Adolescent Pregnancy in Australia

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Keywords

Australian adolescent pregnancy · Birth outcomes · Domestic violence · Emergency contraceptive pill · First intercourse · Illicit and licit drug use · Indigenous adolescents · Low birth weight · Rapid repeat adolescent pregnancy · Sexually transmitted infection

Introduction

The Commonwealth of Australia's mainland is made up of six states and three territories. All states and two of the three internal territories have their own parliaments and administer themselves; the remaining territories are administered by the Federal Government. The total population of Australia is estimated to be 22.7 million. Indigenous people are classified as the original people of Australia and all first nation and Torres Straight Islander peoples, who are recognized as such by their communities (Australian Bureau of Statistics 2010). The Aboriginal and Torres Strait Islander population comprises around 2.5 % of the Australian population.

Adolescent pregnancy is a major health, social, and economic issue for Australia. Research over more than three decades has identified many risk factors for early pregnancy (e.g., poverty, disrupted family structure, low educational achievement), but not yet an understanding of the multiple systems of influence, mediating mechanisms, and trajectories leading to adolescent pregnancy.

Trends in Australian Adolescent Birth over Time

The Australian Bureau of Statistics is Australia's national statistical agency. In Australia, the Australian Bureau of Statistics provides information in relation to the rate of adolescent pregnancy. The incidence of adolescent pregnancy is defined as the number of pregnancies per 1,000 adolescent females per year. Although the birth rate among Australian adolescents (aged 15–19 years) has fallen in recent decades to a low of 15.5 births per 1,000 in 2010 (Australian Bureau of Statistics 2010) (see Table 1).

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Table 1 Age-specific fertility rates for 15–19-year-old women using data from the Australian Bureau of Statistics

Year	NT	TAS	QLD	WA	NSW	SA	VIC	ACT	AUST
1971									55.5
1977									32.1
1980	98.9	38.1	36.9	30.2	28	26.3	21	19.9	27.6
1992	90.5	29	26.5	25	22.8	18.7	14.7	14	22.0
1997	75.5	27.3	25.6	21.2	19.5	16.2	12.4	13.5	19.8
2000	68.8	26.3	223.0	21.2	16.9	15.2	11.0	10.6	17.7
2001	71.0	32.7	22.6	19.4	17.1	14.5	11.5	9.8	17.7
2002	63.3	28.3	22.3	18.8	16.5	15.5	11.3	11.1	17.2
2003	63.5	26.1	21.4	18.5	15.0	14.7	10.2	8.6	16.1
2004	56.4	24.9	21.6	19.6	15.0	13.5	10.3	7.8	16.0
2005	61.4	26.8	20.4	20.5	13.4	18.5	9.7	9.1	15.7
2006	63.5	26.5	19.7	19.6	13.2	16.7	9.7	9.1	15.3
2007	58.8	27.4	23.0	20.5	12.3	17.5	10.0	10.3	16.0
2008	51.9	27.5	24.7	22.7	13.9	18.3	10.6	8.0	17.2
2009	48.0	27.1	26.7	20.1	13.0	15.9	9.9	9.7	16.7
2010	48.1	21.5	24.0	19.1	12.9	15.3	8.5	8.9	15.5

Data from the Australian Bureau of Statistics, birth catalogs (Australian Bureau of Statistics 2004, 2005, 2008, 2010)

Australia continues to have an adolescent birth rate several times higher than other comparable countries and Organization for Economic Co-operation and Development (OECD) nations, such as the Netherlands (United Nations International Children's Education Fund 2001; Shaw et al. 2006; Singh and Darroch 2000).

The downward trend in adolescent births (since the 1980s) has been attributed to the fact that Australian adolescents have had increasing control of their fertility (Australian Bureau of Statistics 2005), especially in terms of access to the combined oral contraceptive pill (Fraser and Ward 1995) and abortion following the reinterpretation of the abortion law in 1971 (Drabsch 2005) in New South Wales (when nationally the rate of teenagers giving birth had peaked at 55.5 births per 1,000) (Table 1).

Birth Trends with Indigenous and Rural Adolescents

There is evidence that not all cohorts of Australian adolescents are mirroring the overall downward trend in adolescent births (Table 2). Especially, those living in rural (Robson et al. 2006), socially disadvantaged areas (Coory 2000), and Indigenous adolescents (Van der Klis et al. 2002) who experience a fertility rate of 76.3 per 1,000 (Australian Bureau of Statistics 2010), more than four times that of non Indigenous adolescent women.

This situation is particularly apparent in Western Australia which has the highest rate of Indigenous adolescent pregnancy in Australia at 103.5 per 1,000 (Australian Bureau of Statistics 2010), six times higher than the overall rate of Australian adolescent births (Table 1). In 2008, births to Australian adolescent women accounted for 4 % of all Australian births, with Indigenous adolescent women accounting for 20 % of all births (Australian Bureau of Statistics 2008).

