



Abortion and the Physical & Mental Health of Women

A review of the evidence for health professionals
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EXECUTIVE SUMMARY

Informed consent is one of the cornerstones of modern medical practice, expressed in numerous national and international codes of ethics, including that of the New Zealand Medical Association. It is just as applicable in relation to evidence about the effect of abortion on women as to any other procedure, and perhaps even more so because of the complex social, legal and ethical aspects of abortion.

This document is for health professionals and reviews international evidence to date about the relationship between abortion and the physical and mental health of women.

Women choose abortion for a wide variety of reasons including relationship problems, pressure from partners and family members, inability to cope, study and career aspirations, financial difficulties, lack of confidence as a mother, lack of community support, foetal disability and risk to her physical health.

Intimate partner violence (IPV) is strongly correlated with abortion, with some research showing a 6-fold increase of IPV in women undergoing abortion compared to those in antenatal care. Abortion has also been linked to international trafficking and slavery of women.

Ambivalence to abortion is common and is linked to some adverse post-abortion outcomes.

The prevalence of foetal abnormalities has increased in many countries and women commonly report a lack of information provided to them about the child's condition, and the options open to them.

The physical effects of abortion include an increased risk of premature delivery in subsequent pregnancies, and this appears to be related to surgical abortion but not medical abortion. However, when it comes to the overall incidence of complications, medical abortions outstrip surgical ones by a factor of at least four.

Significant inconsistencies exist in research about a possible link between abortion and the risk of breast cancer, yet there is strong evidence showing that carrying a pregnancy to term is protective against breast cancer.

Numerous studies have been undertaken about the relationship between abortion and overall mortality. While causal links cannot reliably be made, many studies have identified an increased risk of death in women undergoing abortion compared with those who have never been pregnant or carried a child to term, whether from suicide or other causes. Hence, pregnancy and carrying to term confer a protective effect even though the reasons are unclear. At the least, it is likely that there are common risk factors for both death and abortion.

The relationship between abortion and mental health has been the subject of intense research interest, yielding results that have not always been consistent. Nevertheless, there is clearly a correlation between abortion and adverse mental health outcomes.

A prominent researcher from the United States has argued that *"[there is a] ... truly shameful and systematic bias that permeates the psychology of abortion. Professional organisations in the USA and elsewhere have arrogantly sought to distort the scientific literature and paternalistically deny women the information they deserve to make fully informed healthcare choices and receive necessary mental health counseling when and if an abortion decision proves detrimental."*

Some researchers, including a research team from New Zealand, consider it possible that there is a causal link between abortion and harm to a woman's mental health; that is, abortion causes adverse mental health outcomes like depression, anxiety, substance abuse, and post-traumatic stress disorder, rather than there being simply a correlation between the two. Some studies consider it likely that 10% of the mental health burden results from abortion.

Many studies have also identified emotional distress after abortion, including feelings of sadness, loneliness, shame, guilt, grief, doubt, and regret. Some also report positive emotions like relief, happiness, and satisfaction.

When abortion is undertaken for foetal abnormality, the evidence is clearer – that abortion results in significant mental harm, including persistent grief, depression and post-traumatic stress.

In conclusion, abortion is associated with a wide range of adverse physical and psychological outcomes, and it is essential that women are made fully aware of all the risks. Presentation for abortion may also be an opportunity to address the risk of coercion and intimate partner violence.

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INTRODUCTION

Women considering an abortion must be provided with accurate information about the procedure and its possible effects on their health – not least because it is most often carried out on healthy women¹. Additionally, there are complex legal, social, ethical and personal questions relating to abortion that do not pertain to other procedures. Moreover, because ambivalence about an abortion decision is common², and ambivalence is related to post-abortion distress^{3,4,5}, the requirement to provide information is made even more acute.

Abortions have been conducted legally in many countries over the past few decades and considerable international research has been undertaken on the physical and psychological impact on women, and also on the circumstances surrounding the decision-making process.

The information that follows comes from this large body of research.

It should be noted that abortion research suffers from particular obstacles, one of which is reporting bias. In a prospective study of women aged 15 to 27, for example, the reported rate of abortion was 74% of what would be expected from national data sets⁶. In a Dutch cohort study, abortion history was clearly underreported, mentioned by only 1.2% of all women giving birth⁷. Underreporting of abortion leads to an underestimation of its effects⁸. Other sources of bias, expanded upon in the section on psychological effects below, include the fact that distressed women are often excluded from studies⁹, or refuse to participate. Moreover, many studies of the physical risks of abortion include only healthy women¹⁰, specifically excluding women who are at higher risk of complications.

A significant amount of research begins and ends with the simple assertion that abortion, both medical and surgical, is 'safe'. This is particularly the case for politically driven research - for example to prove that abortion facilities don't need hospital admitting privileges or ambulatory surgical standards¹¹, or to prove that women do not benefit from pre-abortion counselling^{12,13}. However, risk and safety have subjective elements, and with regard to an abortion procedure, it is the woman herself who will interpret what the risks are and whether she considers abortion 'safe' or not, based on the information provided to her. Importantly, given the ongoing nature of much abortion research, definitive statements that abortion is safe are inappropriate.

This review of the evidence informs medical professionals of the issues that need to be raised with patients considering abortion. Medical professionals may consider providing an information sheet for patients.



1 In NZ in 2016, the vast majority (97%; 12,437) of abortions were performed under the category 'Danger to Mental Health'. The remainder were performed under categories related to physical health of the mother or disability of the unborn child. 0.03% involved a criminal offence, such as rape or incest. Report of the Abortion Supervisory Committee 2017.

See <https://www.justice.govt.nz/assets/Documents/Publications/ASC-Annual-Report-2017.pdf>.

2 Kero A, Högberg U, Jacobsson L & Lalos A (2001) Legal abortion: a painful necessity. *Social Science and Medicine* 53:1481-1490.

3 Kero A, Högberg U & Lalos A (2004) Wellbeing and mental growth – long-term effects of legal abortion. *Social Science and Medicine* 58:2559-2569.

4 Coleman PK, Reardon DC, Strahan T & Cogle JR (2005) The psychology of abortion: a review and suggestions for future research. *Psychology and Health* 20(2):237-271.

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8 *Ibid.*

9 Purcell C, Cameron S, Caird L, Flett G & Laird G (2014) Access to and experience of later abortion: accounts from women in Scotland. *Perspectives on Sexual and Reproductive Health* 46(2):101-108.

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11 *Ibid.*

12 Baron C, Cameron S & Johnstone A (2015) Do women seeking termination of pregnancy need pre-abortion counselling? *J Fam Plann Reprod Health Care* 41:181-185.

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MOTIVES UNDERLYING AN ABORTION DECISION

General

Medical practitioners need to be aware of the motivating factors that underlie an abortion decision, because there may be a need for referral to support services. For example, since intimate partner violence (IPV) is strongly correlated with abortion, practitioners need to ascertain whether a woman is at risk of physical, emotional or psychological harm¹⁴. Or a woman may wish to proceed with pregnancy but does not have material support, necessitating referral to social services.

Some motivating factors may have implications for post-abortion effects, specifically mental health effects. For example, if a woman is motivated to have an abortion because of foetal disability, her risk for psychological harm is higher than if motivated by other reasons, like not being able to cope or fear of jeopardising her future¹⁵.

Deciding to have an abortion is far more complex than simply not intending to become pregnant¹⁶. The concepts of pregnancy wantedness and intendedness are often used by researchers to understand why women might seek abortions. Yet women are ambivalent about pregnancy and abortion in ways that do not fall neatly into the categories some social scientists use for understanding ambivalence¹⁷. Women rarely see babies themselves as a threat, and instead almost always feel positively towards them. However, it is the related experiences, like the future stress and difficulty of parenthood, financial stress, loss of freedom, ongoing violence or deprivation that women may be hoping to avoid by seeking abortion¹⁸.

Health professionals do not always recognise the complexities of women's lives and are at risk of presuming in favour of abortion. In a study of young pregnant black refugee/migrant women in government care, all women (even those pregnant as a result of rape) chose motherhood instead of abortion despite the difficulties they faced and despite the negative assumptions of healthcare professionals¹⁹. This study highlights the power held by individual healthcare professionals to create a caring environment that is woman-centred and culturally sensitive. Similarly, in a population of formerly homeless young women whose lives stabilised when they became mothers, the researchers concluded that, "having a baby can serve as an asset to street exit for some homeless youth including motivating discontinuation of substance abuse; parenthood can activate hope and motivation; salience is high while the challenges are many; however, social service agencies have an essential and ongoing role to foster and support development for mothers and their children and to assist with avoidance of repetitive cycles of family trauma."²⁰

In addition to the notion of pregnancy wantedness, pregnancy intention is likewise a blurry concept. Women do not always formulate pregnancy intentions, and many become pregnant without reference to intention. Pregnancy planning is an unattainable ideal for many women, and seems to be more within the province of privileged women, and/or those with stable relationships and financial security²¹. Millions of women around the world will never achieve this, but will have children regardless. Borrero and colleagues show that pregnancy intendedness, happiness about pregnancy, and acceptability of pregnancy are all separate constructs. Many women are happy about pregnancy regardless of their intentions. And some women terminate wanted pregnancies because of financial, relationship or other personal problems. These authors recommend abandoning the term 'planning' and instead propose assisting women to prepare for whatever might happen²².

In most cases, no single factor motivates women to seek abortion. Rather, a variety of factors are involved. These include relationship problems, pressure from partners and family members, study and career aspirations, financial

14 Pallitto CC, Garcia-Moreno C, Jansen HAFM, Heise L, Ellsberg M & Watts C (2013) Intimate partner violence, abortion, and unintended pregnancy: results from the WHO Multi-country Study on Women's Health and Domestic Violence. *Int J Gynecology Obstetrics* 120:3-9.

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18 *Ibid*.

19 Mantovani N & Thomas H (2014) Choosing motherhood: the complexities of pregnancy decision-making among young black women 'looked after' by the State. *Midwifery* 30:e72-e78.

20 Ruttan L, Laboucane-Benson P & Munro B (2012) Does a baby help young women transition out of homelessness? Motivation, coping, and parenting. *J Family Social Work* 15(1):34-49.

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22 Borrero S, Nikolajski C, Steinberg JR, Freedman L, Akers AY, Ibrahim S & Schwarz EB (2015) "It just happens": a qualitative study exploring low-income women's perspectives on pregnancy intention and planning. *Contraception* 91:150-156.

difficulties, lack of confidence as a mother, and lack of community support^{23,24}. Women report multiple disruptive events in their lives at the time of the abortion, including unemployment, separation from a partner, falling behind on rent or mortgage payments, and moving house²⁵.

