



Current Trends for Teenage Births in New Zealand



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This report is based on two draft reports prepared for the Families Commission by researchers at the National Institute of Demographic and Economic Analysis at the University of Waikato:

- *Update on the Regional and National Trends in Teen Births* by Shefali Pawar and Natalie Jackson

- *Current Trends for Teen Births in New Zealand* by Mervyl McPherson



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Trends in teenage births

Fewer teenagers are giving birth

- The number of teenage births continues to decline.
- New Zealand's teenage birth rate in 2013 was 23.8 births per 1,000 women aged 15-19 years.
- The proportion of teenage registered births has also declined, with teenage mothers accounting for only 5.9 per cent of births in 2013. This is the lowest recorded percentage accounted for by teenage mothers, and 0.8 percentage points below the level in 2001 (6.7 per cent).

Fewer teenagers under the age of 18 are giving birth

- The decline in teenage fertility is greatest for younger teenagers. There were fewer births to younger teenagers (17 years and under) over the period 2006 to 2013, with the proportion declining from 33.4 per cent of all teenage births in 2006, to 28.4 per cent in 2013.
- Births to teenage mothers are increasingly occurring during the older teenage years. Almost three-quarters (71.6%) of all teenage births in 2013 were to 18 and 19 year olds (up from 66.6% in 2006).

Few young teenagers have a second child before they are 20 years old

- After having a first birth at age 15 in 2008, very few New Zealand women were likely to have a second or subsequent birth before their 20th birthday¹. The probability of having a subsequent birth was lower than the national average in Auckland, Wellington and Canterbury, as well as in the rest of the South Island. The smaller rural regions had marginally higher probabilities of teenage mothers progressing to a subsequent birth, with the highest likelihood for Northland and Gisborne.

Teenage births are decreasing in most regions

- Teenage births have declined across all regions in New Zealand, except Northland where there was a small increase. The most significant declines over 2001-2013 were seen in Wellington and Taranaki. The metropolitan regions of Auckland, Wellington, Canterbury, along with the rest of the South Island, have teenage birth rates well below the national average. In Northland and Gisborne, the age-specific fertility rate per 1,000 women aged 15-19 in 2013 was significantly higher than the national average. The predominantly rural regions of the Hawke's Bay, Bay of Plenty, Waikato and Manawatu-Wanganui also have relatively high teenage birth rates.

The teenage birth rate is declining for Māori

- The Māori teenage birth rate in 2013 was 53.1 births per 1,000 women aged 15-19 years, down from 72.2 births in 2000.

¹ It should be noted that those giving birth age 15 are a very small cohort



- The Māori teenage birth rate is still higher than the national rate, but both rates are declining and the gap between them is narrowing.

Rates of teenage pregnancy are also dropping internationally, but New Zealand still has a comparatively high teenage birth rate

- New Zealand has a higher rate of teenage births than other comparable countries, except for the United States.
- Like New Zealand, many other countries showed a pattern of a temporary increase in teenage births in the mid-2000s, followed by a decline. This suggests that influences on the teenage birth rate are widespread and not specific to New Zealand.

Drivers

- The factors driving both the likelihood of teenage pregnancy and its decline are multifaceted, suggesting that prevention interventions also need to be multifaceted.
- Both international and New Zealand research suggests that important factors in this decline are the increasing use of contraception and less sexual activity amongst teenagers. In New Zealand, the Youth 2000 survey series of secondary school students (carried out in 2001, 2007 and 2012) found decreases in sexual activity and pregnancy between 2007 and 2012.
- Research suggests a link between social disadvantage and teenage births. In New Zealand, a 2011 report by the Families Commission noted higher rates of teenage pregnancy in lower socio-economic areas of New Zealand. Social disadvantage is broader than financial; extending to factors such as parental involvement, education, employment opportunities, leisure and community involvement.
- Cultural differences in norms, values and traditions also underlie sub-population/group differences in teenage birth rates. These can act to both increase and decrease rate of early motherhood. American studies with African-American, Latino or American-Indian youths identify a range of factors, in addition to disadvantage, that may explain ethnic differentials in teenage birth rates. These include cultural attitudes or norms towards early motherhood, cultural support systems for young mothers and their children, cultural identity transition and conflict between traditional family culture and the culture of wider society, and access to health services and information.
- The declining birth rate in the United States has been linked to the provision of accessible information and services to teenagers and more holistic education programmes that go beyond information about sex and contraception. International research indicates that trends and drivers vary for teenagers of different ages and ethnicities, and therefore interventions may be most effective if they are appropriately targeted.

Implications

- The implications for New Zealand of a declining teenage birth rate need to be considered in the context of 21st century population decline and structural ageing.
- Relatively high teenage birth rates in countries like New Zealand and the US are part of generally higher total fertility rates. A potential benefit is that this may offer some protection against the impacts of structural ageing, such as a declining population of workforce age to support a growing proportion of elderly people.



Has there been a change in the teenage birth rate, and why?

Policymakers in New Zealand have been concerned by the teenage birth rate for many years. Cross-country comparisons indicate that New Zealand has a higher rate of teenage births than other comparable countries, except for the United States (see section 2 below). In 2012, in response to a ministerial request, the Families Commission contracted the National Institute of Demographic and Economic Analysis (NIDEA) at the University of Waikato to analyse birth registration data and report on national and regional trends in teenage births for the ten year period 2002 to 2011.² A key finding of this study was that the teenage birth rate in New Zealand declined significantly between 1962 and 1985 and then remained fairly stable. Rates rose slightly in the mid-2000s and fell back again.

In 2014, the Commission contracted NIDEA to update this analysis by including data for two additional years, 2012 and 2013 (where available), to examine current trends and any changes.³ An additional focus of the updated analysis has been to examine what factors may be contributing to the declining teenage birth rate.

More specifically, this report addresses the following questions contained in the Families Commission proposal for the updated report:

- What are the current trends in teenage births?
- How have they changed over the longer term?
- How have they changed recently?
- Are there significant⁴ differences in these trends by area and ethnicity?
- Is the reduction consistent across ethnicities?
- How do these trends compare internationally?
- What might be driving these changes?
- What are the implications of these changes?

The report outlines current trends, as identified through the updated analysis of teenage birth data, along with contextual information on age-related trends, ethnic trends and international comparisons. It then discusses the potential drivers of these trends including direct drivers, such as contraceptive use and sexual activity, as well as underlying or indirect drivers such as socio-economic circumstances, ethnic and cultural differences and

² See Sceats et al., (2012) 'Teen births: regional and national trends' presented to the Families Commission in August 2012.

³ A three year rolling average of the year of registration / year of delivery was used for the analysis presented in the original report (e.g. the average of the number of live births in 2002, 2003 and 2004 was used as the estimate for 2003; the average for 2003, 2004 and 2005 was used as the estimate for 2004 and so on). The rolling average for the year 2011 was consequently based on a two year average instead of three. This report update is also based on rolling averages. In this report the value for 2011 is revised to a three year rolling average (2010, 2011 and 2012). This means that the numbers presented for 2011 will differ to those in the original report. However, the numbers for 2002 and 2013 remain based on their respective two year averages. It should be noted that although the majority of the data for the year 2013 would have been recorded in the Birth Registration database at the time of extraction, a small number of births may not have been registered by June 2014. In case of the MAT (National Maternity Collection) database, the data for the 2012 year is still provisional and that for 2013 not available.

⁴ Note that this does not refer to statistical significance which is relevant only to sample data, not population data.



family characteristics. The report concludes by discussing the implications of these trends and offers suggestions for further research and action.

Key Statistical Measures and Definitions

Number of teenage births: The number of teenagers giving birth in a given year.

Proportion of teenage births: The proportion of teenagers amongst all women giving birth in a given year.

Teenage birth rate: the number of live births per 1,000 women aged 15-19 years.

Age-specific fertility rates⁵: The number of live births per 1,000 women for a particular age group in a given year.

Section 1: What are the current trends in teenage births?

The following discussion of key trends is based on two measures of teenage births: number/proportion of teenage births and age-specific fertility rates for teenagers.

1.1 Fewer teenagers are giving birth

Key finding: both the number of teenage births and the teenage birth rate have declined in recent years, continuing a long term trend.

Number and proportion of teenage births

In 2013, 3,546 births to teenagers were registered, accounting for 5.9 per cent of all births recorded that year.⁶ This reflects a continuing decline.⁷ Figure 1 below shows the number of registered births to mothers aged less than 20 years, and the proportion of all women giving birth over the 2001-2013 period who were teenagers (analysis based on rolling averages). Overall, looking at the period 2001-2013, the number of teenage births has declined by 19.8 per cent with a significant decline in the second half of the period (2006-2013) offsetting the increase in 2001-2006. Between 2001 and 2006 the number of teenage births increased by 20.0 per cent (+750 births) and then declined by a slightly higher margin (-21.0 per cent, 942 fewer births) over the period 2006-2013. It should be noted that these trends mirror those for all women of reproductive age. After peaking in 2007 and 2008, the proportion of all births that are teenage births has continued to decline, reaching 5.9 per cent in 2013, which is the lowest percentage ever recorded and 0.8 percentage points below the level recorded in 2001 (6.7%).⁸

⁵ Age-specific fertility rates are used in addition to numbers of births as they control for possible changes over time in the number of women in a particular age group.

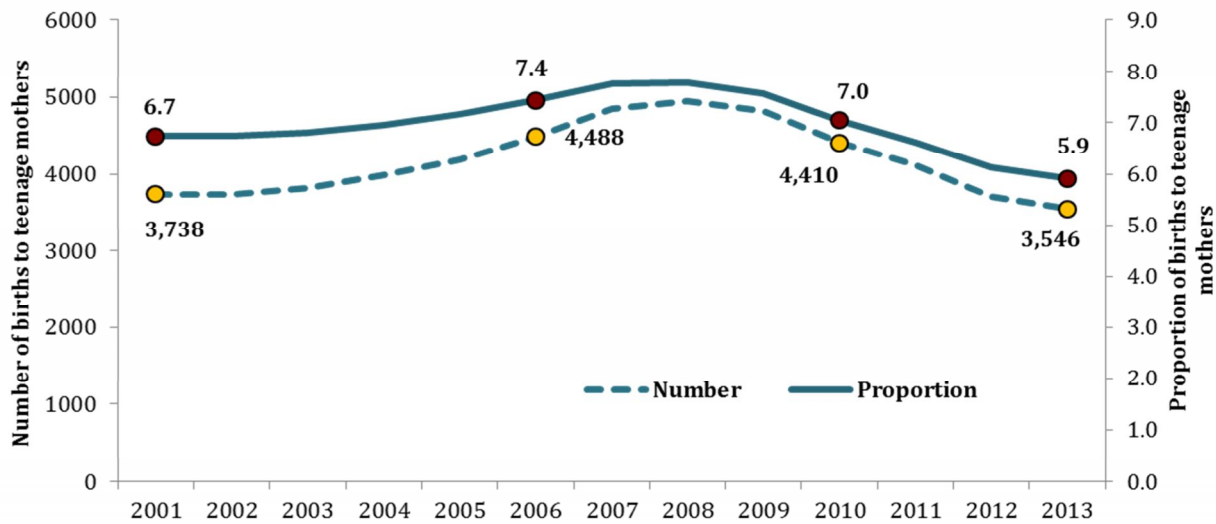
⁶ The number of registered births for 2013 is based on a two-year rolling average (2012 and 2013) instead of the three years used for the other years.

⁷ See Appendix Tables 1 and 2 for the underlying Birth Registration data used in this analysis, as well as MAT data which produced similar results.

⁸ See Appendix Figure 1 for the proportion of teenage mothers aged less than 20 years among women giving birth over the 1962 – 2013 period as published by Statistics New Zealand.



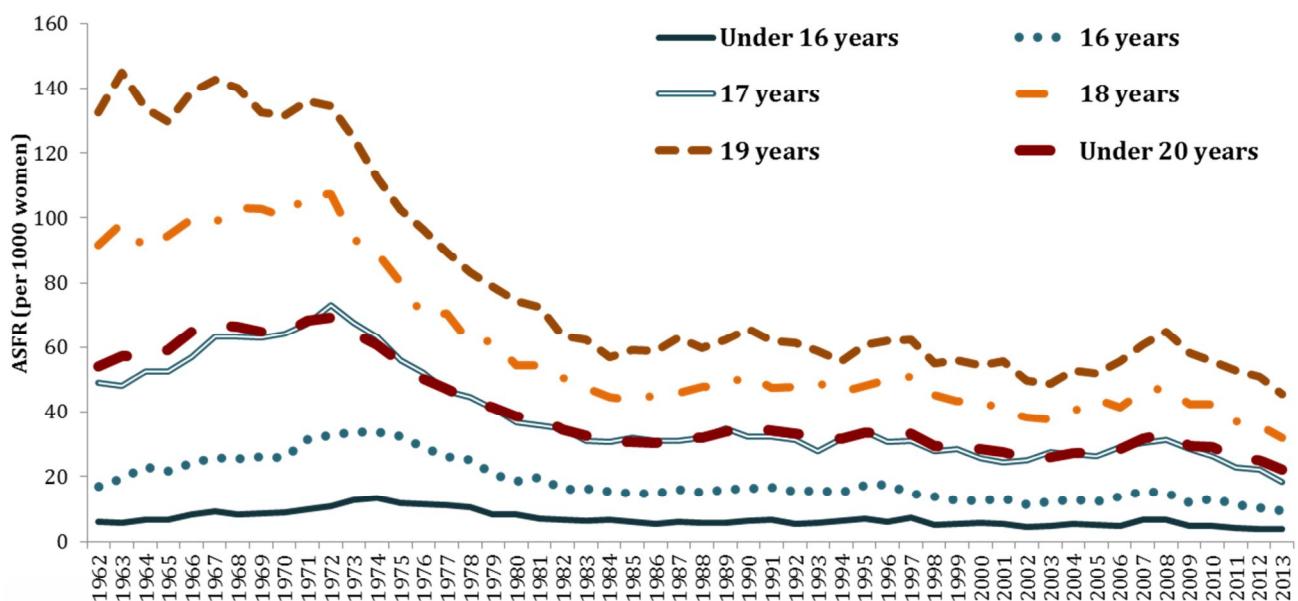
Figure 1: Number and proportion of registered births to teenagers over the period 2001-2013



Age specific fertility rates for teenagers

To place current trends in a historic context, Figure 2 shows the national age specific fertility rates (ASFRs) for mothers aged less than 20 years, over the period 1962-2013 (refer to Appendix Table 3 for the underlying data). The national age specific fertility rates presented in this section are based on published data by Statistics New Zealand. Age specific fertility rates for teenagers started to decline significantly after 1970. Over the two-decade period 1970-1990, the ASFR for all women aged less than 20 years declined by 45.3 per cent, with the sharpest declines in the three oldest teenage years of 17, 18 and 19. After 1990, the ASFR for teenagers continued to decline, except for the years 2007 and 2008, when the rates were unusually high (the period referred to as a 'baby blip' and affecting women of all ages).

Figure 2: Age specific fertility rates (ASFR per 1,000) for teenage mothers over the period 1962-2013



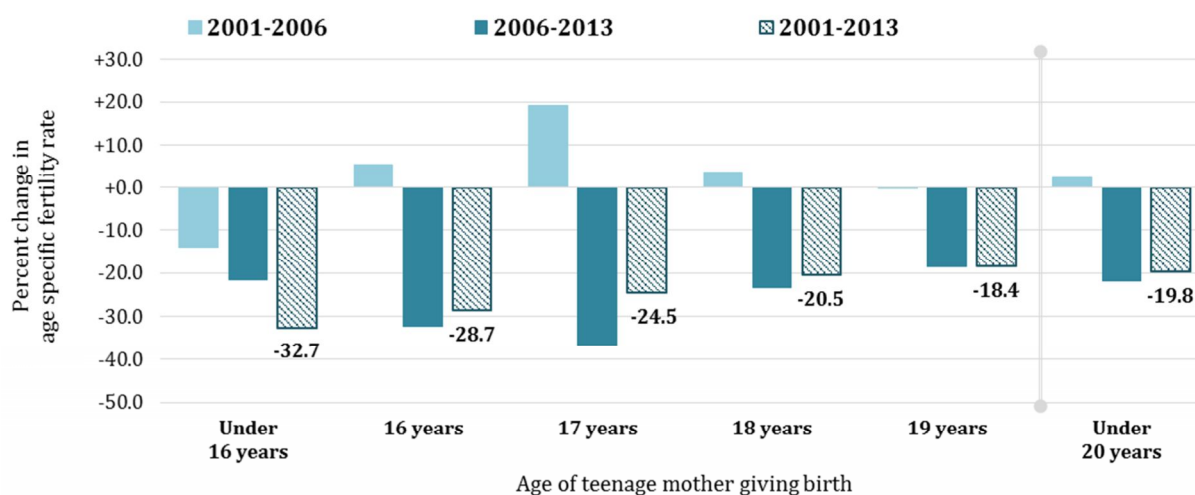
Source: ASFRs provided by Statistics NZ



Figure 3 shows the percentage change in the age specific fertility rates for teenagers by single year of age over the period 2001-2013. As noted previously, during this period the fertility rate among teenagers declined overall by 19.8 per cent, with a significant decline in the second half of the period offsetting the small increase between 2001 and 2006. The same pattern is seen for almost all single year of age groups. The number giving birth under the age of 16 has declined continuously over the entire period 2001-2013.

The most significant declines in the age specific fertility rates over the period 2001-2013 are amongst the two youngest age groups, under 16 (-32.7 per cent) and 16 years (-28.7 per cent).