Characteristics of Australian Adolescents Who Give Birth

Although it is clear that there is heterogeneity in the adolescents who give birth, especially in terms of ethnicity (e.g., Indigenous adolescents are more likely to be single and less likely to be married than non Indigenous adolescents (Westenberg et al. 2002), there are also important

Table 2 Age-specific fertility rates for Indigenous 15–19-year-old women in Australia

Year	NT	TAS	QLD	WA	NSW	SA	VIC	AUST
1998	117.9		69.5	96.9	70.4	77.2	50.3	77.6
2001	146.1	51.4	74.2	85.3	58.9	54.2	36.3	75.9
2002	127.8	53.0	74.6	72.5	69.4	62.6	47.3	76.2
2004	111.0		68.0	88.0				70.9
2005	105.8	45.6	69.5	99.6	53.2	84.1	51.6	72.1
2006	116.3	32.2	61.6	89.7	57.0	71.6	47.6	69.0
2007	110.8	27.0	73.5	101.6	47.7	70.9	44.9	70.0
2008	91.0	36.5	77.1	116.6	56.9	94.3	50.6	75.2
2009	87.6	38.2	99.7	103.4	56.0	82.0	53.0	78.8
2010	91.1	35.9	94.7	103.5	56.3	75.6	38.7	76.3

Data from the Australian Bureau of Statistics, birth catalogs (Australian Bureau of Statistics 2004, 2006, 2008, 2010). Empty cells indicate there was no data available

similarities. These include: patterns in sexual activity; contraceptive use at first intercourse; disadvantage as a result of lower socioeconomic status; family characteristics; illicit and licit drug use; and domestic violence.

Sexual Activity

In Australia, the median age of first intercourse for females is 16 years (Rissel et al. 2003). Indigenous adolescents are more likely than non Indigenous adolescents to fall pregnant at a younger age (Australian Bureau of Statistics 2010; Westenberg et al. 2002). Cultural norms and social context shape sexual activity and pregnancy in adolescents. Among the most influential sources of social influence are parents, siblings, friends, and sexual partners. Sexual debut has been linked to gaining friends' respect, being strongest in those adolescents who are highly involved with their friends (Skinner et al. 2008, 2009).

Pressure from partners also plays a role in earlier sexual activity (Skinner et al. 2009) with male adolescents often having higher levels of pregnancy idealization than their female counterparts (Condon et al. 2000; Larkins et al. 2011). This may influence their female partners' wish to conceive. Research suggests that increasing numbers of 16–17-year-old females are having sex with multiple partners (Agius et al. 2010).

Sexually Transmitted Infection

Sexually transmitted infection is a major contributor to overall morbidity in the Australian adolescent age group (Skinner and Hickey 2003). Sexually transmissible infections among young Australians increased dramatically between 1997 and 2007, with rates of Chlamydia increasing by 528 % and rates of Gonorrhea by 169 % among those 15–19 years old (Macbeth et al. 2009). Pregnant adolescents have been found to have a high prevalence of Chlamydia (27 %) (Quinlivan et al. 1998) reinforcing the findings of others that consistent use of contraception in this cohort is low.

Abortion

Almost one-third of adolescents who give birth have previously been pregnant (Van der Klis et al. 2002). Australian adolescents have a high abortion rate with approximately half known pregnancies, ending in abortion (Joyce and Tran 2011; Van der Klis et al. 2002). Younger adolescents have higher rates of abortion, between 2006 and 2009; West Australian adolescents

terminated 70–80 % of their pregnancies. In 2003, the estimated rate of induced abortion for Australian adolescents was 20.8 per 1,000 (Grayson et al. 2005). Although the rate of induced abortion in Australian adolescents is declining, it is still higher than many Western European countries.

Australian rates of induced abortion tend to mirror South Australian trends. High socioeconomic areas in South Australia have been found to have the lowest adolescent pregnancy rates, but the highest proportion of adolescent induced abortion (Van der Klis et al. 2002). A South Australian time series study from 1996 to 2006 (which used cases from a termination of pregnancy service provider) found there had been no significant changes or trends in induced abortion for those adolescents 19 years and younger. Indigenous adolescents are more likely to have a live birth than their non Indigenous counterparts and less likely to have an induced abortion (Westenberg et al. 2002; Lewis et al. 2009).

Only a small number of states (South Australia, Western Australia, and the Northern Territory) actually require notification of abortions to a central register. National induced abortion rates are therefore estimated from Medical Benefits Scheme item numbers and are likely to be underestimated (Walker et al. 2011).

Rapid Repeat Adolescent Pregnancy

Rapid repeat adolescent pregnancy (when a second birth occurs within two years of a first) in Australia is high, with an estimated one-third of adolescent mothers giving birth again. An Australian prospective cohort study of 147 participants found 49 (33 %) experienced a rapid repeat pregnancy (Lewis et al. 2010a, b). Sexual intercourse was independently significantly associated with: using an oral contraceptive; living with the birth father; intending to become pregnant; smoking marijuana; and using alcohol. Adolescents who used an oral contraceptive had a similar risk of rapid repeat pregnancy compared with those using barrier methods or no contraception. Use of long-acting contraceptives reduced the likelihood of rapid repeat pregnancy. The adversity for adolescent mothers is amplified when a second pregnancy occurs within this short time period.

Disadvantage as a Result of Low Socioeconomic Status

Australian adolescent mothers are up to four times more likely to originate from poor families (Coory 2000; Gaudie et al. 2010) and have been brought up in and currently live in an area of socioeconomic disadvantage (Quinlivan et al. 2004; Van der Klis et al. 2002). In addition, Indigenous adolescent pregnancy is associated with lower socioeconomic status and residing in remote areas (Grayson et al. 2005).

By the time adolescent mothers are in their early 1930s, they are less likely than older mothers to be purchasing their own homes (Bradbury 2006). Analysis of responses from 9,689 young participants in the Longitudinal Study on Women's Health was used to examine predictors of outcomes of early motherhood in Australia, finding social disadvantage predisposes women to become mothers early and to adopt unhealthy behaviors (Lee and Gramotnev 2006). Financial stress caused by exclusion from both education and employment that is caused as a result of being an adolescent mother compounds this situation.

