Abortion in a New Zealand cohort – Incidence, reasons, and emotional impact

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A thesis submitted for the degree of
Master of Public Health
At the University of Otago, Dunedin,
New Zealand

December 2017

Abstract

Background: Abortion is a relatively common experience for New Zealand women. The reasons for abortion have not been studied in a New Zealand context. While the potential links between mental health outcomes have been studied extensively in New Zealand and internationally, the emotional impact of abortion is less often described.

Aim: To describe the incidence, circumstances, reasons and emotional impact of abortion for women and men by age period (under 21 years, 21-26 years, 26-32 years and 32-38 years).

Methods: A longitudinal study of a cohort born in New Zealand between 1972 and 1973. Outcomes measured were the outcome of all pregnancies, self-reported reasons for abortion and the emotional impact of abortion. Related characteristics or circumstances such as, happiness about pregnancy, preconception relationship, attitude to abortion and who made the abortion decision were also described. The epidemiological approach was a descriptive study of the incidence, reasons for and impact of abortion. Associations between various measures were tested using Chi-Squared tests.

Results: For the entire study period (up to the age of 38), the rate of abortions was 349 per 1000 women. One in four women reported abortions and one in five men reported abortions and almost one in six of all pregnancies with known outcomes ended in abortion. The proportion of reported pregnancies that ended in abortion was greatest in the youngest age period and declined as the study members aged. Being not ready was the most common single reason reported for abortion, followed by relationship reasons, including being in the wrong relationship and being alone. Relief predominated as the feeling reported by women following an abortion, and men reported a higher proportion of regret following an abortion than women. There are potential associations between a negative emotional impact and women focused reasons for abortion, such as career, education and health.

Conclusions: Abortions are common outcomes of pregnancies, especially at younger ages. The reasons for abortion that are reported here may provide clarification for policy makers and for clinicians in terms of understanding the perspectives of women that undergo abortions, though further qualitative research is necessary. Associations between reasons for abortion and emotional impact may be clinically relevant in order to identify those who are vulnerable to

negative impacts and provide better post-abortion care. Further research to identify who is at risk of long term negative impacts should include both New Zealand women and men.

Acknowledgements

I would like to thank Professor Jennie Connor for her unwavering support and guidance and Associate Professor Nigel Dickson for his expertise and useful comments throughout. I would also like to thank Dr Claire Cameron for statistical advice and Dr Antoinette Righarts for her guidance with data management.

I gratefully acknowledge the study participants and their families as well as those who have been involved with the study over the years.

To my family and friends, I am truly thankful for all the coffee breaks, post-lunch pump-ups and long phone calls. It was a team effort.

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1 BACKGROUND

1.1 Legal Context of Abortion in New Zealand

In New Zealand, abortion is regulated by both an amendment to the Crimes Act (1961)[1] and by the Contraception, Sterilisation and Abortion Act (1977). Induced abortion is the deliberate and premature termination of a pregnancy and is legally defined by the Contraception, Sterilisation and Abortion Act as a medical or surgical procedure carried out for the purpose of procuring the "destruction or death of an embryo or fetus after implantation" (Contraception, Sterilisation and Abortion Act 1977, s2a), or "the premature expulsion or removal of an embryo or fetus after implantation, otherwise than for the purpose of inducing the birth of a fetus believed to be viable or removing a fetus that has died" (Contraception, Sterilisation and Abortion Act 1977, s2b). Prior to the 1977 Act, induced abortion in all forms was illegal in New Zealand. Illegal 'back-alley' abortions were fairly common, and when abortion became quasi-legal in Australia in the 1960's, those with the means often travelled to Australia to procure abortions (Sparrow & Abortion Law Reform Association of New Zealand, 2010).

Section 187a of the Crimes Act 1961 specifies on what grounds an abortion is legal. Abortion is considered generally illegal, unless the pregnancy is less than 20 weeks and it is believed that continuing the pregnancy would be a 'serious danger' to the life or to the physical or mental health of the woman or girl (Crimes Act 1961, s187A(1) (a)). Grounds for abortion also include if the pregnancy is a result of incest, or if the fetus is severely abnormal; defined in the Act as at risk of being either physically or mentally handicapped (Crimes Act 1961, s187A(1)). If the pregnancy is more than 20 weeks gestation, an abortion may only be performed to save the life of the woman or girl, or to avoid a serious and permanent physical or mental injury (Crimes Act 1961, s187A(3)). Factors that may be included for consideration, but are not themselves grounds for granting an abortion are cases of sexual violation (rape) and the extremities of age; either very young or very old (Crimes Act 1961, s187A(2)). There is no minimum age at which a female is able to consent to her own abortion, that is, a woman or girl of any age is able to consent to or refuse an abortion.

[1] Amended, on 16 December 1977, by section 6 of the Crimes Amendment Act 1977 (1977 No 113)

The Contraception, Sterilisation and Abortion Act 1977 requires two certifying consultants to agree that the woman or girl meets the requirements under section 187A of the Crimes Act (Contraception, Sterilisation and Abortion Act 1977, s33). Certifying consultants are medical doctors licenced by the Abortion Supervisory Committee (ASC), and at least one of the certifying consultants in every abortion decision must be a practising obstetrician or gynaecologist (Contraception, Sterilisation and Abortion Act 1977, s32(2)(b)).

1.2 Functions of the Abortion Supervisory Committee

The ASC functions as a board that grants licences to certifying consultants and to institutions that provide abortions. The ASC also reviews the facilities of institutions that hold abortion licences and reports to the government about abortion related statistics (Contraception, Sterilisation and Abortion Act 1977, s14). It is required of abortion providers to notify the ASC of every abortion performed, and the committee publishes reports on the data collected annually (Contraception, Sterilisation and Abortion Act 1977, s14). This information is publically available from both the annual report of the ASC and annual Statistics New Zealand reports (Abortion Supervisory Committee, 2016, Statistics New Zealand, 2015). As a result of legislated data collection and reporting of statistics, we have good knowledge about some general aspects of abortion in New Zealand, including the number per year, and for each abortion, the age of the woman, gestational age of the fetus and whether or not it was the woman's first abortion.

1.2.1 Recent statistics available from the Abortion Supervisory Committee

According to the 2016 report by the ASC describing abortion statistics of the year ending December 2015, the total number of abortions performed in the year 2015 was 13,155 (Abortion Supervisory Committee, 2016). This was similar to that of the previous year, 2014, where 13,137 abortions were reported to the ASC (Abortion Supervisory Committee, 2015) and lower than the greatest number of abortions performed in one year; 18,382 in 2006 (Abortion Supervisory Committee, 2016).

The general abortion rate, which measures the number of abortions per 1000 of the mean estimated population of women aged 15-44 years, was the lowest in 2015 since 2005, at 14.2 abortions per 1000 women aged 15-44 years. The greatest number of abortions per 5-

year age group were performed on women aged 20-24 years (3,777) and 25-29 years (3,256).

In 2015, ninety-seven percent of abortions were carried out on the grounds of protecting the mental health of the woman or the girl, in line with all previous years (Statistics New Zealand, 2016). Only a small percentage of 'not justified abortion certificates' are issued each year. In 2014, 216 not justified certificates were issued, representing between 1 and 2% of requests for an abortion (obtained under Official Information Act 1982 request to the ASC, 2015). There is no way of knowing whether those whose requests were considered not justified continued the pregnancy, or chose to engage with different consultants, which is within the law.

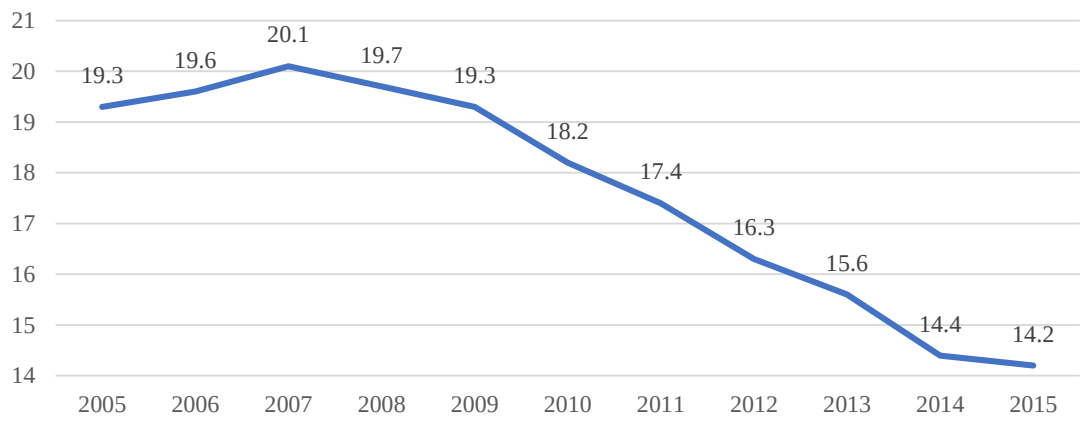

Figure 1. General abortion rate (number of abortions per 1000 women aged 15-44 years) in New Zealand between 2005 and 2015 [adapted from the report of the ASC (2016)].

As shown in Figure 1, the general abortion rate in 2015 was the lowest it has been since 2005, from a peak of 20.1 abortions per 1000 women in 2007 to 14.2 abortions per 1000 women in 2015. The abortion ratio, which is the number of abortions per 1000 known pregnancies (excluding miscarriages) has also been decreasing since 2005, from 232 abortions per 1000 known pregnancies in 2005 to 177 abortions per 1000 known pregnancies in 2015 (Figure 2).

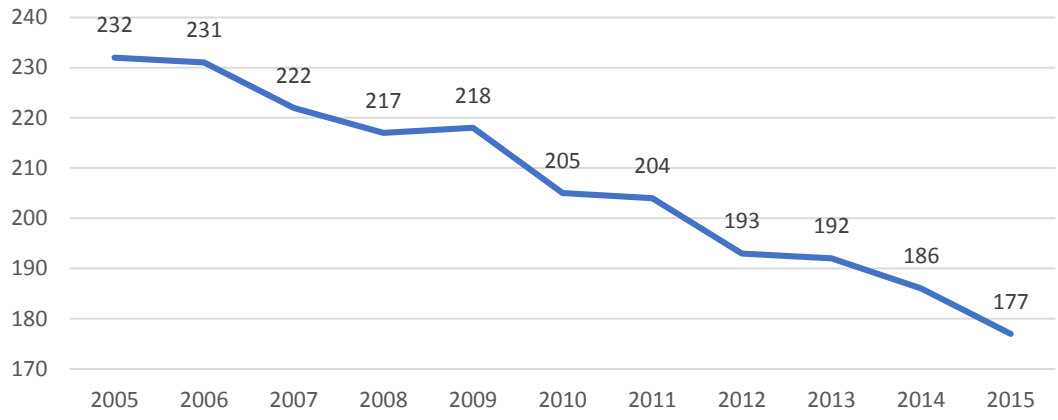

Figure 2. Abortion ratio (number of abortions per 1000 known pregnancies excluding miscarriages) in New Zealand between 2005 and 2015 [adapted from the report of the ASC (2016)].

Comparisons between New Zealand's abortion statistics and other similar countries must be made with care. Many countries do not consider abortion a notifiable procedure and rates may not be as reliable as in New Zealand. The general abortion rate in New Zealand in 2014 (14.4 per 1000) when compared to other countries general abortion rates shows that countries like Norway (13.9 per 1000) and Denmark (14.3 per 1000) have similar rates to New Zealand. England and Wales and Sweden both had higher general abortion rates than New Zealand, 16.5 per 1000 and 20.2 per 1000 respectively (Abortion Supervisory Committee, 2015).

While we have good routine data about abortion in New Zealand, there is little research that explores the experience of abortion in a New Zealand specific context. The general aim of this research was to use existing data collected in the Dunedin Multidisciplinary Health and Development Study (DMHDS) to fill in some of the current gaps in understanding of the context of abortion in New Zealand.

1.3 The Dunedin Multidisciplinary Health and Development Study

1.3.1 History of the cohort

The DMHDS is an ongoing longitudinal study of a birth cohort which was formed originally to study the effects of being born in adverse circumstances on the development of children. The cohort was formed from all babies born in the Queen Mary Maternity Hospital of Dunedin, Otago in New Zealand between April 1, 1972 and March 30, 1973. Families of eligible children were invited to participate in the study if they still lived in the greater Otago

area at age 3 years. Nine percent of those eligible declined or were unable to participate. The original cohort was *n* = 1037, of whom 535 were males and 502 were females. The study members have been assessed regularly their whole lives at ages 3, 5, 7, 9, 11, 13, 15, 18, 21, 26, 32 and 38. At the most recent (age 38 assessment), 95% of living study members were assessed (Poulton, Moffitt, & Silva, 2015). Most study members have remained in New Zealand, however there are some, at the age 38 assessement that were living outside of New Zealand. The majority of these overseas based study members were in Australia, the United Kingdom, Europe or North America, where abortion is at least permitted under certain grounds.

1.3.2 Relevance to this research

In the late 1980s and 1990s the study members born in Dunedin in 1972 and 1973 were entering their teens and early twenties. We know from national statistics that during this time all measures of abortion; the crude number of abortions, the general abortion rate and the abortion ratio, were increasing with every year. The cohort of the DMHDS was the second generation to experience the new quasi-legal status of abortion in New Zealand. The 1990s saw an increase in the proportion of women under the age of 20 terminating their pregnancies and a large rise in the abortion ratio for women in the 20-24 years age group. This may be attributed to both the number of abortions increasing and the number of pregnancies decreasing. It likely also reflects the trend of women choosing to have children later in their reproductive lives than in previous generations (Statistics New Zealand, 2009).

The longitudinal cohort design of this study has several advantages for this research, as it has allowed collection of data closer to the time of the abortion that a cross sectional study, and a wide range of background information about study members has been collected. The longitudinal design of the study also allows comparisons of the same group of study members over time, at different life stages.

2 LITERATURE REVIEW

2.1 Method

The literature included in this review was identified by a search of the online database Medline, a search of the web archives of relevant organisations, and a hand search of the reference lists of other relevant papers. The scope of this literature review is not that of a systematic review, though all published New Zealand research related to abortion was reviewed. Selected international literature from countries similar to New Zealand and related to the aims of the study was also reviewed here.

2.2 Epidemiology of abortion

2.2.1 Global estimates of abortion rates

It is estimated that between one in three and one in four women in developed nations will have an abortion in their reproductive lifetimes (between the ages of 15 to 44 years) (Chan & Keane, 2004; Jones & Jerman, 2017). Sedgh et al (2016) estimated that globally, there were 35 abortions per 1000 women (90% CI: 33-34) aged 15-44 years (in developed and developing nations), in each year between 2010 and 2014 (Sedgh et al., 2016). This was a reduction from the estimate of 40 abortions per 1000 women aged 15-44 between 1990 and 1994 (Sedgh et al., 2016).

In developed nations, the annual abortion rate has declined significantly from 46 abortions per 1000 women in 1990-1994 to 27 abortions per 1000 women in 2010-2014 (Sedgh et al., 2016). Developing nations did not experience the same decline in annual abortion rate in the same time period. The proportion of pregnancies that ended in abortion between 2010 and 2014 globally was estimated to be 25% (90% CI 23-29). In developed nations, this was estimated to be 28%, and in developing nations, 24% (Sedgh et al., 2016).

There is no evidence that legal status of abortion is associated with abortion rates. Where abortion is completely prohibited, or only allowed to save the life of the women, the annual abortion rate was 37 (34-51) abortions per 1000 women. Where legal abortion is available on request, it is estimated at 34 (29-46) abortions per 1000 women. In countries where abortion is legally allowed to protect the mental health of women, like New Zealand, the

abortion rate is estimated to be 33 abortions per 1000 women per year (Sedgh et al., 2016). Between 2010 and 2014 in New Zealand, the abortion rate was 16.4 abortions per 1000 women per year and the proportion of known pregnancies that ended in abortion was 19.6% (Statistics New Zealand, 2016b). It is unclear why there is such a large difference between the abortion rate estimate of Sedgh et al (2016) and that reported by Statistics New Zealand (2016b).

While legality of abortion may not affect the rates of abortion, it does affect the safety of abortion (Singh, 2009). The proportion of all abortions performed globally that were unsafe was estimated to be 50% in 2008, with 98% of all unsafe abortions occurring in developing or low socioeconomic status nations (Shah & Åhman, 2012). Most unsafe abortions occurred in young women between the ages of 15-24 years (Shah & Åhman, 2012).

2.2.2 Rates of abortion in New Zealand

Rates of abortion in New Zealand are publically available as part of mandatory reporting of all procedures to the Abortion Supervisory Committee (ASC). Reports are published by the ASC, and Statistics New Zealand also publishes reports of statistics. Current New Zealand abortion statistics were reported in Chapter One.

A survey of sexual health and experiences of 2922 New Zealand university students aged 17-24 years in 2009 asked participants if they had ever had, or had been responsible for, an unintended pregnancy and whether that unintended pregnancy had resulted in a termination. Of the women studied, 5.8% reported at least one unintended pregnancy. Of the men surveyed 5% reported ever being responsible for an unintended pregnancy (Psutka, Connor, Cousins, & Kypri, 2012). Of these unintended pregnancies, women reported 74% ended in abortion, men reported 70% ended in an abortion and an additional 19% of men said they did not know the outcome of the pregnancy (Psutka et al., 2012). While there are no statistics available from the ASC that describe the age-specific abortion ratios for the year ended December 2009, the median age of abortion in 2009 was 24 years, and women aged 20-24 had the highest abortion rate at 36 abortions per 1000 women (Statistics New Zealand, 2010). The lifetime prevalence of abortions described by Psutka et al (2012) should be understood in the context that these are unintended pregnancies experienced by high school and university students for whom education and socioeconomic reasons may play a larger

part in the decision to have an abortion that their peers who are not on a trajectory to studying at university.

2.3 Characteristics and circumstances of women who have abortions

2.3.1 Ethnicity

Table 1 illustrates the change in distribution of ethnicities of women presenting for abortion in 1995, 1999 and 2002 in an unspecified New Zealand clinic. The ethnicity of women presenting to the abortion clinic changed from majority European to majority Asian ('Asian' in this case refers to a number of ethnicities, though the majority were Chinese and most were young students or recent immigrants) (Goodyear-Smith & Arroll, 2003). The pattern of more Asian women having abortions continued into the late 2000's, where in 2008, Asian women were around 3 times as likely to have had an abortion than New Zealand European women (Fanslow, Silva, Whitehead, & Robinson, 2008). Since 2008, the proportion of known pregnancies that end in abortion for Asian women has steadily decreased, though it still remains higher than women of European descent (Abortion Supervisory Committee, 2016).

Table 1. Self-reported ethnicity of a sample of abortion patients in Auckland, New Zealand in 1995, 1999 and 2002 [adapted from Goodyear-Smith and Arroll, 2003]

	1995		1999		2002	
	n	**%**	**n**	**%**	**n**	**%**
European	123	61.5	218	54.5	131	32.8
Maori	44	22.0	104	26.0	33	8.3
Pacific Island	6	3.0	17	4.3	12	3.0
Asian	24	12.0	53	13.3	221	55.3
Other	3	1.5	7	1.8	3	0.8
Missing data	0	0.0	1	0.3	0	0.0
Total	200		400		400	

2.3.2 Age and parity

In developed nations, younger nulliparous women and older multiparous women are the most likely age groups to have an abortion (Fanslow et al., 2008; Shusterman, 1979).

Though, in a study of New Zealand women, they were more likely to be nulliparous in 2002 than when the study was done in 1995 and 1999 (65% were nulliparous compared with 41% and 48% in 1995 and 1999 respectively). They were also more likely to be students, and less likely to be involved only in homemaking or childcare (Goodyear-Smith & Arroll, 2003).

Sixty percent of abortion patients in the U.S. in 2014 were in their 20s and 25% were in their 30s (Jerman, Jones, & Onda, 2016). Additionally, almost 60% of abortion patients in 2014 had at least one prior birth (Jerman et al., 2016). Jerman et al (2016) also reported that in 2014 compared to 2008 the proportion of women younger than 20 undergoing abortions declined by 32%. A study of selected low and middle-income countries showed a similar pattern of age at abortion, with more than half of abortions taking place in women aged 20-29 and adolescents (women younger than 20 years) not undergoing a disproportionate number of abortions compared to women of other reproductive ages (Chae, Desai, Crowell, Sedgh, & Singh, 2017).

In New Zealand, women aged 20-24 years have had the highest abortion rate (per 1000 women) of all age groups since 1980, peaking in 2003 (Statistics New Zealand, 2009; Statistics New Zealand, 2016a). Additionally, the abortion rate for women aged 40-44 years almost doubled from 2.1 per 1000 women age 40-44 in 1980 to 4.0 per 1000 women aged 40-44 years in 2007 (Statistics New Zealand, 2009).

As shown in Figure 3, the abortion ratio (the number of abortions per 1000 known pregnancies) increased for adolescents between 1985 and 2007, and in every age group up until the 30-34 years age group. There was a smaller abortion ratio for women aged 35 plus in 2007 than in 1987 (2009). This likely represents changing patterns of fertility in recent decades, a stronger desire to delay or avoid parenthood for younger women resulting in women being older when they start their families.

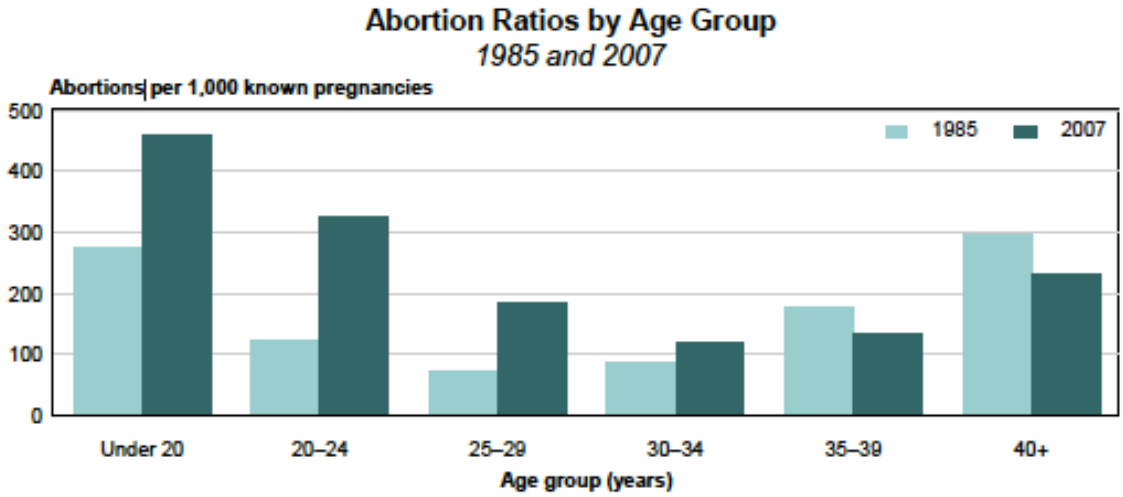

Figure 3. Abortion ratios by age group in 1985 and 2007 [from Abortion Trends in New Zealand 1980-2007, report from Statistics New Zealand, 2009]

2.3.3 Socioeconomic status

Women of all socioeconomic status levels choose to have abortions; however, women of lower socioeconomic status are more likely to have unwanted or mistimed pregnancies than women of higher socioeconomic status and therefore the number of abortions is greater. Women of higher socioeconomic status are more likely to choose abortion when faced with an unwanted pregnancy (Turner, 2004). A study of 259,242 Finnish women found that teenagers of higher socioeconomic status had the lowest risk of abortion, though in the case of a teenage pregnancy, teenagers of low socioeconomic status backgrounds were more likely to give birth than teenagers of a higher socioeconomic background (Vaisanen & Murphy, 2014).

In 2014, of U.S. women who were over 20 and had an abortion 91% had graduated high school, and 23% of those had graduated from university (Jerman et al., 2016). Poor women (defined in this study as at or below the poverty threshold) were 2.5 times as likely to have an abortion than middle or high-income women (Jerman et al., 2016). Globally, between 2010 and 2014, the majority of abortions (86%) occurred in low and middle-income countries. In a study by Chae et al of low and middle-income countries, in four out of five countries for which they had educational data, the majority of abortions were had by women with higher levels of education (considered in this case to be one year of secondary education or more) (Chae et al., 2017).

New Zealand based research that is able to examine socioeconomic outcomes and wellbeing for women that have abortions is limited to one study published by Fergusson et al in 2007 (Fergusson, Boden, & Horwood, 2007) that examined life-course outcomes such as education, economic and relationship based outcomes. Abortion seemed to prevent educational disadvantage associated with an early, unintended pregnancy. It also seemed that terminating an unintended pregnancy early in reproductive years conferred a freedom to pursue education that is not available to those who choose to have a child from an unintended pregnancy. The researchers stated that these positive effects did not extend to income and relationship factors when adjusted for various confounders. Before adjustment for confounding factors it seems that abortion had positive effects on all socioeconomic outcomes measured, though it may be that these effects are due women being more likely to choose abortion if they are from an advantaged background already.

A survey of New Zealand women found that women who lived in an urban area were 1.8 times as likely to have had an abortion than rural women (Fanslow et al., 2008). This is echoed by other international research (Vikat, Rimpelä, Kosunen, & Rimpelä, 2002; Chae et al, 2017) This disparity may reflect access to abortion services or differing perspectives on childbearing.

2.3.4 Relationship status

Being married is often used as an indicator of pregnancy intention, with married women having the lowest rates of unintended pregnancy, compared to women who are cohabiting or in other types of relationships (Finer & Zolna, 2016). Additionally, when an unintended pregnancy occurs, women who are married are significantly less likely than non-married women to choose to have an abortion (Finer & Zolna, 2016; Jerman et al., 2016). Women who were cohabiting but not married were twice as likely as the average to have an abortion, possibly due to increased exposure to sexual activity and therefore a greater chance of conception than women not living with a partner (Jerman et al., 2016). A similar study of low and middle-income countries found that in seven of the ten countries studied, married women had the majority of abortions, though there was some concern about underreporting of abortions by unmarried women, especially in countries were premarital sex and abortion are both highly stigmatised (Chae et al., 2017).

Relationship status is not part of the mandatory reporting to the ASC in New Zealand, though in a random sample of 2855 women aged 18-64 years in the Auckland and Waikato region of New Zealand, those who were living with a partner were 31% less likely to have had an abortion than those not living with a partner (Fanslow et al., 2008).

2.3.5 Intimate partner violence

In a study published in 2008, 2391 New Zealand women aged 18 to 64 years who had ever been pregnant were interviewed in order to examine the association between intimate partner violence (IPV) and two pregnancy outcomes; spontaneous miscarriage and abortion (Fanslow et al., 2008). One in three women who had ever been pregnant reported at least one miscarriage in her lifetime, and 1 in 10 reported ever having an abortion. Women who had experienced IPV were 2.5 times as likely to report having an abortion than women who had never experienced IPV. This association existed even after controlling for poverty, and other confounding factors (Fanslow et al., 2008). This built upon previous New Zealand based research which reported that 50% of women surveyed in an abortion clinic reported experiencing IPV in their lifetime (Whitehead & Fanslow, 2005). This is a greater prevalence of IPV than found in the wider population (Fanslow et al., 2008).