Figure 3: Per cent change in the age specific fertility rates for teenagers, 2001-2013



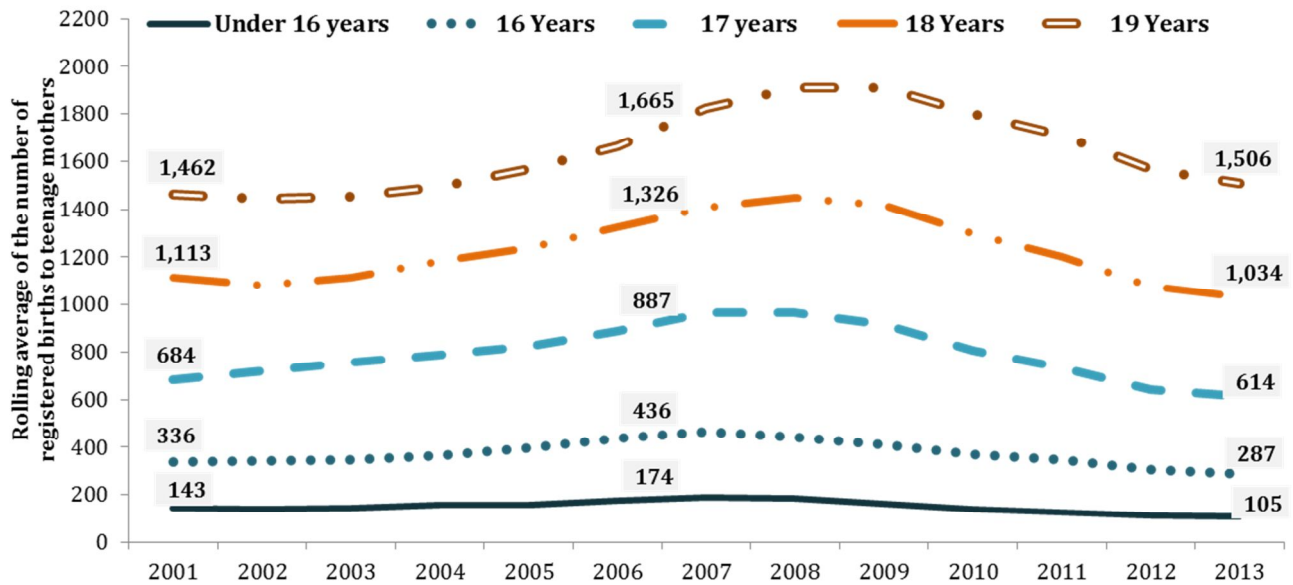
1.2 Fewer teenagers under the age of 18 are giving birth

Key findings:

- ***The number of births to young teenagers has decreased between 2006 and 2013.***
- ***Births to teenage mothers are increasingly occurring in the older teenage years.***

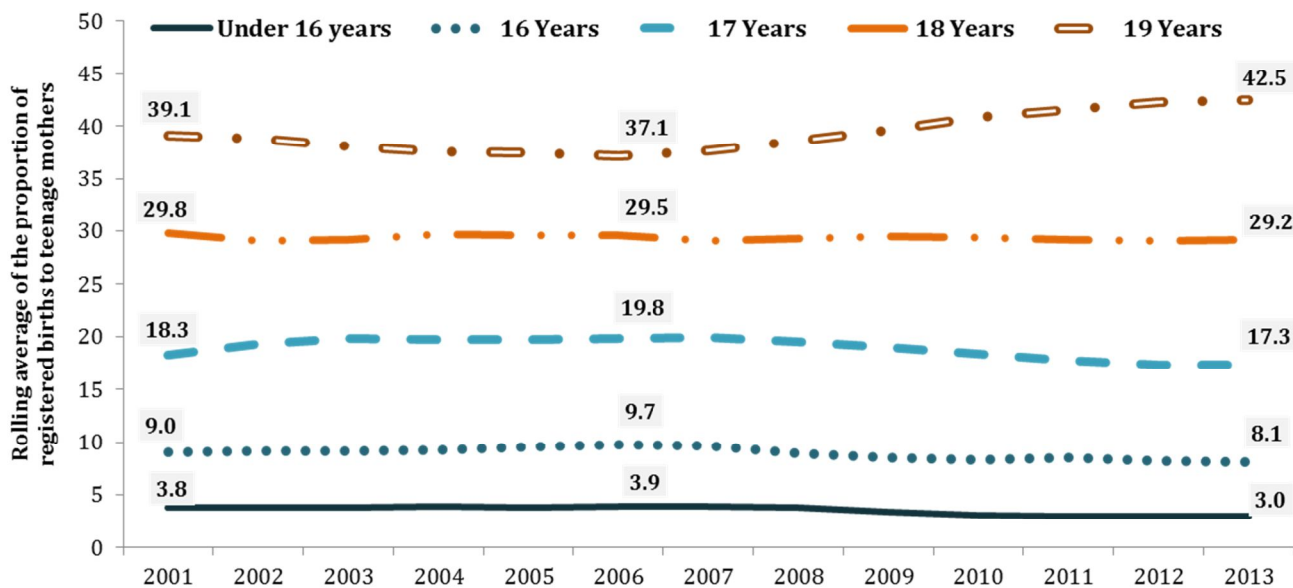
The number of births to teenage mothers by each single year of age increased over the 2001-2006 period, reaching a peak between 2007 and 2008, and then declined over the period to 2013 (Figure 4). Figures 4 and 5 show the number of births and the proportion of all births to teenage mothers, respectively, by single year of age, for the period 2001-2013. Between 2006 and 2013, the most significant decline was in the two youngest ages, with a 39.7 per cent decline in the number of births for teens under 16, and a 34.2 per cent decline among 16 year olds.

Figure 4: Number of births to teenage mothers by single year of age, 2001-2013



Teenage births are increasingly occurring during the older teen years. In 2006, 37.1 per cent of all teenage births were to mothers aged 19 years. This proportion increased to 42.5 per cent in 2013 (Figure 5). Almost three-quarters (71.6 per cent) of all teenage births in 2013 were to 18 and 19 year olds (up from 66.6 per cent in 2006). Conversely, there were fewer births to younger teenagers over the period 2006 to 2013, with the proportion declining from 33.4 per cent of all teenage births in 2006, to 28.4 per cent in 2013.

Figure 5: Proportion of all births to teenage mothers by single year of age, 2001-2013



1.3 Few young teenagers have a second child before they are 20 years old

Key finding: *After having a first birth at age 15 in 2008, very few New Zealand women were likely to have a second or subsequent birth before their 20th birthday (a cumulative probability of 0.02).*

The probability of women having a first and a subsequent birth during their teenage years was examined. How teenagers pass through their reproductive years building their childbearing experience and thus eventual family size, adds an important dimension to the study of fertility and family formation. The best way that this can be done is to follow real cohorts of women as they progress from age to age, and thus from calendar year to calendar year, from adolescence.

The analysis began with the estimated female population aged 15 years in 2008, who were then followed as they reached age 16 in 2009, 17 in 2010, 18 in 2011 and 19 in 2012. For each region and at each of these ages the simple probability of having a **first birth**, and then the joint probability of having a **subsequent (second or higher) birth**, having previously had a first, was computed. The probabilities thus calculated for the female cohort aged 15 years in 2008 have also been compared to those presented in the original report for the female cohort aged 15 years in 2006. Adjustments have been made to account for unrecorded data and only adjusted values are reported here.⁹ The tables and figures for the unadjusted probabilities of first and subsequent births, using the data for only the women for whom birth information was recorded, are included in the Appendix. By and large the adjusted and unadjusted probabilities do not vary in pattern, but the adjusted values are generally slightly higher.

Probabilities of a first birth among teenage girls who were 15 years old in 2008 (2008 cohort)

The adjusted cumulative probability for the 2008 cohort of having or not having a first birth (live or still) over the period 2008-2012 is shown in Figure 6. It compares the regions to total New Zealand (see Appendix Figure 2 for the unadjusted cumulative probability graph). Appendix Tables 4 and 5 give the cohort, age and calendar year-specific probabilities, by region and for New Zealand, of not having and of having a first birth. The cumulative probability of New Zealand women having a first live or still birth over their teenage years (15-19) is very low at 0.11, with a significant majority unlikely to do so in this period of their life. This indicates that teenage childbearing is a relatively infrequent event.

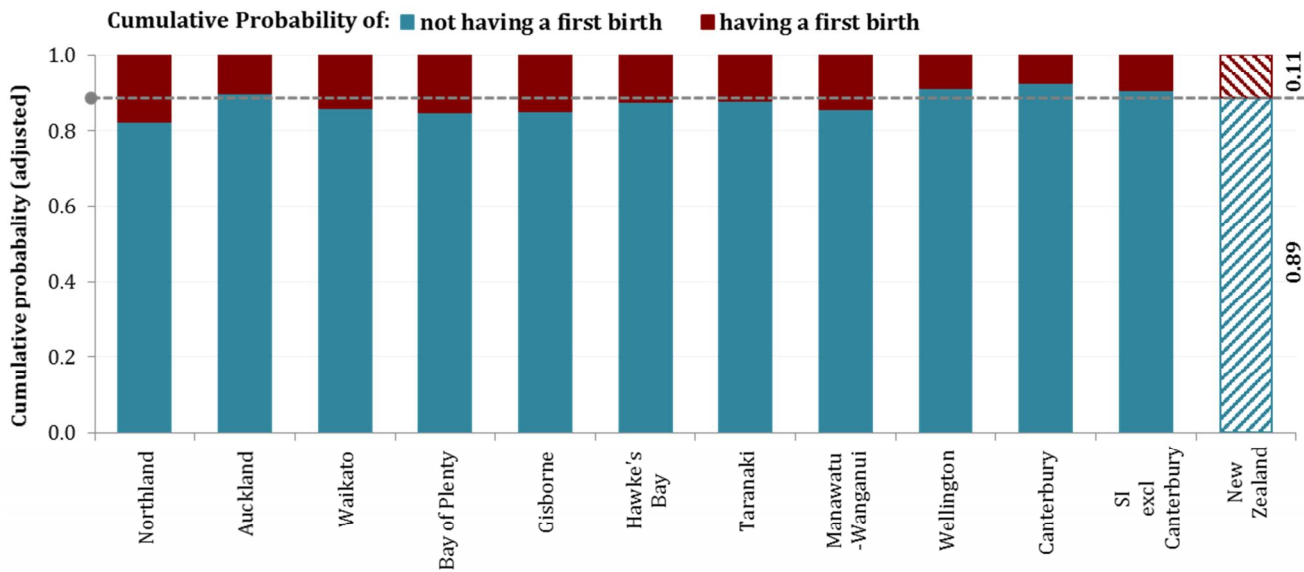
There are some regional differences in the cumulative probability of having a first birth over the late teenage years, with the metropolitan and large population regions of Auckland, Wellington and Canterbury, as well as in

⁹ Of the 22,616 women aged 15-19 years who gave birth (live or still) in the period 2008 – 2012, the parity number for 4,289 (19 per cent) of women was not recorded. This is an under-reporting error for a particular field on each woman's record; it is not an undercount of maternity events. The proportion varies across regions as well as over the years, ranging from 0.6 per cent for the Bay of Plenty in 2008 to 42.9 per cent for Northland in 2009. The exclusion of women for whom there is no parity count recorded from the analysis disproportionately affects the parity progression probabilities (see original report for details). Rather than exclude these women, we have adjusted for the unrecorded parity data and these have been incorporated in the calculation of the probabilities presented in this section (see original report for method used) and referred to as 'adjusted probabilities' in the text where we present results.



the rest of the South Island, showing probabilities similar to or lower than the national average. The highest probability of a teenager giving birth across the age group 15 - 19 years is in Northland (0.18)

Figure 6: Cumulative probability (adjusted) of the 2008 cohort of females aged 15 years of having or not having a first birth between 2008 and 2012, Regions and New Zealand

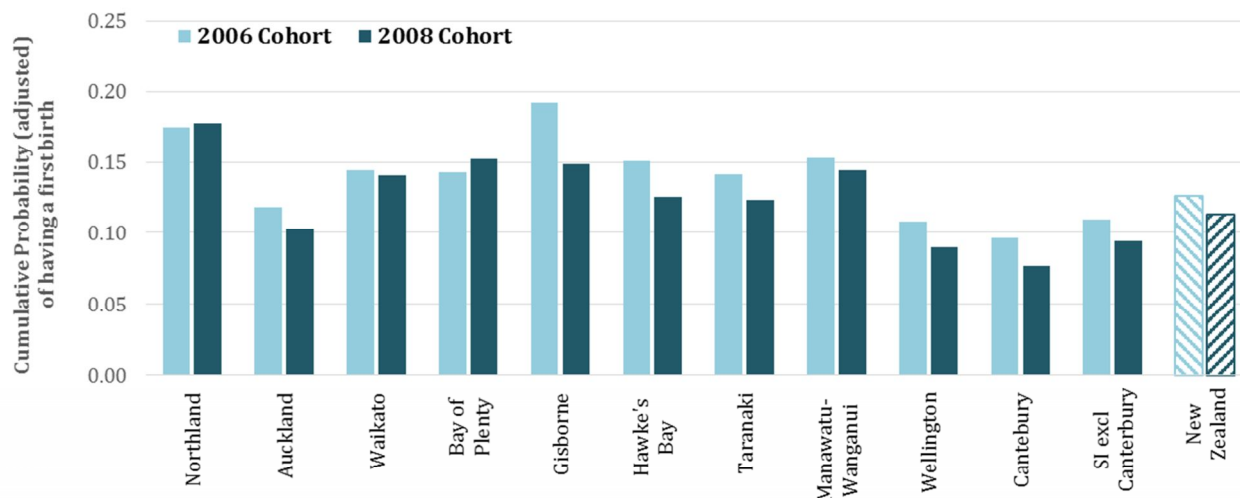


Based on MAT data (adjusted data)

Comparison between 2008 and 2006 cohort

Figure 7 compares the cumulative probability of having a first birth (live or still) between the teenage years of 15 and 19 years for the 2006 cohort (as presented in the 2012 report) and the 2008 cohort presented above (see Appendix Figure 3 for the unadjusted cumulative probability graph). Nationally, this probability has declined, with teens in the 2008 cohort less likely to give birth over their teen years than those in the 2006 cohort (0.11 for the 2008 cohort compared to 0.13 for the 2006 cohort). With the exception of Northland and Bay of Plenty, this trend is evident across all regions, with the most significant declines occurring in Gisborne and Wellington.

Figure 7: Comparison of cumulative probability (adjusted) of the 2006 and 2008 cohort of females aged 15 years having a first birth between ages 15 and 19 years, Regions and New Zealand



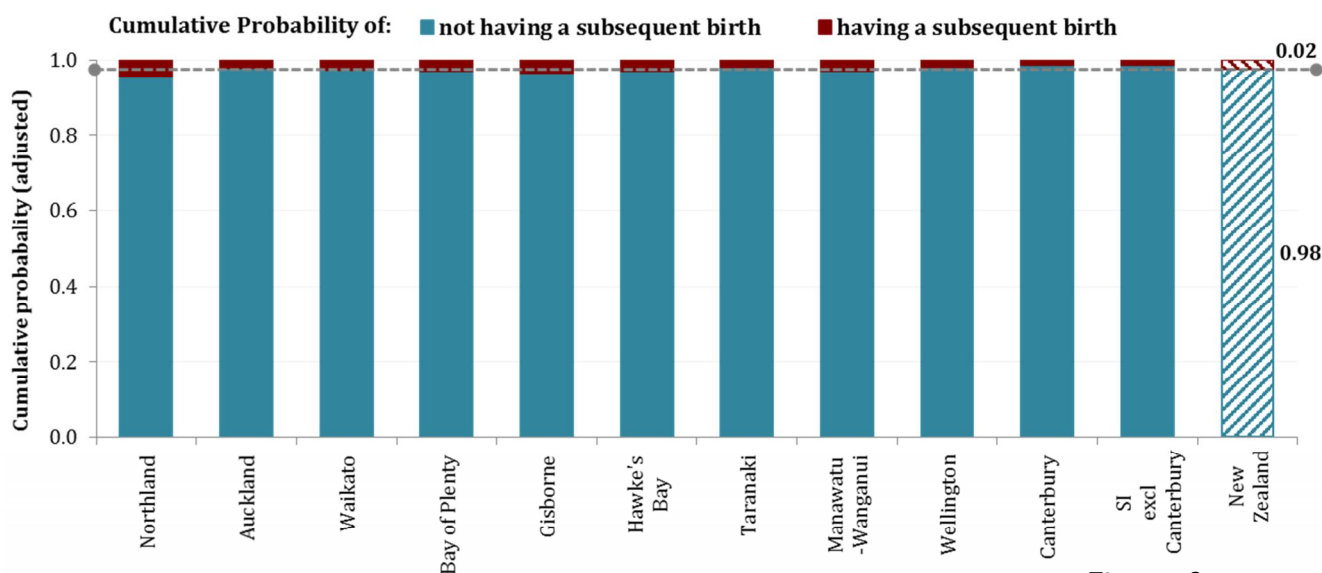
Based on MAT data (adjusted data)



Probabilities of a subsequent birth for the 2008 cohort

Figure 8 shows the probability of moving to each subsequent age with or without having had the combined events of a first and then a second birth (again, live plus still births) for the 2008 cohort (refer to Appendix Figure 4 for the unadjusted cumulative probability graph). It shows that after having a first birth at age 15 in 2008, very few New Zealand women (0.02) were likely to have a second or subsequent birth before their 20th birthday. Once again, the probability of females having a subsequent birth was lower than the national average in Auckland, Wellington and Canterbury, as well as in the rest of the South Island. The smaller rural regions had marginally higher probabilities of teenage mothers progressing to a subsequent birth, with the highest likelihood for Northland and Gisborne. Appendix Tables 6 and 7 give the cohort, age and calendar year-specific probabilities, by region and for New Zealand, for not having and of having a first birth and then a subsequent birth.

Figure 8: Cumulative probability (adjusted) of the 2008 cohort of females aged 15 years, of having or not having a subsequent birth between 2008 and 2012, Regions and New Zealand

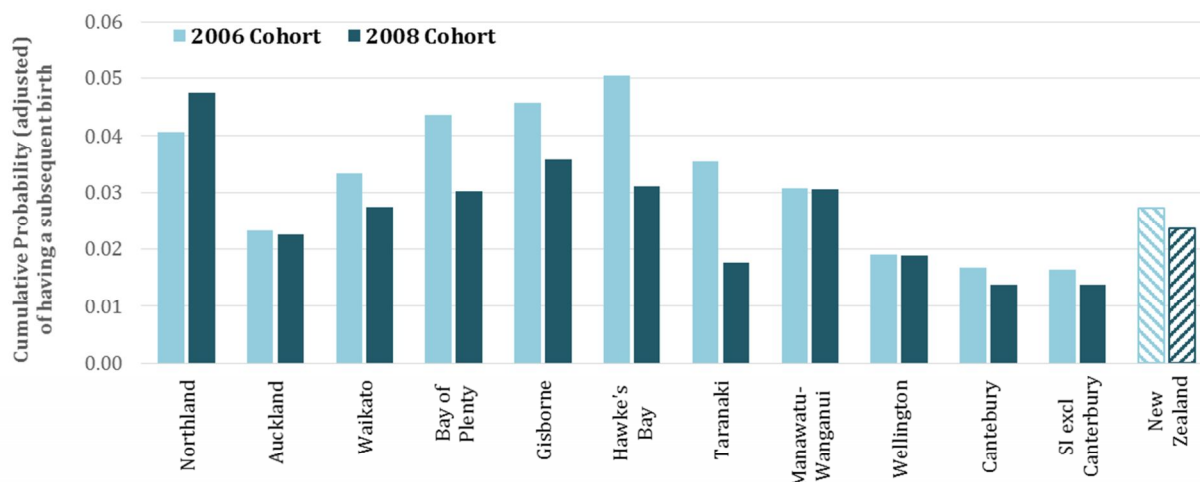


Based on MAT data (adjusted data)

Figure 9 compares the cumulative probability for the 2006 cohort (as presented in the 2012 report) and the 2008 cohort (See Appendix Figure 5 for the unadjusted cumulative probability graph). The data shows that the likelihood of 15 year old teenage mothers having a first birth and going on to have another birth has also declined nationally (0.02 for the 2008 cohort compared to 0.03 for the 2006 cohort). This trend is seen across all regions with the exception of Northland where this probability has increased.