Education

Adolescent mothers are more likely than their older counterparts to come from a family background in which their own carriers did not reach an age appropriate education (Gaudie et al. 2010). Adolescents who see childbearing as a threat to their educational goals are less likely to become pregnant, with young women who chose abortion being more likely to have completed secondary school to year 12 (Evans 2004). Pregnant adolescents often have age inappropriate education

with one study highlighting 65 % are one school year or more behind (Lewis et al. 2010a, b) and another, that only one-third of pregnant adolescents had completed schooling beyond year 10 (Gaff-Smith 2005). This has implications for targeting sex education at those adolescents in school. In addition, the children of adolescent mothers have been found to have poorer school performance and reading ability (Shaw et al. 2006).

Family Characteristics

One-fifth of Australian adolescents, whose mother had been an adolescent mother, become adolescent mothers themselves. Disrupted family structure with a history of parental separation is common in the families of adolescent mothers. Family violence has also been identified as an issue (Gaudie et al. 2010; Quinlivan et al. 2004).

Partners Characteristics

Adolescents are more likely to be single parent than older mothers (Bradbury 2011; Shaw et al. 2006). In one study of 147 adolescent mothers in Perth, Australia, 34 % were no longer in a relationship with the father of their child at the time of the birth (Lewis et al. 2010a, b). It is also unlikely that adolescent mothers will be living with the father of their child when the child is an adolescent (Bradbury 2011; Bradbury and Norris 2005; Shaw et al. 2006). The mean age difference between adolescent mothers and the birth father is more than two to three years (Tan and Quinlivan 2006). Inevitably, some of these pregnancies result from involuntary sex, but the exact percentage is hard to assess as these data are rarely collected.

Fathers of infants born to adolescent mothers are consistently found to have age inappropriate education with an educational inadequacy of around two years (Tan and Quinlivan 2006). Low educational attainment and employment opportunities are common in these men; therefore, it is not surprising that they are likely to be socioeconomically disadvantaged with one-third of birth fathers, of infants born to adolescent mothers, being homeless or living in unstable accommodation (Quinlivan and Condon 2005).

It is inevitable that educational achievement will increase employment and income opportunities, which in turn affects the financial support that can be given to the adolescent mother and their child. In addition, these men are at increased risk of being exposed to domestic violence and family dysfunction as children. Involvement with illegal activities especially illicit drugs is not unusual (Tan and Quinlivan 2006).

Domestic Violence

Domestic violence and adolescent pregnancy have been shown to be associated with each other. Recent research suggests that one-fifth of pregnant adolescents experience physical abuse before the age of 16 years with 9 % experiencing both sexual and physical abuse (Quinlivan et al. 2004). Data from the younger cohort of the Australian Longitudinal Study on Women's Health, comprising 14,776 young women in 1996 (of whom 9,683 were resurveyed in 2000), found women reporting adolescent termination of pregnancy were more likely to be a victim of partner violence (Taft and Watson 2007). Australian adolescents subjected to domestic violence have been shown to exhibit reduced attachment to their infants (Quinlivan and Evans 2006).

Sexual Abuse

Adolescents, who have a pregnancy, are more likely to report having had an unwanted sexual experience in the past. The fourth National Survey of Australian Secondary Students HIV/AIDS and Sexual Health, surveyed almost 3,000 students in year 10 (aged 14–15 years), year 11 (aged 15–16 years) and year 12 (aged

16–17 years) in more than 100 secondary schools from every jurisdiction in Australia). It found the number of young women experiencing unwanted sex, had increased significantly between the 2002 and 2008 surveys (Smith et al. 2008).

Pregnant adolescents may require consideration as to whether they have been the victim of an abusive sexual relationship. If an adolescent has had a sexual relationship with an older person, then concerns regarding the possibility of sexual abuse or assault must be considered. Coercive relationships in this setting can be difficult to determine as most adolescent mothers who fall pregnant to an older partner, often describe a caring consensual relationship.

In Australia, sexual activity under the age of 16 is against the law. If a young pregnant adolescent presents to a health practitioner, there is a legal requirement to notify welfare authorities. Mature minor status of adolescent mothers less than 16 years (where the adolescent is deemed competent to choose or reject a specific health care treatment) needs to be carefully considered, and the pregnant adolescent's relationship often need to be monitored. A risk assessment based on the vulnerability of the young mother and the history of the partner should be made, hence the need for involvement of welfare services.

Smoking

Between 32 % (Lewis et al. 2009) and 42 % (Chan and Sullivan 2008) of Australian adolescents smoke during their pregnancy; while Indigenous pregnant adolescents are more likely to smoke than their non Indigenous counterparts. In addition, a retrospective study of 4,896 nulliparous pregnant women delivering in Western Australia found prevalence of smoking in pregnancy was associated with maternal ethnicity and age, with the youngest Indigenous adolescents (those aged 16 years and below) being the most likely to smoke (Lewis et al. 2009).

Using data from the New South Wales Midwives Data Collection (a population-based surveillance system administered by the New South Wales Department of Health that covers all births) for 1999–2003, 426,344 pregnancies were analyzed to explore the socio-demographic characteristics of women who continued to smoke during pregnancy. Smoking rates were highest in adolescents, Indigenous women, and those with a lower socioeconomic background (Mohsin and Bauman 2005).

A subsequent study by Mohsin et al. (2011) found that although the prevalence of smoking in Australian pregnancy had declined, the smallest declines were among adolescent and rural remote mothers. Maternal age, ethnicity, being Indigenous, living in an area of remoteness, and socioeconomic status were all independently associated with smoking in pregnancy. Smoking in adolescent pregnancy remains a public health issue especially for Indigenous women (Lewis et al. 2009), for whom tobacco use is a risk factor for premature morbidity and mortality (Australian Bureau of Statistics 2006).