Studies undertaken in other similar countries have found a similar relationship between IPV and abortion, which is possibly influenced by an increased likelihood of unintended pregnancies in women exposed to IPV (Pallitto et al., 2013; Roberts et al., 2014). Intimate partner violence may also be linked to repeat abortion (Fisher et al., 2005). An increased likelihood of unintended pregnancy for individuals exposed to sexual abuse in childhood (CSA) was also suggested by Boden et al (2007) to explain the apparent link between CSA and an increased risk of abortion found in the cohort of the Christchurch Study (Boden, Fergusson, & Horwood, 2009).

2.3.6 Terminations of pregnancy in the post-partum period

The experience of a small number of women in the Waikato District Health Board (DHB) who had undergone an abortion within the post-partum period of a previous pregnancy was explored, with the aim of identifying barriers to obtaining effective contraception in the post-partum period (Joseph & Whitehead, 2012). The study found that women who had become accidentally pregnant in the post-partum period reported requesting an abortion

because they felt they were not being able to cope with another baby within a year of the last one (Joseph & Whitehead, 2012). The study recruited women who had an abortion scheduled less than six months since the birth of their last child, within the one year period of the study. Twenty-two women in total were recruited and completed the questionnaire, however there was no data provided that described how many women were eligible to be recruited to the study and chose not to participate.

2.4 Reasons for abortion

2.4.1 Unintended and unwanted pregnancy

The most fundamental reason for abortion is that the pregnancy is unwanted (Bankole, Singh, & Haas, 1998; Chae, Desai, Crowell, & Sedgh, 2017; Kirkman, Rosenthal, Mallett, Rowe, & Hardiman, 2010; Kirkman, Rowe, Hardiman, Mallett, & Rosenthal, 2009). It is crucial when discussing abortion to distinguish between unintended or unplanned pregnancies and unwanted pregnancies (Sable & Libbus, 2000). Pregnancies can be unintended for various reasons, generally related to non-use or imperfect use of contraception, whereas unwanted pregnancies are usually unintended and mistimed or otherwise not compatible with a woman's current circumstances (Finer & Henshaw, 2006; Frost & Darroch, 2008; Frost, Singh, & Finer, 2007). Unintended pregnancies reported by members of the DMHDS cohort as occurring under the age of 25 years were more likely to be due to contraception non-use than contraception failure (Dickson, Wilson, Herbison, & Paul, 2002). Contraceptive non-use is influenced by economic and education disparities that contribute to lower socioeconomic status women having a higher burden of unintended pregnancies (Finer & Zolna, 2011).

The 'Growing Up New Zealand' cohort study conservatively estimated the proportion of unplanned pregnancies was around 40%, however they were unable to recruit women who chose to terminate their pregnancies or experienced pregnancy loss, therefore it is more accurate to conclude that of children born to New Zealand mothers, 40% of those pregnancies were unplanned (Morton, 2010). The distinction between the two types of pregnancies is that not all unintended pregnancies are concurrently unwanted. Studies that have compared various medical and social outcomes of women who have abortions to those who give birth to a child often fail to account for whether the pregnancy was intentional, and more importantly, how wanted the pregnancy was at the time.

Women often report a general desire to avoid pregnancy, or delay their entrance in to parenthood. When an unwanted pregnancy occurs, the pregnancy may be considered mistimed for financial, education or career reasons or reasons relating to being too young or too old to become a parent. Women may believe that having another child would be detrimental to their ability to care for their existing children, or they wish to space their children appropriately. There may be known health issues that would prevent a healthy pregnancy. They may also feel that they are in an unsuitable relationship with the prospective co-parent, or that the prospective co-parent themselves are unsuitable to raise a child with (Bankole et al., 1998; Chae et al., 2017; Finer, Frohwirth, Dauphinee, Singh, & Moore, 2005; Kirkman et al., 2010; Kirkman et al., 2009).

The reason that the pregnancy is unwanted is often the basis for why abortion is chosen, however, unwanted pregnancies do end in live birth when the woman's social environment or her personal beliefs rule out abortion as an option, or when abortion is difficult to access.

2.4.2 Reasons for abortion

Personal, socioeconomic and health factors are the most commonly cited reasons contributing to the decision to have an abortion. Financial situations tend to be the most often cited specific reason for choosing have an abortion (Chae et al., 2017), however, studies that focus on only the main, or one, reason for why abortion was chosen fail to elucidate the more complex and interacting factors and circumstances that drive the decision to have an abortion. In a survey of women who had abortions in New Zealand clinics in 2009, 37% of women had decided to have an abortion before or immediately upon thinking they were pregnant, 29.3% decided to have an abortion as soon as they had a positive pregnancy test and 34% sometime after they had a positive pregnancy test (Silva, McNeill, & Ashton, 2010). It may be that those who make the decision at different times in the process have differing reasons for abortion, but evidence for this is unclear.

Bankole et al (1998) conducted a review of 37 studies that explored reasons why women have abortions. Based on the review, Bankole et al proposed nine categories of reasons;

- Wants to postpone childbearing
- Wants no (more) children
- Cannot afford a baby
- Having a child will disrupt education or job

- Has a relationship problem or partner does not want pregnancy
- Too young: parent(s) or other(s) object to pregnancy
- Risk to maternal health[2]
- Risk to fetal health
- Other

A 2009 review of 19 relevant studies (from Sweden, US, Greece, Canada, Australia, Denmark, Holland and Norway) further divided reasons for abortion into three main categories; 'woman-focused', 'other focused' and 'material' (Kirkman et al., 2009). Woman-focused reasons included 'wrong timing', 'family complete', 'does not want children', 'physical or mental health' and 'does not want a disabled child'. Other-focused reasons included relationship issues, the influence of others, sexual assault or violence, concern for the potential child's needs and fear for potential fetal damage brought upon by inadequate prenatal care (this included self-identified substance abuse while pregnant). Material-focused reasons included financial and housing concerns (Kirkman et al., 2009).

Most studies concluded that the reasons women have abortions are often complex and interacting, and generally dependent on the socio-cultural environment in which the woman lives, socioeconomic factors as well as individual/personality characteristics (Kirkman et al., 2010).

2.4.3 Characteristics related to reasons for abortion

As financial constraints are one of the most often cited reasons for choosing to have an abortion by women of all ages, it is likely that socioeconomic status does affect the likelihood of choosing abortion. However, substantial numbers of women of every socioeconomic status choose to either abort or continue their pregnancy which suggests other factors contribute to the decision to have an abortion. In addition, the age of the woman when the abortion occurred may have an effect on the reasons for abortion. A mixed methods study of US women found that childless and younger women (under the age of 20) were more likely to cite reasons relating to not being ready to be a mother or not being able to afford a child, whereas older women were more likely to cite responsibilities to other children as a reason for their abortion (Finer et al., 2005). Childless or younger women were

[2] The category of reason for abortion 'risk to maternal health' that was proposed by Bankole et al (1998) did not distinguish between physical and mental health.

also more likely than older women to cite interference with education or career as a reason for abortion than older women or women with children (Finer et al., 2005). Whether the abortion is a woman's first, second or third abortion, does not seem to influence the stated reasons for abortion (Osler, David, & Morgall, 1997).

2.4.4 Attitude towards abortion

Progressive social attitudes towards women's roles in society often predict a general socio-cultural pro-choice attitude to abortion (Wall et al., 1999; Wang & Buffalo, 2004). Indeed, New Zealand based research by Huang et al linked the ideology of benevolent sexism[3], with 'pro-life' attitudes to abortion (Huang, Davies, Sibley, & Osborne, 2016). However, 'pro-life' and 'pro-choice' attitudes are rarely a dichotomy in the abortion debate. Within individuals, contradicting beliefs about abortion are prevalent, usually resulting from the perceived legitimacy of various hypothetical reasons for abortion (Craig, Kane, & Martinez, 2002). Abortions that are performed to protect the health or life of the woman or abortions of pregnancies that are the result of a rape are often considered more legitimate reasons than 'elective' reasons for abortion such as financial reasons, or not wishing to parent, thus a hierarchy of abortion legitimacy is formed (Craig et al., 2002; Kimport, Weitz, & Freedman, 2016). In their US based study, Kimport et al (2016) emphasised the hierarchical legitimacy of abortions not only in terms of social attitudes and stigma associated with abortion, but how the personal beliefs of medical professionals can influence the type of care provided, particularly related to level of empathy the referring physician felt towards the patient (Kimport et al., 2016). There is some evidence that women have more liberal attitudes to abortion than men (Patel & Johns, 2009; Wall et al., 1999). Other than gender, factors that may influence attitudes to abortion include religion, income, education, ethnicity and ideal family size (Wang & Buffalo, 2004). Social stigmatisation may influence women differently, depending on where the reason for her abortion falls in the hierarchy of abortion legitimacy. The pervasive social attitudes to abortion may influence both a woman's decision to have an abortion and also the emotional impact of that abortion (Kimport, Foster, & Weitz, 2011).

[3] The idealisation of traditional gender roles, namely viewing motherhood as a woman's most important and sacred role. Abortion is seen as a rejection of these traditional gender roles (Glick & Fiske, 1996).

2.5 Impact of abortion

2.5.1 Mental health impacts of abortion

2.5.1.1 International evidence

There is considerable debate surrounding the potential relationship between abortion and subsequent mental health outcomes, though several reviews have concluded that there is no evidence of any link between abortion and mental health, see: (Adler et al., 1992; Charles, Polis, Sridhara, & Blum, 2008; Major, 2008; National Collaborating Centre for Mental Health, 2011). There are some studies that have linked abortion with an increased risk of adverse mental health outcomes (Coleman, 2011; Cougle, Reardon, & Coleman, 2005), though these studies have been heavily criticised for their flawed methodologies and their authors various conflicts of interest (Steinberg, Trussell, Hall, & Guthrie, 2012). Indeed, studies that attempt to examine the association between abortion and mental health outcomes often have weak designs, related to their inability to measure mental health prior to the abortion, or control for other circumstances that may confound the relationship between mental health and abortion (Adler et al., 1992). Most commonly, studies fail to have an adequate comparison group, where the pregnancy was concurrently unwanted, and did not end in abortion (Adler et al., 1992; Roberts, Rocca, & Foster, 2014).

Research comparing mental health outcomes for women who received an abortion or were denied an abortion (assuming that in both cases the pregnancy was unwanted) is limited to studies based on data from the US based 'Turnaway Study'. A two year follow up of women who received an abortion and women who were denied an abortion found that depressive symptoms were similar between the groups and declined over time (Foster, Steinberg, Roberts, Neuhaus, & Biggs, 2015). Symptoms of anxiety were more prevalent in women who were denied an abortion than those who received an abortion initially, however, both groups had similar levels of anxiety symptoms after two years (Foster et al., 2015). A separate study based on the same data found no difference in the risk of Post-Traumatic Stress Disorder (PTSD) between women who received an abortion and those who were denied one (Biggs, Rowland, McCulloch, & Foster, 2016). Post-abortion syndrome (said to mimic certain aspects of PTSD) is a common falsehood espoused by researchers (Speckhard & Rue, 1992) and anti-abortion campaigners alike (Haugeberg, 2017).

There is a small body of evidence that there is a higher prevalence of illicit drug use among women who have abortions than women who have no previous pregnancies, or have had children (Coleman, Reardon, & Cougle, 2005; Coleman, Reardon, Rue, & Cougle, 2002; Dingle, Alati, Clavarino, Najman, & Williams, 2008; Fergusson, Horwood, & Boden, 2008). However, none have shown a temporal relationship, distinguishing substance abuse that follows abortion from substance abuse that precedes the abortion. Substance abuse is conceivably part of the reason that women choose to have abortions. Studies based on data from the Turnaway Study have found no difference in illicit drug use between women that had an abortion and those who were denied an abortion (Roberts et al., 2014).

2.5.1.2 New Zealand evidence

There is some New Zealand research that has explored the links between abortion and mental health. A study of stressful life events that are antecedent to anti-depressant prescription identified a small number of New Zealand women who cited either miscarriage or abortion as a source of their distress. Eighteen percent of those who were prescribed anti-depressants and reported stressful life events or circumstances reported 'losses' as a stressor and an unspecified proportion of losses were reported as being related to a miscarriage or an abortion (Hartdegen, Gibson, Cartwright, & Read, 2017).

2.5.1.3 Christchurch Health and Development Study

Most New Zealand based research on abortion and mental health outcomes comes from the Christchurch Health and Development Study (CHDS). The CHDS is a longitudinal study of a birth cohort born in mid-1977 in the Christchurch region of New Zealand. The cohort of 1265 has been studied at regular intervals from birth, at 4 months, 1 year old, annually up until age 16, then again 18, 21, 25, 30 and 35. The study originally had a cohort of 630 women and has a retention rate of around 80% (Fergusson, Horwood, & Ridder, 2006).

Using CHDS data, Fergusson et al compared the common mental health diagnoses of women at age 25 who had never been pregnant, women who had been pregnant and gave birth, or women who became pregnant and had an abortion (Fergusson et al., 2006). This study was able to use data that were collected from birth to examine some factors that may have confounded the association of abortion and subsequent mental health issues. Factors that were considered included socioeconomic status and education, as well as individual

indicators of personality and behaviours (such as early sexual onset and tobacco and alcohol use in adolescence). A limitation of this study was the inability to examine the extent to which the pregnancy was planned for or wanted. This may have overestimated the effect of abortion as the cause of mental health issues and instead may represent to some extent a relationship between unplanned pregnancy and mental health diagnoses. Fergusson et al (2006) concluded that exposure to abortion had at least some impact on susceptibility to mental disorders in young women.

Fergusson et al repeated the study when the women of the cohort were aged 30 (Fergusson et al., 2007). The study further examined the association between pregnancy outcomes, including abortion, spontaneous pregnancy loss and live birth with common mental health diagnoses such as depression, anxiety, substance abuse disorders and suicidal behaviours. Additionally, the live birth group was able to be divided by those who had an 'adverse reaction' to the pregnancy (adverse reaction was defined as reporting the pregnancy was unwanted or that the woman had felt distressed upon learning of the pregnancy) and those who had a live birth with no adverse reaction. While all groups showed a moderate increase in the risk of adverse mental health outcomes compared to women who carried a wanted pregnancy to term, the study reported a moderate increase in the risk of negative mental health outcomes for women who had abortions, that were not associated with other pregnancy outcomes measured (Fergusson et al., 2007). In 2013, Fergusson et al also published an analysis of the reviews by Coleman (2011) and the National Collaborating Centre for Mental Health (2011) and concluded that there was no evidence for the therapeutic effects of abortion on mental health (Fergusson, Horwood, & Boden, 2013), which is consistent with the findings of Foster et al (2015) from the Turnaway Study (Foster et al., 2015). Fergusson et al are most often criticised for using inappropriate comparison groups which do not take into account the wanted-ness of the pregnancy and for failing to adequately control for confounding variables, including prior mental health issues.

2.5.2 Emotional impact of abortion

Whether or not a person is at any greater risk of mental health harm following an abortion, it is likely that they will have some sort of emotional response. If one considers an abortion as an outcome of pregnancy, just as live birth or miscarriage are, it follows that an abortion may be a significant event in a person's life (Fergusson et al., 2007). Of potential public health concern is the physical, mental and emotional well-being of the person that undergoes

abortion and the self-perception of decision-rightness, that is, the potential regret of the decision to abort a pregnancy.

In a study of US women, 63% anticipated feeling relief following their abortion and 24% and 21% anticipated feeling ‘a little sad’ and ‘a little guilty’ respectively (Foster, Gould, & Kimport, 2012). Other research suggests that a woman’s acute emotional response to abortion is often a mixture of positive and negative emotions, with relief often being the predominate feeling reported (Rocca et al., 2015a; Subramaney, Wyatt, & Williams, 2015). Questions about long term emotional effects and whether or not abortions are regretted remain largely unanswered by current literature. It is important to note that the concept of decision rightness or regret is distinct from negative emotions, in that regret may be more clinically significant than negative emotions towards the abortion.

2.5.2.1 Decision rightness and regret

Retrospective studies that have attempted to understand whether abortions are regretted have potentially suffered from recall and selection biases. A prospective study by Rocca et al (2013) concluded that after terminating a pregnancy, women generally adjusted well and felt that the abortion was the right decision for them (Rocca, Kimport, Gould, & Foster, 2013). Most (95%) of the women studied who had abortions felt it was the right decision both at the time and in the 5 years after (Rocca et al., 2015b). High resilience and coping was not observed among all individuals, and those who had more living children or had difficulty making the abortion decision often had more negative emotional outcomes after the abortion (Harris, Roberts, Biggs, Rocca, & Foster, 2014; Rocca et al., 2015b). Higher levels of perceived social stigma surrounding abortion and lower partner or social support were also associated with more negative emotions (Harris et al., 2014). Most studies were limited by their inability to distinguish between negative emotions in response to the abortion per se, or negative emotions towards the circumstances that have necessitated an abortion, i.e. an unplanned or unwanted pregnancy.

The proposed relationship between responsibility and regret is of particular importance to the issue of abortion. It has been proposed that regret is an emotion felt more strongly or more often when the person is responsible for the outcome rather than when the outcome was something that occurred out of their control (Zeelenberg, van Dijk, Manstead, & van der Pligt, 2000). Whether or not people experience regret and or other negative emotions in

response to having an abortion, the most pertinent question is how these people cope with these emotions. Regret or negative emotions do not necessary mean that the reasons for abortion were less legitimate, nor does the occurrence of regret demonstrate the moral impermissibility of abortion (Greasley, 2012; Watson, 2014; Weitz, Moore, Gordon, & Adler, 2008).

2.5.2.2 Loss, grief and relief

Feelings of loss and short-term grief are likely a natural reaction to elective abortion, as they are for other pregnancy losses (Williams, 2001). Negative emotions following an abortion tend to subside quickly (Rocca et al., 2015b), however, having difficulty deciding to abort the pregnancy, having existing children or having limited support were associated with an increased incidence of and more persistent negative emotions following an abortion (Astbury-Ward, 2008; Harris et al., 2014; Rocca et al., 2015b). Women who think of the pregnancy more strongly in terms of a child rather than a fetus can also have more difficulty coping following the abortion (Stalhandske, Makenzius, Tyden, & Larsson, 2012).

In a study of Brazilian and Portuguese women who had undergone abortions, between 23% and 28% of cases reported feelings of guilt post-abortion (Nomura et al., 2011). Younger women, with poor self-esteem and poor support structures are also more likely to have long-term negative emotions about the abortion (Astbury-Ward, 2008).

Relief is often cited as a common emotional response to abortion (Foster et al., 2012; Kero & Lalos, 2000; Rocca et al., 2013; Rocca et al., 2015b; Subramaney et al., 2015). Feeling guilty about feeling relieved, i.e. ‘guilty relief’ is also a potentially common response, that has the potential to be mediated by counselling women that relief is a common and valid emotional response to abortion (Kero & Lalos, 2000; Lazarus, 1985; Weitz et al., 2008). Various studies have also highlighted the ambivalence that many feel in response to abortion (Adler et al., 1992; Kero & Lalos, 2000).

2.5.3 The male experience of abortion

In New Zealand, as in most countries where abortion is permitted under some circumstances, men have no legal right to either encourage or prevent the abortion of a pregnancy they contributed to. As a consequence of this, the male experience of abortion and its potential emotional sequelae has been studied very little. It is likely that men who

are involved in pregnancies that result in abortion, have diverse experiences with the abortion and its aftermath that depend on factors including the wanted-ness of the pregnancy and motivations for obtaining an abortion. When asked, men tend to offer the same reasons for seeking an abortion that women frequently give (Kero, Lalos, Högberg, & Jacobsson, 1999). Reasons for obtaining an abortion reported by men tend to fall into three main categories;

1. Family planning reasons
2. Socioeconomic reasons
3. Relationship reasons

These reasons differ between age groups, education levels and employment factors. Family planning reasons, for men, relate to already having the number of children they want or not wanting to start a family at this time. A survey of 75 Swedish men, either accompanying a female to an abortion clinic or given the self-administered survey by their female partners, found that half of the men already had children, most were happy with their financial situation, most were happy in the relationship, most had ambivalent or negative feelings towards pregnancy and most were involved in the decision. The main reason cited by men was that they were young students and/or were not ready to start a family (Kero et al., 1999).

This same survey, reported by Kero et al, asked about feelings towards the pregnancy and also feelings towards the abortion. Results echo the trend for women that choose abortion, i.e. that feelings towards the pregnancy range from indifferent, to joy and wonder and to dread and anxiety, or a combination of all of these. Of the men studied, 41% chose words that expressed both happiness and pain when asked about the pregnancy, while 32% only used words that described negative feelings, 27% chose only words that described positive feelings. Similarly, when asked their feelings on the abortion, 57% expressed a combination of relief and of guilt, 29% used only negatively charged words and 13% only used words that describe positive emotions. No matter their initial feelings towards the pregnancy or their feelings about the impending abortion, the majority of the men still wanted their partners to get an abortion (around 80-90% either wanted the abortion to take place, or supported the woman's decision). Studies from Sweden (Kero & Lalos, 2004; Kero et al., 1999) and a report from Ipas[4] (2009) suggest that, like women, men experience a range of

[4] A nonprofit organization that advocates for safe and accessible comprehensive reproductive health care and abortion services.

emotions in relation to the (generally) unwanted pregnancy and the abortion, though no studies have truly been able to elucidate long term impacts.

2.6 Other New Zealand research

2.6.1 Gestational limits and wait times

Legal abortion is generally a very safe procedure, though risks increase as gestational age of the fetus increases (Bartlett et al., 2004). Therefore, there is an incentive to perform an abortion as early as possible once the woman has presented to a clinic requesting an abortion. In 2015, almost 90% of abortions in New Zealand where performed when the pregnancy was less than 12 weeks, and about 35% of abortions were performed late in that period, between 10-12 weeks (Abortion Supervisory Committee, 2016). An audit of 2950 patient records from various New Zealand abortion clinics in 2009 found there was an average delay of about 25 days between a woman visiting her doctor to first request an abortion and when the procedure was performed (Silva et al., 2010). Once a woman has requested an abortion, long wait times may impact not only physically, but psychologically (Silva et al., 2010). However, evidence of psychological distress due to wait times for abortion is limited to research that suggests delays to any type of elective surgical procedure impact psychological health, particularly symptoms of anxiety (Oudhoff, Timmermans, Knol, Bijnen, & van der Wal, 2007).

2.6.2 Contraception

New Zealand research published in 2003 by Goodyear-Smith and Arroll aimed to compare contraceptive use before and after abortion in 1995, 1999 and 2002 (Goodyear-Smith & Arroll, 2003). They concluded that 90% of women left the clinic with their contraception of choice, however cited another study that found while 93% of adolescent girls chose a form of contraception following their abortion, only 28% reported using it at a follow up visit in the following year (Hewell & Andrews, 1996). This study also highlighted that due to cultural and knowledge differences, Asian women tended to not use reliable contraception either before or after their abortion, resulting in abortion becoming a family planning method rather than a backup measure for contraceptive failure (Goodyear-Smith & Arroll, 2003).

A prospective cohort study of New Zealand women found that those who choose to use a long-acting reversible contraceptive (LARC) were significantly less likely to have a repeat abortion with a 24 month follow up period than those who do not choose a LARC method (Rose & Lawton, 2012). Since 2014, the ASC has monitored the provision of contraception at the time of the procedure by mandatory reporting. In 2014, the uptake of intrauterine devices following abortion was about 34% and in 2015 was about 36% (Abortion Supervisory Committee, 2015, 2016)

A review of 400 cases of women presenting for an abortion in mid-1999 by Goodyear-Smith & Arroll, published in 2002, examined the links between panic-stopping of the oral contraceptive pill and abortion. Panic-stopping of the combined oral contraceptive pill was widespread in the late 1990's when the media sensationalised the potential risk of pulmonary embolism and deep venous thrombosis from third generation combined oral contraceptive use, resulting in a 'pill scare' (Spitzer, 1999). Almost half (38/78) of women who were combined oral contraceptive users prior to their abortion self-reported that the pregnancy resulted from panic-stopping the pill due media portrayal of safety risk (Goodyear-Smith & Arroll, 2002). Therefore, panic stopping of the oral contraceptive pill was implicated in almost 10% of abortions in the sample (38/400) (Goodyear-Smith & Arroll, 2002). A rise in abortion rates following the pill scare was observed in Britain and other European countries (Furedi, 1999; Skjeldestad, 1997).

2.7 Summary

Beyond the scope of the 'official' reasons for abortion that are reported to the ASC by certifying consultants, there is no New Zealand based research that has explored the self-reported reasons why women seek an abortion. There is also no New Zealand based research that has studied the emotional impact of abortion, in terms that are not related to mental illness. Current research is severely hampered by study design limitations, usually the inability to use a suitable comparison group.

Based mostly on international research, women who choose to have an abortion when faced with an unwanted pregnancy come from all socioeconomic levels and demographic categories. Additionally, reasons for abortion and the responses to abortion are often multiple and contingent on each other and the context in which a woman lives.

3 AIMS AND METHOD

3.1 Aims

The aims of this study were to describe, in a New Zealand birth cohort:

1. The abortion rate and the abortion ratio for pregnancies reported by men and women, by age
2. The self-reported reasons for choosing abortion reported by women, by age
3. The self-reported impact of an abortion on the emotions of the respondent, by gender and by age
4. The circumstances at the time of pregnancy and their associations with abortion compared with live birth, by gender and by age

3.2 Study Design and participants

The data for this study were collected as part of the Dunedin Multidisciplinary Health and Development Study (the Dunedin Study). The Dunedin Study is a longitudinal study of a cohort of children born in the Queen Mary Hospital in Dunedin between 1 April 1972 and 31 March 1973. The cohort was formed when the participants were aged three, and participants were eligible to be included in the study if they still resided in Otago, the province in which Dunedin is the main city. There were 1139 children who met these inclusion criteria and the parents or care-givers of 1037 gave consent for their children to participate. Study members have subsequently been assessed at regular intervals for their whole lives. Since age 3, they were assessed every two years up until age 15. After the age 15 assessment, they were assessed at 18, 21, 26, 32 and 38. At the time of this study the participants are 43-44 years of age and are due to be assessed in their 45th year. Participation rates for the entire study are presented below (Table 2).

Table 2. Response rates for the Dunedin Multidisciplinary Health and Development Study (DMHDS)

Age	Year	Survivors (n)	Assessed (n)	Response Rate (%)
3	1975-1976	1037	1037	100
5	1977-1978	1037	991	96
7	1979-1980	1035	954	92
9	1981-1982	1035	955	92
11	1983-1984	1033	925	90
13	1985-1986	1031	850	82
15	1987-1988	1029	976	95
18	1990-1991	1027	993	97
21	1993-1994	1020	992	97
26	1998-1999	1019	980	96
32	2004-2005	1015	972	96
38	2009-2010	1007	961	95

Sexual Behaviour and Reproductive Health (SBRH) assessments were included in the Dunedin Study at the age 21, 26, 32 and 38 assessments. Data were collected by self-report via a computer-presented questionnaire to encourage disclosure of potentially sensitive information.