Figure 9: Comparison of cumulative probability (adjusted) of the 2006 and 2008 cohort of females aged 15 years having a subsequent birth between ages 15 and 19 years, Regions and New Zealand



Based on MAT data (adjusted data)

1.4 Teenage births are decreasing in most regions

Key findings:

- **Both the number of teenage births and the teenage birth rate have declined in all regions of New Zealand except Northland.**
- **In 2013, Northland and Gisborne teenagers had much higher birth rates than teenagers in other regions. The teenage birth rate in Gisborne, however, is trending down, unlike Northland. Similar to the national trend, across all regions the majority of teenage births are to women aged 18 and 19 years.**

Regional trends in the number and proportion of teenage births

Like at the national level, births to teenage mothers at the regional level continue to decline, with lower proportions for all regions compared to 2006. The metropolitan regions of Auckland, Wellington, and Canterbury, and also the rest of the South Island, have lower proportions of teenage births among births to all women, compared to New Zealand as a whole. This proportion has now dropped below the national average for the Taranaki region as well (in 2001, the proportion of teenage births for Taranaki at 7.9 per cent was higher than the national average). The highest proportion of teenagers among all women giving birth was in Northland (10.0 per cent) and Gisborne (10.4 per cent). Figure 10 shows the proportion of all births in 2001, 2006 and 2013 in each region which were to teenage mothers.¹⁰

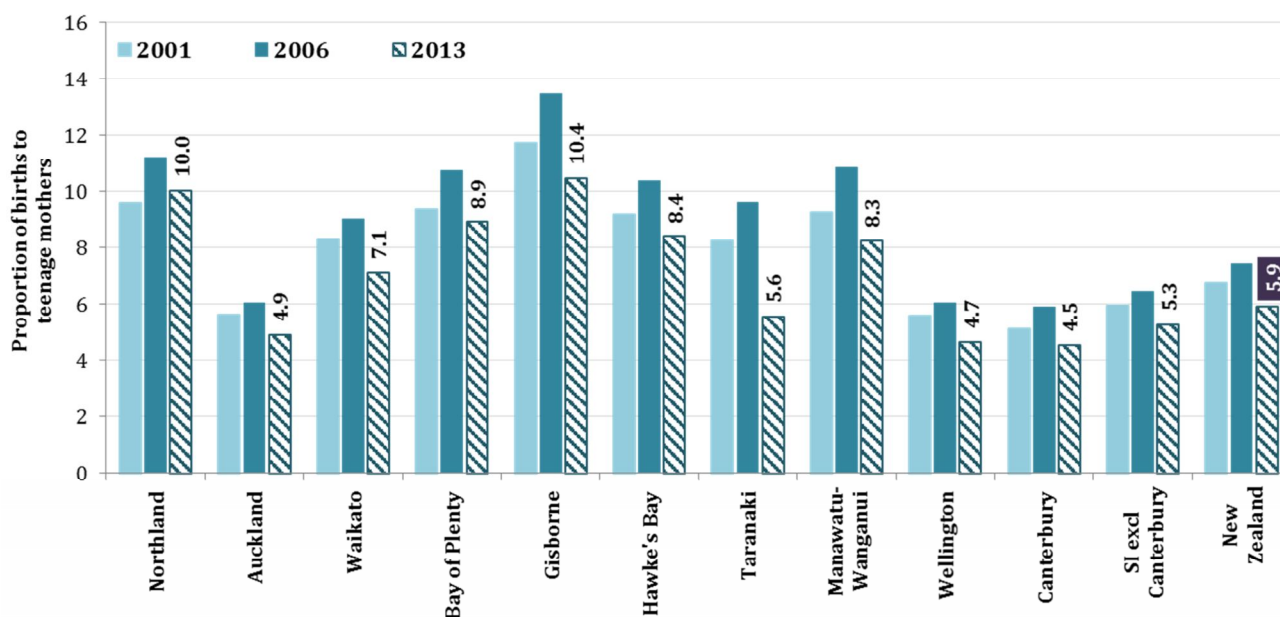
A similar pattern is seen across all regions, with the proportion of births to teenage mothers increasing over the 2001-2006 period and then declining over the 2006-2013 period. With the sole exception of Northland, the proportion recorded in 2013 is lower than that in 2001. The most significant decline in the number of teenage births between 2006 and 2013 period was in the Taranaki region (-40.9 per cent). The proportion of teenagers

¹⁰ Refer to Appendix Tables 8 and 9 for the number and proportion of births to teenage mothers by region.



among women giving birth in this region declined by four percentage points, from 9.6 per cent in 2006 to 5.6 per cent in 2013.

Figure 10: Proportion of births to mothers aged less than 20 years among women giving birth; 2001, 2006 and 2013 by region



Like the national trend, across all regions the majority of the teenage births are to women aged 18 and 19 years. Figure 11 shows the distribution of births in 2013 to teenage mothers by single year of age and region (refer to Appendix Table 10 for the underlying data and the corresponding age distribution data for the years 2001 and 2006). All regions saw the proportion of older teens giving birth increase across the 2006-2013 period. The only exception is Gisborne where there has been a small decline of -1.3 per cent in the proportion of older teens aged 18 and 19 years giving birth.

The highest proportion of births to younger teenage mothers aged 17 years or less are in the predominantly rural regions of Gisborne (32.3 per cent) and Bay of Plenty (31.3 per cent), where the proportions of young Māori are disproportionately higher. Figure 12 shows the change (percentage point difference) over the 2006-2013 period in the proportion of younger teenage mothers aged 17 years or less among all teenagers giving birth. This proportion has declined across all regions, with the most significant decline of over 10 percentage points in the Taranaki region (22.9 per cent of teen mothers aged 17 years or less compared to 33.1 per cent in 2006). In 2013, this region had the lowest proportion of under 18 year olds among teens giving birth. The Canterbury and Manawatu-Wanganui regions also show greater declines in this proportion than seen nationally.



Figure 11: Proportion of births to teenage mothers by single year of age in each region, 2013

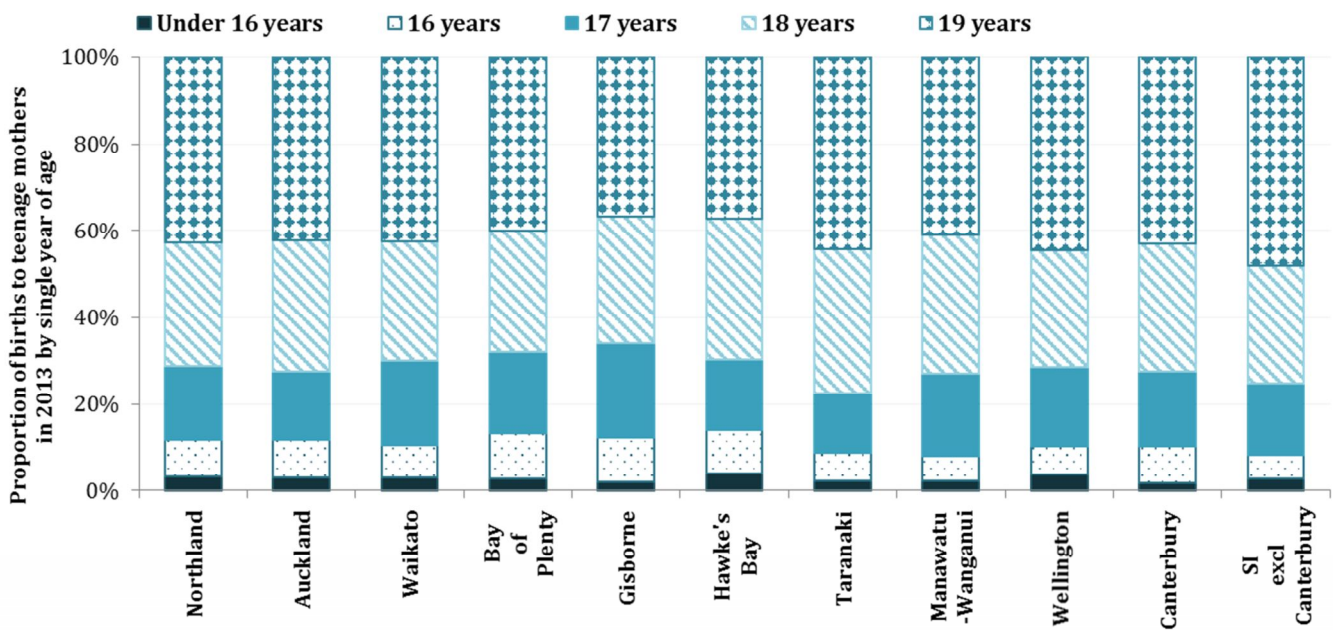
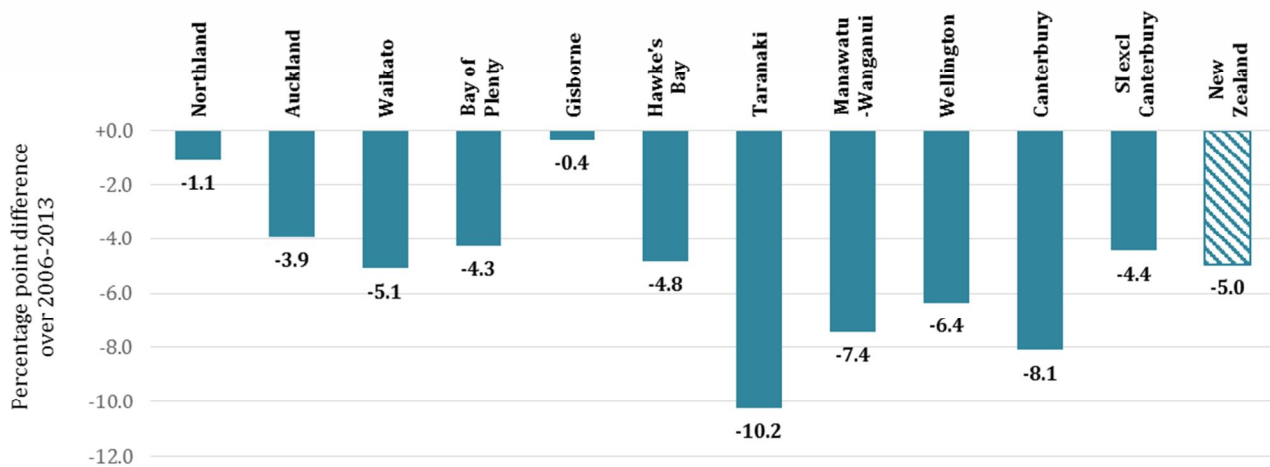


Figure 12: Percentage point difference over the 2006-2013 period in the proportion of younger mothers aged 17 years or less among teenagers giving birth



Regional trends in age-specific fertility rates for teenagers¹¹

In 2013, the age specific fertility rate per 1,000 women aged 15-19 years was significantly higher than the national average in Northland and Gisborne, with more than twice the levels seen in the more urban regions. Four other predominantly rural regions: Hawke's Bay, Bay of Plenty, Waikato and Manawatu-Wanganui, also recorded relatively high overall teenage fertility rates. Figure 13 shows regional teenage fertility rates for all teenage mothers (ages 15 – 19) alongside the rate for total New Zealand (refer to Appendix Table 11 for the underlying data).¹²

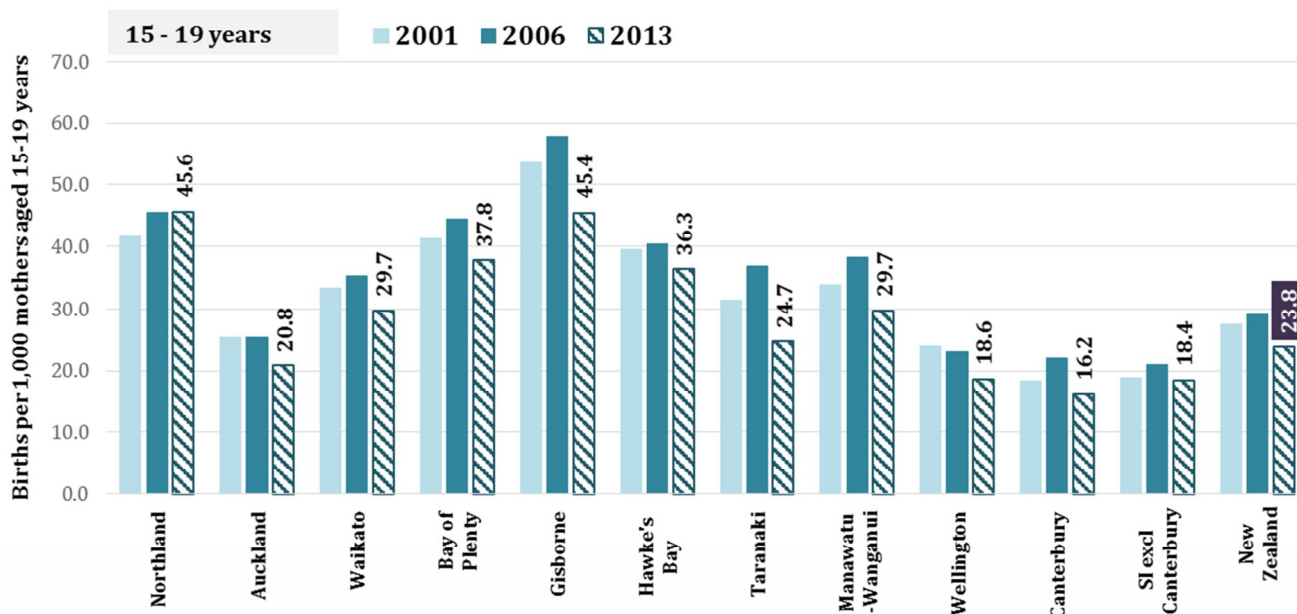
¹¹ The regional and national age specific fertility rates presented in this section are based on the Birth Registration data (rolling average). MAT data produce very similar results (see Appendix for more information on data sources).

¹² Regional teenage fertility rates were also compared for each single year of age (under 16, 16, 17, 18 and 19 years). This analysis is shown in Appendix Figures 6 to 10. In general, the predominantly rural regions, such as Northland and Hawkes Bay, showed the highest teenage fertility rates for each single teenage year, above the national average, as compared with metropolitan regions.



The predominantly metropolitan regions of Auckland, Wellington and Canterbury, as well as the rest of the South Island, all had rates well below the national average, with the lowest teenage fertility rate seen in Canterbury (16.2 births per 1,000 women aged 15-19 years). The teenage fertility rate declined across all regions over the period, with the exception of Northland where there was a small increase (+9.6 per cent). The most significant declines over the 2001-2013 period were seen in Wellington (-22.2 per cent) and Taranaki (-21.1 per cent).

Figure 13: Regional age specific fertility rates per 1,000 teenage mothers aged 15-19 years, 2001, 2006 and 2013



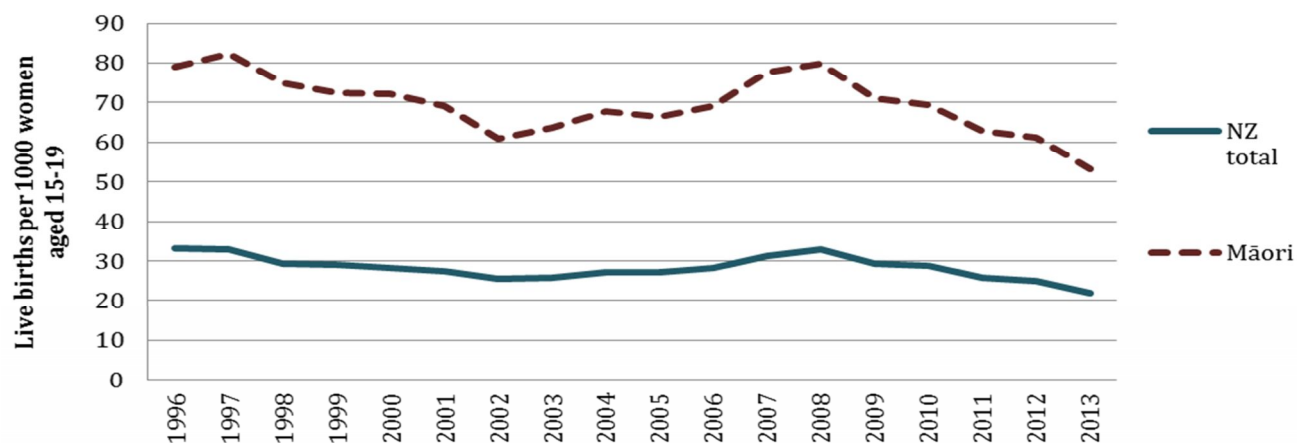
1.5 The teenage birth rate is declining for Māori

Key finding: The teenage birth rate for Māori remains higher than the national rate. Both rates have declined over time and the gap between them has narrowed.

The Māori teenage birth rate in 2013 was 53.1 births per 1,000 women aged 15-19 years, down from 72.2 births in 2000. Data sourced from Statistics New Zealand, of teenage birth rates for Māori and for the total population (see Figure 14), show that while teenage birth rates have always been higher for Māori, they are declining at a similar rate to the total population. Both New Zealand total and Māori teenage birth rates declined by 33% from 1996 to 2013, which narrows the gap from 46.01 to 31.14 over this period (see Appendix Table 12). Both rates spiked briefly in 2007-2008 and then showed a decline between 2008 and 2013. With Māori accounting for nearly one in five women aged 15-19 in 2013, trends in the Māori birth rate will influence the total birth rate.



Figure 14: Teenage birth rates, Total NZ and Māori, 1996-2013



Source: Statistics New Zealand Vital Statistics annual data online through Infoshare.

Rates for other ethnicities

At the time of writing, current data on teen birth rates by ethnicity of mother were unavailable. Statistics New Zealand produces this information based on census data every five years.



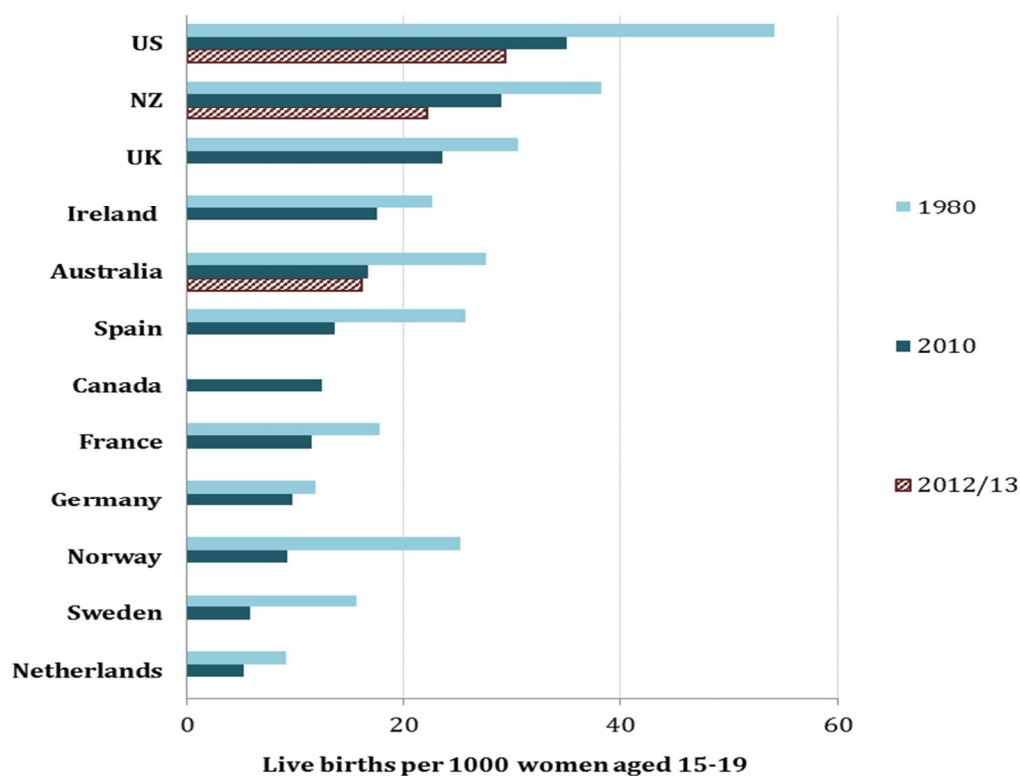
Section 2: How does New Zealand compare with other developed countries?

Key findings:

- **New Zealand has a relatively high teen birth rate in comparison to other developed countries.**
- **Teen birth rates are dropping in other developed countries. Like New Zealand, many other countries had a temporary increase in teen births for a period in the 2000s and then a subsequent decline.**

Figure 15 shows a cross-country comparison of teen birth rates in 1980, 2010 and 2012-13 (where available). The United States has the highest teen pregnancy and birth rate in the developed world, followed by New Zealand and the United Kingdom. Australia also had high rates in 1980, but these have reduced more than in New Zealand. However, while Australian rates appear to have been levelling off since 2010, New Zealand continues to decline and is now approaching the Australian rate.

Figure 15: Teen birth rates, international comparison; 1980, 2010, 2012/13



Source: Statistics New Zealand; OECD Family database Chart SF2.4.D: Adolescent fertility rates, supplemented by US and Australian Statistics Bureaus data.

Australian Statistics Bureaus data.