Other Illicit and Licit Drug Use

Consumption of cigarettes, alcohol, marijuana, solvents, and heroin is higher in pregnant Australian adolescents than the general Australian adolescent population (Quinlivan et al. 1999). Use of alcohol is a risk factor for sexual activity in adolescents (Skinner et al. 2009) with 69 % of adolescent mothers found to use alcohol before they conceived (Lewis et al. 2010a, b). Use of alcohol reduces the perceived health benefits of protected sex with failure to use contraception being associated with the use of alcohol (Skinner et al. 2009). During pregnancy, alcohol and substance use drop off, but rates of smoking remain high. Postpartum, the use of cigarettes and alcohol and marijuana increases with time (Lewis et al. 2010a, b).

Contraception

Contraceptive counseling should be performed before adolescent females are prescribed contraception. Medico-legally, a young person who is a legal minor may need to be deemed competent to consent to treatment before contraception can be prescribed or administered without parental consent.

Australian research has identified that attitudes and beliefs of sexually active female adolescents have an impact on pregnancy risk. For example, those adolescents who perceive a low risk of pregnancy, or who consider that motherhood would have a positive impact on their lives, may be at higher risk of pregnancy. Some adolescent females believe they are infertile. These beliefs are usually based on their previous experiences of unprotected sex, which did not result in pregnancy. Adolescents may also hold false beliefs about side effects of contraception or of the limited efficacy of contraception (Skinner et al. 2009).

Where an adolescent perceives: pregnancy is low risk; that motherhood will have a positive impact on their lives; or that contraception has side effects; or is not effective, they are unlikely to have the motivation to use contraception consistently; their beliefs should be explored in a constructive way. For example, guiding the adolescent to consider how they and their family would feel if they fell pregnant may help. However, some adolescent females consider motherhood a logical and appropriate life choice, and it may not be possible or appropriate to change these beliefs. It may be more appropriate to ensure they understand the importance of good prenatal care (Lewis et al. 2010a, b).

In adolescent heterosexual relationships, the female partner usually assumes the responsibility for birth control. Many studies have found that pregnancy prevention is the main concern for both males and females who are sexually active, prevention of sexually transmitted infection concerns adolescents less. Couples should be encouraged to attend contraceptive counseling together, this provides an opportunity for the male partner to access sexual health clinical services and can help the couple to discuss contraception.

Contraceptive Use at First Intercourse

Consistent use of contraceptives in Australian adolescents is low, despite adolescents being aware of their contraceptive options (Larkins et al. 2007; Lewis et al. 2010a, b; Skinner et al. 2009). At first intercourse, most Australian teenagers only use condoms, or a less effective form of contraception such as withdrawal. Little Australian data are available in relation to patterns of contraceptive use at first intercourse in adolescence. Risky behaviors such as not using contraceptives consistently and doubting the need for contraceptives are increased by the developmental processes that adolescents are experiencing in conjunction with first sex (Skinner and Hickey 2003).

Over half adolescent pregnancies occur within six months of first intercourse (Marie Stopes International 2010) suggesting contraceptives were either not used or used inappropriately. Indeed, a recent study found although three quarters of female adolescents' did not intend pregnancy, just under half were not using contraception when they conceived (Lewis et al. 2010a, b). Therefore, adolescent females may present requesting contraception, some months after they become sexually active.

Australia has not implemented a comprehensive sexual health program to teach adolescents about their sexual health and the value of contraception to not only prevent pregnancy but sexually transmitted infection. This failure is perhaps based on the belief that education of children and young adolescents about contraception and safe sex may promote earlier sexual activity (Skinner and Hickey 2003).

Emergency Contraceptive Pill

Emergency contraception can be accessed through pharmacies in Australia without a

doctor's prescription; this provides for more rapid access and hence has the potential for greater efficacy. Adolescent females are the most frequent users of the emergency contraceptive pill at Australian Family Planning clinics (Mirzaj et al. 1998). However, recent research in relation to pharmacy access highlighted the finding that adolescents aged 16–19 years old were less likely than adults to access the emergency contraceptive pill (Hobbs et al. 2011). Despite this finding, an estimated 27 % of adolescents aged 16–19 years have used the emergency contraceptive pill (Smith et al. 2003).

Condom Use

Younger adolescents are more likely to use condoms than older adolescents. Younger adolescents tend to use condoms alone for pregnancy protection and then transition from condom use to hormonal contraception as their relationships become more established.

Studies exploring the knowledge and sexual health behaviors of secondary school students aged 14 to 17 years old repeatedly find 45 % of sexually active female Australian high school students do not use condoms consistently. An estimated 31 % of adolescents use condoms without another form of contraception, with those aged 14 to 15 years being more likely to use a condom than those aged 16 to 17 years (Agius et al. 2010; Lindsay et al. 1999). Indigenous adolescents have been found to lack ability to negotiate with partners in relation to condom use, with condoms being associated with shame, a bad reputation and coercion (Larkins et al. 2007).

Oral Contraceptive Pill

Contraceptive methods which require daily action, such as the contraceptive pill and those which are coital-dependent such as condoms, have higher typical failure rates than methods which are administered less frequently such as the long-reversible contraceptives (Lewis et al. 2010a, b). Australian qualitative research has highlighted that pregnant adolescents experienced difficulties with the oral contraceptive pill particularly in relation to remembering to take it consistently (Skinner et al. 2008).