Themes from the stories of women aged 18-24 who underwent abortions were described by researchers as follows: "There is more often than not a story of a boyfriend who was not supportive, or a pregnancy with a person they did not know well involving a 'poor decision', and alcohol seemed to be involved quite often. Parents are often not involved. ... to give future children a good life, they had to 'get through school' so 'gave up this one' ... Some noted that they didn't want a child brought up in their family or current living situation. Often described was the pain and anguish of being pregnant and very few knowing ... wondering if 'the right decision was made' ..."²⁶

The primary reasons change somewhat when an abortion is sought in the second trimester, and include delay due to indecision, poor or absent relationship with a partner²⁷, late diagnosis of pregnancy, and lack of certainty about being pregnant^{28,29}. The reasons why women find the decision to abort difficult include the humanity of the foetus, their perception of themselves and the impact of their decision upon others^{30,31}.

As noted, ambivalence about an abortion decision is common^{32,33}. And what is of particular concern is the relationship between ambivalence and the potential development of long-term post-abortion psychological distress³⁴, exacerbated by "impulsive and not fully internalised decisions"³⁵.

There are two other risk factors for later psychological distress of which medical professionals need to be aware. The first of these is moral opposition to abortion. Women sometimes have abortions despite being morally opposed to them³⁶, which might indicate the presence of coercive influences in favour of abortion³⁷. Studies have identified more negative post-abortion effects when women are morally opposed to abortion³⁸.

The second risk factor is abortion for foetal disability or disease. Abortions of this type lead to more severe consequences not only for the woman but also for her partner. Numerous studies have identified a high incidence of negative emotions³⁹, psychological distress⁴⁰, post-traumatic symptoms⁴¹ and somatic complaints⁴². Furthermore, women may not be fully aware of the role and consequences of screening for foetal disability. For example, in relation to screening for Down syndrome, researchers found that only 37% of decisions were informed, 31% did not know that miscarriage was a potential consequence of amniocentesis, and only 62% knew that abortion would be offered if Down syndrome was identified⁴³.

Social support is of vital importance in the context of unexpected pregnancy or when a pregnant woman is unsure if she can cope. In these circumstances, women want nurturing and social network support, emotional support, and direct advice to provide some form of certainty in a difficult, frightening situation⁴⁴.

23 Allanson S & Astbury J (1995) The abortion decision: reasons and ambivalence. *Journal of Psychosomatic Obstetrics and Gynecology* 16:123-136.

24 Kirkman M, Rowe H, Hardiman A & Rosenthal D (2011) Abortion is a difficult solution to a problem: A discursive analysis of interviews with women considering or undergoing abortion in Australia. *Women's Studies International Forum* 34: 121-129.

25 Jones RK, Frohwirth L & Moore AM (2013) More than poverty: disruptive events among women having abortions in the USA. *J Fam Plann Reprod Health Care* 39(1):36-43.

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27 Loeber O & Wijsen C (2008) Factors influencing the percentage of second trimester abortions in the Netherlands. *Reproductive Health Matters* 16 Supplement 31:30-36.

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30 Kirkman M et al. (2011) *Op. Cit.*

31 Coleman PK et al. (2017) *Op. Cit.*

32 Törnbom M, Ingelhammar E, Lilja H, Svanberg B & Möller A (1999) Decision-making about unwanted pregnancy. *Acta Obstetrica et Gynecologica Scandinavica* 78:636-641.

33 Kirkman M, Rosenthal D, Mallett S, Rowe H & Hardiman A (2010) Reasons women give for contemplating or undergoing abortion: A qualitative investigation in Victoria, Australia. *Sexual and Reproductive Healthcare* 1:149-155.

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42 White-Van Mourik MCA et al. (1992) *Op. Cit.*

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Foetal anomaly

In many countries, there has been an increase in the prevalence of foetal abnormalities, mainly due to increasing maternal age^{45,46}. However, screening rates vary widely around the world due to a diversity of social and health policy environments. In 2010, screening rates were at 61% in England, 84% in France, and 26% in the Netherlands⁴⁷.

A high percentage of pregnancies where a disability is identified may be terminated. For example, an estimated 99% of babies with Down syndrome are terminated in England and Wales (UK Department of Health statistics on abortion for foetal abnormality may be unreliable, for example reporting only 49% of all terminations for Down syndrome)⁴⁸. Moreover, lower socioeconomic areas appear to have lower rates of antenatal detection and also termination of Down syndrome⁴⁹.

Where prenatal tests are routine, women may feel that they are more or less compulsory, and when they find themselves in a stressful situation a common coping mechanism is to comply with what they believe is the health professional's recommendation⁵⁰. Women's choices also rely heavily on the resources their family can access to cope with a disabled baby. A Norwegian study concluded that while screening technologies increase 'options' they also effectively decrease 'choice', that is, freely made decisions⁵¹.

Factors that increase the chance of termination for sex chromosome abnormality included parents' fear and anxiety about children with disabilities, as well as directive counselling⁵². Nevertheless, some women are more likely to resist social norms and refuse termination for Down syndrome. For example, religious women, older women, women with a desire for more children, those pregnant at a later gestation, those with no history of abortion, women who are more familiar with children who have a disability (especially Down syndrome), women who hold positive attitudes toward individuals with disabilities, women who perceive there exists more social support for parenting a child with a disability, women who have knowledge of available services for people with disabilities, and those who have been provided with counselling by genetic specialists⁵³.

International research shows that while health professionals tend to value accuracy and early testing for Down syndrome in prenatal care, women are instead more interested in test safety and comprehensive information⁵⁴. In a Swedish study, 25.6% of women who opted for termination for foetal malformation reported that the "information provided was not adequate to enable a decision". These women were uncertain of the future prognosis for the child and unsure of the implications of the anomaly, yet they terminated their pregnancies⁵⁵. A Brazilian study found similarly that women did not always fully understand the malformation and needed greater attention by health professionals than they received. Yet, "when the option of continuing the pregnancy is chosen, a feeling of intense hope is observed, a feeling that change might be possible."⁵⁶ A recent study of 45 women receiving prenatal testing found that while they understood the testing, women had a poor understanding of Down syndrome, no knowledge of Edwards and Patau syndromes, and few knew someone with these syndromes⁵⁷.

Pregnant women and their families need accurate, up-to-date information about the care practices, quality of life, and resources available for individuals with disabilities and their families. Healthcare providers need to be aware that their own attitudes toward people with disabilities will have an influence on their ability to provide this information⁵⁸.

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57 Lewis C, Hill M & Chitty LS (2016) A qualitative study looking at informed choice in the context of non-invasive prenatal testing for aneuploidy. *Prenatal Diagnosis* 36:875-881.

58 Choi H *et al.* (2012) *Op. Cit.*

Intimate partner violence (IPV)

IPV is a strong risk factor for abortion all over the world^{59,60,61,62,63,64,65}. A WHO multi-country study of women's health and domestic violence found that women with a history of IPV had increased odds of unintended pregnancy and almost three times the risk of abortion. In a study of London clinics, there was a six times higher rate of IPV in women undergoing abortion compared with women receiving antenatal care⁶⁶.

Women who had experienced IPV were also more likely to experience suicidal ideation if they had a history of perinatal loss, whether it was abortion, stillbirth or miscarriage⁶⁷. Furthermore, the association between IPV and repeat abortion indicates that there is often a repetitive cycle of abuse and pregnancy⁶⁸.

In the USA, a survey of 4245 women identified the impact of gender-based violence across their life-course and how it impacted upon their pregnancy outcomes. Child sexual abuse was significantly related to teenage dating violence, which in turn was strongly linked to adult IPV. As women's experiences of gender-based violence increased, so did their odds of experiencing an abortion⁶⁹. Coercion and pressure are well established risk factors for women's psychological adjustment to abortion^{70,71}.

Healthcare professionals should know which organisations and advocates are available to provide support in the clinical setting and in the community; for example, social workers, victim advocates, domestic violence agencies, shelters, rape crisis centres and child protective services⁷². Guidelines from some peak bodies (e.g. the Royal College of Obstetricians and Gynaecologists) recommend that healthcare services should identify issues such as IPV among women seeking abortion and refer them to appropriate support services. However, there is insufficient evidence to show whether screening increases uptake of assistance or reduces harm, hence more research is needed⁷³.

The foetus

The developmental age of the embryo/foetus at the time of abortion may be an important consideration for some women. A woman may want to know the size and characteristics of the embryo/foetus before coming to a final decision. In that case, accurate information based on the best scientific and diagnostic evidence needs to be made available. Later gestational stages may attract a higher degree of moral ambivalence, which might increase the risk of post-abortion effects. Furthermore, since different procedures may be used for different gestational ages, what method will be used is also important, along with sufficient detail.

It is possible that some women may ask for information about foetal sentience and foetal pain. Whilst this is a controversial issue and not well understood, it is possible, if not likely, depending upon developmental age, that the



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- 67 Gulliver P & Fanslow J (2013) Exploring risk factors for suicidal ideation in a population-based sample of New Zealand women who have experienced intimate partner violence. *Aust NZ J Public Health* 37(6):527-33.
- 68 Hall M, Chappell LN, Parnell BL, Seed PT & Bewley S (2014) Associations between intimate partner violence and termination of pregnancy: A systematic review and meta-analysis. *PLOS Medicine* 11(1):e1001581.
- 69 McCloskey LA (2016) The effects of gender-based violence on women's unwanted pregnancy and abortion. *Yale Journal of Biology and Medicine* 89:153-159.
- 70 Coyle CT, Shuping MW, Speckhard A & Brightup JE (2015) The relationship of abortion and violence against women: Violence prevention strategies and research needs. *Issues in Law and Medicine* 30(2):111-127.
- 71 Coleman PK *et al.* (2017) *Op. Cit.*
- 72 Miller E & Silverman JG (2010) Reproductive coercion and partner violence: implications for clinical assessment of unintended pregnancy. *Expert Review of Obstetrics and Gynecology* 5(5):511.
- 73 O'Doherty L, Hegarty J, Ramsay J, Davidson LL, Feder G & Taft A (2015) Screening women for intimate partner violence in healthcare settings. *Cochrane Database Syst Rev* 22(7):CD007007.

foetus will experience pain⁷⁴. The presence of the nervous system, even at an early stage, is sufficient for this possibility to be seriously considered. Some researchers believe that pain sensation may occur before the 10th week of gestation (and possibly as early as the 6th-7th week), due to maturation of particular neural structures as well as the lack of pain inhibition mechanisms⁷⁵.

Abortion and trafficking/slavery

Abortion plays a part in the abuse and control of women and girls who are trafficked, not only for sex but also those exploited in labour such as agriculture, fishing, textile, manufacturing, mining, and domestic servitude⁷⁶. The risk of sexual violence is high for these women and girls, beginning at the point where they agree to or are forced to travel. Forced abortion is common for those trafficked into prostitution, and often provided by untrained or poorly qualified practitioners in unsafe settings. Other than abortion, trafficked women rarely have access to healthcare.

In a study of 107 survivors of sex trafficking in the USA, the women reported a total of 114 abortions, many forced⁷⁷. Over half the women said that the doctor performing the abortion was aware she was 'on the street'. One woman's abortions were performed by a doctor who was also her client. Abortion is one of many severe physical and psychological health consequences that trafficked women experience. Healthcare professionals must seek training and protocols to identify and assist these women, who at present are often going unnoticed.