The declining teenage birth rate in the US, ethnic differences, and comparisons with New Zealand

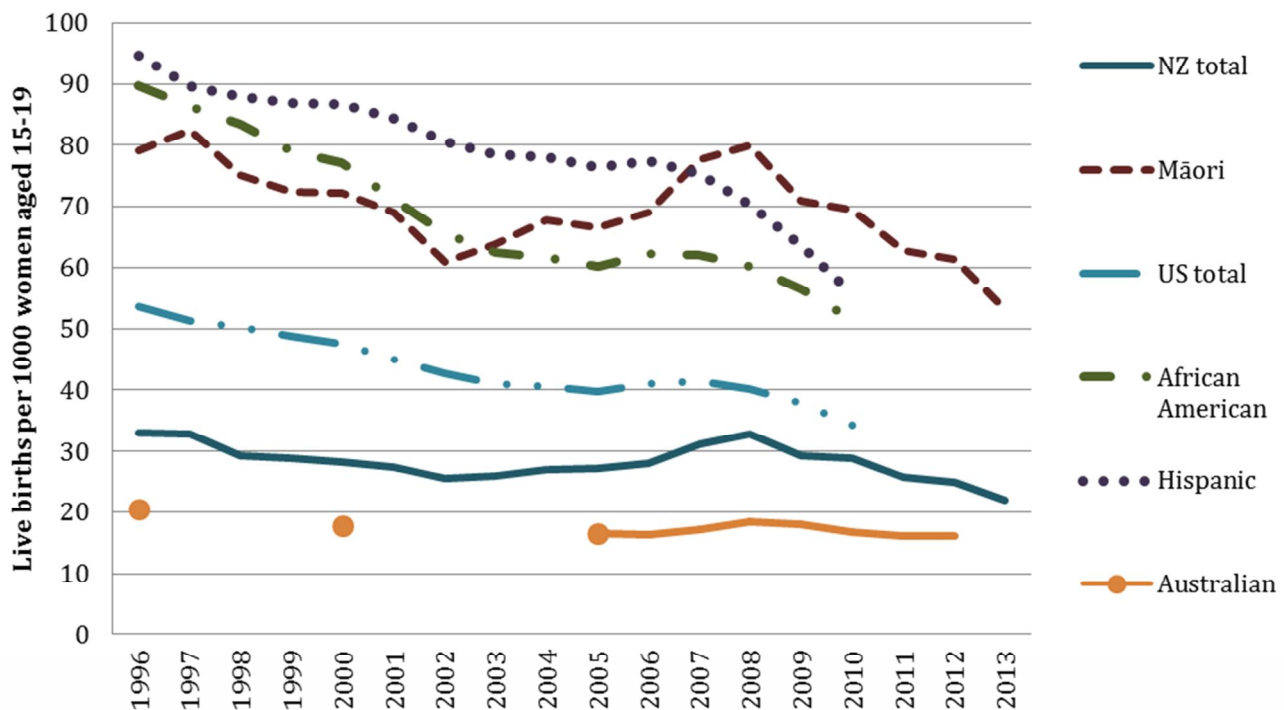
The teenage birth rate in the United States has been declining since 1990, with a brief upturn in 2006 followed by a large decline over 2008-2010 (Kost and Henshaw, 2014:3). The decline applies across all teen age groups and young 20s, and all ethnic groups. The rate of decline has been especially rapid since 2008: 2.5% per annum to 2008, and 7.5% per annum in the period 2008 to 2012 (Kearney and Levine, 2014:1).



The upturn in the United States began slightly earlier than in New Zealand, but Australia and Canada also experienced temporary upturns in the teenage birth rate around 2008 which was similar to the New Zealand pattern (Australian Institute of Family Studies, 2014; Milan, 2008). This suggests that influences on the teenage birth rate are widespread and not specific to New Zealand.

The United States also experiences differences by ethnic group in teenage birth and pregnancy rates which provide a useful comparison for considering New Zealand’s ethnic differences. Figure 16 shows African-American and Hispanic teenage birth rates to be higher than the US total rate, but similar to the Māori rate in New Zealand. The African-American rate started to decline earlier than the Hispanic rate, but the Hispanic rate has declined faster, so both were similar in 2010. Although both were higher than the Māori rate in 1996, both were below the Māori rate in the 2000s. By 2013, the Māori rate had declined to the US ethnic groups rate in 2010. It appears that the late 2000s ‘blip’ for Māori was higher than that experienced in the United States around 2006, but all groups represented in Figure 16 show a decline in recent years. This analysis is useful background to the following discussion of the factors that may be contributing to a decline in the teenage birth rates.

Figure 16: Teenage birth rates, New Zealand, United States and Australia; 1996-2013



Source: Statistics New Zealand; Kost and Henshaw, 2014; Australian Institute of Family Studies, 2014.



Section 3: What are the factors that may be driving the decline in teenage birth rates, and ethnic and regional disparities?

Overview

It is difficult to provide a simple explanation for the recent declines in teenage birth rates. The research literature, most of which is from the United States, suggests that the factors driving trends in teenage birth rates are multifaceted, operating both directly and indirectly, and at several levels: individual, family, community and society. Unfortunately, there is little New Zealand research in this area and it is unclear whether the overseas research is applicable in the New Zealand context. The main factors identified in the literature that directly impact on teenage birth rates are increased contraception use and postponement of becoming sexually active. Pregnancy prevention programmes may also have an impact, and differences in the way they are delivered and the broader social contexts in which they are delivered, may explain differences across countries.

Increased contraception use and reduced welfare benefits have been used to explain the first period of decline in the United States. But the role of policy is likely to be secondary as a similar decline has occurred in most other developed countries. This suggests that broader trends, which transcend national boundaries, are causing the recent declines. In addition to increased contraception, these include educational opportunities, employment opportunities and media influences (Kearney and Levine, 2014). This is consistent with an earlier UN report on declining teenage births across developed countries by as much as 50 per cent from 1970 to 2000 attributed to a combination of both motivation and means, which include; rising levels of education, more career choices for women, more effective contraception and changing preferences (UNICEF, 2001).

“The incentive to avoid early parenthood stems from a stake in the future, a sense of hope, and an expectation of inclusion in the benefits of living in an economically advanced society” (UNICEF, 2001:25).

The report attributes high rates of teenage births in New Zealand, the United Kingdom and the United States to a lack of income equality and social inclusion in these countries compared to those countries with the lowest rates, such as Sweden and the Netherlands.

The following discussion examines in greater detail several key factors, both direct and underlying, that may play a role in the declining teenage birth rate. It is important to note that trends and drivers vary for different ethnic and age groups. These issues are also highlighted in the discussion below.

3.1 Changing patterns of sexual behaviour

Delaying becoming sexual active among school-aged teenagers is an important factor in the declining teenage birth rate in New Zealand. Contraceptive use is less likely to be a factor given there has been little change in the proportion of sexually active school-aged teenagers in New Zealand who use contraceptives.

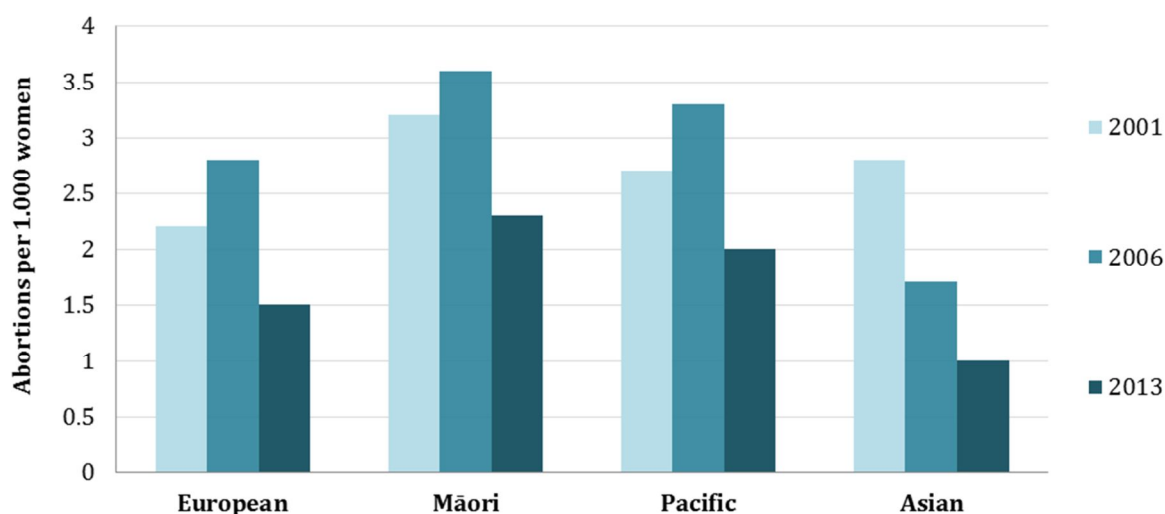


Sexual activity, pregnancy and abortion

A survey of New Zealand secondary school students (ages 13-17) carried out in 2001, 2007 and 2012 found declines in sexual activity and pregnancy between 2007 and 2012 (Clark et al, 2013). In 2001 and 2007, approximately 33 per cent of school-aged teenagers had begun sexual activity, and in 2012 this had dropped to 24 per cent (Clark et al, 2013:25).

A reduction in teenage pregnancy is also evident in the declining abortion rate. The abortion rate for New Zealand teenagers halved from a peak of 27 per 1,000 in 2007 to 14 per 1,000 in 2013 (Statistics New Zealand, 2014). These declines in abortion have occurred across all ethnic groups (Figure 17).

Figure 17: Abortion rates, 15-19 year olds by ethnic group; 2001, 2006 and 2013



Source: Statistics New Zealand/Infoshare/abortions by ethnicity and age of woman, annual Dec.

Research suggests that the decline in teenage births in the United States is due to a combination of less sexual activity at a young age and increased contraceptive use rather than an increase in abortions (Kearney and Levine, 2012). Not only have teenage births declined in recent years, but fewer teenagers are sexually active or get pregnant. The proportion of sexually active US teenagers declined from 40% in 1990 to 33% in 2010 (Kearney and Levine, 2012). At the same time the teenage pregnancy rate in the US declined from 116.9 to 57.4 per 1,000 in the 15-19 year age group, and the abortion rate for teenagers declined from 40.5 to 14.7 per 1,000 (Kost and Henshaw, 2014:3).

Contraceptive use

Kearney and Levine (2012) compared the United States to countries with lower teenage birth rates and found the main difference was in the extent of contraception use rather than sexual activity. US teenagers had a lower level of sexual activity than many of the European countries with lower birth rates, but also had a much lower level of contraception use. However, both sexual activity and contraception use are moving in positive directions with sexual activity declining and contraception use increasing, thus both contributing to the decline in teenage births in the United States. According to Kost and Henshaw (2012:3), almost all of the decline in teenage births for 18-19 year olds and 75 per cent of the decline for 15-17 year olds from 1995 to 2002 resulted



from increased contraception use. Due to a combination of increased promotion and acceptance, contraception use by 18-19 year olds in the US tripled between 2007-2009 (Kost and Henshaw, 2014:6). In particular there was an increase in the use of long-acting, reversible methods of contraception.

It is difficult to say if these findings are transferable to New Zealand as there does not appear to be any recent data on contraception use for New Zealand teenagers aged 15 to 19. The New Zealand Health and Wellbeing survey of secondary school students (ages 13-17) carried out in 2001, 2007 and 2012 found the proportion of sexually active students who reported always using contraception remained unchanged at around 60% (Clark et al, 2013:25). This study also found that New Zealand has one of the lowest proportions of students using condoms, and that this rate declined between 2007 and 2012. Reported sexual activity also appeared to have declined during the same period.¹³

Santelli and Melnikas (2010) found that contraception use is the main reason for the lower teenage birth rates in Europe compared to the US. They also found the main reason for higher contraception use by European teenagers is that parents were more likely to normalise both sexual activity and contraception use, especially in the Netherlands which has the lowest teenage pregnancy rate. Conversely, the earlier UN study of developed countries attributed the high rate of teenage births in New Zealand, the United Kingdom and the United States in part to a judgemental attitude towards teenage sexuality and contraception (UNICEF, 2001). Other US research on contraception use among teenagers found some teens had fears about using contraception (Stevens-Simon et al, 2005) and some Latinas have difficulties negotiating condom use with male partners (Gilliam, 2007).

The use of contraception depends on a combination of availability and desire to use it. Some teens are not convinced of the negative effect that pregnancy on their lives or are ambivalent about whether or not they want to have a baby (Stevens-Simon et al, 2005) or even actively seek to become a mother (Davies et al, 2001; Kost and Henshaw, 2014). A study with American-Indian youth (Kaufman et al, 2007) found that for older teenagers there was ambiguity about desirability of getting pregnant which was not consistent with using contraception. Some studies of Latina teenagers in the US had similar findings (Biggs et al, 2010).

Sexual initiation

In a large population-based US study, teenage women whose first sexual experience was vaginal were more likely to have a teenage pregnancy than those who began with oral sex or a combination (Reese et al, 2013). This suggests that sex education which creates awareness of alternatives to vaginal intercourse could delay and reduce teenage pregnancy. A qualitative study focusing on young women whose first sexual experience was forced and/or in the context of subcultural norms of violence and substance abuse found this was linked to teenage pregnancy, among other negative outcomes (Dunlap et al, 2003).

¹³ Due to a change in question wording results are not directly comparable (Adolescent Health Research Group, 2013:25).



3.2 Sex education approaches and innovations

The role of sex education programmes in changing adolescent sexual behaviour, including increasing the use of contraception, was covered in a previous Families Commission report (2011). Although we did not set out to evaluate the effectiveness of sex education programmes, we found several studies on the use of modern media technology in adolescent health and sex education, along with a few referring to education approaches that were most effective. These are discussed below.

Use of media technology in delivering interventions

Some recent US studies have looked at the use of contemporary media technology in delivering health related messages and interventions to teenagers. An early study found that the lack of accurate information about sexual health in teen-oriented media such as magazines, movies, television and music reinforced common misperceptions regarding sexual behaviour among adolescents, but this study did not include the internet or social media (Hust et al, 2008). Messer et al, (2011) found that peer norms are significantly associated with pregnancy-related outcomes and are not influenced by communication between teenagers and their parents. Together these findings suggest a role for social media in presenting accurate sexual health information to teenagers in ways that are acceptable and accessible to them.

Since then, follow-up studies of the 2009 *'16 and pregnant'* reality TV show on MTV have shown very positive impacts: 82 per cent of teenagers say it helped them understand the challenges of unexpected parenthood and one-third of the total decline in teenage births in the 18 months following the show's first screening were attributed to it (Kearney and Levine, 2014b). A smaller qualitative evaluation based on feedback from discussion group leaders and participants found using film clips plus guided discussion to be a valuable method for teaching teenage pregnancy prevention (Herrman et al, 2012).

More recent studies have found high use of internet and social media by teenagers, including specifically searching for sexual health information. Craig-Rushing and Stephens (2011) explored the use of media technologies such as internet, cell phones and video games for health education among 400 Native American teenagers. They found higher than average use of these technologies, including high rates of online health information-seeking reported by 75% of the sample. These findings are now used by Indian Health Boards to design culturally-appropriate, technology-based health interventions, including teenage pregnancy prevention.

Ralph et al, (2011) used surveys and focus groups with youth from low-income communities to explore the potential of social media for connecting youth to sexual health services. They found high levels of internet and social networking sites use (94%) and searching for health information online (40%); with 50 per cent of their sample expressing interest in receiving sexual health information online. But they also found disparities in these outcomes by race/ethnicity, with African-American and Latinas less likely to access from home, and less likely to join a clinic's online social network, which may affect the success of this strategy in some populations. However, this study indicates the potential of social media sites and the internet to reach diverse youth with



important health information as part of a comprehensive outreach strategy. It also offers a way of overcoming barriers of confidentiality, cost and accessibility of sexual health services for youth.

Types of programmes

Kearney and Levine (2014) found the most successful sex education programmes were those that offered comprehensive services addressing multiple aspects of a teenager's life, rather than just focusing on sex education and family planning. A randomised field trial study by Greene et al, (2011) found no statistically significant links between abstinence-only programmes and reduced or delayed sexual initiation.

There are differences by age group in the impact of programmes. Upadhy and Ellen (2011) noted that there are two groups of teenagers: those who do not want pregnancy/birth and those who are ambivalent or actively desire parenthood. Interventions need to be separately targeted to be effective at all ages as older teenagers are more likely to consider planned pregnancy as a desirable chosen option. While the first group responds to contraceptive awareness and availability, the second group is more likely to be motivated by alternative opportunities, such as good jobs resulting from improved education outcomes for disadvantaged teenagers.

3.3 Economic factors

Trends in teenage births are occurring in the broader context of economic cycles, including the recent global financial crisis and resultant recession. Relative economic status may also underlie regional and ethnic group differences in teenage birth trends.

Economic cycle

The evidence on the impact of the economic cycle on teenage birth rates is inconsistent and reinforces the view that drivers are multiple and complex and require a multi-faceted, targeted response. Kost and Henshaw (2014) and Kearney and Levine (2014) claim the global recession beginning in 2008 may have been a factor in the recent US decline in teenage births. Although the US peak was earlier in 2006, this would be consistent with a decline in teenage births from the peak around 2008 in New Zealand, Australia and Canada (Australian Bureau of Statistics, 2012; Milan, 2008). In New Zealand this post-2008 period was accompanied by a rise in unemployment in the 15-19 year age group.¹⁴ It is also consistent with evidence of teenage pregnancy declines associated with an increase in unemployment in the Los Angeles County (Rollin-Alamillo et al, 2014). However there are ethnic group differences: Ananat et al, (2013) found job loss for African-American teenagers was associated with a decrease in the birth rate for this group, but not for American-European teenagers.

These findings on differing impacts of wider economic forces on different ethnic groups appear to be consistent with an earlier report that the economic boom and associated expanded labour market opportunities of the

¹⁴ See Appendix Table 12



1990s was associated with the teenage pregnancy decline in the US during that period (Colen et al, 2006). This was especially the case for African-American teenagers, and particularly at ages 18-19 years Colen et al stress the importance of investigating the drivers and motivations of different groups separately, as their findings did not apply to European teenagers.

Socio-economic disadvantage

The research is more consistent on the links between disadvantage and teen births (Kearney and Levine, 2012; Santelli and Melnikas, 2010). The previous Families Commission report on teenage pregnancy and parenting (Zodgekar, 2011) notes the higher rates in lower socio-economic areas of New Zealand. This disadvantage, however, is broader than financial, involving factors such as parental involvement, education, and employment opportunities. Pickett et al (2005:1182) found that teenage birth rates were positively correlated to OECD income inequality ratings (a correlation of 0.73). However, more recent trends in income inequality and teenage birth rates do not show this relationship, with New Zealand showing a small decline in income inequality since 1990 and a large decline in teenage birth rates, but the US showing increasing income inequality despite declining teenage birth rates (OECD, 2013).

New Zealand research from the Christchurch longitudinal study found that while family income was inversely related to the teenage pregnancy rate, more refined analysis found it was not the level of income itself but associated social, family and individual contextual factors such as abuse, family instability and conflict, and education (Gibb et al, 2012). The authors conclude that reducing income inequality will not in itself lead to a reduction in teenage pregnancies without addressing the complex psycho-social factors involved. This is consistent with other international studies that find links between social deprivation or disadvantage, or individual and family factors, and teenage pregnancy (Christoffersen, 2009; Hao et al 2007; Stewart, 2003). In some specific examples, Barber (2001) found “parental investment” (defined in terms of unemployment, imprisonment, poverty, and marital opportunity by way of gender ratios), predicted teenage births and explained ethnic differences in the US. Parental imprisonment increases teenage births while marital opportunity decreases births for both African-American and American-European teens, but poverty only predicts births for European teens, not African-Americans. Imprisonment, unemployment rates and lower availability of marriageable men (which is related to differential mortality and imprisonment rates) also explain ethnic differentials in teenage births, with African Americans having higher rates of all these factors (ibid).

Rodgers and McGuire (2012), using multivariate analyses on data for over 7000 adolescents, found interpersonal violence or sexual coercion with partners or family and parenting behaviour, rather than poverty, predicted early sexual activity and substance abuse. Similar findings emerged from an ethnographic study of inner-city disadvantaged African-American households (Dunlap et al, 2003). These findings are consistent with the conclusions of Woodward et al (2001) in the New Zealand Medical Journal that the intergenerational cycles of poor social functioning need to be broken in order to move beyond the degree of success achieved by sex education programmes.



A review of the literature on Latino reproductive health (Driscoll et al, 2001) found that when socio-economic status (SES) is held constant, the gap between Europeans and other ethnic groups narrows but does not close; that is, there is still an ethnic or cultural effect on disparate trends in teenage births. This is consistent with findings from an earlier Families Commission report (2011) that Māori rates are higher even when SES is held constant. Since SES cannot be addressed directly through sexual health education programmes, more information is needed on the specific links between SES and teenage births that are amenable to intervention (Driscoll et al, 2001), for example, financial planning, education and acculturation.