The National Surveys of Australian Secondary Students, HIV/AIDS and Sexual Health, have shown consistently that hormonal contraceptive use is more common in older adolescents than younger adolescents (Lindsay et al. 1997). Similarly among Australian high school students, only 50 % report use of hormonal contraceptives at last sexual encounter. A survey conducted in 2001 by the Australia Bureau of Statistics, used data from a nationally representative sample of 5,872 women aged 18–49. It found women aged 18 and 19 had increased their use of the oral contraceptive pill from 21 % in 1977 to 38 % in 2001 (Yusef and Siedlecky 2007). However, data from a 1997 national survey of 3,550 Australian secondary school students highlighted that of the 961 sexually active students, 45 % were using the oral contraceptive pill with some other method of contraception (mainly condoms) and only 10 % were using the oral contraceptive pill exclusively (Lindsay et al. 1999).

Long-Acting Contraception

Long-acting contraceptives have been demonstrated to be more effective in the prevention of rapid repeat adolescent pregnancy (when a second birth occurs within two years of a first) than other forms of contraception (Lewis et al. 2010a, b). They have also been shown to be appropriate options for adolescents with low motivation to use contraception, as such they are a good choice for those wanting to avoid unplanned pregnancy.

An Australian prospective cohort study compared repeat adolescent pregnancy over a 24 month period postpartum, among users of three contraceptive groups (Implanon; oral contraception or Depot Medroxyprogesterone Acetate

and barrier methods or nothing). At 24 month postpartum, 35 % of adolescents had conceived. Implanon users became pregnant later than other contraceptive groups, with those choosing Implanon significantly less likely to become pregnant and to continue with this method of contraception 24 month postpartum, compared with those who chose the other contraceptive methods (Lewis et al. 2010a, b).

Birth Outcomes for Adolescent Women and Their Infants

Antenatally, Australian adolescents have been found to experience anemia, urinary tract infection, and pregnancy-induced hypertension more often than adults. Although most Australian studies report that adolescents' babies are at greater risk of adverse outcomes (Lewis et al. 2009; O'Leary et al. 2007; Van der Klis et al. 2002; Westenberg et al. 2002), it has been suggested both nationally and internationally (Ratikainen et al. 2006) that these associations can be minimized if high-quality antenatal care is provided. Therefore, it is concerning that Australian adolescents attend fewer antenatal visits (Van der Klis et al. 2002). Encouragingly, they are less likely to deliver by cesarean section and have fewer instrumental deliveries (O'Leary et al. 2007; Quinlivan and Evans 2004).

Neonatal Outcomes

Australian adolescent pregnancy is considered to be high risk for adverse neonatal outcomes specifically: preterm delivery; low birth weight; stillbirth; and neonatal death.

Indigenous adolescents are over represented among Australian adolescents who give birth, their babies are more likely to experience preterm birth, low birth weight, and childhood death than their non Indigenous counterparts (Freemantle et al. 2006a; Westenberg et al. 2002). Although it is encouraging that live births have increased and stillbirths decreased for the Indigenous population as a whole, from 2001 to 2004, infants born to Indigenous adolescents continued to have a higher incidence of death, especially those caused by infection (Freemantle et al. 2006b; Grayson et al. 2005). Despite obstetric advances in Australia in recent years, Indigenous adolescents remain one of the most vulnerable cohorts of women giving birth in Australia today.

Low Birth Weight and Preterm Delivery

Low birth weight (<2,500 g) and preterm labor is associated with Australian Adolescent pregnancy especially in association with smoking (Chan and Sullivan 2008) and being Indigenous (Lewis et al. 2009; Van der Klis et al. 2002; Westenberg et al. 2002).

Although the mechanisms associated with preterm labor are often not known, numerous factors have been found to be associated with preterm labor and adolescent pregnancy. These factors include: being l6 years of age or younger (Van der Klis et al. 2002); living in a rural/remote area (Robson et al. 2006); having limited access to adequate antenatal care (Quinlivan and Evans 2004); smoking (Lewis et al. 2009) and Indigenous status (Van der Klis et al. 2002; Van der Klis et al. 2002). Smoking is a modifiable factor which can be targeted to prevent low birth weight and decreased preterm delivery.

Stillbirth and Neonatal Death

Although the rate of stillbirth is decreasing among Indigenous adolescents, the stillbirth rate is consistently higher among Australian adolescents than Australian adults. A recent Western Australian study found the increased risk of stillbirth in adolescent mothers was completely explained by socio-demographic factors (O'Leary et al. 2007).

The risk of neonatal death (between birth and the first 28 days of life) is also higher in Australian adolescents than Australian adults (Van der Klis et al. 2002). This increased risk could be attributable to the higher risk of preterm birth

and low birth weight that the babies of Australian adolescent mothers experience. There is controversy in relation to whether this association can be explained by biological immaturity, lifestyle, inadequate prenatal care, or a combination of these factors (Freemantle et al. 2006b).

Welfare

Australian adolescents have numerous welfare benefits they can access. The most common are family tax benefits, youth allowance, and living away from home payments. In addition, Indigenous adolescents can receive help with their medical expenses.

The baby bonus is a cash payment introduced in 2004 by the Australian Federal Government to increase fertility. The initial 2004 payment was a one off payment of $3,000 (Australian dollars); this was increased to $4,000 (Australian dollars) in 2006 and $5,000 (Australian dollars) in 2008. In 2008, following media and public pressure, the one off payment to adolescents was reviewed and broken up into installments, for those mothers 18 years or younger at the time of their child's birth.

In the adolescent population, this bonus continues to cause concern because there is evidence that the baby bonus has had a negative impact on the declining rate of adolescent pregnancy (Lain et al. 2010) Although there is no evidence that births to first time adolescents have increased, second births to adolescents from disadvantaged or average socioeconomic status have increased since its implementation, along with a relative increase in rural and remote adolescent pregnancy (Lain et al. 2009).