PHYSICAL EFFECTS OF ABORTION

Medical and surgical abortion

In many jurisdictions around the world, medical abortion is rapidly becoming more common than surgical abortion. For example, in 2014, medical abortions overtook surgical abortions in England and Wales for the first time⁷⁸. New Zealand appears to be an exception with only 15.4% of abortions being medical⁷⁹.

The most common clinically significant adverse events are hospital admission, blood transfusion, emergency room treatment, IV antibiotics administration, infection and, rarely, death. Clinically significant outcomes are ongoing intrauterine pregnancy (the teratogenic effects of misoprostol are of concern), and ectopic pregnancy diagnosed after medical abortion treatment. Yet research by abortion providers without exception describes the procedures as safe and effective^{80,81}.

A 2013 systematic review of 200mg mifepristone followed by misoprostol found that the rate of method failure was 4.8%, the hospitalisation rate was 0.3%, and the ongoing pregnancy rate was 1.1%. The authors concluded that "*currently used medical misoprostol regimens are so effective and safe that additional research aimed at further clinical improvements will have little public health benefit.*"⁸² A 2015 systematic review, co-authored by a Danco consultant (Danco manufactures mifepristone), concluded that outpatient medical abortion regimens up to 70 days gestation are highly effective and severe adverse events are uncommon⁸³. However, in a study by Niinimäki and co-workers, the incidence of adverse events was 4 times higher in medical versus surgical abortion (20% v 5.6%). Moreover, haemorrhage in medical versus surgical abortions was significantly higher at 15.6% compared with 2.1%, as was incomplete abortion (6.7% v 1.6%)⁸⁴. The increase in complications with medical abortion was supported by other studies^{85,86}.

74 McCullagh P (1996) *Foetal Sentience*, London, All-Party Parliamentary Pro-Life Group.

75 Sekulic S, Gebauer-Bukurov K & Cvijanovic M *et al.* (2016) Appearance of fetal pain could be associated with maturation of the mesodiencephalic structures. *Journal of Pain Research* 9:1031-1038.

76 Zimmerman C, Hossain M & Watts C. (2011) Human trafficking and health: A conceptual model to inform policy, intervention and research. *Social Science and Medicine* 73:327-335.

77 Lederer LJ & Wetzel CA (2014) The health consequences of sex trafficking and their implications for identifying victims in healthcare facilities. *Annals of Health Law* 23:61-91.

78 Kmietowicz Z (2015) Medical abortions more common than surgery for first time in 2014 in England and Wales. *BMJ* 350:h3177.

79 Report of the Abortion Supervisory Committee 2017, page 22. See <https://www.justice.govt.nz/assets/Documents/Publications/ASC-Annual-Report-2017.pdf>

80 Cleland K, Creinin MD, Nucatola D, Nshom M & Trussell J (2013) Significant adverse events and outcomes after medical abortion. *Obstet Gynecol* 121(1):166-171.

81 Trussell J, Nucatola D, Fjerstad M & Lichtenberg ES (2014) Reduction in infection-related mortality since modifications in the regimen of medical abortion. *Contraception* 89(3):193-196.

82 Raymond EG, Shannon C, Weaver MA & Winikoff B (2013) First-trimester medical abortion with mifepristone 200mg and misoprostol: a systematic review. *Contraception* 87:26-37.

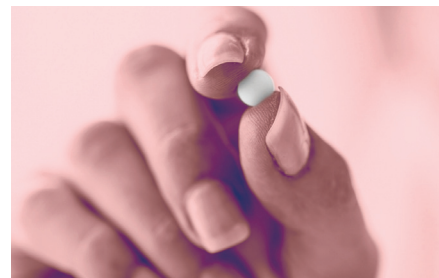
83 Chen MJ & Creinin MD (2015) Mifepristone with buccal misoprostol for medical abortion: a systematic review. *Obstetrics and Gynecology* 126(1):12-21.

84 Niinimäki M, Pouta A, Bloigu A, Gissler M, Hemminki E, Suhonen S & Heikinheimo O (2009) Immediate complications after medical compared with surgical termination of pregnancy. *Obstet Gynecol* 114(4):795-804.

85 Ashok PW, Templeton A, Wagaarachchi PT & Flett GM (2002) Factors affecting the outcome of early medical abortion: a review of 4132 consecutive cases. *BJOG* 109:1281-1289.

86 Rorbye C, Norgaard M & Nilas L (2004) Medical versus surgical abortion efficacy, complications and leave of absence compared in a partly randomized study. *Contraception* 70:393-399.

A study of all Planned Parenthood affiliate data over 2009 and 2010 found one death over this two-year period, from an undiagnosed ectopic pregnancy. The rate of adverse events or outcomes was found to be 0.65% using a regimen of 200mg mifepristone and buccal misoprostol up to 49 days gestation. As this study only included clinic data, it may not have included all adverse events and outcomes. Some patients may not return with complaints, and staff may be motivated to conceal poor outcomes⁸⁷. Planned Parenthood has improved safety in its administration of medical abortion after noting several deaths from infection, and in response to a 1996 meta-analysis of medical abortion, required routine use of antibiotics. This has reduced deaths from infection substantially over the period 2001 to 2012. All medical abortion deaths around the world (at least those acknowledged by Planned Parenthood) have involved vaginal application (as opposed to oral) or no antibiotics⁸⁸.



Despite the glowing reviews of medical abortion by providers and advocates, women find medical abortion substantially more painful than surgical abortion due to uterine contractions⁸⁹. High levels of pain are experienced by women in the days following their abortions, yet pain is a neglected issue by researchers and clinicians. The authors of this French study suggest that a higher dose of 600mg mifepristone rather than 200mg helps women to be more comfortable. However, USA abortion providers and advocates are lobbying for the FDA-approved protocol to be lowered to 200mg mifepristone^{90,91}. There are also increasing calls to allow midwives, nurses and physician assistants to provide medical abortion to expand access, as many doctors do not want to be involved in abortion practice⁹².

Why do women choose medical abortion? Qualitative interviews with 22 women in the USA who were going to undergo a medical abortion identified five themes that underpinned their choice. A common reason was to avoid 'surgery', referring to aspiration abortion (some abortion providers argue this is not strictly surgical). Most aspiration abortions are performed under local anaesthetic, yet women have adverse reactions to hearing the electric pump, and experiencing the suction. They saw medical abortion as a more 'natural' process: *"It just seems a little more human, a little more natural than the surgical track which seems so archaic."* *"... less invasive."* *"The medical abortion seemed more like a process that my body would know how to do ..."* They perceived medical abortion as similar to a commonly occurring miscarriage, giving it a sense of normalcy. They spoke of respecting the baby, not wanting to cause suffering. The vast majority of women used the term 'baby' or 'child'. Women may choose medical abortion to fit with schedules and commitments, or to avoid appointments at the clinic. They appreciated the home setting rather than the clinical setting. These findings indicate that surgical abortion is known by women to be traumatic⁹³. Medical abortion requires more patient participation than a surgical abortion, and women are more aware of the physical aspects of the process^{94,95}.

While the experiences of surgical versus medical abortion are vastly different for women, a large register-linked study of 8294 women in Finland found no differences in outcomes of subsequent pregnancies after medical versus surgical⁹⁶. Planned Parenthood data from the US also indicates that medical and surgical abortion in the first trimester have equivalent levels of safety and efficacy⁹⁷. Surgical evacuation is still required for 2-8% of women after a medical abortion⁹⁸.

With respect to later abortions, British Pregnancy Advisory Service surgeon Dr Richard Lyus claimed in 2013 that women were not being given choice of procedure. He claimed that most women prefer surgical over medical, and that in the second trimester surgical abortion is safer⁹⁹. Nevertheless, some clinicians expressed concern that surgical abortion may affect subsequent pregnancies (and more recent data confirms this). Speaking about medical abortion, he asks, *"Why do most women having an abortion for foetal abnormality undergo a less safe procedure*

87 Cleland K, Creinin MD, Nucatola D, Nshom M & Trussell J (2013) Significant adverse events and outcomes after medical abortion. *Obstet Gynecol* 121(1):166-171.

88 Trussell J *et al.* (2014) *Op. Cit.*

89 Saurel-Cubizolles MJ, Opatowski M, David P, Bardy F & Dunbavand A (2015) Pain during medical abortion: a multicenter study in France, *European Journal of Obstetrics and Gynecology and Reproductive Biology* 194:212-217.

90 Abbas D, Chong E & Raymond EG (2015) Outpatient medical abortion is safe and effective through 70 days gestation. *Contraception* 92:197-199.

91 Dalton VK & Wallett S (2015) The evolution of medication abortion care: using science to achieve quality. *Obstetrics and Gynecology* 126(1):3-4.

92 Foster AM, Jackson CB, LaRoche KJ, Simmonds K & Taylor D (2015) From qualified physician to licensed health care professional: the time has come to change mifepristone's label. *Contraception* 92:200-202.

93 Cappiello J, Merrell J & Rentschler D (2014) Women's experience of decision-making with medication abortion. *MCN Am J Matern Child Nursing* 39(5):325-330.

94 Bartz D & Goldberg A (2009) *Op. Cit.*

95 Kelly T, Suddes J, Howel D, Hewison J & Robson S (2010) Comparing medical versus surgical termination of pregnancy at 13-20 weeks gestation: a randomised controlled trial. *British Journal of Obstetrics and Gynaecology* 117:1512-1520.

96 Männistö J, Mentula M, Bloigo A, Hemminki E, Gissler M *et al.* (2012) Medical versus surgical termination of pregnancy in primigravid women - is the next delivery differently at risk? A population based register study. *BJOG* 120:331-337.

97 Ireland LD, Gatter M & Chen AY (2015) Medical compared with surgical abortion for effective pregnancy termination in the first trimester, *Obstetrics and Gynecology* 126(1):22-28.

98 Huber D, Curtis C, Irani L, Pappa S & Arrington L. (2016) Postabortion care: 20 years of strong evidence on emergency treatment, family planning, and other programming components. *Global Health: Science and Practice* 4(3):481-494.

99 Lyus R, Robson S, Parsons J, Fisher J & Cameron M (2013) Second trimester abortion for fetal abnormality. *BMJ* 347:f4165.

that takes longer and may be more unpleasant for the patient?" The answer is that access to surgical abortion for later pregnancies, especially by Dilatation and Evacuation (D&E), is extremely limited in England and Wales. This does not appear to be the case in New Zealand¹⁰⁰, but nevertheless does underscore concern about the potentially more negative impact of medical abortion on women undergoing second trimester abortions.

Authors of a USA systematic review argued that abortion providers do not need hospital admitting privileges or facilities to meet ambulatory surgical centre standards. They found that for surgical abortions major complications occurred in less than 0.1% of procedures, and hospitalisation was necessary in less than 0.5%¹⁰¹. Anaesthesia-related complications occurred in less than 0.5% of procedures. No deaths were reported, although few studies reported on deaths (therefore some deaths may in fact have occurred). It is noteworthy that most hospital-based studies of abortion included only healthy women with uncomplicated pregnancies.

