningham et al. 2006), the age distribution of the women's health sample is comparable to that based on the population estimates (Table 4.2). The restriction of the women health's sample to the reproductive ages appears to render it more representative than the larger study sample.

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<sup>56</sup> Initially, the DRUID Study used separate questionnaires for general medical history and risk factors, and psychosocial factors. After six months, these questionnaires were shortened and combined into one form in response to concerns about slower-than-anticipated recruitment (Cunningham et al. 2006).



**Table 4.2: Comparison of age distribution of females 15-44 years, DRUID participants (women's health questionnaire) and estimated resident population of the Yilli Rreung ATSIC Region 2004**

Age group	Per cent distribution	
	DRUID study (women's health)	Yilli Rreung ATSIC Region
15-19	21.7	23.1
20-24	12.1	15.8
25-29	15.2	15.5
30-34	16.9	18.0
35-39	14.4	15.2
40-44	19.9	12.4

Sources: ABS (2004b) *Experimental projections of Aboriginal and Torres Strait Islander Australians, ATSIC regions, 2001-2009. Catalogue No. 3238.0.55.002* and DRUID Study Women's Health Sample.

From the age of 25 years and over, the majority of women in the DRUID women's health sample reported that they had been pregnant (Table 4.3). Somewhat anomalous, particularly in light of the high rates of teenage fertility, is the low reporting of childbearing among teenage girls in the DRUID sample. This could reflect recruitment of participants at Darwin secondary schools and at Charles Darwin University, which has campuses in Darwin and Palmerston. While the census data reporting number of children born to women has been shown to be unreliable for estimating fertility levels,<sup>57</sup> the per cent of Indigenous women in the Darwin Urban region in 2006 who reported having any children show similar patterns to the DRUID data, except for the youngest ages (Table 4.3). The DRUID Study women's health sample is therefore unlikely to offer a reliable profile of young childbearing behaviour by young women at the time of the survey. However, because it captures women's fertility history it should be a relatively reliable measure of the timing of first birth by respondents over the age of 20 years. Respondents under the age of 20 have therefore been excluded from the sample for all analysis in this research. A further three cases in the 20-44 year age range were removed from the sample because no information was collected about pregnancy, births, or number of children, nor could the information be inferred from other data collected. The final sample used was thus 329 women.

<sup>57</sup> Census results showing the same level of childbearing among women aged 15-19 and 20-24 years are also unexpected. The intercensal age-specific fertility rates shown in Figure 4.1 also show much lower than expected fertility for the 20-24 year age group, indicating that census data for this age group might be particularly affected by issues of undercount and/or non-response to the children ever-born question.

**Table 4.3: Per cent Indigenous women who have ever had live birth by age at time of survey/census, Darwin Urban, 2004 and 2006**

Age group	% women in age group who were ever pregnant	
	DRUID sample 2004 ( <i>n</i> =419)	Census population 2006 <sup>(1)</sup> ( <i>n</i> =2,453)
15-19	7	41
20-24	50	41
25-29	77	74
30-34	85	86
35-39	88	87
40-44	88	94

(1) Usual resident population. Includes women who reported having one or more children.

Sources: Author's calculations based on customised tables from the Australian Bureau of Statistics and the DRUID Study Women's Health Sample.

The DRUID Study women's health questionnaire included a range of questions on the topics of menstrual history, contraceptive use, pregnancy, infertility, hysterectomy and menopause. A characteristic of the women's health questionnaire that warrants highlighting is the absence of questions pertaining to the timing of contraceptive use, either by age at time of use or in relation to pregnancies. Women were asked if they had ever taken the oral contraceptive pill or any other hormonal form of contraception (Implanon or Depo-Provera), the length of time they had used the form of contraception and whether they were currently using either form of contraception (no other methods were included in the questionnaire). This reflects the purpose of the DRUID Study to explore risk factors for diabetes, heart disease and other conditions rather than fertility *per se*.

The DRUID Study women's health questionnaire included four questions related to pregnancy and childbirth:

- Have you ever been pregnant?
- What age were you first pregnant?
- How many children have you had?
- What age were you when your first child was born?

These questions were used to create five outcome variables:

- Ever-pregnant (Yes/No)
- Ever-pregnant as a teenager (Ever-teen pregnancy) (Yes/No)

- Ever-given birth as a teenager (Ever-teen birth) (Yes/No)
- Age at first birth (Years)
- Parity (Number of children)

Predictor variables were created from both the women's health and general questionnaires. Because the outcome variables focus on age of entry to childbearing and number of children, only variables that can reasonably be expected to have an association with these historical events were selected. As shown in Chapter Two, past analysis of Indigenous fertility in Australia has identified age of leaving school, labour force status and family income as important drivers of fertility difference (Gray 1989a). Among Indigenous populations internationally, access to contraception has been recognised as a critical contributor to declining fertility rates (Caldwell 2002). For women who are employed, have received education to the end of secondary school or beyond, and who are in receipt of higher incomes we would expect lower fertility, and concomitant with this lower fertility, later entry to childbearing. Likewise for women who use contraception for longer periods of time, one would expect lower parity and older age at first birth. These assumptions for Indigenous women living in the Darwin Urban area are able to be explored using data from the DRUID women's health sample.

'Predictor' variables were developed to look at the relationship between employment, education, income and contraception use and pregnancy or birth outcomes. Labelling these variables as predictors is somewhat of a misnomer. Except for age of leaving school, all of the predictor variables relate to socio-economic or contraceptive use status at the time of the survey. They may thus be as much a consequence of childbearing as a predictor of it. Bradbury (2006a) has shown being a teenage mother means women are more likely to receive income support payments and have poorer educational outcomes, and to be less likely to be partnered once they reach their 30s, and if partnered, their partner is more likely to have a lower income. Except for partnering outcomes, teenage motherhood is not in and of itself a causal factor for socio-economic disadvantage (Bradbury 2006a, 2006b). The reasons for disadvantage lie in the factors that determine fertility at young ages rather than via the effect of young motherhood itself. That being said, young motherhood is a strong signal of later disadvantage (Bradbury 2006a). In the absence of other data, then, the DRUID variables remain among the few that enable us to explore the association between socioeconomic status and contraceptive use, and pregnancy and birth outcomes for Indigenous women in the Northern Territory.

The following ‘predictor’ variables are used:

- Currently in paid employment (including full-time, part-time and casual employment<sup>58</sup>) (Yes/No)
- Left school aged 16+ years (Yes/No)
- Education to Year 12 or post-school qualifications (Yes/No)
- Current equivalised weekly household income \$200+<sup>59</sup> (Yes/No)
- Ever-using contraception (oral contraceptive pill, Implanon or Depo Provera) 2+ years (Yes/No)<sup>60</sup>.

Age group (20-29, 30-39, and 40-44 years) is also included as a predictor variable when looking at whether women have ever been pregnant, age they had their first child, and the number of children they have had, as all of these outcomes rise with older age.

Missing or ‘don’t know’ responses in the ‘predictor’ variables were addressed in the following ways:

- Paid employment status: missing responses (n=38) were labelled as ‘no’, not currently in paid employment. It was assumed if people were working and in receipt of an income they would report it, either by selecting one of the response options to the questions or describing the work in the open ended response category to the question.
- Age of leaving school: for those respondents with no information recorded on age at leaving school or highest qualification (n=4), it was assumed that respondents left school before the age of 16 years.

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<sup>58</sup> Does not include CDEP participants or students (full-time or part-time). A variable was created that included CDEP participants to render results more comparable with those based on census data but very few respondents fell in the ‘no’ category and it made the results somewhat meaningless. It represents another way the DRUID sample differs from the population as measured from the census.

<sup>59</sup> Equivalised household income, which accounts for the economies of scale that occur when people live together, was estimated using the modified Organisation for Economic Co-operation and Development (OECD) scale, which uses a weight of 1 for the first adult in the household, 0.5 for all other adults aged 15 years and over, and 0.3 for children. Equivalised income was calculated by dividing the midpoint of the relevant household income category by the sum of weights for all household members (Cunningham et al. 2008:26).

<sup>60</sup> Because of co-linearity between the ever-used contraception and the using contraception 2+ years predictor variables, both are unable to be used in multivariate analyses. Univariate analysis of each contraception variable against the outcome variables that are the focus of this research found using contraception 2+ years was significant against all outcome variables, but ever-use of contraception was not. Ever-use of contraception is thus excluded from the analysis. ‘No’ responses include women who had never-used contraception.

- Highest qualification: it was assumed that women would know and report school attendance to Year 12 or to a tertiary level, so missing and don't know responses (n=5) were recoded as not receiving education to Year 12 or higher.
- Current equivalised weekly income: missing responses for current weekly household income (n=34) were reassigned to the category of less than \$200 per week. This assumption was based on results from the 2006 Census for the Darwin Urban region which showed that households with Indigenous persons residing within them had a median weekly income of only \$574.50, and an average household size of nine people. Assuming at least two adults lived in a household of this size would give an equivalised weekly household income of \$159.58, and the equivalised income would be less with a greater number of adults residing in the household.
- Using contraception two plus years: there were no missing responses to the question, 'have you ever used contraception?' and thus all 'no' responses to the ever used contraception questions were coded as 'no', have not used contraception for two plus years. Two respondents had used contraception but did not report a length of time for use. They were both over the age of 30 and they were assigned to 'yes', have used contraception for two or more years.

Descriptive statistics have been used to report socio-economic data and fertility outcomes. Life table techniques are used to explore age at first pregnancy and birth. Logistic regression models or multiple regression models were developed for each of the outcome variables to explore the influence of the predictor variables detailed above. For the logistic regression models, odds ratios (OR) with 95 per cent confidence intervals (95%CI) are reported. Also reported are values for the -2 Log-likelihood<sup>61</sup> and the Cox & Snell pseudo R<sup>2</sup>.<sup>62</sup> For the multiple regression models, beta values ( $\beta$ ) with 95%CI are reported, alongside F-ratios<sup>63</sup> and R<sup>2</sup> results.<sup>64</sup> All analyses were performed using SPSS 16.0/17.0.

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<sup>61</sup> Log-likelihood is a measure of error or unexplained variation in categorical models (Field 2009:789).

<sup>62</sup> Cox & Snell pseudo R<sup>2</sup> is a version of the co-efficient of determination for logistic regression which measures the proportion of variance in one variable explained by a second variable (Field 2009:784).

<sup>63</sup> F-ratio is the ratio of the average variability in the data that a given model can explain to the average variability unexplained by the same model (Field 2009:785-786).

<sup>64</sup> R<sup>2</sup> is the coefficient of determination (i.e. the proportion of data explained by the model) (Field 2009: xxxii).

#### 4.4: Termination of pregnancy (TOP) data

Terminations of pregnancy (TOP), or induced abortions data, provide important information about how many women are getting pregnant, and enable estimates of pregnancy rates to be determined by combining births and TOP data.<sup>65</sup> Terminations are carried out at Royal Darwin and Alice Springs Hospitals and the Darwin Private Hospital through the obstetrics clinic on referral from a General Practitioner. Notification of induced abortion has been required in the Northern Territory since 1974.

Hospital separations' data are available by Indigenous status of patient from 1992. De-identified data tables were requested from the Department of Health and Families<sup>66</sup> using diagnosis codes based on the International Classification of Diseases (ICD) as determined by Chan and Sage (2005) to estimate Australia's abortion rates 1985-2003. Diagnosis codes were selected by Chan and Sage in discussion with coding specialists to ensure continuity during the time period between two revisions of the ICD (Chan and Sage 2005). The diagnosis codes used were:

- 635.00 – 635.92 when the ICD, 9<sup>th</sup> revision, clinical modification was used; and
- O04.0 – O04.9 when the ICD, 10<sup>th</sup> revision, Australian modification was used.

Data for the Darwin Private Hospital are available from Medicare statistics but these are not available by Indigenous status. Because very few Indigenous women use Darwin Private Hospital for birthing services, it was assumed the same pattern of use was true for abortions and Medicare data were not included in this research. The data in this research therefore refer to number of terminations carried out in the Northern Territory's public hospitals only.

Termination of pregnancy data can be used to look at abortion rates within the population, calculated in the same way as fertility rates. They can also be used to investigate the ratio of abortions to live births. Population-based proxy pregnancy rates (age-specific and total) can be calculated by adding together termination of pregnancy and live birth data. At the Northern Territory level, a general pregnancy rate can be

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<sup>65</sup> A true pregnancy rate would include spontaneous abortions, or miscarriages, and stillbirths. There are no data available for miscarriages to Indigenous women in the Northern Territory. Stillbirths data are available by Indigenous status, but not age, of the mother. They can thus be included in a general pregnancy rate, but not age-specific pregnancy rates. The numbers are very small and are unlikely to greatly affect the overall trends.

<sup>66</sup> Data were only made available following the receipt of ethics approval from the Menzies School of Health Research and Department of Health and Families Human Research Ethics' Committee (Protocol Number 08/24) and approval from the Department's own data manager.

calculated that also includes number of stillbirths (these data are not available by age of the mother or by region of usual residence). Measures based on termination of pregnancy data are detailed in Table 4.4.

**Table 4.4: Pregnancy and abortion measures used in this research**

Measure	Formula
General pregnancy rate	$((B+A+S)/P_{15,49}) \times 1,000$ <p>Where B = annual live births born to Indigenous mothers, A = annual induced abortions attributed to Indigenous women, S = annual stillbirths born to Indigenous women, <math>P_{15,49}</math> = Indigenous female population 15-49 years.</p>
Age-specific pregnancy rate (ASPR)	$((B_x + A_x)/P_x) \times 1,000$ <p>Where <math>B_x</math> = annual live births born to Indigenous mothers aged <math>x</math>, <math>A_x</math> = annual induced abortions attributed to Indigenous women aged <math>x</math>, <math>P_x</math> = Indigenous female population aged <math>x</math>.</p>
Total pregnancy rate	$\left( (5 \sum_{a=15-19}^{a=30-34} ASPR_a) + (15 * ASPR_{35-49}) \right) / 1,000$ <p>Where <math>ASPR_a</math> = ASPR for age groups 15-19 to 30-34 years and <math>ASPR_{35-49}</math> = ASPR for age group 35-49 years.</p>
Age-specific abortion rate	$(A_x/P_x) \times 1,000$ <p>Where <math>A_x</math> = annual induced abortions attributed to Indigenous women aged <math>x</math>, <math>P_x</math> = Indigenous female population aged <math>x</math>.</p>
Age-specific abortion ratio	$(A_x/B_x) \times 1,000$ <p>Where <math>A_x</math> = annual induced abortions attributed to Indigenous women aged <math>x</math>, <math>B_x</math> = annual live births born to Indigenous mothers aged <math>x</math>.</p>

Source: Lamb and Siegel (2004) in *The Methods and Materials of Demography*.

## 4.5: Summary

Despite the availability of additional sources of data that can inform our knowledge of Indigenous fertility in the Northern Territory, they are limited in terms of testing the accuracy of fertility levels from the main data sources outlined in Chapter Three. They are also limited in how much they can inform our understanding of the reasons for the fertility patterns seen in the Northern Territory. As will be shown in the next three chapters, many of the results are ambiguous, or at best, show some form of correlation

between fertility outcomes and socio-economic indicators. A main reason for this is that most of the data sources used to understand the exogenous influences on fertility were not collected for the express purpose of understanding birth outcomes. The data presented in this chapter then increase our understanding of the parameters within which we must understand Indigenous fertility in the Northern Territory, rather than providing definitive measures of that fertility.

The next chapter turns to the results based on the data we have at our disposal to understand Indigenous fertility in the Northern Territory. It explores fertility trends for the Northern Territory and how they differ across different geographical regions.



## **CHAPTER FIVE: PLACE MATTERS – TOWN AND BUSH VARIATIONS IN NORTHERN TERRITORY FERTILITY<sup>67</sup>**

### **5.1: Introduction**

Geography has been identified as an important exogenous influence on fertility for this research (Figure 2.3 in Chapter Two). Differentiation between urban and rural populations has been justified on the basis that where people live affects behaviour such as reproduction and the practicalities of accessing data have also played an important role. Despite critiques of a didactic approach to population analysis, in Australia there is a clear relationship between demographic outcomes and remoteness (Hugo 2007). As was shown in Chapter Three, the connection between population and place is not fixed, particularly for fertility analysis in the Northern Territory where women outside of Darwin, Alice Springs, Nhulunbuy and Katherine are required to travel elsewhere for at least two weeks in order to give birth. Despite conceptual and data constraints for understanding how place influences fertility outcomes, this chapter highlights important differences between town and bush (rural and remote parts of the Northern Territory) with some trends moving in unexpected directions, even with the different definitions for urban populations as outlined in Chapter Three. This chapter also highlights how the choice of geography for demographic analysis can influence our understanding of fertility trends, further complicated by the choice of data used for analysis.

### **5.2: Number of children born to Indigenous women in the Northern Territory**

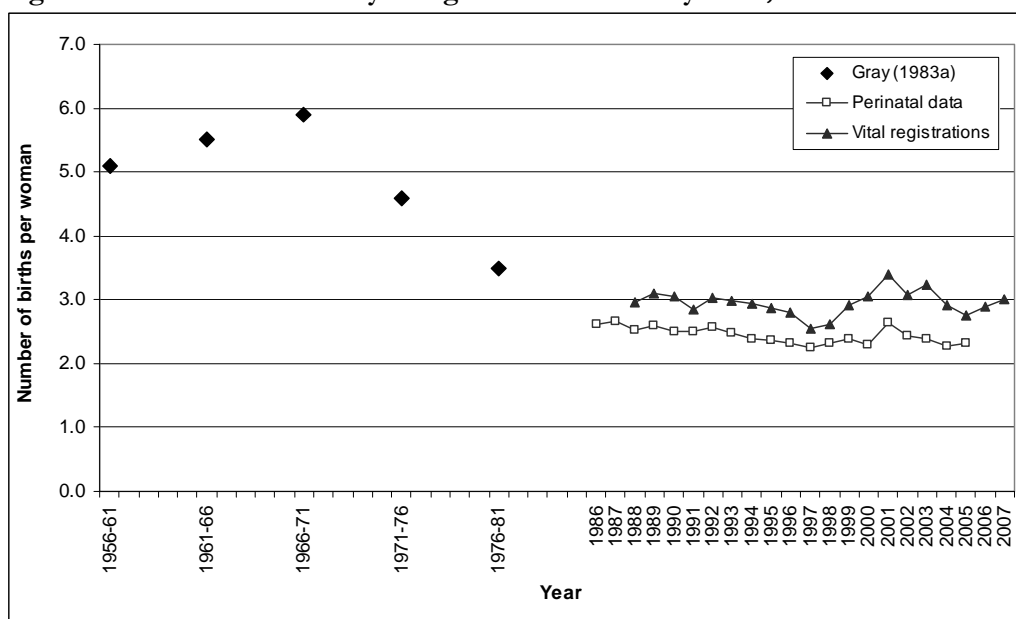
Among Indigenous women in the Northern Territory there has been remarkably little change to the average number of children born to each woman over the 20-year period from the 1980s. The TFR derived from both perinatal and vital registration data shows fluctuations but little overall change between the start and end points of each period (Figure 5.1). Rates calculated using the perinatal data show a slight downward trend from 2.61 to 2.31 births per woman between 1986 and 2005. The vital registration data also showed a decline during the 1990s, but by 2007 the TFR was almost the same as in

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<sup>67</sup> This chapter is drawn from: Johnstone, K. 2010. “Indigenous fertility in the Northern Territory of Australia – what do we know? (and what can we know?)”, *Journal of Population Research*, 27(3):169-192. (DOI 10.1007/s12546-011-9048-3).

1988 (3.01 and 2.96 births per woman respectively). This reflects a rise in fertility for 2006 and 2007 based on vital registration data because the TFR in 2005 (2.75 births) was lower than in 1988 (2.96). The rates derived from vital registrations are higher than those based on perinatal data because of the higher birth counts as outlined in Chapter Three, but the overall pattern of declining and rising TFRs is reflected in both collections. It is therefore reasonable to assume that when the 2006 and 2007 perinatal data become available for the Northern Territory they too may show higher TFRs than in 2005.<sup>68</sup>

**Figure 5.1: Northern Territory Indigenous total fertility rates, 1956-2007**



Sources: Gray (1983a) and author’s calculations using customised tables from the NT Department of Health and Families and the Australian Bureau of Statistics.

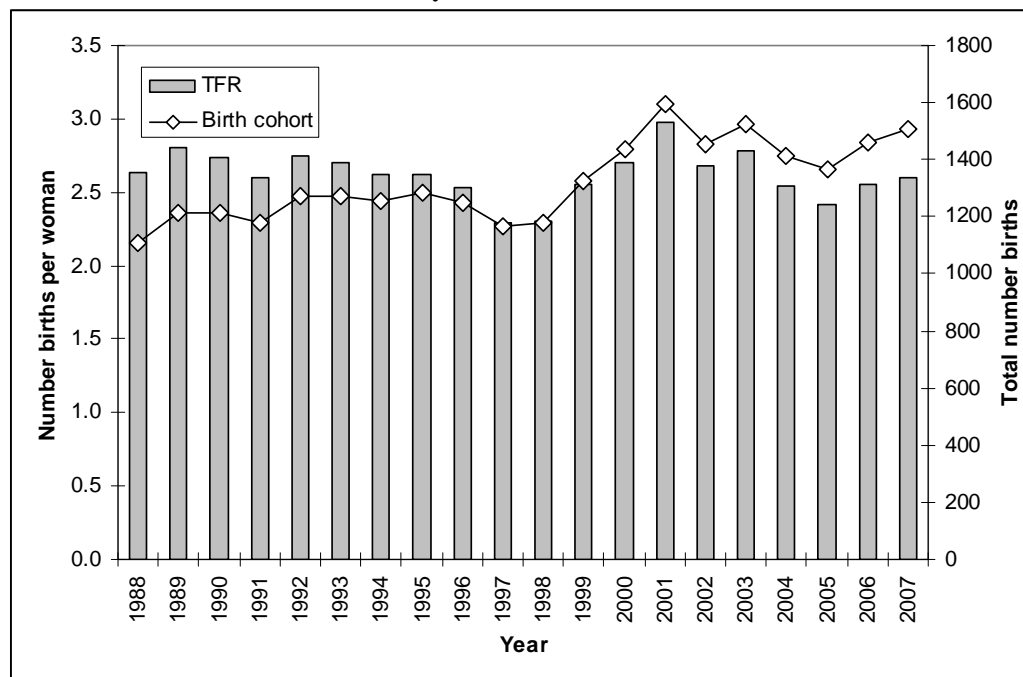
These total fertility rates are not exceptionally high. Gray’s estimates of Northern Territory Indigenous TFRs for 1956-61 to 1976-81 showed a decline from 5.1 to 3.5 births per woman respectively (1983a:134). Gray (2002) concluded that fertility estimates that rely on census data are lower than those calculated from birth registration data, implying that the fertility decline during the 1960s and 1970s was even more rapid than has been documented, with an abrupt halt to decline in the 1980s. Alternatively, this relative stability in TFRs from the mid-1980s onwards could indicate that early estimates were too high despite their reliance on census data (Johnstone 2008, Taylor

<sup>68</sup> A report based on the 2006 Northern Territory perinatal data has been released (Tew and Zhang 2010) which shows a TFR of 2.4 for Indigenous women in the Northern Territory. Data by five-year age group have not been published or made available to the author for inclusion here.

1997). The aim of this research is not to investigate the validity of early estimates of fertility, which have fully exploited all available data and for which no evidence-based alternatives have ever been proposed. Rather, it seeks to investigate contemporary features of Indigenous fertility in the Northern Territory, and based on this summary measure, stability rather than decline features prominently. This pattern reflects fertility patterns for Australia as a whole (Carmichael and McDonald 2003, Kippen 2003), albeit at higher levels and, as is shown below, with a very different age profile. The absence of a continued fertility decline is also indicative of delayed demographic transition, so described when trends of fertility decline are not sustained.

The relatively low TFR among Indigenous women in the Northern Territory only provides some of indications of the total number of children being born. As Figure 5.2 shows, the relatively stable TFR is leading to Indigenous birth cohorts of increasing size as older cohorts reach the childbearing ages. The increasing number of babies being born to Indigenous mothers shapes perceptions of fertility levels and has important implications for demand on maternal and child health services and subsequent services and infrastructure such as education or housing as these larger cohorts age.

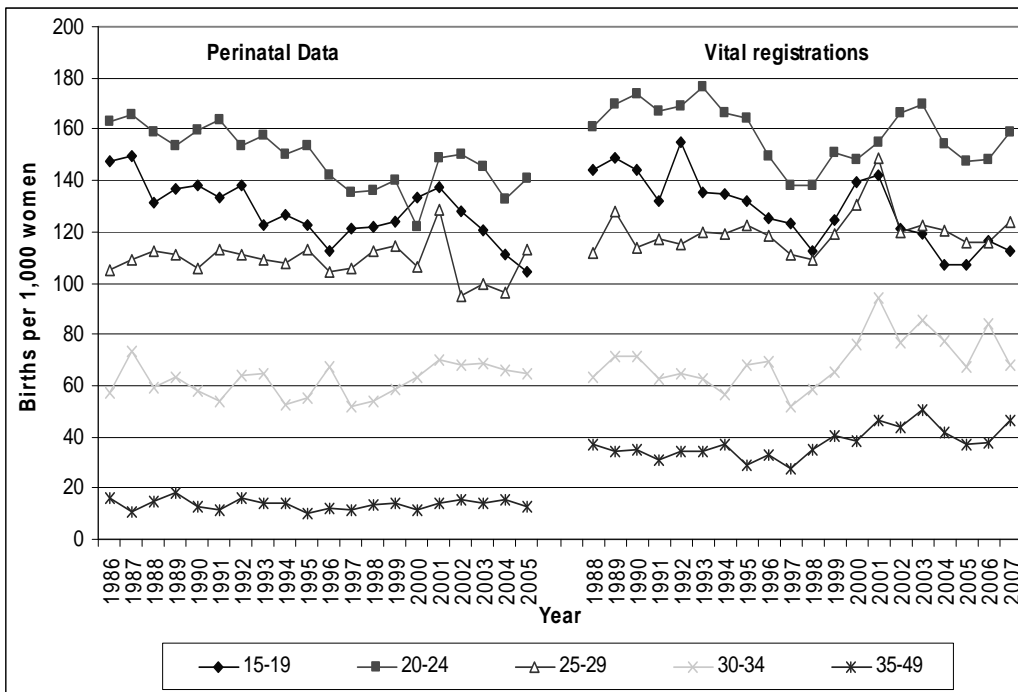
**Figure 5.2: Total fertility rates and cohort size, births to Indigenous women in the Northern Territory, 1988-2007**



Source: Author's calculations using customised tables from the Australian Bureau of Statistics.

Age-specific fertility rates show that the relative stability in the TFR hides a pattern of fertility decline among young Indigenous women, alongside very high rates of fertility at the younger ages (Figure 5.3). These fertility declines have not been monotonic. Indigenous teenage fertility rates declined from the 1980s but began to rise again in the 1990s (from 1996 based on the perinatal data and from 1998 based on vital registration data). They began to decline again from 2001 to 2005, and rates based on vital registration data show another upward fluctuation for 2006 and 2007. This highlights the importance of analysis over a sufficient period to ascertain real trends. Among Indigenous teens, there is a steeper downward fertility trend for rates derived from the vital registration data compared to rates derived from the perinatal data. This difference is still in evidence when data for 1988-2005 only are used, thus eliminating any effect from the different start and end dates of each data set. Both vital registration and perinatal data show that peak childbearing for Indigenous women in the Northern Territory is among the 20-24 year age group.

**Figure 5.3: Indigenous age-specific fertility rates, Northern Territory, 1986-2007 (vital registration and perinatal data)**



Source: Author's calculations using customised tables from the NT Department of Health and Families and the Australian Bureau of Statistics.

While there is a trend of fertility decline for women in their early 20s over the 20-year period covered by both data sources, this has occurred with fluctuations throughout

each period. For the 20-24 year age group there is a steeper downward trend using fertility rates derived from the perinatal data compared to those derived from the vital registration data.

This pattern of high fertility among Indigenous women in their early 20s has been documented by all researchers who have attempted to measure Indigenous fertility in the Northern Territory since the middle of last century (Gray 1983a 1983b, 1989b, Jones 1972, Khalidi 1989, Smith 1980). It is probably more noteworthy because it is taking place alongside moves to older childbearing among the non-Indigenous population in the Northern Territory and the rest of Australia<sup>69</sup> (Jain and McDonald 1997, Kippen 2003, Zhang et al. 2010).

Certainly, for some of the women interviewed for this research, young mothering was the norm across generations. One woman aged in her 50s had two children by the age of 24, and her oldest child aged in his early 30s had two teenage children himself. She also said that in her community, *“some women have them early – first baby”*. Another woman in her late 40s had three children by her mid-20s, and she now had three granddaughters. Two were born to a daughter before she was 20, and another to a daughter when she was 15 or 16 years old. A woman aged 44 years had three children, the oldest of whom was born when the woman was 20 or 21. All of her children were married and two had children of their own. Another woman aged in her 40s with two daughters in their late teens to early 20s said:

*“My daughters haven’t had any children, and I’m probably really lucky ‘cos as I say that I do know that there’s others that are 20 and younger who are having children and thank God my girls haven’t”*.