Recommendations for Further Research

There is a need to build on the existing Australian research in relation to adolescent pregnancy. The following suggestions for further research are made:

- Research to investigate the value of sustained contraceptive support for adolescents.
- Further investigation in relation to pregnancy intention in adolescent pregnancy. Especially, how pregnancy intentions are assessed in this population, as the current research provides limited evidence for recommending clinical practice, and it is clear that this information would be useful for those caring for this population.
- Further research in relation to Indigenous adolescent pregnancy. This research may need to be performed by Indigenous researchers as they will be aware of the unique perceptions, values, and beliefs about pregnancy and parenthood that their culture holds.

Summary

Although there has been a downward trend in the number of Australian adolescents giving birth since the 1980s, the rate of Indigenous adolescent pregnancy is declining at a slower rate and is high compared with the average rate of Australian adolescent pregnancy.

In comparison with international data, research into Australian adolescent pregnancy is limited. We know that adolescent mothers in Australia are more likely to be: single, smoke, have high levels of illicit and licit substance use, live in an area of socioeconomic disadvantage, have pregnancies with uncertain dates, have partners at increased risk of exposure to domestic violence and family dysfunction as children, and partners who are often involved with illegal activities especially illicit drugs.

Over the last few decades, the median age of first pregnancy has increased significantly for non Indigenous women, while this has not occurred in the Indigenous population. When Indigenous adolescents are compared with non Indigenous adolescents, they are more likely to smoke, have anemia, and experience pregnancy-induced hypertension. Addressing Indigenous social disadvantage is complex. Providing Indigenous adolescents with culturally

appropriate and accessible contraceptive services should be an integral part of this process. This is important in terms of reducing Indigenous adolescent mothers exposure to the increased social inequality associated with adolescent pregnancy.

Adolescent parents and their children are vulnerable to adverse outcomes. It is likely that there are a number of maternal risk factors (e.g., smoking and being an Indigenous adolescent) which may precipitate medical and obstetric conditions resulting in adverse birth outcomes such as preterm delivery, low birth weight, and stillbirth. These maternal risk factors may be individual, psychological, or behavioral and identifying the individual pathways of the association between these maternal risk factors and adverse birth outcomes is difficult as they are likely to be multifaceted.

Greater understanding of the issues that surround adolescent pregnancy should be a high priority for Australia, especially in terms of evidence to assist with the development of effective intervention programs.

References

Agius, P., A., Pitts, M., K., Smith, A., M., & Mitchell, A. (2010). Sexual behaviour and related knowledge among a representative sample of secondary school students between 1997 and 2008. *The Australian and New Zealand Journal of Public Health*, *34*(5), 476–81.

Australian Bureau of Statistics. (2004). *Births, Australia*. Canberra, Australia: ABS cat. no. 3301.0. Retrieved from http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3301.02004?OpenDocument

Australian Bureau of Statistics. (2005). *Births, Australia*. Canberra, Australia: ABS cat. no. 3301.0. Retrieved from http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3301.02005?OpenDocument

Australian Bureau of Statistics. (2006). *Population distribution, Aboriginal and Torres Strait Islander Australians*. Canberra, Australia: ABS cat. no. 4705.0; 2006 Retrieved from http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4705.0Main+Features12006?OpenDocument

Australian Bureau of Statistics. (2008). *Births, Australia*. Canberra, Australia: ABS cat. no. 3301.0, Retrieved from http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3301.02008?OpenDocument

Australian Bureau of Statistics. (2010). *Births, Australia*. Canberra, Australia: ABS cat. no. 3301.0; (updated 2010). Retrieved from: http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3301.02010?OpenDocument

Bradbury, B. (2006). Disadvantage among Australian young mothers. *Australian Journal of Labour Economics, 9*(2), 147–171.

Bradbury, B. (2011). *Young Motherhood and Child Outcomes*. Report for the Department of Families, Housing, Community Services and Indigenous Affairs under the Deed of Agreement for the Provision of Social Policy Research Services: Social Policy Research Centre University of New South Wales.

Bradbury, B., & Norris, K. (2005). Income and separation. *Journal of Sociology, 41*(4), 425–446.

Chan, D., & Sullivan, E. (2008). Teenage smoking in pregnancy and birth weight: A population study, 2001–2004. *Medical Journal of Australia, 188*(7), 392–396.

Condon, J., Donovan, J., & Corkindale, C. (2000). Australian adolescents' attitudes and beliefs concerning pregnancy, childbirth and parenthood: the development, psychometric testing and results of a new scale. *Journal of Adolescence, 24*, 729–742.

Coory, M. (2000). Trends in birth rates for teenagers in Queensland, 1988 to 1997: an analysis by economic disadvantage and geographic remoteness. *The Australian and New Zealand Journal of Public Health, 24*(3), 316–319.

Drabsch, T. (2005). *Abortion and the law in New South Wales: Briefing Paper No 9/05*. Sydney: New South Wales Parliamentary Library. Retrieved from http://www.parliament.nsw.gov.au/prod/parlment/publications.nsf/0/4B0EC8

Evans, H. (2004). Education and the resolution of teenage pregnancy in Australia. *Health Sociology Review, 13*(1), 27–42.

Fraser, A., & Ward, R. (1995). Association of young maternal age with adverse reproductive outcomes. *The New England Journal of Medicine, 332*(17), 1113–1117.