Mortality

It is crucial to understand how many women die directly from their abortion procedures, but it is also important to find out whether women are more likely to die from any cause after abortion versus after giving birth, and not necessarily from gynaecological causes. The term 'pregnancy-associated death' is defined as "the death of a woman while pregnant or within 1 year of termination of pregnancy, irrespective of the cause of death or the site of pregnancy."¹⁰² This reflects the fact that reproductive events have a profound impact upon women's lives, reverberating beyond the physical and into their psychological health and well-being. Analyses of mortality data are complicated by a myriad of potential confounders and mediating factors such as physical and mental health, previous and subsequent pregnancies, relationship status, socioeconomic status, genetic factors, behavioural factors, and life experiences.

When deaths from all causes are examined in the first year following an abortion, several large studies have identified an increased risk compared either to giving birth or never being pregnant, although causality has not been confirmed^{103,104,105}.

A register-based study in Finland showed that the risk of suicide was decreased after birth (5.9 per 100 000 births) compared to non-pregnant women (11.3 per 100 000 person-years), while suicide risk was increased after miscarriage (18.1 per 100 000 miscarriages) and much more so after induced abortion (34.7 per 100 000 induced abortions). Women aged less than 25 were most at risk. The risks for accidental death and homicide also increased after abortion¹⁰⁶.

In another recent Finnish register study, the mortality rate for suicide after abortion was 21.8 per 100 000 women, while the rate was 3.3/100 000 in pregnancies ending in birth and 10.2 per 100 000 among non-pregnant women¹⁰⁷. This study was designed to follow up the finding from a 2004 Finnish study in which pregnancy-associated mortality for 1987-2000 was 36.7 per 100 000 pregnancies, while the age-adjusted mortality in the non-pregnant population was 57.0 per 100 000 person-years; women giving birth were at lowest risk of death (28.2 per 100 000) compared with women after induced abortion (83.1 per 100 000) or spontaneous abortion (51.9 per 100 000)¹⁰⁸. The authors conclude "after updating the current care guidelines, emphasising the need for psychological support, Finland has achieved a reduction in the suicide rate after termination of pregnancy."¹⁰⁹

A population register-based study in Denmark over the years 1980 – 2004 found abortion was associated with significantly higher death rates up to ten years after abortion compared with women who gave birth. Women had an 80% increased risk of death after abortion compared to after birth within the first year. The same dataset revealed a dose effect of birth and pregnancy loss; that is, increasing numbers of births decreased mortality risks, while more

100 With regard to surgical versus medical abortions, the key official report on abortion for NZ does not provide a detailed breakdown by trimester; however, by far the majority of abortions past the 9th week were surgical (94%). Report of the Abortion Supervisory Committee 2017, Table 9.1, page 22. See <https://www.justice.govt.nz/assets/Documents/Publications/ASC-Annual-Report-2017.pdf>

101 White K, Carroll E & Grossman D (2015) Complications from first-trimester aspiration abortion: a systematic review of the literature. *Contraception* 92:422-438.

102 World Health Organization (2004) *Definitions of Maternal Death. Beyond the numbers: Reviewing maternal deaths and complications to make pregnancy safer*, Geneva, 2004.

103 Reardon DC, Strahan TW, Thorp JM Jr & Shuping MW (2002) Deaths associated with pregnancy outcome: a record linkage study of low income women. *Southern Medical Journal* 95(8):834-841.

104 Gissler M, Berg C, Bouvier-Colle MH & Buekens P (2004) Pregnancy-associated mortality after birth, spontaneous abortion, or induced abortion in Finland, 1987-2000. *American Journal of Obstetrics and Gynecology* 190(2):422-7.

105 Gissler M, Hemminki E & Lönnqvist J (1996) Suicides after pregnancy in Finland, 1987-94: register linkage study. *British Medical Journal* 313:1431-4.

106 Gissler M, Karalis E & Ulander VM (2015) Decreased suicide rate after induced abortion, after the Current Care Guidelines in Finland 1987 – 2012. *Scandinavian Journal of Public Health* 43:99-101.

107 Karalis E, Ulander VM, Tapper AM & Gissler M (2016) Decreasing mortality during pregnancy and for a year after while mortality after termination of pregnancy remains high: a population-based register study of pregnancy-associated deaths in Finland 2001-2012. *BJOG* DOI 10.1111/1471-0528.14484.

108 Gissler M et al. (2004) *Op. Cit.*

109 Karalis E et al. (2016) *Op. Cit.*

perinatal losses were associated with greater risks of death¹¹⁰.

In stark contrast with all large record-linked studies, a 2012 paper reported that the risk of death associated with childbirth is 14 times higher than that with abortion in the USA. Using CDC data, birth certificates, and Guttmacher Institute surveys, the authors surmise that abortion allows women to avoid caesarean delivery and also any complications that may arise in late pregnancy¹¹¹. Despite its unique conclusion, this paper is now widely cited as evidence that abortion is safer than childbirth.

Maternal deaths are defined as the death of a woman during or up to six weeks (42 days) after the end of pregnancy (whether the pregnancy ended by termination, miscarriage or a birth, or was an ectopic pregnancy) through causes associated with, or exacerbated by, pregnancy. Maternal deaths¹¹² are difficult to identify because this requires information regarding pregnancy status at or near the time of death, as well as the accurate medical cause of death, which are both difficult to ascertain¹¹³. A recent review of research methods demonstrates that the majority of published studies of maternal mortality are of very poor quality; most problematic is the conflation of induced and spontaneous abortion data¹¹⁴. Even global WHO data on maternal mortality has been criticised for errors, its figures being called “*implausibly low*” due to underreporting¹¹⁵. In this WHO data, the abortion category refers to abortion, miscarriage, and ectopic pregnancy, and was measured at 7.9% of the global burden of maternal mortality, that is, around 193 000 deaths annually¹¹⁶. On the other hand, the 2014 Global Burden of Disease Study calculated abortion deaths to be 14.9% of total maternal mortality, almost twice the WHO estimate¹¹⁷.

Risk of death resulting directly from complications during abortion is rare, but increases with each week of gestation¹¹⁸. Abortion-related deaths are normally expressed as a proportion of maternal mortality, and are almost always underestimated, being the least well measured. To measure deaths directly related to abortion procedures there are four sources of data: confidential enquiries, vital registration data, verbal autopsy (“*a systematic tool used to collect health information from lay-person informants to assess causes of death*”), and facility-based data sources¹¹⁹. Using just one of these sources will lead to underestimation. Gerds *et al.* describe some of the barriers to measurement of abortion-related deaths, which include women’s and practitioners’ unwillingness to participate in research, misclassification of deaths and complications, and underreporting. Abortion-related deaths may be misclassified because of similarities to other obstetric complications such as miscarriage, haemorrhage or sepsis. Furthermore, illegal or stigmatised abortion leads to women being unwilling to seek help for complications. And even in the USA where abortion is widely practised and accepted, doctors fail to report recent or current pregnancies on a minimum of 50% of death certificates¹²⁰. These errors result in abortion appearing safer than it really is.

The protective effects of giving birth are well-established yet not well understood. There are several possible explanations. First, the “*healthy pregnant woman effect*” suggests that healthier women are more likely to be able to conceive and carry to term, and have more contact with healthcare professionals than non-pregnant women. Second, pregnancy may produce direct health benefits. For example, pregnancies carried to term are associated with physiological changes that reduce the risk of reproductive cancers, and behavioural changes associated with being a parent improve healthy lifestyle behaviours and reduce risky behaviours. Third, perinatal loss may contribute to physiological or psychological effects that lead to an association with increased risk of suicide, substance abuse, PTSD, and poorer general health¹²¹. Women who have abortions may already take more risks or care less for their health. Alternatively, they may experience stress after an abortion that is linked to it, or abortion itself may produce psychological stresses that increase the risk of death¹²².

110 Coleman PK, Reardon DC, & Calhoun BC (2012) Reproductive history patterns and long-term mortality rates: a Danish, population-based record linkage study. *European Journal of Public Health* 23(4):579-574.

111 Raymond EG & Grimes DA (2012) The comparative safety of legal induced abortion and childbirth in the United States. *Obstet Gynecol* 119:215-9.

112 The definition of maternal mortality is “the death of a woman whilst pregnant or within 42 days of delivery or termination of pregnancy, from any cause related to, or aggravated by pregnancy or its management, but excluding deaths from incidental or accidental causes.” Say L, Chou D, Gemmill A, Tunçalp Ö, Moller AB *et al.* (2014) Global causes of maternal death: a WHO systematic analysis. *Lancet Glob Health* 2:e323-33.

113 Coleman PK *et al.* (2012) *Op. Cit.*

114 Gerds C, Vohra D & Ahern J (2013) Measuring unsafe abortion-related mortality: a systematic review of the existing methods. *PLOS One* 8(1):e53346.

115 Gerland P, Masquelier B, Helleringer S, Hogan D, Mathers CD *et al.* (2015) Correspondence: Maternal mortality estimates. *The Lancet* 384(9961):2211.

116 Say L *et al.* (2014) *Op. Cit.*

117 Kassebaum NJ, Bertozzi-Villa A & Coggeshall MS *et al.* (2014) Global, regional, and national levels and causes of maternal mortality during 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet* 384:980-1004.

118 Diedrich J & Steinauer J (2009) Complications of surgical abortion. *Clinical Obstetrics and Gynecology* 52(2):205-212.

119 Gerds C, Tunçalp Ö, Johnston H & Ganatra B (2015) Measuring abortion-related mortality: challenges and opportunities. *Reproductive Health* 12:87.

120 Horon I (2005) Under-reporting of maternal deaths on death certificates and the magnitude of the problem of maternal mortality. *Am J Public Health* 95:478-82.

121 Reardon DC & Coleman PK (2012) Short and long term mortality rates associated with first pregnancy outcome: Population register based study for Denmark 1980-2004. *Medical Science Monitor* 18(9):PH71-76.

122 Reardon DC *et al.* (2002) *Op. Cit.*

Overall, the evidence points to common risk factors for both death and abortion. An abortion request should be viewed as a flag for women who might need assistance in various areas of their lives. The Finnish government has acted upon this and achieved a small reduction in post-abortion mortality by providing such post-abortion support¹²³.

Subsequent pregnancies

The impact of abortion on subsequent pregnancies remains a contested field of research, even though numerous studies over the past decade have identified an increased risk of premature delivery^{124,125,126,127,128,129,130,131,132}.

Brazil has a high rate of preterm birth and a large multicentre case control study has found that previous abortion is a risk factor¹³³. A study of 9969 nulliparous women self-reporting their reproductive histories found that women with a history of induced abortion were at higher risk of spontaneous preterm birth and premature rupture of membranes than women without a history of induced abortion. Abortion was likely underreported so the risk is underestimated. There was no data on method (medical versus surgical)¹³⁴.



Recent evidence strongly suggests that cervical trauma due to instrumentation during surgical abortion procedures may play a large part in premature births in subsequent pregnancies, since medical abortion does not appear to confer this risk.