While the patterns of age-specific fertility shown by the two data sets presented here are similar there are some slight differences at the older ages that have implications for how we might think about fertility patterns into the future. In addition to declines at the youngest ages, rates based on perinatal data in Figure 5.3 show very slight fertility declines among women aged 25-29 years, small increases among women aged 30-34 years and virtually no change among women aged 35-49 years. The vital registrations on the other hand show increases from 1988-2007 for age groups 25-29, 30-34 and 35-49

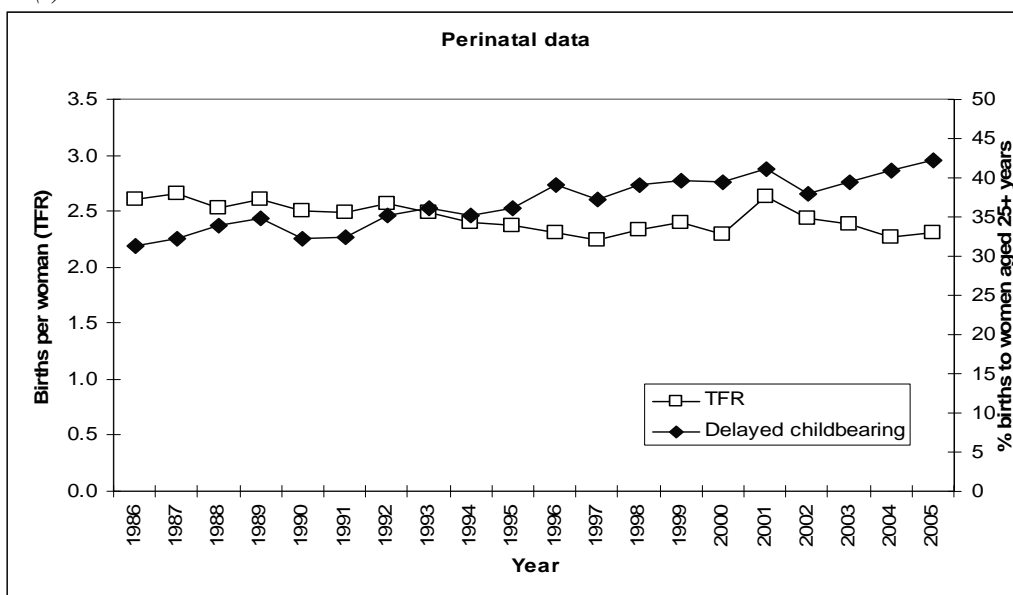
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<sup>69</sup> In 2007, the Indigenous teenage fertility rate in the Northern Territory (derived from vital registration data) was seven times higher than the rate for Australia as a whole (113 and 16 births per 1,000 women aged 15-19 years respectively). The fertility rate of Indigenous women aged 20-24 years was nearly three times higher than the rate for Australia as a whole (159 and 56 births per 1,000 women aged 20-24 years respectively) (ABS 2008b and author’s calculations).

years, alongside the declines among women under the age of 25 years. These same trends are seen when data for 2006 and 2007 are excluded from the analysis. None of these trends have occurred in a linear fashion with fertility rates at all ages subject to annual fluctuations.<sup>70</sup> The vital registrations data imply a shift from very young to slightly older fertility, while declines at the youngest ages based on the perinatal data imply overall declines in fertility. Any difference between data sets is less marked when the proportion of births to women aged 25 years and older, a measure of delayed childbearing, is looked at alongside the TFR (Figure 5.4). It is clear that there has been a move to delayed childbearing from the mid to late 1980s among Indigenous women in the Northern Territory. This again highlights the importance of analysis over a sufficient period of time to ascertain real trends. The differences between data sets for the observed rates also provide evidence of the role of data choice in influencing our understanding of observed demographic patterns.

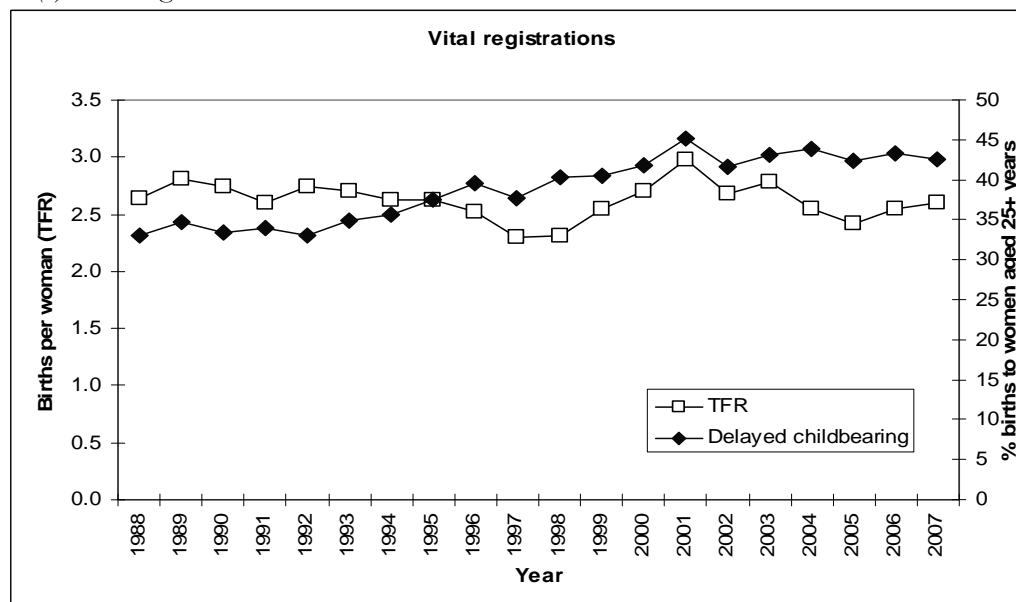
**Figure 5.4: Indigenous fertility rates and delayed childbearing, Northern Territory, 1986-2007 (vital registration and perinatal data)**

*5.4(a): Perinatal data*



<sup>70</sup> Three-year rolling averages were calculated to address these annual fluctuations but the same upward and downward trends were in evidence so it was decided to present annual rates for better comparison with other results presented throughout this thesis.

## 5.4(b): Vital registration data



Delayed childbearing = proportion of births born to women aged 25 years and older.

Source: Author's calculations using customised tables from the NT Department of Health and Families and the Australian Bureau of Statistics.

The wave-like patterns seen in the total and age-specific fertility rates over time suggest the possibility of tempo effects on the period rates. The tempo-adjusted TFR developed by Bongaarts and Feeney (1998, 2000), which aims to eliminate the tempo distortions from the conventional TFR and measure birth quantum only, indicates that tempo effects have had a small impact on observed fertility rates among Indigenous women in the Northern Territory (Table 5.1). These results point to a slightly higher level of completed fertility compared to indications based on period data alone.

**Table 5.1: Indigenous observed and tempo-adjusted total fertility rates, Northern Territory, 1986, 1995, 1996, 2005**

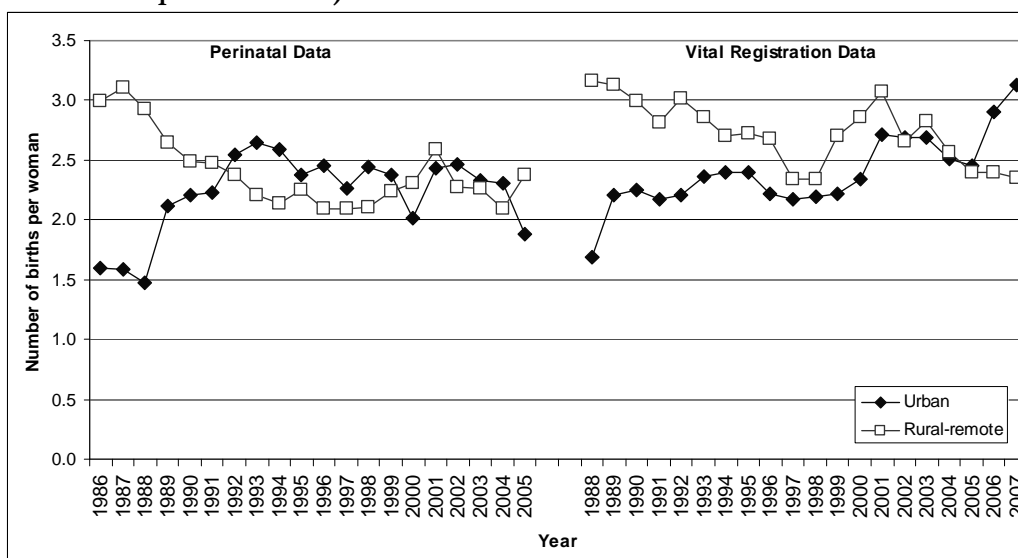
Year	TFR <sub>observed</sub>	TFR <sub>adjusted</sub>
1986	2.65	2.65
1995	2.40	2.51
1996	2.31	2.31
2005	2.32	2.46
1986	2.65	2.65
2005	2.32	2.46

Source: Author's calculations using customised tables from the NT Department of Health and Families.

### Regional variations in total fertility rates

As was made clear in Chapter Three, regional variations across the Northern Territory in fertility rates among Indigenous women are affected by choice of geography and by choice of data. Not only do these choices affect the levels of fertility, but also the geographic differentiation we might expect to see. All researchers who have investigated Indigenous demography have viewed urbanisation as a factor associated with fertility decline (Gale 1970, Gray 1983a, 1989b, Taylor 1997). As Figure 5.5 shows, however, such an assumption does not necessarily appear to hold true for the Northern Territory. Conclusions here are tentative as the different geographic patterns seen between the perinatal and vital registration data illustrate how data choices can affect our perceptions of demographic outcomes. The perinatal data suggest that high urban fertility may be a long term-pattern, while the vital registration data suggest it is only a recent phenomenon.

**Figure 5.5: Indigenous total fertility rates, urban<sup>(1)</sup> and rural-remote<sup>(2)</sup> usual place of residence, Northern Territory, 1986-2007 (vital registration and perinatal data)**



(1) Includes Darwin, Alice Springs, Nhulunbuy, Katherine and Tennant Creek.

(2) Includes all areas outside urban centres listed in (1).

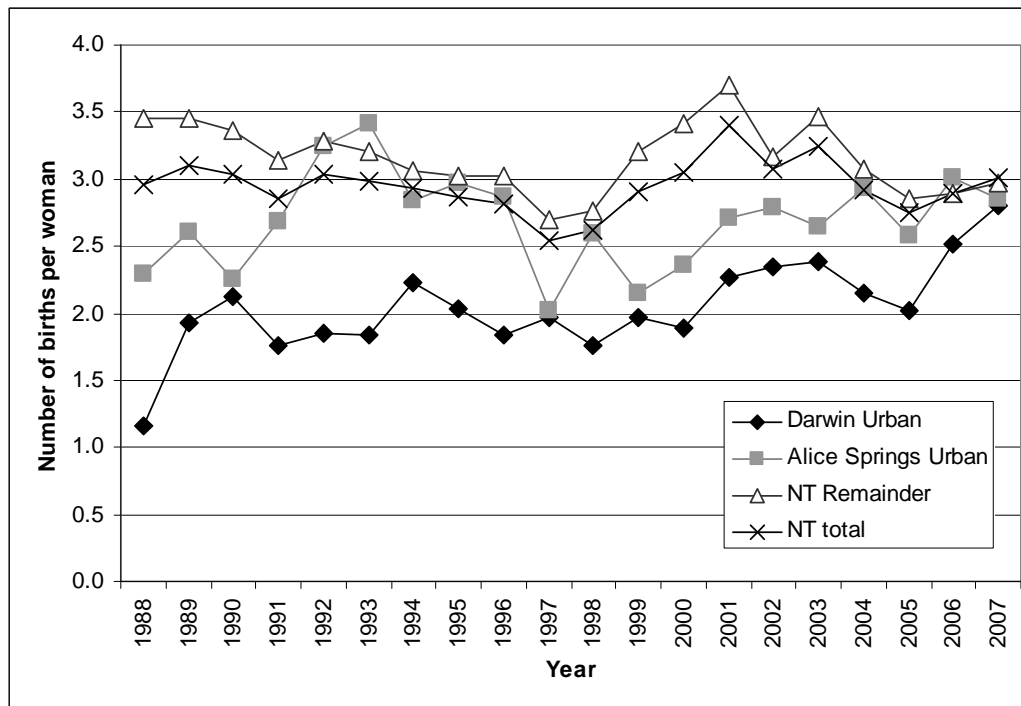
Sources: Author's calculations using customised tables from the NT Department of Health and Families and the Australian Bureau of Statistics.

While on average 75 per cent of urban births are to Indigenous women usually resident in Darwin or Alice Springs, the higher urban fertility shown in Figure 5.5 is influenced by births to women from Nhulunbuy, Katherine or Tennant Creek. When vital registration data are used to examine trends for Darwin Urban, Alice Springs Urban and the



remainder of the Northern Territory (Figure 5.6), Darwin Urban has the lowest TFR throughout the 1988-2007 period compared to the other regions. Alice Springs Urban also has lower fertility than the rest of the Northern Territory (NT Remainder) outside the two largest centres, except in 1993 and 2006. In relation to urbanisation and fertility, it appears that size does matter. Centres with larger populations do have lower overall fertility, at least when measured using vital registration data.

**Figure 5.6: Indigenous total fertility rates, Darwin Urban<sup>(1)</sup>, Alice Springs Urban and NT Remainder usual place of residence, Northern Territory, 1988-2007**



(1) Includes Darwin City, Palmerston City and geographically close communities on the outskirts of Palmerston including Howard Springs, Humpty Doo and McMinns Lagoon.

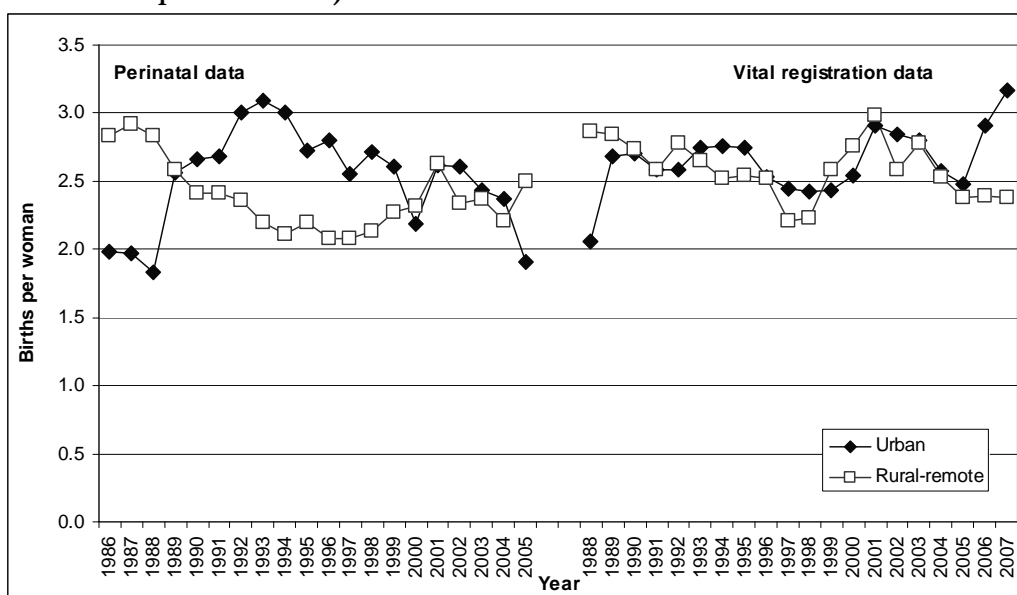
Source: Author's calculations using customised tables from the Australian Bureau of Statistics.

### Migration effects

The apparent convergence over time of total fertility rates between the urban and rural-remote regions, between Darwin Urban, Alice Springs Urban and the remainder of the Northern Territory and between the general fertility rates for the health districts shown in Chapter Three raises questions about the impact of the zero migration assumption in the denominator population. As noted in Chapter Three, migration movements have had a positive net urbanisation effect in the Northern Territory Indigenous population which essentially reduces the urban population size back in time. Fertility rates created

using a denominator that includes a net urbanisation migration assumption show higher fertility in urban areas for much of the 20-year period covered by the perinatal data. Urban fertility during the 1990s and some of the first decade of the 21st century is also shown to be higher for rates derived from the vital registration data (Figure 5.7). This result is hardly surprising given the migration assumption used here creates smaller urban denominator populations and larger rural-remote denominator populations back in time.

**Figure 5.7: Indigenous total fertility rates using population denominator with migration assumption, urban<sup>(1)</sup> and rural-remote<sup>(2)</sup> usual place of residence, Northern Territory, 1986-2007 (vital registration and perinatal data)**



(1) Includes Darwin, Alice Springs, Nhulunbuy, Katherine and Tennant Creek.

(2) Includes all areas outside urban centres listed in (1).

Sources: Author's calculations using customised tables from the NT Department of Health and Families and the Australian Bureau of Statistics.

The question is thus raised whether the fertility rates shown in Figure 5.7, based on a population denominator that includes an internal migration assumption, are more accurate than those that assume zero net migration. Urbanisation within the Northern Territory among the Indigenous population from the 1980s onwards is a reasonable assumption, but there is enough doubt over the accuracy of migration data and of the usual place of residence of mothers as recorded in the births data (both perinatal and vital registration) to cloud a definitive answer one way or another. While the higher urban fertility seen in Figure 5.7 compared to Figure 5.5 points to the possibility that

higher urban fertility may be a real feature of contemporary Indigenous fertility in the Northern Territory, data constraints mean any conclusions must be made cautiously.

### ***Regional variations in age-specific fertility rates***

The issue of higher fertility in urban areas compared to rural-remote areas is more complex when age-specific fertility rates are examined rather than the summary TFR measure. Moreover, the regional differences that emerge are not consistent between the perinatal and vital registration data (Figure 5.8).

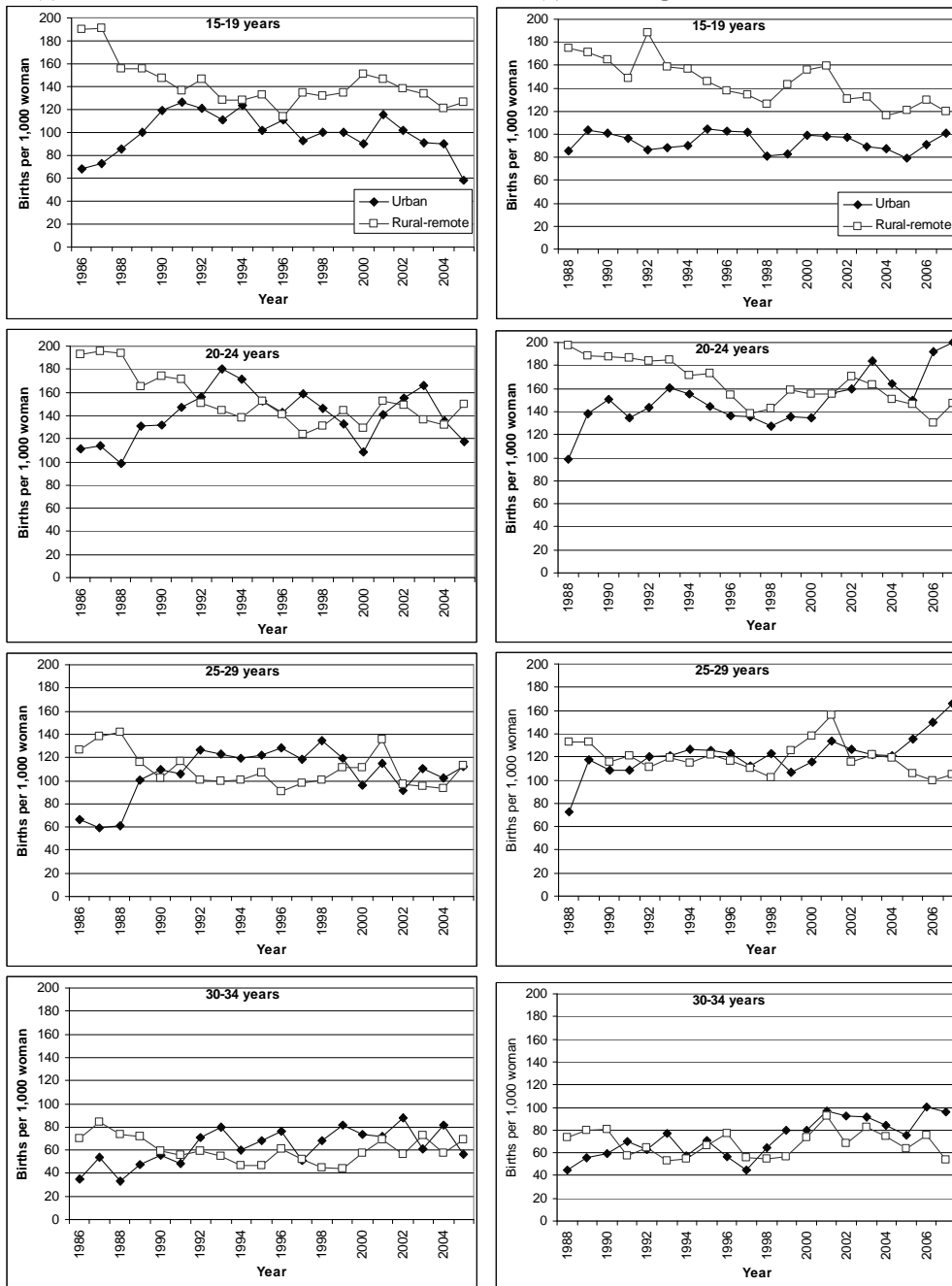
Both data sets show that very young childbearing (under the age of 20 years) is more pronounced in rural-remote areas of the Northern Territory. They also show that fertility declines at the Territory-level appear to be driven by fertility declines among rural-remote Indigenous women. The perinatal data show higher urban fertility most years from the early 1990s onwards for the age groups 20-24, 25-29 and 30-34 years. In contrast, the vital registration data show lower fertility among urban women in the 20-24 years age group until 2003 when the pattern changed to higher fertility. In the older age groups, fertility levels based on vital registration data for urban and rural-remote women were similar until 2005, when urban fertility rates increased notably among women aged 25-29 and 30-34 years. While not shown, the fertility rates for women aged 35-49 years were very low in both data sets. There was no discernable change over the 20-year period covered by each of the data sets, except in 2007 when the vital registration data show a notable increase in fertility rates for this oldest group of mothers.

If higher urban fertility compared to rural-remote fertility is a real feature of contemporary Indigenous demography in the Northern Territory, then it is predominantly because of births taking place to mothers aged in their 20s. Given the data constraints identified in Chapter Three, the possibility of births to women aged in their 20s being better recorded than births to older mothers must also be acknowledged. There is no way to determine if this is the case but none of the investigation of data collection processes for this research indicated differences by age for the capture of information about births. There may also be age misreporting affecting these results, although evidence of this is impossible to ascertain from the data.

**Figure 5.8: Indigenous age-specific fertility rates, urban<sup>(1)</sup> and rural-remote<sup>(2)</sup> place of usual residence, 1986-2007 (vital registration and perinatal data)**

5.8(a): Perinatal data

5.8(b): Vital registration data



(1) Includes Darwin, Alice Springs, Nhulunby, Katherine and Tennant Creek.

(2) Includes all areas outside urban centres listed in (1).

Source: Author's calculations based on customised tables from the NT Department of Health and Families and the Australian Bureau of Statistics.

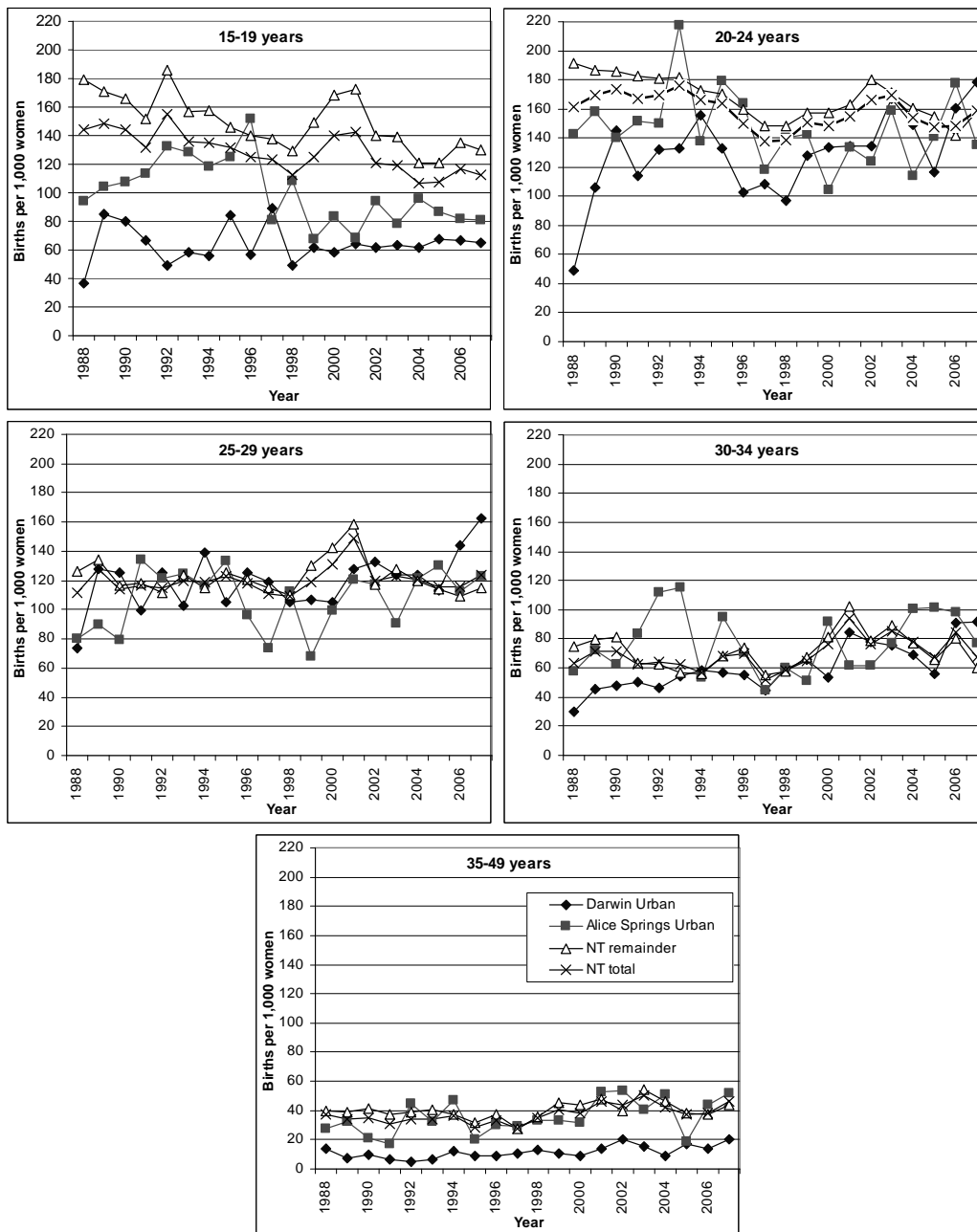
When looking at fertility rates by age it is clear that teenage childbearing is a characteristic of rural and remote Indigenous mothers. Both data sets show the same

pattern. Fertility at the youngest ages is consistently higher in rural-remote areas compared to urban areas as measured by both data sets. Indigenous women aged 20-24 years have higher fertility than women of any other age group in both urban and rural-remote areas of the Northern Territory. In urban areas, the next highest rates are for women aged 25-29 years, followed by women aged 15-19 years. The reverse is true for rural-remote areas, with the second highest fertility rates being among women aged 15-19 years, followed by women aged 25-29 years. What is also demonstrated here is that age-specific fertility patterns among Indigenous women for the Northern Territory as a whole reflect fertility trends outside of Darwin and Alice Springs.

When vital registration data for Darwin Urban and Alice Springs Urban are looked at separately then a more expected pattern of lower urban fertility emerges (Figure 5.9). This is not consistent for the whole period 1988-2007, nor is it consistent across age groups. In the 25-29 year age group in particular, the fertility rates are remarkably similar across regions. The largest geographic differences are at the youngest ages, with both Alice Springs Urban and Darwin Urban having lower fertility rates among women aged 15-19 years compared to the rest of the Northern Territory, particularly during the late 1990s and early 2000s for Alice Springs. The vital registration data show that the rise in the TFR for Darwin Urban in 2006 and 2007 was because of increases in age-specific fertility among Indigenous women aged 20-34 years.

While there are differences in fertility levels and the age of childbearing in between the Northern Territory's two largest centres and the rest of the Northern Territory, there have been moves to delayed childbearing across all regions (Figure 5.10). For Alice Springs Urban and the NT Remainder there has been a steady, though fluctuating, increase in the proportion of births born to women aged 25 years and over. For Darwin Urban the apparent increase in delayed childbearing from 1990 has been a fluctuating return to the proportion of women having children over the age of 25 years, first seen in 1988, and again in 1998, 2001, 2002 and 2007. While there are indications of increasingly delayed childbearing in all regions of the Northern Territory, it is a much more common phenomenon in Darwin and more recently in Alice Springs.