3.3 Inclusion Criteria

All study members who participated in the age 21, 26, 32 or 38 assessments were eligible to participate in the SBRH assessment. However, study members were only able to provide answers in the pregnancy section of the questionnaire if they had ever had heterosexual intercourse. Therefore, in order to be included in this research, study members were required to report 'yes' to ever having heterosexual intercourse at any of the SBRH assessments. At each SBRH assessment, study members were asked if they had *ever* had heterosexual intercourse. By the age 38 assessment 99% of study members reported they had ever had

heterosexual sexual intercourse (n = 926). The number and proportion of study members assessed in the SBRH that indicated they had engaged in heterosexual sex at each assessment from 26 are presented in Table 4 of Chapter Four.

3.4 Data Management

The data set was mostly complete when received by the candidate. Missing data on specific measures for eligible study members were identified and are described as 'missing' in the descriptive tables of Chapter Four. Missing data were generally excluded from tests of association, due to the number of missing data in general, being small. If missing data were included in tests of association, it is stated alongside the results.

Data were mostly clean when received by the candidate. The main issue addressed by the candidate in the data management phase of the research was inconsistency between the assessments in the questions that were asked and exactly how they were asked i.e. whether phrasing differences had implications for analysis of measures across the age periods. There were also differences in how the data were collected and stored between age periods, even for identically phrased questions. This required standardisation of scales or categories for some measures. The candidate had no role in designing the questionnaire or in data collection.

3.5 Measures

At both the age 21 and age 26 assessments, eligible participants were asked if they had *ever* been, or were currently pregnant (women) or had ever got someone pregnant (men). Subsequent assessments (age 32 and 38) asked participants to recall if they had been or were currently pregnant, or had got someone pregnant in the six years since the previous assessment.

In order to analyse the data by age, four age periods were chosen to align with the age at each assessment; up to age 21, 21-26, 26-32 and 32-38 years inclusive. All pregnancies with known outcomes were assigned to age periods based on the age they were reported to have occurred or the assessment age they were reported at, depending on which assessment the pregnancies were reported at. Though participants were asked about pregnancies at the age 21 assessment, they were not asked any questions about abortion until the age 26

assessment, when detailed information on all pregnancies up until the age 26 assessment was collected. For this reason, all pregnancy and abortion data for the age period up to 21 years as well as the 21-26 years age period were constructed from the self-reported age of each pregnancy given at the age 26 assessment. Pregnancies that were included in the 26-32 years and 32-38 years age periods are sourced from pregnancies reported at the age 32 and age 38 assessments respectively.

Pregnancies could have potentially been reported twice, especially if they occurred around the boundary ages between the latter two age periods i.e. around 26 years or around 32 years. There was also a possibility of misclassification of the ages at which pregnancies occurred close to the boundary ages, as study members were not always assessed exactly when they were at the age of the assessment age. For example, some study members may have been aged 31 years when assessed at the age 32 assessment. Reclassifying pregnancies to the correct age period was considered, but presented an insurmountable logistical difficulty when aiming to retain the integrity of the measures of the associated circumstances of the pregnancy, especially when multiple pregnancies could have occurred for individual study members within every age period.

It may have been possible to identify live births that were reported twice based on age of pregnancy reported at each assessment and total number of live births reported at the age 38 assessment. However, there was no way of knowing whether abortions had been reported twice, as more than one abortion could occur at the same age, and study members were not asked to report a total number of abortions at any point. Therefore, to maintain consistency, all reported pregnancies with known outcomes have been included as potential double reporting could not be identified for abortions or other pregnancies that ended early.

3.5.1 Characteristics of participants

3.5.1.1 Socioeconomic status

Personal SES of all study members was measured at the age 26 and age 32 assessments using the Elley-Irving Scale (Elley & Irving, 1976) and at the age 38 assessment by the NZ Socioeconomic Index (NZSEI) based on occupation status (Milne, Byun, & Lee, 2013). Provisions were made for those not in the workforce for example, home-makers, unemployed study members or those in prison.

Family SES at the age 15 years assessment was a composite variable which measured average family SES (using the Elley-Irving scale) up until the age of 15 for study members who participated in the age 26 assessment.

3.5.1.2 Education

Education level was measured at the age 26 assessment by self-report of highest education qualification attained. For this research, categories of education level were collapsed from an eight-point scale that ranged from 'none' to 'higher degree' to: high school or less, post-secondary (not University), and University.

3.5.1.3 Age of first coitus

Age of first coitus, was a composite measure made from data from the 21 assessment and subsequent assessments. At the age 21 assessment, study members were asked at what age they first had sexual intercourse, answers were given in a discrete numerical form. For this study, a new measure was created that described the age of first coitus in the categories; 15 years and younger, 16-19 years and 20 years and older. If study members were not assessed at age 21 or were not sexually active at the age 21 assessment, they were included in the over 20 age group if they indicated being sexually active at subsequent assessments.

3.5.2 Pregnancy outcomes

For each known pregnancy, including pregnancies that ended very early, participants were asked what the outcome of that pregnancy was. Live birth, miscarriage, abortion, stillbirth, ectopic pregnancy and still pregnant were the categories available at all assessment phases. Men were additionally able to answer they did not know the outcome of the pregnancy at the age 26 assessment, though not in the subsequent assessments at ages 32 and 38. A measure of 'pregnancy loss' was constructed using miscarriage, still birth, ectopic pregnancy and abortions for abnormality from self-reported pregnancy outcomes at age 26, 32 and 38.

In order to compare individual factors and pregnancy-related factors to pregnancy outcome, a measure was constructed that described only whether a pregnancy ended in a live birth or

an abortion (this excluded all other pregnancy outcomes, including abortions for abnormality).

The total number of live births, abortions and pregnancy losses were calculated by summing the number of reported pregnancies with each known outcome in all four age periods.

3.5.2.1 Abortion for abnormality

Study members who reported an abortion also reported whether the abortion was for a [fetal] abnormality. Abortions for abnormality were considered separate from abortions for other reasons and were therefore excluded from analysis for the purposes of this research Abortions for fetal abnormality were excluded because reasons for choosing to terminate are very different. Describing the experience of women and men who choose to have an abortion due to a fetal abnormality is beyond the scope of this research.

3.5.2.2 Prior abortion

A measure of whether or not a study member had reported an abortion in a previous age period was constructed for the age 21-26 years age period, the age 26-32 age period and the 32-38 years age period by identifying individual study members who had reported at least one abortion in any of the previous age periods.

3.5.2.3 Prior live birth

A measure of whether or not a study member had reported a live birth in a previous age period was constructed for the age 21-26 years age period, the age 26-32 age period and the 32-38 years age period by identifying individual study members who reported at least one live birth in any of the previous age periods.

3.5.2.4 Number of abortions

The number of abortions reported by individuals was a measure created by identifying the number of reports of abortion for each study member (through unique study ID), both within each of the four defined age periods, and across the entire study period (up to the age 38 assessment age).

3.5.3 Wanted-ness of pregnancy

A measure of wanted-ness of the pregnancy was only available for the up to age 21 age period and the 21-26 age period. Study members were asked for each pregnancy reported at the age 26 assessment whether they wanted to get pregnant (women) or wanted the pregnancy to happen (men). Possible responses included: no, yes or unsure. Responses to the 'wanted-ness' question at the age 26 assessment were separated in to pregnancies that occurred under the age of 21 and pregnancies that occurred between the ages of 21 and 26 using the self-reported age of pregnancy.

3.5.4 Feelings about pregnancy

Feelings about pregnancy was used as a proxy for wanted-ness of pregnancy, assuming that whether or not a pregnancy was planned had less bearing on the outcome of that pregnancy than the emotions experienced when becoming aware of a pregnancy.

When she/you became pregnant how did you feel?

- Very happy
- Fairly happy
- Rather unhappy
- Very unhappy
- Don't know

This question was asked about all pregnancies in every age period. The scale used is consistent across the age periods. For this research, the scale was collapsed to 'happy' which included very happy and fairly happy, and 'unhappy' which included rather unhappy and very unhappy. Reports of 'don't know' were excluded when estimating associations as it has an unclear meaning in this context; 'don't know' could refer to a feeling of ambivalence or be more akin to 'didn't think' or 'can't remember'.

3.5.5 Relationship at time of conception

A measure of preconception relationship was constructed using the data from two questions; was there a preconception relationship and if so, how long was the relationship prior to conception? The original categories for length of relationship were collapsed from 'less than one month', '1-6 months', '6-12 months', '1-4 years' and '5 or more years' to 'no

relationship', '[relationship for] less than 1 year, '1-4 years' and '5 or more years'. The original question given to study members included overlapping categories. This was mitigated by collapsing the categories, for example, "6-12 months" was included in "under one year "

3.5.6 Attitude to abortion

Study members were asked at the age 26, 32 and 38 assessments about their general opinion of abortion. The original seven-point scale included: always wrong, mostly wrong, sometimes wrong, rarely wrong, not wrong at all, depends and don't know. For this research, the scale was collapsed to: 'always/mostly wrong', 'sometimes wrong', 'rarely wrong/not wrong' and 'depends/don't know'. For some tests of association where the numbers were small, the scale was further collapsed to 'negative attitudes' which included 'always/mostly wrong' and 'sometimes wrong', and 'positive or ambivalent attitudes' which included 'rarely wrong/not wrong' and 'depends/don't know'.

3.5.7 Abortion decision

Both women and men who reported an abortion were asked who they considered to have made the decision to have an abortion. At the age 26 assessment, study members were able to report it was either: by the female, by both or they didn't know. At the age 32 assessment, study members were able to report it was either: by the female, by the male, by both or don't know. The age 38 assessment presented to study members the options: 'it was my decision', 'it was my partner's decision', 'it was a joint decision with my partner' or 'don't know/can't remember'.

3.5.8 Abortion reasons

If the abortion was not for an abnormality, eligible women were asked to report what they considered their reason(s) for having an abortion for that particular pregnancy. This was done via yes/no responses to a list of possible reasons. Multiple reasons were able to be reported by the women, and at the age 32 and 38 assessments, those who considered their reason for abortion to be 'other' were able to write in a free text space what they considered their reason for having an abortion. The free text 'other' reasons have been re-categorised if they fit with an existing category of reason/s and an additional category 'health'

(encompassing both emotional and physical health) was constructed by identifying themes in the free text 'other' reasons. This is described in Appendix A. Health as a reason for abortion was not possible to create for the up to 21 years or the 21-26 years age group.

Categories of reasons for abortion were not wholly consistent between assessments. Table 3 (below) displays categories supplied at each assessment as presented to study members.

The categories 'didn't want a child from that relationship' and 'partner did not want a child' were combined at the age 38 assessment to create a measure of 'wrong relationship' in order to be consistent with the previous assessments. Results are presented in Chapter Four using the language and categories from the age 32 assessment.

Table 3. Categories of reasons for having an abortion offered to respondents at each assessment

26 years	32 years	38 years
Not ready	Not ready	Not ready for a child
Wrong relationship	Wrong relationship	Didn't want a child from that relationship
Couldn't afford	Couldn't afford	Couldn't afford a child
Alone	Alone	Didn't want to bring up a child by myself
Education	Education	Wanted to finish my training/education
Other	Other	Another reason(s)
Don't know	Don't know	Don't know/ can't remember
	Career	A child would have interfered with my career
	Enough Children	Had enough children
		Partner did not want a child

3.5.9 Impact of abortion on emotions of study members in the year after the abortion

All study members who reported an abortion that was not for an abnormality were eligible to answer a question about the emotional impact of that abortion. Study members were asked to report one or more feelings about the abortion in the year after the abortion. The categories available in all four age periods were;

- Loss

- Relief
- Regret
- Didn't think
- Other
- Don't know

Reports of loss, relief and regret were used separately from reports of 'didn't think', 'other' and 'don't know' when describing associations of impact of abortion with reasons for abortion or with the various circumstances of the related pregnancy.

3.6 Data analysis

3.6.1 Epidemiological approach

The incidence of abortion was measured in two ways, the number of abortions per 1000 women in each age period and at all ages measured (up to 38 years) and the number of abortions per 1000 known pregnancies. Reasons for abortion and the emotional impact of the abortion were described as proportions of the eligible study members (those who self-reported abortions not for fetal abnormality). The distribution of individual characteristics and circumstances of pregnancies were described as proportions of eligible study members. The eligibility criteria of each measure were defined in Section 3.5. Unadjusted relative risk (risk ratios) with 95% confidence intervals were calculated for some measures of association.

3.6.2 Statistical analysis

Tests of association between measures were made using Pearson's chi-squared test, or Fisher's exact test if expected cell counts were less than five. All analyses were performed using Stata version 15.0 by the candidate.

4 RESULTS

4.1 Study Population

4.1.1 Eligibility

This study included all DMHDS members who reported that they had ever had heterosexual penetrative sex at any of the assessments. The numbers of eligible study members are presented in Table 4 below.

Table 4. Study members that completed the SBRH questionnaire at age 26, age 32 and age 38 assessments, by whether they had ever had heterosexual sex

	Yes		No		Skipped		Total assessed	
	n	%	n	%	n	%	n	%
Age 26 assessment								
Women	466	97.9	10	2.1	0	0.0	476	100.0
Men	473	96.5	15	3.1	2	0.4	490	100.0
Total	939	97.2	25	2.6	2	0.2	966	100.0
Age 32 assessment								
Women	467	98.9	5	1.1	0	0.0	472	100.0
Men	479	98.4	7	1.4	1	0.2	487	100.0
Total	946	98.6	12	1.3	1	0.1	959	100.0
Age 38 assessment								
Women	460	98.7	5	1.1	1	0.2	466	100.0
Men	466	99.2	4	0.8	0	0.0	470	100.0
Total	926	98.9	9	1.0	1	0.1	936	100.0

A total of 939 individuals (466 women and 473 men) were eligible for inclusion in this study by the age 26 assessment. By the age 38 years assessment, 926 study members were eligible for inclusion, made up of 460 women and 466 men. The number of women and men eligible for inclusion in the study do not differ significantly from each other.

Data used in this study were collected when the study members were the ages of 26, 32 and 38 years, referred to as assessment ages. Four age groups have been constructed for this study that represent all pregnancies that occurred under the age of 21, between 21 and 26 years of age, between 26 and 32 years of age and between 32 and 38 years of age[5].These

[5] The oldest two age groups may have some overlap around boundary ages due to the timing of assessments not always reflecting the exact age of individual participants.

are referred to hereafter as age periods. In the sections that follow, some measures have been constructed using data from more than one assessment.

4.1.2 Characteristics of eligible population at each assessment age.

The following section that includes Table 5, Table 6 and Table 7, describes the socioeconomic characteristics of the study members assessed at each assessment (age 26, 32 and 38 years respectively) and selected pregnancy related characteristics of those eligible for this study at each assessment.

4.1.2.1 Age 26 assessment

Table 5. Socioeconomic status (SES) of the individual study members and family of origin and history of pregnancy at age 26 assessment

	Women		Men		Total	
	n	**%**	**n**	**%**	**n**	**%**
Personal SES						
Low	92	19.3	156	31.8	248	25.7
Medium	244	51.3	245	50.0	489	50.6
High	96	20.2	87	17.8	183	18.9
Missing	44	9.2	2	0.4	46	4.8
Total	476	100.0	490	100.0	966	100.0
Average family SES up to age 15						
Low	81	17.0	80	16.3	161	16.7
Medium	293	61.6	316	64.5	609	63.0
High	102	21.4	94	19.2	196	20.3
Total [α]	476	100.0	490	100.0	966	100.0
Highest educational qualification						
High School or less	157	33.0	176	35.9	333	34.5
Post-secondary, not University	185	38.9	214	43.7	399	41.3
University	122	25.6	94	19.2	216	22.4
Missing	12	2.5	6	1.2	18	1.8
Total	476	100.0	490	100.0	966	100.0
Reported pregnancy at age 26 assessment [β]						
Yes	156	33.5	127	26.8	283	30.1
No	297	63.7	305	64.5	602	64.1
Unsure	10	2.1	33	7.0	43	4.6
Missing	3	0.6	8	1.7	11	1.2
Total	466	100.0	473	100.0	939	100.0
Reported a pregnancy that occurred under 21 years						
Yes	99	21.2	73	15.4	172	18.3
No	354	76.0	359	75.9	713	75.9
Unsure	10	2.1	33	7.0	43	4.6
Missing	3	0.6	8	1.7	11	1.2
Total	466	100.0	473	100.0	939	100.0

[α] Total eligible study members at age 26 assessment when this composite variable was created
[β] Ever pregnant for women, ever caused a pregnancy for men

4.1.2.2 Age 32 assessment

Table 6. Socioeconomic status (SES) of the individual study members and history of pregnancy at age 32 assessment

	Women		Men		Total	
	n	**%**	**n**	**%**	**n**	**%**
Personal SES						
Low	141	30.2	146	30.5	287	30.3
Medium	253	54.2	244	50.9	497	52.5
High	72	15.4	89	18.6	161	17.0
Missing	1	0.2	0	0.0	1	0.1
Total	467	100.0	479	100.0	946	100.0
Reported pregnancy between 26-32 years						
Yes	241	51.6	207	43.2	448	47.4
No	211	45.2	252	52.6	463	48.9
Unsure	8	1.7	9	1.9	17	1.8
Missing	7	1.5	11	2.3	18	1.9
Total	467	100.0	479	100.0	946	100.0

4.1.2.3 Age 38 assessment

Table 7. Socioeconomic status (SES) of the individual study members, history of pregnancy and age of sexual initiation at age 38 assessment

	Women		Men		Total	
	n	**%**	**n**	**%**	**n**	**%**
Personal SES						
Low	56	12.2	119	25.5	175	18.9
Medium	243	53.5	225	48.3	468	50.5
High	159	34.6	121	26.0	280	30.2
Missing	2	0.4	1	0.2	3	0.3
Total	460	100.0	466	100.0	926	100.0
Reported pregnancy between 32-38 years						
Yes	233	50.7	236	50.7	469	50.7
No	224	48.7	220	47.3	444	48.0
Don't Know	3	0.7	9	1.9	12	1.2
Missing	0	0.0	1	0.1	1	0.1
Total	460	100.0	466	100.0	926	100.0
Age of 1st coitus						
15 & younger	145	31.9	129	27.7	274	29.8
16-19 years	257	56.6	261	56.0	518	56.3
20 & older	52	11.5	76	16.3	128	13.9
Total [α]	454	100.0	466	100.0	920	100.0

[α] Variation in denominator due to variable being a composite created using data from multiple assessments.

4.2 Outcomes of reported pregnancies

The following section describes the outcomes of all reported pregnancies, and the proportion of pregnancies that ended in abortion for each age period, for women and men. The outcomes of reported pregnancies are described as a proportion of all known pregnancies, including pregnancy loss and also as a proportion of pregnancies that ended in either a live birth or an abortion. Pregnancy loss is excluded from the latter measure, as it is not a choice.

4.2.1 Under 21 years age period

At the age 26 assessment, 21% of women (n=99) and 15% of men (n=73) reported at least one pregnancy that occurred before the age of 21 years (Table 5, above). A total of 218 pregnancies were reported before 21 years by 172 study members, of which 47% resulted in a live birth, 39% in an abortion and 14% in pregnancy loss (see Table 8).

Of pregnancies that were known to end in either a live birth or an abortion, 45% of pregnancies under 21 ended in abortion. Men reported a higher proportion of pregnancies that they were involved in ended in abortion compared to women; 54% of pregnancies, whereas women reported that 39% of their pregnancies ended in abortion in the same age period.

Most study members who reported at least one abortion under the age of 21 had only one abortion before 21 years of age (89%). Five men and one woman reported two abortions in the period and two men reported three abortions.

Table 8. Outcomes of all pregnancies and distribution of abortions among individuals for pregnancies that occurred under the age of 21 as reported at the age 26 assessment

	Women		Men		Total	
	n	**%**	**n**	**%**	**n**	**%**
Reported outcome of all known pregnancies						
Live Birth	68	53.5	35	38.5	103	47.2
Abortion	43	33.9	41	45.1	84	38.5
Pregnancy Loss	16	12.6	14	15.4	30	13.8
Don't Know	0	0.0	1	1.1	1	0.5
Total Pregnancies	127	100.0	91	100.0	218	100.0
Outcome of pregnancies that ended in either live birth or abortion						
Live Birth	68	61.3	35	46.1	103	55.1
Abortion	43	38.7	41	53.9	84	44.9
Total Pregnancies	111	100.0	76	100.0	187	100.0
Distribution of abortions amongst individuals						
1 abortion	41	97.6	25	78.1	66	89.2
2 abortions	1	2.4	5	15.6	6	8.1
3 abortions	0	0.0	2	6.3	2	2.7
Total [α]	42	100.0	32	100.0	74	100.0

[α] Total who had at least one abortion

4.2.2 21-26 years age period

A total of 400 pregnancies and their respective outcomes were reported by 283 study members as occurring between the ages of 21 and 26. Of these pregnancies, 48% resulted in a live birth, 17% in pregnancy loss and 24% in abortion (Table 9). Women reported that 22% of their pregnancies ended in abortion and men reported that 25% of their partner's pregnancies ended in abortion. Some study members who reported pregnancies in this age period were still pregnant or their partners were still pregnant at the time of the assessment (11% of total reported pregnancies in this age period).

Of pregnancies that were known to end in either a live birth or an abortion, a third of pregnancies ended in abortion between 21 and 26 years, with men and women reporting similar proportions. The majority (82%) of study members that reported an abortion in this age period, reported one abortion. Three women and nine men reported two abortions in the age period and two women reported three abortions. The maximum number of abortions reported by one individual in this period was three.

Table 9. Outcomes of all pregnancies and distribution of abortion among individuals for pregnancies that occurred between the ages of 21 and 26, as reported at the age 26 assessment

	Women		Men		Total	
	n	**%**	**n**	**%**	**n**	**%**
Reported outcome of all known pregnancies						
Live Birth	106	48.4	88	48.6	194	48.5
Abortion	49	22.4	45	24.9	94	23.5
Pregnancy Loss	32	14.6	35	19.3	67	16.8
Still Pregnant	32	14.6	13	7.2	45	11.3
Total Pregnancies	219	100.0	181	100.0	400	100.0
Outcomes of pregnancies that ended in either live birth or abortion						
Live Birth	106	68.4	88	66.2	194	67.4
Abortion	49	31.6	45	33.8	94	32.6
Total Pregnancies	155	100.0	133	100.0	288	100.0
Distribution of abortions among individuals						
1 abortion	37	88.1	27	75.0	64	82.1
2 abortions	3	7.1	9	25.0	12	15.4
3 abortions	2	4.8	0	0.0	2	2.6
Total [α]	42	100.0	36	100.0	78	100.0

[α] Total who had at least one abortion

4.2.3 26-32 years age period

There were 735 pregnancies reported by 448 study members as occurring between 26 and 32 years of age (Table 10). Twelve percent (n=90) of all pregnancies reported by study members at the age 32 assessment ended in abortion. The proportion of pregnancies reported by men that ended in abortion was about 15%, which was greater than the proportion of pregnancies reported by women that ended in abortion (11% of all pregnancies). Of the reported pregnancies in this age period, 55 (8%) had no known outcome, with the study member or their partner still being pregnant at the time of the assessment.

Of pregnancies that were known to end in either a live birth or an abortion, 16% of pregnancies ended in abortion between 26 and 32 years. Ninety-three percent of study members that reported an abortion occurring in this age period, reported only one abortion. The remaining 7% reported two abortions, which was the greatest number of abortions reported in this age period.

Table 10. Outcomes of all pregnancies and number of abortions between the ages of 26 and 32, as reported at the age 32 assessment

	Women		Men		Total	
	n	**%**	**n**	**%**	**n**	**%**
Reported outcome of all known pregnancies						
Live Birth	264	64.4	201	61.8	465	63.3
Abortion	43	10.5	47	14.5	90	12.2
Pregnancy Loss	74	18.0	51	15.7	125	17.0
Still Pregnant	29	7.1	26	8.0	55	7.5
Total Pregnancies	410	100.0	325	100.0	735	100.0
Outcomes of pregnancies that ended in either live birth or abortion						
Live Birth	264	86.0	201	81.0	465	83.8
Abortion	43	14.0	47	19.0	90	16.2
Total Pregnancies	307	100.0	248	100.0	555	100.0
Distribution of abortions among individuals						
1 abortion	39	95.1	39	90.7	78	92.9
2 abortions	2	4.9	4	9.3	6	7.1
Total[α]	41	100.0	43	100.0	84	100.0

[α] Total who had at least one abortion

4.2.4 32-38 years age period

A total of 813 pregnancies were reported by 469 study members at the age 38 assessment as occurring between the ages of 32 to 38 (see Table 11). The majority of pregnancies (73%) were reported to end in live birth, the next most common outcome in this age period was pregnancy loss, which was reported for 17% of pregnancies. Six-percent of all reported pregnancies at this age period ended in an abortion. A small proportion (4%) of study members reported that they, or their partner was still pregnant at the time of the assessment. When reports of pregnancy loss and those that were still pregnant at the time of the assessment are excluded, the proportion of pregnancies that ended in an abortion rose slightly to 8%.

Of the 44 study members who reported abortions as occurring between the ages of 32 and 38, 93% had only one abortion in this period. Seven-percent reported two abortions: two women and one man.

Table 11. Outcomes of all pregnancies and number of abortions between the ages of 32 and 38 years, as reported at the age 38 assessment

	Women		**Men**		**Total**	
	n	**%**	**n**	**%**	**n**	**%**
Reported outcome of all pregnancies						
Live Birth	298	72.9	297	73.5	595	73.2
Abortion	27	6.6	20	5.0	47	5.8
Pregnancy Loss	76	18.6	64	15.8	140	17.2
Still Pregnant	8	2.0	23	5.7	31	3.8
Total Pregnancies	409	100.0	404	100.0	813	100.0
Pregnancies that ended in either live birth or abortion						
Live Birth	298	91.7	297	93.7	595	92.7
Abortion	27	8.3	20	6.3	47	7.3
Total Pregnancies	325	100.0	317	100.0	642	100.0
Number of abortions in the age period*						
1 abortion	23	92.0	18	94.7	41	93.2
2 abortions	2	8.0	1	5.3	3	6.8
Total[α]	25	100.0	19	100.0	44	100.0

[α] Total who had at least one abortion

4.2.5 Summary of pregnancy outcomes in all age periods

4.2.5.1 Outcomes of all pregnancies at all age periods

The outcomes of pregnancies with known outcomes reported by both men and women in the study across the four age periods (Table 12), shows that there was a decreasing proportion of abortions as the age at which the pregnancy occurred increased; from a peak of almost 40% for pregnancies that occurred under the age of 21, to a low of 6% for pregnancies that were reported to have occurred between the ages of 32 and 38.