Freemantle, C., J., Read, A., W., de Klerk, N., H., McAullay, D., Anderson, I., P., & Stanley, F., J. (2006). Patterns, trends, and increasing disparities in mortality for Aboriginal and non-Aboriginal infants born in Western Australia, 1980–2001: population database study. *The Lancet, 367*(9524), 1758–1766.

Freemantle, C. J., Read, A. W., De Klerk, N. H., McAullay, D., Anderson, I. P., & Stanley, F. J. (2006b). Sudden infant death syndrome and unascertainable deaths: Trends and disparities among Aboriginal and non-Aboriginal infants born in Western Australia from 1980 to 2001 inclusive. *Journal of Paediatrics and Child Health, 42*(7–8), 445–451.

Gaff-Smith, M. (2005). Are rural adolescents necessarily at risk of poorer obstetric and birth outcomes? *Australian Journal of Rural Health, 13*(2), 65–70.

Gaudie, J., Mitrou, F., Lawrence, D., Stanley, F.J., Silburn, S.R., & Zubrick, S.R. (2010). Antecedents of teenage pregnancy from a 14-year follow-up study using data linkage. *BMC Public Health, 10*(63). doi: 10.1186/1471-2458-10-63 Retrieved from http://www.biomedcentral.com/1471-2458/10/63

Grayson, N., Hargreaves, J., & Sullivan, E. (2005). *Use of routinely collected national data sets for reporting on induced abortion in Australia*. Sydney: AIHW National Perinatal Statistics Unit.

Hobbs, M., K., Tafta, A., J., Amir, L., H., Stewart, K., Shelley, J., M., Smith, A., M., Chapman, C. B. & Hussainy, S. Y. (2011). Pharmacy access to the emergency contraceptive pill: a national survey of a random sample of Australian women. *Contraception, 83*, 151–158.

Joyce, A., & Tran, B. (2011). *Induced Abortions in Western Australia 2006-2009*. Report of the Western Australian Abortion Notification System. Department of Health Department of Health, Western Australia.

Lain, S., J., Ford, J., B., Raynes-Greenow, C., H., Hadfield, R., M., Simpson, J., M., Morris, J., M., & Roberts, C., L. (2009). The impact of the Baby Bonus payment in New South Wales: who is having "one for the country"? *The Medical Journal of Australia, 190*(5), 238–241.

Lain, S., J., Roberts, C., L., Raynes-Greenow, C., H., & Morris, J. (2010). The impact of the baby bonus on maternity services in New South Wales. *Australian and New Zealand Journal of Obstetrics and Gynaecology, 50*(1), 25–29.

Larkins, S., Page, R., Panaretto, K., Scott, R., Mitchell, M., Alberts, V., et al. (2007). Attitudes and behaviours of young Indigenous people in Townsville concerning relationships, sex and contraception: the "U Mob Yarn Up" project. *The Medical Journal of Australia, 186*, 513–518.

Larkins, S., L., Page, R., P., Panaretto, K., S., Mitchell, M., Alberts, V., McGinty, S., & Veitch, P. (2011). The transformative potential of young motherhood for disadvantaged Aboriginal and Torres Strait Islander women in Townsville, Australia. *Medical Journal of Australia, 194*(10), 551–555.

Lee, C., & Gramotnev, H. (2006). Predictors and outcomes of early motherhood in the Australian longitudinal study on women's health. *Psychology, Health & Medicine, 11*(2), 29–47.

Lewis, L., Hickey, M., Doherty, D., & Skinner, S. (2009). How do pregnancy outcomes differ in teenage mothers? A Western Australian study. *The Medical Journal of Australia, 190*(10), 537–541.

Lewis, L., N., Doherty, D., A., Hickey, M., & Skinner, S. R. (2010). Implanon as a contraceptive choice for teenage mothers: a comparison of contraceptive choices, acceptability and repeat pregnancy. *Contraception, 81*(5), 421–426.

Lewis, L. N., Doherty, D. A., Hickey, M., & Skinner, S. R. (2010b). Predictors of sexual intercourse and rapid-repeat pregnancy among teenage mothers: an Australian prospective longitudinal study. *The Medical Journal of Australia, 193*(6), 338–342.

Lindsay, J., Smith, A., & Rosenthal, D. (1997). *Secondary students HIV/AIDS and sexual health 1997*. Carlton: Centre for the Study of Sexually Transmissible Diseases, La Trobe University Australia.

Lindsay, J., Smith, A., & Rosenthal, D. A. (1999). Conflicting advice? Australian adolescents' use of condoms or the pill. *Family Planning Perspectives, 31*, 190–194.

Macbeth, A., Weerakoon, P., & Sitharthan, G. (2009). Pilot study of Australian school-based sexual health education: Parents' views. *Sexual Health, 6*, 328–333.

Marie Stopes International. (2010). *Marie Stopes International Australia.* Retrieved from http://www.mariestopes.org.au/

Mirzaj, T., Kovacs, G. T., & McDonald, P. (1998). The use of reproductive health services by young women in Australia. *The Australian and New Zealand Journal of Obstetrics and Gynaecology, 38*(3), 336–339.

Mohsin, M., & Bauman, A. (2005). Socio-demographic factors associated with smoking and smoking cessation among 426,344 pregnant women in New South Wales, Australia. *BMC Public Health, 5* 138. doi: 10.1186/1471-2458-5-13. Retrieved from http://www.biomedcentral.com/1471-2458/5/138

Mohsin, M., Bauman, A. E., & Forero, R. (2011). Socio-economic correlates and trends in smoking in pregnancy in New South Wales, Australia. *Journal of Epidemiology and Community Health, 65*(8), 727–732.