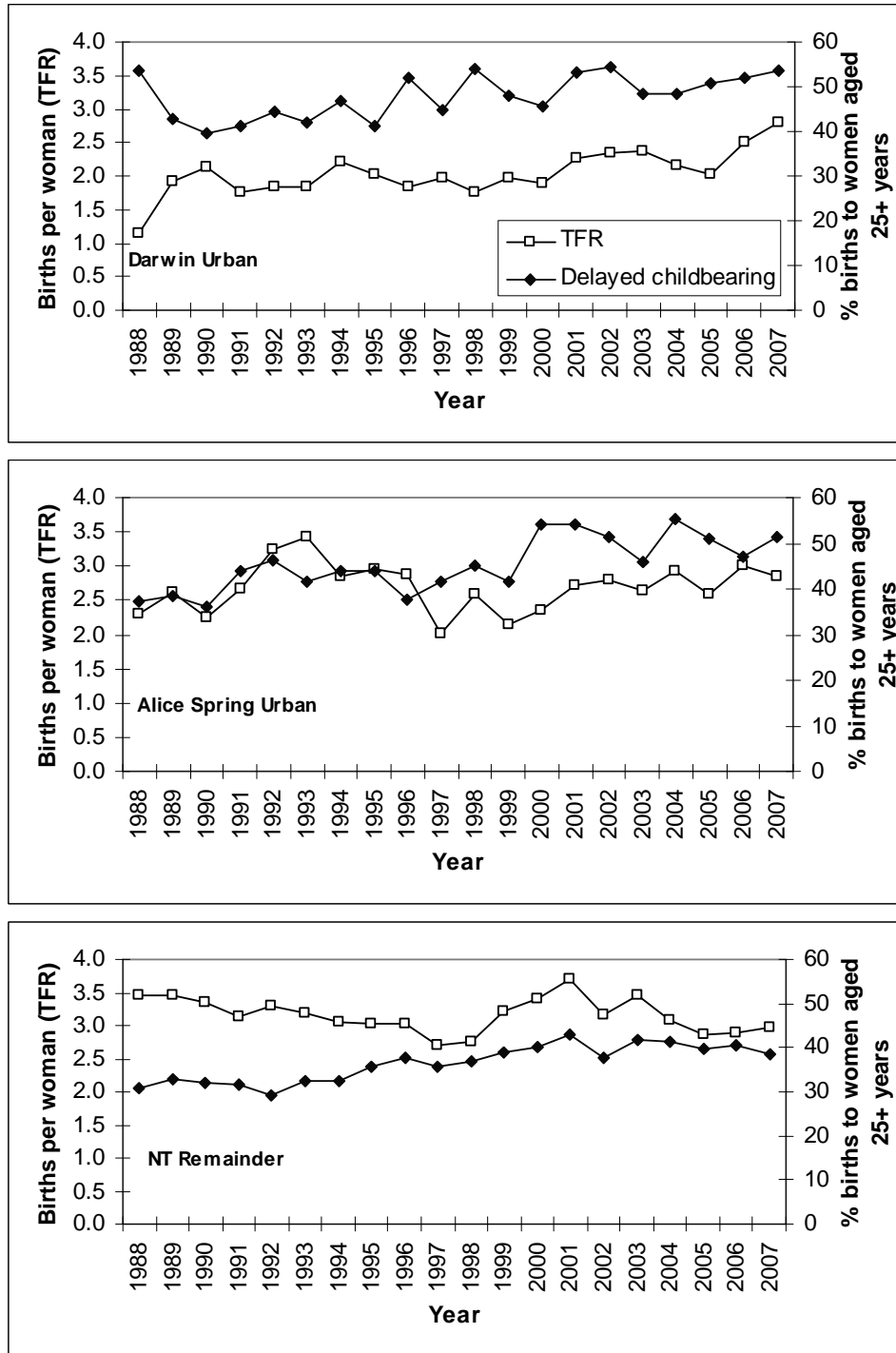
**Figure 5.9: Northern Territory Indigenous age-specific fertility rates, Darwin Urban<sup>(1)</sup>, Alice Springs Urban and NT Remainder usual place of residence, 1988-2007**



(1) Includes Darwin City, Palmerston City and geographically close communities on the outskirts of Palmerston including Howard Springs, Humpty Doo and McMinns Lagoon.

Source: Author's calculations using customised tables from the Australian Bureau of Statistics.

Figure 5.10: Indigenous fertility rates and delayed childbearing, Darwin Urban, Alice Springs Urban and NT Remainder usual place of residence, 1988-2007



Delayed childbearing = proportion of births born to women aged 25 years and older.

Source: Author's calculations using customised tables from the Australian Bureau of Statistics.

This measure of delayed childbearing, however, hides sub-regional changes among Indigenous women of different ages. If the fertility rates at the start and end of the

period 1988 to 2007 are looked at (*cf* Pool 2005), a shift to older childbearing is apparent for the Northern Territory as a whole and there are early indications of a shift in Alice Springs Urban. The Northern Territory indications of deferred childbearing are thus a balance of an increase in fertility rates among women in Darwin Urban between 1988 and 2007 and a decline in the NT Remainder region.

**Table 5.2: Indigenous age-specific fertility rates, Darwin Urban<sup>(1)</sup>, Alice Springs Urban and NT Remainder usual place of residence, Northern Territory, 1988 and 2005**

Age group	Rate per 1,000 women		
	1988	2007	Difference
<i>Darwin Urban</i>			
15-19	36.73	65.29	28.56
20-24	48.54	178.79	130.25
25-29	73.39	162.65	89.26
30-34	30.22	91.61	61.39
35-49	14.06	20.56	6.50
<i>Alice Springs Urban</i>			
15-19	94.17	80.77	-13.40
20-24	142.43	135.32	-7.11
25-29	79.94	122.68	42.74
30-34	57.87	76.92	19.05
35-49	27.92	51.64	23.73
<i>NT Remainder</i>			
15-19	179.05	13.36	-48.69
20-24	191.84	157.93	-33.90
25-29	126.09	114.55	-11.54
30-34	74.84	59.97	-14.87
35-49	39.44	43.96	4.51
<i>Northern Territory</i>			
15-19	144.29	112.79	-31.50
20-24	161.10	159.21	-1.89
25-29	111.69	123.95	12.26
30-34	63.18	67.69	4.50
35-49	37.16	46.19	9.03

Source: Author's calculations using customised tables from the Australian Bureau of Statistics.

This pattern of young mothering being characteristic of women living in remote communities was also seen among women interviewed for this research. All of the women interviewed who were past the age of childbearing who had lived most of their lives in remote communities had their children during their teens and early 20s, and their



children had gone on to have children while young. In contrast, women who grew up in Darwin began childbearing during their late 20s and early 30s.

#### Migration effects

As with the TFR, age-specific fertility rates for Indigenous women in the Northern Territory are affected when a population denominator is used that includes a net urbanisation migration assumption (Figure 5.11). The perinatal data show higher urban fertility compared to rural-remote fertility for much of the period for all age groups (except the 35-49 year age group for whom rates are not shown but which were similar throughout the whole period). The vital registration data show higher rural-remote fertility rates for the 15-19 year age group for most of the period 1988-2007, but higher urban fertility at the older age groups (and although not shown with very similar rates in the 35-49 year age group). Again, this indicates that if urban fertility is higher than in rural and remote parts of the Northern Territory it is because of births to Indigenous women aged in their 20s and older.

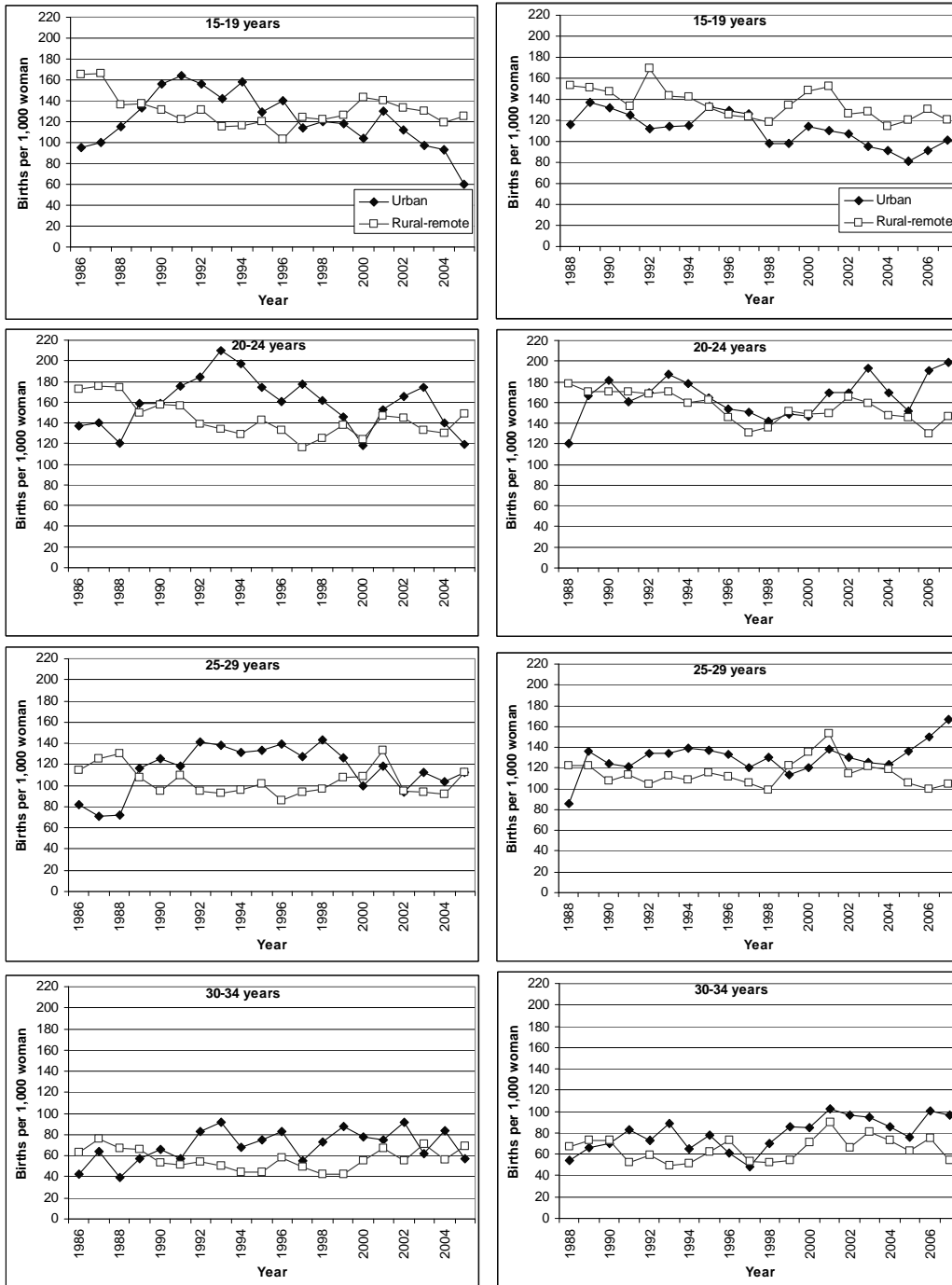
The inclusion of a net urbanisation assumption in the population denominator results in an interesting age shift in terms of highest rates of childbearing among Indigenous women usually resident in urban areas of the Northern Territory. The vital registration data still show the highest fertility as among Indigenous women aged 20-24 years. From 1988 to 1997 the next highest fertility rates are for women aged 15-19 years, followed by women aged 25-29 years. By 1998, the second highest fertility rates were among women aged 25-29 years, followed by women aged 15-19 years. By 2006, the third highest fertility rates for urban Indigenous women were among women aged 30-34 years. The perinatal data show this same shift for the period 1986-2005, but without the final shift to the third highest rates being among the 30-34 year age group.

These results indicate a move to older childbearing among Indigenous women living in urban centres of the Northern Territory that is less evident when a zero migration assumption is used in the population denominator. However, the role of migration in influencing these trends is difficult to determine here, both in relation to its influence on data collection, and in relation to birth outcomes. Women who move to larger urban centres from remote communities can either bring with them similar young childbearing patterns to women in their home community or delay having children. Their movement affects population size, and the number of births for different places. There may also be age misreporting effects that are unable to be explored in this research

**Figure 5.11: Indigenous age-specific fertility rates using population denominator with migration assumption, urban<sup>(1)</sup> and rural-remote<sup>(2)</sup> place of usual residence, Northern Territory, 1986-2007 (vital registration and perinatal data)**

5.11(a): Perinatal data

5.11(b): Vital registration data



(1) Includes Darwin, Alice Springs, Nhulunbuy, Katherine and Tennant Creek.

(2) Includes all areas outside urban centres listed in (1).

Source: Author's calculations based on customised tables from the NT Department of Health and Families and the Australian Bureau of Statistics.

**Regional variation in census data**

While Chapter Four demonstrated that the reported fertility levels in the census are lower than in other data sets and that fertility rates based on these data are unreliable, they do provide an alternative data source to investigate regional fertility patterns. This section focuses on data from the Darwin Urban region, and the urban and rural-remote regions based on inclusion or exclusion from the Northern Territory's five largest centres. For ease of presentation results for the Northern Territory excluding Darwin Urban are not included. Results for this larger region are nearly the same as those for the rural-remote region and it would be repetitious to include both.

Table 5.3 shows the average reported number of children born to Indigenous women in all age groups from 20-24 to 40-44 years. The census data show that Darwin Urban has lower fertility than elsewhere in the Northern Territory. This difference was most marked in 1986, with women in the Darwin Urban region reporting a lower average number of children compared to women across the larger urban category comprising Darwin, Alice Springs, Nhulunbuy, Katherine and Tennant Creek. By 2006, in contrast, this difference had almost disappeared.

**Table 5.3: Average parity reported by Indigenous women aged 20-44 years, Darwin Urban<sup>(1)</sup>, urban<sup>(2)</sup> and rural-remote<sup>(3)</sup> place of usual residence, Northern Territory, 1986, 1996, 2006**

<i>Year</i>	<i>Region</i>	<i>Age group</i>				
		<i>20-24</i>	<i>25-29</i>	<i>30-34</i>	<i>35-39</i>	<i>40-44</i>
<b>1986</b>						
	<b>Darwin Urban</b>	0.48	1.83	2.29	2.79	2.92
	<b>Urban</b>	0.54	1.87	2.44	2.89	2.97
	<b>Rural-remote</b>	0.72	2.00	2.52	2.74	2.67
<b>1996</b>						
	<b>Darwin Urban</b>	0.44	1.69	2.11	2.21	2.17
	<b>Urban</b>	0.91	1.77	2.19	2.56	2.61
	<b>Rural-remote</b>	1.09	1.81	2.34	2.64	2.91
<b>2006</b>						
	<b>Darwin Urban</b>	0.33	1.32	1.78	1.90	2.06
	<b>Urban</b>	0.38	1.38	1.78	2.12	2.13
	<b>Rural-remote</b>	0.60	1.58	1.90	2.18	2.27

(1) Includes Darwin City, Palmerston City and geographically close communities on the outskirts of Palmerston including Howard Springs, Humpty Doo and McMinns Lagoon.

(2) Includes Darwin, Alice Springs, Nhulunbuy, Katherine and Tennant Creek. Also includes undefined Darwin and no usual address.

(3) Includes all areas outside urban centres listed in (1).

Source: Author's calculations using customised tables from the Australian Bureau of Statistics.

Of note is that in only three instances is the reported average parity higher among urban women compared to rural-remote women (urban women aged 35-39 and 40-44 in 1986 and Darwin Urban women aged 15-19 in 1996). Children ever-born data from the census do not therefore support the finding of higher urban fertility. However, when the estimated resident population (ERP) based on the 2006 census are used to calculate child-women ratios by Darwin Urban, Alice Springs Urban and NT Remainder higher urban fertility is clearly suggested by the results (Table 5.4). The impact of migration by women with young children to towns is an important factor that must be considered here. Clearly, the issues of undercount and accuracy of reporting mean any conclusion based on the census must be somewhat speculative and this result merely reiterates the data caveats that surround any investigation of Indigenous fertility in the Northern Territory.

**Table 5.4: Indigenous child-women ratios<sup>(1)</sup>, Darwin Urban<sup>(2)</sup>, Alice Springs Urban and NT Remainder place of usual residence, Northern Territory, 2006**

<b>Region</b>	<b>Child-women ratio</b>
Darwin Urban	0.504
Alice Springs Urban	0.482
NT Remainder	0.470
NT Total	0.477

(1) All children aged 0-4 years / Women aged 15-44 years

(2) Includes Darwin City, Palmerston City and geographically close communities on the outskirts of Palmerston including Howard Springs, Humpty Doo and McMinns Lagoon.

Source: Author's calculations using customised tables from the Australian Bureau of Statistics.

If average parity at ages 40-44 years is taken as an indicator of completed lifetime fertility then declines in fertility can be seen across all regions within the Northern Territory (Table 5.3). This does not support increases seen in some fertility rates in urban areas across the 20-year periods outlined in the previous sections.

The Gray indices (Table 5.5) provide another view of regional fertility patterns. At each successive census year when data were collected, the Childlessness Index is higher in all regions. The most notable increase in the Childlessness Index was in the Darwin Urban region, from 126 to 198 (with anything over 100 showing a greater propensity to have no children compared to the standard population). In contrast, the Index of Maternal Fertility showed little change over time, but it too showed small increases from 1986 to 2006 for Darwin Urban and the rural-remote region. In each census, childlessness was

greater in urban areas than in rural-remote areas. Geographic differences for the intensity of childbearing were less marked. In 2006, Darwin Urban had an Index of Maternal Fertility that was slightly higher than the rural-remote region, and also higher than the larger urban region. The slight increases in the Index of Maternal Fertility alongside the marked increases in the Childlessness Index point to a deferment of childbearing among Indigenous women aged 15-34 years who live in one of the Northern Territory's five main service centres, and particularly in and around Darwin.

**Table 5.5: Reported children ever born by NT Indigenous women aged 15-34 years, Darwin Urban<sup>(1)</sup>, urban<sup>(2)</sup> and rural-remote<sup>(3)</sup> place of usual residence, 1986, 1996, 2006**

<i>Year</i>	<b>No children</b>		<b>Mothers</b>			
	<b>Usual residence</b>	<b>Number</b>	<b>Index<sup>(4)</sup></b>	<b>Number</b>	<b>Children</b>	<b>Index<sup>(5)</sup></b>
<b>1986</b>						
	<b>Darwin Urban</b>	402	126	780	1318	95
	<b>Urban</b>	713	119	1513	2626	96
	<b>Rural-remote</b>	1226	92	3709	6607	102
<b>1996</b>						
	<b>Darwin Urban</b>	580	136	863	1623	99
	<b>Urban</b>	1056	123	1810	3480	99
	<b>Rural-remote</b>	1447	90	4728	8580	100
<b>2006</b>						
	<b>Darwin Urban</b>	338	198	249	1526	107
	<b>Urban</b>	1232	121	2108	3182	95
	<b>Rural-remote</b>	2031	92	5064	7943	105

(1) Includes Darwin City, Palmerston City and geographically close communities on the outskirts of Palmerston including Howard Springs, Humpty Doo and McMinns Lagoon.

(2) Includes Darwin, Alice Springs, Nhulunbuy, Katherine and Tennant Creek. Also includes undefined Darwin and no usual address.

(3) Includes all areas outside urban centres listed in (2).

(4) Childlessness Index: indirectly age-standardized index of number of women with no children against expected number.

(5) Index of Maternal Fertility: indirectly age-standardized index of average number of children ever born by mothers against expected number.

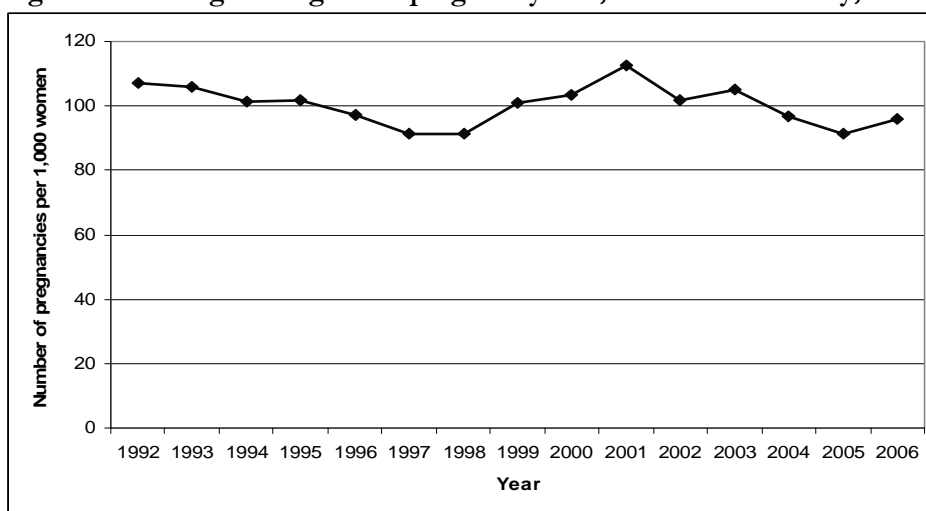
Source: Author's calculations using customised tables from the Australian Bureau of Statistics.

### **5.3: The impact of induced abortion**

Induced abortion data allow investigation of the role access to medical intervention has played in fertility outcomes among Indigenous women in the Northern Territory. Combining induced abortion, stillbirth and fertility data provides a proxy general

pregnancy rate.<sup>71</sup> From 1992 to 2006, there was an overall decline in the pregnancy rate of Indigenous women aged 15-49 years in the Northern Territory (Figure 5.12), with a spike in pregnancies in 2001. This overall decline has been led by a decline in the general fertility rate, because over this period the general abortion rate has increased. While the increase in the abortion rate is less than the decline in the fertility rate, some of the fertility decline among Indigenous women in the Northern Territory is because of women accessing abortion services.

**Figure 5.12: Indigenous general pregnancy rate, Northern Territory, 1992-2006**



Source: Author’s calculations using customised tables from the NT Department of Health and Families, the Australian Bureau of Statistics, and data from Zhang and Johnstone (2009), *Northern Territory Midwives’ Collection, Mothers and Babies 2005*. .

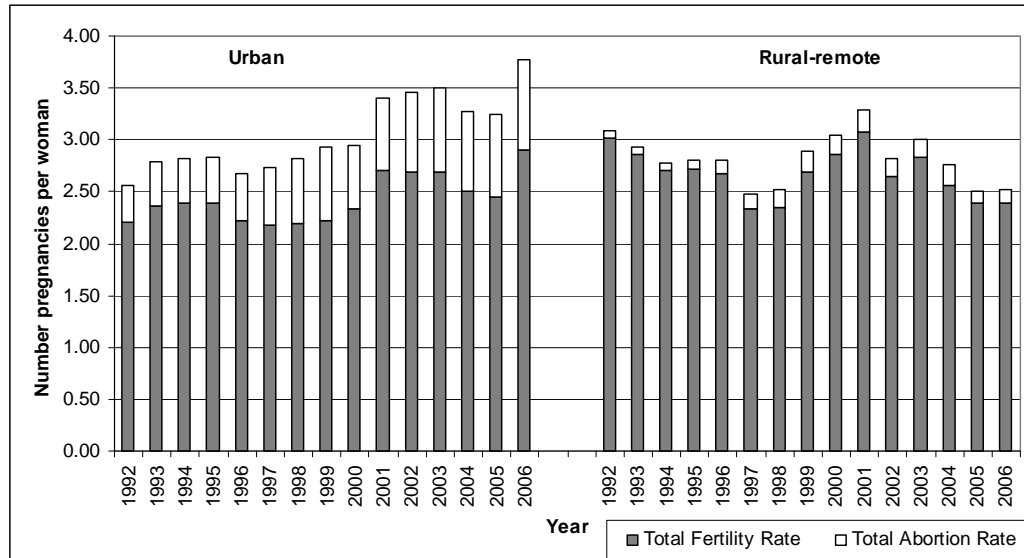
When a total pregnancy rate based on live births and induced abortion data is calculated,<sup>72</sup> three things are apparent (Figure 5.13). First, induced abortion is largely used to control fertility by women living in urban areas of the Northern Territory. Undoubtedly, this is largely comprised of women living in Darwin and Alice Springs, the only two towns to provide abortion services.<sup>73</sup> Second, induced abortion has increased in both urban and rural-remote parts of the Northern Territory, albeit to much lower levels outside the urban centres. Third, since 1997 urban total pregnancy rates have been higher than rural-remote total pregnancy rates (except in the year 2000).

<sup>71</sup> Excluded are spontaneous abortions, more commonly called miscarriages. Fertility data in this measure are based on vital registrations.

<sup>72</sup> Stillbirth data are not included as they are unavailable by age of mother.

<sup>73</sup> Informal conversations with staff who have worked at other hospitals in the Northern Territory indicated that if doctors and anaesthetists were available who were willing to perform terminations of pregnancy then the procedure was carried out at these other hospitals. No public records of these have been found, however, and the assumption that most of terminations recorded for women living in the urban region are for women living in Darwin and Alice Springs is maintained for the analysis.

**Figure 5.13: Indigenous total pregnancy rates, urban<sup>(1)</sup> and rural-remote<sup>(2)</sup> usual place of residence, Northern Territory, 1992-2006**



(1) Includes Darwin, Alice Springs, Nhulunbuy, Katherine and Tennant Creek. Also includes undefined Darwin and no usual address.

(2) Includes all areas outside urban centres listed in (1).

Source: Author's calculations using customised tables from the NT Department of Health and Families and the Australian Bureau of Statistics

Once again, the data appear to indicate that higher urban fertility compared to rural-remote fertility among Indigenous women living in the Northern Territory is a real possibility. Certainly, the abortion rates (abortions per 1,000 women) and abortion ratios (abortions per 1,000 live births) for Indigenous women are much higher in urban centres of the Northern Territory compared to rural-remote areas (Figure 5.14). These results, alongside the pregnancy rates, point to higher rates of conception for Indigenous women in urban parts of the Northern Territory.

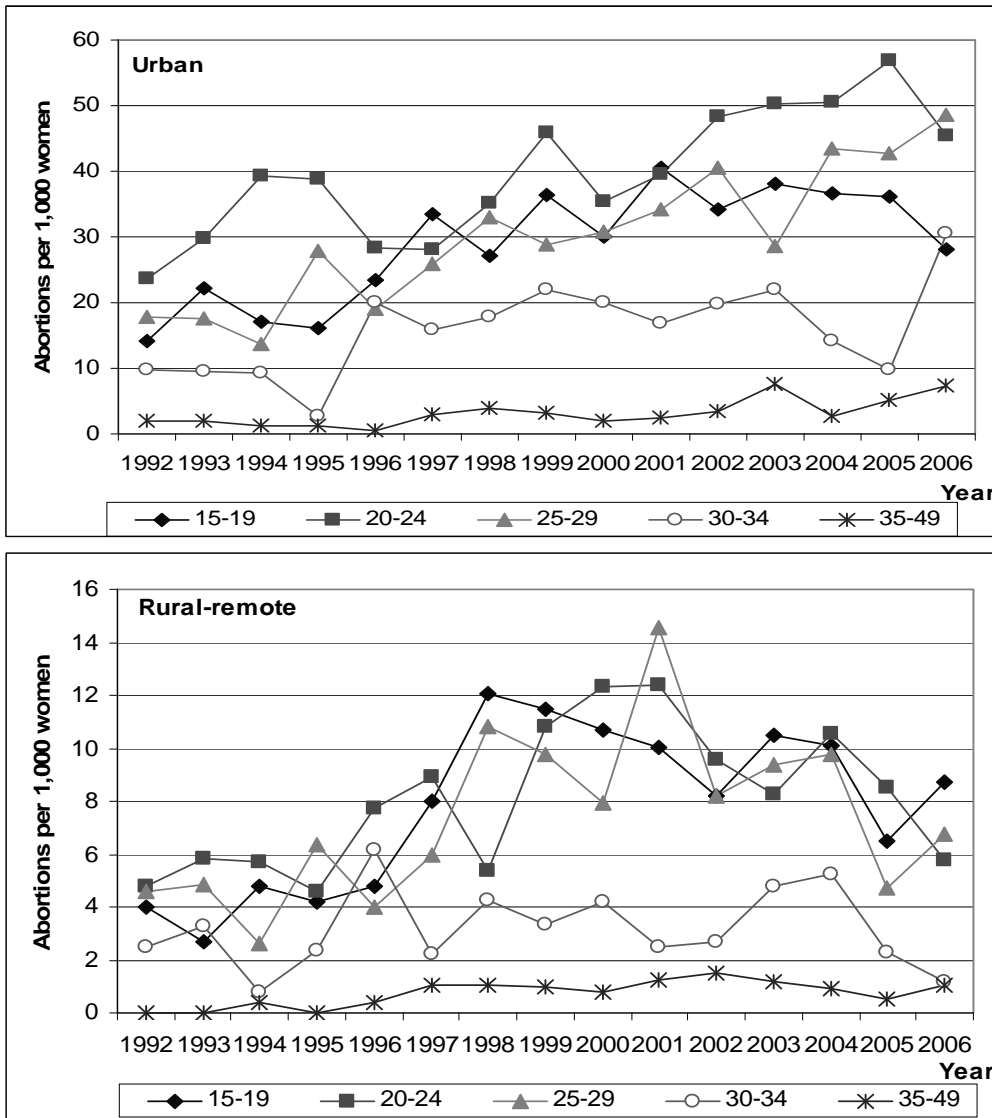
There is another interesting geographic difference between the abortion rates and ratios of Indigenous women living in urban and rural-remote parts of the Northern Territory. Despite fluctuations, the urban rates and ratios show a general pattern of increase from 1992 to 2006. The rates and ratios for Indigenous women living in rural-remote parts of the Northern Territory, however, appear to have declined from the turn of the 21st century after a period of increase in the preceding decade.

Anecdotally, medical staff working in the Northern Territory report that there has been a large increase in demand for Implanon in remote communities during recent years

(Desley Williams and Dr Christine Connors, personal communication). Female school teachers in the Northern Territory talk about young Indigenous girls from remote communities feeling their arms to see if they have Implanon inserted (Cris Edmonds-Wathen, personal communication). It has also been noted that among some young Indigenous women who are under the age of 20, contraception (and Implanon in particular) is often sought after a first birth at a young age (Dr Gurmeet Singh, personal communication). Access to contraception could thus be affecting the abortion rates and the declining fertility rates in rural-remote regions of the Northern Territory, but not in urban settings.