Concurrently, the proportion of pregnancies that ended in live birth increased as age increased, from 48% of pregnancies with known outcomes in the under 21 age period, to 76% in the 32-38 years age period.

Table 12. Outcomes of all pregnancies with known outcomes at each age period

	Women		Men		Total	
	n	%	n	%	n	%
Under 21 years						
Live Birth	68	53.5	35	38.9	103	47.5
Abortion	43	33.9	41	45.6	84	38.7
Pregnancy Loss	16	12.6	14	15.6	30	13.8
Total Pregnancies	127	100.0	90	100.0	217	100.0
21-26 years						
Live Birth	106	56.7	88	52.4	194	54.6
Abortion	49	26.2	45	26.8	94	26.5
Pregnancy Loss	32	17.1	35	20.8	67	18.9
Total Pregnancies	187	100.0	168	100.0	355	100.0
26-32 years						
Live Birth	264	69.3	201	50.4	465	59.6
Abortion	43	11.3	47	11.8	90	11.5
Pregnancy Loss	74	19.4	51	12.8	125	16.0
Total Pregnancies	381	100.0	399	100.0	780	100.0
32-38 years						
Live Birth	298	74.3	297	78.0	595	76.1
Abortion	27	6.7	20	5.2	47	6.0
Pregnancy Loss	76	19.0	64	16.8	140	17.9
Total Pregnancies	401	100.0	381	100.0	782	100.0

Pregnancies reported by women and by men followed the same pattern of a decreasing proportion of abortions as age increased; women reported a peak of 34% in the under 21 age period and a low of 7% in the 32-38 years age period and men a peak of 46% in the under 21 age period and a low 5% in the 32-38 years age period.

As shown in Figure 4 (below), for reports of abortion from women and men combined, the proportion of pregnancies that ended in abortion decreased as the age period at which the pregnancy was reported to have occurred increased.

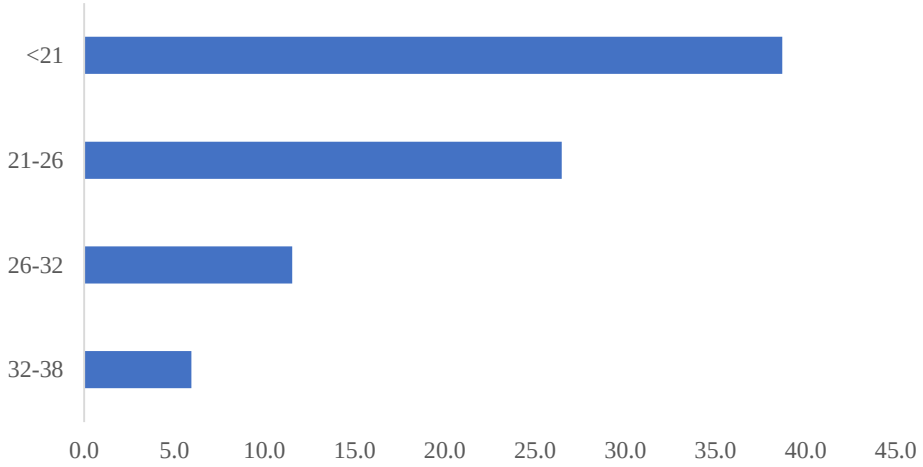

Figure 4. Proportion of known pregnancies that ended in abortion in each age period, reported by both men and women

4.2.5.2 Outcomes of pregnancies in the entire study period

Table 13 (below) describes the outcomes of all reported pregnancies with known outcomes across the entire study period (up to age 38 years), reported by both women and men in the study. More than two-thirds of reported pregnancies ended in a live birth (67% of all pregnancies with known outcomes, including live birth, abortion and pregnancy loss). Fifteen percent, or approximately 1 in every 6 pregnancies with known outcomes ended in an abortion.

The majority of study members who reported an abortion, reported only one across the entire study period (74% of women and 68% of men). About 20% of study members who reported at least one abortion, reported 2 abortions across the entire study period. Nine percent of men and 4% of women reported 3 abortions across the study period and 3% of women and less than 1% of men reported 4 abortions. The maximum number of abortions reported by

an individual study member across the entire study period was four. Pregnancies that ended in abortion occurred at a mean age of 24 years for women and 25 years for men.

By the age of 38, 25% of women eligible for this study had at least one abortion. Thirty percent of women that reported ever being pregnant reported at least one abortion. Twenty-one percent of men eligible for this study reported that a pregnancy they were responsible for ended in abortion. Twenty-eight percent of men that reported at least one pregnancy up to age 38 reported one or more of those pregnancies ended in an abortion.

Table 13. Reported outcomes of all pregnancies with known outcomes and the distribution of abortions amongst individuals up to age 38 years

	Women		**Men**		**Total**		**Women cf. men**	
	n	**%**	**n**	**%**	**n**	**%**	**χ^2**	**p value**
Reported outcome of all pregnancies with known outcomes								
Live Birth	736	67.2	621	66.2	1357	66.7		
Abortion	162	14.8	153	16.3	315	15.5	0.93	0.629
Pregnancy Loss	198	18.1	164	17.5	362	17.8		
Total Pregnancies	1096	100.0	938	100.0	2034	100.0		
Outcome of pregnancies that ended in either live birth or abortion								
Live Birth	736	82.0	621	80.2	1357	81.2		
Abortion	162	18.0	153	19.8	315	18.8	0.81	0.367
Total Pregnancies	898	100.0	774	100.0	1672	100.0		
Distribution of abortions amongst individuals								
1 abortion	89	74.2	73	68.2	162	71.4		
2 abortions	23	19.2	23	21.5	46	20.3		
3 abortions	5	4.2	10	9.3	15	6.6	1.32	0.519 $^{\beta}$
4 abortions	3	2.5	1	0.9	4	1.8		
Total $^{\alpha}$	120	100.0	107	100.0	227	100.0		

Average age of reported abortions (years)

	Women	**Men**	**Total**
Mean	24	25	24
Mode	24	18	18

$^{\alpha}$ Total who had at least one abortion

$^{\beta}$Number reporting three and four abortions combined for Chi-squared test

4.2.6 Abortion rates and ratios at each age period

As shown in Table 14, the rate of abortions is estimated to be 349 abortions per 1000. This would suggest that about 1 in every 3 women in this study had an abortion, however, some women reported more than one abortion and more than 2 out of 3 reported none. Just over one in four eligible women in the study reported an abortion and about one in five men reported an abortion up to the age of 38. The age period specific abortion rate shows the greatest rate of abortions per 1000 women occurring in the 21-26 years age period (105 abortions per 1000 women) and the lowest rate occurring in the 32-38 years age period (59 abortions per 1000 women). The average abortion rate across the four age periods was 87 abortions per 1000 women.

The age period specific abortion ratios, both including reports of pregnancy loss and excluding reports of pregnancy loss, illustrates again, the effect of the age period at which pregnancy occurs on whether that pregnancy will end in abortion or another outcome, which is usually live birth. Men had a considerably larger abortion ratio than women in the under 21 years age period, though the significant difference between women and men was not sustained in subsequent age periods.

Table 14. Rates of abortion per 1000 women and abortion ratios for women and men in the study, by age period and for entire study period

	Under 21	**21-26**	**26-32**	**32-38**	**Entire study period**
Rate (per 1000 women)					
	92	105	92	59	349$^{\alpha}$
Ratio (number of abortions per 1000 known pregnancies excluding pregnancy loss)					
Women	398	325	139	92	180
Men	557	358	184	68	198
Ratio (number of abortions per 1000 known pregnancies, including pregnancy loss)					
Women	339	262	113	67	148
Men	456	268	118	52	163

α Estimated with total number of abortions reported by women across entire study period and the mean number of eligible women study members at each of the 3 assessment ages.

4.3 Circumstances at the time of pregnancy

The following section describes some of the circumstances at the time of pregnancy, including whether the pregnancy was wanted or not, how happy the study members were when they first learnt of the pregnancy and how long the preconception relationship was for all reported pregnancies. For age periods after under 21 years, study members attitudes to abortion was described, along with whether they had reported either a prior abortion or a prior live birth. The association between gender and reporting the various circumstances was also described.

In addition, the circumstances of the pregnancy are described for both women and men by whether abortion or live birth was reported, to test for associations between circumstances of the pregnancy and abortion or live birth.

4.3.1 Characteristics of the context in which pregnancies occurred

4.3.1.1 Under 21 years age period

As shown in Table 15 (below), more than three-quarters of all pregnancies that occurred under the age of 21 were reported as being unwanted. There was no significant difference in the proportion of unwanted pregnancies between women and men in the study. While the majority of study members also reported being unhappy in response to the pregnancy (58% of pregnancies reported by women and 52% of pregnancies reported by men), more men than women reported don't know [whether happy or unhappy] in response to the pregnancy (21% compared to 13%), however the difference was not significant (χ^2= 2.2, p = 0.336).

Men were less likely to report no preconception relationship than women for pregnancies in the under 21 years age period, with men reporting no preconception relationship in 9% of cases and women in 27% of cases, the association was significant at p=0.008. The majority (44%) of study members in the under 21 years age period reported that they were in a relationship at the time of conception, with the relationship being less than 1 year in duration. There was a difference between the proportion of men and women reporting the preconception relationship of less than 1 year duration, 39% of pregnancies for women and 52% of pregnancies for men.

Table 15. Circumstances of pregnancies under 21 years of age, by gender of study member, as reported at the age 26 assessment

	Women		Men		Total		Women cf. men	
	n	**%**	**n**	**%**	**n**	**%**	**χ^2**	**p value**
Wanted-ness of each pregnancy as reported at age 26								
Yes	24	18.9	12	13.2	36	16.5		
No	96	75.6	73	80.2	169	77.5	1.3	0.523
Unsure	7	5.5	6	6.6	13	6.0		
Total	127	100.0	91	100.0	218	100.0		
Feeling about pregnancy when first aware of it, as reported at age 26								
Happy	37	29.1	25	27.5	62	28.4		
Unhappy	73	57.5	47	51.6	120	55.0	2.2	0.336
Don't know	17	13.4	19	20.9	36	16.5		
Total	127	100.0	91	100.0	218	100.0		
Preconception relationship as reported at age 26								
No relationship	34	26.8	8	8.8	42	19.3		
Less than 1 year	49	38.6	47	51.6	96	44.0		
1-4 years	40	31.5	31	34.1	71	32.6	11.7	0.008
5+ years	3	2.4	4	4.4	7	3.2		
Skipped	1	0.8	1	1.1	2	0.9		
Total	127	100.0	91	100.0	218	100.0		

4.3.1.2 21-26 years age period

Table 16 (below) describes the context of pregnancies that occurred in the 21-26 years age period by gender of the study member. The majority of study members (54%), reported that the pregnancy was unwanted, however there was marked difference between men and women, with men reporting 64% of reported pregnancies were unwanted and women reporting only 45% were unwanted in this age period (χ^2= 14.9, p = 0.001). The difference between men and women was not so apparent when questioned on their feelings about the pregnancy at the time. Feeling ‘happy’ was reported in 64% of pregnancies reported by women and in 56% of pregnancies reported by men. Men again reported feeling ‘don’t know’ in greater numbers than women (in 11% of pregnancies compared to 4% of pregnancies), though the difference was not significant.

The vast majority of study members reported being in a relationship with their partner pre-conception for pregnancies in this age period, with both men and women reporting that there was no preconception relationship in 13% of pregnancies. Women reported being in longer preconception relationships than men in this age period. A relationship of less than 1 year was reported by men for 33% of pregnancies and by women for 20% of pregnancies.

As shown in Table 16, study members were asked their attitude to abortion. It is presented on a scale from always/mostly wrong through to rarely/not wrong and depends/don't know. The majority of study members indicated either they felt that abortion was rarely or not wrong, or depends/don't know (31% and 34% respectively). There was no significant difference between the attitudes to abortion of women and men in this study.

Of study members who reported a pregnancy in the 21-26 age period, about 26% (n=74) had reported an abortion in the previous age period (under 21 years). There was no difference between women and men. There was a difference between women and men who reported a pregnancy in the 21-26 age period and having reported a live birth in the previous age period, with 35% of women reporting a previous live birth and 25% of men reporting a previous live birth (χ^2= 4.51, p = 0.034).

Table 16: Circumstances of pregnancies in 21-26 age period, by gender of study members, as reported at the age 26 assessment

	Women		Men		Total		Women cf. men	
	n	**%**	**n**	**%**	**n**	**%**	**χ^2**	**p value**
Wanted-ness of pregnancy as reported at age 26								
Yes	111	50.7	60	33.2	171	42.8		
No	98	44.7	117	64.6	215	53.8	14.9	0.001
Unsure	10	4.6	4	2.2	14	3.5		
Total	219	100.0	181	100.0	400	100.0		
Feelings about pregnancy at time of pregnancy, reported at age 26								
Happy	140	63.9	101	55.8	241	60.3		
Unhappy	70	32.0	61	33.7	131	32.8	0.7	0.387
Don't Know	9	4.1	19	10.5	28	7.0		
Total	219	100.0	181	100.0	400	100.0		
Preconception relationship as reported at age 26								
No relationship	31	14.2	21	11.6	52	13.0		
Less than 1 year	43	19.6	59	32.6	102	25.5	9.6	0.023
1-4 years	100	45.7	75	41.4	175	43.8		
5+ years	45	20.5	26	14.4	71	17.8		
Total	219	100.0	181	100.0	400	100.0		
Attitude to abortion as reported at age 26								
Always/mostly wrong	89	19.1	83	17.5	172	18.3		
Sometimes wrong	66	14.2	66	14.0	132	14.1	0.5	0.912
Rarely/not wrong	139	29.8	149	31.5	288	30.7		
Depends/don't know	159	34.1	160	33.8	319	34.0		
Skipped	13	2.8	15	3.2	28	3.0		
Total $^{\alpha}$	466	100.0	473	100.0	939	100.0		
Prior abortion								
Yes	42	26.9	32	25.2	74	26.1		
No	114	73.1	95	74.8	209	73.9	0.11	0.742
Total $^{\beta}$	156	100.0	127	100.0	283	100.0		
Prior live birth								
Yes	55	35.3	30	23.6	85	30.0		
No	101	64.7	97	76.4	198	70.0	4.51	0.034
Total	156	100.0	127	100.0	283	100.0		

αWho had ever had heterosexual sex

β Who reported a pregnancy in the 21 to 26 years age period

4.3.1.3 26-32 years age period

Table 17 (below) describes the context of pregnancies that were reported as occurring between the ages of 26 and 32. Data on the wanted-ness of the pregnancies were not available for this age period. However, feelings about the pregnancy could be assessed. In almost 80% of pregnancies in this age period, men and women reported feeling happy [about the pregnancy]. Slightly more women than men reported being unhappy with the pregnancy (in 19% of pregnancies compared to 17% of pregnancies) and more men than women reported 'don't know' (in 4% compared to 2% of pregnancies). Neither of these differences were substantial or statistically significant.

Women reported longer preconception relationships than men for pregnancies that occurred in this age period, with the majority of pregnancies reported by women (56%) occurring in relationships 5 years or longer. The majority (43%) of pregnancies reported by men also occurred in relationships 5 years or longer, though men reported more pregnancies that occurred either not in a relationship (3% compared to women's 2%) and in relationships of less than 1 year in length: in 22% of pregnancies compared to 9% for women, this was significant at (χ^2= 28.3, p = < 0.000).

Of study members who reported a pregnancy in the 26-32 years age period, 21% of women and 11% of men had reported an abortion in a previous age period, (χ^2= 7.9, p = 0.005). There was no statistically significant difference between men and women reporting live births in previous age periods, though more women than men reported a previous live birth, 31% of women and 25% of men.

Table 17. Circumstances of pregnancies in the 26-32 age period, by gender of study member, reported at the age 32 assessment

	Women		Men		Total		Women cf. men	
	n	%	n	%	n	%	χ^2	p value
Feelings about pregnancy at time of pregnancy, reported at age 32								
Happy	326	79.1	258	79.4	587	79.6		
Unhappy	80	19.4	55	16.9	135	18.3	0.5	0.468
Don't Know	6	1.5	12	3.7	18	2.4		
Total	412	100.0	325	100.0	737	100.0		
Preconception relationship as reported at age 32								
No relationship	6	1.5	10	3.1	16	2.2		
Less than 1 year	37	9.0	70	21.5	107	14.5		
1-4 years	129	31.3	98	30.2	227	30.8	28.3	0.000
5+ years	229	55.6	138	42.5	367	49.8		
Skipped	11	2.7	9	2.8	20	2.7		
Total	412	100.0	325	100.0	737	100.0		
Attitude to abortion as reported at age 32								
Always/mostly wrong	81	17.3	79	16.5	160	16.9		
Sometimes wrong	64	13.7	81	16.9	145	15.3		
Rarely wrong/not wrong	116	24.8	129	26.9	245	25.9	4.4	0.223
Depends/Don't know	198	42.4	173	36.1	371	39.2		
Skipped	8	1.7	17	3.5	25	2.6		
Total $^{\alpha}$	467	100.0	479	100.0	946	100.0		
Prior abortion								
Yes	51	21.2	23	11.2	74	16.6		
No	190	78.8	182	88.8	372	83.4	7.9	0.005
Total $^{\beta}$	241	100.0	205	100.0	446	100.0		
Prior live birth								
Yes	76	31.5	52	25.2	128	28.6		
No	165	68.5	154	74.8	319	71.4	2.2	0.142
Total	241	100.0	206	100.0	447	100.0		

αWho had ever had heterosexual sex

β Who reported a pregnancy in the 26 to 32 years age period

4.3.1.4 32-38 years age period

For eighty-nine percent of pregnancies that occurred between the ages of 32 and 38 years, women and men reported feeling happy about the pregnancy (Table 18, below). A greater proportion of women than men reported feeling unhappy about their pregnancy at this age period; 12% compared to 6% of pregnancies reported by men (χ^2= 7.03, p = <0.001).

Three-percent of all reported pregnancies occurred when there was no preconception relationship and more than two-thirds (68%) occurred in relationships 5 years or longer. Men may have been more likely to report shorter pre-conception relationships in this age period, but the difference was not significant. Around a third of all eligible study members at this age period reported that their attitudes to abortion were either sometimes wrong, or always or mostly wrong (negative attitudes), the remaining two-thirds reported rarely or not wrong and depends or don't know (positive or ambivalent attitudes). When attitudes to abortion are dichotomised in this fashion, men reported negative attitudes to abortion slightly more than women, and these differences were potentially significant (χ^2= 3.99, p = 0.001).

Around one in five study members who reported a pregnancy in the 32-38 years age period had reported an abortion in one of the previous age periods. Women reported previous live births more than men: almost half of women and about a third of men reported a previous live birth, and this difference was statistically significant (p = <0.001).

Table 18. Circumstances of pregnancies in the 32-38 age period, by gender of study member, reported at the age 38 assessment

	Women		Men		Total		Women cf. men	
	n	**%**	**n**	**%**	**n**	**%**	**χ^2**	**p value**
Feelings about pregnancy at time of pregnancy, reported at age 38								
Happy	355	86.0	374	91.7	729	88.8		
Unhappy	48	11.6	26	6.4	74	9.0		
Don't Know	8	1.9	8	2.0	16	1.9	7.03	0.000
Skipped	2	0.5	0	0.0	2	0.2		
Total	413	100.0	408	100.0	821	100.0		
Preconception relationship as reported at age 38								
No relationship	15	3.9	10	2.5	25	3.2		
Less than 1 year	15	3.9	30	7.5	45	5.8		
1-4 years	81	21.2	96	24.1	177	22.7	7.10	0.688
5+ years	271	70.9	262	65.8	533	68.3		
Total	382	100.0	398	100.0	780	100.0		
Attitude to abortion as reported at age 38								
Always/mostly wrong	69	15.0	77	16.5	146	15.8		
Sometimes wrong	55	12.0	76	16.3	131	14.1		
Rarely wrong/not wrong	132	28.7	128	27.5	260	28.1	5.02	0.170
Depends/Don't know	199	43.3	178	38.2	377	40.7		
Skipped	5	1.1	7	1.5	12	1.3		
Total $^{\alpha}$	460	100.0	466	100.0	926	100.0		
Prior abortion								
Yes	100	42.9	90	41.3	190	42.1		
No	133	57.1	128	58.7	261	57.9	0.83	0.361
Total $^{\beta}$	233	100.0	218	100.0	451	100.0		
Prior live birth								
Yes	107	45.9	79	36.2	186	41.2		
No	111	47.6	154	70.6	265	58.8	10.7	0.000
Total	233	100.0	218	100.0	451	100.0		

α Who had ever had heterosexual sex
β Who reported a pregnancy in the 32 to 38 years age period

4.3.2 Associations of circumstances at the time of pregnancy, with abortion compared with live birth

4.3.2.1 Under 21 years age period

Error! Reference source not found. (below), describes the association of abortion and live birth outcomes with feeling about the pregnancy, preconception relationship length and attitude to abortion for pregnancies under the age of 21 years reported by women in the study. In the vast majority of abortions that occurred under the age of 21, women reported feeling unhappy, this is compared to reporting feeling unhappy in 41% of pregnancies that ended in a live birth. The difference between abortion and live birth outcomes with respect to feelings about the pregnancy was significant at $p = <0.001$. As shown in Table 20 (below), in two-thirds of abortions that occurred under the age of 21, men reported feeling unhappy about the pregnancy, compared to reporting feeling unhappy in less than a third of pregnancies that ended in a live birth, this difference was significant at $p = <0.001$. Men also reported they didn't know if they were happy or unhappy about the pregnancy in a similar proportion of both abortions and live births (23%).

Length of preconception relationship seems to have no effect on the likelihood of choosing abortion or live birth when pregnant under the age of 21 for women (**Error! Reference source not found.**). Having no preconception relationship compared to a preconception relationship of any length also had no significant effect on abortion and live birth outcomes. There were no significant differences between abortion and live birth in terms of length of preconception relationship for pregnancies reported by men in this age period. There was also no difference in pregnancy outcome for no preconception relationship compared to a preconception relationship of any length.

Women that reported their attitude to abortion being either 'always or mostly wrong' or 'sometimes wrong' were not significantly more likely to have a live birth than an abortion in this age period compared to women who reported the more positive abortion attitudes. Men who reported abortions in this age period were less likely to report they thought that abortion was always or mostly wrong than men who reported live births: less than five-percent compared with 29% of live births at this age period ($\chi^2 = 13.31$, $p = 0.004$). Similarly, men who reported an abortion were more likely to view abortion as rarely or not wrong than men who reported a live birth (34% compared with 9%). If attitudes to abortion are collapsed to two categories; negative and positive/ambivalent, there is still an association between

negative attitudes to abortion and choosing abortion for men in this age period (χ^2= 4.4, p = 0.036).

Table 19. The association of circumstances at the time of pregnancy and abortion compared with live birth for pregnancies under the age of 21, as reported by women in the study

	Abortion		Live birth		Total		Abortion cf. live birth	
	n	%	n	%	n	%	χ^2	p value
Feeling about pregnancy								
Happy	2	4.4	33	48.5	35	31.0		
Unhappy	36	80.0	28	41.2	64	56.6	24.8	0.000
Don't know	7	15.6	7	10.3	14	12.4		
Total	45	100.0	68	100.0	113	100.0		
Preconception relationship								
No relationship	12	26.7	16	23.5	28	24.8		
Less than 1 year	19	42.2	27	39.7	46	40.7		
1-4 years	13	28.9	23	33.8	36	31.9	0.46	0.933[a]
5+ years	1	2.2	1	1.5	2	1.8	0.14	0.705[β]
Missing	0	0.0	1	1.5	1	0.9		
Total	45	100.0	68	100.0	113	100.0		
Attitude to abortion								
Always/mostly wrong	4	8.9	10	14.7	14	12.4		
Sometimes wrong	2	4.4	12	17.6	14	12.4		
Rarely wrong/not wrong	18	40.0	18	26.5	36	31.9	6.72	0.082[δ]
Depends/Don't know	19	42.2	22	32.4	41	36.3		
Missing	2	4.4	6	8.8	8	7.1		
Total	45	100.0	68	100.0	113	100.0		

a Missing data excluded from analysis. If those who indicated 5 + year preconception relationships are included with the 1-4 years group, still no significant association, (χ^2 = 0.28, p-value 0.877).
β Chi-squared test of 'no relationship' compared to preconception relationship of any length
δ Chi-squared test excludes missing data as a category

Table 20: The association of circumstances at the time of pregnancy and abortion compared with live birth for pregnancies under the age of 21, reported by men in the study

	Abortion		Live birth		Total		Abortion cf. live birth	
	n	**%**	**n**	**%**	**n**	**%**	**χ^2**	**p value**
Feeling about pregnancy								
Happy	5	11.4	18	51.4	23	29.1		
Unhappy	29	65.9	9	25.7	38	48.1	17.3	0.000
Don't know	10	22.7	8	22.9	18	22.8		
Total	44	100.0	35	100.0	79	100.0		
Preconception relationship								
No relationship	4	9.1	3	8.6	7	8.9		
Less than 1 year	21	47.7	17	48.6	38	48.1	0.04	0.980[α]
1-4 years	19	43.2	10	28.6	29	36.7		
5+ years	0	0.0	4	11.4	4	5.1		
Skipped	0	0.0	1	2.9	1	1.3		
Total	44	100.0	35	100.0	79	100.0		
Attitude to abortion								
Always/mostly wrong	2	4.5	10	28.6	12	15.2		
Sometimes wrong	7	15.9	4	11.4	11	13.9	13.74	0.008[β]
Rarely wrong/not wrong	15	34.1	3	8.6	18	22.8	13.31	0.004[δ]
Depends/Don't know	17	38.6	14	40.0	31	39.2		
Skipped	3	6.8	4	11.4	7	8.9		
Total	44	100.0	35	100.0	79	100.0		

[α] Missing data excluded from analysis. If those who indicated 5 + year preconception relationships are included with the 1-4 years group

[β] Chi-squared test includes missing data as a category

[δ] Chi-squared test excludes missing data as a category

4.3.2.2 21-26 years age period

As described in Table 21 (below), in the majority of abortions (86%) that occurred between the ages of 21 and 26, women reported feeling unhappy with the pregnancy, compared to reporting feeling unhappy in 12% of pregnancies that ended in a live birth (χ^2= 17.3, p = <0.001). In the same age period (as described in Table 22), men reported being unhappy in 57% of pregnancies that ended in abortion and in 23% of pregnancies that ended in live birth. Additionally, men reported 'don't know' in relation to their feelings in 24% of pregnancies that ended in abortion and in only 3% of pregnancies that ended in a live birth (χ^2= 28.82, p = <0.001).