Education and employment opportunities

Some studies have investigated how education and educational opportunities impact on teenage birth rates. Barber (2001) found that teenagers with a good educational background are more likely to abort a pregnancy, while those with poorer education are more likely to give birth. Stewart (2003) used data from a national longitudinal US study to investigate specific aspects of deprivation and found that educational and occupational aspirations mediate the connection between deprivation and teenage pregnancy outcomes. Also motherhood may be seen as a means of gaining control for those from disadvantaged backgrounds with few alternative opportunities, such as higher education and careers. Driscoll et al (2005) found that educational aspirations reduced the likelihood of teenage pregnancy for Europeans and Latino ethnic groups, (as did Dogan-Ates and Carrion-Basham (2007) for Latinos) and for those from low-SES, but not for African-American teenagers from disadvantaged communities. As with other factors, this suggests a complex interplay of multiple factors influence teenage birth trends. Education and employment opportunities were also found to be key factors in not having a subsequent teenage birth (Manlove et al, 2000).

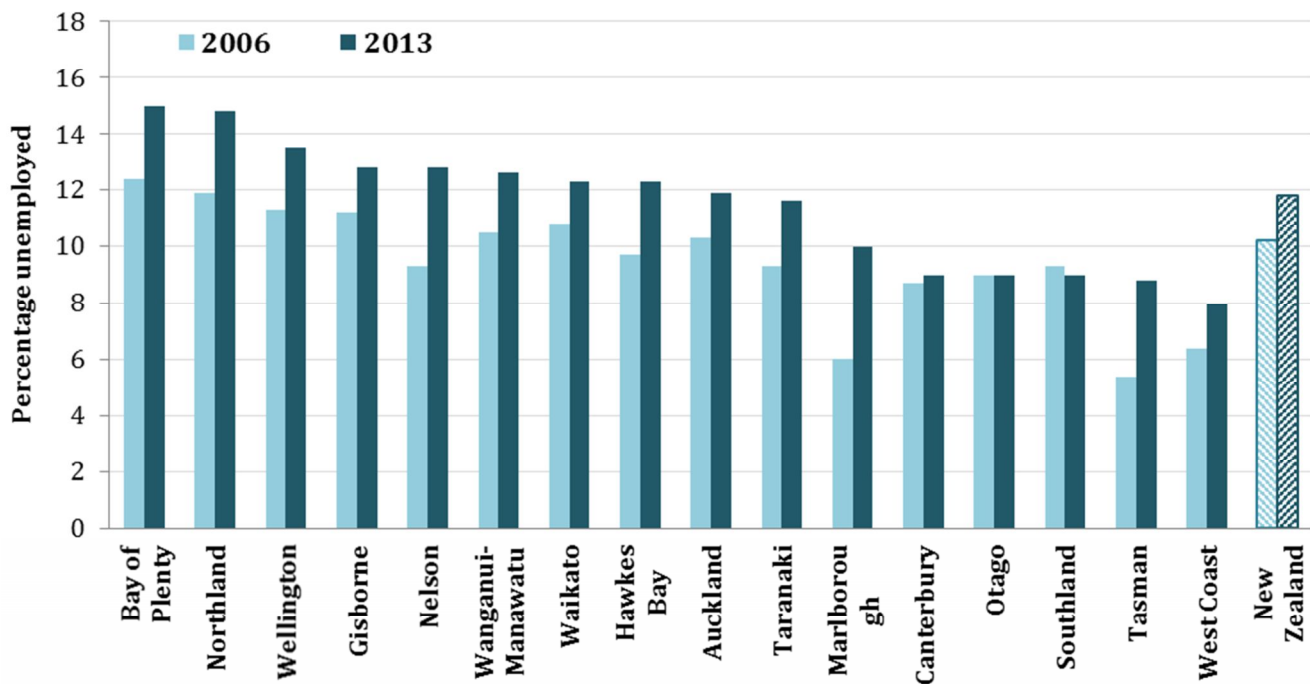
Regional differences in economic circumstances

The US literature shows regional differences in teenage birth rates are also related to regional differences in economic circumstances. Within the US both Pickett et al (2000) and Kearney and Levine (2012) found a link between geographic differentials in teenage births and inequality. A New Zealand report for the Families Commission suggests that regional differences may also be affected by a rural-urban divide in terms of access to sexual health services, especially for teenagers, and to educational and employment opportunities (Kaipuke Consultants, 2012).

To further illustrate the link between regional differences in teenage birth rates and regional differences in economic circumstances, we can look at results from the present study in light of economic factors such as unemployment rates. Earlier, we described regional differences in teenage birth rates and trends in New Zealand, specifically noting that in Northland the rate is high and increasing while in Gisborne it is high but declining. Figure 18 presents the regional unemployment rates for 15-19 year olds for 2006 and 2013. This shows that the high and increasing teenage birth rate in Northland is consistent with the second-highest regional unemployment rate for this age group.



Figure 18: Regional unemployment rates for 15-19 year olds; 2006 and 2013



Source: Statistics New Zealand Census 2013 Regional tables

A recent education overview also found that Northland primary schools had the poorest “National Standards” outcomes in New Zealand, and that they had dropped since 2011.¹⁵ While Northland has a relatively high Māori population at ages 15-19 (46%), it is not as high as in Gisborne (62%), which has better education and employment outcomes. Bay of Plenty has the highest teenage unemployment rate (15%), and a relatively high proportion of Māori (41%), both similar to Northland, but the teenage birth rate (37.8) - while third highest after Northland (45.6) and Gisborne (45.4) - is considerably lower and has declined while Northland’s has not. These local regional differentials suggest a complex mix of economic circumstance and ethnicity. There may also be a rural-urban divide in terms of access to sexual health services, especially for teenagers.

3.4 Ethnic and cultural differences

New Zealand research suggests that higher rates of teenage pregnancy among Māori are due to a combination of family and cultural factors (Danette, Fergusson and Boden, 2011). Danette et al., found that after controlling for other factors, factors relating to cultural identity influenced the higher Māori teenage birth rate, but the mechanisms by which this occurred were not clear. In a review of existing information on Māori teenage pregnancy conducted for the Families Commission, Pihama (2011) noted the lack of research and literature on Māori views on the topic (Pihama, 2011).

A number of US studies with African-American, Latino or American-Indian youths identify a range of factors in addition to disadvantage that may explain ethnic differentials in teenage birth rates. These factors include

¹⁵ <http://www.educationcounts.govt.nz/topics/education-overview/national-education/region>



cultural attitudes or norms towards early motherhood; cultural support systems for young mothers and their children that protect from negative impacts usually associated with teenage births; cultural identity transition and conflict between the traditional culture of their families and the culture of the wider society; access to health services and information; and perceived educational and employment opportunities.

Attitudes to early motherhood

There is greater acceptance of early motherhood among some cultures in the US (Barr et al, 2013; Dogan-Ates and Carrion-Basham, 2007; Gilliam, 2013). In a study of 300 African-American adolescent girls, Barr et al (2013) found that early teenage motherhood, especially rapid repeat pregnancy, had more favourable associations in the family and community contexts of these young women. According to Dogan-Ates and Carrion-Basha, (2007) motherhood in some cultures may also be a sign of having reached adulthood. Gilliam (2007) argues that young Latinas' cultural realities need to be recognised, such as their desire to become a mother early, rather than offering sexual health programmes focused solely on prevention.

Cultural support against negative outcomes

Qualitative studies with both African-American and American-Indian youth indicate that some cultures provide more support for early motherhood, offering protection from some of the negative outcomes generally associated with teenage births. A qualitative study within one tribe of American-Indian youth (Kaufman et al, 2007) found there were few social or economic recriminations associated with teenage births which, combined with pressures for early sex, substance abuse and not associating condom use with disease prevention, result in high levels of teenage births and STDs. A small qualitative study with African-American teens also found kin caretaking networks plus expectations of uncertain health and short lifespans, may underlie higher rates of teenage pregnancy and births in this group compared to working class Europeans and middle class teenagers (Geronimus, 1996).

On the other hand, Latino communities with low teenage birth rates have stronger community networks and more support for protective cultural norms than those with high rates (Denner et al, 2001). Specifically, some important factors are: shared adult monitoring, information channels, locally run agencies, staff educated and from the community, strong social networks between youth who look out for one another as well as between adults and between youth and adults, positive view of youth, commitment to family, intergenerational families, religious values and respect for adults. These factors tend to be more common in communities that are less assimilated – the more groups mix with others, the weaker their traditional protective social capital.

Cultural identity transition and conflict

Driscoll et al (2001) found acculturation level (length of time living in a dominant culture and the extent to which a person adapts to the lifestyles and values of the dominant culture) a factor in teenage sexual behaviour and outcomes among Latinas, with high community support for pregnant teenagers and teenage mothers among the less assimilated. According to Driscoll et al (2001), Latinas with low levels of acculturation are more



likely to desire children at a young age and to prioritise early motherhood over education. Kaufman et al (2007) also identify cultural identity transition in minority adolescents as a possible factor in sexual risk-taking behaviour in the earlier stages. “The difficulties of navigating through this life stage, compounded by the challenges of navigating two cultures, can make the teenage years especially perilous for young Latinos” (Driscoll et al, 2001:315).

Peer norms

Among a survey of “at-risk” youth, African-American teenagers were more likely to exhibit “optimistic bias” – a misperception that they are less likely than others to experience negative outcomes, such as pregnancy – and this has been linked to sexual risk-taking (Chapin, 2001). This study also found that these teenagers have a belief that most of their ethnic peer group are sexually active at a young age and engage in risky behaviours, such as unprotected sex/not using contraception. Chapin concludes that changing perceived peer norms may change risky sexual behaviour by these teenagers.

Access to health information and services

A qualitative study of 51 African-American teenage mothers found that they had little access to formal health care services and reproductive information prior to becoming pregnant (Brubaker, 2007). Similarly, a study with pregnant Latina teenagers found the lack of contraceptive information an issue (Biggs et al, 2010). Latinas have the highest teenage birth rate among subpopulations in the US, due to a combination of high rates of early sexual initiation and low rates of contraception use (Driscoll et al, 2001; Trejos-Castillo and Vazsonyi, 2009). There are similarities to Māori, being a young population that as a group has low income and low levels of educational attainment. These findings, therefore, may have relevance for New Zealand’s Māori teenagers. Māori also experience poorer health outcomes and life expectancies than European New Zealanders, but also potentially benefit from the customary whānau family system of support (Pihama, 2011; Families Commission, 2011).

3.5 Family relationships and characteristics

Literature from the United States, particularly on minority ethnic groups, indicates that relationships with parents, especially mothers, and good communication on sexuality are influential factors in preventing teenage pregnancy and births (Driscoll et al, 2001; Trejos-Castillo and Vazsonyi, 2008; Stauss et al, 2011; Gilliam, 2007). A small qualitative study found that the reason communication from mothers had an impact but not fathers was that fathers tended to reinforce traditional religious values on sexuality while mothers discussed contraception (Stauss et al, 2011). This study concluded that the youth themselves wanted more parental communication on sex, particularly young men. Another small study of 300 female students found that father-daughter communication about sex was a strong moderator of the impact of MTV’s video on teenage pregnancy (Wright et al, 2013): those whose fathers did communicate with them about sex were less likely to have had recent teenage sex, and were more likely to use contraception when they did.



Acculturation, or length of time living in another dominant culture, can create conflict with cultural traditions of parents (Driscoll et al, 2001). Stauss et al (2011) found this in their qualitative study of Latino parents and teenagers, with some parents uncomfortable talking about sex with their children, despite their children wanting them to, especially fathers. Stauss et al (2011:193) and Murphy-Erby et al (2011) also note that those delivering prevention programmes in different cultures need to be aware of and respect cultural traditions, and approach what is a complex issue of parental communication about sex in a culturally appropriate way so as not to create 'cultural discord'.

A number of other family characteristics have been linked to teenage parenthood. For example, Dogan-Ates and Carrion-Basham (2007) found that living with biological parents was associated with lower teenage birth rate. The extent to which a family is religious also affects teenage sexual behaviour, first by delaying first experience, but also by making contraception less likely when sex does occur, according to a national longitudinal US study (Manlove et al, 2006). Several studies also found parental supervision or monitoring and positive relationships with parents to be protective against teenage pregnancy (Biggs et al, 2010; Denner et al, 2001; Dogan-Ates and Carrion-Basham; 2007 Kivisto, 2001). A large scale longitudinal UK study found that early childhood factors, such as changes in father's social class, new siblings in middle childhood (age 11), parental illness in early childhood and maternal death during adolescence, maternal employment during early and mid-childhood, possibly through lack of supervision, and parental involvement and interest in education, affect teenage childbearing risk (Russell, 2002). Most of these factors, however, are not easily amenable to intervention to reduce teenage pregnancy risk. These findings on the influence of family relationships and characteristics fit with recommendations from an earlier New Zealand Families Commission report that interventions to reduce teenage pregnancy, especially repeat pregnancies, need to include families (Zodgekar, 2011).

3.6 Individual factors

It is difficult to separate individual factors from the social and family contexts in which individuals live. Issues of self-esteem, locus of control, educational and employment aspirations and opportunities, extracurricular activities and mental health and substance abuse are interrelated with disadvantage and family functioning, and have been linked to rates of teenage pregnancy and early motherhood.

Self-esteem, locus of control, self-efficacy

A matched control study of teenagers who became pregnant and those who did not, identified external locus of control (or a person's belief that life events are controlled by environmental factors which they cannot influence) and lower self-efficacy (or belief in one's ability to succeed in specific situations) predicted likely teenage pregnancy, as well as lower expectations of education and occupation (Young et al, 2001). Similarly Kivisto (2001) compared teenage mothers with teenagers using family planning services and found high risk teenagers had less well formed self-identities and future goals, were more likely to begin sexual activity at a younger age and were less likely to use contraception. The teenagers that were using family planning services



expressed a desire for control over their lives and future. However, while this is consistent with qualitative research showing that young women from disadvantaged backgrounds form positive identities and gain self-worth from motherhood, the links between favourable prototypes of young motherhood and disadvantage were not statistically significant and did not apply to the most disadvantaged (Barr et al 2013). This suggests that other factors are also involved.

Mental health and psychiatric disorders, substance abuse

Those with mental health or psychiatric problems have a higher risk of teenage pregnancy, so those treating them need to be aware, and sexual education programmes should include a mental health component as a prevention strategy (Kessler et al, 1997). Those at a higher risk of teenage pregnancy are also more likely to engage in other risky behaviours such as drinking alcohol, smoking and using illegal drugs (Kivisto, 2001). The role of alcohol consumption in relation to increased likelihood of teenage pregnancy was also examined by (Cintina, 2012).

3.7 Wider social context

The social context in which teenage births occur includes both the legislative or policy environment, and prevailing social attitudes or norms. Each of these is considered below.

Policy

A search of the recent literature on the decline in teenage birth rates found no clear relationships with related welfare or health policies. Kearney and Levine (2012:17) examined a wide range of US federal and state policies related to teenage childbearing. They concluded that expanded eligibility for publicly funded family planning services reduces teenage fertility, and this is consistent with previous research. However they also noted that “policy prescriptions that are often advocated to reduce teenage childbearing rates do not come close to explaining the extensive geographic variation that exists”.

Welfare policy

Levine (2002) and Hao et al (2007) found no relationship between teenage pregnancy and welfare policies in general. But Hao et al (2007) did find that strong enforcement of child support payment policies for fathers deters teenage pregnancies and births and increases school enrolment of teenage girls. Horton (2006) found a small decline (3.25% to 2.8%) in teenage childbearing following the 1997 US welfare reform aimed at making assistance temporary and encouraging work. Horton argues, however, that this reform shifted responsibility to families and worsened the economic situation of teenage African American mothers and their children.

Abortion policy

Some US studies found that parental involvement laws were related to a reduction in teenage pregnancy and abortion (Levine, 2002; Altman-Palm and Tremblay, 1998). However, a 2009 study of the relationship between



state abortion laws and teenage pregnancy rates in the US found that more restrictive abortion was related to fewer unwanted teenage pregnancies, but that parental involvement was not statistically significant (Medoff, 2009). Types of restrictions that had a significant impact were cost and a requirement for informed consent, and these applied to both teenagers under 18 and those aged 18-19 years. However, states in the US with restrictive laws tended to have a high level of organised public opposition to abortion, which may also have affected the teenage pregnancy rate (although this was controlled for in the model used).

Social norms/attitudes/ideologies

There is conflicting evidence on the long-term outcomes of teenage births, and a debate in the literature around the ideological positions that define it as a problem (Pihama , 2011). Robson and Berthoud (2003) found teenage motherhood increased the likelihood of later disadvantage in all countries considered, although the strength of the association varied and there was no control for the level of disadvantage prior to having a teenage birth. Other studies have considered the pre-existing conditions of teenage mothers, and found that they would be more likely to drop out of school and be in poverty whether or not they had a child (Horz et al, 1999 cited in Johnson, 2007; Kearney and Levine, 2012).

Furstenberg (2007) has studied the teenage pregnancy issue in the United States for forty years and finds its identification as an issue is ideologically and politically driven. It first emerged as an issue when rates were declining but more of it was outside marriage in the 1960s and 1970s, and again in the 1990s when attempts to alleviate the issues associated with early childbearing were challenged by conservatives as encouraging teenage pregnancy. This was despite rates falling further, especially among unmarried teenagers. According to Price (2011), ingrained fears about teenage sexuality in some cultures underlie policy decisions, such as restricting emergency contraception to those over 18 in the US. On the other hand, traditional gender ideology, which sees the role of women primarily as mothering, is related to greater teenage childbearing (Stewart, 2003). This may also explain greater acceptance of early motherhood among some cultures, such as Latinas in the US, where it may also be a sign of adulthood (Dogan-Ates and Carrion-Basham, 2007).



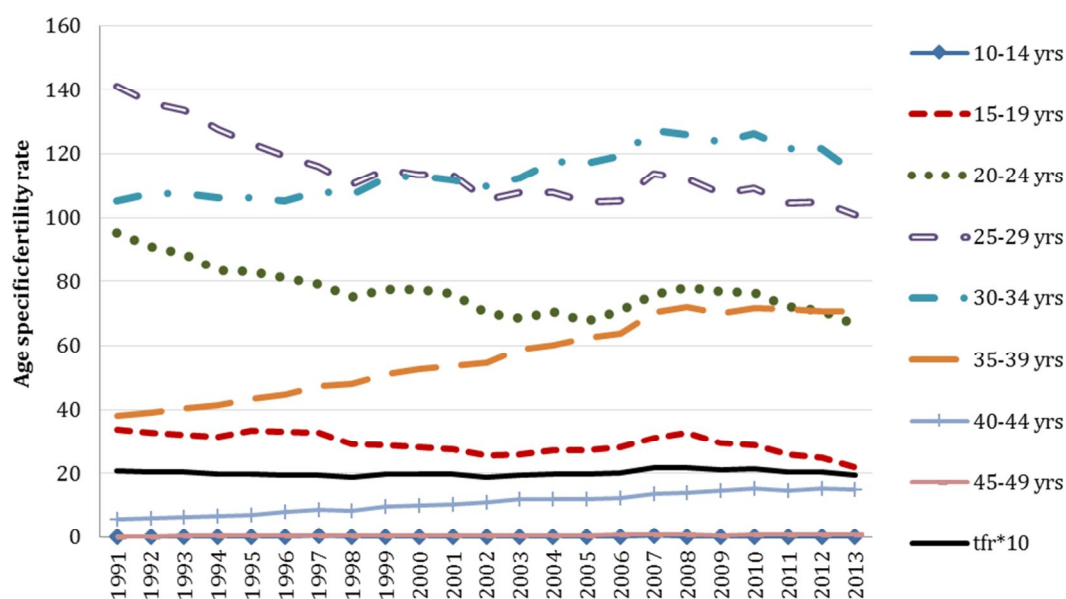
Section 4: What are the implications of current trends?