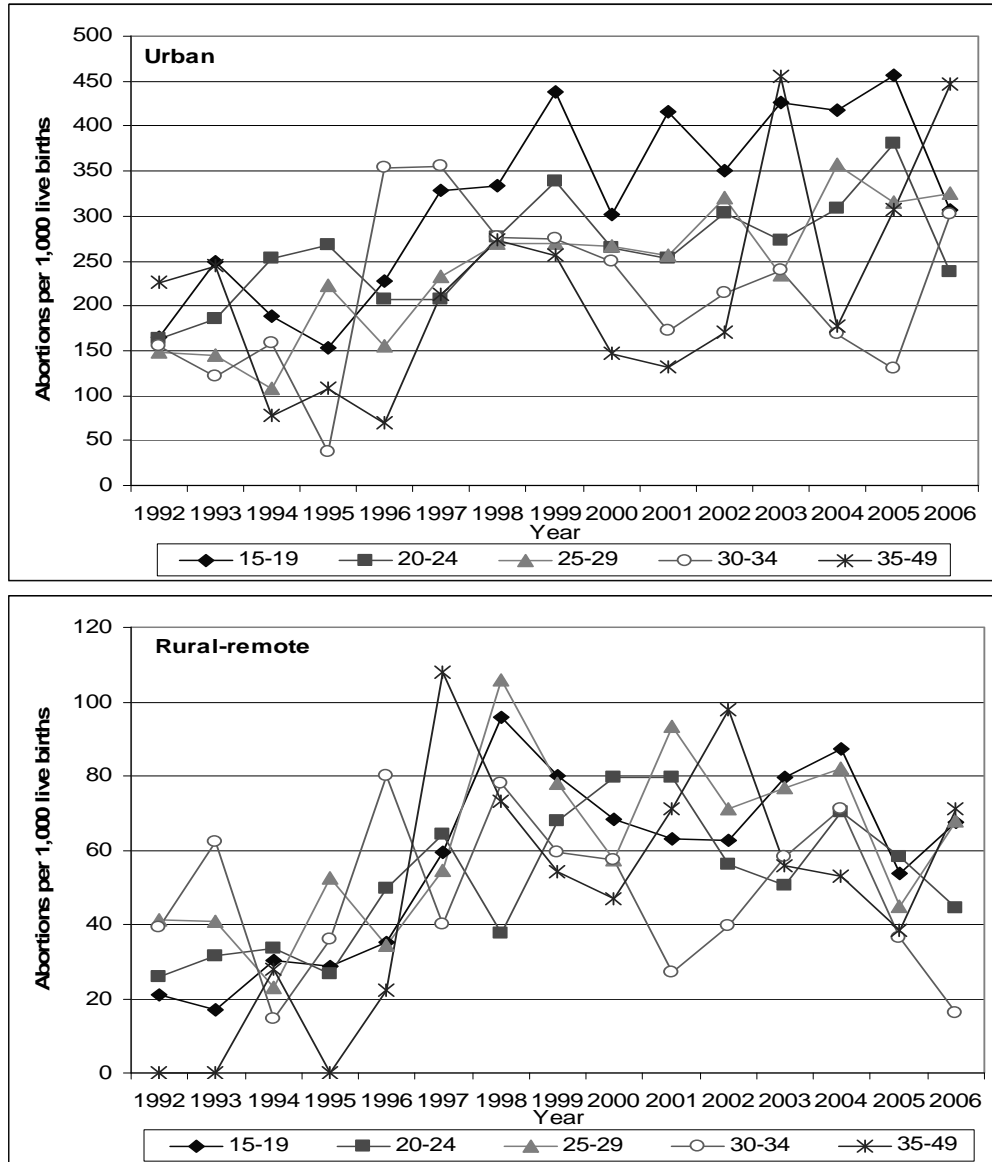
**Figure 5.14: Northern Territory Indigenous abortion rates and ratios, urban<sup>(1)</sup> and rural-remote<sup>(2)</sup> usual place of residence, 1992-2006**

5.14(a) *Abortion Rates*





5.14(b) *Abortion Ratios*



(1) Includes Darwin, Alice Springs, Nhulunbuy, Katherine and Tennant Creek. Also includes undefined Darwin and no usual address.

(2) Includes all areas outside urban centres listed in (1).

Source: Author’s calculations using customised tables from the NT Department of Health and Families.

The abortion data for urban Indigenous women living in the Northern Territory also show interesting age differences. At a population level during 1992-2006, 20-24 year old Indigenous urban women were more likely to have an abortion compared to women of other age groups. Indigenous women aged 15-19 and 25-29 years had the next highest rates followed by the 30-34 years age group and with the lowest rates in the 35-49 year age group. These patterns follow those for fertility rates. Abortion ratios for urban Indigenous women, however, show that from 1998 the ratio of induced abortions to live

births was highest for women aged 15-19 years, except in 2003 and 2006 when the highest ratio was for women aged 35-39 years. Very young urban Indigenous women then are most likely to use abortion services if they become pregnant. These differences by age are less clear for rural-remote Indigenous women, although the abortion rates show that women under the age of 30 years are more likely to have an abortion than women in their 30s and older, with abortion rates notably lower for the oldest age groups.

#### **5.4: Geography and socio-economic interactions**

As outlined in Chapter Two, women's employment and education are two key factors linked to fertility outcomes that can be operationalised for this research. They are investigated here, fully cognisant of their limitation in fully explaining their influence on fertility (*cf* Riedman 1993). Using census data to create the Gray indices of fertility tempo and fertility intensity, it is evident that paid employment and education influence fertility outcomes. Among Indigenous women in the Northern Territory, having a job is associated with a higher level of childlessness and a higher intensity of childbearing, as is staying at school until 16 years or older or obtaining post-school qualifications (Table 5.6).

These results reiterate Gray's (1989a) findings based on 1981 and 1986 census data. When changes over time are looked at there is an apparent increase in childlessness, indicating delayed entry to childbearing among Indigenous women aged 15-34 years, regardless of employment or education status. There have also been increases in the intensity of childbearing by women who reported having had children, again for all women regardless of education or employment levels. The increase in the Index of Maternal Fertility in 2006 for the age women left school may reflect the change in census question from 1986 and 1996 to 2006. For 2006, completion of Years 10-12 or equivalent is used as a proxy for leaving school aged 16 years or older, but it is possible it also includes women who returned to school as adult students (Howard 2002).

Any time series analyses based on census data are naturally subject to limitations because of changed undercount, non-response and misreporting over time. Despite such a caveat, these results do indicate that post-school qualifications and having a paid job are important correlates of delayed childbearing and having fewer children compared to women with no tertiary qualifications or who are not in paid employment.

**Table 5.6: Reported children ever born by Indigenous women aged 15-34 years, education and employment status, Northern Territory, 1986, 1996, 2006**

<i>Year</i>	No children		Mothers			
	Education/employment	Number	Index <sup>(1)</sup>	Number	Children	Index <sup>(2)</sup>
<b>Age left school<sup>(3)</sup></b>						
<i>1986</i>						
	16 years and over <sup>(4)</sup>	1054	122	2038	3684	104
	Under 16 years	503	93	1516	3112	117
<i>1996</i>						
	16 years and over <sup>(4)</sup>	1811	122	3045	6281	110
	Under 16 years	822	90	2275	4785	113
<i>2006</i>						
	16 years and over <sup>(5)</sup>	1547	133	2296	4593	124
	Under 16 years <sup>(6)</sup>	1308	100	2921	5577	126
<b>Post-school qualifications</b>						
<i>1986</i>						
	Post-school qual	57	142	122	248	97
	No post-school qual's	1550	110	3637	7138	111
<i>1996</i>						
	Post-school qual	120	150	215	449	97
	No post-school qual's	2552	109	5175	10873	113
<i>2006</i>						
	Post-school qual	354	151	542	1145	119
	No post-school qual's	2653	114	4735	9032	125
<b>Paid employment status<sup>(7)</sup></b>						
<i>1986</i>						
	Paid employment <sup>(8)</sup>	544	148	951	1852	97
	No paid employment <sup>(9)</sup>	1286	97	3545	6925	113
<i>1996</i>						
	Paid employment <sup>(8)</sup>	897	130	1706	3650	107
	No paid employment <sup>(9)</sup>	1884	100	4077	8212	111
<i>2006</i>						
	Paid employment <sup>(8)</sup>	1086	146	1508	2956	116
	No paid employment <sup>(9)</sup>	2079	107	4052	7765	127

(1) Childlessness Index (see Chapter Four).

(2) Index of Maternal Fertility (see Chapter Four).

(3) Excludes age left school not stated and those who did not go to school.

(4) Includes those still at school.

(5) Women who had completed Years 10-12 or equivalent.

(6) Women who had completed Year 9 or below, or equivalent.

(7) Excludes labour force status not stated. Totals are therefore different to age left school.

(8) Includes part-time and full-time employment.

(9) Includes women unemployed and not in the labour force.

Source: Author's calculations based on customised tables from the Australian Bureau of Statistics.

A Darwin mother interviewed for this research who has two daughters aged in their 20s observed:

*“I think that I’m probably surprised that there’s only, I think, one girl, maybe in their peer group that’s had a baby. For the most part ... they’re all stepping out into finding their ways in their career, study, whatever, and none of them seems interested in having children. Whereas, I notice with my niece, who is a bit older than them ... a lot of her friends, and she herself, were all getting pregnant. But I wonder about whether or not that’s ... because I pushed them to consider career, financial independence, education, ‘cos my sister didn’t really do that with her girls and I notice with my niece, she didn’t finish school, she was allowed to have a boyfriend ... she was pregnant at 17 and had a baby at 18 ... I wonder if that’s because if they don’t have a goal or a dream for themselves, they see this as an easy way out”.*

This pattern of greater intensity of childbearing among women who left school at young ages, and among those who are not in paid employment is, for the most part, seen throughout urban and rural-remote parts of the Northern Territory Table 5.7).<sup>74</sup> Education and employment have a much greater impact on the tempo of entry to childbearing (Childlessness Index) than on the intensity of childbearing (Index of Maternal Fertility) in urban and rural-remote settings. Differences in fertility due to employment have been considerably more pronounced in urban than in rural-remote areas since 1986, particularly for the Darwin Urban area. Differences due to education, in contrast, have become less pronounced by 2006 in urban relative to rural-remote areas, although as already noted this may reflect the change in census question from age of leaving school to highest year of school completed.

Based on children-ever born census data from the 1980s Gray (1989a:24) concluded that, “[g]eographic differentials, while they exist, are not as strong as differentials associated with age of leaving school, labour force status and family income”. These results imply that geographic differences do play a role. Employment and, to a smaller extent, education are less likely to be correlated with lower fertility in rural-remote areas of the Northern Territory compared to urban centres, a finding congruent with the fertility experience of Indigenous populations in the United States (Snipp 1996).

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<sup>74</sup> Post-school qualification data are not looked at by region because of the small number of Indigenous women with post-school qualifications, particularly when disaggregated below the Northern Territory as a whole.

**Table 5.7: Gray indices for Northern Territory Indigenous women aged 15-34 years, place of usual residence, employment and education status, 1986, 1996, 2006**

		No children <sup>(4)</sup>		Mothers <sup>(5)</sup>	
Year	Usual residence	Paid Employment Status			
		Employed <sup>(6)</sup>	Not employed <sup>(7)</sup>	Employed <sup>(6)</sup>	Not employed <sup>(7)</sup>
1986	Darwin Urban <sup>(1)</sup>	177	115	82	109
	Urban <sup>(2)</sup>	162	111	86	111
	Rural-remote <sup>(3)</sup>	137	92	105	114
1996	Darwin Urban <sup>(1)</sup>	168	133	91	114
	Urban <sup>(1)</sup>	164	117	95	115
	Rural-remote <sup>(2)</sup>	111	92	112	109
2006	Darwin Urban <sup>(1)</sup>	198	128	107	133
	Urban <sup>(1)</sup>	185	121	110	132
	Rural-remote <sup>(2)</sup>	119	101	119	126
Year	Usual residence	Age Left School			
		16+ years <sup>(8)</sup>	<16 years	16+ years <sup>(8)</sup>	<16 years
1986	Darwin Urban <sup>(1)</sup>	151	98	99	105
	Urban <sup>(1)</sup>	144	90	97	107
	Rural-remote <sup>(2)</sup>	95	94	86	77
1996	Darwin Urban <sup>(1)</sup>	162	96	104	121
	Urban <sup>(1)</sup>	148	98	108	116
	Rural-remote <sup>(2)</sup>	107	87	111	112
2006 <sup>(9)</sup>	Darwin Urban <sup>(1)</sup>	164	130	124	122
	Urban <sup>(1)</sup>	155	130	124	134
	Rural-remote <sup>(2)</sup>	114	94	125	124

- (1) Includes Darwin City, Palmerston City and geographically close communities on the outskirts of Palmerston including Howard Springs, Humpty Doo and McMinns Lagoon.
- (2) Includes Darwin, Alice Springs, Nhulunbuy, Katherine and Tennant Creek.
- (3) Includes all areas outside urban centres listed in (2).
- (4) Childlessness Index: indirectly age-standardized index of number of women with no children against expected number.
- (5) Index of Maternal Fertility: indirectly age-standardized index of average number of children ever born by mothers against expected number.
- (6) Includes part-time and full-time employment.
- (7) Includes women unemployed and not in the labour force.
- (8) Includes those still at school.
- (9) Left school at ages 16+ years measured by those who completed Years 10-12 or equivalent.

Source: Author's calculations based on customised tables from the Australian Bureau of Statistics.

## 5.5: Discussion

Childbearing among Indigenous women in the Northern Territory is overwhelmingly young, a characteristic indicated by all of the available data. While there are some indications of declining fertility below the age of 25 years in rural and remote regions of the Northern Territory, fertility at young ages remains high. The very young childbearing is such an important feature of Northern Territory Indigenous fertility that it is explored in more detail in Chapter Seven.

This chapter has also highlighted the importance of taking Northern Territory regional differences into account, although the practicalities of achieving this are by no means straightforward because of the small population size and data constraints. Territory-wide Indigenous fertility trends are clearly driven by rural and remote events, but Darwin is sufficiently different from the other main service centres in the Northern Territory to warrant separate consideration. This is done in the next Chapter, exploiting the DRUID Study women's health sample to explore fertility outcomes and socio-economic correlates.

While regional differences are important, they are also complicated. This Chapter has raised the possibility of higher urban fertility than rural-remote fertility among Indigenous women living in the Northern Territory. Such a claim is counter to previous analyses (Gray 1989) and the fertility experience of other populations, Indigenous or otherwise (Pool 1991, Snipp 1996). The results presented here do not provide definitive evidence of higher rural-remote fertility. They do show that very young childbearing is a more common feature of rural and remote populations compared to their urban counterparts, which may have implications for higher lifetime fertility associated with earlier age at first birth. In Darwin, the Northern Territory's largest urban centre, the vital registration data point to lower fertility than elsewhere in the Territory. But even here, there are indicators that this may be changing. Fertility rates in the 20-34 year age groups in 2007 were highest in Darwin Urban as measured by vital registration data; child-women ratios based on census data in 2006 were highest in Darwin Urban as was the Index of Maternal Fertility.

Further complicating the geographic variations found within these flawed data are the influences of education and employment on fertility outcomes. The census data indicate that education and employment have some influence on Indigenous women's

childbearing patterns; however, they only account for some of the variation as there have been changes in the Childlessness Index and the Index of Maternal Fertility among women both unemployed and who left school under the age of 16 years.

So while geography matters and urban/rural-remote differentials are in evidence, there is not a consistent trend across all data sources. Geographic differences observed are clearly influenced by definitions of urban in the Northern Territory, in particular the large urban grouping of the Northern Territory's five main service centres. When results for this large urban region are excluded, the results are more likely to show fertility as being highest outside of Darwin Urban. This is by no means consistent, however, for results based on the census (child-women ratios and the Index of Maternal Fertility). Moreover, in 2007, the vital registration data showed fertility to be highest in the 20-34 year age group in the Darwin Urban Region. This highlights the importance of a long-term view of fertility change, as the higher rate in 2007 could be one of the many fluctuations seen throughout the 20-year period for which data are available. It could reflect in-migration to Darwin by women of child-bearing age following the Northern Territory Emergency Response (see Chapter Two). It could also reflect the difficulty of accurately capturing usual place of residence. Given the well-documented difficulties involved in capturing census data from the Indigenous population, in particular usual place of residence (Martin et al. 2002, Morphy 2007b), the observation that Indigenous women living in the Darwin Urban region have lower fertility than elsewhere in the Northern Territory should be treated with caution. It is also true that standard data sources make measuring differences at the sub-regional level very difficult.

More certain is an urban/rural-remote difference in the very young age that Indigenous women become mothers. Given the data constraints, these results should not be seen as an urban/rural dichotomy of two different spheres but as opposite ends of a conceptual continuum with people and communities falling in between the two extremes (Lang 1986, in Hugo 2007:347). This continued young entry to childbearing is indicative of delayed demographic transition, if a movement to older mothering is assumed to be a natural outcome of the fertility declines of the 1960s and 1970s. Some of the factors influencing fertility outcomes are explored in more detail for the Darwin Urban Region in the next chapter.





## CHAPTER SIX:

### A PROFILE OF INDIGENOUS FERTILITY IN DARWIN

#### 6.1: Fertility patterns in Darwin

Darwin is the Northern Territory's largest urban centre and has the Northern Territory's largest Indigenous population. As shown in Chapter Five, the fertility profile of Indigenous women in Darwin and its surrounds is different from the rest of the Northern Territory. It appears the Northern Territory capital and its close neighbour Palmerston have lower fertility levels among Indigenous women but that this does not necessarily hold true for women who are not in paid employment or who left school early. Fertility rates also appear to be increasing in the Darwin Urban region, a counter-trend to patterns seen elsewhere in the Northern Territory. This Chapter uses data from the DRUID Study women's health sample (detailed in Chapter Four) to investigate Indigenous women's fertility outcomes in the Darwin region and the factors that influence those outcomes.

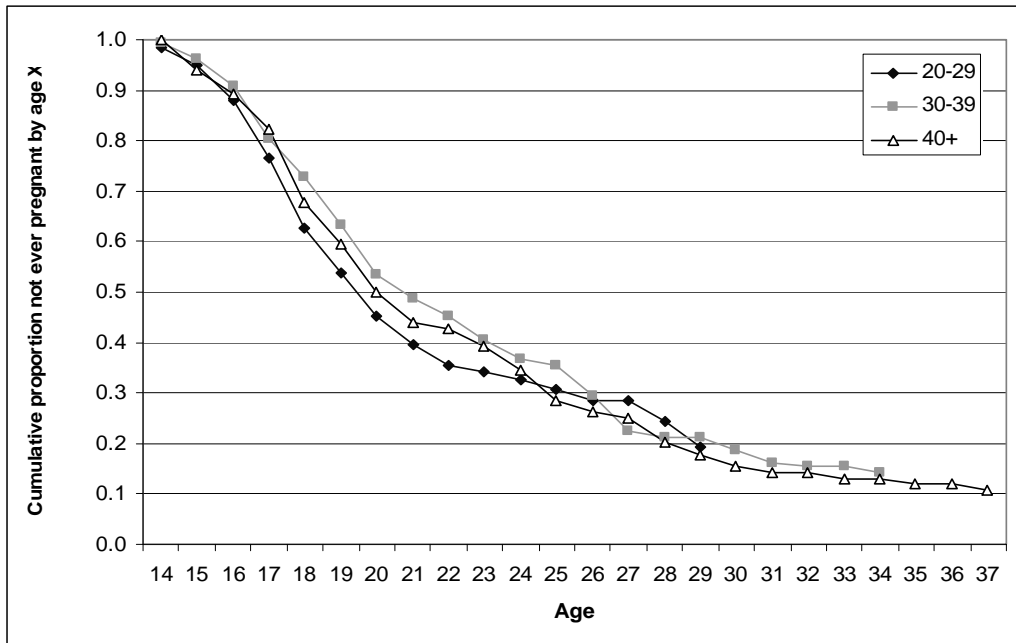
The DRUID Study women's health sample shows average reported parity to be 2.08 children per woman aged 20-44 years. Higher parity was reported for women at older ages ranging from 2.83 for women aged 40-44 years, 2.37 for women aged 30-39 years, to 1.18 for women aged 20-29 years. The TFR for Indigenous women in the Darwin Urban region for the period 2003-2005 based on vital registrations was 2.19 births per woman. The DRUID data thus appear to reflect fertility levels indicated by the vital registration period data.

As noted in Chapter Four, the majority of women in the DRUID Study women's health sample from the age of 20 years and older reported that they had given birth at least once (79%). Survival curves for predicted age at first pregnancy and age at first birth show that among the DRUID Study sample, half of the women aged 30 years and older had a first pregnancy by age 21, and half had a first birth by age 23. Among the 20-29 year age group, first pregnancy and first birth were more likely at slightly younger ages (Figure 6.1). Over half of the 20-29 year age group were predicted to have been pregnant by age 20, and to have had a first birth by age 21. This echoes the early age of childbearing indicated by the age-specific fertility rates in Chapter Five, as well as the rising fertility rates over time for the 15-19 and 20-24 year age groups in the Darwin

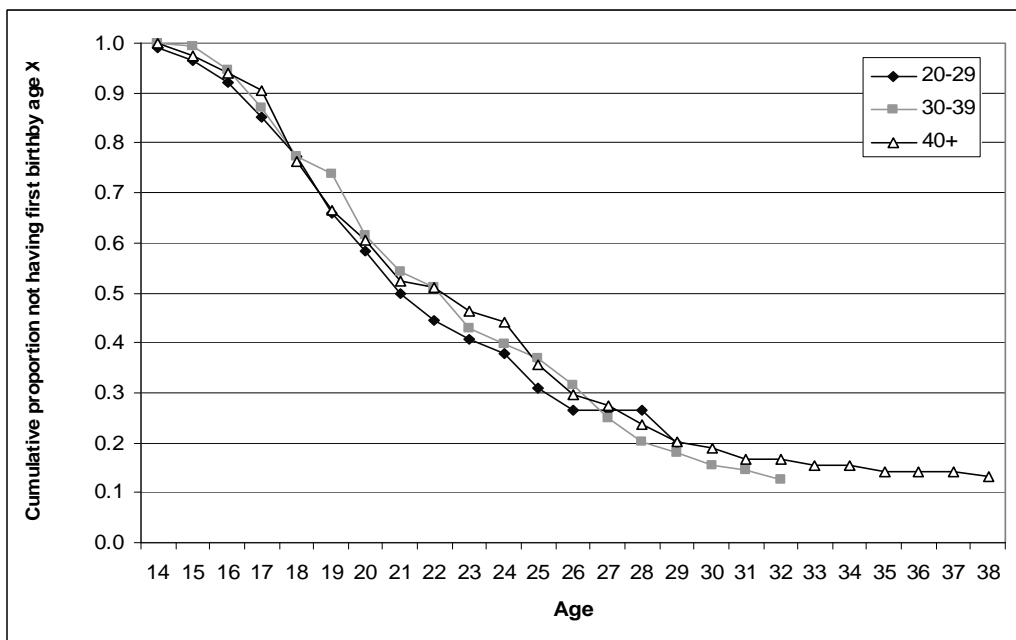
Urban area. That being said, the differences between age groups are not great, more notably for age at first birth.

**Figure 6.1: Cumulative proportion of Indigenous women, 20-44 years, who had never been pregnant and never had a first birth, Darwin Urban 2003-2005**

6.1(a): *Cumulative proportion never-pregnant*



6.1(b): *Cumulative proportion never had a first birth*



Source: DRUID Study women's health sample.

## 6.2: Influences on fertility outcomes in an urban setting

This chapter focuses on three fertility outcomes; whether women report ever-being pregnant, reported age at first birth, and reported parity. The socio-economic and contraceptive status variables investigated for their relationship to fertility outcomes are those detailed in Chapter Four, namely:

- Left school aged 16+ years (Yes/No)
- Education to Year 12 or post-school (Yes/No)
- Currently in paid employment (Yes/No)
- Current equivalised weekly household income \$200+ (Yes/No)
- Using contraception 2+ years (Yes/No).

As already noted in Chapter Four, these variables are not able to explore the temporal relationship between social outcomes and childbearing. Past research focusing on Indigenous fertility in Australia (Gray 1983a, 1989a) indicates these variables should provide some indications of the association between socio-economic status and having children.

### ***Ever being pregnant***

The majority of women surveyed for the DRUID Study women's health sample reported having been pregnant. Table 6.1 provides insight into the results outlined in this chapter. Simple cross-tabulations of the 'predictor' variables by whether a woman has been pregnant are presented. They show that for some variables the numbers are very small among women who report never being pregnant. For example, only four women report leaving school under the age of 16 years and never being pregnant.

These cross-tabulations show that age is an important predictor of whether women have ever experienced pregnancy. Many of the predictors are themselves likely to change with older age (e.g. household income, and the effect of age is also apparent in the models presented in Table 6.2 later in this chapter). Inclusion of interaction variables between each of the 'predictors' and age group in the logistic regression models detailed below showed these interactions not to be significant and they are therefore not included.

**Table 6.1: Number and per cent of DRUID Study women’s health sample<sup>(1)</sup> who reported being ever-pregnant by socio-economic and contraceptive use characteristics**

Characteristic	Ever-pregnant			
	Yes		No	
	<i>n</i>	%	<i>n</i>	%
Age group				
20-29 years	82	71.9	32	28.1
30-39 years	117	88.6	15	11.4
40-44 years	78	94.0	5	6.0
Employed full-time				
No	128	85.3	22	14.7
Yes	149	83.2	30	16.8
Left school aged 16+ years				
No	63	94.0	4	6.0
Yes	212	82.2	46	17.8
Education to Year 12 or post-school				
No	118	89.4	14	10.6
Yes	159	80.7	38	19.3
Weekly equivalised household income \$200+				
No	169	80.9	40	19.1
Yes	108	90.0	12	10.0
Using contraception <sup>(2)</sup> 2+ years				
No	182	85.4	31	14.6
Yes	95	81.9	21	18.1

(1) Indigenous women, 20-44 years, Darwin Urban, 2003-2005.

(2) Oral contraceptive pill, or Implanon, or Depo Provera.

Source: DRUID Study women’s health sample.

Table 6.2 presents results of three logistic regression models. Model I explores the influence of age group on whether women have been pregnant. Model II extends this analysis to include the influence of socio-economic characteristics on whether women have experienced pregnancy, and Model III provides a further extension with the inclusion of contraceptive use.

It is clear that the older a woman is, the more likely she is to have been pregnant at some time in her life, although this result is hardly surprising. None of the identified socio-economic or contraceptive use variables show any significant association with having ever-been pregnant. This is perhaps not unexpected given the caveats surrounding the ability to ‘predict’ past events (pregnancy) with current socio-economic or contraceptive

**Table 6.2: Logistic regression coefficients – estimates of influence from socio-economic and contraceptive use characteristics on ever-being pregnant, Indigenous women 20-44 years, Darwin Urban region, 2003-2005**

	Model I		Model II		Model III	
	<i>B</i> (SE)	OR (95%CI)	<i>B</i> (SE)	OR (95%CI)	<i>B</i> (SE)	OR (95%CI)
20-29	0.00	1.00	0.00	1.00	0.00	1.00
30-39	1.11 (0.34)	3.04 (1.56-5.98)**	1.20 (0.35)	3.33 (1.67-6.63)**	1.26 (0.36)	3.54 (1.75-7.13)**
40+	1.81 (0.51)	6.09 (2.26-16.42)**	1.74 (0.52)	5.68 (2.06-15.70)**	1.83 (0.53)	6.21 (2.22-17.43)**
Left School 16+			-0.94 (0.57)	0.39 (0.13-1.20)	-0.91 (0.57)	0.40 (0.13-1.24)
Education Year 12/post-school			-0.65 (0.36)	0.52 (0.26-1.06)	-0.57 (0.37)	0.56 (0.28-1.16)
In paid employment			0.27 (0.46)	1.31 (0.53-3.26)	0.34 (0.47)	1.40 (0.56-3.56)
Equivalent household income \$200+			-0.46 (0.46)	0.63 (0.26-1.55)	-0.57 (0.47)	0.57 (0.23-1.42)
Contraception 2+ years					-0.43 (0.34)	0.65 (0.33-1.28)
Constant	0.94 (0.21)	**	2.25 (0.62)**		2.32 (0.36)**	
-2 Log Likelihood	266.60		256.47		254.94	
Degrees of freedom	2		6		7	
Cox and Snell pseudo R <sup>2</sup>	.06		0.09		0.09	
Number of cases	329		329		329	

\* p<0.05, \*\* p<0.01. Dependent variable coded as 1=Yes (ever-pregnant), 0= No (never pregnant).

Source: DRUID Study women's health sample.

use status. It also reflects the difficulties of trying to understand fertility outcomes from data sources designed for other purposes.

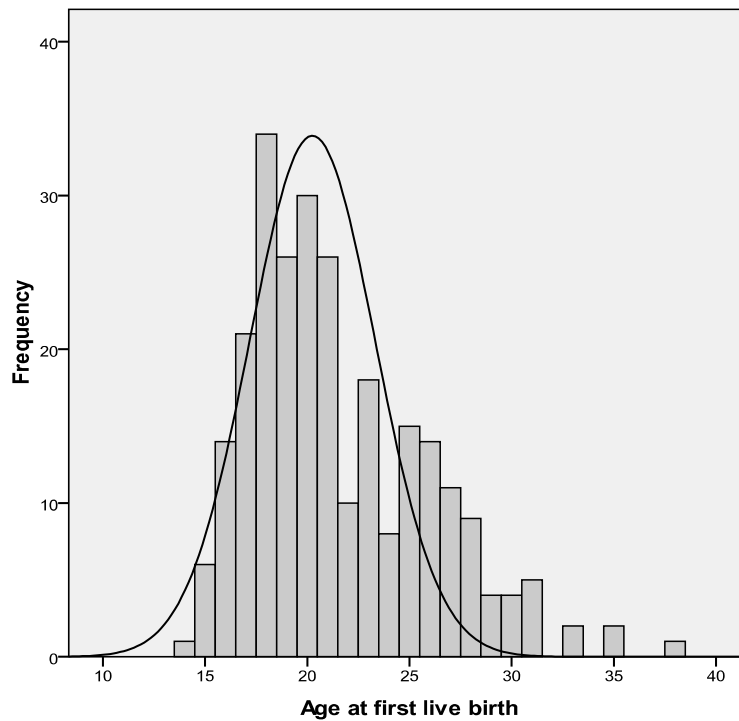
### ***Age at first birth***

As was shown in Figure 6.1, almost half of the Indigenous women in the DRUID Study women's health sample are likely to have had a first birth by the age of 20 years. In this sample there is some indication of a shift to younger childbearing among Indigenous women with the youngest age group more likely to have been pregnant or to have had a first birth by the age of 20 years than the older women included in the sample. This young age of entry to childbearing means that while age at first birth among respondents in the DRUID sample is reasonably normally distributed, the distribution is positively skewed (see Figure 6.2).