There was an association between preconception relationship length and abortion compared with live birth for pregnancies that occurred between the ages of 21 and 26. Women who reported no preconception relationship in pregnancies between the ages of 21 and 26 were six times as likely to report that their pregnancy ended in abortion than women who were in a relationship with their partner at the time of conception (CI 2.3-13.3, p = <0.01). Men who reported no preconception relationship were seven times as likely to report that their pregnancy ended in abortion than men who were in a relationship with their partner at the time of conception (CI 2.2-20.2, p = <0.01).

For women who reported pregnancies in the 21-26 age period, there are no significant associations between prior abortion and abortion or live birth in the 21 to 26 years age period. There were also no significant associations between reporting a prior live birth and either abortion or live birth in this age period for women. For men however, there were some associations between reporting a prior abortion and reporting an abortion in the 21-26 years age period. Men who reported a prior abortion were 4 times as likely to report an abortion in this age period than men who did not report a prior abortion (CI 1.1-13.8, p= <0.04).

Table 21. The association of circumstances at the time of pregnancy and abortion compared with live birth for pregnancies between the ages of 21 and 26 years, as reported by women in the study

	Abortion		Live birth		Total		Abortion cf. live birth	
	n	%	n	%	n	%	χ^2	p value
Feeling about pregnancy								
Happy	4	8.2	90	84.9	91	58.7		
Unhappy	42	85.7	13	12.3	55	35.5	84.54	0.000
Don't know	0	0.0	0	0.0	0	0.0		
Missing	3	6.1	3	2.8	6	3.9		
Total	49	100.0	106	100.0	155	100.0		
Preconception relationship								
No relationship	18	36.7	10	9.4	28	18.1		
Less than 1 year	14	28.6	19	17.9	33	21.3		
1-4 years	15	30.6	51	48.1	66	42.6	25.78	0.000
5+ years	2	4.1	26	24.5	28	18.1		
Total	49	100.0	106	100.0	155	100.0		
Attitude to abortion								
Always/mostly wrong	1	2.0	27	25.5	28	18.1		
Sometimes wrong	5	10.2	11	10.4	16	10.3	49.01	0.000[β]
Rarely wrong/not wrong	31	63.3	12	11.3	43	27.7	48.16	0.000[δ]
Depends/Don't know	10	20.4	49	46.2	59	38.1		
Missing	2	4.1	7	6.6	9	5.8		
Total	49	100.0	106	100.0	155	100.0		
Prior abortion								
Yes	6	12.2	17	16.0	23	14.8		
No	43	87.8	89	84.0	132	85.2	0.38	0.537
Total	49	100.0	106	100.0	155	100.0		
Prior live birth								
Yes	10	20.4	25	23.6	35	22.6		
No	39	79.6	81	76.4	120	77.4	0.19	0.660
Total	49	100.0	106	100.0	155	100.0		

[β] Chi-squared test includes missing data as a category
[δ] Chi-squared test excludes missing data as a category

Table 22. The association of circumstances at the time of pregnancy and abortion compared with live birth for pregnancies between the ages of 21 and 26 years, as reported by men in the study

	Abortion		Live birth		Total		Abortion cf. live birth	
	n	**%**	**n**	**%**	**n**	**%**	**χ^2**	**p value**
Feeling about pregnancy								
Happy	8	17.8	64	73.6	72	54.5		
Unhappy	26	57.8	20	23.0	46	34.8	28.82	0.000
Don't know	11	24.4	3	3.4	14	10.6		
Total	45	100.0	87	100.0	132	100.0		
Preconception relationship								
No relationship	13	28.9	5	5.7	18	13.6		
Less than 1 year	15	33.3	29	33.3	44	33.3		
1-4 years	13	28.9	37	42.5	50	37.9	14.87	0.002
5+ years	4	8.9	16	18.4	20	15.2		
Total	45	100.0	87	100.0	132	100.0		
Attitude to abortion								
Always/mostly wrong	1	2.2	22	25.3	23	17.4		
Sometimes wrong	11	24.4	12	13.8	23	17.4	11.73	0.020[β]
Rarely wrong/not wrong	11	24.4	17	19.5	28	21.2	11.64	0.009[δ]
Depends/Don't know	18	40.0	30	34.5	48	36.4		
Missing	4	8.9	6	6.9	10	7.6		
Total	45	100.0	87	100.0	132	100.0		
Prior abortion								
Yes	7	15.6	4	4.6	11	8.3		
No	38	84.4	83	95.4	121	91.7	4.66	0.031
Total	45	100.0	87	100.0	132	100.0		
Prior live birth								
Yes	3	6.7	17	19.5	20	15.2		
No	42	93.3	70	80.5	112	84.8	3.82	0.051
Total	45	100.0	87	100.0	132	100.0		

[β] Chi-squared test includes missing data as a category
[δ] Chi-squared test excludes missing data as a category

4.3.2.3 26-32 years age period

As shown in Table 23, women who reported being happy about their pregnancy were significantly more likely to also report that the pregnancy resulted in a live birth. For almost all abortions, women reported feeling unhappy about the pregnancy. Length of preconception relationship also had an association with pregnancy outcomes at this age period for women, with women who reported no relationship or shorter relationships more likely to also report that the pregnancy ended in abortion, this association was significant at p = <0.0001. Women who had a pregnancy that ended in abortion in this age period were more likely to also report more positive attitudes towards abortion than those who reported live births. Of women who reported an abortion in the 26 to 32 years age period, 42% had reported at least one abortion at a previous assessment. Twenty-percent of women that reported a live birth in this period had reported an abortion at a previous assessment. Of women that reported an abortion in this age period, 42% had reported a pregnancy that ended in a live birth in a previous assessment.

For men in the same age period (Table 24), feeling happy about the pregnancy was associated with the outcome of that pregnancy being a live birth rather than an abortion (χ^2=59.00, p = <0.001). However, men were 11 times as likely as women to report being happy about a pregnancy that ended in abortion (CI 2.4-53.9, p=0.002). Men who reported that pregnancies ended in a live birth also reported longer preconception relationships than those who reported pregnancies that ended in an abortion.

Men that reported an abortion were also more likely to report more positive or ambivalent attitudes towards abortion in general than men who reported live births in this period. Around 11% of men who reported a pregnancy that ended in either a live birth or an abortion this age period had reported an abortion at a previous assessment, however, a greater proportion of those who reported an abortion had reported a prior abortion than those who reported a live birth (21% compared to 9%). Women were slightly more likely than men to have reported a prior abortion when reporting an abortion at this age period (RR 2.0, CI 1.0-3.8, p= 0.04). Of men that reported a pregnancy that ended in either live birth or an abortion, almost a third had reported a live birth in a previous assessment. Thirteen-percent of men that reported an abortion in the 26-32 years age period had reported a live birth at a previous assessment.

Table 23. The association of circumstances at the time of pregnancy and abortion compared with live birth for pregnancies between the ages of 26 and 32 years, as reported by women in the study

	Abortion		Live birth		Total		Abortion cf. live birth	
	n	**%**	**n**	**%**	**n**	**%**	**χ^2**	**p value**
Feeling about pregnancy								
Happy	2	4.7	245	92.8	247	80.5		
Unhappy	41	95.3	18	6.8	59	19.2		0.001$^{\alpha}$
Don't know	0	0.0	1	0.4	1	0.3		
Total	43	100.0	264	100.0	307	100.0		
Preconception relationship								
No relationship	7	16.3	0	0.0	7	2.3		
Less than 1 year	12	27.9	11	4.2	23	7.5		
1-4 years	14	32.6	89	33.7	103	33.6		<0.001$^{\beta}$
5+ years	6	14.0	159	60.2	165	53.7		
Missing	4	9.3	5	1.9	9	2.9		
Total	43	100.0	264	100.0	307	100.0		
Attitude to abortion								
Always/mostly wrong	4	9.3	71	26.9	75	24.4		
Sometimes wrong	3	7.0	39	14.8	42	13.7		
Rarely wrong/not wrong	15	34.9	33	12.5	48	15.6	18.41	0.004
Depends/Don't know	19	44.2	113	42.8	132	43.0		
Missing	2	4.7	8	3.0	10	3.3		
Total$^{\delta}$	43	100.0	264	100.0	307	100.0		
Prior abortion								
Yes	18	41.9	52	19.7	70	22.8		
No	25	58.1	212	80.3	237	77.2	10.32	0.001
Total	43	100.0	264	100.0	307	100.0		
Prior live birth								
Yes	18	41.9	74	28.0	92	30.0		
No	25	58.1	190	72.0	215	70.0	3.37	0.066
Total	43	100.0	264	100.0	307	100.0		

α Fisher's exact test
β Fisher's exact test
δ Total who reported a pregnancy in this age period

Table 24. The association of circumstances at the time of pregnancy and abortion compared with live birth for pregnancies between the ages of 26 and 32 years, as reported by men in the study

	Abortion		Live birth		Total		Abortion cf. live birth	
	n	%	n	%	n	%	χ^2	p value
Feeling about pregnancy								
Happy	15	31.9	177	88.1	192	77.4		
Unhappy	27	57.4	23	11.4	50	20.2		
Don't know	5	10.6	0	0.0	5	2.0	59.00	0.000
Missing	0	0.0	1	0.5	1	0.4		
Total	47	100.0	201	100.0	248	100.0		
Preconception relationship								
No relationship	6	12.8	0	0.0	6	2.4		
Less than 1 year	18	38.3	28	13.9	46	18.5		
1-4 years	11	23.4	66	32.8	77	31.0		$<0.001^{\alpha}$
5+ years	8	17.0	95	47.3	103	41.5		
Missing	4	8.5	12	6.0	16	6.5		
Total	47	100.0	201	100.0	248	100.0		
Attitude to abortion								
Always/mostly wrong	3	6.4	50	24.9	53	21.4		
Sometimes wrong	6	12.8	26	12.9	32	12.9	16.28	0.003^{β}
Rarely wrong/not wrong	15	31.9	33	16.4	48	19.4	11.15	0.011^{δ}
Depends/Don't know	22	46.8	73	36.3	95	38.3		
Missing	1	2.1	19	9.5	20	8.1		
Total	47	100.0	201	100.0	248	100.0		
Prior abortion								
Yes	10	21.3	18	9.0	28	11.3		
No	37	78.7	183	91.0	220	88.7	5.77	0.063
Total	47	100.0	201	100.0	248	100.0		
Prior live birth								
Yes	6	12.8	68	33.8	74	29.8		
No	41	87.2	133	66.2	174	70.2	7.43	0.006
Total	47	100.0	201	100.0	248	100.0		

α Fisher's exact test
$^{\beta}$ Chi-squared test includes missing data as a category
$^{\delta}$ Chi-squared test excludes missing data as a category

4.3.2.4 32-38 years age period

As shown in Table 25, the majority of women who reported abortions between the ages of 32-38 years reported being unhappy about the pregnancy. Conversely, more than 90% of women who reported a live birth in this age period, reported being happy with the pregnancy. In this age period, the majority of women who reported a pregnancy that ended in either a live birth or an abortion were in a relationship prior to conception (96%), with just over 70% being in relationships for five years or longer. However, women who reported abortions reported more instances of no preconception relationship and relationships of shorter length than women who reported live births.

Attitude to abortion had no statistically significant association with abortion compared to live birth, though the proportion of those who reported negative attitudes towards abortion was greater for women who reported live birth than women who reported an abortion in this age period. There was also no statistically significant association between prior abortion and abortion compared with live birth in this age period for women. Women who reported a prior live birth reported more abortions than would be expected if there was no association between a previous live birth and abortion.

As shown in Table 26, for pregnancies reported by men that ended in live birth and occurred in the age 32 to 38 period, in almost all cases (92%), men reported being happy about the pregnancy. For pregnancies that ended in abortion, one-fourth reported feeling happy about the pregnancy, 60% felt unhappy, and the remaining 15% didn't know their feelings towards the pregnancy. Men who reported abortions also reported no preconception relationship and shorter preconception relationships than those who reported live births, with the majority of live births occurring in relationships five years or longer (68%) compared to only a third of abortions occurring in relationships five years or longer. Attitude to abortion had no statistically significant association with abortion compared to live birth for men in this age period. Though a greater proportion of those who reported abortion reported more positive or ambivalent attitudes to abortion. In almost one-fourth of live births reported by men in this age period, an abortion had been reported in a previous assessment. In half of reported abortions in this age period, an abortion had been reported prior. In over half of abortions reported in this age period (55%), no live birth had been reported prior, and for live births reported, 70% had reported a live birth in a prior assessment.

Table 25. The association of circumstances at the time of pregnancy and abortion compared with live birth for pregnancies reported by women as occurring between the ages of 32 and 38 years

	Abortion		Live birth		Total		Abortion cf. live birth	
	n	%	n	%	n	%	χ^2	p value
Feeling about pregnancy								
Happy	4	15.4	254	92.0	258	85.4		
Unhappy	22	84.6	18	6.5	40	13.2	124.23	0.000
Don't know	0	0.0	3	1.1	3	1.0		
Missing	0	0.0	1	0.4	1	0.3		
Total	26	100.0	276	100.0	302	100.0		
Preconception relationship								
No relationship	4	15.4	9	3.3	13	4.3		
Less than 1 year	3	11.5	6	2.2	9	3.0		
1-4 years	8	30.8	58	21.0	66	21.9	19.41	0.000
5+ years	11	42.3	203	73.6	214	70.9		
Total	26	100.0	276	100.0	302	100.0		
Attitude to abortion								
Always/mostly wrong	0	0.0	47	17.0	47	15.6		
Sometimes wrong	4	15.4	39	14.1	43	14.2		
Rarely wrong/not wrong	10	38.5	67	24.3	77	25.5	2.3	0.850^{α}
Depends/Don't know	12	46.2	119	43.1	131	43.4		
Missing	0	0.0	4	1.4	4	1.3		
Total*	26	100.0	276	100.0	302	100.0		
Prior abortion								
Yes	8	30.8	56	20.3	64	21.2		
No	18	69.2	220	79.7	238	78.8	1.56	0.211
Total	26	100.0	276	100.0	302	100.0		
Prior live birth								
Yes	19	73.1	116	42.0	135	44.7		
No	7	26.9	160	58.0	167	55.3	9.27	0.002
Total	26	100.0	276	100.0	302	100.0		

α Chi-squared test performed on categories ‘negative attitudes’ and ‘positive or ambivalent’ attitudes to abortion due to low numbers

Table 26. The association of circumstances at the time of pregnancy and abortion compared with live birth for pregnancies reported by men as occurring between the ages of 32 and 38 years

	Abortion		Live birth		Total		Abortion cf. live birth	
	n	%	n	%	n	%	χ^2	p value
Feeling about pregnancy								
Happy	5	25.0	280	96.6	285	91.9		
Unhappy	12	60.0	8	2.8	20	6.5	120.46	0.000
Don't know	3	15.0	2	0.7	5	1.6		
Total	20	100.0	290	100.0	310	100.0		
Preconception relationship								
No relationship	2	10.0	4	1.4	6	1.9		
Less than 1 year	7	35.0	16	5.5	23	7.4		
1-4 years	5	25.0	72	24.8	77	24.8	33.33	0.000
5+ years	6	30.0	198	68.3	204	65.8		
Total	20	100.0	290	100.0	310	100.0		
Attitude to abortion								
Always/mostly wrong	2	10.0	52	17.9	54	17.4		
Sometimes wrong	2	10.0	56	19.3	58	18.7		
Rarely wrong/not wrong	4	20.0	55	19.0	59	19.0	2.64	0.104$^{\alpha}$
Depends/Don't know	12	60.0	120	41.4	132	42.6		
Missing	0	0.0	7	2.4	7	2.3		
Total*	20	100.0	290	100.0	310	100.0		
Prior abortion								
Yes	10	50.0	69	23.8	79	25.5		
No	10	50.0	221	76.2	231	74.5	6.77	0.009
Total	20	100.0	290	100.0	310	100.0		
Prior live birth								
Yes	9	45.0	90	31.0	99	31.9		
No	11	55.0	200	69.0	211	68.1	1.68	0.195
Total	20	100.0	290	100.0	310	100.0		

α Chi-squared test performed on categories ‘negative attitudes’ and ‘positive or ambivalent’ attitudes to abortion
due to low numbers

4.3.3 The association of abortion compared with live birth with circumstances for all age groups

Table 27 (below), describes the associations of abortion and live birth with circumstances at the time of pregnancy for all pregnancies reported by women at any assessment, up to the age of 38 years. Feeling happy about the pregnancy was associated with live birth and not with abortion, and this was significant at $p = <0.001$. Largely, for pregnancies that ended in live birth, women reported feeling happy about the pregnancy and for pregnancies that ended in abortion, women reported feeling unhappy. Reporting 'don't know' for feelings about the pregnancy was not common in general, though slightly more common for pregnancies that ended in abortion, 4% of abortions compared to 2% of live births.

Reporting no preconception relationship was associated with abortion, as was reporting shorter preconception relationships. The majority of reported live births occurred in relationships of at least one year duration (86%), and more than half of live births were the product of relationships of more than five years duration. Conversely, more than half of abortions occurred in no preconception relationship or in relationships of less than one year duration, 43% of abortions occurred in relationships longer than one year, 12% occurred in relationships longer than five years.

More positive or ambivalent attitudes to abortion were associated with reports of abortion and more negative attitudes to women who reported live birth. For fourteen percent of abortions reported, the woman reported that she felt abortion was always, mostly or sometimes wrong. In around six-percent of abortions, the woman reported she felt abortion was always or mostly wrong. This is in contrast to reports of live birth, where more than a third of woman reported feeling that abortion was always, mostly or sometimes wrong and 22% felt abortion was always or mostly wrong. Almost two–thirds of women reported positive or ambivalent attitudes to abortion, regardless of whether abortion or live birth was reported.

Neither prior abortion or prior live birth had any significant associations with abortion or live birth up to the age of 38, though almost 30% of women that reported an abortion had reported an abortion prior and 40% had reported a prior live birth.

Table 27. The association of circumstances at the time of pregnancy and abortion compared with live birth for all pregnancies reported by women up to age 38 years

	Abortion		Live birth		Total		Abortion cf. live birth	
	n	%	n	%	n	%	χ^2	p value
Feeling about pregnancy								
Happy	12	7.4	622	87.1	634	72.3		
Unhappy	141	86.5	77	10.8	218	24.9	434.05	0.000
Don't know	7	4.3	11	1.5	18	2.1		
Missing	3	1.8	4	0.6	7	0.8		
Total $^{\delta}$	163	100.0	714	100.0	877	100.0		
Preconception relationship								
No relationship	41	25.2	35	4.9	76	8.7		
Less than 1 year	48	29.4	63	8.8	111	12.7		
1-4 years	50	30.7	221	31.0	271	30.9	159.72	0.000
5+ years	20	12.3	389	54.5	409	46.6		
Missing	4	2.5	6	0.8	10	1.1		
Total	163	100.0	714	100.0	877	100.0		
Attitude to abortion								
Always/mostly wrong	9	5.5	155	21.7	164	18.7		
Sometimes wrong	14	8.6	101	14.1	115	13.1		
Rarely wrong/not wrong	74	45.4	130	18.2	204	23.3	64.99	0.000 $^{\alpha}$
Depends/Don't know	60	36.8	303	42.4	363	41.4	29.30	0.000 $^{\beta}$
Missing	6	3.7	25	3.5	31	3.5		
Total	163	100.0	714	100.0	877	100.0		
Prior abortion								
Yes	32	27.1	125	19.3	157	20.5		
No	86	72.9	521	80.7	607	79.5	3.6	0.055
Total $^{\eta}$	118	100.0	646	100.0	764	100.0		
Prior live birth								
Yes	47	39.8	215	33.3	262	34.3		
No	71	60.2	431	66.7	502	65.7	1.89	0.170
Total	118	100.0	646	100.0	764	100.0		

α Chi-squared test of four categories excluding missing
β Chi-squared test performed on categories ‘negative attitudes’ and ‘positive or ambivalent’ attitudes to abortion
δ Total who reported a pregnancy in this age period
η Total excludes pregnancies under 21 years, as prior abortions or live births could not be ascertained

As for women, feeling happy about the pregnancy was associated with live birth and not with abortion for men (Table 28). Men reported being happy about the pregnancy in almost 90% of live births and for only 20% of abortions. Men reported ‘don’t know’ about their feelings towards the pregnancy in a greater proportion of abortions than live births (19% compared to 2%). Men also reported ‘don’t know’ about their feelings towards pregnancies that ended in abortion more than women, men in 19% and women in 4%. For 60% of abortions, men reported feeling unhappy about the pregnancy, whereas feeling unhappy was only reported in 10% of live births. There was an association between being in a preconception relationship and live birth, with the two-thirds of men who reported no preconception relationship, reporting abortion. A shorter preconception relationship was more prevalent amongst reports of abortion than live birth, and this was significant at $p = <0.001$.

Positive or ambivalent attitudes towards abortion had an association with abortion where negative attitudes did not. Men who reported live births had more negative attitudes towards abortion on average than men who reported abortions. Both prior live birth and prior abortion are potentially associated with pregnancy outcomes. Eighty-four percent of men that reported abortion had no prior live births, compared to 70% of live births reported by men had prior live births. Men who reported abortion reported prior abortion in a larger proportion than those who reported live births (27% compared to 19%), though almost a fifth of men that reported a live birth up to the age of 38 had a known prior abortion.

Table 28. The association of circumstances at the time of pregnancy and abortion compared with live birth for all pregnancies reported by men up to age 38 years

	Abortion		Live birth		Total		Abortion cf. live birth	
	n	%	n	%	n	%	χ^2	p value
Feeling about pregnancy								
Happy	33	21.2	539	87.9	572	74.4		
Unhappy	94	60.3	60	9.8	154	20.0	294.2	0.000
Don't know	29	18.6	13	2.1	42	5.5		
Missing	0	0.0	1	0.2	1	0.1		
Total $^{\delta}$	156	100.0	613	100.0	769	100.0		
Preconception relationship								
No relationship	25	16.0	12	2.0	37	4.8		
Less than 1 year	61	39.1	90	14.7	151	19.6	54.1	0.000 $^{\alpha}$
1-4 years	48	30.8	185	30.2	233	30.3	134.4	0.000 $^{\beta}$
5+ years	18	11.5	313	51.1	331	43.0		
Missing	4	2.6	13	2.1	17	2.2		
Total	156	100.0	613	100.0	769	100.0		
Attitude to abortion								
Always/mostly wrong	8	5.1	134	21.9	142	18.5		
Sometimes wrong	26	16.7	98	16.0	124	16.1	27.6	0.000 $^{\mu}$
Rarely wrong/not wrong	45	28.8	108	17.6	153	19.9	15.1	0.000 $^{\lambda}$
Depends/Don't know	69	44.2	237	38.7	306	39.8		
Missing	8	5.1	36	5.9	44	5.7		
Total	156	100.0	613	100.0	769	100.0		
Prior abortion								
Yes	27	24.1	91	15.7	118	17.1		
No	85	75.9	487	84.3	572	82.9	4.6	0.031
Total $^{\eta}$	112	100.0	578	100.0	690	100.0		
Prior live birth								
Yes	18	16.1	175	30.3	193	28.0		
No	94	83.9	403	69.7	497	72.0	9.4	0.002
Total	112	100.0	578	100.0	690	100.0		

α Chi-squared test of 'no relationship' and relationship of any length
β Chi-squared test of all presented categories
μ Chi-squared test of four categories excluding missing
λ Chi-squared test performed on categories 'negative attitudes' and 'positive or ambivalent' attitudes to abortion
δ Total who reported a pregnancy in this age period
ηTotal excludes pregnancies under 21 years, as prior abortions or live births could not be ascertained

4.4 Perceived decision maker in abortion decision

Table 29 (below) describes who was perceived to have made the decision to have the abortion for all non-abnormality abortions that were reported by both women and men in the study. For abortions that occurred under the age of 21, women were more likely to report that the decision to have an abortion was made by only them (in 63% of cases), compared to men who considered that the decision was made by the woman in only 29% of cases and by both parties in the majority (71%) of cases.

For abortions that occurred between the ages of 21 and 26, women still considered themselves the sole decision makers in the majority (51%) of cases. Men reported that the woman was the sole decision maker in 40% of cases and both parties were involved in the majority of cases (60%) in the 21-26 age period. For abortions that occurred between the ages of 26 and 32, both women and men perceived the decision to have an abortion as being made by both parties involved in the majority of cases (49% and 70% respectively), though men were 2.4 times as likely to report the decision was made by both parties than women (95% CI: 1.01 – 5.64, p value 0.046).

There were a small number of abortions in which the perceived decision maker was reported to be only the man involved in the pregnancy. For abortions that occurred between the ages of 26 and 32 years, three women reported the decision was made by a man, (3% of total reported abortions in this age period). For abortions that occurred between the ages of 32 and 38 years, three study members reported that the man made the decision about the abortion (6% of total reported abortions in this age period).

For women in the study, the perception of being the sole decision maker for the abortion decreased in proportion as the age of the pregnancy increased; from 63% of abortions in the under 21 age period to 42% in abortions at ages 32-38 years. The decrease in perception of being the sole decision maker was accompanied by an increase in perception that the decision to have the abortion was made by both parties involved in the pregnancy; from 35% of abortions in the under 21 age period to 58% in the 32-38 age period. Men consistently reported both parties being involved in the decision to have an abortion in the majority of cases; between approximately 60% and 70% of reported abortions in each age period.

Table 29. Who made the decision to have the abortion as reported by women and men for each abortion in each age period

	Women		Men		Total	
	n	**%**	**n**	**%**	**n**	**%**
Abortion decision under 21						
By female	27	62.8	12	29.3	39	46.4
By both	15	34.9	29	70.7	44	52.4
Don't know/can't remember	1	2.3	0	0.0	1	1.2
Total abortions	43	100.0	41	100.0	84	100.0
Abortion decision 21-26						
By female	25	51.0	18	40.0	43	45.7
By both	22	44.9	27	60.0	49	52.1
Don't know	2	4.1	1	2.2	2	2.1
Total	49	100.0	45	100.0	94	100.0
Abortion decision 26-32						
By female	20	44.4	14	30.4	34	37.4
By male	3	6.7	0	0.0	3	3.3
By both	22	48.9	32	69.6	54	59.3
Total	45	100.0	46	100.0	91	100.0
Abortion decision 32-38						
By female	11	42.3	5	23.8	16	34.0
By male	1	3.8	2	9.5	3	6.4
By both	15	57.7	13	61.9	28	59.6
Total	26	100.0	21	100.0	47	100.0

4.5 Reasons reported by women for choosing abortion, and associated characteristics

The following section describes the reasons for abortion as reported by women in the study only. Men were not asked to report the reasons why their partner had an abortion for abortions that occurred during any age period.

4.5.1 Self-reported reasons for having an abortion in each age period

4.5.1.1 Under 21 age period

Table 30 describes the distribution of self-reported reasons for having an abortion as reported by women for pregnancies that occurred under the age of 21. It is expressed as a proportion of the total number of abortions in the age period that were reported by women.