A large analysis presented to the annual meeting of the European Society of Human Reproduction and Embryology in Lisbon, 2015, assessed 21 cohort studies including nearly two million women¹³⁵. The reviewers reported that the use of D&C for miscarriage or termination increased preterm birth in subsequent pregnancies by 29%, and very preterm birth by 69%. The risk was highest for women who had several abortions. The authors urge the prevention of preterm labour by minimising the use of D&C.

These findings align with a large Scottish record linkage study indicating that surgical but not medical abortion increases the risk of spontaneous premature birth in a second pregnancy¹³⁶. A similar Scottish record linkage study showed that the association of preterm birth with abortion declined over the study period (1980 to 2008), and the authors propose that the decline is due to the increasing use of medical abortion as well as pre-treatment of the cervix prior to surgical abortion¹³⁷.

In the Netherlands, a large nationwide cohort study found that surgical abortion was associated with preterm delivery, cervical incompetence, placental implantation or retention problems, and postpartum haemorrhage in subsequent pregnancies – the association was not found for medical abortions. Abortion history was clearly underreported, being mentioned by only 1.2% of all women giving birth, thus underestimating the outcomes¹³⁸.

123 Gissler M, Karalis E & Ulander VM (2015) Decreased suicide rate after induced abortion, after the Current Care Guidelines in Finland 1987 – 2012, *Scandinavian Journal of Public Health* 43:99-101.

124 Swingle H. M, Colaizy TT, Zimmerman MB & Morriss FH (2009) Abortion and the risk of subsequent preterm birth: a systematic review with meta-analysis. *The Journal of Reproductive Medicine* 54:95-108.

125 Van Oppenraaij RHF, Jauniaux E, Christiansen OB, Horcajadas JA, Farquharson RG & Exalto N (2009) Predicting adverse obstetric outcome after early pregnancy events and complications: a review. *Human Reproduction Update* 15(4):409-421.

126 Ancel PY, Lelong N, Papiernik E, Saurel-Cubizolles MJ & Kaminski M (2004) History of induced abortion as a risk factor for preterm birth in European countries: results of the EUROPOP study. *Human Reproduction* 19(3):734-40.

127 Brown JS Jr, Adera T & Masho SW (2008) Previous abortion and the risk of low birth weight and preterm births. *Journal of Epidemiology and Community Health* 62(1):16-22.

128 Swingle HM, Colaizy TT, Zimmerman MB & Morriss FH (2009) Abortion and the risk of subsequent preterm birth: a systematic review with meta-analysis. *The Journal of Reproductive Medicine* 54:95-108.

129 Van Oppenraaij RH *et al.* (2009) *Op.Cit.*

130 Shah PS & Zao J (2009) Induced termination of pregnancy and low birthweight and preterm birth: a systematic review and meta-analyses. *British Journal of Obstetrics & Gynaecology* 116(11):1425-42.

131 Scholten B, Page-Christiaens GCML, Franx A, Hukkelhoven CWPM & Koster MPH (2013) The influence of pregnancy termination on the outcome of subsequent pregnancies: a retrospective cohort study. *BMJ Open* 3:e002803.

132 Moreau C, Kaminski M, Ancel PY, Bouyer J, Escande B *et al.* (2005) Previous induced abortions and the risk of very preterm delivery: results of the EPIPAGE study. *British Journal of Obstetrics & Gynaecology* 112(4):430-7.

133 Passini R, Cecatti JG, Lajos GJ, Tedesco RP, Nomura ML *et al.* (2014) Brazilian multicentre study on preterm birth (EMIP): prevalence and factors associated with spontaneous preterm birth. *PLOS One* 9(10):e109069.

134 Makhlof MA, Clifton RG, Roberts JM, Myatt L, Hauth JC *et al.* (2014) Adverse pregnancy outcomes among women with prior spontaneous or induced abortions. *Am J Perinatol* 31(9):765-772.

135 Kmietowicz Z (2015) Dilatation and curettage procedure raises risk of premature birth in subsequent pregnancies, study finds. *BMJ News* 350:h3261.

136 Bhattacharya S, Lowit A, Bhattacharya S, Raja EA, Lee AJ *et al.* (2012) Reproductive outcomes following induced abortion: a national register-based cohort study in Scotland. *BMJ Open* 2:e000911.

137 Oliver-Williams C, Fleming M, Monteath K, Wood AM & Smith GCS (2013) Changes in association between previous therapeutic abortion and preterm birth in Scotland, 1980 to 2008: A historical cohort study. *PLOS Medicine* 10(7).

138 Scholten BL, Page-Christiaens GCML, Franx A, Hukkelhoven CWPM & Koster MPH (2013) The influence of pregnancy termination on the outcome of subsequent pregnancies: a retrospective cohort study. *BMJ Open* 3:e002803.

Other studies have not found any association between abortion and subsequent premature birth^{139,140,141}.

Women with a history of abortion have a modest reduction in risk of preeclampsia in later pregnancy, although it is unclear whether this is a causal relationship¹⁴².

In later pregnancies, a study of Finnish Registry Data 1983-2007 found abortion to be associated with smoking after the first trimester, and overweight during pregnancy; the authors recommend that doctors performing abortion should inform their patients about the importance of adequate prenatal care in subsequent pregnancies¹⁴³.

Breast cancer

Whether breast cancer risk is elevated by abortion is a controversial question that has been the subject of numerous studies, several showing increased risk^{144,145,146,147,148,149,150,151,152} and some showing none^{153,154,155,156,157}. The field remains in dispute^{158,159}, partly due to problems in some studies where research design has been poor. Problems include failure to ensure adequate follow-up time, use of inaccurate abortion registers, choosing inappropriate study populations and not adequately dealing with under-reporting of abortion. Nevertheless, many commentators prefer to claim that the matter is settled¹⁶⁰.

At the very least, and on precautionary grounds, women presenting for abortion need to be made aware of the intense research interest in this matter, and the divergent views of researchers. What is of direct relevance to women considering abortion is the uncontroversial fact that carrying a first pregnancy to birth is protective against breast cancer^{161,162}. This means that a woman will have higher breast cancer risk if she undergoes an abortion compared to carrying to term.

PSYCHOLOGICAL EFFECTS OF ABORTION

The highly complex psychology of abortion has been examined by hundreds of researchers over previous decades, with a diversity of methodologies and interpretations. In precise scientific terms the question of causality cannot

139 Raatikainen K, Heiskanen N & Heinonen S (2006) Induced abortion: not an independent risk factor for pregnancy outcome, but a challenge for health counselling. *Annals of Epidemiology* 16(8):587-592.

140 Reime B, Schücking BA & Wenzlaff P (2008) Reproductive outcomes in adolescents who had a previous birth or induced abortion compared to adolescents' first pregnancies. *BMC Pregnancy Childbirth* 8:4.

141 Woolner A, Bhattacharya S & Bhattacharya S (2013) The effect of method and gestational age at termination of pregnancy on future obstetric and perinatal outcomes: a register-based cohort study in Aberdeen, Scotland. *BJOG* 121:309-318.

142 Basso O (2015) Invited Commentary: Induced abortion and the risk of preeclampsia in a subsequent pregnancy. *American Journal of Epidemiology* 182(8):670-672.

143 Holmlund S, Kauko T, Matomäki J, Tuominen M, Mäkinen & Rautava P (2016) Induced abortion - impact on a subsequent pregnancy in first-time mothers: a registry-based study. *BMC Pregnancy and Childbirth* 16:325.

144 Brind J, Chinchilli VM, Severs WB & Summy-Long J (1996) Induced abortion as an independent risk factor for breast cancer: a comprehensive review and meta-analysis. *Journal of Epidemiology and Community Health* 50:481-96.

145 Daling JR, Malone KE, Voigt LF, White E & Weiss NS (1994) Risk of breast cancer among young women: relationship to induced abortion. *Journal of the National Cancer Institute* 86(21):1584-92.

146 Daling JR, Brinton LA, Voigt LF, Weiss NS, Coates RJ *et al.* (1996) Risk of breast cancer among white women following induced abortion. *American Journal of Epidemiology* 144(4):373-80.

147 Ozmen V, Ozcinar B, Karanlik H, Cabioglu N, Tukenmez M *et al.* (2009) Breast cancer risk factors in Turkish women – a University Hospital based nested case control study. *World Journal of Surgical Oncology* 7:37.

148 Hosseinzadeh M, Ziaei JE, Mahdavi N, Aghajari P, Vahidi M *et al.* (2014) Risk factors for breast cancer in Iranian women: A hospital-based case-control study in Tabriz, Iran. *Journal of Breast Cancer* 17(3):236-243.

149 Balekouzou A, Yin P, Pamatika CM, Bekolo CE, Nambei SW *et al.* (2017) Reproductive risk factors associated with breast cancer in women in Bangui: a case-control study. *BMC Women's Health* 17:14.

150 Zouré AA, Bambara AH, Sawadogo AY, Ouattara AK, Quédrado M, Traoré SS, Bakri , Bakri and Simporé J (2016), Multiparity and breast cancer risk factor among women in Burkina Faso, *Asian Pac J Cancer Prev* 17(12):5095-5099.

151 Huang Y, Zhang X, Li W, Song F, Dai H *et al.* (2013) A meta-analysis of the association between induced abortion and breast cancer risk among Chinese females. *Cancer Causes Control* 25(2):227-36.

152 Kamath R, Mahajan KS, Ashok L & Sanal TS (2013) A study on risk factors of breast cancer among patients attending the Tertiary Care Hospital, in Udipi District. *Indian J Community Med* 38(2):95-99.

153 Beral V, Bull D, Doll R, Peto R & Reeves G (2004) Breast cancer and abortion: collaborative reanalysis of data from 53 epidemiological studies, including 83,000 women with breast cancer from 16 countries. *Lancet* 363:1007-16.

154 Ye Z, Gao DL, Qin Q, Ray RM & Thomas DB (2002) Breast cancer in relation to induced abortions in a cohort of Chinese women. *British Journal of Cancer* 87:977-981.

155 Beral V *et al.* (2004) *Op. Cit.*

156 Wu JQ, Li YY, Ren JC, Zhao R, Zhou Y & Gao ES (2014) Induced abortion and breast cancer: results from a population-based case control study in China. *Asian Pac J Cancer Prev* 15(8):3635-40.

157 Karim SM, Baeshen W, Neamatullah SN & Bin B (2015) Oral contraceptives, abortion and breast cancer risk: a case control study in Saudi Arabia. *Asian Pac J Cancer Prev* 16(9):3957-60.

158 Brind J (2009) The abortion-breast cancer connection. *Specialty Law Digest. Health Care Law* 340:9-35.

159 Rowlands S (2011) Misinformation on abortion. *European Journal of Contraception and Reproductive Health Care* 16(4):233-40.