Table 6.3 presents results of three multiple linear regression models. As in the previous section, Model I explores the influence of age group on Indigenous women's age at first birth. Model II extends this analysis to include the influence of socio-economic characteristics on the age women had a first birth, and Model III provides a further extension with the inclusion of contraceptive use. Interaction variables of age at the time of the survey with each of the predictor variables were created and tested but did not show any significant associations in any case with age at first birth and were thus excluded from subsequent analysis.

As with the logistic regression models for whether women were ever pregnant, age group is significantly associated with older age at first birth in each model. Models II and III show that leaving school aged 16 years or older is significantly associated with having a first birth at an older age. Model II also shows completion of high school to Year 12 or post-secondary qualification as significant in relation to have a later age at first birth. Model III does not show qualifications as significantly associated with later age at first birth, but using contraception for two or more years is shown as significant. This being said, the age of first birth for Indigenous women is very young – the constant for all models is less than 20 years of age.

**Figure 6.2: Distribution of age at first live birth, Indigenous women, 20-44 years, Darwin Urban 2003-2005**



Source: DRUID Study women's health sample.

While not significant, Models II and III show that being in paid employment is associated with a slightly younger age at first birth. This apparent contradiction is indicative of the difficulty trying to establish a relationship between historical outcomes (having had a child at some time in the past) and current events (being in paid employment). Women who had children at young ages are able to enter the workforce after the children are born, and will have less caring demands on their time as the children reach school ages. The results also highlight again the data limitations for trying to understand the relationship between fertility and other factors for Indigenous women in the Northern Territory.

The  $R^2$  results of Models I, II and III show an increasing proportion of the variability in the age of first birth accounted for by the predictors added to each of the models. In contrast, however, the F-ratio is lower from Model I through to Model III indicating that the models with socio-economic and contraceptive use predictors are no better at predicting age at first birth than age at time of interview.

**Table 6.3: Multiple linear regression coefficients – estimates of influence from socio-economic and contraceptive use characteristics on age at first birth, Indigenous women 20-44 years, Darwin Urban region, 2003-2005**

	Model I		Model II		Model III	
	<i>B</i> (SE)	95%CI	<i>B</i> (SE)	95%CI	<i>B</i> (SE)	95%CI
20-29	-		-		-	
30-39	2.37 (0.63)	1.13-3.62**	2.05 (0.62)	0.84-3.26**	1.93 (0.61)	0.73-3.14**
40+	2.61(0.70)	1.27-4.02**	2.83 (0.69)	1.47-4.19**	2.62 (0.69)	1.26-3.98**
Left School 16+			2.51 (0.64)	1.26-3.76**	2.44 (0.63)	1.19-3.86**
Education Year 12/post-school			1.05 (0.53)	0.01-2.09*	0.94 (0.53)	-0.10-1.97
In paid employment			-0.16 (0.72)	-1.58-1.25	-0.31 (0.72)	-1.72-1.10
Equivalised household income \$200+			0.81 (0.70)	-0.57-2.18	0.89 (0.70)	-0.48-2.26
Contraception 2+ years					1.15 (0.54)	0.09-2.21*
Constant	19.74 (0.49)	18.77-20.71**	16.93 (0.79)	15.36-18.49**	16.80 (0.79)	15.24-18.36**
F	9.16		7.58		7.25	
Degrees of freedom	2		6		7	
R <sup>2</sup>	0.07		0.15		.017	
Number of cases	261		261		261	

\* p<0.05, \*\* p<0.01. Dependent variable = age at first birth (years).

Source: DRUID Study women's health sample.

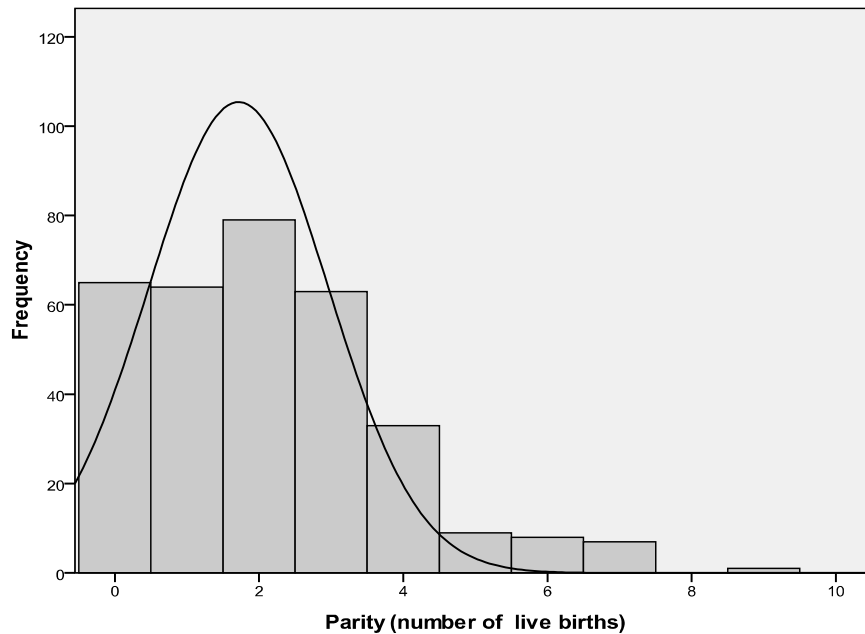


**Parity**

Figure 6.3 shows the distribution of the number of children born alive to Indigenous women in the DRUID Study women’s health sample. Parity is reasonably normally distributed, albeit positively skewed. Reflecting average parity for women in the sample (2.08 live births per woman), two children was the modal number of live births reported by women aged 20-44 years.

Three multiple linear regression models have again been tested against the number of children born to Indigenous women in the DRUID Study women’s health sample (Table 6.4). Model I explores the influence of age group on the number of children born to Indigenous women, Model II extends the analysis to include the influence of socio-economic characteristics, and Model III also includes contraceptive use. Interaction variables of age with each of the ‘predictor’ variables were created and tested but were not significant in any case as a predictor for number of children born and were thus excluded from further analysis.

**Figure 6.3: Distribution of number of children born to Indigenous women, 20-44 years, Darwin Urban 2003-2005**



Source: DRUID Study women’s health sample.

**Table 6.4: Multiple linear regression coefficients – estimates of influence from socio-economic and contraceptive use characteristics on number of children born, Indigenous women 20-44 years, Darwin Urban region, 2003-2005**

	Model I		Model II		Model III	
	<i>B</i> (SE)	95%CI	<i>B</i> (SE)	95%CI	<i>B</i> (SE)	95%CI
20-29	-		-		-	
30-39	1.19 (0.20)	0.79-1.59**	1.19 (0.20)	0.81-1.58**	1.24 (0.20)	0.86-1.63**
40+	1.65 (0.23)	1.19-2.10**	1.60 (0.23)	1.16-2.05**	1.68 (0.23)	1.23-2.13**
Left School 16+			-0.32 (0.22)	-0.76-0.12	-0.29 (0.22)	-0.73- -0.14
Education Year 12/post-school			-0.59 (0.18)	-0.94- -0.24**	-0.52 (0.18)	-0.87- -0.17**
In paid employment			0.05 (0.25)	-0.43-0.53	0.11 (0.24)	-0.38-0.59
Equivalised household income \$200+			0.12 (0.24)	-0.35-0.59	0.06 (0.24)	-0.41-0.53
Contraception 2+ years					-0.44 (0.18)	-0.80- -0.08*
Constant	1.18 (0.15)	0.89-1.48**	1.73 (0.27)	1.19-2.26**	1.79 (0.27)	1.26-2.32**
F	29.24		13.22		12.35	
Degrees of freedom	2		6		7	
R <sup>2</sup>	0.15		0.20		0.21	
Number of cases	329		329		329	

\* p<0.05, \*\* p<0.01. Dependent variable = number of children born.

Source: DRUID Study women's health sample.

The results presented in Table 6.4 show that age is significantly associated with having more children, a result which is not surprising. Models II and III show that achieving at least a Year 12 qualification is significant in relation to lower parity. Model III shows that using contraception for two or more years is also significantly associated with having fewer children. While not significant, Models II and III both show being in paid employment and having a weekly equivalised household income of \$200 or more are associated with higher parity. As already noted, this apparent contradiction reflects the difficulties of investigating past outcomes based on current events or status and the data constraints of this research.

Models II and III are both significant, and the  $R^2$  results indicate that a greater proportion of the variability in the number of children born to women is accounted for by the predictors in the models. However, as with age at first birth, the inclusion of socio-economic and contraceptive use variables decreases the F-ratio result, indicating a smaller improvement in prediction from fitting the models. If nothing else, this indicates the complex relationship between socio-economic status and the number of children Indigenous women will have.

### **6.3: Overview**

None of the results based on the DRUID Study women's health sample in and of themselves 'explains' when women will have their first child or how many they will have. The most consistent result is that as women move through the reproductive ages, they are more likely to have at least one pregnancy, and more likely to have more children. These results are perhaps not surprising, based as they are on a data source the purpose of which was not to examine fertility outcomes. Moreover, there are multiple and complex biological, psychological and social reasons for fertility differentials unable to be captured by these survey data. The improving  $R^2$  and pseudo  $R^2$  results, for example, show that adding layers of complexity to the models improved the explained variability slightly, but not necessarily with predictors that are significant. These improvements also took place alongside worsening F-ratios.

It is clear that education has an impact on the fertility outcomes of Indigenous women living in Darwin. Women who stay at school to at least the age of 16 were predicted to enter childbearing at an older age than those who left school early. Even these 'older' ages, however, were still young. Age of leaving school was not significantly associated with how many children women went on to have, but completed education level was a significant 'predictor' of parity. This means the use of two different education measures to create one continuous time series based on

the census data (age at leaving school and highest year of schooling completed) as reported in Chapter Five may not be appropriate, further highlighting the data constraints for research of this nature.

These results indicate that socio-economic characteristics might not be strong influences on when women start having children or how many children they have. This is reflective of the difficulties exploring fertility outcome based on current socio-economic status. It is also indicative of the interactive nature of fertility. For women living in poverty, children may be the catalyst for entry to higher education, providing as it does access to government benefits for child support, priority listing for public housing, and subsidised child care for mothers who are full-time enrolled students. Children may also inspire mothers to seek a different way of life. One of the women interviewed for this research said:

*“My mother experienced public rejection, from my father and from her own mob, and so she worked to get a law degree [when we were growing up]”* [Woman aged in her 30s with no children].

The next chapter explores the age women begin childbearing in more depth and shows that young childbearing among Indigenous women in the Northern Territory is a long-standing norm.

## CHAPTER SEVEN: HAVING BABIES YOUNG – THE TERRITORY NORM

### 7.1: Introduction

Having explored geographic variations in Chapter Five and the way socio-economic factors influence fertility outcomes for the Darwin Urban region in Chapter Six, this chapter explores the young profile of Indigenous childbearing in the Northern Territory in greater detail. It investigates the suggested delays in entry to childbearing raised in Chapter Five. As has been shown, fertility rates at young ages are exceptionally high for Indigenous women in the Northern Territory. In 2007, the Indigenous teenage pregnancy rate in the Northern Territory was seven times higher than the rate for Australia as a whole (113 and 16 births per 1,000 women aged 15-19 respectively)<sup>75</sup> (author's own calculations and ABS 2008a). Also, the fertility rate of women aged 20-24 years was nearly three times higher than the rate for Australia as a whole (159 and 56 births per 1,000 women aged 20-24 respectively) (author's own calculations and ABS 2008a). As Guimond and Robitaille (2009) have highlighted for Canadian Indians, these elevated, early fertility rates warrant closer inspection because of the implications for women's socio-economic and health status and that of their children. Drawing on the perinatal parity data, this chapter looks at the timing and spacing of having children, and uses the DRUID Study women's health sample to investigate socio-economic or contraceptive use predictors of young childbearing. It also examines the influence of data choice in shaping our understanding of the age profile of Indigenous fertility in the Northern Territory.

Much of the focus of this chapter is on births to women under the age of 20 years. All births and abortion data provided by the Northern Territory Department of Health and Families and the Australian Bureau of Statistics include births or abortions to women under the age of 15 years in the 15-19 year age group. There are therefore some additional births attributed to the female population aged 15-19 years.<sup>76</sup>

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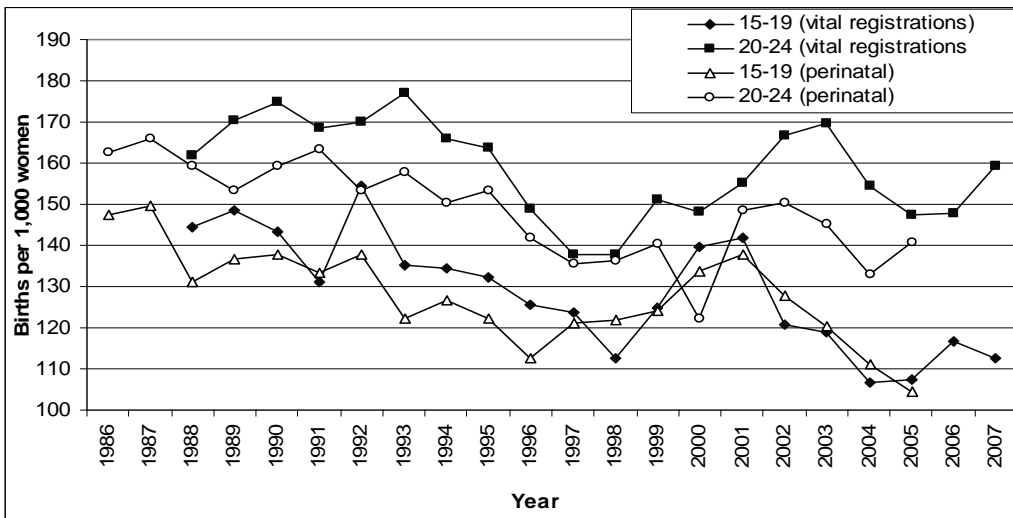
<sup>75</sup> To place the Indigenous teenage fertility rate for the Northern Territory in an international context, a 2008 UNFPA report showed that only 24 countries (out of 186) had a teenage fertility rate that was higher, and most of these were countries in Western, Middle and Eastern Africa (UNFPA 2008).

<sup>76</sup> Published perinatal reports for 1996-2002 (Carnegie et al. 1999, d'Espaignet et al. 1999, Gladigau et al. 2000, NT Perinatal Information Management Group 2002, Stewart and Li 2005) show that less than two per cent of all births in any one year were to girls aged less than 15 years, and the age-specific fertility rates show less than 10 girls in 1,000 gave birth. Teenage fertility rates are therefore slightly higher by two or three births per 1,000 females aged 15-19 years with these younger births included.

### 7.2: Data effects on the youth profile of Indigenous fertility

Both of the births data sets available for this research show similar fertility rates and trends for the youngest age groups (Figure 7.1). The perinatal and vital registration data show that by the 21<sup>st</sup> century fewer young Indigenous women in the Northern Territory were having babies than previously. As was discussed in detail in Chapter Five, any declines have been characterised by fluctuations. For the 20-24 year fertility rates based on vital registration data, there was little difference between the rates at the beginning and end of the 20-year period under observation. Chapter Three has already shown that the higher birth counts in the vital registration data compared to the perinatal data are not a consistent feature for the 15-19 year age group in all years, but for the 20-24 year age group measures based on vital registration data are consistently higher than those based on perinatal data.

**Figure 7.1: Northern Territory Indigenous age-specific fertility rates, women aged 15-24 years, 1986-2007 (vital registration and perinatal data)**

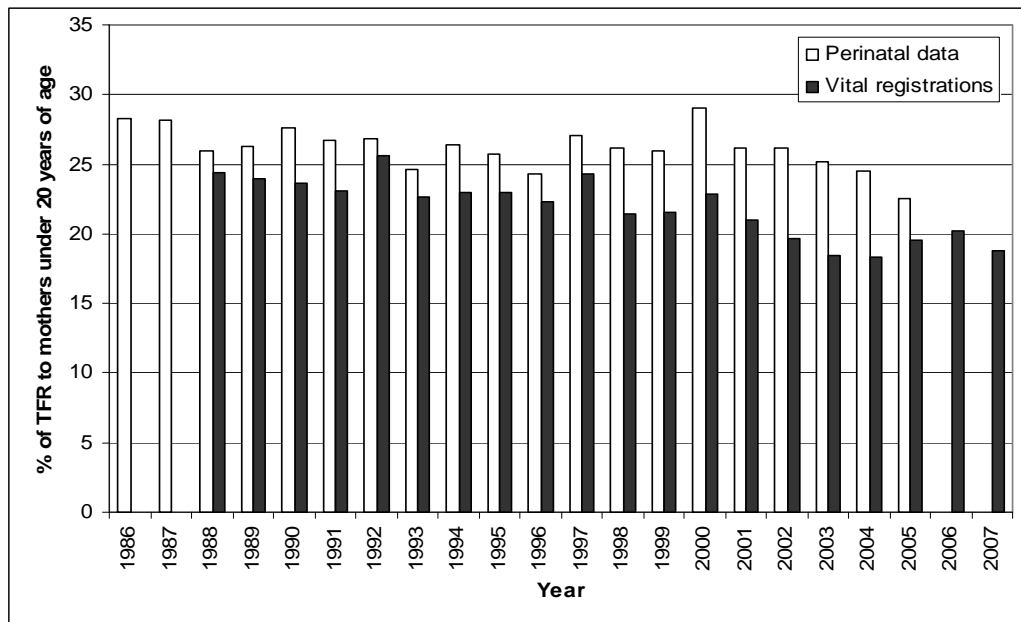


Source: Author’s calculations based on customised tables from the NT Department of Health and Families and the Australian Bureau of Statistics.

A measure of the early force of childbearing (ETFR), showing the proportion of the TFR attributed to childbearing of women under the age of 20 years, reiterates this decline in fertility at the youngest ages (Figure 7.2) and reflects the increases in delayed childbearing discussed in Chapter Five. Despite this decline, the continued contribution of very young motherhood to Indigenous fertility levels is also evident. The ETFR results show that the perinatal data accentuate the youthful nature of Northern Territory Indigenous childbearing more than results based on vital registrations. The vital

registration data show that by 2002 less than 20 per cent of the TFR for Indigenous women in the Northern Territory was attributable to mothers under the age of 20 years. In contrast, the perinatal data show percentages that do not fall below 23 per cent, and for most of the 1986-2005 period over a quarter of the TFR was attributable to teenage women. While these differences are not large they have implications for how we understand results from the parity information in the perinatal dataset. The differences may also reflect age misreporting.

**Figure 7.2: Early force of childbearing, Northern Territory Indigenous women, 1986-2007 (vital registration and perinatal data)**



Source: Author's calculations based on customised tables from the NT Department of Health and Families and the Australian Bureau of Statistics.

The different age profiles of fertility between the two main data sets also has possible implications for population age composition, and age composition of families, although these may not be significant. Calculation of the mean length of generation ( $T$ ) derived from the intrinsic rate of natural increase based on vital registration data found  $T=24.73$  years, while vital registration data redistributed to reflect the perinatal data age distribution of births found  $T=24.53$ . Because of the lower fertility rates based on the perinatal data set a direct comparison fails to illustrate the impact of the different age profiles of the two data sets.

### 7.3: Pregnancy and births

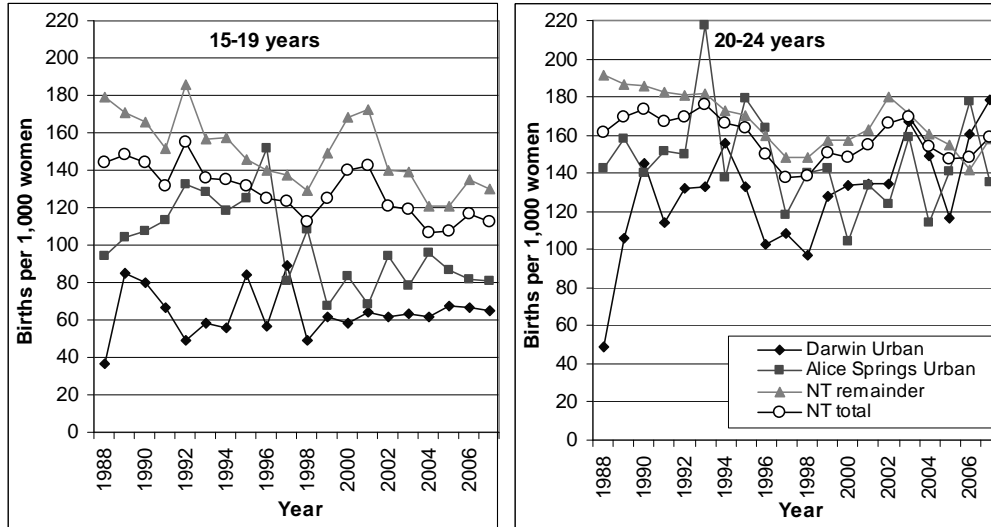
Despite the decline in fertility at ages 15-19 years documented above, it is clear that for the Northern Territory, this is a decline that has, for the most part, mirrored declines in rural and remote parts of the Northern Territory. Both data sets, using different geographies, show how closely the trends for Indigenous women in rural and remote regions (approximating the NT Remainder for results based on the vital registrations) mirror those for the Northern Territory as a whole (Figure 7.3).

The different patterns for the large urban region using perinatal data and Darwin Urban and Alice Springs Urban using the vital registration data are noteworthy. For these youngest age groups in Darwin Urban, based on vital registration data, there was an increase in fertility rates between 1988 and 2007. While there was an upward trend from the beginning of the 20-year period to the end when only the end points of the period are looked at, there was significant volatility in the rates. During this time, rates fluctuated from a low of 37 births per 1,000 females aged 15-19 years in 1988 to 89 births per 1,000 teenage women in 1997. For the 20-24 year age group the fluctuations were within the range of the lowest rates at the start of the 20-year period in 1988 and the highest rates at the end of the period in 2007 (48 and 179 births per 1,000 women aged 20-24 years respectively). In Alice Springs Urban, rates were lower in 2007 than in 1988 for young women, but there was a notable upward trend in fertility rates between 1988 and 1994. Among women aged 15-19 years this increase was followed by much lower but fluctuating rates. For women aged 20-24 years there were declines from 1994 to 1998 followed by increases to 2003, another decline to 2005 and further increases to 2007. When the Northern Territory's five main urban centres are looked at together using the perinatal data, fertility rates for women aged 15-19 and 20-24 years showed a period of increase from 1986 to 1991, followed by fluctuating decline. For the 15-19 year age group this decline led to lower fertility in 2005 at the end of the 20-year period than at the start, but higher fertility for the 20-24 year age group.

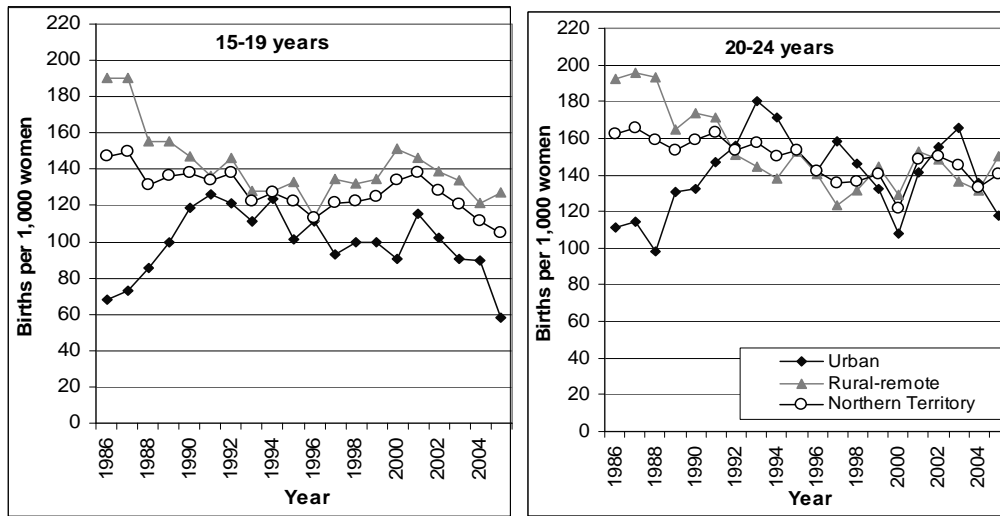


**Figure 7.3: Indigenous age-specific fertility rates, women aged 15-24 years, Northern Territory and sub-regions, 1986-2007 (vital registration and perinatal data)**

7.3(a): *Vital registration data*



7.3(b): *Perinatal data*



Source: Author's calculations based on customised tables from the NT Department of Health and Families and the Australian Bureau of Statistics.

Of note for the 20-24 year age group, based on results for both vital registration and perinatal data but most easily observed for the perinatal data, are the reduced urban/rural-remote differences in fertility rates from 1992/1993 onwards. As has already been commented on, this could reflect a data effect, from miscoding of usual place of residence in the births' data, or the back projected population creating a denominator that exaggerates these geographic differences the further back in time they are taken, or a combination of the two.

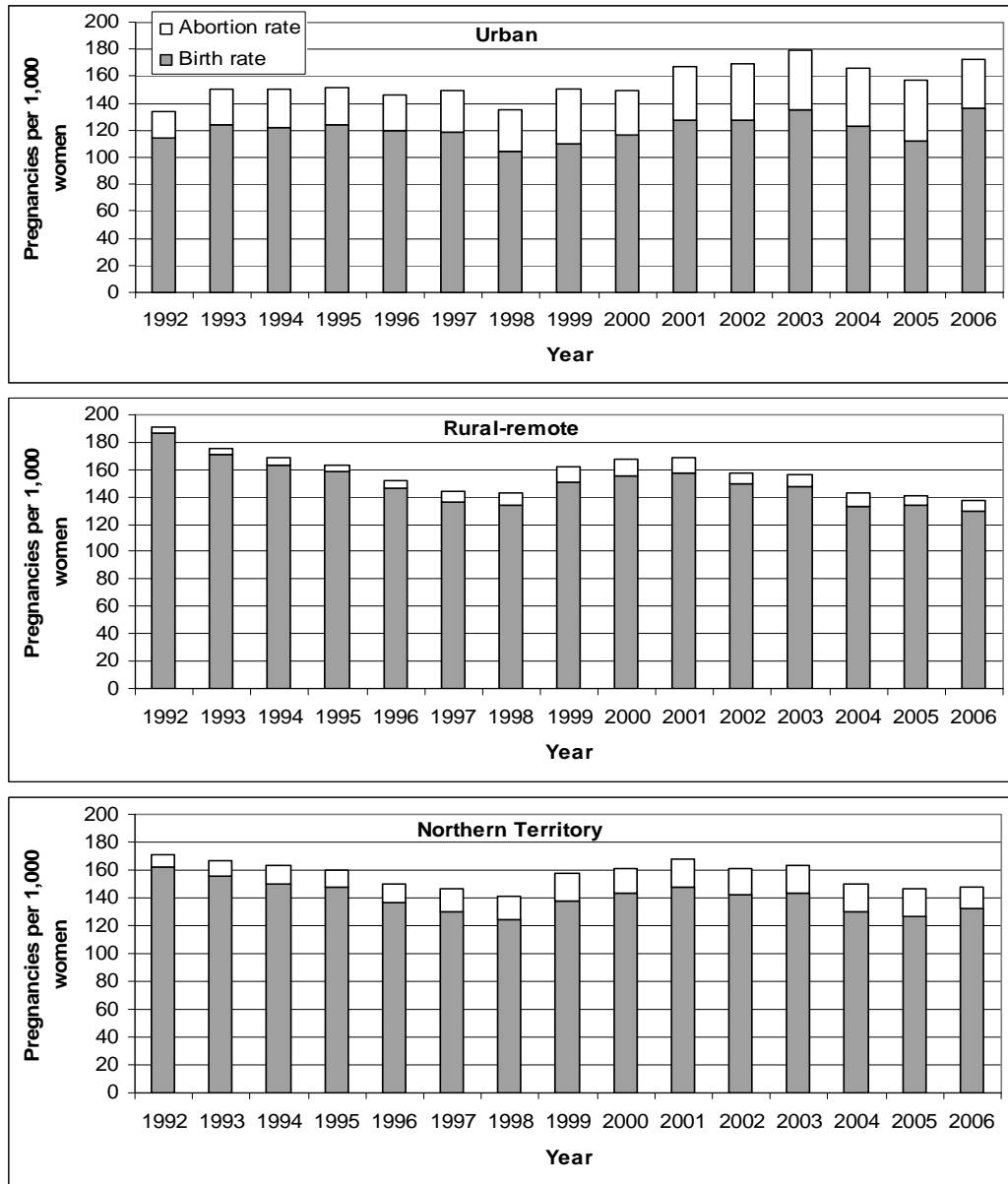
Even taking account of the fertility declines in some regions and the lower fertility rates in urban settings, the fertility rates for the youngest Indigenous mothers in the Northern Territory are high. In 2007, vital registration data show fertility rates ranging from 65 births per 1,000 females aged 15-19 years in Darwin Urban to 130 births per 1,000 teenage females in the Northern Territory outside of Darwin and Alice Springs. Outside of Darwin and Alice Springs (NT Remainder), teenage fertility rates have not fallen below 120 births per 1,000 women aged 15-19 years for the whole 20-year period.