Table 30. Self-reported reasons for having an abortion, as reported by women at the age 26 assessment, describing abortions that occurred under the age of 21

	n	%
Reasons for abortion		
Not ready	38	90.5
Wrong relationship	14	33.3
Couldn't afford	24	57.1
Alone	15	35.7
Education	14	33.3
Other	4	9.5
Don't know	1	2.4
Total abortions	42	100.0

Proportions do not add to 100%, as women were able to report more than one reason for each abortion.

The most commonly reported reason for having an abortion under the age of 21 was ‘not ready’ [to have a child], which was reported in 91% of abortions. Women reported ‘couldn’t afford’ [to raise a child] in 57% of abortions that occurred under the age of 21. Relationship centred reasons; being in the wrong relationship or facing single parenthood (alone) were reported in 33% and 36% of abortions respectively. Education, ostensibly the want to continue further education, was reported in a third of abortions that occurred under the age of 21 (Table 30, above).

4.5.1.2 21-26 years age period

Table 31 (below), describes the self-reported reasons for abortion for abortions that occurred between 21 and 26 years of age. In seventy-six percent of abortions that were reported in the 21-26 years age period, ‘not ready' was considered a reason for having that abortion. ‘Couldn’t afford’ was reported by women in 45% of abortions in this age period. Being in the ‘wrong relationship’ was reported in almost half of abortions and [being] alone was considered a reason in 41% of abortions in this age period. Education was considered a reason for abortion in 22% of abortions. Additionally, in approximately six-percent of abortions in this age period, women indicated an ‘other’ reason.

Table 31. Self-reported reasons for having an abortion, as reported by women at the age 26 assessment, representing abortions that occurred between the ages of 21 and 26

	n	%
Reasons for abortion		
Not ready	37	75.5
Wrong relationship	24	49.0
Couldn't afford	22	44.9
Alone	20	40.8
Education	11	22.4
Other	3	6.1
Don't know	0	0.0
Total abortions	49	100.0

Proportions do not add to 100%, as women were able to report more than one reason for each abortion.

4.5.1.3 26-32 years age period

As shown in Table 32, not ready [for a child] predominated as a reason for having an abortion in the age 26 to 32 years age period, reported in almost two thirds of abortions. The next most common reason reported by women in this age period was being in the wrong relationship (44%), followed by ‘couldn’t afford’ (33%) and ‘alone’ (28%). Having enough children emerged as a reason for choosing abortion in this age period, being reported in 19% cases. Career and education reasons were reported in 19% and 9% of cases respectively. Health reasons contributed to approximately 5% of abortions in the 26-32 age period.

Table 32. Self-reported reasons for having an abortion, as reported by women at the age 32 assessment, representing abortions that occurred between the ages of 26 and 32

	n	%
Reasons for abortion		
Not ready	28	65.1
Enough children	8	18.6
Wrong relationship	19	44.2
Couldn't afford	14	32.6
Alone	12	27.9
Education	4	9.3
Career	8	18.6
Health	2	4.7
Other	3	7.0
Don't know	0	0
Total abortions	43	100

Proportions do not add to 100%, as women were able to report more than one reason for each abortion.

4.5.1.4 32-38 years age period

As shown in Table 33, 'wrong relationship' was the most common reason for abortion between the ages of 32 and 38, reported by women in over half of all abortions. Having enough children was reported in 42% of cases and being not ready to raise a child was reported in 29% of cases. Couldn't afford [to raise a child] was reported in 21% of abortions and being alone was reported in 17% of abortions. Career and education reasons were reported in 4% of abortions each (n=1). Women reported 'other' reasons in 29% of abortions in this age period.

Table 33. Self-reported reasons for having an abortion, as reported by women at the age 38 assessment, representing abortions that occurred between the ages of 32 and 38

	n	%
Reasons for abortion		
Not ready	7	29.2
Enough children	10	41.7
Wrong relationship	13	54.2
Couldn't afford	5	20.8
Alone	4	16.7
Education	1	4.2
Career	1	4.2
Other	7	29.2
Don't know	0	0.0
Health	2	8.3
Total abortions	24	100.0

Proportions do not add to 100%, as women were able to report more than one reason for each abortion.

4.5.2 Summary of self-reported reasons for having an abortion across all age periods

As shown in Table 34, the reasons reported for having an abortion differed across the four age periods in this study. The proportion of abortions in which feeling not ready to have a child was reported to be a reason for abortion decreased considerably as the age at which the abortion occurred increased. Not ready for a child was reported in 90% of cases in the under 21 age period and in only 29% of cases in the oldest age period, 32 to 38 years. Conversely, reporting having enough children as a reason peaked in the oldest age period, 32-38 years (in 42% of abortions 32-38 years and 19% of abortions 26-32 years).

Couldn't afford [to have a child] was also reported in fewer abortions as age increased, from being reported in 57% of abortions in the under 21 age period to 21% in the 32-38 age period. Being alone peaked for abortions in the 21 to 26 age period, with women reporting being alone in 41% of abortions at this age. In the 32-38 age period, women indicated being alone was a factor in their decision to have an abortion in 17% of abortions.

Being in the wrong relationship continued across the age periods as a fairly common reason for having an abortion, though it increased from being reported in 33% of abortions in the under 21 age period to 54% in the 32-38 age period. Both education and career reasons were reported less as the abortion was reported to occur at an older age period. The proportion of abortions in which an 'other' reason was reported was between seven and nine-percent in the earliest three age periods, before increasing to 29% in the 32-38 years age period.

Table 35 (also below) describes the reported reasons for all abortions that were reported up to age 38. The most common reason reported was 'not ready', which was reported in more than two-thirds of all abortions. Wrong relationship and could not afford were reported in 44% and 41% of abortions respectively. The least common reasons reported were career and health reasons.

Table 34. Self-reported reasons for abortion, expressed as a proportion of the total number of abortions reported by women in each age period

	Under 21 %	21-26 %	26-32 %	32-38 %
Reasons for abortion				
Not ready	90.5	75.5	65.1	29.2
Enough children	*NA*	*NA*	18.6	41.7
Wrong relationship	33.3	49.0	44.2	54.2
Couldn't afford	57.1	44.9	32.6	20.8
Alone	35.7	40.8	27.9	16.7
Education	33.3	22.4	9.3	4.2
Career	*NA*	*NA*	18.6	4.2
Health	*NA*	*NA*	4.7	8.3
Other	9.5	6.1	7.0	29.2
Don't know	2.4	0.0	0	0.0

Table 35. Self-reported reasons for abortions reported by women for all abortions up to age 38 years

	n	%
Reasons for abortion		
Not ready	110	69.6
Enough children	18	11.4
Wrong relationship	70	44.3
Couldn't afford	65	41.1
Alone	51	32.3
Education	30	19.0
Career	9	5.7
Health	4	2.5
Other	17	10.8
Don't know	1	0.6
Total abortions	158	100.0

Proportions do not add to 100%, as women were able to report more than one reason for each abortion.

Figure 5 through Figure 12 (below) show the proportion of abortions in each age period for which each stated reason was reported. It displays the trends of reasons for abortion as the age of at which the abortion occurred increases.

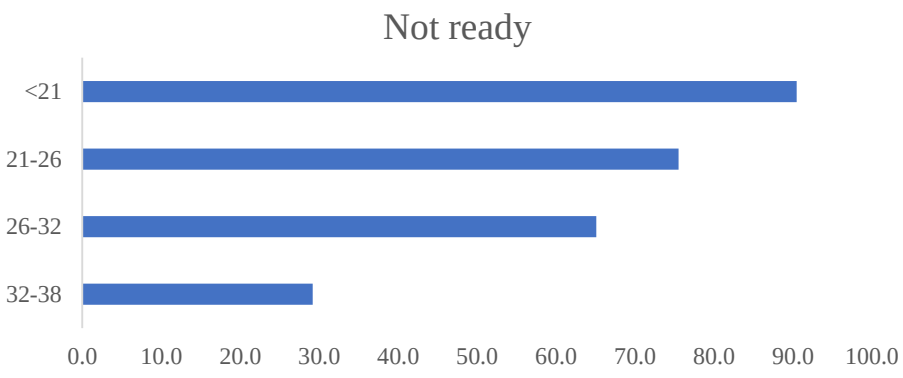

Figure 5. Proportion of abortions at each age period where women reported being not ready as a reason for their abortion

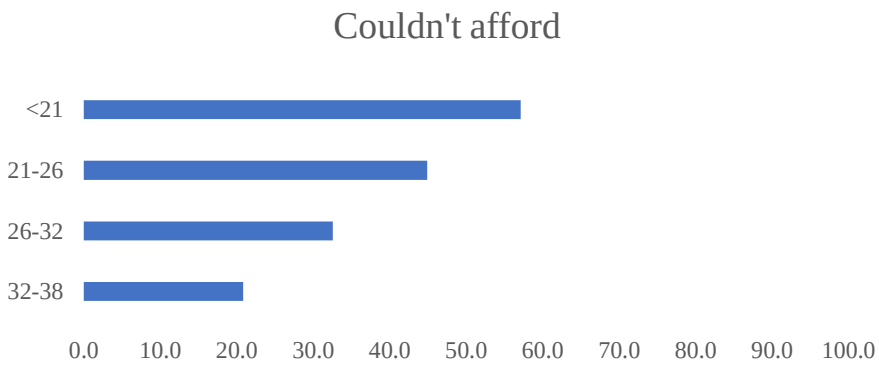

Figure 6. Proportion of abortions at each age period where women reported couldn't afford as a reason for their abortion

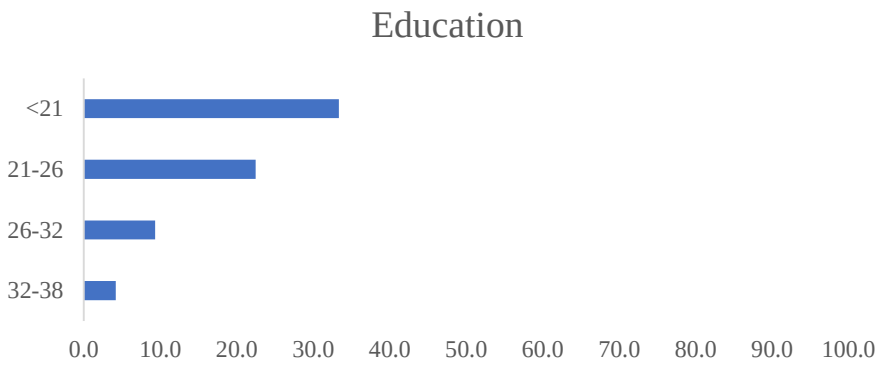

Figure 7. Proportion of abortions at each age period where women reported education as a reason for their abortion

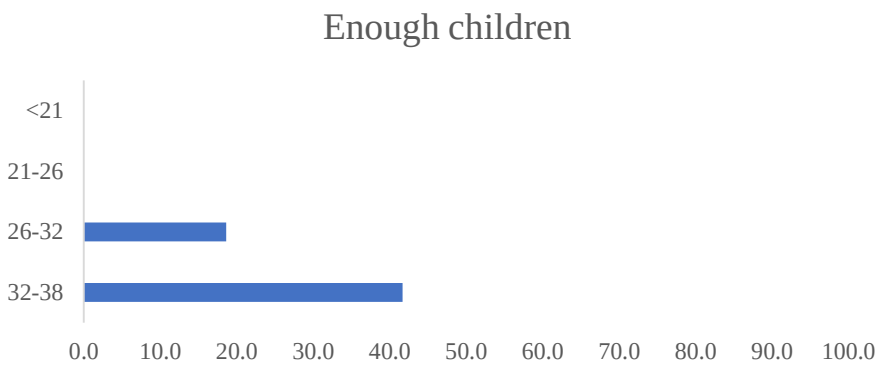

Figure 8. Proportion of abortions at each age period where women reported having enough children as a reason for their abortion

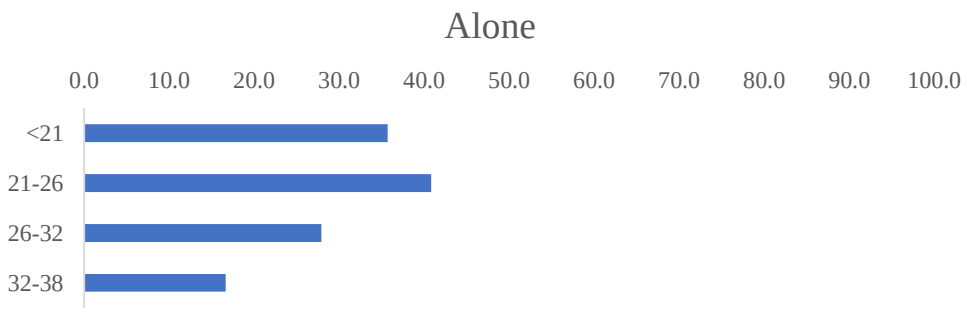

Figure 9.Proportion of abortions at each age period where women reported being alone as a reason for their abortion

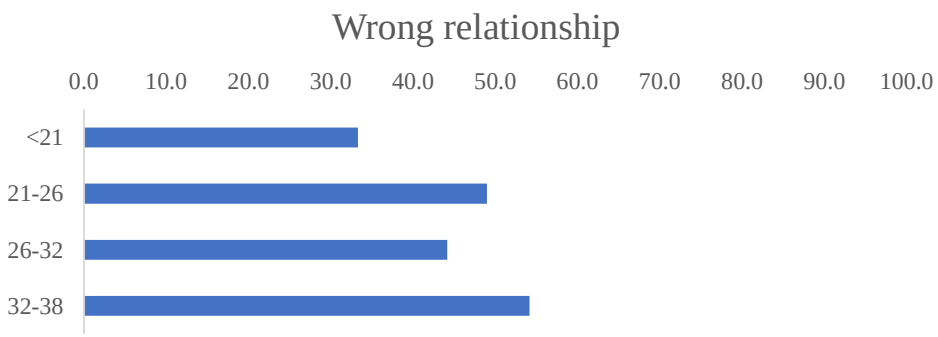

Figure 10. Proportion of abortions at each age period where women reported being in the wrong relationship as a reason for their abortion

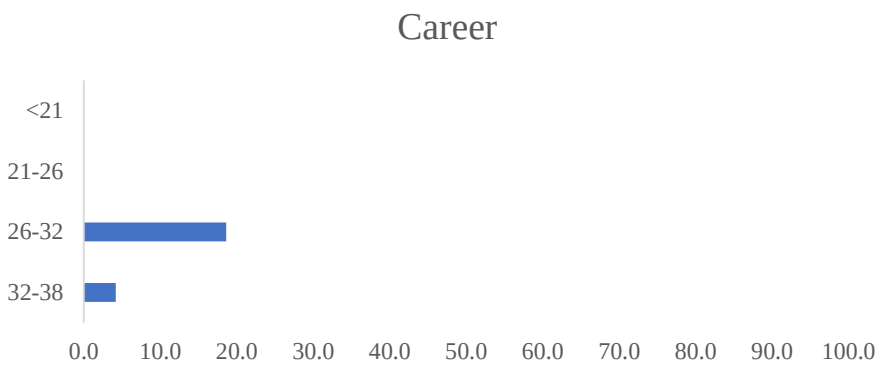

Figure 11. Proportion of abortions at each age period where women reported career as a reason for their abortion

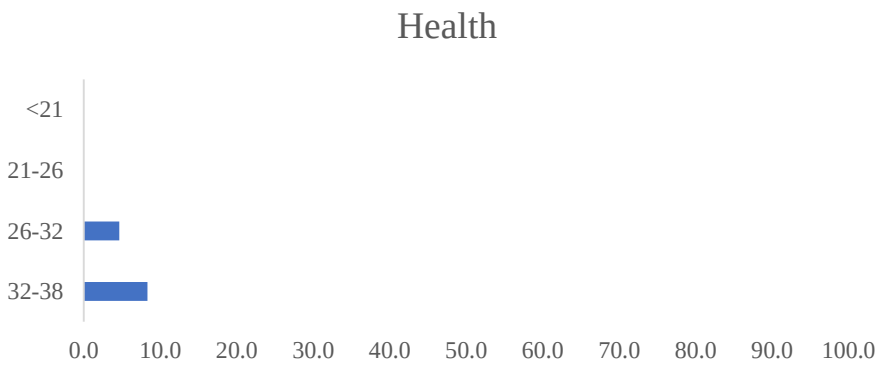

Figure 12. Proportion of abortions at each age period where women reported health as a reason for their abortion

4.6 Reported emotional impact of abortion study members, and associated characteristics or circumstances

The following section describes the self-reported impact of abortion for both women and men in the study for each age period and for all abortions up to age 38. As study members were able to report more than one feeling about the abortion, how those feelings were reported together is displayed in Venn diagrams for each age period and for all abortions up to age 38. Additionally, the associations of reasons for abortion and loss, relief and regret are described.

4.6.1 Self-reported emotional impact of abortions

4.6.1.1 Under 21 age period

Men and women who reported abortions that were not for an abnormality, were also asked to report the emotional impact of that abortion they experienced in the year following the abortion. As shown in Table 36, for abortions that were reported by women in the under 21 age period, feelings of relief predominated, reported in 44% of abortions. Regret was the most common feeling reported by men (in 34% of abortions), with relief being the next most often reported (in 29% of abortions during this age period). In abortions reported by women, regret was reported in 30% of abortions. Feelings of loss were reported more by women than by men for abortions in this age period, in 28% and 10% of abortions respectively. ‘Didn’t think’ was reported in 20% of all reported abortions in the under 21 age period, but was reported in a higher proportion of abortions by women than men (26% compared to 15%). Both ‘none’ and ‘don’t know/can’t remember’ were reported in a combined 8% of all abortions reported by women and men in this age period. There was some overlap of feelings of loss, relief and regret, illustrated in Figure 13 (below).

Table 36. Emotional impact of abortion in the year after, for abortions of pregnancies that occurred under the age of 21 (reported at the age 26 assessment)

	Women		**Men**		**Total**	
	n	**%**	**n**	**%**	**n**	**%**
Loss	12	27.9	4	9.8	16	19.0
Relief	19	44.2	12	29.3	31	36.9
Regret	13	30.2	14	34.1	27	32.1
Didn't think	11	25.6	6	14.6	17	20.2
None	4	9.3	1	2.4	5	6.0
Don't know/can't remember	1	2.3	1	2.4	2	2.4
Total*	43	100.0	41	100.0	84	100.0

*Total number of abortions in this age period. Proportions add to greater than 100% as more than one answer could be given.

If only reports of loss, relief and regret are considered, in a small proportion (five-percent) of abortions, study members reported all three feelings in response to abortions in this age period. In eight-percent of abortions, study members reported feelings of both relief and regret, in 11% of abortions, relief and loss were both reported. Regret and loss together were reported in 10% of abortions. Figure 13 also shows that 28% of study members who reported feelings of regret, also reported feelings of relief following the same abortion. Loss and relief had significant overlap, with 56% of study members who reported feelings of loss also reporting feelings of relief for the same abortion. Loss and regret were also closely linked, with 45% of those who reported loss also reporting feelings of regret.

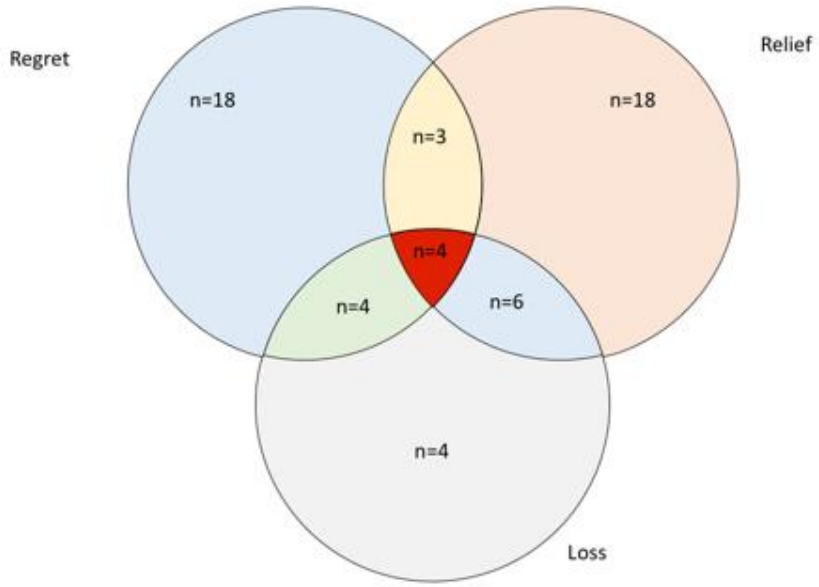

Figure 13. The overlap of regret, relief and loss felt in the year after the abortion for abortions that occurred under the age of 21 reported by women and men

4.6.1.2 21-26 years age period

For abortions that occurred in the 21-26 years age period (Table 37), women were four times as likely as men to report they felt relief in the year following the abortion (in 53% of abortions compared to 22% of abortions for men). Relief was clearly the predominate feeling reported by women, with a 20-point difference between reports of relief and the next most commonly reported feeling, 'didn't think' (in 33% of abortions). Reporting feelings of regret also seemed to have gender differences, with women reporting feelings of regret in 18% of abortions and men reporting feelings of regret in 36% of abortions in the 21-26 age period.

Regret was the predominate feeling reported by men, though not as strongly as relief was for women, with only a five-point difference between regret and 'didn't think' for men. As with women, 'didn't think' was the second most commonly reported feeling for men (reported in 31% of abortions). Loss was reported in 22% of all abortions in this age period, with women reporting loss in 26% of abortions and men reporting loss in 18% of abortions. In 11% of all abortions either 'none' or 'don't know/can't remember' was reported. Men reported these feelings more than women, in 16% of abortions compared to 8% of abortions for women.

Table 37. Feelings about the abortion in the year after for abortions reported as occurring between the ages of 21 and 26. Reported at the age 26 assessment

	Women		Men		Total	
	n	**%**	**n**	**%**	**n**	**%**
Loss	13	26.5	8	17.8	21	22.3
Relief	26	53.1	10	22.2	36	38.3
Regret	9	18.4	16	35.6	25	26.6
Didn't think	16	32.7	14	31.1	30	31.9
None	4	8.2	6	13.3	10	10.6
Don't know/can't remember	0	0.0	1	2.2	1	1.1
Total*	49	100.0	45	100.0	94	100.0

*Total number of abortions in this age period. Proportions add to greater than 100% as more than one answer could be given.

As shown in Figure 14, in five-percent of abortions, study members reported all three feelings of regret, relief and loss. Thirteen-percent of abortions had both relief and regret reported, 10% had relief and loss reported and 11% had regret and loss reported. Of reports of regret, relief or loss in this age period (n=82), less than half (43%) of study members only reported one feeling for an abortion. Almost 50% of study members who reported regret also reported relief, and a third of those who reported relief also reported regret. Of those that reported loss, almost half also reported regret (48%) and a similar proportion also reported relief (43%).

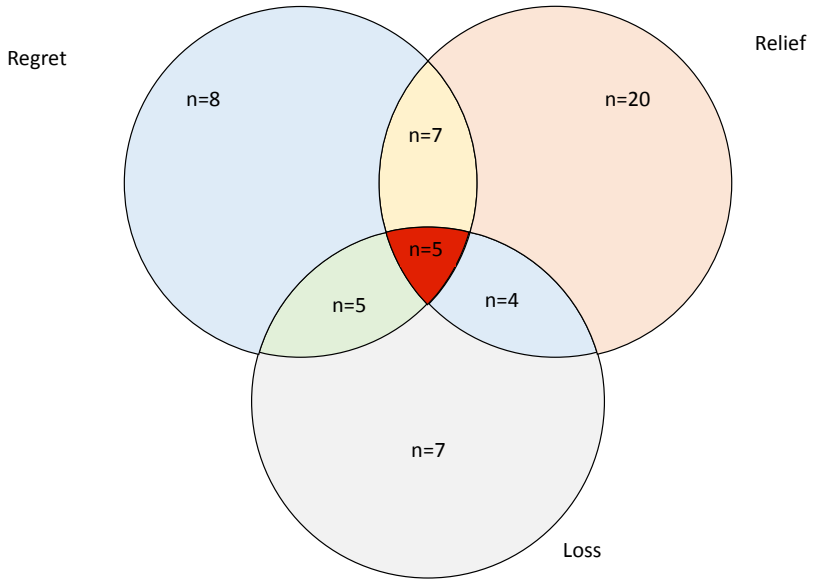

Figure 14. The overlap of regret, relief and loss following abortions that occurred between the ages of 21 and 26 years

4.6.1.3 26-32 years age period

Table 38 shows the emotional impact of abortion reported by women and men, for abortions that occurred between the ages of 26 and 32. Women reported relief for 51% of abortions, loss for 35% of abortions and regret for 16% of abortions. Women also reported that they 'didn't think' in 33% of abortions in this age period. Relief was clearly the predominate feeling reported by women, reported 1.5 times as often as the next most commonly reported feeling, loss. Loss was closely followed by reports of 'didn't think'.

Men reported 'didn't think' most often in this age period, in 38% of abortions, followed in equal numbers by relief and regret (in 21% of cases apiece). Loss was reported by men in 19% of abortions and 'none' was reported in 17% of abortions. Don't know or can't remember was only reported my men in this age period, in 6% of the abortions reported by men (n=3).

Table 38. Feelings about the abortion in the year following the abortion, reported at the age 32 assessment.

	Women		Men		Total	
	n	**%**	**n**	**%**	**n**	**%**
Loss	15	34.9	9	19.1	24	26.7
Relief	22	51.2	10	21.3	32	35.6
Regret	7	16.3	10	21.3	17	18.9
Didn't think	14	32.6	18	38.3	32	35.6
None	2	4.7	8	17.0	2	2.2
Don't know/can't remember	0	0.0	3	6.4	0	0.0
Total*	43	100.0	47	100.0	90	100.0

*Total number of abortions in this age period. Proportions are greater than 100% as more than one answer could be given.

Figure 15 describes how feelings of regret, relief and loss were reported concurrently for single abortions in the 26-32 years age period. In just over four-percent of abortions in this period, regret, relief and loss were all reported. In another four-percent of abortions, both relief and regret were reported, relief and loss together were both reported in nine-percent of abortions and only regret and loss in two-percent of abortions.

Of those who reported regret in response to an abortion in this age period, almost 50% also reported relief. Similarly, for abortions where loss was reported, 50% also had relief reported. Relief was the predominate feeling reported for abortions in this age period, and of those that reported relief, 25% also reported regret and 38% also reported loss.