160 Phillips KA, Bruinsma FJ & Milne RL (2014) Abortion and breast cancer risk for Australian women. *MJA* 201(7):381.

161 Verlinden I, Güngör N, Wouters K, Janssens J, Raus J & Michiels L (2005) Parity-induced changes in global gene expression in the human mammary gland. *European Journal of Cancer Prevention* Apr, 14(2):129-37.

162 Russo IH & Russo J (2011) Pregnancy-induced changes in breast cancer risk. *Journal of Mammary Gland Biology and Neoplasia* 16(3):221-33.

be answered definitively as it is not possible to conduct a randomised controlled trial assigning some women to an abortion group and others to a birth group. Therefore, most studies examine the association between abortion and mental health, even though some researchers point to various characteristics of the data that infer causality¹⁶³.

Reviews

Reviews have arrived at disparate conclusions^{164,165,166,167,168,169,170} highlighting that the field is riven with disagreement^{171,172} making the provision of guidance to physicians difficult. Taking into account more recent research, a 2013 review by Bellieni and Buonocore concludes that abortion is linked to a variety of adverse mental health outcomes, arguing that foetal loss is traumatic, whether by miscarriage, induced abortion, or stillbirth¹⁷³. Nevertheless, some reviews advance a very strong view that there is no link^{174,175} unprepared to even acknowledge controversy in the field. While some researchers acknowledge an effect on some women, they can be quick to blame social mores as the cause of mental harm¹⁷⁶. In a poll conducted in New Zealand seeking the views of the general public about the effects of abortion on mental health, nearly half of all respondents agreed that abortion risked harming mental health.¹⁷⁷

One prominent researcher has described problems in the field as follows:

“[there is a] ... truly shameful and systematic bias that permeates the psychology of abortion. Professional organisations in the USA and elsewhere have arrogantly sought to distort the scientific literature and paternalistically deny women the information they deserve to make fully informed healthcare choices and receive necessary mental health counseling when and if an abortion decision proves detrimental.”¹⁷⁸

Comparison groups

One of the more contentious matters in studies on the psychological impact of abortion, which may have a bearing upon outcomes, involves what groups should be compared with one another. It is possible to compare women having an abortion with those having a miscarriage, with those who give birth, or with those who have never been pregnant. Additionally, it would be possible to compare groups based upon whether a pregnancy was intended or not, or wanted or not. However, the use of such terminology is fraught because there is no equivalence for example between an intended pregnancy and a wanted one, let alone whether seeking abortion simply equates with a pregnancy being unwanted^{179,180,181,182,183}. Nevertheless, for studies on psychological effects of abortion, there seems to be some consensus that the most appropriate comparison is between women who abort an unintended pregnancy and those who do not¹⁸⁴. This is not to deny that where other comparisons have been made, useful and informative data nonetheless exists.

163 Sullins DP (2016) Abortion, substance abuse and mental health in early adulthood: Thirteen-year longitudinal evidence from the United States. *SAGE Open Med* 4:1-11.

164 American Psychological Association (2008) *Report on the Task Force on Mental Health and Abortion*. Washington DC.

165 Charles VE, Polis CB, Sridhara SK & Blum RW (2008) Abortion and long-term mental health outcomes: a systematic review of the evidence. *Contraception* 78:436-450.

166 Major B, Applebaum M, Beckman L, Dutton MA, Russo NF & West C (2009) Abortion and Mental Health: Evaluating the Evidence. *American Psychologist* 64(9):863-890.

167 Coleman PK (2011) Abortion and mental health: quantitative synthesis and analysis of research published 1995-2009. *The British Journal of Psychiatry* 199(03):180-186.

168 Cameron S (2010) Induced abortion and psychological sequelae. *Best Practice & Research Clinical Obstetrics and Gynaecology* 24:657-665.

169 Casey PR (2010) Abortion among young women and subsequent life outcomes. *Best Practice & Research Clinical Obstetrics and Gynaecology* 24:491-502.

170 Steinberg JR & Rubin LR (2014) Psychological aspects of contraception, unintended pregnancy, and abortion. *Policy Insights from the Behavioral and Brain Sciences* 1(1):239-247.

171 Steinberg JR, Trussell J, Hall KS & Guthrie K (2012) Fatal flaws in a recent meta-analysis on abortion and mental health. *Contraception* 86:430-437

172 Steinberg JR & Finer LB (2012) Coleman, Coyle, Shuping, and Rue make false statements and draw erroneous conclusions in analyses of abortion and mental health using the National Comorbidity Survey. *J Psychiatr Res* 46:407-8; with reply by Coleman PK.

173 Bellieni CV & Buonocore G (2013) Abortion and subsequent mental health: Review of the literature. *Psychiatry and Clinical Neurosciences* 67:301-310.

174 Stotland NL (2011) Induced abortion and adolescent mental health. *Curr Opin Obstet Gynecol* 23:340-3.

175 Robinson GE, Stotland NL, Russo NF, Lang JA & Occhiogrosso M (2009) Is there an “abortion trauma syndrome”? Critiquing the evidence. *Harv Rev Psychiatry* 17:268-290.

176 Kelly K (2014) The spread of ‘Post Abortion Syndrome’ as social diagnosis. *Social Science and Medicine* 102:18-25.

177 Independent poll commissioned by Family First NZ and undertaken by Curia Market Research. 46% of respondents agreed with the statement “Women who have abortions risk harming their mental health as a result of the abortion.” Agreement was stronger amongst younger respondents. See <https://www.familyfirst.org.nz/wp-content/uploads/2017/03/Abortion-Mental-Health-Results-2016.pdf>

178 Coleman PK (2012) Author reply to “Abortion and mental health: guidelines for proper scientific conduct ignored.” *The British Journal of Psychiatry* 200:74-83.

179 Pulley L, Klerman LV, Tang H & Baker BA (2002) The extent of pregnancy mistiming and its association with maternal characteristics and behaviours and pregnancy outcomes. *Perspectives on Sexual and Reproductive Health* 34(4):206-211.

180 Finer LB & Henshaw SK (2006) Disparities in rates of unintended pregnancy in the United States 1994-2001. *Perspectives on Sexual and Reproductive Health* 38(2):90-96.

181 Barrett G & Wellings K (2002) What is a ‘planned’ pregnancy? empirical data from a British study. *Social Science and Medicine* 55:545-557.

182 Kirkman M *et al.* (2010) *Op. Cit.*

183 Williams L, Piccinino L, Abma J & Arguillas F (2001) Pregnancy wantedness: attitude stability over time. *Social Biology* 48(3):212-233.

184 Fergusson DM, Horwood LJ & Boden JM (2013) Abortion and mental health: A response to Romans and Steinberg. *Aust N Z J Psychiatry* 47(12):1201-1203.

The 'Turnaway Study'

Before considering the bulk of the research, one study in particular deserves special mention for three reasons. First, because it claims to use the most appropriate comparison groups; second, because it has followed women longitudinally over 5 years; and third, because it has been influential, at least in part because the authors have chosen to derive numerous papers from the one data set, and also because the papers draw strong links to the policy implications the authors support.

The study in question is termed the 'Turnaway Study', because it compares women who have an abortion close to the gestational limit set by the clinic, with women seeking an abortion but denied one because their pregnancy was advanced beyond the gestational limit set by the clinic. These limits vary from 10 weeks to 23 weeks. A third comparison group was women receiving first trimester abortions.

The authors of the study claim that comparing 'turnaways' with those receiving an abortion is of most relevance because it allows a comparison free of the possibility that not wanting a pregnancy may be related to adverse mental health outcomes rather than the abortion itself. In other words, all women in the study do not want to be pregnant, and therefore any findings are related to the abortion alone and not whether a pregnancy was unintended or unwanted.

The study has resulted in at least 27 papers¹⁸⁵.

In brief, the primary finding of the study, and contrary to the majority of others, was that having an abortion does not have an adverse effect on a variety of mental health outcomes and other measures. This includes on emotional responses^{186,187} perceived stress and emotional support¹⁸⁸ substance use and/or abuse^{189,190,191,192} self-esteem or life satisfaction¹⁹³ partner relationship^{194,195} depression, anxiety and post-traumatic stress^{196,197,198,199} and aspirational plans²⁰⁰.

Unfortunately, this plethora of papers carries the false appearance of a significant and varied body of work.

However, all the papers published as part of the Turnaway Study rely on a single flawed data set, hence all papers are in a sense pre-determined by it.

The Turnaway Study is the work of Advancing New Standards in Reproductive Health at the Bixby Center for Global Reproductive Health at the University of California. ANSIRH is committed to free and open access to abortion²⁰¹, and funders of the work include like-minded organisations such as the David and Lucille Packard Foundation. Most of the papers include statements about the authors' desired political outcomes.

The Turnaway Study has a variety of flaws, but the essential one involves the initial selection of women, and this failing affects all that follows. Only 37.5% of women consented to participate at the time of their abortion or turnaway and a further 15% did not undertake the baseline interview. Hence, only 31.9% of women began the study, with further

185 For a full list, see <https://www.ansirh.org/research/abortion>

186 Rocca CH, Kimport K, Gould H & Foster G (2013) Women's emotions one week after receiving or being denied an abortion in the United States. *Perspect Sex Reprod Health* 45:122–31.

187 Rocca CH, Kimport K, Roberts SCM, Gould H, Neuhaus J, & Foster DG (2015) Decision Rightness and Emotional Responses to Abortion in the United States: A Longitudinal Study. *PLoS ONE* 10(7): e0128832.

188 Harris LF, Roberts SCM, Biggs MA, Rocca CH & Foster DG (2014) Perceived stress and emotional social support among women who are denied or receive abortions in the United States: a prospective cohort study. *BMC Womens Health* 14(76).

189 Roberts SC & Foster DG (2014) Receiving versus being denied an abortion and subsequent tobacco use. *Matern Child Health J* 19(3):438–46.

190 Roberts SCM, Rocca CH & Foster DG (2014) Receiving versus being denied an abortion and subsequent drug use. *Drug Alcohol Depend* 134:63–70.

191 Roberts SCM, Subbaraman, Delucchi KL, Wilsnack SC & Foster DG (2016) Moderators and mediators of the relationship between receiving versus being denied a pregnancy termination and subsequent binge drinking. *Drug and Alcohol Dependence* 159:117–124.

192 Roberts SCM, Delucchi K, Wilsnack SC & Foster DG (2015) Receiving versus being denied a pregnancy termination and subsequent alcohol use: A longitudinal study. *Alcohol and Alcoholism* 50(4):477–484.

193 Biggs MA, Upadhyay UD, Steinberg JR & Foster DG (2014) Does abortion reduce self-esteem and life satisfaction? *Qual Life Res* 23(9):2505–13.

194 Mauldon J, Foster DG & Roberts SCM (2015) Effect of abortion vs. carrying to term on a woman's relationship with the man involved in the pregnancy. *Perspectives on sexual and reproductive health* 47(1):11–18.

195 Roberts SCM, Biggs MA, Chibber KS, Gould H, Rocca CH & Foster DG (2014) Risk of violence from the man involved in the pregnancy after receiving or being denied an abortion. *BMC Med* 12:144.