This increase in Darwin Urban fertility rates at young ages is reflected in pregnancy rates at ages 15-24 years for the larger urban region of the Northern Territory (Figure 7.4). As noted in Chapter Four, induced abortions for the urban region are likely to be predominantly for women usually resident in Darwin and Alice Springs because of access to the only hospitals in the Territory which provide abortion services. As Figure 7.4 shows, by 2006, the urban pregnancy rate was higher than in 1992 (172 pregnancies per 1,000 women aged 15-24 years and 134 pregnancies respectively). In the 21<sup>st</sup> century, however, there was a decline in pregnancies at the youngest ages, from 179 pregnancies per 1,000 females in 2003 (the highest rate for the whole period) to 157 pregnancies per 1,000 females in 2005, and up again to 172 pregnancies per 1,000 women in 2006. The predominance and increasing use of abortion in the urban areas alongside an increase in the birth rates means that from 2003 pregnancy rates changed from being higher in rural-remote areas to being higher in the urban region. Much of this higher urban pregnancy rate can be attributed to increases in birth rates among the 20-24 year old urban Indigenous population because when pregnancy rates for 15-19 year old females are looked at, rates remain higher in rural-remote areas than in urban areas, albeit with a greatly reduced differential (from a 90 per cent difference in 1992 to 10 per cent in 2006).

When births data are disaggregated based on a Darwin Urban and rest of the Northern Territory classification, the differential in teenage fertility rates between the two regions is also found to diminish over the 20-year period from 1988-2007. The driver is increasing fertility in the Darwin Urban region at ages 15-19 years among Indigenous women. Despite this increasing fertility, the early force of childbearing has decreased in Darwin Urban reflecting increasing fertility at all ages. As Table 7.1 shows, the early force of childbearing for Indigenous women in Territory regions outside of Darwin has also declined and the differential for the early force of childbearing between the two regions has remained about the same. This may be important because during this 20-

year period the difference in age structures between Darwin Urban and the rest of the Northern Territory has declined, although the differences have never been great. From 2004, Darwin Urban showed a slightly younger age profile of Indigenous women in the reproductive ages compared to the rest of the Northern Territory.

**Figure 7.4: Age-specific pregnancy rates, Indigenous women aged 15-24 years, urban and rural-remote regions, Northern Territory, 1992-2006**



Source: Author's calculations based on customised tables from the NT Department of Health and Families and the Australian Bureau of Statistics.

**Table 7.1: Measures of early childbearing, Indigenous women, Darwin Urban and NT Remainder, selected years 1988 to 2007**

Year	Darwin Urban			NT Remainder		
	ASFR <sub>15-19</sub> <sup>(1)</sup>	ETFR <sup>(2)</sup>	% women 15-19 <sup>(3)</sup>	ASFR <sub>15-19</sub> <sup>(1)</sup>	ETFR <sup>(2)</sup>	% women 15-19 <sup>(3)</sup>
1988	36.7	15.9	21.9	169.2	25.6	23.0
1993	58.1	15.9	20.0	153.5	23.2	21.0
1998	49.2	14.0	18.6	127.0	22.7	19.8
2003	63.3	13.3	18.8	132.7	19.7	18.8
2007	65.3	11.7	19.2	125.3	21.1	17.7

(1)  $ASFR_{15-19} = \text{Births}_{15-19} / \text{Women}_{15-19} * 1,000$

(2)  $ETFR = ((5 * ASFR_{15-19}) / 1,000) / TFR * 100$

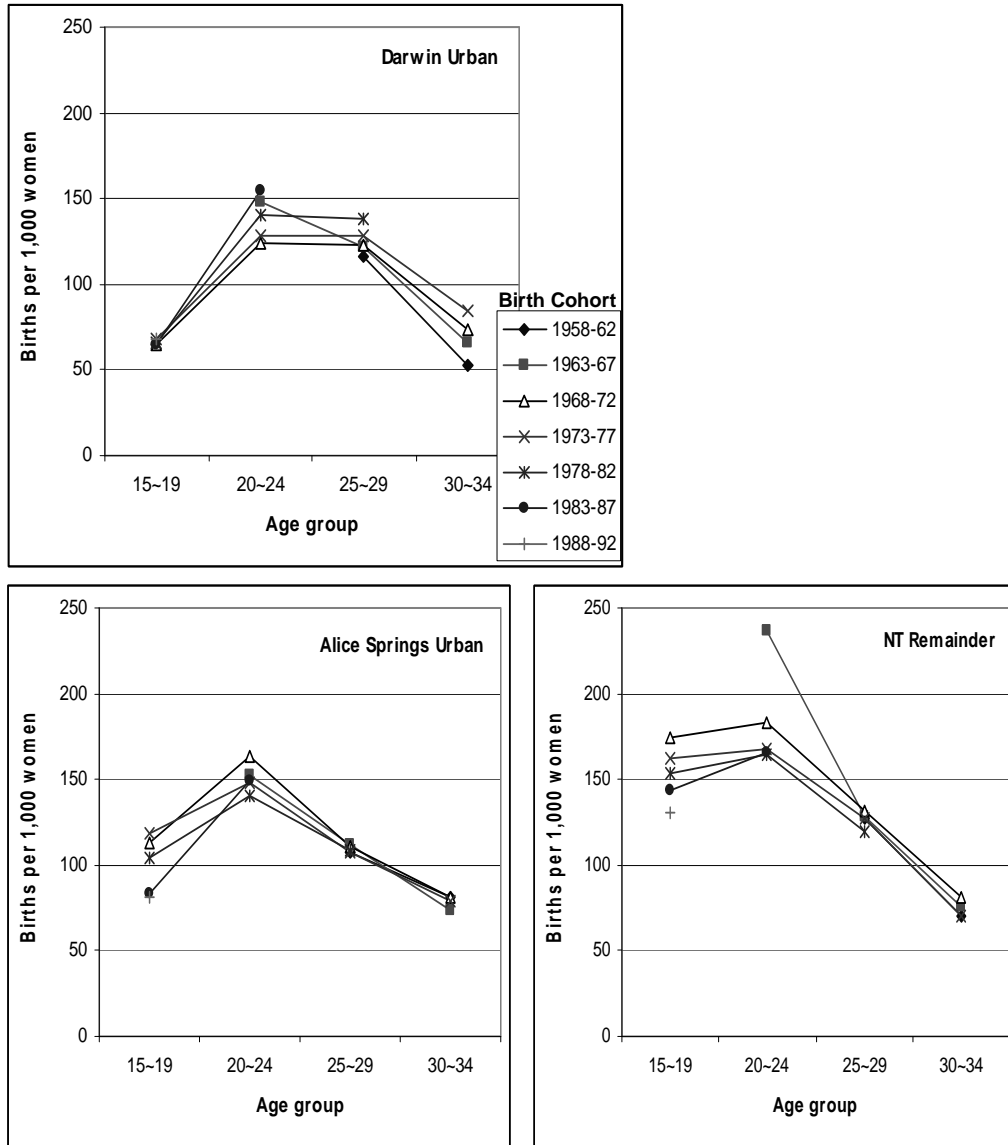
(3)  $\text{Women}_{15-19} / \text{Women}_{15-49} * 100$

Source: Author's calculations based on customised tables from the NT Department of Health and Families and the Australian Bureau of Statistics.

The rising fertility rates at the youngest ages in Darwin Urban appear to be both a period and cohort effect. Figure 7.5 shows the limited cohort fertility rates that can be constructed for Indigenous women in the Northern Territory based on a 20-year data set. There is a decline in childbearing at the younger ages (15-19 and 20-24 years) for successive birth cohorts of Indigenous women in both the Alice Springs Urban and NT Remainder regions. In contrast, there was little difference in fertility rates at 15-19 years of age for successive birth cohorts of Indigenous women in the Darwin Urban region, and a clear increase in fertility rates at ages 20-24 years for successive birth cohorts.

This rise in fertility at the younger ages among successive cohorts of Indigenous women in the Darwin Urban region is also seen at the older ages as well for successive birth cohorts. (Because of the 20-year time limit for the data set, these increases are for different birth cohorts than those experiencing increased fertility at the younger ages). This rising fertility at ages 25-29 and 30-34 years is not a feature shared by Indigenous women in the Alice Springs Urban or NT Remainder regions, where there were very similar fertility rates between birth cohorts for women at these ages. This is noteworthy because it highlights the differences seen among Indigenous women living in the Darwin Urban area compared to Indigenous women living elsewhere.

**Figure 7.5: Birth cohort age-specific fertility rates, Indigenous women born 1958 to 1992, by usual place of residence**



Source: Author’s calculations using customised tables from the Australian Bureau of Statistics.

This rising fertility among Indigenous women in Darwin is at odds with the fertility patterns seen in remote areas of the Northern Territory. While Darwin Urban rates remain lower than other regions of the Northern Territory, the direction of the trends appears to contradict earlier research in Australia and overseas that shows urban Indigenous populations leading fertility decline compared to those in rural or remote areas (Douglas 1977, Gale 1969, Gray 1983a, Pool 1991, Snipp 1996).

The possibility of data effects must figure in any discussion of differing fertility rates at the sub-regional level given the evidence already presented regarding the capture of vital

registration and perinatal data. The capture of usual place of residence information is fraught, as was detailed in Chapter Three. Poor birth outcomes could contribute to an increase in the number of mothers needing to stay in Darwin longer and therefore citing Darwin as their usual place of residence when registering a birth. A 20-year report documenting trends from the Northern Territory perinatal data shows that the number of preterm births (less than 37 weeks' gestation) born to Indigenous mothers increased by 26 per cent between 1986 and 2005 (from 137 to 197 each year), and the number of low birthweight babies (weighing less than 2,500 grams) increased by 39 per cent (from 157 to 180 each year)<sup>77</sup> (Zhang et al. 2010). These poor birth outcomes were alongside an overall increase in average birthweight for babies born to Indigenous mothers and a decline in the proportion of babies with low Apgar scores<sup>78</sup> born to Indigenous mothers. Nonetheless, preterm and low birthweight are associated with a longer postnatal stay in hospital for the baby, which would necessitate a longer stay in town near the hospital for the mother if she is from a rural or remote community.<sup>79</sup> Royal Darwin Hospital has the largest number of deliveries in any one year compared to other Northern Territory hospitals.<sup>80</sup> It also receives critical care cases from across the Northern Territory (with Central Australian critical care cases often being flown to Adelaide). An increase in the number of mothers staying in town for weeks or months near the hospital where their child is an in-patient could complicate the recording of usual place of residence. As was noted in Chapter Three, the resolution of this issue of usual residence accuracy requires a much more detailed data matching exercise than is possible for this research, and patient journey information that includes how usual-place of residence is asked of individuals and recorded.

#### **7.4: Timing and spacing**

Despite the apparent anomaly of increasing Indigenous fertility in the Darwin Urban region, at the Territory level there are clear declines in the rate of childbearing at the

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<sup>77</sup> While the number of low birthweight babies increased, the proportion of all births that were low birthweight babies did not change from 14 per cent between the start and the end of the 1986-2005 period. The proportion of preterm births increased from 13 per cent of all births in 1986-1990 to 15 per cent in 2001-2005.

<sup>78</sup> An Apgar score is a numerical score used to indicate a baby's condition at one and five minutes after birth. Between 0 and 2 points are given for each of five characteristics: heart rate, breathing, colour, muscle tone and reflex irritability. The total score is between 0 and 10 (Zhang and Johnstone 2009).

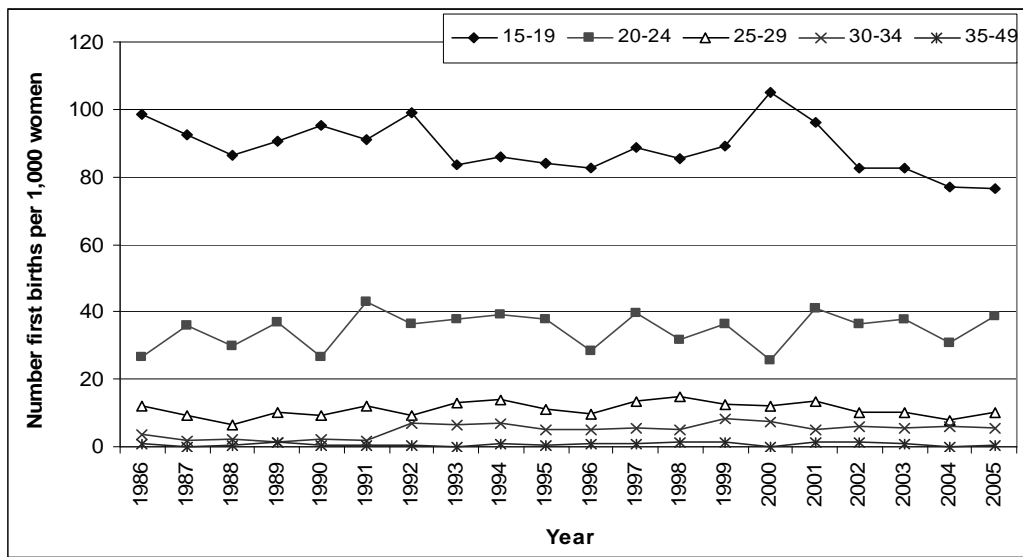
<sup>79</sup> While perinatal data show a decline in the average length of postnatal hospital stay for Indigenous mothers from 1986 to 2005 (Zhang et al. 2010), length of postnatal stay for the baby is not publicly available.

<sup>80</sup> In 2005, Royal Darwin Hospital had 552 Indigenous women give birth compared to 437 in Alice Springs Hospital, 164 in Katherine Hospital, 131 in Gove District Hospital, 12 in Tennant Creek Hospital and 11 in Darwin Private Hospital (Zhang and Johnstone 2009).

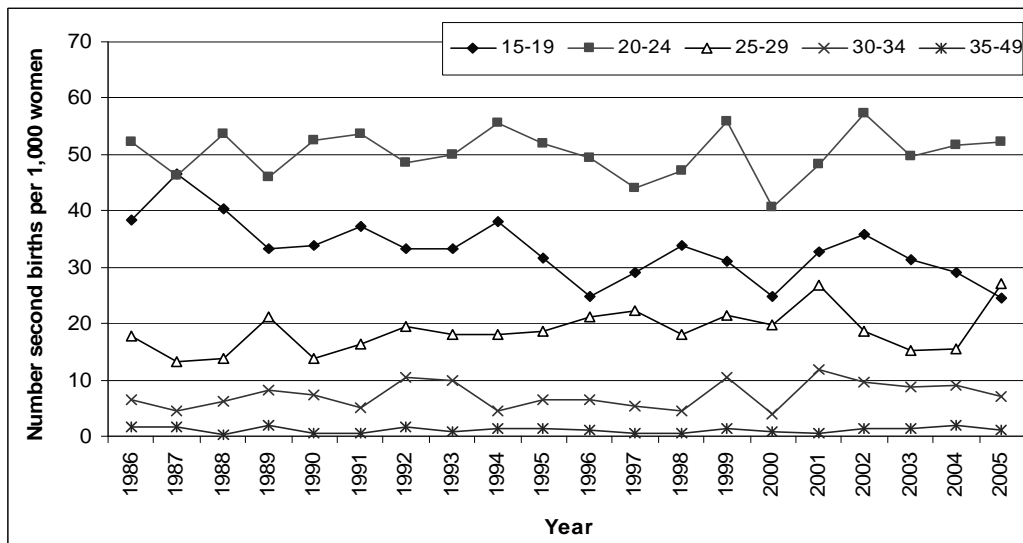
youngest ages. The perinatal data include information on births by mothers' parity and these also point to declining fertility among Indigenous women less than 20 years of age. However, first-order age-specific fertility rates clearly show that Indigenous women in the Northern Territory were more likely to begin childbearing during the teenage years than any other age (Figure 7.6). There was an overwhelming concentration of very young childbearing despite any declines. While there were clearly women beginning childbearing at older ages, they were a minority.

**Figure 7.6: Age-specific first and second-order specific fertility rates, Indigenous women, Northern Territory, 1986-2005**

7.6(a): *First births*



7.6(b): *Second births*



Source: Author's calculations based on customised tables from the NT Department of Health and Families.

When both first and second births are examined it is clear that childbearing is a life stage associated predominantly with young women under the age of 30 years. There has been a decline in 15-19 year first and second-order specific fertility rates throughout the 20-year period 1986-2005, offset by an increase in first-order fertility rates at ages 20-24 years and an increase in second-order fertility rates at ages 25-29 years. These increases have not been of the same magnitude as the declines, nor have the change in rates in either direction been monotonic as there were evident annual fluctuations. However, these patterns are indicative of deferment of childbearing from the teen years to the early 20s.

This youthful concentration of childbearing is reiterated by the median age at first birth and the typical age childbearing ends (determined by interpolation of the TFR and the median age of each order-specific birth) (Estee 2004). While the median age childbearing begins has risen slightly over the 20-year period 1986-2005, it has fluctuated and hovered around 19 years, indicating that while fertility rates at the youngest ages might be declining, there has been little change in the age Indigenous women commence childbearing. A similar pattern is seen for the typical age that childbearing ends, namely a slight increase over the 1986-2005 period (Figure 7.7). Over 20 years then, the average length of time for childbearing among Indigenous women is four to five years and typically completed before the age of 25 years.<sup>81</sup> Even for women with higher-order parity (up to five births) most childbearing takes place before women turn 30 years old (Table 7.2).

**Table 7.2: Median age (years) of Indigenous mothers by order of birth, Northern Territory, 1986-2005 (four-year averages)**

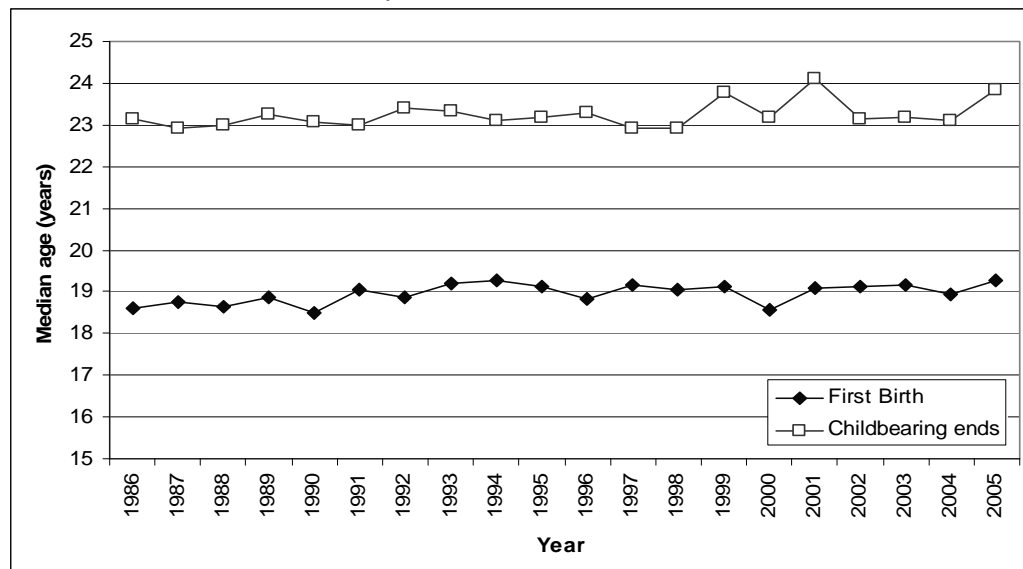
Year	Order of birth(s)					
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup> and over
<b>1986-1989</b>	18.7	21.7	24.0	26.3	28.0	32.0
<b>1990-1993</b>	18.9	22.1	24.3	26.6	28.9	31.6
<b>1994-1997</b>	19.1	22.3	24.7	27.3	28.5	31.6
<b>1998-2001</b>	19.0	22.5	25.0	27.3	29.2	32.3
<b>2002-2005</b>	19.1	22.5	25.0	24.7	29.7	32.0

Source: Author's calculations based on customised tables from the NT Department of Health and Families.

<sup>81</sup> This estimated age that childbearing ends is based on a TFR calculated from perinatal data and is thus lower than the rate calculated from vital registrations. Using a median age at first birth derived from perinatal data, the typical age childbearing ends based on the TFR derived from the vital registration data is another year older. However, this may simply reflect the combining of results from the two data sets and must be viewed with great caution.



**Figure 7.7: Median age childbearing begins and ends<sup>(1)</sup>, Indigenous women, Northern Territory, 1986-2005**



(1) Median age childbearing ends determined by interpolation of the TFR and median age of each order-specific birth (Estee 2004).

Source: Author's calculations based on customised tables from the NT Department of Health and Families.

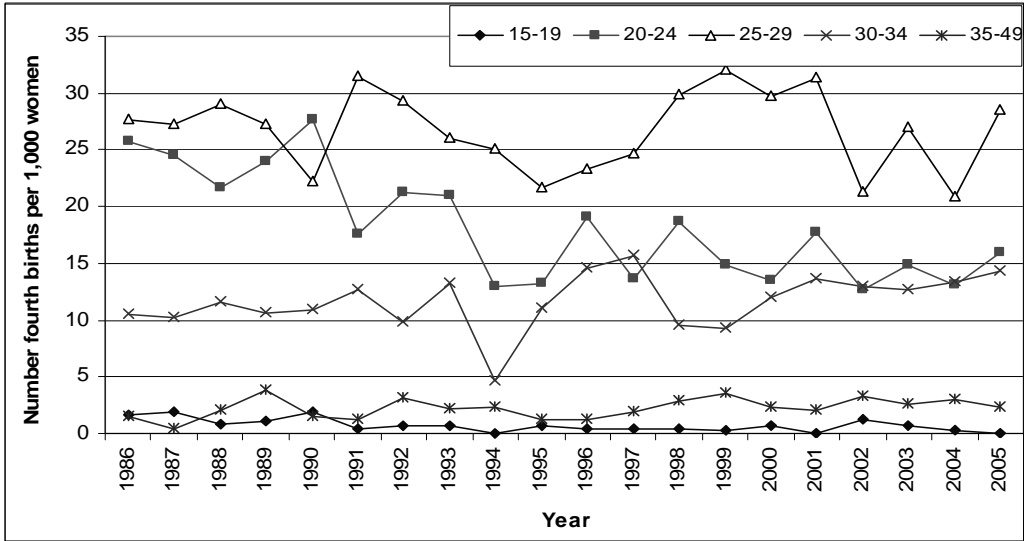
While the early childbearing shown by the parity data may be exaggerated slightly because it is based on the perinatal data, which have a slightly younger profile than the vital registration data, having babies young among Indigenous women in the Northern Territory is clearly the norm. This is in stark contrast to non-Indigenous women in the Northern Territory, who are more likely to become first time mothers in their late 20s or early 30s (Zhang et al. 2010). Young childbearing is usually associated with higher fertility - the earlier one begins childbearing, the longer the length of time within the reproductive span to conceive and give birth. As the total fertility rates in Chapter Five showed, this is not necessarily the case for Indigenous women in the Northern Territory. There are some women, however, who will have many children. The DRUID Study women's health sample, for example, included 25 women (or eight per cent of the sample) who reported having five or more children born alive.

Figure 7.8 shows that higher order parity is most common among Indigenous women aged 25 years and older. This is by no means a surprise, as there are obvious physical constraints that require the passage of time to conceive and carry a pregnancy to term. Order-specific fertility rates for six or more births declined at all ages during 1986-2005, although for fourth and fifth births there were increases in the order-specific fertility rates at ages 30-34 and 35-49 years (rates for the fifth birth are not shown). These

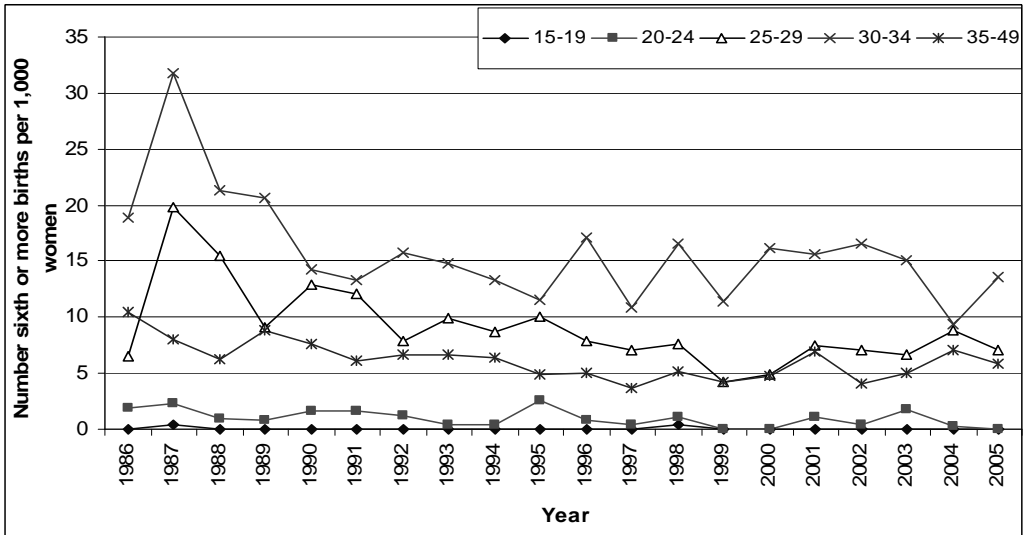
increases are possibly an indication of deferment of childbearing for some women, rather than an increase in spacing, as the median age of having children by order does not show a greater number of years between births (Table 7.2).

**Figure 7.8: Age-specific fourth and sixth or more-order specific fertility rates, Indigenous women, Northern Territory, 1986-2005**

7.8(a): Fourth birth



7.8(b): Sixth or more birth



Source: Author's calculations based on customised tables from the NT Department of Health and Families.

Period parity progression ratios show an increase in the proportion of first-time mothers who went on to have a second birth during 1986 to 2005 but remarkably little change in the proportion of mothers going on to have third, fourth or fifth births, despite some fluctuations in the ratios (Table 7.3). When only the period parity progression ratios for

women aged 15-24 years are looked at there was a decline in the proportion of young Indigenous mothers who continued on to have a third, fourth or fifth birth throughout the 20-year period.

**Table 7.3: Period parity progression ratios, Indigenous women 15-49 years, Northern Territory, 1986-2005 (four-year averages)**

Years	% women 15-49 years having birth after:			
	1 <sup>st</sup> Birth	2 <sup>nd</sup> Birth	3 <sup>rd</sup> Birth	4 <sup>th</sup> Birth <sup>(1)</sup>
1986-1989	78	79	65	57
1990-1993	74	76	68	59
1994-1997	75	77	58	59
1998-2001	70	74	73	49
2002-2005	83	73	66	59

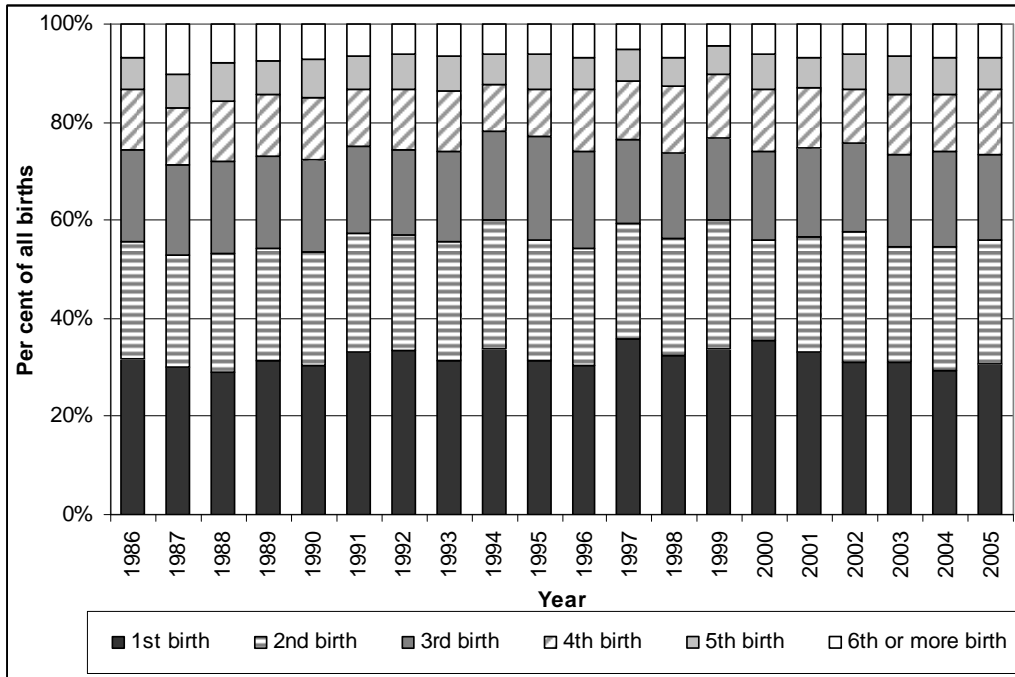
Years	% women 15-24 years having birth after:			
	1 <sup>st</sup> Birth	2 <sup>nd</sup> Birth	3 <sup>rd</sup> Birth	4 <sup>th</sup> Birth <sup>(1)</sup>
1986-1989	69	63	43	32
1990-1993	65	59	44	27
1994-1997	66	56	33	28
1998-2001	60	52	40	21
2002-2005	70	50	35	23

(1) There are notable annual fluctuations in the parity progression ratios from five to six or more births and they have been excluded from this table as unreliable.