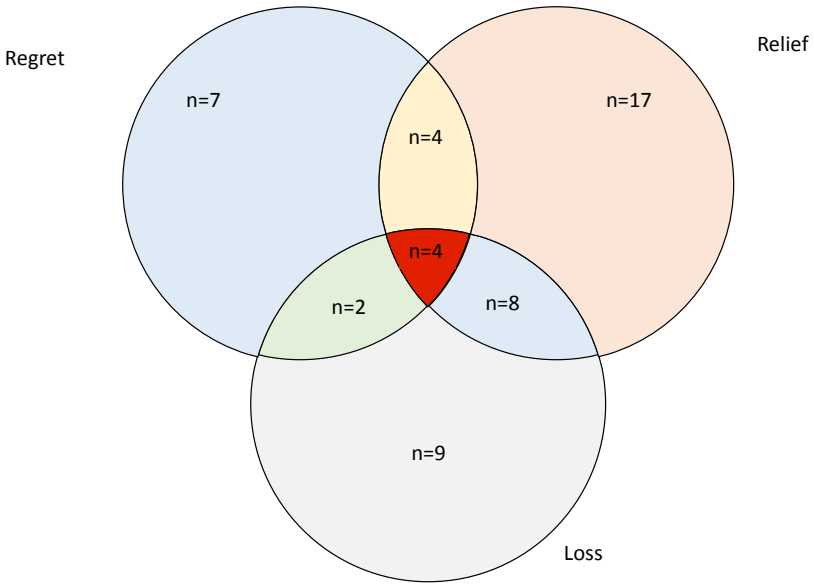

Figure 15. Overlap of loss, relief and regret in abortions that occurred between 26 and 32 years

4.6.1.4 32-38 years age period

As shown in Table 39, for women, loss and relief were the predominate feelings after abortions in this age period, reported in 48% and 45% of abortions respectively. Women were 4 times as likely than men to report feelings of loss in the year following abortions that occurred during the 32-38 years age period (CI 1.07-14.71, p=0.039). Relief was most commonly reported by men in this age period, reported in almost 60% of cases. Regret was the second most commonly reported emotion for men and the third most common for women. Women reported regret in 29% of cases and men reported it in a third of abortions in this age period. 'Didn't think' was reported similarly by women and men in this age period, in 18% and 19% of cases respectively.

Table 39. Feelings about the abortion in the year following the abortion, reported at the age 38 assessment.

	Women		Men		Total	
	n	**%**	**n**	**%**	**n**	**%**
Loss	13	46.4	4	19.0	17	34.7
Relief	12	42.9	12	57.1	24	49.0
Regret	8	28.6	7	33.3	15	30.6
Didn't think	5	17.9	4	19.0	9	18.4
None	2	7.1	3	14.3	5	10.2
Don't know/can't remember	0	0.0	0	0.0	0	0.0
Total*	28	100.0	21	100.0	49	100.0

*Total number of abortions in this age period. Proportions are greater than 100% as more than one answer could be given.

As shown in Figure 16, for ten-percent of abortions in this age period, regret, relief and loss were all reported. In an additional 10% of abortions both relief and loss were reported. Regret and relief were reported together in six-percent of abortions, as were regret and loss. Of those who reported regret (n=15), over half (53%) also reported relief, the same proportion also reported loss. Of those who reported loss, 56% also reported relief and 44% also reported regret. Relief was the most common feeling reported for all abortions in this age period, and for abortions where relief was reported, a third also reported regret and 40% also reported loss.

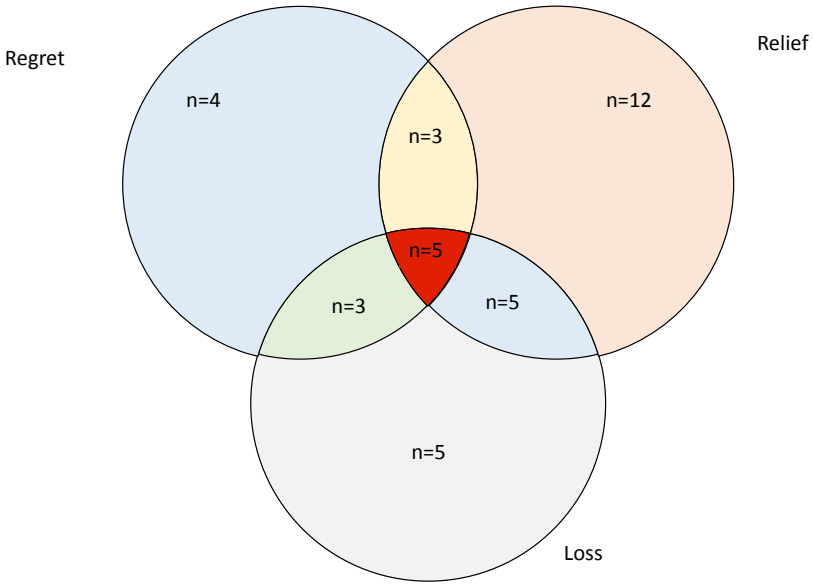

Figure 16. Overlap of loss, relief and regret in abortions that occurred between 32 and 38 years

4.6.1.5 Summary of self-reported emotional impact of abortion across all age periods

Table 40 shows the proportion of abortions where each feeling was reported at all four age periods. For women study members, the proportion of abortions where loss was reported increased with age, from 28% of abortions in the under 21 years age period to 48% of abortions in the 32-38 years age period. The proportion of abortions for which women reported feelings of relief remains fairly consistent across the four age periods, at or around 44% of abortions. There is however, a slight increase in feelings of relief for abortions in the 21-26 years age period, with relief being reported in 53% of cases.

For women, feelings of regret following an abortion were reported in the highest proportion of abortions in both the youngest and the oldest age periods in this study. Regret was reported in 30% of abortions that occurred under the age of 21 and in 28% of abortion that occurred between the ages of 32 and 38. Regret was reported in a smaller proportion of abortions in the middle two age periods: 21-26 years and 26-32 years, at 18% and 16% respectively. 'Didn't think' forms a significant part of women's feelings towards their abortion at each age period, falling between 17% and 30% of abortions, though 'didn't think' was reported less often in the youngest and oldest age period.

For men, there was an increase in reports of loss for abortions that occurred from age 21 and up compared to abortions that occurred under 21 years of age, though after 21 years, the proportion of abortions where loss was reported hovered at about 20%. Reports of relief by men were almost a third of abortions in the youngest age period, and about a fifth of abortions in the 26-32 years age period, reports of relief by men increased to over a half of all abortions in the oldest age period regret was reported in about a third of abortions for men at each period, except for the 26-32 age period, where it was reported in only 21% of abortions. 'Didn't think' was a commonly reported feeling for men, especially in the middle two age periods, between 31% and 38%. Reports of no feelings ('none') were almost as common as loss for men, particularly in the latter age periods.

Table 40. Distribution of women and men's feelings about their or their partner's abortion, in each age period.

	Under 21 %	21-26 %	26-32 %	32-38 %
Women				
Loss	27.9	26.5	40.0	48.3
Relief	44.2	53.1	42.2	44.8
Regret	30.2	18.4	15.6	27.6
Didn't think	25.6	32.7	31.1	17.2
None	9.3	8.2	4.4	6.9
Don't know	2.3	0.0	0.0	0.0
Men				
Loss	9.8	17.8	19.1	19.0
Relief	29.3	22.2	21.3	57.1
Regret	34.1	35.6	21.3	33.3
Didn't think	14.6	31.1	38.3	19.0
None	2.4	13.3	17.0	14.3
Don't know	2.4	2.2	6.4	0.0

Figure 17 and Figure 18 (below) show the general trends across the four age periods of this study for feelings of loss, relief and regret reported by women and men respectively. Men consistently reported feelings of loss in the year following their partner's abortion in a smaller proportion of abortions than women at each age period. In abortions that occurred under the age of 21, men reported feeling loss in approximately 10% of abortions, compared to women who reported feelings of loss in 28% of abortions. Similarly, men reporting feelings of loss increased slightly as the age period at which the abortion occurred increased, rising to 19% in the oldest two age periods, 26-32 years and 32-38 years.

The greatest change across the age periods for men were feelings of relief; ranging from between 21% and 29% in the earlier age periods before spiking to 57% in the 32-38 years age period (Figure 18). Regret was reported by men at consistently higher proportions than women in the same age periods, in an average of 34% of cases, though regret dipped slightly at the age 26-32 age period to being reported by men in 21% of cases.

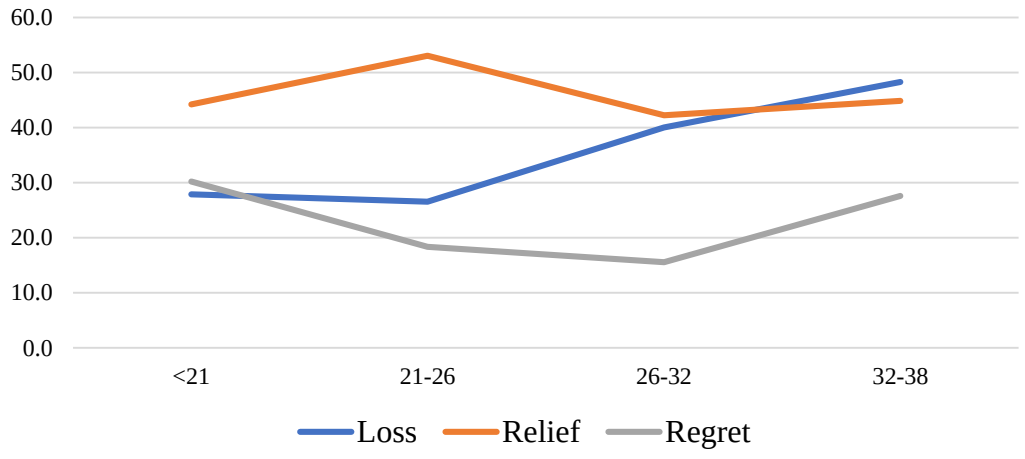

Figure 17. Women's self-reported feelings about her abortion in the 1 year following the abortion

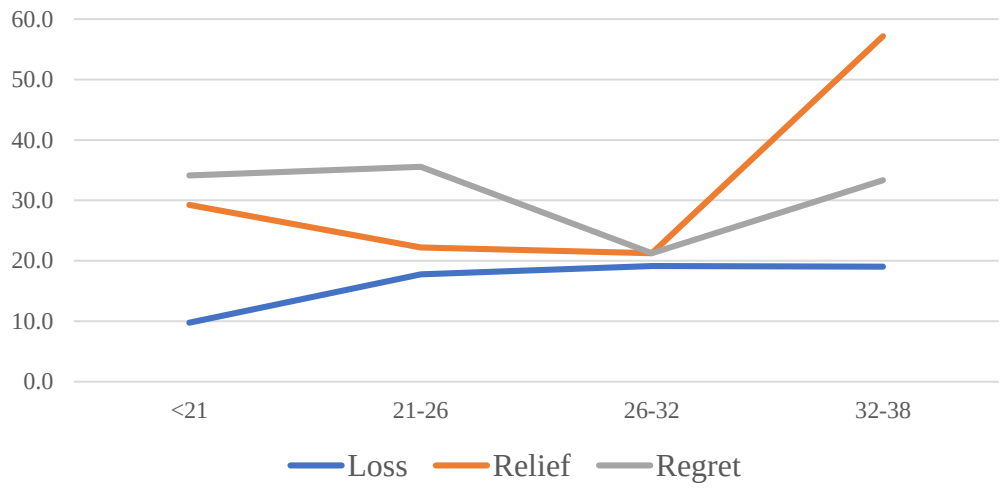

Figure 18. Men's self-reported feelings about their partner's abortion in the 1 year following the abortion

4.6.1.6 *Summary of the self-reported emotional impacts of abortion up to the age of 38 years*

As shown in Table 41, for all abortions that were reported by both women and men up until the age of 38 years, relief was the predominate feeling, reported in almost 40% of abortions. 'Didn't think' was the next most commonly reported feeling, reported in 28% of all abortions. Regret and loss were reported in similar proportions, in 27% and 25% of abortions respectively. 'None' was reported in nine-percent of abortions and 'don't know' or 'can't remember' was reported in two-percent of abortions.

Regret was the predominate feeling reported by men and was reported in a greater proportion of abortions than women, 31% compared to 23%. Relief was the predominate feeling reported by women (in almost half of abortions), whereas, men reported relief in only about a third of abortions. Women reported loss in a greater proportion of abortions than men, in a third of all abortions, compared to 16%. 'Didn't think' was reported in similar proportions by women and men, 28% and 27% respectively. 'Don't know' or 'can't remember' was reported in a small proportion of abortions, but was reported slightly more by men, in three-percent of abortions, compared to in less than one-percent by women.

Table 41. Feelings about the abortion in the year following the abortion, for all abortions in the study period up to age 38 years, by gender

	Women		**Men**		**Total**	
	n	**%**	**n**	**%**	**n**	**%**
Loss	53	32.7	25	16.3	78	24.8
Relief	79	48.8	44	28.8	123	39.0
Regret	37	22.8	47	30.7	84	26.7
Didn't think	46	28.4	42	27.5	88	27.9
None	12	7.4	18	11.8	30	9.5
Don't know/can't remember	1	0.6	5	3.3	6	1.9
Total$^{\alpha}$	162	100.0	153	100.0	315	100.0

α Total number of abortions in the study period. Proportions add to greater than 100% as more than one answer could be given.

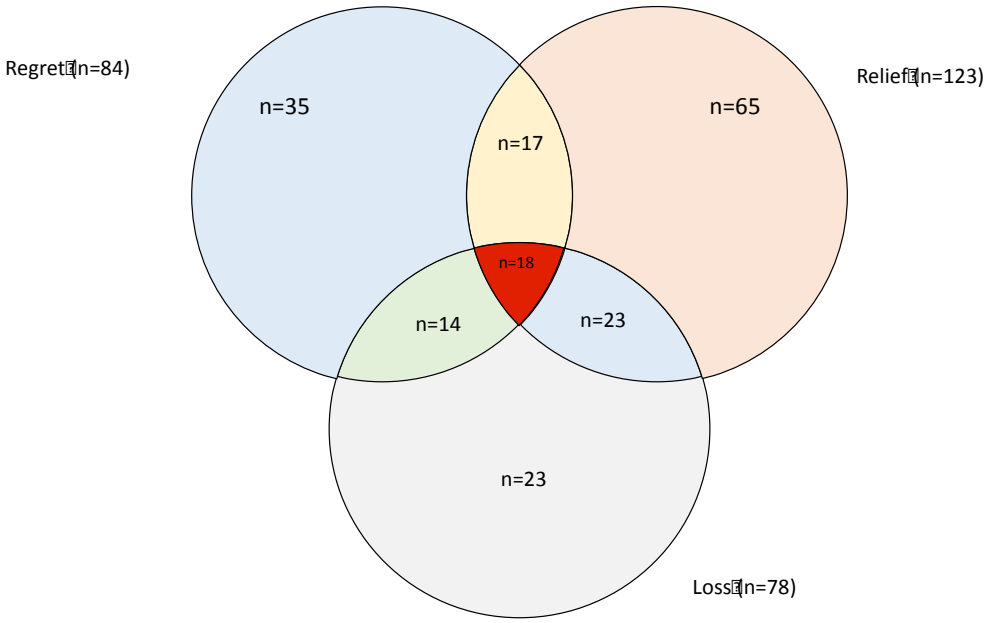

Figure 19. The overlap of loss, relief and regret, for all abortions in the study period

Of all abortions reported up to the age of 38 (n=315), the combination of regret, relief and loss was reported in 18 or about six-percent of cases. However, in almost 50% of abortions where relief was reported, study members also reported feelings of either loss or regret for the same abortion. For abortions where regret was reported, around 40% also reported relief. Regret and loss were also reported together frequently, with around 40% of those who reported regret, also reporting loss and vice versa. Loss and relief were also closely linked, with a third of those who reported relief also reporting loss and more than 50% of those who reported loss also reporting relief.

4.6.2 Associations of self-reported emotional impact and self-reported reasons for having an abortion

This section describes the associations of the self-reported reasons for having an abortion and the self-reported emotional impact of abortion. These associations were only able to be reported for women, as men were not asked to report their reasons for abortion. The terms 'impact' and 'feelings' are used interchangeably to refer to the feelings of loss, relief and regret described in Section 4.6.1.

4.6.2.1 Under 21 years age period

Table 42 (below) describes the association of feelings of loss, relief and regret and the reason reported for the abortion. For women who reported being not ready as the reason for their abortion, relief was the predominate feeling in the year after (in 47% of cases), loss was the next most commonly reported, in 32% of cases, and regret in 26% of cases. Abortions that were reported as due to the 'wrong relationship' showed the greatest difference (35-point difference) between the proportions that reported relief, and loss, with relief being reported in almost two-thirds of abortions for wrong relationship and loss being reported in less than one-third of abortions (regret was reported least, in 14% of abortions). Abortions for education reasons contributed the largest proportion of abortions where regret was also reported (29%), followed by feeling not ready (26%). Abortions for 'other' reasons are the only category of reason where relief is not the predominate feeling reported, instead, loss is reported in two thirds of cases and relief only 17%.

Table 42. The association of loss, relief and regret in the year following an abortion and the reasons for that abortion. For abortions reported by women as occurring under the age of 21 years

	Loss		Relief		Regret	
	n	%	n	%	n	%
Not ready (n=38)	12	31.6	18	47.4	10	26.3
Wrong relationship (n=14)	4	28.6	9	64.3	2	14.3
Couldn't afford (n=24)	6	25.0	12	50.0	6	25.0
Alone (n=15)	4	26.7	8	53.3	3	20.0
Education (n=14)	2	14.3	7	50.0	4	28.6
Other (n=6)	4	66.7	1	16.7	1	16.7
Don't know (n=1)	1	100.0	0	0.0	1	100.0
Total	12		19		13	

4.6.2.2 21-26 years age period

Table 43 (below) describes the association of feelings of loss, relief and regret and the reasons reported for the abortion for abortions between the ages of 21 and 26 years. Relief was the predominate feeling reported by women in all abortions in this age period, though for abortions where ‘couldn’t afford’ was a reported reason, relief more strongly dominated reports of both loss and regret, (by 41 and 50 points respectively) than abortions for any of the other reasons. For example, reports of relief for abortions where ‘not ready’ was a reported reason were 30 points greater than reports of loss and 35 points greater than regret.

Table 43. The association of loss, relief and regret in the year following an abortion and the reasons for that abortion. For abortions reported by women as occurring between the ages of 21 and 26 years

	Loss		Relief		Regret	
	n	%	n	%	n	%
Not ready (n=37)	9	24.3	20	54.1	7	18.9
Wrong relationship (n=24)	7	29.2	15	62.5	4	16.7
Couldn't afford (n=22)	7	31.8	16	72.7	5	22.7
Alone (n=20)	6	30.0	13	65.0	4	20.0
Education (n=11)	4	36.4	5	45.5	4	36.4
Other (n=3)	2	66.7	2	66.7	2	66.7
Don't know (n=0)	0	0.0	0	0.0	0	0.0
Total	13		26		9	

4.6.2.3 26-32 years age period

As shown in Table 44 (below), the feeling of loss was reported in 39% of cases, relief was reported in 57% of cases and regret was reported in 14% of cases of abortions in the 26 to 32 years age period, where at least one of the reasons was considered being not ready. For abortions where 'couldn't afford' was reported, there was the biggest point difference between relief and the negative feelings; loss and regret. The only reason for abortion where relief was not the most common feeling was reported was 'alone'. There were no reports of regret in response to abortions for health reasons at this age period. Women who reported 'other' reasons in this age period (n=3) did not report either loss, relief or regret in response to the abortion.

Table 44. The association of loss, relief and regret in the year following an abortion and the reasons for that abortion. For abortions reported by women as occurring between the ages of 26 and 32 years

	Loss		Relief		Regret	
	n	%	n	%	n	%
Not ready (n=28)	11	39.3	16	57.1	4	14.3
Enough children (n=8)	0	0.0	2	25.0	2	25.0
Wrong relationship (n=19)	6	31.6	10	52.6	3	15.8
Couldn't afford (n=14)	5	35.7	10	71.4	2	14.3
Alone (n=12)	5	41.7	7	31.8	3	25.0
Education (n=4)	2	50.0	2	50.0	2	50.0
Career (n=8)	6	75.0	6	75.0	3	37.5
Health (n=2)	1	50.0	1	50.0	0	0.0
Other (n=3)	0	0.0	0	0.0	0	0.0
Don't know (n=0)	0	0.0	0	0.0	0	0.0
Total	15		22		7	

4.6.2.4 32-38 years age period

In Table 45, the association of reasons for abortion and emotional impact reported are shown for abortions that occurred between the age of 32 and 38 years. The most commonly reported reason at this age period was 'wrong relationship'. Women reported regret in almost a third of abortions that were reported to be due to the wrong relationship. Relief and loss were reported in 23% of 'wrong relationship' abortions each. No woman reported regret for abortions where 'couldn't afford' was the reason reported. Loss was reported most commonly for abortions were being alone was a reported reason (in 50% of cases), both relief and regret were reported

in 25% cases. Women that chose ‘other’ reasons for abortion reported relief most often, but the numbers were small. Education, career and health reasons were reported in small numbers at this age period also.

Table 45. The association of loss, relief and regret in the year following an abortion and the reasons for that abortion. For abortions reported by women as occurring between the ages of 32 and 38 years

	Loss		Relief		Regret	
	n	%	n	%	n	%
Not ready (n=7)	2	28.6	3	42.9	2	28.6
Enough children (n=10)	5	50.0	6	60.0	1	10.0
Wrong relationship (n=13)	3	23.1	3	23.1	4	30.8
Couldn't afford (n=5)	3	60.0	3	60.0	0	0.0
Alone (n=4)	2	50.0	1	25.0	1	25.0
Education (n=1)	0	0.0	1	100.0	0	0.0
Career (n=1)	0	0.0	0	0.0	0	0.0
Health (n=2)	2	100.0	1	50.0	2	100.0
Other (n=7)	1	14.3	2	28.6	1	14.3
Don't know (n=0)	0	0.0	0	0.0	0	0.0
Total	13		12		8	

4.6.2.5 Summary of self-reported emotional impact associations with self-reported reasons for having an abortion

As shown in Table 46 (below), relief was reported most commonly for most reasons for abortion except for abortions for health and ‘other’ reasons, where loss predominated for both. In general, relief was the most common emotion reported, followed by loss and then regret. However, for abortions where ‘couldn’t afford’ was a reported reason, relief was more commonly reported than loss or regret than the differences for abortions for other reasons. Feelings of relief were also more strongly prevalent for abortions where being alone and being not ready were reported, compared to the more even distribution of loss, relief and regret for abortions where education and having enough children was reported.

Table 46. The association of loss, relief and regret in the year following an abortion and the reasons for that abortion. Including all abortions reported by women up to age 38.

	Loss		Relief		Regret	
	n	%	n	%	n	%
Not ready (n=110)	34	30.9	57	51.8	23	20.9
Enough children (n=18)	5	27.8	8	44.4	3	16.7
Wrong relationship (n=70)	20	28.6	37	52.9	13	18.6
Couldn't afford (n=65)	21	32.3	41	63.1	13	20.0
Alone (n=51)	17	33.3	29	56.9	11	21.6
Education (n=30)	8	26.7	15	50.0	10	33.3
Career (n=9)	6	66.7	6	66.7	3	33.3
Health (n=4)	3	75.0	2	50.0	2	50.0
Other (n=17)	7	41.2	5	29.4	4	23.5
Don't know (n=1)	1	100.0	0	0.0	1	100.0
Total	53		79		37	

Figure 20 (below), shows the proportion of what reason was reported for abortion when women reported loss, relief or regret for any abortion up to age 38. To some extent, this figure displays the trends in reasons for abortion, where being not ready was the most common and ‘don’t know’ the least common reason reported for all abortions up to the age of 38. However, how the proportion of each reason differs for each feeling shows how different reasons for abortion may confer different feelings about the abortion. The largest difference in proportions of loss, relief and regret was for abortions where ‘couldn’t afford’ was reported, with an average of an 11-point difference between the three feelings. Wrong relationship and not ready have the next largest average differences, at eight-points and seven-points respectively. This may indicate that on average, women who report that they could not afford to have a baby, were not ready to have a baby or it was the wrong relationship are more likely to report relief following the abortion than in abortions for other reasons.

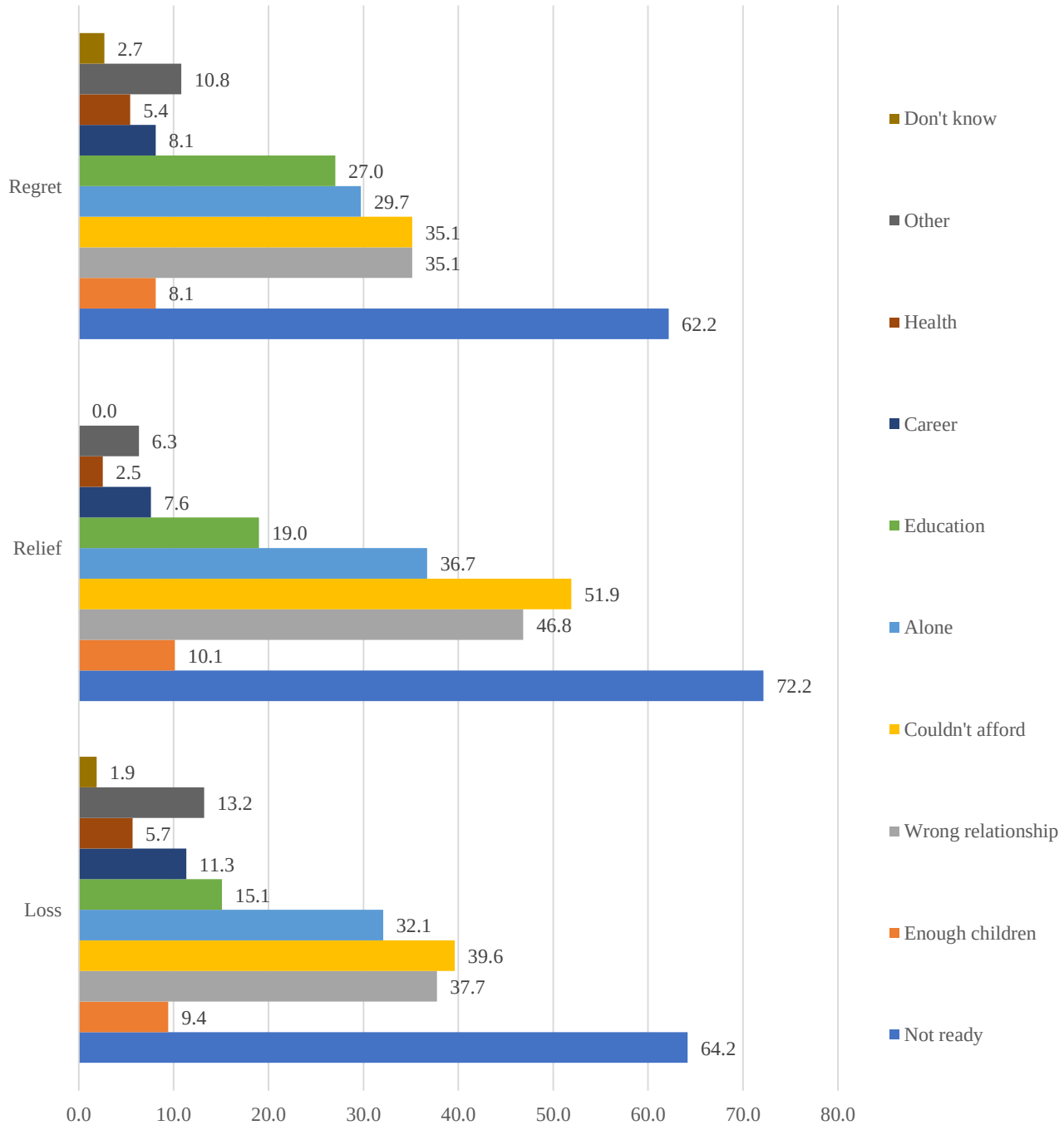

Figure 20. Distributions of reported reasons for abortion for women experiencing regret, relief or loss in the year after, for all abortions reported by women in the entire study period

5 SUMMARY AND DISCUSSION

This discussion follows the structure suggested by Docherty & Smith in their 1999 editorial published in the British Medical Journal (Docherty & Smith, 1999). Due to the descriptive nature of the study, only key results are summarized here, and the associations described between measures are not interpreted as being causal. Future directions for research, described below, could include novel uses of the data that were used in this study and the development of new studies to answer questions raised by this work.