196 Biggs MA, Rowland B, McCulloch CE & Foster DG (2016) Does abortion increase women's risk for posttraumatic stress? Findings from a prospective longitudinal cohort study. *BMJ Open* 2016;6:e009698.

197 Foster DG, Steinberg JR, Roberts SCM, Neuhaus J & Biggs MA (2015) A comparison of depression and anxiety symptom trajectories between women who had an abortion and women denied one. *Psychol Med* 45:2073–82.

198 Biggs MA, Neuhaus JM & Foster DG. (2015) Mental Health Diagnosis 3 years after receiving or being denied an abortion in the United States. *Am J Publ Health* 105(12):2557–2563.

199 Biggs MA, Upadhyay UD, McCulloch CE & Foster DG (2016) Women's mental health and well-being 5 years after receiving or being denied an abortion. A prospective, Longitudinal Cohort Study. *JAMA Psychiatry* Dec 14 doi:10.1001/jamapsychiatry.2016.3478.

200 Upadhyay UD, Biggs MA & Foster DG (2015) The effect of abortion on having and achieving aspirational one-year plans. *BMC Women's Health* 15:102.

201 For example, see My Abortion Story by Director of the Turnaway Study, Rana Barar. <https://ww2.kqed.org/perspectives/2016/06/24/my-abortion-story/>

dropout yielding 22% participation at 5 years. It is unsurprising that those wishing not to participate would include those potentially most affected by the abortion, either initially or subsequently. And given that the turnaway group can only be derived from a small number of women and the abortion group from a very large pool, it is almost certain that the abortion group would represent women least likely to suffer adverse consequences.

Selection bias and other problems

The problem of selection bias appears in other papers as well. For example, in a study claiming there was no link between abortion and posttraumatic stress, 56% of those asked refused to participate, and then 49% of those who participated at the baseline interview did not respond at the 3-month mark^{202,203} leaving a sample of just 29%. When a sample is self-selected in this way, just as in the Turnaway study, there is every reason why women who have reacted adversely to the abortion would not wish to participate²⁰⁴.

Another important aspect of research design involves the timing of when surveys are conducted. For example, in a study by Toffol and coworkers²⁰⁵, who concluded that abortion is associated with an overall reduction in anxiety, the baseline survey was administered prior to the abortion, which was conducted later that day. As has been pointed out²⁰⁶, it is not surprising that there would be some decline in anxiety given the highly anxious moments just prior to an abortion being used as a 'baseline', instead of a more accurate historical measure some time prior to pregnancy.

Another potential weakness of some studies is the failure to follow psychological effects for long enough – a few months or even years may be too short a time frame²⁰⁷. Phenomenological research suggests that women may cope well initially, but years later reappraise the event negatively^{208,209}. Finally, there are two further problems. First, as noted, under-reporting of past abortions could result in misclassification, in that those who have had an abortion but claim not to have, may appear in the control group and hence dilute any adverse effect. And second, studies that rely on self-report about current or past psychological health risk memory recall bias and/or distortion due to cognitive dissonance in relation to a memory that is painful to relive²¹⁰.

Emotional distress

Numerous studies have identified emotional distress immediately after abortion and in the months following. Women experience a range of emotions after abortion, including sadness, loneliness, shame, guilt, grief, doubt and regret^{211,212,213,214,215,216}. However, some studies also identify positive reactions like relief, happiness and satisfaction²¹⁷. In the longer term, some women exhibited cognitive dissonance, describing their abortions of 10 years or more ago in terms of negative emotions yet believing the correct choice was made²¹⁸. Specific strategies of avoidance were used to cope.

In a study of Canadian university students, all participants described significant grief 3 years after the index abortion²¹⁹.

In a recent study by Coleman and co-workers designed to examine in depth responses to abortion, women reported "*deep feelings of loss, existential concerns, and reduced quality of life, with heart-wrenching clarity. For many women,*

202 Wallin Lundell I, Georgsson Öhman S, Frans Ö *et al.* (2013) Posttraumatic stress among women after induced abortion: a Swedish multi-centre cohort study. *BMC Womens Health* 13:52.

203 Wallin Lundell I, Sundstrom Poromaa I, Frans O *et al.* (2013) The prevalence of posttraumatic stress among women requesting induced abortion. *Eur J Contracept Reprod Health Care* 18:480–488.

204 Weisaeth L (1989) Importance of high response rates in traumatic stress research. *Acta Psychiatr Scand Suppl* 355:131-137.

205 Toffol E, Pohjoranta E, Suhonen S *et al.* (2016) Anxiety and quality of life after first-trimester termination of pregnancy: a prospective study. *Acta Obstet Gynecol Scand* 95(10):1171-80.

206 Reardon DC (2016) Missed opportunities and overstated results in anxiety and quality of life study following termination of pregnancy. *Acta Obstet Gynecol Scand* doi: 10.1111/aogs.13053.

207 Trybulski J (2005) The long-term phenomena of women's postabortion experiences. *Western Journal of Nursing* 27(5):577-582.

208 Goodwin P & Ogden J (2007) Women's reflections upon their past abortions: An exploration of how and why emotional reactions change over time. *Psychology and Health* 22(2):231-248.

209 Trybulski J (2006) Women and abortion: the past reaches into the present. *Journal of Advanced Nursing* 54(6):683-690.

210 Keys J (2010) Running the gauntlet: women's use of emotion management techniques in the abortion experience. *Symbolic Interaction* 33(1):41-70.

211 Kero A *et al.* (2001) *Op. Cit.*

212 Kero A *et al.* (2004) *Op. Cit.*

213 Fergusson DM, Horwood LJ & Ridder EM (2006) Abortion in young women and subsequent mental health. *Journal of Child Psychology and Psychiatry* 47(1):16-24.

214 Fergusson DM *et al.* (2009) *Op. Cit.*

215 Hess RF (2004) Dimensions of women's long-term postabortion experience. *The American Journal of Maternal Child Nursing* 29(3):193-198.

216 Korenromp MJ *et al.* (2005) *Op. Cit.*

217 Fergusson DM *et al.* (2009) *Op. Cit.*

218 Dykes K, Slade P & Haywood A (2011) Long term follow-up of emotional experiences after termination of pregnancy: women's views at menopause. *Journal of Reproductive and Infant Psychology* 29(1):93-112.

219 Curley M & Johnston C (2013) The characteristics and severity of psychological distress after abortion among university students. *Journal of Behavioral Health Services & Research* 40(3):279-293.

*the abortion experience became a pivotal point in their lives, impacting their self-image, their personality, and their connectivity to others.*²²⁰

Among US college students - women who had an abortion and men whose partners had an abortion – one third of women and one third of men were uncomfortable and expressed regret about the abortion decision²²¹. A third of men and women also experienced a sense of longing for the aborted foetus. Moreover, they often use terms like ‘child’ or ‘baby’ to describe their loss.

In a comparison between the mental health effects of miscarriage compared to induced abortion, Broen and co-workers found that 5 years later, women who had an abortion experienced levels of avoidance, guilt, shame and relief that remained elevated compared to women who miscarried²²². In contrast, in a pilot study, Canario and co-workers found there to be no difference in emotional adjustment between women who had a miscarriage, induced abortion, or abortion for foetal anomalies²²³. These authors also found that a couple’s relationship could assist in emotional adjustment. Interestingly, in a qualitative study aimed at exploring women’s emotional difficulties after abortion, the author concludes that any difficulty results from “social disapproval, romantic relationship loss, and head versus heart conflict”²²⁴. It is important to note that in this study the women were recruited through an abortion talkline, and that about half of callers could not be recruited because they were “judged too distraught”.

Depression and anxiety

Results from a 2006 New Zealand study²²⁵ on mental health and abortion confirm other work showing a link between the two²²⁶. The New Zealand study revealed that 42% of women who had an abortion experienced major depression in the four years prior to interview. This is nearly twice the rate of those who had never been pregnant and 35 % higher than those who had continued their pregnancy. This study also showed that abortion increased the risk of anxiety disorders. The same research team undertook a more detailed follow up study correcting carefully for possible confounders, in which their earlier findings were confirmed²²⁷. In the more recent study, they concluded that women who had abortions experienced mental health disorders 30% more often compared to women who had not had an abortion. The authors went further to suggest that there were good grounds for causality, but that more work needed to be done before strong definitive statements about abortion causing mental health disorders could be made.



Another more recent paper from the same group showed that the extent to which women reported an adverse reaction to abortion correlated with the extent of mental health disorders²²⁸. Other researchers have also found a link between abortion and depression^{229,230,231} as well as anxiety²³², although some groups have not been able to confirm

220 Coleman PK et al. (2017) *Op. Cit.*

221 Coleman PK & Nelson ES (1998) The quality of abortion decisions and college students’ reports of post-abortion emotional sequelae and abortion attitudes. *Journal of Social and Clinical Psychology* 17(4):425-442.

222 Broen AN, Moum T, Sejersted Bodtker A & Ekeberg O (2005) The course of mental health after miscarriage and induced abortion: a longitudinal, five-year follow-up study. *BMC Medicine* 3(1):18.

223 Canario C, Figueiredo B & Ricou M (2011) Women and men’s psychological adjustment after abortion: a six month prospective pilot study. *Journal of Reproductive and Infant Psychology* 29(3): 262-275.

224 Kimport K (2012) (Mis)Understanding abortion regret. *Symbolic Interaction* 35(2):105-122.

225 Fergusson DM et al. (2006) *Op. Cit.*

226 Reardon DC & Cogle JR (2002) Depression and unintended pregnancy in the National Longitudinal Survey of Youth: a cohort study. *British Medical Journal* 324:151-2.

227 Fergusson DM, Horwood LJ & Boden JM (2008) Abortion and mental health disorders: evidence from a 30-year longitudinal study. *British Journal of Psychiatry* 193(6):444-451.

228 Fergusson DM et al. (2009) *Op. Cit.*

229 Pedersen W (2008) *Op. Cit.*

230 Rees DI & Sabia JJ (2007) The relationship between abortion and depression: new evidence from the fragile families and child wellbeing study. *Medical Science Monitor* 13(10):CR430-6.

231 Coleman PK, Coyle CT, Shuping M & Rue VM (2009) Induced abortion and anxiety, mood, and substance abuse disorders: Isolating the effects of abortion in the national comorbidity survey. *Journal of Psychiatric Research* 43:770-776.

232 Broen AN et al. (2005) *Op. Cit.*

this^{233,234,235,236}. With regard to post-abortion anxiety and possibly depression, others have found these mood disorders to be related to pre-abortion factors rather than to the abortion itself^{237,238,239}.

In a 2016, well-controlled study of 8005 American women, which attempted to replicate work by the New Zealand group, Sullins found a 30% elevated risk of depression and a 25% elevated risk of anxiety²⁴⁰. Sullins, like Coleman *et al.*²⁴¹, estimates that approximately 10% of the prevalence of mental health disorders comes from induced abortion.

Although a very short-term investigation one week after abortion, Yilmaz *et al.* found that symptoms of post-abortion depression were more prevalent amongst those who had undergone a surgical abortion compared with a medical one²⁴².