Source: Author's calculations based on customised tables from the NT Department of Health and Families.

Despite declines in the parity progression ratios for higher order births, the proportion of all births that were a fourth child or more has been relatively stable throughout the 1986-2005 period (Figure 7.9). This indicates that among babies being born throughout the 20-year period an average of 13 per cent of babies were born to mothers who already had at least four children. The declining parity progression ratios and the declining fertility rates for six or more births indicates that there is a group of Northern Territory mothers who continue to have high life time fertility. This is not surprising given the young childbearing that is in evidence. Given the relatively low total fertility rates for Indigenous women in the Northern Territory, however, it points to a notable proportion of women not having any children or a very small number of children, either by choice or infertility.

**Figure 7.9: Per cent distribution of births to Indigenous mothers by parity of mother, Northern Territory, 1986-2005**



Source: Author's calculations based on customised tables from the NT Department of Health and Families.

Table 7.4 again highlights the young childbearing taking place among Indigenous women in the Northern Territory. From 1986 to 2005, almost one in ten Indigenous females aged 15-19 years had their first child. There were declines in the first, second and third birth fertility rates for teenage women, but throughout the period under investigation, having had a child, one-third went on to have a second child before they turned 20 years of age. Despite a decline in early-order birth rates for women aged 15-19 years over the 20-year period 1986-2005, the rates remained high. By 2005 four in every 1,000 Indigenous teenagers in the Northern Territory was having a third baby.

**Table 7.4: Indigenous 15-19 year order-specific fertility rates and period parity progression ratios, Northern Territory, 1986-2005 (four-year averages)**

Years	Order-specific births per 1,000 women 15-19 years			% women 15-19 years having another birth after:	
	1 <sup>st</sup> Birth	2 <sup>nd</sup> Birth	3 <sup>rd</sup> Birth	1 <sup>st</sup> Birth	2 <sup>nd</sup> Birth
1986-1989	91.9	39.6	10.6	43	27
1990-1993	92.2	34.4	6.4	37	18
1994-1997	85.2	30.9	6.1	36	20
1998-2001	94.1	30.6	5.2	32	17
2002-2005	79.7	30.2	6.1	38	20

Source: Author's calculations based on customised tables from the NT Department of Health and Families.

Parity data are not available by sub-region for the Northern Territory because of small numbers. As Chapter Five and the earlier part of this Chapter have shown, Territory-level trends tend to reflect the fertility experience for Indigenous women in rural and remote regions. Survival curves for the age at first birth from the DRUID Study women's health sample found half of the sample was predicted to have a first birth by the age of 22 years, which indicates that young childbearing is a characteristic in the Darwin Urban region, although it may be concentrated in the early 20s rather than the teenage years (Figure 6.1). Until the parity data are available by sub-region, this remains conjecture. The availability of vital registration data on all previous births to the mother registering a birth regardless of paternity of those births from 2007 onwards may provide another avenue for exploring geographic variations in the timing of childbearing for Indigenous women in the Northern Territory in future research. Comparisons of vital registrations and perinatal parity data will also be able to take account of how the age profiles of the two data sets influence our understanding of birth timing and spacing.

### **7.5: Socio-economic 'predictors' of teenage pregnancy and childbirth**

The DRUID Study women's health sample collected retrospective information on age at first pregnancy and age at first birth. Because the sample includes women who are aged 20-49 years, they have all exited the teenage years and this enables exploration of factors that may be correlated with having experienced pregnancy or birth before 20 years of age using logistic regression. In Australia, women who have their first child at a young age have significantly poorer socio-economic outcomes than women who delay child-bearing (Bradbury 2006a). Analysis of data from the Australian Longitudinal Survey of Women's Health suggests for economic outcomes this is primarily a selection effect, namely that women who are less likely to do well in education or the labour market are more likely to become pregnant and have a live birth (Bradbury 2006b). While current socio-economic status is not a determinant of past births, the evidence suggests women who had an early first birth may be more likely to have lower education, employment or income levels later in life compared to those who had a first birth at a later age. This assumption is able to be tested using the same 'predictors' as already explored in Chapter Six, namely:

- Left school aged 16+ years (Yes/No)
- Education to Year 12 or post-school (Yes/No)
- Currently in paid employment (Yes/No)
- Current equivalised weekly household income \$200+ (Yes/No).

A fifth 'predictor' exploring life-time use of contraception (Using contraception 2+ years (Yes/No)) is also used because a longer time using contraception is associated with reduced exposure to conception (Pool et al. 1999). Age group at the time of interview is not included because it cannot influence whether a woman aged 20-49 years was pregnant or gave birth before the age of 20 years, and univariate analysis showed it to be not significant. Table 7.5 also shows there is limited evidence of a cohort effect for early pregnancy or birth. While the youngest age group at the time of the DRUID Study (20-29 years) had the largest proportion of women who reported having been pregnant or having a live birth before the age of 20, lower proportion of early pregnancy and birth for the 30-39 year age group compared to women both younger and older than them mean the differences are likely a sampling effect rather than cohort differences.

Of note in Table 7.5 is the lesser number of early births compared to early pregnancies. Among women aged 20-44 years in the DRUID Study women's health sample, 138 reported having a first pregnancy under the age of 20, and 104 reported having a first birth under the age of 20. Nineteen women in the sample were first pregnant at age 19 and gave birth at age 20. There are thus 13 women in the sample who were first pregnant before the age of 20 years but whose pregnancy did not result in a live birth. These pregnancies resulted in either miscarriage, stillbirth or induced abortion but this information was not collected in the DRUID Study women's health sample. Given the increase in induced abortion rates for Indigenous women in urban areas of the Northern Territory, it is almost certain that some of these pregnancies were aborted. (There are a further 12 'lost' pregnancies in the Study sample, 10 for women aged 20-24 at the age of first pregnancy, and two for women aged 28 years when they had their first pregnancy. There were 35 women (11%) in the DRUID Study women's health sample who reported having repeated miscarriages, which undoubtedly accounts for some of the lost pregnancies).

**Table 7.5: Number and per cent of DRUID Study women’s health sample<sup>(1)</sup> who reported being pregnant or having a live birth before the age of 20 by socio-economic and contraceptive use characteristics**

Characteristics	Pregnant before age 20				Live birth before age 20			
	Yes		No		Yes		No	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Age group								
20-29 years	53	46.9	60	53.1	41	36.6	71	63.4
30-39 years	50	38.5	81	61.8	36	27.5	95	72.5
40-44 years	35	43.2	46	56.8	29	35.8	52	64.2
Left school aged 16+ years								
No	39	58.2	28	41.8	36	53.7	31	46.3
Yes	99	38.4	159	61.6	70	27.2	187	72.8
Education to Year 12 or post-school								
No	65	50.0	65	50.0	56	43.1	74	56.9
Yes	73	37.4	122	62.6	50	25.8	144	74.2
Currently in paid employment								
No	46	40.4	68	59.6	33	29.2	80	70.8
Yes	92	43.6	119	56.4	73	34.6	138	65.4
Current equivalised weekly household income \$200+								
No	59	44.4	74	55.6	43	32.6	89	67.4
Yes	79	41.1	113	58.9	63	32.8	129	67.2
Ever-used contraception <sup>(2)</sup> 2+ years								
No	102	48.6	108	51.4	81	38.8	128	61.2
Yes	36	31.3	79	68.7	25	21.7	90	78.3

(1) Indigenous women, 20-44 years, Darwin Urban, 2003-2005.

(2) Lifetime use of oral contraceptive pill, or Implanon, or Depo Provera.

Source: DRUID Study women’s health sample.

Table 7.6 presents results for two logistic regression models. Model I explores the influence of socio-economic characteristics on whether Indigenous women in Darwin experienced pregnancy before the age of 20 years or not. Model II extends this analysis to include contraceptive use. The same two models are used to explore influences on whether Indigenous women in Darwin gave birth to their first child before the age of 20 years, and results are presented in Table 7.7.

Two variables within the models stand out as important for both early pregnancy and early birth. Models I and II show that leaving school after the age of 16 years was a significant influence on reducing the odds of an Indigenous woman in Darwin having experienced pregnancy or birth before the age of 20 years.<sup>82</sup> Model II also shows life-

<sup>82</sup> That teenage pregnancy can be both a cause of leaving school early, and a consequence, is recognised but unable to be explored with the data available.

**Table 7.6: Logistic regression coefficients – estimates of influence from socio-economic and contraceptive use characteristics on being pregnant before the age of 20 years, Indigenous women 20-44 years, Darwin Urban region, 2003-2005**

	Model I		Model II	
	<i>B</i> (SE)	OR (95%CI)	<i>B</i> (SE)	OR (95%CI)
Left School 16+	-0.73 (0.29)	0.48 (0.27-0.85)*	-0.72 (0.29)	0.49 (0.28-0.87)*
Education Year 12/post-school	-0.38 (0.24)	0.69 (0.43-1.09)	-0.28 (0.24)	0.76 (0.47-1.22)
In paid employment	0.41 (0.33)	1.51 (0.78-2.90)	0.51 (0.34)	1.67 (0.85-3.27)
Equivalised household income \$200+	-0.46 (0.32)	0.63 (0.34-1.19)	-0.58 (0.33)	0.56 (0.29-1.08)
Contraception 2+ years			-0.71 (0.25)	0.49 (0.30-0.81)**
Constant	0.50 (0.32)		0.67 (0.33)	*
-2 Log Likelihood	429.75		421.60	
Degrees of freedom	4		5	
Cox and Snell pseudo R <sup>2</sup>	.04		0.06	
Number of cases	325		325	

\* p<0.05, \*\* p<0.01. Dependent variable coded as 1=Yes (first pregnancy before the age of 20 years), 0= No (first pregnancy after the age of 20 years or never pregnant).

Source: DRUID Study women's health sample.



**Table 7.7: Logistic regression coefficients – estimates of influence from socio-economic and contraceptive use characteristics on having a baby born before the age of 20 years, Indigenous women 20-44 years, Darwin Urban region, 2003-2005**

	Model I		Model II	
	<i>B</i> (SE)	OR (95%CI)	<i>B</i> (SE)	OR (95%CI)
Left School 16+	-1.00 (0.29)	0.37 (0.21-0.66)**	-1.00 (0.30)	0.37 (0.21-0.66)**
Education Year 12/post-school	-0.61 (0.25)	0.54 (0.33-0.89)*	-0.52 (0.26)	0.60 (0.36-0.98)*
In paid employment	0.44 (0.36)	1.55 (0.77-3.14)	0.55 (0.37)	1.73 (0.84-3.57)
Equivalised household income \$200+	-0.35 (0.35)	0.71 (0.36-1.39)	-0.47 (0.36)	0.63 (0.31-1.26)
Contraception 2+ years			-0.77 (0.28)	0.47 (0.27-0.80)**
Constant	0.31 (0.29)		0.49 (0.34)	
-2 Log Likelihood	385.95		378.07	
Degrees of freedom	4		5	
Cox and Snell pseudo R <sup>2</sup>	0.07		0.09	
Number of cases	324		324	

\*  $p < 0.05$ , \*\*  $p < 0.01$ . Dependent variable coded as 1=Yes (first birth before the age of 20 years), 0= No (first birth after the age of 20 years or never pregnant).

Source: DRUID Study women's health sample.

time use of contraception for two or more years significantly reduced the odds of having an early pregnancy or birth. Achieving educational qualifications to Year 12 or at tertiary level was also a significant influence on reducing the odds of having a baby born before the age of 20 years. Education, both time attending school and achieving qualifications, is thus an important factor mitigating against teenage motherhood. This relationship between education and age at first birth cannot be inferred as causal because of the nature of the data and the inability to look at the timing of higher education in relationship to a first birth or to control for other factors that could influence fertility decisions. That said, the results are in line with research from around the globe, including Indigenous and non-Indigenous women (e.g. Caldwell 2002, Douglas 1977, Murphy and Carr 2007, Pool et al. 2007).

While not significant, it is noteworthy that being in paid employment at the time of the DRUID Study increased the odds of Indigenous women in Darwin having been pregnant or having given birth as a teenager. This reflects the complexity of the relationship between the timing of childbearing and paid employment and the difficulties of using current socio-economic status to understand past events. It also demonstrates how difficult it is to investigate fertility with data not collected expressly for that purpose.

The Cox & Snell pseudo  $R^2$  results indicate that the models that include contraceptive use account for more variability in early pregnancy or birth outcomes than models that do not. They also show that while both Models I and II are better 'predictors' for early birth than early pregnancy, neither approach is particularly good based on the Log-likelihood or pseudo  $R^2$  values.

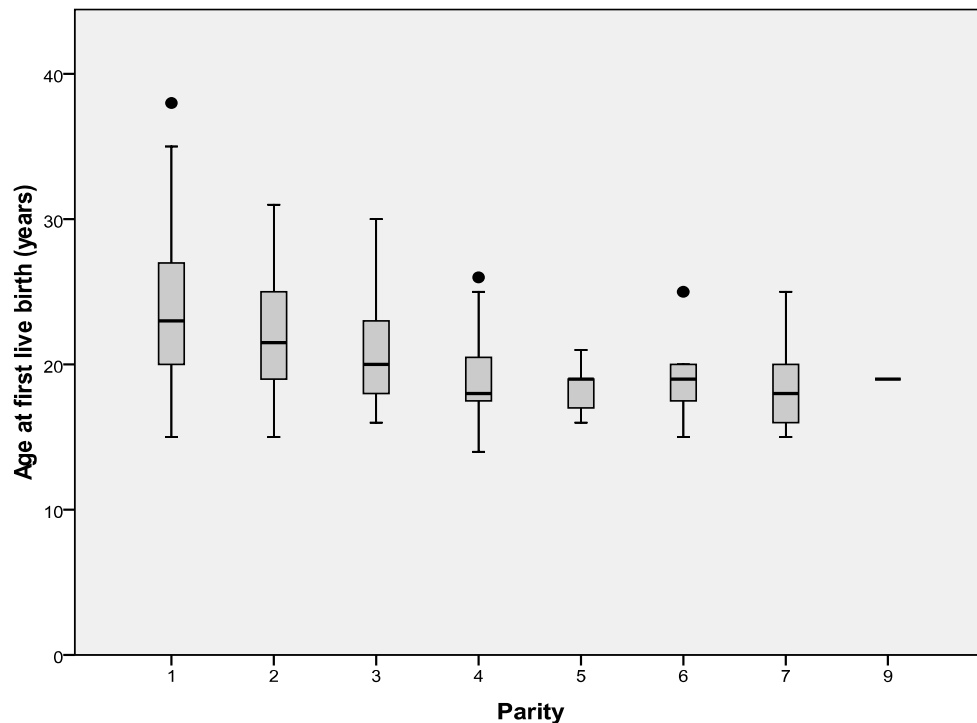
Because the DRUID Study women's health sample captures the age a woman had her first birth, and the number of children she had born at the time of the survey, it is possible to explore whether early entry to motherhood and parity are correlated.<sup>83</sup> Only three women in the DRUID Study women's health sample had a first live birth over the age of 35 years, and thus exploration of the correlation between age at first birth and parity for women 35-44 years gives an indication of the relationship between age at first birth and life-time parity (Figure 7.10). The relationship between age of entry to childbearing and number of children born is strong for this age group ( $r_s = -.51$ ,  $p$  (one-tailed)  $<.01$ ), with age of first birth accounting for 26 per cent of the variability in

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<sup>83</sup> Spearman's correlation coefficient ( $r_s$ ) was used to explore this relationship.

number of children born to women in the sample. Figure 7.10 shows a large range in the age at first birth at most parity levels, indicating that having a first child young does not necessarily mean a woman will have a large number of children. There is nonetheless a pattern of higher parity with younger age at first birth, showing that it is those women who start having children young who are most likely to have more children, a finding that is not at all unexpected.

**Figure 7.10: Distribution of median age at first birth by parity, Indigenous women 35-44 years, Darwin Urban, 2003-2005**



Source: DRUID Study women's health sample.

## **7.6: Young mothers – observations and experiences from on the ground**

As detailed in Chapter One, a range of approaches was used to talk to Aboriginal and Torres Strait Islander peoples about the experience of having babies in their own families. To reiterate, the methods for gathering individuals' views included a short interview with both men and women (n=28), a short focus group with young women participating in an antenatal program for mothers under the age of 25 years (n=8), and longer one-on-one interviews with women (n=10). All respondents were living in Darwin at the time of the interview or focus group. Young mothering featured in many

individuals' comments and experiences from their own lives or their family. What has happened in people's own lives and their observations provide insight into the trends indicated by the macro-level data already discussed in this thesis.

The short interview with 28 Indigenous men and women who have lived in Darwin all their lives found that the majority thought Indigenous women were having babies younger today than in the past. This was not necessarily linked to women having more children as most people interviewed also thought Indigenous women were having less or the same number of babies today than in the past. There were four main reasons given for why respondents thought Indigenous women were having children younger:

- Easy access to government money was the most commonly cited reason for women having children at younger ages (eight respondents). Most respondents spoke generally about 'money' without reference to any specific payments (e.g. *"it's just the money"*, *"easy access to money"*). One respondent said they had recently spoken to a 15-year old who gave the reason for having a child as the \$5,000 baby bonus.
- A lack of education was another commonly cited reason for women having children at younger ages (four respondents). Three respondents said how difficult it was to get a job without education and that the lack of employment opportunities led to women having babies at a young age.
- Three respondents talked about young childbearing among Indigenous women today as *"history repeating"* and that it was *"like the grandparents did"*. Another said that *"Aboriginal people have always had babies young, have always done it this way"*.
- Parental problems or neglect were also given as a reason for women having children at younger ages today compared to the past (three respondents).
- Other reasons given included peer pressure, unprotected sex, having sex at a young age, *"wanting to experience too soon"*, and false expectations raised by television.

Counter to those people who thought women were having children younger were those who thought women were having children at older ages (two women said this was 25-28 years and another said mid to late thirties). The reasons cited for older childbearing were more education for women than in the past, a focus on career, access to contraception and abortion, the cost of living, and not wanting to settle down too early.

While there may be perceptions that women are having babies younger because of ‘the money’, young women in Darwin under the age of 25 years<sup>84</sup> who were themselves pregnant and who participated in the short focus group (n=8) were unanimous in their derision of the idea that they would have a baby for only a few thousand dollars:

*“Ohh, I don’t think it’s enough money to have a baby.”*

*“As if you’d have a baby only for some money.”*

*“I’m like angry ... Like \$5,000 for a lifetime it’s not enough.”*

One woman aged 20-24 years, pregnant with her third child, talked about not knowing she was entitled to the baby bonus when she had had her previous child. Another woman talked about a friend who had got pregnant and didn’t know the baby bonus existed. There were many nods of agreement from the women while these stories were being told, suggesting that it is common for women not to know what government funds they are entitled to when they have a baby. In the Northern Territory it has been reported that from July 2004 to June 2006 there were approximately 450 baby bonus payments that had not been claimed by Northern Territory mothers (McLean 2007), accounting for approximately six per cent of the births registered during that period. Research from Western Australia has shown that after the introduction of the Baby Bonus in July 2004, the greatest increase in births was among women residing in the highest socioeconomic areas and who had the lowest general fertility rate in 2004 (Langridge et al. 2010). For the small group of women who participated in the focus group, seven of the eight pregnancies were not planned and the baby bonus was not a factor for any of them in deciding to have a baby.

Access to government payments for women who were pregnant was not discussed by any of the focus group participants although, as part of the program the women were participating in, presentations were made by Centrelink representatives on payments they would have access to once their child was born. Two women commented on the costs of having children when asked if their pregnancies were unplanned:

*“I don’t know if you can really plan when it comes to children ‘cos what is the average cost to raising a child to the age of 10 – it’s something like a million dollars or something”* [woman aged 20-24 years pregnant with third child].

*“I’m with my partner now and you know we think there’s no such things as financial security for a child”* [woman under 20 years of age pregnant with first child].

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<sup>84</sup> Six of the eight women who took part in the focus group were under the age of 20 years.

So while these young women were aware of the costs associated with having children, with the baby bonus inadequate to meet those costs, they did not see these costs as a deterrent to becoming a mother once they found out they were pregnant. While they had all experienced negative comments from people around them about their pregnancy (family, friends, school teachers and work colleagues), they believed if they were old enough to get pregnant they were capable of looking after a child. One young woman talked about the positive benefits of being pregnant:

*“People who say we’re too young, and they say what about the party life but the party life is all, it’s all about drinking and smoking and it’s all the stuff you can’t do as a mother, so when you have a baby it changes you. I’m better, I’m much more healthy, not drinking or smoking, more responsible. So, I’m very changed a lot, it’s much better than doing that old stuff that I was doing. In a way it’s a good thing that I fell pregnant ‘cos I’m really changed a lot”* [woman under 20 years of age pregnant with first child].

There is also a clear difference in attitude towards women who are pregnant as teenagers at 18 or 19 years, compared to when younger. One young woman said:

*“I had a really bad experience the first time. I was 15 when I found out, ummm my family was not happy and now this time I’m a bit older they’re a lot better and they’re wanting to help out”* [woman aged 20-24 years pregnant with second child].

One of the women who took part in a longer one-on-one interview commented that:

*“It’s always been natural to have babies when young when you’re Indigenous, but because of Western world negative views, this has changed”* [woman aged in her 30s with no children].

Among the women who took part in the longer interviews, young childbearing was a contemporary feature in their own families. One woman aged in her late 40s had three grandchildren, two born to a daughter before she was 18 or 19 years of age, and another born to a daughter when she was 15 or 16 years old.<sup>85</sup> Four other women talked about cousins and siblings who have “*huge families*” and who started having children “*very very young*”. One woman, for example, had two nieces who had both had a child very young, one at the age of 12 and one at the age of 14. Another woman commented that the issue was not age or number of children but needing to be able to cope:

*“From a family perspective ... there’s just a sense that if you’re in that child bearing time it’s good to actually have children. And you have children what you can cope with. So having babies I guess is a very... it’s a good process within the family. It’s not seen as something horror like”* [woman aged in her 50s with two children].

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<sup>85</sup> As noted in the introduction, and as observed by Morphy et al. (2007c) during the 2006 Census, asking for a chronological age from many Indigenous people who speak English as a second or third language and for whom age is not a cultural concern is problematic and this is why exact ages are not reported here.

The preceding quote highlights how important family is in influencing attitudes towards having children. This came through in all the interviews. Two women talked about their mother continually reinforcing the need to finish school and get a job, and to not get pregnant. Mothers were influential in other ways. One woman who was interviewed had a younger sister who had had seven children because she wanted to have the same number of babies as their mother. That family has an important influence on fertility decisions should not be unexpected. Preliminary research by Coughlan (2008) investigating teenage fertility across Australia suggested that parity levels of teenage girls' elder sisters, mothers, aunts and grandmothers who lived nearby had a strong direct association with the parity of young women aged 15-19 years.

All but one of the interviewees said that when they were young they expected to have children and this had influenced their childbearing decisions at older ages. Only one woman said she did not want children when she was growing up. Most women talked about always wanting children when growing up because they had always been around children - babysitting, being part of regular family get togethers, or having extended family live with them when they were young. One of the interviewees who herself had two daughters when she was 28 and 39 years of age talked about her own daughters wanting large families: *“they say because it’s really important that they have ... people around to play with”*. This woman herself had wanted more children but had not become pregnant despite not using contraception for many years. However, she said:

*“...as it’s turned out being the second eldest ... I took responsibility, sort of caring for the extended family. So I’ve raised a lot of the nieces and nephews along the way ... I think somehow that that was meant to be because I have played a heavy role in looking after other children”*.

While the focus of this research is on births and all of the women interviewed talked about some family members having lots of children, the inability for Indigenous women to have children was commented on by several interviewees. In addition to the woman quoted above, another aged in her 50s said, *“I wanted a big mob family but only had two”*. One woman aged in her 40s had a daughter aged in her late teens who *“had been married a long time, but has no babies”*, and another woman also in her 40s had a sister who *“couldn’t have babies”*. Family stories of women unable to have the children they want is likely to be an important factor influencing perceptions about the ease of getting pregnant, the perceived need for contraception and the perceived supply of children.

These brief forays into Indigenous people's lives support the idea that young mothering is a norm for many Indigenous women (always aware of the positive bias towards young mothers that comes from talking to women who are themselves pregnant at a young age as in the case of the focus group). Three of the women who took part in in-depth interviews had made deliberate decisions to not have children young (one woman had no children; one had her first pregnancy at 26 and a third at 35 years of age). For one of these women there was a clear acknowledgement that she differed from her family:

*"My mother comes from another place, and all of my relatives who come from that place are, they've got more than one child ... my immediate cousin who I relate very closely to, she's got eight children, the same age as me, eight children ... I've obviously made different choices ... I was pregnant with my first child and I was kind of told that I was being very precious about it. Because people had already had children by that stage"* [woman aged in her early 50s with two children].

This norm of young mothering was linked to the abundance of children while growing up for the women who participated in longer interviews. Both long and short interviews carried out for this research highlighted that some people thought the young mothering was either a return to the "grandparents' day" or a continuation of how things had always been. There were mixed views as to whether young mothering was good or bad. One woman said it was "just because, just one of those things, just accept it". As already noted, one woman who was interviewed thought Western views had led to young mothers being viewed as "disgusting". A key factor influencing people's views appears to be whether young mothers took responsibility for their children. One of the young, pregnant women who took part in the focus group said:

*"So young mothers who have kids and who don't worry about their kids and just dump them with their family that's really not good and they should be looked after"* [young woman under the age of 20 pregnant with first child].

Views on the appropriateness of young mothering were also tempered by whether it was seen as an active choice. One woman commented that based on her volunteer work:

*"Among young people things are getting worse. The girls have no freedom because of sexual abuse, grog, petrol – they don't see a choice, they keep sniffing and they refuse medication – the impact of things like sniffing on babies is not understood. Young girls don't use contraception, they sell their bodies, and they are also raped. There are not boundaries around their bodies"* [woman in her 30s with no children].

Young mothers receive great attention in the media, from policy makers and from researchers because of concerns about the negative effects of early parenting on their own life chances and because of the potential negative effects on the children born to young mothers. While the interview and short questionnaire respondents showed that



some Indigenous women do delay childbearing, and for not unexpected reasons such as education, employment and securing financial independence, this is not the case for most women. The documented births data show young mothering to be a long-standing trend among Indigenous women in the Northern Territory that is also reflected in the stories from Indigenous people's own families.

## 7.7: Discussion

That young childbearing is an enduring, contemporary demographic feature of the Indigenous population in the Northern Territory is clearly shown by the results in this chapter. Over half of all births are to women under the age of 25 years, and typically, childbearing is completed by this age. Moreover, fertility rates at the youngest ages (under 20 years) are extremely high. They exceed teenage fertility rates for Indigenous women elsewhere in Australia for the period under investigation here,<sup>86</sup> and exceed any historical teenage fertility rates for the non-Indigenous population (ABS 2008a).

This young childbearing is more of a feature in areas outside of the Darwin Urban area. However, the lower rates of young childbearing among Indigenous women living in the Darwin Urban region mask an apparent period and cohort increase in childbearing for the youngest women living in the Northern Territory's largest centre over the past 20 years. Despite these increases, the data hint at deferment of childbearing from the teen years to the early 20s, although such a trend is by no means overwhelming or self-evident.

Despite the relatively low total fertility rates discussed in Chapter Five, it is clear that some Indigenous women in the Northern Territory continue to have large families. On average, nearly 50 per cent of babies born each year to Indigenous mothers between 1986 and 2005 would have been the younger sibling to at least two older children. The DRUID Study women's health sample data show that these larger families are most common for women who start childbearing at young ages. The DRUID Study data also show that not staying at school beyond the age of 16 years is a significant 'predictor' of falling pregnant or having a baby before turning 20 years of age.

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<sup>86</sup> In 2008 and 2009, for the first time since birth registration data by Indigenous status have been available, the Northern Territory did not have the highest teenage fertility rate. The Northern Territory teenage fertility rate of 91 babies per 1,000 women was exceeded by Western Australia and South Australia (ABS 2009, ABS 2010).

All data sources available to us to explore Indigenous fertility in the Northern Territory, however, are subject to data effects. For the DRUID Study data, the need for dichotomous coding of post-school qualifications to ensure adequate numbers for analysis might have affected results. As has been shown, the perinatal data has an apparent youth bias compared to the vital registration data. The volatile trends over a 20-year period, particularly at the sub-Territory level, are perhaps indicative of small numbers influencing results. Geographic differences are ever-subject to concerns about the accuracy of coding of usual place of residence. Even taking these caveats into account, however, the youth profile of Indigenous childbearing remains clearly in evidence.

The impact of having children young is far reaching, both at a population level, and for the young mothers and their babies. Having children young affects rates of population growth and young mothers also contribute to a youthful population structure. Jackson (1998, 2008) has shown that an Indigenous minority population with a young age structure is likely to mask the true gaps in socio-economic outcomes between Indigenous and non-Indigenous populations. She demonstrated for Australia that declines in the gap between educational attainment of the Indigenous and non-Indigenous populations were a function of an Indigenous youthful age structure rather than true improvement (Jackson 2008).

For the young mothers themselves, having children obviously has impacts on their lives and life chances. Teenage pregnancy is associated with higher likelihood of experiencing socio-economic disadvantage for the mother and child (Jeon et al. 2008), and is also associated with low birthweight for the baby (Hendrickson 1998). In 2009, teenage births were included for the first time in the *Overcoming Indigenous Disadvantage Key Indicators* report (SCRGSP 2009), because Indigenous teenage fertility rates were so much higher than non-Indigenous teenage fertility rates.