4.1 Impact on total fertility rate

Teenage pregnancy and birth has been framed as a social and health problem in some developed countries, particularly the United States and New Zealand (CDC, 2014; Kearney and Levine, 2012; Families Commission, 2011; Pihama, 2011). There is a lack of research on the potential *negative* impacts of a decline in the teenage birth rate, or its impact on the total fertility rate. Traditionally, early childbearing has been linked to a higher total fertility rate, as the earlier a woman starts the more children she can potentially have. Conversely, delayed first birth is associated with a declining total fertility rate. Once contraception became widely available this link was less automatic, with average family size reducing and controlled at an average of two births whatever the age of first birth (Pool and Sceats, 1981). Figure 19 shows declines in births at younger ages have been matched by increases at ages 30+, resulting in a relatively stable total fertility rate.¹⁶

New Zealand evidence shows that very few teenage mothers go on to have a second teenage birth: only 2 per cent as reported earlier. We also found that teenage births in recent years contribute a very small proportion of total births, 5.9 per cent in 2013, so further decline in teenage birth is unlikely to have a noticeable impact on the total fertility rate.

Figure 19: Fertility rate trends by age compared with the Total Fertility Rate; 1991-2013



Source: Statistics New Zealand infoshare/population/births.

4.2 Implications of declining teen births

At one time reducing the total fertility rate was seen as desirable. Now fertility rates are widely below replacement rate (the number of children a woman needs to have to retain a stable population). Consequently

¹⁶ Total fertility rate – the number of births a woman can be expected to have in her lifetime based on current age specific fertility rates – has been multiplied by 10 to provided comparative scale on the graph.



there may be a problem of structural population ageing, whereby there are potentially too few in the working age group to support a growing dependent elderly population (Jackson, 2004; Reher, 2007; Australian Government, 2008; Rollin-Alamillo et al (2014). As a result many developed countries are considering policies to retain and increase their fertility rate (Reher, 2007). Thus it would seem that pursuing a further decline in teenage birth rates might be counter-productive to retaining New Zealand's relatively healthy total fertility rate and lower consequent elderly dependency levels. New Zealand and the US have relatively high total fertility rates which has a benefit in terms of relatively less structural ageing (Jackson, 2011; Reher, 2007), and higher teenage birth rates can be seen as part of this higher total fertility, which is a positive thing.

While much of the research links teenage childbearing with poor health and outcomes, Kearney and Levine (2012) also found that much of the negative economic impact on teenage mothers could be explained by the negative economic impacts of being a sole parent. Some studies identify circumstances which support positive outcomes for teenage parents, as noted in the earlier Families Commission report (2011). The factors which lead to positive outcomes tend to include continuing the young mother's education and employment opportunities, as well as the level of family and community support available. Some ethnic groups in the US in fact show no adverse outcomes for teenage mothers (Geronimus, 1996; Kaufman et al, 2007). Rollin-Alamillo et al (2014) is one of a few studies to note the public health impacts of teenage births as lower in some respects, including costs, than births to older women, especially those aged 40+, but also those aged 35-39. For example, premature and low-birth rate babies are more likely at older ages than for women aged 15-19, as are caesareans, multiple births, gestational diabetes and pre-eclampsia.

4.3 Implications of regional and ethnic differentials

While some regional and ethnic variations in teenage births remain, all groups and regions in New Zealand (with the exception of Northland) have shown a continuing downward trend in both teenage births and abortions. This indicates that existing approaches are effective across all groups, but lessons could be learned from those areas that have shown greater declines. All ethnic groups are trending towards the national average, but more could be done for young Māori. Any interventions should take into account the information gained from the review of overseas trends and drivers of cultural and ethnic differentials, as well as existing knowledge about Māori teenage sexual behaviours and drivers (Families Commission, 2011), while also respecting cultural differences towards early motherhood.

Summary and Conclusions

Trends in New Zealand's teenage birth rate are similar to those of other developed countries, showing a decline both recently and longer term. This is especially so for the younger age group (under 18) where births are more likely to be unplanned. The decline is also evident across all ethnic groups in both New Zealand and the US, which has the highest teenage birth rate in the developed world. The Māori rate is still higher than the national rate, but the gap is narrowing. The decline has also happened in all regions of New Zealand except Northland. The temporary upturn in New Zealand trends between 2002 and 2008 seems to have been an international trend, possibly related to the general financial crisis. The biggest factor in the reduction in births in both New Zealand and the US has been the reduction in pregnancy, as abortions have been declining too. Again, this is across ethnic groups in both countries. The factors driving both likelihood of teenage pregnancy and its decline are multifaceted, suggesting prevention interventions also need to be multifaceted. The main direct factor in recent declines has been the increased use of contraception, but the other is delaying age of first sexual experience and the nature of that experience.

Underlying differences in the use of contraception and age at first sexual experience are a range of social, economic and cultural factors. Socio-economic disadvantage is a key factor, and this is broader than financial disadvantage: it involves broader social capital factors such as parental involvement, education, employment opportunities, leisure activities and community involvement. These factors have shown positive associations in the US, particularly among African-American and Hispanic groups, as have cultural factors such as strong social and family networks, building strong cohesive communities, and sexual education programmes delivered by and within the community. There are also different cultural and peer values and norms about early motherhood that underlie group disparities in teenage birth rates and need to be considered in any approach to change teenage behaviour. At a policy level, publicly funded family planning information and services that are accessible to teenagers are related to lower teenage birth rates. However, they need to be available in all regions, including rural areas, and delivered in culturally appropriate ways. The use of social media has been shown to be a potential means of reaching teenagers with sexual health messages.

The regional analysis is useful as a starting point for further analysis in New Zealand. For example, what has been happening in Wellington and Taranaki to contribute to above average declines in teenage births? On the other hand, what has or has not been happening in Northland? Why has Gisborne had larger declines than Northland when both are economically disadvantaged rural areas with large Māori youth populations? Future research should explore sexual health education and family planning services for youth in each region of New Zealand to match approaches with declines in teenage births, particularly among younger teenagers. In addition, community development and family support initiatives in those areas with declining teenage birth rates could be introduced to those areas that are still high or not declining. At a wider level, economic development, youth education and training and employment initiatives are all likely to assist in reducing the teenage birth rate among groups and areas where it is still relatively high.



Finally, the implications of a declining teenage birth rate need to be considered in the 21st century context of population decline and structural ageing where relatively high teenage birth rates in countries like New Zealand and the US are part of generally higher total fertility rates. This may offer positive protection against the impacts of structural ageing, such as declining population at workforce age to support a growing proportion of elderly people.



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DATA SOURCES AND METHODS

The following data were used for the analysis in this update:

1. **Birth Registration data:** The number of live births by selected mother's age by region for the period 2002-2013, sourced from Statistics New Zealand
2. **Number of live and still-born babies to teenage mothers** in New Zealand for the period 1996-2011 by single year of age (under 17, 18, and 19) sourced from Birth Registration data collected by Statistics New Zealand. Due to small numbers, it is not possible to get these data at a regional level.
3. **Estimated resident population** of females by single year of age by region. It should be noted that estimates for the period 2006-2013 inclusive are based on the 2006 Census (boundaries as at July 2013). The updated 2013 Census-based estimates will become available in November 2014.
4. **National Maternity Collection (MAT)** data for the period, sourced from the Analytical Services division of the Ministry of Health (MoH) for 2002-2012.
5. **Age-specific fertility rates** collated by Statistics NZ for single year and five year age groups, total population (Annual-Dec).

Two important differences between two of the data collections should be noted. First, the Birth Registration data contain information on the number of **children** registered after birth in New Zealand to New Zealand residents, while the MAT data included in this report gives information on the number of **mothers** giving birth in New Zealand (excluding overseas residents). The second major difference between the two datasets is the use of date of birth **registration** in the former, and date of **delivery/ birth** in the latter.

For the purpose of comparability between the two datasets, it has been **assumed that the number of live births from teenage mothers registered within the Birth Registration database equals the number of teenage mothers giving birth to at least one live-born child in any given year.** (Less than 1 per cent of teenage mothers had multiple births).¹⁷

The ethnic data for New Zealand was drawn from Statistics New Zealand's website on age-specific fertility and abortion rates.

International comparisons of trends in teen births were done using a range of secondary sources for the international data and Statistics New Zealand online sources for New Zealand comparisons.

¹⁷ Of the 918 sets of live-born twins in 2008, 39 (4 per cent) were born to mothers aged under 20 years, which is about 0.7 per cent of all confinements (a confinement being a pregnancy resulting in the birth of at least one live or still-born child) for women aged under 20 years. This proportion is much lower for triplets with none of the 11 sets of live-born triplets in 2008, born to teenage mothers (Statistics NZ, 2010b). A similar trend was noted in 2005, with no teen mothers giving birth to triplets and only 0.8 per cent of all teen confinements resulting in twin births (Statistics NZ, 2006).

A literature search was undertaken to examine what might be driving the declining teen birth rate, and ethnic and regional differentials. This used academic online databases such as Sociological Abstracts and Index New Zealand, websites of New Zealand organisations such as the Families Commission, and overseas national statistical bureaus and international statistical sources, such as the OECD. International material was sourced from 2000 to 2014, with a focus for New Zealand material on the period since the previous research and reports on teen births by the Families Commission (2011).

Appendix Table 1: Actual number of births registered (Birth Registration data) and number of mothers (MAT data), 2001 – 2013

No. of live births	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Under 16 years	149	129	143	160	162	149	211	202	145	142	123	106	104
16 years	356	317	347	381	373	438	496	468	365	398	342	303	270
17 years	664	699	790	783	789	898	974	1,020	903	823	698	676	551
18 years	1,090	1,077	1,086	1,178	1,285	1,255	1,439	1,526	1,376	1,352	1,160	1,094	973
19 years	1,514	1,400	1,418	1,542	1,527	1,633	1,835	2,008	1,881	1,837	1,685	1,607	1,405
<i>Total Under 20 yrs</i>	<i>3,773</i>	<i>3,622</i>	<i>3,784</i>	<i>4,044</i>	<i>4,136</i>	<i>4,373</i>	<i>4,955</i>	<i>5,224</i>	<i>4,670</i>	<i>4,552</i>	<i>4,008</i>	<i>3,786</i>	<i>3,303</i>
20 years and Over	52,026	50,399	52,350	54,029	53,609	54,820	59,089	59,119	57,873	59,345	57,395	57,392	55,414
Total All Ages	55,799	54,021	56,134	58,073	57,745	59,193	64,044	64,343	62,543	63,897	61,403	61,178	58,717

Source: Birth Registration data

No. of mothers	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Under 16 years	n/a	133	159	181	159	165	190	214	152	131	124	110	n/a
16 years	n/a	340	353	377	392	451	475	459	402	383	336	324	n/a
17 years	n/a	738	816	774	846	884	998	1,005	888	799	699	694	n/a
18 years	n/a	1,115	1,088	1,198	1,261	1,288	1,446	1,543	1,422	1,311	1,190	1,108	n/a
19 years	n/a	1,410	1,492	1,539	1,607	1,628	1,871	1,974	1,910	1,874	1,679	1,634	n/a
<i>Total Under 20 yrs</i>	<i>n/a</i>	<i>3,736</i>	<i>3,908</i>	<i>4,069</i>	<i>4,265</i>	<i>4,416</i>	<i>4,980</i>	<i>5,195</i>	<i>4,774</i>	<i>4,498</i>	<i>4,028</i>	<i>3,870</i>	<i>n/a</i>
20 years and Over	n/a	50,608	52,230	53,098	53,696	55,328	58,164	58,294	58,250	58,900	57,316	n/a	n/a
Total All Ages	n/a	54,344	56,138	57,167	57,961	59,744	63,144	63,489	63,024	63,398	61,344	n/a	n/a

Source: MAT data



Appendix Table 2: Rolling averages (3 year*) for the number of births registered (Birth Registration data) and number of mothers (MAT data), 2001 – 2013

No. of live births	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*
Under 16 years	143	140	144	155	157	174	187	186	163	137	124	111	105
16 years	336	340	348	367	397	436	467	443	410	368	348	305	287
17 years	684	718	757	787	823	887	964	966	915	808	732	642	614
18 years	1,113	1,084	1,114	1,183	1,239	1,326	1,407	1,447	1,418	1,296	1,202	1,076	1034
19 years	1,462	1,444	1,453	1,496	1,567	1,665	1,825	1,908	1,909	1,801	1,710	1,566	1506
<i>Total Under 20 yrs</i>	<i>3,738</i>	<i>3,726</i>	<i>3,816</i>	<i>3,988</i>	<i>4,183</i>	<i>4,488</i>	<i>4,850</i>	<i>4,950</i>	<i>4,815</i>	<i>4,410</i>	<i>4,116</i>	<i>3,700</i>	<i>3,546</i>
20 years and Over	51,737	51,592	52,259	53,329	54,153	55,839	57,676	58,694	58,779	58,204	58,044	56,734	56,403
Total All Ages	55,475	55,318	56,076	57,317	58,337	60,327	62,527	63,643	63,594	62,614	62,159	60,433	59,948

Source: Birth Registration data

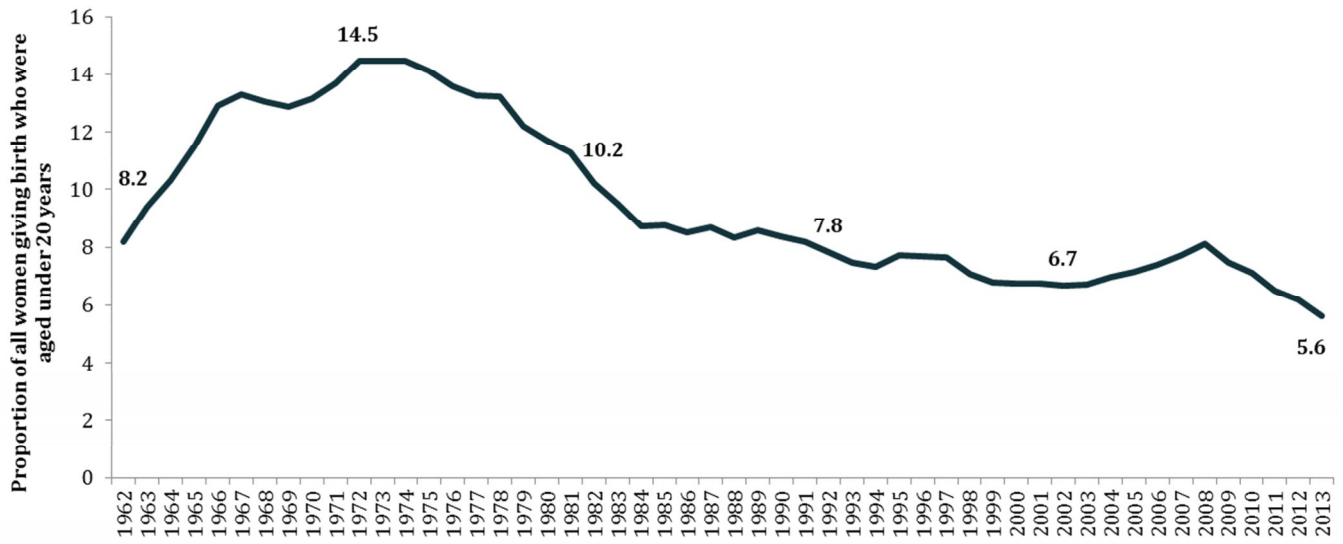
No. of mothers	2001	2002*	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013
Under 16 years	n/a	146	158	166	168	171	190	185	166	136	122	117	n/a
16 years	n/a	347	357	374	407	439	462	445	415	374	348	330	n/a
17 years	n/a	777	776	812	835	909	962	964	897	795	731	697	n/a
18 years	n/a	1,102	1,134	1,182	1,249	1,332	1,426	1,470	1,425	1,308	1,203	1,149	n/a
19 years	n/a	1,451	1,480	1,546	1,591	1,702	1,824	1,918	1,919	1,821	1,729	1,657	n/a
<i>Total Under 20 yrs</i>	<i>n/a</i>	<i>3,823</i>	<i>3,905</i>	<i>4,080</i>	<i>4,250</i>	<i>4,553</i>	<i>4,864</i>	<i>4,982</i>	<i>4,822</i>	<i>4,434</i>	<i>4,133</i>	<i>3,950</i>	<i>n/a</i>
20 years and Over	n/a	51,419	51,979	53,008	54,041	55,729	57,262	58,236	58,481	58,155	58,108	57,316	n/a
Total All Ages	n/a	55,242	55,884	57,088	58,291	60,282	62,126	63,218	63,303	62,589	62,241	61,266	n/a

Source: MAT data

*The number of births/mothers in each year are based on a 3 year rolling average except for the years 2002 and 2012 in MAT data and 2013 in Birth Registration data, which are based on a two year average.



Appendix Figure 1: Proportion of all women giving birth who are aged under 20 years, 1962 - 2013



Source: Statistics New Zealand, Infoshare, Table reference: VSB004AA

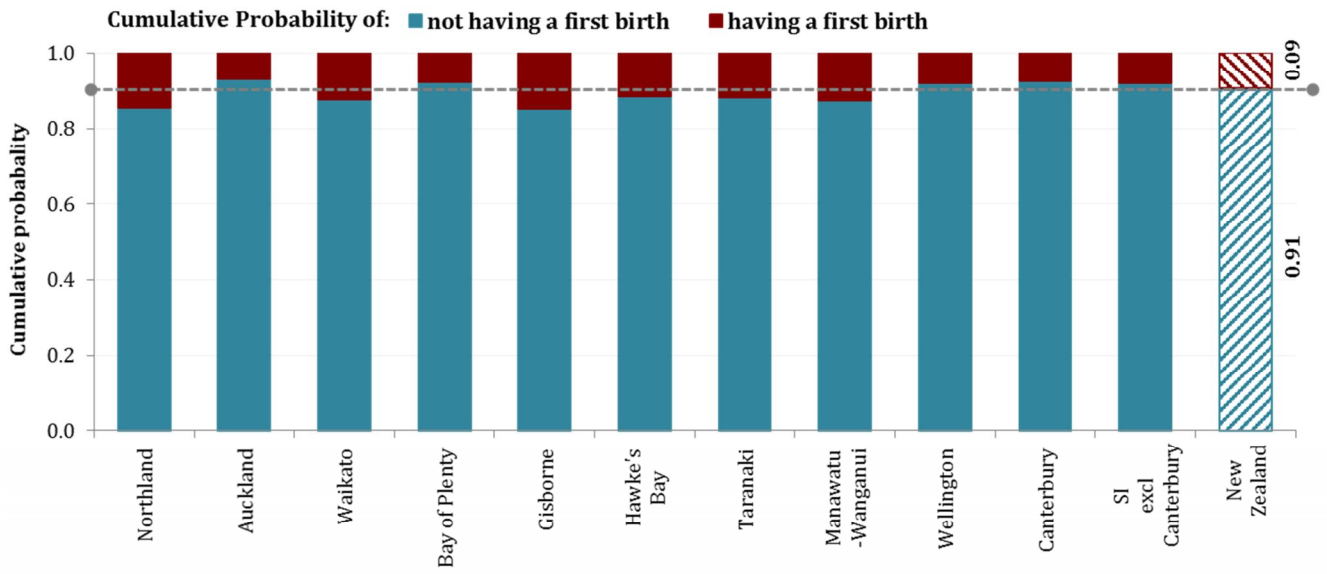


Appendix Table 3: Age specific fertility rates (ASFR) for teenagers, 1962-2013, Source: Statistics NZ