5.1. Statement of findings

The overall rate of abortions for women up to the age of 38 was 349 abortions per 1000 women. While this suggests almost one in three women in the study had reported an abortion, some of those women reported more than one abortion, and some reported none. The number of individual women who reported an abortion up to the age of 38 years was 120, which means approximately one in four women reported an abortion in the study period. Additionally, one in five men reported an abortion up to the age of 38 years. Almost one in six of all pregnancies with known outcomes up to the age of 38 years were reported to end in abortion, and when reports of pregnancy loss were excluded, approximately one in five pregnancies ended in abortion. The age period specific rate of abortion for women was relatively stable across the four age periods, until the oldest age period (32 to 38 years), where it was almost 40% less than the previous age periods. The age period specific abortion ratio was described for both men and women, and whether pregnancy loss was included or excluded, the abortion ratio was higher in younger age periods than older age periods. The abortion ratio also highlighted differences between men and women, with young men reporting a significantly higher abortion ratios than young women. However, those differences closed over time, and women reported a slightly higher abortion ratio in the oldest age period.

The difference in abortion ratio for men and women, especially in the younger age periods, could be explained by men being able to cause more pregnancies than women can have, even if it was assumed women and men of similar ages were equally likely to have multiple partners. Men may have known about pregnancies that ended early, like abortions, but were not aware of live births, especially at younger ages, which would overestimate the proportion of pregnancies that ended in abortion as has been suggested by Lindberg et al (Lindberg & Kost,

2014). Alternatively, men could have over-reported abortions, especially around boundary ages, due to lack of certainty about abortion or having to recall the endings of pregnancies that occurred for multiple partners (Fikree, Gray, & Shah, 1993). The difference could also be due to women under-reporting abortions, which is usually due to the stigma associated with abortion and an unwillingness to disclose sensitive information (Jagannathan, 2001).

The proportion of pregnancies that were wanted, though only known for the under 21 and 21-26 age periods, shows that wanted-ness of pregnancy was associated with an older age at pregnancy. This is also seen with the measure of happiness about the pregnancy, where an older age at pregnancy is associated with feeling happy about the pregnancy. It is likely that this is related to pregnancy intention and the increase in stable and long-term relationships (Santelli, Speizer, Avery, & Kendall, 2006). Pregnancies that ended in abortion were rarely reported to be pregnancies that study members were initially happy about. However, consistently, men reported being happy about pregnancies that ended in abortion more than women. Men more commonly reporting being happy about pregnancies, regardless of pregnancy intention, is seen elsewhere, though the reasons for this are unclear (Lindberg & Kost, 2014).

Having no preconception relationship was more common in the younger age periods than the older age periods, though the majority of all pregnancies occurred within a relationship. In the under 21 age period, preconception relationship had no association with abortion compared to live birth for women or men. However, in the 21-26 age period women and men who reported no preconception relationship were more likely to report abortion than live birth. This was the same for pregnancies in the 26-32 age period and the 32-38 age period where pregnancies that ended in abortion were more likely to have no, or shorter, preconception relationships than pregnancies that ended in live birth. Attitude to abortion was also associated with pregnancy outcomes at all age periods, with those who reported more negative attitudes to abortion reporting live births more often than those who reported abortions.

The association of abortion with prior abortion is indicative that there may be underlying characteristics that may predict the likelihood of an individual having an abortion. For example, low SES is linked to increased risk of unintended pregnancy and therefore abortion (Finer & Zolna, 2011). Conversely, when an unwanted pregnancy occurs, higher SES seems to predict the likelihood of choosing abortion (Turner, 2004; Vaisanen & Murphy, 2014). It is unlikely that SES is the only predictive characteristic of abortion, as the decision to have an abortion is

usually based on various characteristics of the individual and circumstances of the pregnancy (Chae et al., 2017; Finer et al., 2005; Foster, Gould, Taylor, & Weitz, 2012).

For all reported abortions up to the age of 38 years, more than two-thirds of women reported feeling 'not ready' as a reason for their abortion. Being not ready was the most commonly reported single reason for abortion. Relationship-related reasons, such as being in the wrong relationship or being alone were reported in just over three-quarters of all abortions. Relationship related reasons are cited frequently in literature (Bankole et al., 1998; Kirkman et al., 2009). In a study of US women seeking abortion, about a third reported relationship reasons for abortion, including about eight percent who reported IPV (Chibber, Biggs, Roberts, & Foster, 2014). Given that a sample of New Zealand women who had ever been pregnant indicated that those who had experienced IPV were 2.5 times as likely to have an abortion than those who had no experience of IPV, it is possible that 'wrong relationship' may indicate for some women in this study, the presence of IPV (Fanslow et al., 2008; Whitehead & Fanslow, 2005). Other reasons for reporting relationship based reasons included poor or unstable relationships, characteristics that make the man undesirable to raise a child with or that the man is unwilling to raise the child (Chibber et al., 2014). These reasons would have been indicated by either 'wrong relationship' or 'alone' in this study.

Education and career reasons were reported in a small proportion of all abortions and having enough children and health reasons were reported for the fewest number of abortions. However, 'enough children' was only a category at the age 32 and age 38 assessments and health was an ad-hoc category created from themes identified from 'other' reasons where women were able to write in what their 'other' reasons were. Other studies have reported that education and career reasons are more prevalent that have been found in this study (Kero et al., 1999; Kirkman et al., 2009).

The age period in which the abortion occurred was associated with the reasons given for that abortion. Predictably, the proportion of abortions for which being not ready was reported decreased as the age at which the abortion occurred increased, though it was always the most commonly reported reason until the 32-38 age period, where wrong relationship became the most commonly reported reason. Wrong relationship was reported commonly in all age periods, though most often in the oldest age period. Reporting being alone as a reason for abortion was lowest in the 32-38 age period after being a fairly common reason for abortion in the previous age periods. This may be attributed to women being more likely to be in preconception relationships as they got older, however the proportion of women who reported

no preconception relationship for pregnancies that ended in abortion was the greatest in the youngest and the oldest age period. Therefore, it is perhaps explained by older women feeling that being alone is less of a concern when deciding what to do about an unintended pregnancy.

Career and education reasons followed an unsurprising pattern across the age periods, with younger women being more likely to report education reasons than older women. Although career reasons were a category only available in the oldest two age periods, there was a marked decrease in career reasons being reported in the 32-38 age period compared to the age 26-32 age period. This suggests that career reasons may have been important in the younger age periods when it was not measured, or that the age 26-32 age period was a particularly salient time when women were trying to develop a career and a pregnancy was not desirable. If health had been included in the list of specific options for the question on reasons for abortion it is likely to have been reported more frequently. The proportion of women who said the abortion was for an 'other' reason increased as they aged.

In over half of all abortions in each age period, both parties were considered to have made the decision regarding the abortion. Women were more likely to report only the woman made the decision, though this lessened with the age at which the pregnancy occurred increased. Men were consistently more likely to report that the decision to have an abortion was made by both parties, rather than just by the woman. It is possible that men were not always aware of pregnancies that ended in abortion, and therefore not aware of an abortion decision that had been made (Fikree et al., 1993; Greene & Biddlecom, 2000). This would underestimate the proportion of abortions where men would have reported the decision was made by the woman. However, young men reported a higher abortion ratio than women, suggesting this was not necessarily the case. It is plausible that women felt they were ultimately responsible for making the decision and in that sense, it was theirs alone, even in situations where men felt it to be a joint decision. There were small numbers in the age 26-32 and 32-38 age period who reported that the abortion decision was made only by the man. It would have been interesting, especially in the younger age periods to ask if the abortion decision had been made or influenced by the opinions of parents or others. Although there are no mandatory parental notification laws regarding abortions for women of any age, parents may influence a woman's decision. There is some evidence that the lack of agency in decision making can contribute to negative feelings, especially regret (Zeelenberg et al., 2000). The lack of agency in the decision-making process could also affect how men respond to the abortion.

For women, the most commonly reported feeling following abortion was relief (for all abortions up to the age of 38 years). This is similar to other studies, where relief was the most common feeling reported, or relief was anticipated by women in response to the abortion (Foster et al., 2012; Weitz et al., 2008). However, men most commonly reported feelings of regret. Regret about the abortion is not generally seen in other studies as commonly as it was reported in this study (Rocca et al., 2015b). Though regret it is often measured by decision-rightness, that is, how confident the woman was about her decision immediately following the abortion and a few years after the abortion.

In about one-fifth of abortions reported by both women and men, loss was reported, though men reported feelings of loss significantly less often than women. 'Didn't think' and regret were reported in similar proportions for all abortions up to age 38, and there were no differences between women and men. The least commonly reported feelings following abortion were 'none' or 'don't know', and men reported both for a greater proportion of abortions than women. Women and men often reported a mixture of positive and negative feelings about their abortions. For all abortions up to age 38, women reported an average of 1.4 different feelings per abortion and men reported an average of 1.2. There were no age period differences in the average number of feelings reported per abortion for women or for men. The reporting of seemingly contradictory feelings in response to abortion may be relatively common (Kero & Lalos, 2000). It is important to remember that the men and women in this study are not necessarily reporting on the same pregnancies and related abortions. Further research is needed to explore why there may be a difference between men and women and their response to abortion, and what circumstances may predict the differences.

The age at which the abortion occurred had some impact on the distribution of feelings reported. For women, reports of relief were relatively consistent across the age groups, while reports of loss increased in the older age periods. Men reported feeling relief in significantly fewer cases than women in general, but reports of relief for men increased substantially in the 32-38 age period, where it was clearly the most commonly reported feeling for men. Regret was the next most common feeling for men at this age reported about 60% as often as relief.

Whether stated reasons for abortion have any association with the emotional response to abortion has not been studied before. Reporting that they couldn't afford to have a baby, were not ready for a baby or were in the wrong relationship was potentially associated with reporting relief and not loss or regret. Whereas career, education and health reasons may be more associated with reports of negative emotions. If considered using the categories of reasons for

abortion proposed by Kirkman et al, ‘woman focused’ reasons for abortion may confer a more negative emotional impact than ‘other-focused’ or ‘material reasons’ (Kirkman et al., 2009). Though this explanation seems simplistic in light of the multiple and contingent reasons that precede an abortion decision and the social aspects that promote positive responses to abortion, including lack of stigma and support of the partner or family (Foster et al., 2012; Kimport et al., 2011; Major et al., 1990).

5.2. Strength and Weaknesses

5.2.1 Design

The foremost strength of this study was the prospective, longitudinal design that followed a birth cohort. The use of a birth cohort enabled the measurement of the same people over time, which allowed the comparison of the four age periods without being required to consider whether the time period in which people are living influenced their responses. There was strong data collection design, and a proven history of confidentiality for study members as they had been assessed already their whole lives before the SBRH questionnaire was introduced. Also, the computer based questionnaires for the SBRH section may have enhanced disclosure of what could have been potentially sensitive information for the study members (Arunothong & Ittasakul, 2012) . The timing of the assessments means that in general, the data were being collected close to the event in question, which may limit information bias from imperfect recall to some degree.

The timing of the assessments introduces a weakness to the design, as it means that the events in question could have been potentially five or six years prior to the assessment, and the data from under 21 years, taken from the age 26 assessment, is particularly at risk for recall errors. However, pregnancy and abortion are relatively infrequent and salient events, and are likely to be remembered, making it unlikely that abortion itself is underreported due to recall issues (Bradburn, Rips, & Shevell, 1987). It is however possible that the length of time between the abortion and the assessment would influence the accuracy of recall in regard to the abortion context, reasons for the abortion and emotions following the abortion. This may have differed by gender due to difference in the salience of the event, and may have differed for the under 21 age group, where the pregnancy in question could have occurred ten years ago or more.

It is possible that the results and associations described here are only applicable to the birth cohort and not the wider New Zealand population. However, the sample was considered to be at least representative of the population from which it was taken, and there was no differential participation in the original cohort for those who were eligible (Silva & McCann, 1996).

A particular strength of the DMHDS is the excellent follow up of the cohort, and that participation rates have remained very high across the different assessment ages, therefore, selection bias from differential loss to follow up is not likely to be an issue. Participation in the SBRH questionnaire at the age 26, 32 and 38 assessments was almost 99% of all those assessed in the DMHDS at the respective assessments. It is also an interesting group because the study members were in their teens and twenties when the abortion rate in New Zealand was steadily increasing, until it peaked in 2003, when the study members were about 30 years of age (Statistics New Zealand, 2009).

5.2.2 Measures

The major weakness of this study is that data collection was not specifically designed to meet the aims of this research and therefore the questionnaires had some limitations. For this project, some measures had limited applicability, and there were inconsistencies in measures across the three assessment phases. These were the main data issues addressed by the candidate and may still limit the validity of associations described. Another limiting factor was the categorical nature of most measures and, with the exception of only a few, did not allow participants to write in responses if they felt their experiences were not captured by the categories provided.

Some measures were not available from all assessments, and some used different wording or different categories for one or more assessments. Specifically, the measure of reason for abortion was variable across the age periods. Mental health reasons were never a category, and nor was physical health. While a new category called ‘health’ was created based on themes derived from free text ‘other’ reasons this was limited by small numbers and likely underestimation of health reasons. That a woman may want an abortion because she did not want children (ever) was never considered in the measure, and perhaps these women chose ‘not ready’ as a replacement. ‘Not ready’ itself could be considered ambiguous. Perhaps to some it means not ready to be a mother for the first time, or to others, it may mean they were not ready to have another child so soon following their last child. This may be especially pertinent for the younger two periods where ‘enough children’ was not an option. As previously

stated, career reasons could have been a factor earlier on in a woman's reproductive life than it was available for her to choose. Women were able to indicate an 'other' reason in the first two age periods, but were not asked to write in their reasons, which may have missed important and interesting data. The written-in reasons for those who reported 'other' reasons in the oldest two age periods suggest that 'other' reasons, meant for many women, that the reason for abortion was either complex or could not be explained by any of the categories presented.

When considering the emotional impact of abortion, though the measures were consistent across the assessments, regret may have been an ambiguous term. It may have represented regret about the abortion, or regret about having an unintended pregnancy. Additionally, 'don't know' is potentially hard to interpret. Reporting 'don't know' in response to an abortion was common across all age periods, especially for men, however it is difficult to discern if it meant that they did not remember their feelings or that they did not know how to describe their feelings. Potentially the 'don't know' category could also provide evidence that feelings about abortion are often complex and can be contradictory.

Although study members were asked to recall their feelings about abortion in the year after the abortion, this could have been immediately prior to the assessment or to six or seven years before. As well as potential bias from poor recall, there may be differences in the type of feeling reported dependent on the length of time since the abortion occurred. It would be possible to re-analyse the data taking in to account the amount of time between the abortion and when it was being reported, though whether that would influence the meaning of the results is unclear.

An important strength of this study is that men were assessed about abortions and pregnancies that they had been involved in, aside from for their reasons for abortion. Men's feelings about abortion have never been assessed in New Zealand based research, and rarely in international research. The DMHDS and SBRH endeavoured to use 'gold-standard' measures (for the time) and often measures used by other studies to enhance comparability. Questions in the SBRH questionnaire were often based on those that were used in the 1990 British National Study of Sexual Attitudes and Lifestyles, that had proven reliability and validity (Wellings, Field, Johnson, Wadsworth, & Bradshaw, 1994).

5.2.3 Data

The weaknesses of the data were few. There were some missing data, though the numbers were small and there were no attempts in this research to assess if those that were missing differed

in any important way than those who were not missing for any measure. This could be particularly important for those who may have chosen to not answer questions relating to abortion due to intense negative emotions associated with abortion, which could underestimate both the number of abortions reported and the negative emotions associated with abortion.

However, there was a large amount of data available, for an average of 940 study members across three assessments. Additionally, the data were ID linked, which allowed the merging of multiple data sets easily and to maintain the integrity of linked data across the age periods.

5.2.4 Analysis

The analysis was limited by the time constraints of this piece of research, and therefore no longitudinal analysis was undertaken. As it was limited to descriptive epidemiology, the associations tested using Chi-Squared tests or Fishers exact tests are not intended to be interpreted as causal and may be influenced by confounders that were either not controlled for or measured in the study. In addition, analysis was sometimes hampered by small numbers, especially within individual age periods.

The descriptive approach of this research provides novel insights, given that these data had never been described, and no other descriptive studies of the context of abortion have ever been done using New Zealand specific data. A large number of measures have been summarised and associations between various measures have been identified. This descriptive analysis can perhaps generate hypotheses for future research both using these DMHDS data and other New Zealand specific data.

5.3. Strengths and weaknesses in relationship to other studies

Between 1987 and 2012 the study members were between 15 years of age and roughly 40 years of age. During this time the average rate of abortions was 517 per 1000 women aged 15 to 44 years, see Appendix B (Statistics New Zealand, 2016a). The abortion rate for women in the study (up to the age of 38 was 349 per 1000 women, though these rates are not directly comparable as the national statistics take into account all women in New Zealand aged 15-44 each year and these data represent the same women across their reproductive lives, and not quite 44 years old.

Age-specific abortion rates from Statistics New Zealand matched to the age of the study members in relevant years, suggest abortion may have been less common for study members than the general New Zealand population. This could be due to a number of factors, for example to differences in ethnicity between the cohort and the wider New Zealand population. The cohort also under-represented those of low and high socioeconomic status compared to New Zealand population, which may affect the rate of abortion found in the cohort (P. Silva & McCann, 1996). Other New Zealand studies have found a disproportionate rate of abortions amongst Asian and Māori women, and the abortion ratio for Asian and Māori women has been consistently higher than for women of European descent (Abortion Supervisory Committee, 2016; Statistics New Zealand, 2009). Also, some of the cohort have lived overseas during the period studied.

The average abortion ratio for all New Zealand women between 1987 and 2012 was about 199 per 1000 known pregnancies, excluding miscarriages (Appendix B), and the abortion ratio for women study members was 180 abortions per 1000 pregnancies excluding pregnancy loss. For men in the cohort it was 198 abortions per 1000 pregnancies excluding pregnancy loss. The proportion of known pregnancies that ended in abortion declined in each subsequent age period, which is also evident in national statistics (Statistics New Zealand, 2009). The average age at abortion was 24, which is similar to other studies and national data (Fisher et al., 2005; Statistics New Zealand, 2009).

The most common methodological flaw in analytical studies of the impact of abortion is the failure to have an appropriate comparison group, see (Coleman, 2011; Cougle et al., 2005; Fergusson, Horwood, & Boden, 2008; Romans-Clarkson, 1989; Zulcic-Nakic, Pajevic, Hasanovic, Pavlovic, & Ljuca, 2012). Some studies that have aimed to study the potential association between abortion and mental health issues have compared the mental health of women who have abortions with those who have a live birth without taking in to account pregnancy intention, or compared mental health outcomes to a general population sample without considering confounders. Mental health outcomes for women who have abortions are likely no different than women who carry an unwanted pregnancy to term (Adler et al., 1992; Charles et al., 2008; Gilchrist, Hannaford, Frank, & Kay, 1995; Major, 2008; National Collaborating Centre for Mental Health, 2011; Roberts et al., 2014; Russo & Zierk, 1992). However, mental health issues may predispose women to unintended pregnancies and therefore abortion (Charles et al., 2008).

As this was a descriptive study that aimed to describe the emotional impact of abortion, mental health outcomes were not considered, and nor was there an attempt to compare the emotional state of women after abortion to a weak comparison group. Rather, it was a description of the self-reported emotional impacts of abortion and the potential associations between emotions felt after the abortion and the reasons given for abortion.

A weakness of this study is the inability to assess how the feelings towards abortion may change over time. As described by Rocca et al (2015) and Foster et al (2015), the intensity of emotion felt changes over time (Foster, Steinberg, Roberts, Neuhaus, & Biggs, 2015; Rocca et al., 2015b). Some have suggested that the type of emotion felt towards an abortion can change in response to subsequent events such as miscarriages, birth of children or poor reproductive health that is perceived to be related to a prior abortion (Astbury-Ward, 2008; Bradshaw & Slade, 2003; Stalhandske et al., 2012)

5.4. Meaning of study: possible mechanisms and implications for clinicians and policy makers

Abortion is a relatively common experience for New Zealand women, particularly amongst younger women. However, older women, especially towards the end of their reproductive years, choose to have abortions. This creates a 'U-shape' where the highest abortion ratios in the youngest and oldest age periods (Bankole, Singh, & Haas, 1999). In the 32-38 age period, 1 in every 15 known pregnancies (including pregnancy losses) were reported to end in abortion. The abortion ratio in subsequent age periods for this cohort may increase, as older women wish to limit family size or to avoid becoming a parent again, especially if their other children are much older (Finer et al., 2005). Therefore, it might be expected to see 'enough children' become a more prominent reason in the next assessments. Whether the hypothesised increase in abortion ratio in this cohort does occur as the study members reach the end of their reproductive ages will be apparent in the next one or two assessments. The rate of abortions is unlikely to increase, as natural fertility begins to decline and there are fewer reported pregnancies. For younger New Zealand women, the 'U-shape' of abortion ratio is likely to be shifted to the right as the average age of first birth has increased. For clinicians, that means responding sensitively to the specific needs of older and multiparous women when they are requesting an abortion. Additionally, general fertility has declined, which means the needs of women younger than this cohort are likely to be different.

In this study, younger women were less likely to be in a relationship with the partner than older women, though older women often reported relationship reasons as at least one of the reasons for their abortion. Potentially, women that do not have the support of a partner may have more difficulty coping after the abortion (Adler et al., 1990; Major et al., 1990). This may be of importance for clinicians when assessing the risk of poor coping following an abortion.

Men may have unmet need in post-abortion care, particularly as they are (rightly) legally excluded from abortion decision and according to the results presented here, often have a perception of exclusion from the decision, even when women believe the decision to have been made by both parties. The level of inclusion of the male partner should be at the discretion of the woman, but perhaps clinicians should be aware that this may affect how men respond to abortion.

How the reasons for abortion differ across the ages represents how different life stages and circumstances affect the reasons for abortion, and in turn, the potential correlations between certain reasons for abortion and more negative feelings for abortion. Abortion is generally a highly debated topic. In New Zealand, abortion remains in the Crimes Act and the majority are done on mental health grounds. For policy makers, this research may provide important clarification about the self-reported reasons for abortion.

5.5. Unanswered questions and future research

Further research could include qualitative studies involving New Zealand women of all ages to explore the reasons for abortion, and include health reasons, and in particular mental health reasons. There is little research that aims to explore why women may cope poorly or have a negative emotional reaction following an abortion, or how the system and medical professionals may be able to mitigate the negative response. Further research using DMHDS data could involve modelling the characteristics or circumstances that are related to negative emotions following abortion in order to further understand what may predict negative emotions after abortion. Characteristics or circumstances that may predict negative emotions could be clinically relevant as an avenue for intervention.

Regret and decision rightness following an abortion should be further explored, specifically what regretting an abortion means for New Zealand women and men, especially whether that regret is separate from the unintended pregnancy and how that regret impacts their lives. However, data from the DMHDS is unlikely to provide further understanding of regret

following an abortion. As emotional responses to abortion, both negative and positive are generally transient for most people, it would be advantageous to measure how the emotional impact of abortion changes over time with a prospective study of abortion patients, specifically whether the perception of decision rightness changes over time. Understanding patterns of how the feelings about abortion change over time, and identifying those who are particularly vulnerable to long term negative impacts could have significant clinical implications in terms of providing an increased level of post-abortion care to those most at risk.

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APPENDIX A

Scheme for the recoding of 'other' reasons for abortion to existing categories and to the new category created called 'health'.

Reason Given	Recoded to
Age 32 assessment	
It was just the wrong timing, I was going through a seperation[sic] from my partner of 12 years	Alone
Taking flecanide acetate for heart problem, tablets were shown to cause abnormalities in foetus	Health
I was not in a stable relationship and he also did not want any children and I didn't want any with him this was a big mistake	Wrong relationship
I never wanted children & I have a bad back that could be dangerous durring[sic] pregnancy	Health
He didn't want it or have anything to do with it	Wrong relationship & alone
Excess use of mulitvitamins containing vit A	Health
My 2 children were still in NZ…I was still in the middle of a custody battle to get them over here, so couldn't bare[sic] to think how they would feel if I had another child while they were still in NZ	Remained 'other'
Just out of my marriage and had just met a new guy	Wrong relationship
I'm not interested in having children	Remained 'other'
Age 38 assessment	
Seperation[sic]	Alone
Abusive partner	Didn't want a child from that relationship
Was not with the father at the time we had separated	Alone
I'm not a good mother and was in a bad place emotionally. Also took painkillers	Health
Silly one night stand	Didn't want a child from that relationship
Was depressed, and unwell and made wrong choice to terminate	Health
Health	Health
Wouldn't have coped emotionally	Health
Ability to cope with any more children	Enough children & health
Had 6mth old renovating and living at my mums	'Other'
My health	Health
Emotional stress	Health

APPENDIX B

Age specific abortion rate and abortion ratio for New Zealand women from 1987 to 2012 from Statistics New Zealand Infoshare, when the study members were between about 15 and 40 years old.

Table 47. Rates of abortion 1987-2012, source Statistics New Zealand

1987	322.8
1988	366.3
1989	372.4
1990	406.6
1991	406.7
1992	406.5
1993	417.4
1994	450.7
1995	479.2
1996	519.3
1997	534.2
1998	531.6
1999	554.2
2000	580.4
2001	594.9
2002	621.3
2003	648.2
2004	628.7
2005	600.8
2006	608.8
2007	621.5
2008	606.3
2009	590.6
2010	556
2011	530.3
2012	494.7
Average	**517.3**

Table 48. Abortion ratio 1987-2012, source Statistics New Zealand

1987	137
1988	148
1989	149
1990	156
1991	162
1992	163
1993	168
1994	182
1995	191
1996	204
1997	208
1998	207
1999	213
2000	220
2001	226
2002	242
2003	247
2004	237
2005	232
2006	231
2007	222
2008	217
2009	218
2010	205
2011	204
2012	193
Average	**199**