But caution must be exercised in negatively labelling high fertility at young ages. Young entry to childbearing has been a feature of Northern Territory Indigenous demography from at least the middle of last century (Jones 1972, Gray 1983a, Smith 1980). A baptismal register from Daly River (a small community 220 kilometres south west of Darwin) for the period 1888-1901 indicates a period of high lifetime fertility starting at young ages (Gray 1983b). Information from a 1929 census of the Tiwi Islands (which

lies north of Darwin in the Arafura Sea) also points to high fertility, although age-specific estimates were not made (Peterson and Taylor 1998). Taylor (2004) showed that Murrin-Patha age grades from the Thamarrur region, first identified in the 1950s, remain largely the same in contemporary society. These age grades are developmental, ritual and gender-based life stages and are not linked to a particular chronological age. For girls, marriage and childbearing are key steps to advancing in each stage. Young mothering then has been a long-standing norm for Indigenous women in the Northern Territory.

The extremely high rates of young mothering among Indigenous women in the Northern Territory should not be summarily explained as traditional. High rates of sexual assault and domestic violence raise warning signs that at least some of these pregnancies are unwanted, or pregnancy used as a deterrent for further assault (Arabena 2006). Musharbash (2003) has observed for Yuendumu (a small, isolated community in the Central Australian desert) that having children young is a reaction of young women to the circumstances of contemporary settlement life. Looking after their children or those of their contemporaries, keeps young women occupied and they can do it surrounded by their peers. Coulehan (1995) in writing about Yolŋu (from northeast Arnhem Land) who moved to Darwin either permanently or temporarily to access services noted that motherhood offered autonomy to new mothers in the form of independent income and access to housing (in Darwin, not in home communities). Ireland (2009) observed the same autonomy derived from the receipt of parenting payments for mothers in Wadeye (on the Northern Territory's north-west coast). There is thus both social and economic value associated with children. Certainly, for many of the women interviewed for this research, the social capital gained from children was evident in the way they talked about extended family responsibility for children and the frequent gathering of extended families together.

This norm of young mothering shows little sign of precipitous change. Demographic transition theory is predicated on an assumption of declining fertility for all populations. The rapid fertility declines among Indigenous women in Australia documented by Gray (1983a) during the 1960s and 1970s were identified as being part of this demographic transition, with further fertility declines alongside a move to older childbearing predicted. These predictions are undermined by the evidence presented here.



## CHAPTER EIGHT: CONCLUSIONS

### 8.1: Indigenous fertility – stalled data transition?

“The history of attempting to improve statistical information about the Aboriginal population, especially where the information is based on administrative records, has been so discouraging that it is time to consider a radical solution” (Gray 1983a:318).

Almost 30 years ago, Gray’s radical solution to improving statistical information about the Indigenous population was to establish a national register of Aboriginal people. While in the 21<sup>st</sup> century in Australia there is now an extensive, albeit time shallow, statistical archive on Indigenous Australians within standard and specialised data collections (Rowse 2006), demographic research in Indigenous population change remains discouraging because of data inadequacies. Indeed, it is nearly 50 years since agitation for reform around recording of Indigenous status in vital events began in Australia (Smith 1982) and issues of completeness and accuracy remain (Smith et al. 2009). This research exploring contemporary features of Indigenous fertility in the Northern Territory of Australia over the past 20 years has shown that despite Indigenous population data in the Northern Territory being among Australia’s most accurate (Brown et al. 2008) there remain issues of accuracy of birth counts, accuracy of the information collected about individuals, and difficulties matching numerator and denominator populations.

This research has shown that Indigenous fertility rates for the Northern Territory derived from the perinatal data are lower and reflect a more youthful profile of childbearing than rates derived from vital registration data. The reasons for this difference in counts between the two data sets were not able to be identified through a forensic investigation of data collection and data cleaning mechanisms. Part of the ‘stalled data transition’ in Australia is the paucity of documentation about Indigenous population data collection mechanisms, particularly in relation to issues of accuracy, and the relatively limited public discourse about these shortcomings. This research addresses some of these issues and is one of its important contributions.

A primary hypothesis of this research was that Indigenous fertility rates in the Northern Territory were themselves an artefact of the data used to calculate those rates. All fertility analysis of the Indigenous population in the Northern Territory, particularly at

the sub-regional level, is hampered by data constraints and fertility trends were indeed influenced by choice of data set for analysis, and the denominator population used. Any demographic investigation that seeks a high level of specificity would be fallible and misguided because the flawed nature of the data would imply a degree of accuracy in the results that is not warranted. A key priority for the future must be to better understand the source of data problems. In the first instance, documentation of all data collection and cleaning processes is necessary so all data users are able to identify how data systems might influence measured population outcomes. As Chapter Three made clear, linking records between the vital registration and perinatal data sets would enable identification of any sources of undercount. Because both data sets have records generated by the same data system, CareSys, an investigation of data transfer processes is also warranted. Because of the compulsory movement of rural and remote Northern Territory women into town to give birth, and the recognised difficulties capturing usual place of residence from a highly mobile population, observations of data collection and cleaning processes following the traditions of demographic anthropology (Greenhalgh 2004, Morphy 2007a) would likely provide great elucidation of data collection and cleaning processes.

Vital registrations provide the timeliest and the most accurate data for time series analysis of fertility in the Northern Territory. While the perinatal data are the only source of information for investigation of historical birth timing and spacing, the Indigenous population in the Darwin Urban area is of a sufficient size to generate robust data for detailed analyses while maintaining confidentiality. The results presented here indicate that such investigation is justified and could provide important insight into differences between the behaviours of women in Darwin compared to those in rural and more remote areas.

The differences between births data sets have implications beyond fertility analysis. All population projections are constrained by their assumptions relating to fertility, as well as future migration and life expectancy. For the Indigenous population of the Northern Territory, fertility assumptions refer not only to the assumed future trends but the data source used for those fertility rates. Northern Territory population projections released in 2009 (Northern Territory Treasury 2009) assumed stable fertility into the future and were based on a total fertility rate (TFR) calculated from the perinatal data that was an average over the period 2001 to 2005, using a denominator derived from the 2001 census. The TFR is thus lower than a TFR derived from vital registrations (2.4 births

per woman compared to 2.9 births per woman). Using a basic projection model assuming zero migration, a TFR derived from the perinatal data shows the Indigenous population growing from 64,000 to 101,000 over 30 years whereas projected growth using a TFR derived from vital registration data shows growth from 64,000 to 113,000. The difference of 12,000 people is larger than every town in the Northern Territory outside Darwin, Palmerston and Alice Springs. The TFR used in the Northern Territory population projections was also higher than would have been the case if a denominator population derived from 2006 census data had been used. Understanding the differences between different sources of fertility data thus has important policy and service delivery implications. For the Northern Territory there are also strong financial implications, with monies distributed from the Australian Government determined by population size, distribution and Indigenous composition.

The limitations of contemporary population data collections to capture the reality of Indigenous peoples' lives come to the fore in relation to geographic variations in fertility rates. The higher urban fertility for Indigenous women in the Northern Territory identified by this research is surprising if the results are to be believed. Reliance on administrative boundaries is part of the issue, compounded by trying to capture complex population movements with a static, singular, 'usual place of residence' category. Responding to the challenge of measuring population movement within our data sets is within our technical and conceptual capabilities and will lead to better understanding of demographic regimes of different places. As outlined in Chapter Three, the reasons cited for miscoding of rural-remote residents as urban residents are not new and have been in place for the duration of each data set. Eliminating an assumption of population stability both within one house and in one place would be a first step in designing new ways to capture and record population information.

The level of accuracy of the data sets used in this research is difficult to 'test' against alternative sources. Some data sets, such as the National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) and the National Aboriginal and Torres Strait Islander Social Survey (NATSISS) are inaccessible because of the small numbers within the sample from the Northern Territory. The census, which is the most commonly used data source for historical studies of Indigenous fertility in Australia (Gray 1983a, Smith 1980) was shown to have severe limitations for measuring fertility levels in the Northern Territory because of undercount and non-response. Moreover, the census and other

data sources such as the DRUID Study's women's health sample were shown to offer limited insight into fertility change because the data were not collected with the primary purpose of understanding childbearing behaviour.

This research would not have been possible 20 years ago and the critical importance of having births and population data available by Indigenous status is acknowledged. However, the 'data transition' for understanding Indigenous fertility in the Northern Territory, and across Australia, will only continue when there is transparency about data collection processes, including documentation of those processes, and when greater attempts are made to capture population data that captures peoples' lived realities (*cf* Taylor 2009).

## **8.2: Stalled demographic transition in the Northern Territory**

This research hypothesised that fertility declines documented for Indigenous women in the Northern Territory during the 1960s and 1970s were not maintained into the 21<sup>st</sup> century. Certainly, the rapid declines observed by Gray (1983a) during the 1960s and 1970s were not in evidence during the two decades from the mid-1980s. The total fertility rates declined from the mid-1980s to the mid-1990s but have been characterised by fluctuations since then with returns to levels seen at the start of the 20-year periods. These summary rates belie complex geographic variations and fertility decline at the youngest ages in rural and remote parts of the Northern Territory.

Gray (1983a) concluded that the 1970s fertility decline for Indigenous Australians was concentrated among the older ages and there was little evidence of fertility decline at the younger ages. He predicted further fertility declines at the younger ages (among women less than 25 years of age) and a move to older childbearing. While there has been fertility decline among Indigenous women below the age of 20 years, most notably in areas outside Darwin Urban, childbearing remains highest for women in their early 20s. In this sense, contemporary fertility patterns in the Northern Territory among Indigenous women do represent stalled demographic transition because fertility rates have been remarkably stable since the 1980s without continued fertility decline.

Gray's prediction of a move to older childbearing is in evidence, though probably at a much slower rate and harder to identify than he might have expected three decades on. As was detailed in Chapter Five, if the age-specific fertility rates at the start and end of



the period 1988 to 2007 are looked at (*cf* Pool 2005), a gradual shift to older ages of childbearing for the Northern Territory as a whole can be seen. However, this deferment of childbearing seen at the Northern Territory level is not in evidence when sub-regions are examined. Any suggested move to older childbearing is thus complicated by where women live and their movements between town and bush. This raises uncomfortable questions about the possible impact of poor health status in remote communities on fertility, or more optimistically could reflect easier access to contraception in remote locations through local health clinics.

Any expectation that deferment of childbearing to older ages again will take place in the future is tempered by results based on the perinatal data. These show that the median age of first birth and of the end of childbearing barely changed over 20 years from 1986 to 2005 and are themselves a strong indicator of stalled demographic transition.

One of the most unexpected results emerging from the research was the higher urban fertility compared to rural and remote regions of the Northern Territory, a phenomenon displayed in results based on both vital registration and perinatal data. Higher urban than rural-remote fertility was the usual pattern for the 20-year periods observed when the impact of net migration between towns and rest of the Northern Territory was taken into account in the calculation of fertility rates. The abortion data most clearly highlighted this differential, with abortion rates and abortion ratios notably higher in the urban area of the Northern Territory. Age-specific fertility rates showed higher urban fertility to be less a feature of young mothers and more commonly associated with older mothers.

These geographic differences by age are linked to the way we understand delays in childbearing among Indigenous women across the Northern Territory but the data do not allow exploration of how or why. While the geographic differences found by this research are surprising, and should be treated with some caution as already noted in this Chapter, the results indicate that the demographic behaviour of Indigenous peoples will not necessarily conform to expectations based on population change experienced by other populations. The rising fertility seen among the urban Indigenous population in the Northern Territory cannot be lightly dismissed as a data anomaly. There is no evidence data miscoding of usual place of residence, the most cited reason for the high urban fertility, has worsened during the past 20 years thus pushing rates higher so key

questions remain. Does higher urban fertility reflect urbanisation by rural-remote women who are bringing higher childbearing with them into town, or does it reflect better health status due to better access to primary and tertiary health care services and thus higher fecundity, or does it reflect poorer access to contraception services where travel and cost may be factors? In remote communities with a health clinic, contraception is available at no financial cost and services are accessed by walking down a road. In towns and cities, access is much more difficult than this as free health services are limited and usually require transport in order to be reached. If nothing else, these differences by place indicate the importance of geography for understanding stalled fertility decline among Indigenous women in the Northern Territory.

The fertility declines documented for the 1970s among Indigenous women in the Northern Territory (and across Australia) raised expectations of conformity to an expected demographic transition with continued fertility declines and likely convergence of fertility rates with non-Indigenous Australians. It also raised expectations about the rate of fertility declines from the 1980s onwards. Such expectation may be misplaced as the Northern Territory is unlikely to see a similar confluence of dramatic changes in the near future as occurred during the 1970s. In the 1970s, infant mortality for Indigenous children rapidly declined, state-sanctioned child removal policies were halted, Indigenous people were free to move off mission and government-controlled reserves for the first time since colonisation and the land rights legislative reforms enabled a 'return to country' through the outstations<sup>87</sup> movement. While the mechanisms of influence on fertility cannot be demonstrated in this research, such significant changes must certainly have had some bearing on childbearing decisions. Moreover, modern effective methods of contraception became available during this time, although uptake levels among Indigenous women are not well understood. The relative stability of Indigenous fertility from the mid-1980s could reflect how little has changed in the social and political arena for Indigenous people in the Northern Territory since that time, a rather damning proposition. There is a strong imperative to explore these issues within the broader analytical framework outlined in Chapter Two.

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<sup>87</sup> Outstations are described as small (average size 30 people) relatively permanent decentralised communities consisting of closely related individuals that have been established by Aboriginal people with a strong traditional orientation (Blanchard 1987 cited in Taylor 1992).

### 8.3: Young motherhood

The final hypothesis of this thesis was that contemporary, Indigenous fertility in the Northern Territory is characterised by universal, young mothering but not high parity. Certainly the DRUID Study's women's health sample indicates that mothering is near universal among Indigenous women in the Darwin Urban region with most women in the sample reporting having been pregnant. Over 60 per cent of the sample had a first birth before the age of 25 years. Census data show that once women reach the age of 20 years they are more likely to report having had children than having had none. Childbearing is not the preserve of the young, however, with 72 per cent of the total fertility rate in 2007 attributable to births to mothers aged 25 years and older (the inverse of the early force of childbearing). Furthermore, while the TFRs for the 20-year period are relatively low, the parity data from the perinatal records, the DRUID Study and the census indicate that some women are having large families.

Northern Territory fertility rates, their levels and trends, are clearly driven by the childbearing of Indigenous women from rural and remote areas, and this includes the extremely young profile of Indigenous childbearing. The Darwin Urban area stands out as having different fertility patterns, most notably an upward fertility trend at all ages, albeit with lower fertility at the youngest ages compared to elsewhere in the Northern Territory. The Gray Childlessness Index as measured from census data indicates a move away from early childbearing in Darwin compared to other regions of the Northern Territory, but it is not a pattern supported by the vital registration data. Despite the geographic variability, stalled demographic transition appears common across all parts of the Northern Territory.

Education has been shown to be an important influence on age of entry to childbearing and parity. For women in the Darwin Urban region, the DRUID Study women's health sample showed leaving school at age 16 years or older, and completing Year 12 or a post-school qualification were significant indicators of a later age at first birth, and having a lesser number of children. While these indicators were identified as significant, the impact on age at first birth and number of children were not of dramatic proportions. Census data show that the influence of age of leaving school and employment were greatest in the Darwin Urban area compared to other areas within the Northern Territory. That said, regardless of place of residence, childlessness was higher among women who left school at age 16 years or older compared to those who left before they

turned 16, and among those who were employed compared to those who were not employed. The impact of education and employment on number of children as measured by the Index of Maternal Fertility was less pronounced.

The demonstrated links between education, employment and fertility outcomes provide evidence that continued improvements in school retention, completing qualifications and entering the paid workforce for Indigenous women in the Northern Territory will accompany, if not facilitate, continued fertility declines. This is particularly true in the Darwin Urban region. Access to contraception is also clearly important, with the DRUID Study women's health sample showing that using contraception for two or more years was associated with later age at first birth, reduced odds of having a teenage birth and lower parity. The anecdotal evidence of high uptake of Implanon among Indigenous women, particularly those living in rural and remote areas, has been overwhelming. It cannot be a coincidence that fertility and abortion rates have declined in rural-remote areas of the Northern Territory since Implanon's introduction to the Australian Register of Therapeutic Goods in 2000.

Fertility rates from Indigenous populations elsewhere in the world suggest this low parity childbearing concentrated at very young ages is a pattern that warrants closer inspection within a comparative framework. The similarities reported from North America and New Zealand in particular (e.g. Pool 1991, Pool et al. 2007, Ram 2004, Snipp 1996) could reflect relatively similar timing of colonisation across the globe with Indigenous populations following the same demographic transitions (*cf* Caldwell 2002). It is more probable that the imposition of colonial government policy and services, alienation from land and traditional kin structures, and continuing macro disadvantage in the introduced capitalist society have influenced, and continue to influence, fertility outcomes (*cf* Kunitz 1994).

#### **8.4: Research implications**

This research has exploited all available data sources to investigate Indigenous fertility in the Northern Territory, but as foreshadowed in Chapter Two, while it describes what has happened, it leaves many unanswered questions as to why. New research is needed that specifically focuses on fertility outcomes and investigates possible influences in relation to those outcomes. There is a need to explore how the results (the fertility outcomes) are influenced by the exogenous and social factors identified in the

conceptual framework detailed in Chapter Two. For example, contraceptive use needs to be better understood, particularly in pre and postnatal contexts, as do employment and education histories. A major shortcoming of data from the census and DRUID Study women's health sample for this research was the inability to make such linkages.

Exploring links between fertility, what influences fertility outcomes and why, needs to go beyond standard fertility surveys, which seek to obtain retrospective birth histories, and additional information such as contraceptive histories, marriage histories, employment histories and education histories (Johnstone et al. 2001, Pullum 2004). This research has shown how difficult it can be to obtain information on age from some Indigenous women and attempting to administer a standard retrospective fertility survey questionnaire would be farcical. Employing anthropological methods, in the respondents' own language would be paramount to obtaining any life history type information on birth, partnering or contraception issues. The methods of anthropological demography (Greenhalgh 1990, Szreter et al. 2004) provide the appropriate means to explore some of the key issues raised by this research, and the most suitable way to not only operationalise but also test the proposed conceptual framework.

Use of alternative analytical models for understanding Indigenous fertility is also likely to become increasingly important if the demographic, social and economic impacts of exogamous parenting are to be explored. As Robitaille and Guimond (1994) noted for the Aboriginal population of Quebec in Canada:

“To better identify [the Aboriginal] population and its demographic trends, it will now be necessary to rely on anthropological, political and sociological analyses and to adopt demographic analysis to a new reality whereby an ever-increasing proportion of the population is both Aboriginal and non-Aboriginal” (p. 453, author's translation).

These conclusions echo that of Gray (1983a:316-317):

“What is essentially required is a demographic, sociological, anthropological and economic multi-disciplinary study of the institution of the Aboriginal family, concentrating on dynamic aspects of events – births, family formations, family re-formations and other household changes”.

It is somewhat damning that so little work has been done to understand Indigenous fertility trends in Australia that a primary task of this research had to be a focus on the

data sources rather than responding to Gray's recommendation. It highlights the need for continued vigilance in monitoring long-term fertility trends and changing data collection and processing methods for Indigenous women, not only in the Northern Territory but across Australia. At the very least, historical fertility trends need to be reassessed every five years when population estimates from the quinquennial census are released.

The evidence from this research of stalled demographic transition is a clear indication that continued investigation of long term fertility trends is required to determine if or when fertility rates may fall in the future. Fertility is a key determinant of Indigenous population size and structure and understanding childbearing patterns will provide important clues for what the future population will look like. Maintenance of the current TFR for at least the short term future (10 years) appears a reasonable assumption. Even though there have been declines in fertility at the youngest ages, there have been some concomitant increases at slightly older ages. Moreover, we can expect to see recuperation of these deferred births at older ages which would mean even if there was a decline in the TFR there would be a later rise through the momentum of those deferred births, as happened for New Zealand Māori (Pool 2005).

There will also be different rates of Indigenous population growth between urban and rural-remote communities. While higher fertility at young ages in rural-remote settings means higher growth in the short term, vigilant monitoring of the geographic differentials identified in this research are needed to determine if the urban increases are long-term trends. Exploration of different geographic boundaries would also be useful, both within the Northern Territory and to ascertain if the same trends found in this research are found in the similar remote locations of the neighbouring states. The assumed role of Implanon in the fertility declines seen in rural and remote parts of the Northern Territory merits much closer investigation. Certainly, assuming the same TFR across all of the Northern Territory for Indigenous population projections is erroneous.

The future growth of the Indigenous population in the Northern Territory is further complicated by the impact of births of Indigenous babies to non-Indigenous mothers and Indigenous fathers. This was not investigated in this research, but has been shown to be important for the reproduction of Indigenous populations (Kukutai 2003, Robitaille and Guimond 2003, Robitaille et al. 2010, Wilson and Condon 2006).

Part of this redevelopment of alternative analytical and methodological models must include encouragement, recruitment and training of Indigenous social researchers to the task of analysing, and more importantly, interpreting demographic data and research results (*cf* Walter 2005). Population data can be powerful, but as Walter (2005) has observed, the use of quantitative methods and techniques is relatively uncommon among Indigenous Australian researchers. Understanding of the complexity of Indigenous fertility drivers into the future will only be strengthened if Indigenous researchers are actively involved in the research process and barriers to participation minimised (Kukutai and Webber 2008, Rigney 2001, Smith 1999, Wehipaihana 2008).

### **8.5: Social and policy implications for the Northern Territory and Australia**

While the parameters of population growth into the future may be less than clear, it is undisputed that the Indigenous population in the Northern Territory will continue to grow. As was shown in Chapter Five, birth cohorts will be of increasingly large size because of the higher number of women having children (as a result of past fertility trends). The slight deferment of births indicated from the teen years to the early 20s means we can also expect to see momentum effects on birth cohort sizes well into the future, even if fertility does fall. This has implications for competition for resources within each cohort, even if children are born into smaller families, and between cohorts of differing sizes.

The above replacement fertility means the Indigenous population age structure will remain young. As Jackson (1998, 2002, 2008) has shown for New Zealand and Australia, a young, minority population is at significant risk of unintended negative discrimination on the basis of age structure with the implementation of apparently neutral policy decisions. She particularly highlighted the potentially disparate impact of mainstreaming Indigenous-specific policies in Australia at a time when large cohorts are entering the education system and making their way towards tertiary education (Jackson 2008). Jackson's work showed deterioration in the gap between educational attainment of the Indigenous and non-Indigenous populations in Australia between 1981 and 2006, a disparity that will simply be multiplied by the relative proportions of the populations at each age. This is a particular issue in the Northern Territory where disparities are large and where Northern Territory and Australian government policy initiatives are aimed at 'closing the gap' in education and myriad other socio-economic and health indicators.

The implications of the contemporary fertility experience of Indigenous women in the Northern Territory for 'closing the gap' policies are significant. Given the slow rate of change in fertility rates over the past 20 years it can only be expected that young childbearing will remain the norm in the immediate future. While this research has focused on the Northern Territory, it is most likely that the patterns for the Northern Territory, driven by rural-remote reproductive behaviours, reflect the fertility patterns of the dispersed, remote populations in the Northern Territory's neighbouring state-based jurisdictions (Taylor et al. 2006, Hudson 1991). Any policy interventions aimed at school retention to Year 12, participation in tertiary education or in the paid workforce must assume that many young people will have child-minding responsibilities. While kin networks among Indigenous peoples have been shown to provide ready childcare, increased participation in education or paid work from current levels would place added burden on all carers and childcare options must figure in broader policy responses. Policies such as the Community Development Employment Project (CDEP) aim to provide skills for the long-term unemployed to enter the paid workforce. Expectations of workforce participation, and ability to move to employment opportunities, will be constrained by the family responsibilities most CDEP participants will have.

There are also serious implications for demand for housing. It has been estimated that in 2006, 60 per cent of Indigenous people in the Northern Territory were living in overcrowded housing. Population growth into the future will only exacerbate this demand. Moreover, the youthful profile of the Indigenous population and the young entry of women into childbearing means a rapid increase in demand for housing as new family units are established. Clearly, if there is insufficient housing for the current Indigenous population of the Northern Territory, particularly in remote regions, the problem will only be exacerbated into the future.

There are a range of social and health implications raised by the young profile of mothering among Indigenous women in the Northern Territory presented here. A primary concern is the increased risk of negative health outcomes for mother and child when the mother is under the age of 20 years. Poor health outcomes for the mother have implications for her ability to provide care for her child, and poor health outcomes for her baby (for example, prematurity and low birthweight) have life-long implications for that child. Girls born to teenage mothers may themselves be likely to go on to become teenage mothers (Anderson and Kahn 1992, Pool et al. 2007).



Early childbearing has been identified as an obstacle to social and economic equality for girls and women (United Nations 1994), and affects all aspects of later family and social life (Howard 1999). There are also issues for levels of parenting skills and the ability of parents to provide care. Younger parents also tend to have more limited financial and material resources to support children. While young mothering remains an established norm, the issue is to ensure adequate and appropriate supports are in place for these parents, and their wider kin networks who are also providing support to the young parents.

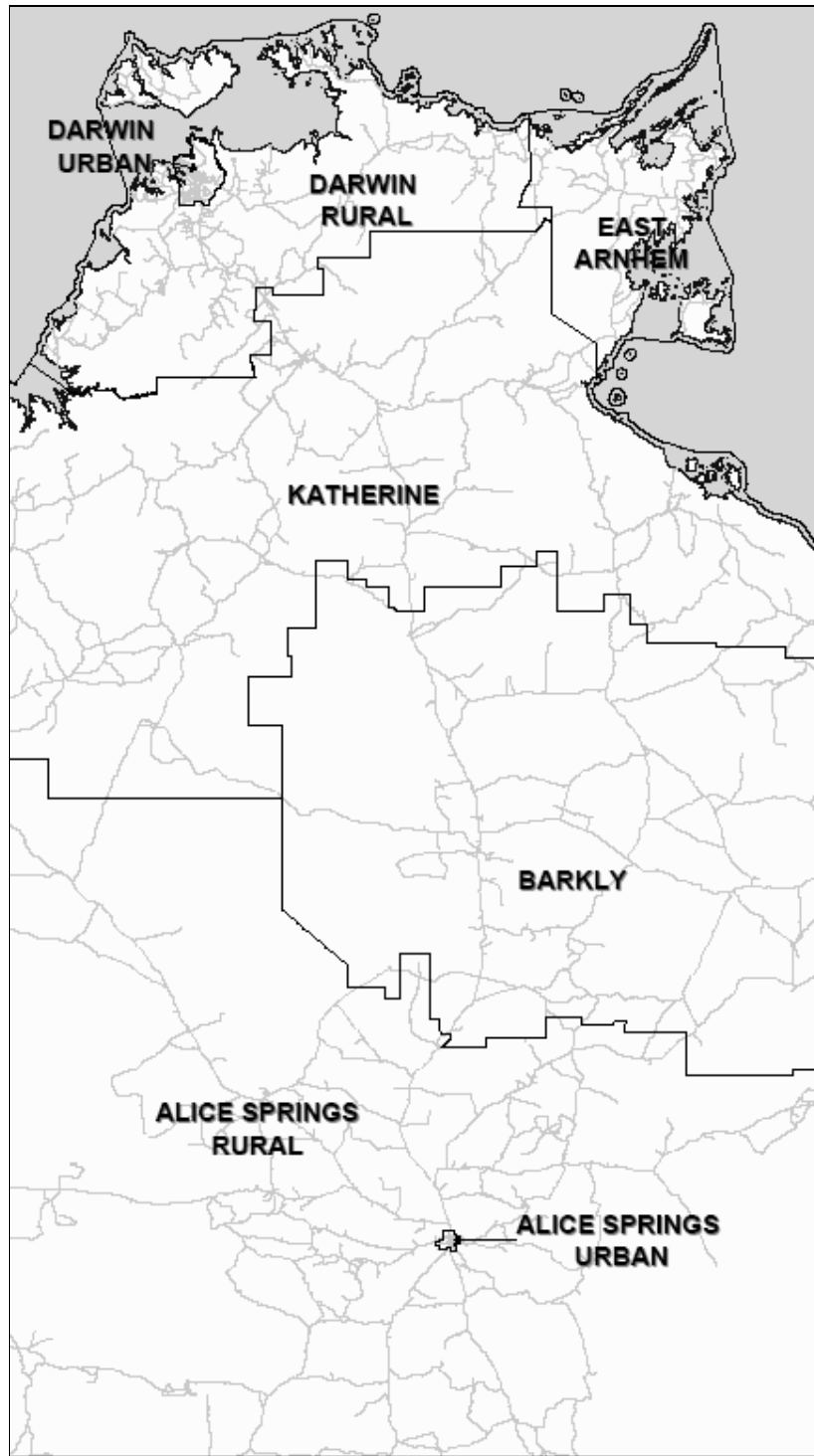
The wider implications of contemporary fertility patterns among Indigenous women are probably not fully appreciated. In New Zealand, fertility decline among Māori had a very significant effect on all aspects of the structure and organisation of *whānau* (family) (Pool et al. 2007). The same is undoubtedly true for Indigenous peoples across Australia. Current fertility patterns characterised by young childbearing, alongside urban drift, will continue to affect family and community structures and functioning. The relatively low TFR means a decline in the number of siblings within a family, which has implications for care of family members, both older kin (more likely as life expectancy improves) and younger children.

While the evidence suggests gradual fertility declines at very young ages, it is likely that Indigenous women will continue to have children at a rate above replacement. As one woman interviewed for this research reported about her daughters:

*“...both my two girls want to have large families. And I ask them why, and they say because it’s really important that they have, you know, people around to play with ... [my youngest] thinks that she’ll have at least six, and I’m thinking, oh [laughter], I’m just thinking about the number of times I’ll probably be going to the maternity ward, holding their hand”* [woman in her 50s with two children].



**Appendix A.1: Health districts, Department of Health,  
Northern Territory**





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