	Under 16 years	16 years	17 years	18 years	19 years	Under 20 years
1962	6.0	16.8	49.0	91.6	132.7	54.0
1963	5.7	19.6	48.1	98.4	144.9	57.4
1964	6.7	22.9	52.6	90.7	133.7	57.3
1965	6.6	21.6	52.4	94.6	129.6	59.1
1966	8.1	24.2	56.9	99.7	138.9	65.0
1967	9.3	25.7	63.4	98.7	142.6	67.2
1968	8.2	25.3	63.3	103.3	140.0	66.6
1969	8.6	26.0	63.0	102.9	132.4	64.9
1970	8.7	25.9	64.2	100.4	131.5	64.4
1971	9.7	31.6	67.4	107.1	135.9	68.3
1972	10.8	32.7	73.0	107.4	134.5	69.4
1973	12.6	33.8	67.7	93.7	124.7	64.5
1974	13.3	33.8	63.3	89.1	112.4	60.8
1975	11.8	32.6	56.0	80.1	102.4	55.2
1976	11.3	29.0	52.3	69.8	96.5	50.3
1977	11.1	26.1	46.6	70.4	89.7	47.2
1978	10.3	25.0	44.6	61.3	83.3	43.7
1979	8.3	20.8	41.0	62.0	78.9	41.4
1980	8.1	18.5	36.7	54.5	74.4	38.5
1981	7.0	19.8	35.8	54.4	72.5	38.3
1982	6.6	15.8	34.9	50.6	63.5	34.6
1983	6.2	16.2	31.1	47.4	62.3	32.7
1984	6.5	15.2	30.7	44.6	57.1	30.7
1985	6.0	14.7	32.0	43.5	59.1	30.6
1986	5.4	14.8	31.0	45.3	58.7	30.4
1987	6.1	15.9	31.0	45.8	62.9	32.0
1988	5.6	15.0	32.1	47.7	59.7	32.0
1989	5.7	15.9	34.9	48.2	62.3	33.8
1990	6.4	16.3	32.2	51.7	65.7	35.2
1991	6.7	16.7	32.1	47.6	62.1	34.1
1992	5.4	15.5	31.3	47.7	61.3	33.2
1993	5.7	15.8	28.0	49.1	58.7	32.4
1994	6.4	14.9	31.8	46.3	55.8	31.6
1995	7.1	17.3	33.8	48.1	60.8	33.7
1996	6.0	17.4	30.6	50.0	62.2	33.3
1997	7.3	14.7	31.0	50.9	62.4	33.2
1998	5.0	13.7	27.8	45.2	55.2	29.5
1999	5.3	12.5	28.4	43.4	55.9	29.2
2000	5.6	12.5	25.7	43.8	54.5	28.4
2001	5.4	13.1	24.4	40.1	55.8	27.7
2002	4.6	11.3	25.0	38.3	49.6	25.8
2003	4.8	12.1	27.4	37.6	48.8	26.1
2004	5.3	12.7	26.9	40.3	52.7	27.3
2005	5.1	12.2	26.1	44.0	51.9	27.4
2006	4.7	13.7	29.1	41.5	55.7	28.3
2007	6.8	15.4	30.3	46.6	60.6	31.6
2008	6.6	14.9	31.4	47.5	64.8	33.1
2009	4.8	11.7	28.5	42.3	58.2	29.6
2010	4.7	13.0	26.2	42.5	55.8	29.0
2011	4.2	11.2	22.7	36.9	52.7	26.0
2012	3.7	10.17	22.15	35.61	51.04	25.0
2013	3.7	9.31	18.41	31.82	45.47	22.2



Appendix Figure 2: Cumulative probability (unadjusted) of the 2008 cohort of females aged 15 years of having or not having a first birth between 2008 and 2012, Regions and New Zealand



Based on MAT data (only including women with parity count recorded)

Appendix Table 4: Cohort, age and calendar year-specific probabilities, by region and for New Zealand, for probabilities of not having (left-hand panel), and of having (right hand panel) a first birth – adjusted data

	Probability of <u>not</u> having a first birth					Probability of having a first birth				
	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
Northland	0.995	0.978	0.954	0.947	0.935	0.005	0.022	0.046	0.053	0.065
Auckland	0.994	0.990	0.980	0.968	0.961	0.006	0.010	0.020	0.032	0.039
Waikato	0.992	0.984	0.964	0.959	0.952	0.008	0.016	0.036	0.041	0.048
Bay of Plenty	0.991	0.984	0.970	0.955	0.938	0.009	0.016	0.030	0.045	0.062
Gisborne	0.995	0.981	0.972	0.944	0.951	0.005	0.019	0.028	0.056	0.049
Hawke's Bay	0.993	0.978	0.977	0.968	0.952	0.007	0.022	0.023	0.032	0.048
Taranaki	0.990	0.987	0.978	0.968	0.948	0.010	0.013	0.022	0.032	0.052
Manawatu-Wanganui	0.993	0.983	0.966	0.960	0.946	0.007	0.017	0.034	0.040	0.054
Wellington	0.996	0.991	0.985	0.972	0.963	0.004	0.009	0.015	0.028	0.037
Canterbury	0.997	0.993	0.982	0.979	0.971	0.003	0.007	0.018	0.021	0.029
SI excl Canterbury	0.997	0.986	0.983	0.972	0.963	0.003	0.014	0.017	0.028	0.037
New Zealand	0.994	0.987	0.976	0.967	0.958	0.006	0.013	0.024	0.033	0.042

Based on MAT data (adjusted data)

Note: Some of the trends might be due to random statistical errors rather than real issues.



Appendix Table 5: Cohort, age and calendar year-specific probabilities, by region and for New Zealand, for probabilities of not having (left-hand panel), and of having (right hand panel) a first birth – unadjusted data

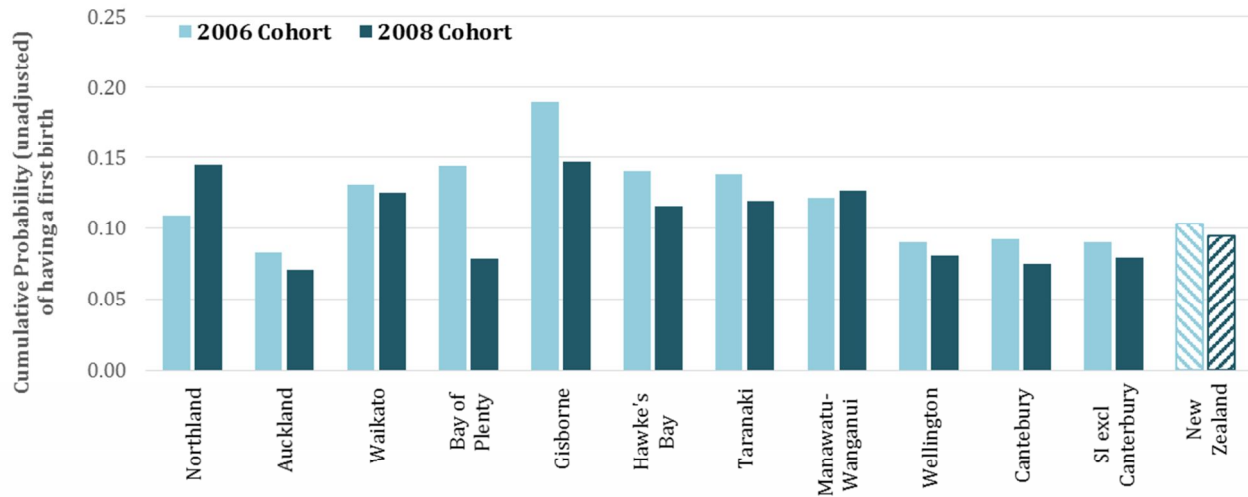
	Probability of <u>not</u> having a first birth					Probability of having a first birth				
	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
Northland	0.996	0.987	0.971	0.953	0.940	0.004	0.013	0.029	0.047	0.060
Auckland	0.997	0.994	0.987	0.978	0.973	0.003	0.006	0.013	0.022	0.027
Waikato	0.994	0.986	0.968	0.965	0.956	0.006	0.014	0.032	0.035	0.044
Bay of Plenty	0.991	0.984	0.970	0.989	0.984	0.009	0.016	0.030	0.011	0.016
Gisborne	0.995	0.981	0.974	0.944	0.951	0.005	0.019	0.026	0.056	0.049
Hawke's Bay	0.995	0.980	0.977	0.973	0.955	0.005	0.020	0.023	0.027	0.045
Taranaki	0.991	0.989	0.979	0.968	0.948	0.009	0.011	0.021	0.032	0.052
Manawatu-Manganui	0.994	0.989	0.971	0.964	0.949	0.006	0.011	0.029	0.036	0.051
Wellington	0.997	0.993	0.986	0.975	0.966	0.003	0.007	0.014	0.025	0.034
Canterbury	0.997	0.993	0.982	0.979	0.971	0.003	0.007	0.018	0.021	0.029
SI excl Canterbury	0.997	0.991	0.985	0.976	0.970	0.003	0.009	0.015	0.024	0.030
New Zealand	0.996	0.990	0.981	0.972	0.963	0.004	0.010	0.019	0.028	0.037

Based on MAT data (only including women with parity recorded)

Note: Some of the trends might be due to random statistical errors rather than real issues.



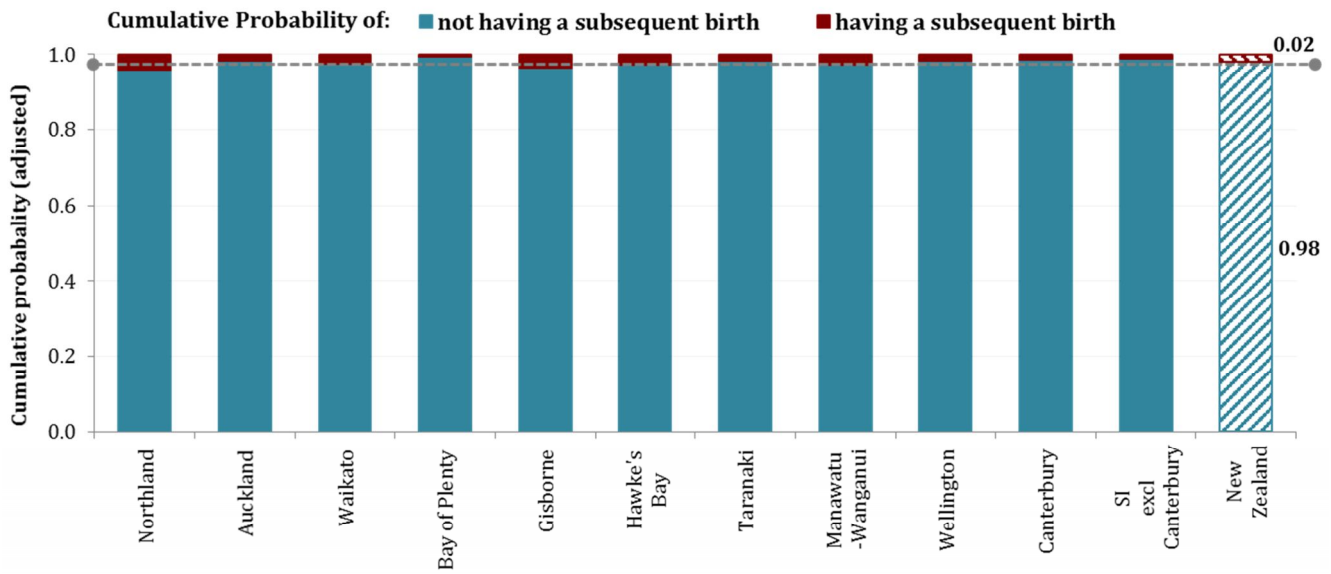
Appendix Figure 3: Comparison of cumulative probability (unadjusted) of the 2006 and 2008 cohort of females aged 15 years having a first birth between ages 15 and 19 years, Regions and New Zealand



Based on MAT data (only including women with parity count recorded)



Appendix Figure 4: Cumulative probability (unadjusted) of the 2008 cohort of females aged 15 years, of having or not having a subsequent birth between 2008 and 2012, Regions and New Zealand



Based on MAT data (only including women with parity count recorded)



Appendix Table 6: Cohort, age and calendar year-specific probabilities, by region and for New Zealand, for probabilities of not having (left-hand panel), and of having (right hand panel) a first birth and then a subsequent birth – adjusted data

	Probability of <u>not</u> having a subsequent birth					Probability of having a subsequent birth				
	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
Northland	1.000	1.000	0.993	0.982	0.977	-	-	0.007	0.018	0.023
Auckland	1.000	1.000	0.997	0.994	0.987	0.000	0.000	0.003	0.006	0.013
Waikato	1.000	0.999	0.997	0.995	0.981	-	0.001	0.003	0.005	0.019
Bay of Plenty	0.999	1.000	0.996	0.989	0.985	0.001	0.000	0.004	0.011	0.015
Gisborne	1.000	0.998	0.995	0.990	0.981	-	0.002	0.005	0.010	0.019
Hawke's Bay	0.999	0.998	0.999	0.993	0.979	0.001	0.002	0.001	0.007	0.021
Taranaki	1.000	0.999	0.996	0.996	0.991	-	0.001	0.004	0.004	0.009
Manawatu-Wanganui	1.000	0.999	0.999	0.991	0.980	-	0.001	0.001	0.009	0.020
Wellington	1.000	0.999	0.998	0.994	0.990	-	0.001	0.002	0.006	0.010
Canterbury	1.000	1.000	0.999	0.996	0.991	0.000	0.000	0.001	0.004	0.009
SI excl Canterbury	1.000	1.000	0.999	0.997	0.991	-	0.000	0.001	0.003	0.009
New Zealand	1.000	0.999	0.997	0.993	0.986	0.000	0.001	0.003	0.007	0.014

Based on MAT data (adjusted data)

Note: Some of the trends might be due to random statistical errors rather than real issues.



Appendix Table 7: Cohort, age and calendar year-specific probabilities, by region and for New Zealand, for probabilities of not having (left-hand panel), and of having (right hand panel) a first birth and then a subsequent birth – unadjusted data

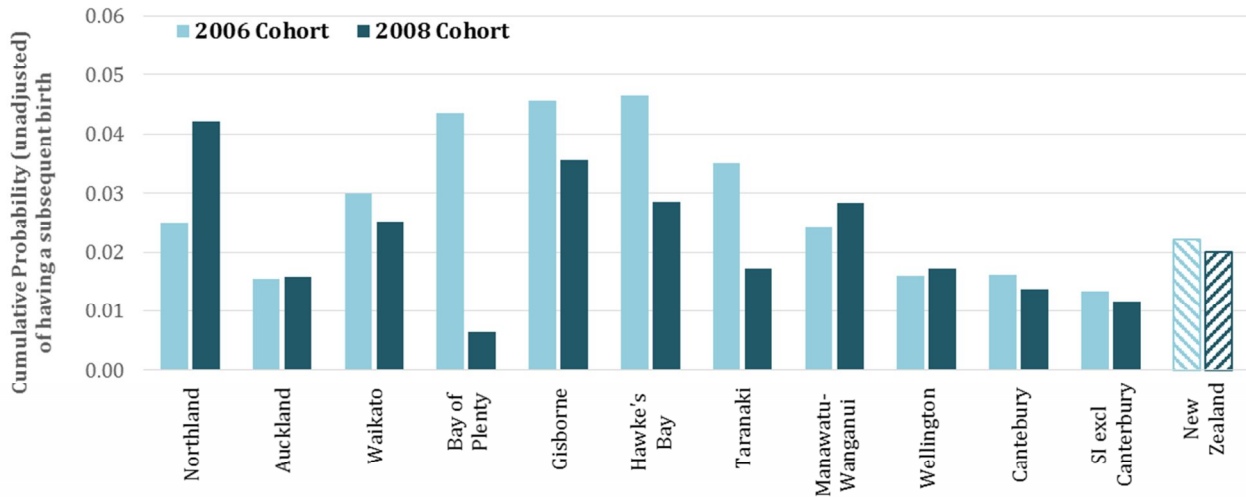
	Probability of <u>not</u> having a subsequent birth					Probability of having a subsequent birth				
	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
Northland	1.000	1.000	0.995	0.984	0.979	-	-	0.005	0.016	0.021
Auckland	1.000	1.000	0.998	0.996	0.991	0.000	0.000	0.002	0.004	0.009
Waikato	1.000	0.999	0.997	0.996	0.982	-	0.001	0.003	0.004	0.018
Bay of Plenty	0.999	1.000	0.996	1.000	0.999	0.001	0.000	0.004	0.000	0.001
Gisborne	1.000	0.998	0.995	0.990	0.981	-	0.002	0.005	0.010	0.019
Hawke's Bay	0.999	0.998	0.999	0.994	0.981	0.001	0.002	0.001	0.006	0.019
Taranaki	1.000	0.999	0.996	0.996	0.991	-	0.001	0.004	0.004	0.009
Manawatu-Manganui	1.000	0.999	0.999	0.992	0.981	-	0.001	0.001	0.008	0.019
Wellington	1.000	0.999	0.998	0.995	0.990	-	0.001	0.002	0.005	0.010
Canterbury	1.000	1.000	0.999	0.996	0.991	0.000	0.000	0.001	0.004	0.009
SI excl Canterbury	1.000	1.000	0.999	0.997	0.993	-	0.000	0.001	0.003	0.007
New Zealand	1.000	1.000	0.998	0.994	0.988	0.000	0.000	0.002	0.006	0.012

Based on MAT data (only including women with parity recorded)

Note: Some of the trends might be due to random statistical errors rather than real issues.



Appendix Figure 5: Comparison of cumulative probability (unadjusted) of the 2006 and 2008 cohort of females aged 15 years having a subsequent birth between ages 15 and 19 years, Regions and New Zealand



Based on MAT data (only including women with parity count recorded)

Appendix Table 8: Number (rolling averages) of births registered by region, 2001, 2006 and 2013

Region	2001					2006					2013				
	Under 16 yrs	16 yrs	17 yrs	18 yrs	19 yrs	Under 16 yrs	16 yrs	17 yrs	18 yrs	19 yrs	Under 16 yrs	16 yrs	17 yrs	18 yrs	19 yrs
Northland	10	18	34	61	69	12	20	45	80	92	8	19	38	64	95
Auckland	41	96	196	328	436	50	125	246	381	510	34	95	174	329	465
Waikato	17	44	78	126	181	19	56	110	157	185	13	32	82	116	179
Bay of Plenty	15	31	64	100	129	18	42	88	115	154	10	36	63	94	136
Gisborne	5	9	19	25	32	3	9	22	25	44	2	8	16	22	27
Hawke's Bay	9	14	36	63	75	12	21	45	70	80	8	19	30	60	69
Taranaki	3	9	24	35	41	7	16	25	42	53	2	6	12	28	38
Manawatu-Wanganui	11	27	54	83	111	14	37	66	105	122	6	15	47	79	102
Wellington	13	38	65	97	138	15	37	82	117	143	11	19	54	78	130
Canterbury	10	26	56	97	122	14	43	85	123	145	6	25	52	88	129
South Island excl Canterbury	8	24	55	96	124	9	29	70	108	134	8	16	48	78	138
New Zealand	143	336	684	1,113	1,462	174	436	887	1,326	1,665	105	287	614	1,034	1,506

Source: Birth Registration data (rolling averages)



Appendix Table 9: Proportion of teenagers (15-19 years) among women giving birth, 2001 – 2013 by region

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Northland	9.6	10.1	10.6	10.8	11.2	11.2	11.7	11.5	11.5	11.5	11.1	10.7	10.0
Auckland	5.6	5.6	5.5	5.7	5.8	6.0	6.5	6.7	6.6	6.0	5.5	5.1	4.9
Waikato	8.3	8.4	8.7	8.8	9.0	9.0	9.5	9.4	9.3	8.7	8.3	7.4	7.1
Bay of Plenty	9.4	9.2	9.6	9.7	10.3	10.7	11.1	11.0	10.4	9.9	9.7	9.2	8.9
Gisborne	11.7	11.7	11.9	13.0	13.4	13.4	13.2	13.3	12.9	11.8	11.0	10.7	10.4
Hawke's Bay	9.2	9.2	9.6	10.1	10.1	10.4	10.7	10.6	10.4	9.6	8.8	8.4	8.4
Taranaki	8.2	9.0	9.4	9.2	9.1	9.6	9.9	9.6	8.7	8.1	7.3	6.2	5.6
Manawatu-Wanganui	9.2	9.3	9.4	9.9	10.4	10.8	10.9	10.5	10.3	9.6	9.1	8.3	8.3
Wellington	5.6	5.5	5.3	5.3	5.6	6.1	6.4	6.4	6.2	5.8	5.4	4.9	4.7
Canterbury	5.1	5.0	5.2	5.4	5.7	5.9	6.1	6.0	5.7	5.2	4.9	4.6	4.5
SI excl Canterbury	5.9	5.9	6.0	6.0	6.2	6.4	6.4	6.5	6.3	5.9	5.5	5.3	5.3
New Zealand	6.7	6.7	6.8	7.0	7.2	7.4	7.8	7.8	7.6	7.0	6.6	6.1	5.9