O'Leary, C., Bower, C., & Knuiman, M. (2007). Changing risks of stillbirth and neonatal mortality associated with maternal age in Western Australia 1984–2003. *Paediatric and Perinatal Epidemiology, 21*(6), 541–549.

Quinlivan, J., & Condon, J. (2005). Anxiety and depression in fathers in teenage pregnancy. *The Australian and New Zealand Journal of Psychiatry, 39*(10), 915–920.

Quinlivan, J., A., & Evans, S., F. (2004). Teenage antenatal clinics may reduce the rate of preterm birth: a prospective study. BJOG: *An International Journal of Obstetrics & Gynaecology, 111*(6), 571–578.

Quinlivan, J., A., & Evans, S., F. (2006). Impact of domestic violence and drug abuse in pregnancy on maternal attachment and infant temperament in teenage mothers in the setting of best clinical practice. *Archives of Women's Mental Health, 8,* 191–199.

Quinlivan, J., Peterson, R., & Gurrin, L. (1998). High prevalence of chlamydia and Pap-smear abnormalities in pregnant adolescents warrants routine screening. *The Australian and New Zealand Journal of Obstetrics and Gynaecology, 38*(3), 245–257.

Quinlivan, J., A., Petersen, R, W., & Gurrin, L. C. (1999). Adolescent pregnancy: psychopathology missed. *Australian and New Zealand Journal of Psychiatry, 33*(6), 864–868.

Quinlivan, J., Tan, L., Steel, A., & Black, K. (2004). Impact of demographic factors, early family relationships and depressive symptamology in teenage pregnancy. *The Australian and New Zealand Journal of Obstetrics and Gynaecology, 38*(4), 197–203.

Raatikainen, K., Heiskanen, N., Verkasalo, P., & Heinonen, S. (2006). Good outcome of teenage pregnancies in high-quality maternity care. *European Journal of Public Health, 16*(2), 157–161. doi:10.1093/eurpub/cki158

Rissel, C., Richters, J., Grulich, A., de Visser, R., & Smith, A. (2003). Sex in Australia: First experiences of vaginal intercourse and oral sex among a representative sample of adults. *The Australian and New Zealand Journal of Public Health, 27*(2), 131–137.

Robson, S., Cameron, C., & Roberts, C. (2006). Birth outcomes for teenage women in New South Wales, 1998–2003. *The Australian and New Zealand Journal of Obstetrics and Gynaecology, 46*(4), 305–310.

Shaw, M., Lawlor, D., & Najman, J. (2006). Teenage children of teenage mothers: psychological, behavioural and health outcomes from an Australian prospective longitudinal study. *Social Science and Medicine, 62*(10), 2526–2539.

Singh, S., & Darroch, J. (2000). Adolescent pregnancy and childbearing: Levels and trends in developed countries. *Family Planning Perspective, 32*(1), 14–23.

Skinner, S., & Hickey, M. (2003). Current priorities for adolescent sexual and reproductive health in Australia. *The Medical Journal of Australia, 179*(3), 158–161.

Skinner, S., R., Smith, J., Fenwick, J., Fyfe, S., & Hendriks, J. (2008). Perceptions and experiences of first sexual intercourse in Australian adolescent females. *Journal of Adolescent Health, 43*(6), 593–599.

Skinner, S., R., Smith, J., Fenwick, J., Hendriks, J., Fyfe, S., & Kendall, G. (2009). Pregnancy and protection: Perceptions, attitudes and experiences of Australian female adolescents. *Women and Birth, 22*(2), 50–56.

Smith, A., M., Rissel, C., E., Richters, J., Grulich, A., E., & de Visser, R., O. (2003). Sex in Australia: Reproductive experiences and reproductive health among a representative sample of women. *Australian and New Zealand Journal of Public Health, 27*(2), 204–209.

Smith, A., Agius, P., A., Mitchell, A., Barrett, C., & Pitts, M., K. (2008). *Secondary Students and Sexual Health.* Melbourne: Australian Research Centre in Sex, Health & Society, La Trobe University.

Taft, A., J., & Watson, L., F. (2007). Termination of pregnancy: associations with partner violence and other factors in a national cohort of young Australian women. *The Australian and New Zealand Journal of Public Health, 31*(2), 135–142.

Tan, L., H., & Quinlivan, J., A. (2006). Domestic violence, single parenthood, and fathers in the setting of teenage pregnancy. *Journal of Adolescent Health, 38*(3), 201–207.

United Nations International Children's Education Fund. (2001). *A league table of teenage births in rich nations.* Florence, Italy: UNICEF. Retrieved from http://www.unicef-irc.org/publications/pdf/repcard3e.pdf

Van der Klis, K., Westenberg, L., Chan, A., Dekker, G., & Keane, R. (2002). Teenage pregnancy: Trends, characteristics and outcomes in South Australia and Australia. *The Australian and New Zealand Journal of Public Health, 26*(2), 125–131.

Walker, J., McNamee, K., Kaldor, J. K., Donovan, B., Fairley, C. K., Pirotta, M., et al. (2011). The incidence of induced abortion in a prospective cohort study of 16- to 25-year-old Australian women. *Sexual Health, 8*, 439–441.

Westenberg, L., Van der Klis, K., Chan, A., Dekker, G., & Keane, R. (2002). Aboriginal teenage pregnancies compared with non-Aboriginal in South Australia 1995–1999. *The Australian and New Zealand Journal of Obstetrics and Gynaecology, 42*(2), 187–192.

Yusef, F., & Siedlecky, S. (2007). Patterns of contraceptive use in Australia: Analysis of the 2001 national health survey. *Journal of Biosocial Science, 39*, 735–744.