Source: Birth Registration data (rolling averages)



Appendix Table 10: Proportion of teenagers among women giving birth, by single year of age for each region: 2001, 2006 and 2013

	2001					2006					2013				
	Under 16 yrs	16 yrs	17 yrs	18 yrs	19 yrs	Under 16 yrs	16 yrs	17 yrs	18 yrs	19 yrs	Under 16 yrs	16 yrs	17 yrs	18 yrs	19 yrs
Northland	5.2	9.5	17.8	31.8	35.6	4.7	7.9	18.0	32.2	37.1	3.4	8.5	17.7	28.5	42.7
Auckland	3.7	8.7	17.9	29.9	39.8	3.8	9.5	18.8	29.0	38.9	3.1	8.6	16.4	30.0	42.4
Waikato	3.8	9.9	17.4	28.3	40.6	3.5	10.6	20.8	29.8	35.2	3.1	7.5	19.3	27.5	42.5
Bay of Plenty	4.4	9.0	18.9	29.5	38.2	4.2	10.2	21.2	27.6	36.9	2.8	10.5	18.0	27.9	40.1
Gisborne	5.9	10.0	21.1	27.4	35.6	2.9	8.4	21.4	24.6	42.7	2.0	10.2	20.1	29.3	36.7
Hawke's Bay	4.4	7.0	18.3	32.1	38.2	5.3	9.1	19.9	30.6	35.1	4.1	10.0	15.4	32.4	37.3
Taranaki	2.7	8.0	21.6	31.4	36.4	4.7	11.2	17.2	29.6	37.3	2.4	6.5	14.0	33.1	44.4
Manawatu-Wanganui	3.8	9.3	19.0	29.0	38.8	4.1	10.8	19.2	30.5	35.4	2.2	5.9	18.6	31.9	41.0
Wellington	3.7	10.7	18.5	27.7	39.4	3.9	9.5	20.8	29.7	36.1	3.8	6.5	17.5	26.8	44.5
Canterbury	3.3	8.4	18.1	31.0	39.1	3.5	10.6	20.7	30.0	35.2	1.8	8.3	16.5	29.4	43.1
SI excl Canterbury	2.7	7.8	18.0	31.2	40.3	2.7	8.3	20.1	30.8	38.2	2.8	5.4	18.4	27.1	48.2
New Zealand	3.8	9.0	18.3	29.8	39.1	3.9	9.7	19.8	29.6	37.1	0.0	33.3	0.0	0.0	66.7

Source: Birth Registration data (based on rolling averages)



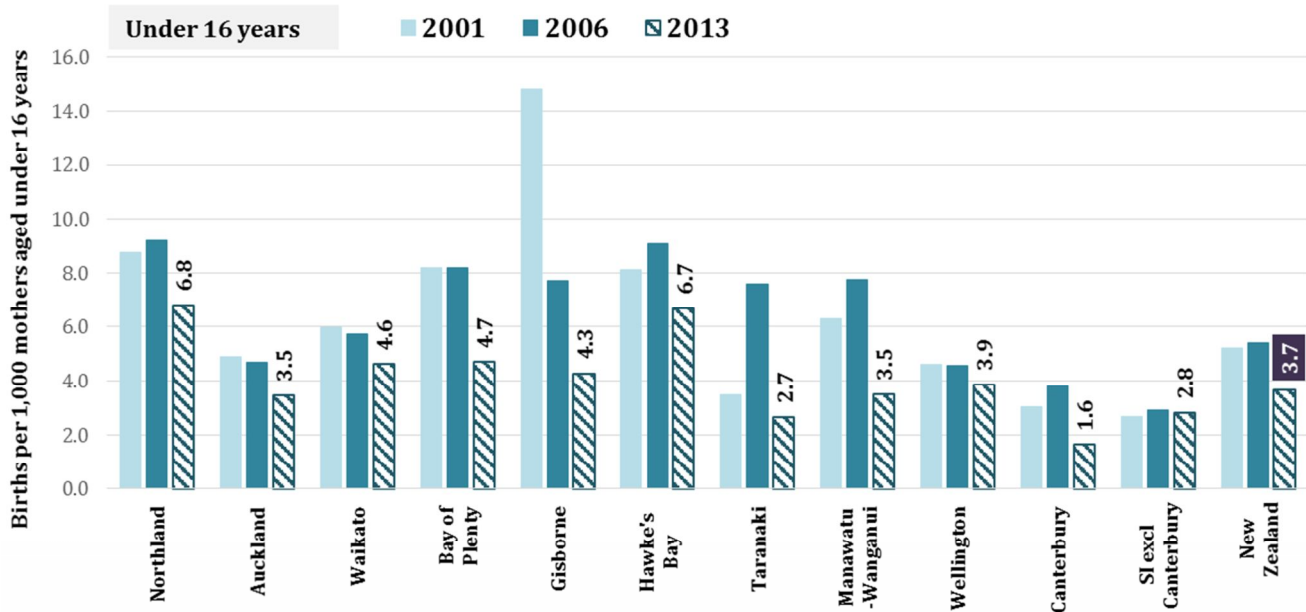
Appendix Table 11: Age specific fertility rates (ASFR) per 1,000 for teenagers (15-19 years), single year of age by region, 2001, 2006 and 2013

	Under 16 years			16 years			17 years			18 years			19 years			15-19 years		
	2001	2006	2013	2001	2006	2013	2001	2006	2013	2001	2006	2013	2001	2006	2013	2001	2006	2013
Northland	8.8	9.2	6.8	16.8	15.2	18.1	36.1	38.8	36.4	80.7	84.8	73.0	99.5	115.0	114.5	41.6	45.4	45.6
Auckland	4.9	4.7	3.5	11.4	11.9	9.3	23.4	24.0	16.5	36.5	36.8	29.8	47.8	51.3	42.0	25.4	25.4	20.8
Waikato	6.0	5.7	4.6	16.4	17.6	11.0	28.4	36.9	28.7	51.0	56.2	41.1	67.5	68.6	64.0	33.2	35.3	29.7
Bay of Plenty	8.2	8.2	4.7	16.4	19.3	18.6	35.6	43.5	34.4	69.4	71.4	57.3	101.8	111.4	88.0	41.3	44.5	37.8
Gisborne	14.8	7.7	4.3	24.3	20.2	18.8	46.3	55.0	45.7	88.1	87.4	74.1	123.1	163.0	117.4	53.6	57.9	45.4
Hawke's Bay	8.1	9.1	6.7	12.0	16.3	16.5	33.0	37.2	26.3	71.2	71.1	67.4	95.7	94.1	84.1	39.5	40.4	36.3
Taranaki	3.5	7.6	2.7	10.6	18.0	7.9	31.2	29.4	15.3	57.9	58.8	42.4	82.0	95.2	67.0	31.3	36.8	24.7
Manawatu-Wanganui	6.3	7.7	3.5	16.6	20.9	9.0	33.3	34.9	28.3	48.8	58.8	45.4	63.4	70.7	57.7	33.9	38.3	29.7
Wellington	4.6	4.6	3.9	13.4	11.1	6.3	22.4	24.8	17.4	32.7	33.2	23.7	43.6	40.8	38.3	23.9	23.2	18.6
Canterbury	3.1	3.8	1.6	8.0	11.2	7.2	16.0	23.4	14.1	28.3	33.2	22.2	35.4	39.1	32.1	18.3	22.0	16.2
SI excl Canterbury	2.7	2.9	2.8	7.6	9.0	5.7	18.4	22.1	16.3	27.1	30.9	23.3	35.8	36.6	36.7	18.9	20.9	18.4
New Zealand	5.2	5.4	3.7	12.3	13.6	9.9	25.2	28.7	20.6	41.1	43.9	33.9	53.9	57.2	49.0	27.5	29.1	23.8

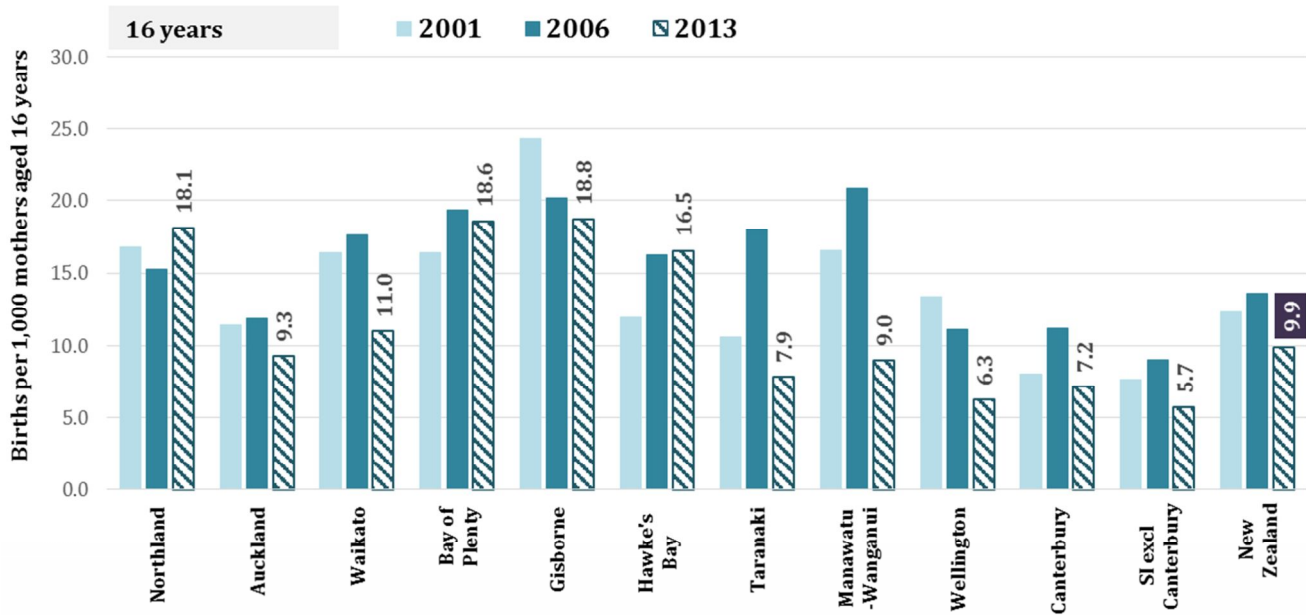
Source: Birth Registration data (rolling averages)



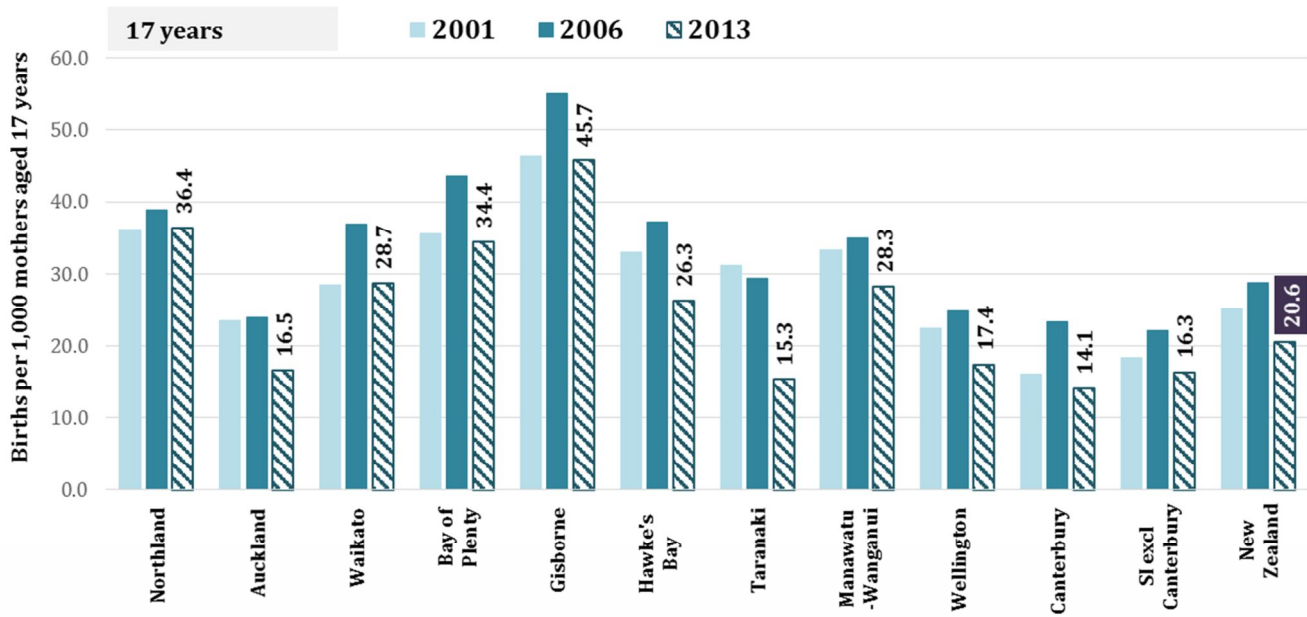
Appendix Figure 6: Regional age specific fertility rates per 1,000 teenage mothers aged under 16 years, 2001, 2006 and 2013



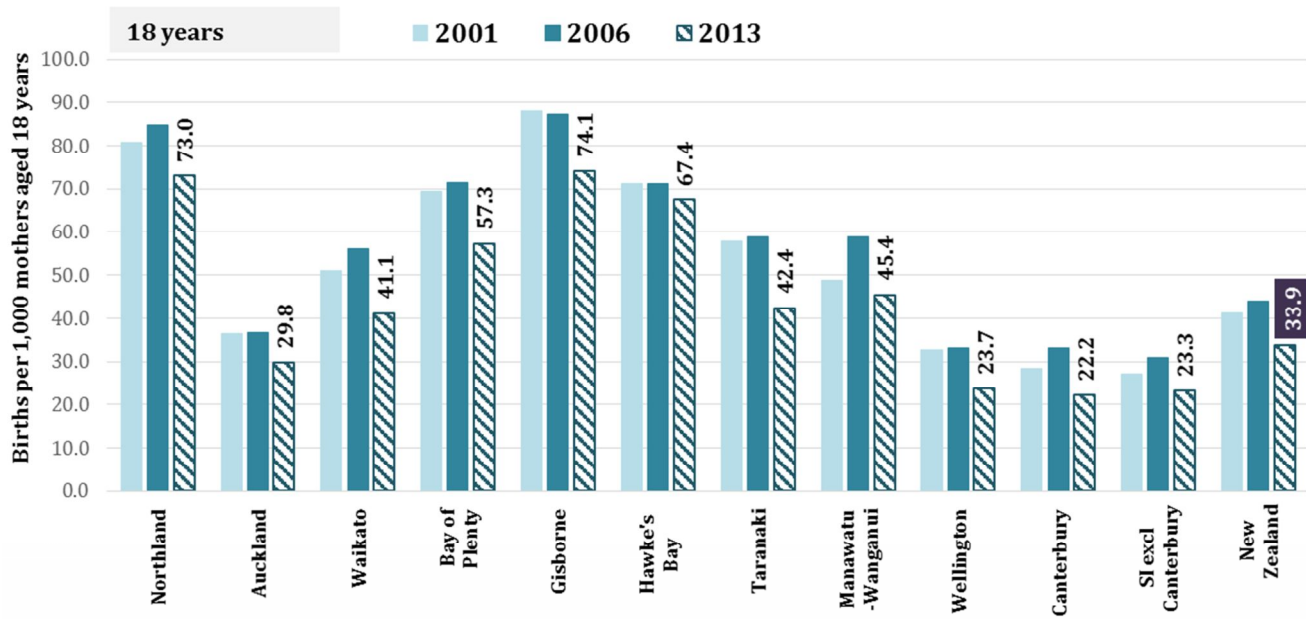
Appendix Figure 7: Regional age specific fertility rates per 1,000 teenage mothers aged 16 years, 2001, 2006 and 2013



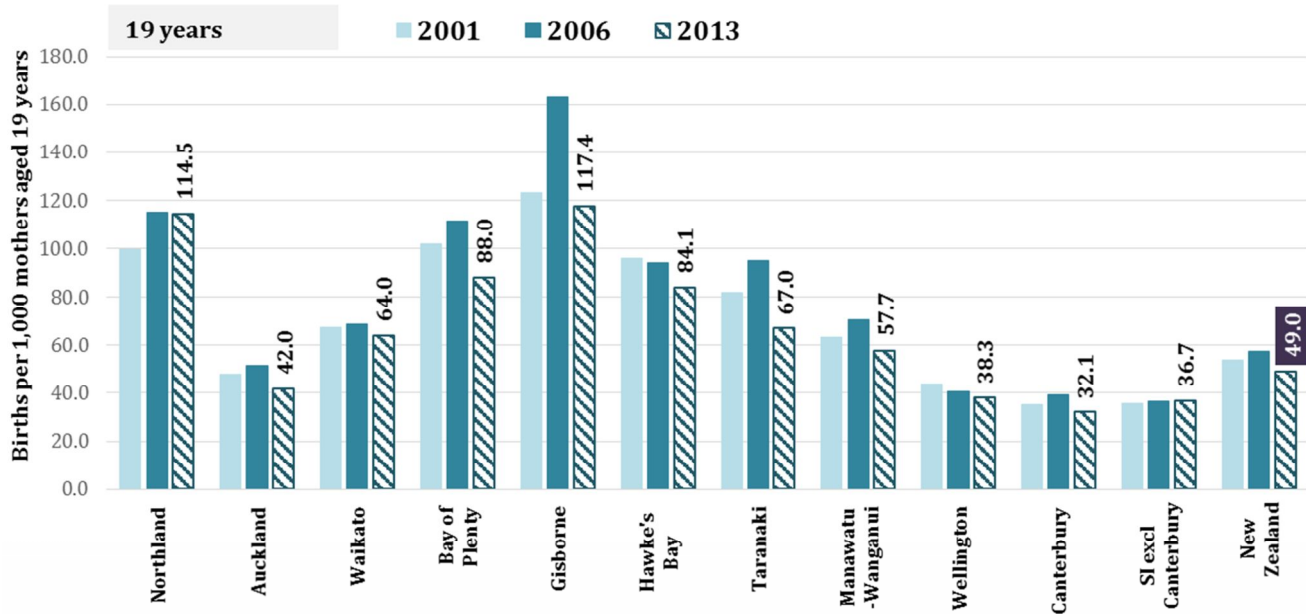
Appendix Figure 8: Regional age specific fertility rates per 1,000 teenage mothers aged 17 years, 2001, 2006 and 2013



Appendix Figure 9: Regional age specific fertility rates per 1,000 teenage mothers aged 18 years, 2001, 2006 and 2013



Appendix Figure 10: Regional age specific fertility rates per 1,000 teenage mothers aged 19 years, 2001, 2006 and 2013



Appendix Table 12: Teen birth rates, New Zealand and Māori, 1996-2013

	NZ total	Māori
1996	33.05	79.06
1997	32.83	82.47
1998	29.24	75.04
1999	28.93	72.42
2000	28.19	72.25
2001	27.46	69.08
2002	25.55	60.98
2003	25.89	63.8
2004	27.09	67.77
2005	27.16	66.47
2006	28.12	69.04
2007	31.27	77.67
2008	32.85	79.96
2009	29.39	70.97
2010	28.84	69.55
2011	25.82	62.76
2012	24.89	61.27
2013	22.04	53.18

Source: Statistics New Zealand, Age specific birth rates by five year age group, Total and Māori populations

Appendix Table 13: Unemployment rates, age 15-19, New Zealand, 1990-2013

Year	Unemployment Rate	Year	Unemployment Rate
1990	17.9	2002	15.8
1991	22.6	2003	14.5
1992	23	2004	13.2
1993	22.3	2005	13.3
1994	19.9	2006	14.2
1995	16.8	2007	14.4
1996	16.4	2008	16.2
1997	16.9	2009	23.4
1998	18	2010	24.7
1999	17.3	2011	25.7
2000	17.4	2012	25.8
2001	15.9	2013	24.3

Source: Statistics New Zealand, Infoshare/work and labour force status