Post-traumatic stress

A small proportion of women develop post-traumatic stress disorder (PTSD) following abortion^{243,244}. This may be related to cultural factors²⁴⁵. More recent studies have confirmed an elevated risk of PTSD after abortion, which weakened but persisted after controlling for confounders^{246,247}. In one of these studies, abortions later in pregnancy were associated with higher PTSD scores²⁴⁸, and in a separate study, PTSD symptoms remained elevated after 3 years²⁴⁹. Incidence of first psychiatric contact for neurotic, stress-related or somatoform disorder was elevated 2-3 months after an abortion²⁵⁰.

In a French study comparing surgical versus medical abortion, PTSD scores were not only high at 6 weeks after abortion, but higher in the medical abortion group, even though these women had less advanced pregnancies²⁵¹. In their review of 48 studies, Daugirdaite *et al.*²⁵² concluded that “Patients with advanced pregnancies, a history of previous traumas, mental health problems, and adverse psychosocial profiles should be considered as high risk for developing PTS [posttraumatic stress] and PTSD following reproductive loss.” The risk of PTS and PTSD in this review were considered alongside other reproductive losses such as miscarriage, stillbirth, neonatal death, perinatal death, and failed IVF.

Substance abuse and self-harm

In 1995, a UK study identified an increase in deliberate self-harm after abortion, which includes substance abuse.²⁵³ This was corroborated more recently in the study by Sullins²⁵⁴ and also by Olsson *et al.*²⁵⁵. Among women whose first pregnancy was unintended, those who had an abortion were at greater risk of substance abuse compared with those who carried their



233 Steinberg JR & Finer LB (2011) Examining the association of abortion history and current mental health: A reanalysis of the National Comorbidity Survey using a common-risk-factors model. *Social Science & Medicine* 72:72-82.

234 Warren JT, Harvey SM & Henderson JT (2010) Do Depression and Low Self-Esteem Follow Abortion Among Adolescents? Evidence from a National Study. *Perspectives on Sexual and Reproductive Health* 42(4):230-235.

235 Olsson CA, Horwill E, Moore E, Eisenberg ME, Venn A *et al.* (2013) Social and emotional adjustment following early pregnancy in young Australian women: a comparison of those who terminate, miscarry, or complete pregnancy. *J Adolesc Health* 54(6):698-703.

236 Leppälähti S, Heikinheimo O, Kalliala I, Santalahti P & Gissler M (2016) Is underage abortion associated with adverse outcomes in early adulthood? A longitudinal birth cohort study up to 25 years of age. *Hum Reprod* 31(9):2142-9.

237 Steinberg JR & Russo NF (2008) Abortion and anxiety: what's the relationship? *Social Science & Medicine* 67(2):238-52. Epub 2008 May 28.

238 Gissler M, Artama M, Ritvanen A & Wahlbeck K (2010) Use of psychotropic drugs before pregnancy and the risk for induced abortion: population-based register-data from Finland 1996-2006. *BMC Public Health* 383:1-10.

239 Mota NP, Burnett M & Sareen J (2010) Associations Between Abortion, Mental Disorders, and Suicidal Behaviour in a Nationally Representative Sample. *The Canadian Journal of Psychiatry* 55(4):239-247.

240 Sullins DP (2016) *Op. Cit.*

241 Coleman PK (2011) *Op. Cit.*

242 Yilmaz N, Kanat-Pektas M, Kilic S & Gulerman C (2010) Medical or surgical abortion and psychiatric outcomes. *J Maternal-Fetal & Neonatal Med* 23(6):541-544.

243 Rue VM *et al.* (2004) *Op. Cit.*

244 Broen AN, Moun T, Bödtker AS & Ekeberg O (2004) Psychological impact on women of miscarriage versus induced abortion: a 2-year follow-up study. *Psychosomatic Medicine* 66:265-271.

245 Rue VM *et al.* (2004) *Op. Cit.*

246 Mota NP *et al.* (2010) *Op. Cit.*

247 Coleman PK, Coyle CT & Rue VM (2010) Late-Term Elective Abortion and Susceptibility to Posttraumatic Stress Symptoms. *Journal of Pregnancy* 2010:1-10.

248 Coleman PK *et al.* (2010) *Op. Cit.*

249 Curley M & Johnston C (2013) *Op. Cit.*

250 Munk-Olsen T, Laursen TM, Pedersen CB, Lidegaard O & Mortensen PB (2011) Induced first-trimester abortion and risk of mental disorder. *New England Journal of Medicine* 364(4):332-9.

251 Rousset C, Brulfert C, Sejourne N *et al.* (2011) Posttraumatic stress disorder and psychological distress following medical and surgical abortion. *Journal of Reproductive and Infant Psychology* 29(5): 506-517.

252 Daugirdaite V, van den Akker O & Purewal S (2015) Posttraumatic stress and posttraumatic stress disorder after termination of pregnancy and reproductive loss: a systematic review. *Journal of Pregnancy* vol. 2015, Article ID 646345. doi:10.1155/2015/646345.

253 Gilchrist AC, Hannaford PC, Frank P & Kay CR (1995) Termination of pregnancy and psychiatric morbidity. *British Journal of Psychiatry* 167:243-8.

254 Sullins DP (2016) *Op. Cit.*

255 Olsson CA (2014) *Op. Cit.*

unintended pregnancy to term²⁵⁶. When pregnancy was assessed in relation to past perinatal loss - which included abortion, stillbirth and miscarriage - only abortion was found to be associated with an increased risk of substance abuse during that pregnancy²⁵⁷. Other research has confirmed the relationship between abortion and substance abuse, perhaps as an attempt to cope with emotional loss^{258,259,260}. It may be that of all the mental health problems related to abortion, substance abuse might contribute most to the community mental health burden^{261,262,263}.

Mental health during a subsequent pregnancy

Several studies have investigated the impact of abortion on women's mental health during a subsequent pregnancy and found an association with depression, anxiety, PTSD, and substance abuse^{264,265,266,267}. Pregnancy may be a particularly vulnerable time for some women who may experience difficult thoughts and emotions about a past pregnancy that ended in abortion. A study by Holmlund *et al.* found no such association but suffered from similar selection bias as the Turnaway Study²⁶⁸, managing to recruit only 18.3% of women asked to participate. Like the Turnaway, women distressed by their past abortion would selectively remove themselves from the research.

Other disorders

Several studies have identified other psychiatric complications following abortion. Women who have an abortion are at higher risk of psychiatric admission compared with women who carried to term^{269,270}. In a Californian study, women who had an abortion were over-represented in treatment categories that included bipolar disorder, neurotic depression and schizophrenic disorders²⁷¹. Nevertheless, a major UK study did not identify a difference in total psychiatric disorders between aborting women and those who carried to term²⁷². With regard to bipolar disorders, some researchers have found an association²⁷³, while others have not²⁷⁴. Sleep disorders and disturbances are also more common in women with a history of abortion²⁷⁵.

Several studies have identified relationship problems between couples where there has been a history of abortion, manifesting as sexual dysfunction^{276,277,278,279}. Furthermore, some evidence exists for a 'replacement pregnancy' phenomenon, where a subsequent pregnancy may be considered a way of resolving grief and stress about an abortion²⁸⁰.

256 Reardon DC, Coleman PK & Cogle JR (2004) Substance use associated with unintended pregnancy outcomes in the National Longitudinal Survey of Youth. *American Journal of Drug and Alcohol Abuse* May 30(2):369-83.

257 Coleman PK, Reardon DC & Cogle JR (2005) Substance use among pregnant women in the context of previous reproductive loss and desire for current pregnancy. *British Journal of Health Psychology* 10:255-268.

258 Dingle K, Alata R, Clavarino A, Najman JM & Williams GM (2008) Pregnancy loss and psychiatric disorders in young women: an Australian birth cohort study. *British Journal of Psychiatry* 193:455-460.

259 Pedersen W (2007) Childbirth, abortion and subsequent substance use in young women: a population-based longitudinal study. *Addiction* 102(12):1971-8.

260 Coleman PK *et al.* (2009) *Op. Cit.*

261 Fergusson DM *et al.* (2009) *Op. Cit.*

262 Coleman PK *et al.* (2009) *Op. Cit.*

263 Mota NP *et al.* (2010) *Op. Cit.*

264 Hamama L, Rauch SA, Sperlich M, *et al.* (2010) Previous experience of spontaneous or elective abortion and risk for posttraumatic stress and depression during subsequent pregnancy. *Depression & Anxiety* 27:699-707.

265 Gong X, Hao J, Tao F, Zhang J, Wang H & Xu R (2013) Pregnancy loss and anxiety and depression during subsequent pregnancies: data from the C-ABC study. *Eur J Obstet Gynecol Reprod Biol* 166(1):30-6.

266 Giannandrea SAM, Cerulli C, Anson E & Chaudron LH (2013) Increased risk for postpartum psychiatric disorders among women with past pregnancy loss. *J Womens Health(Larchmt)* 22(9):760-768.

267 Chojenta C, Harris S, Reilly N, Forder P, Austin MP & Loxton D (2014) History of pregnancy loss increases the risk of mental health problems in subsequent pregnancies but not in the postpartum. *PLoS One* 9(4):e95038. doi: 10.1371/journal.pone.0095038.

268 Holmlund S, Kaljonen A, Junntila N, Riih a H, M akinen J & Rautava P (2014) Psychological ill-being experienced by first-time mothers and their partners in pregnancy after abortion: a cohort study. *J Psychosom Obstet Gynaecol* 35(4):132-9.

269 Reardon DC, Cogle JR, Rue VM, Shuping MW, Coleman PK & Ney PG (2003) Psychiatric admissions of low-income women following abortion and childbirth. *Canadian Medical Association Journal* 168(10):1253-6.

270 Munk-Olsen T *et al.* (2011) *Op. Cit.*

271 Coleman PK, Reardon DC, Rue V & Cogle J (2002) State-funded abortions vs deliveries: a comparison of outpatient mental health claims over four years. *American Journal of Orthopsychiatry* 72:141-152.

272 Gilchrist AC *et al.* (1995) *Op. Cit.*

273 Coleman PK *et al.* (2009) *Op. Cit.*

274 Mota NP *et al.* (2010) *Op. Cit.*

275 Reardon DC & Coleman PK (2005) Relative treatment rates for sleep disorders and sleep disturbances following abortion and childbirth: a prospective record-based study. *Sleep* 28(12):1293-1294.

276 Coleman PK, Rue VM & Coyle CT (2009) Induced abortion and intimate relationship quality in the Chicago Health and Social Life Survey. *Public Health* 123:331-338.

277 Verit FF & Verit A (2008) A Turkish study of prevalence and risk factors for low sexual function in women. *Journal of Sexual Medicine* 5(12):2973-2974.

278 Bianchi-Demicheli F, Perrin E, L udicke F, Bianchi PG, Chatton D & Campana A (2002) Termination of pregnancy and women's sexuality. *Gynecologic and Obstetric Investigation* 53(1):48-53.

279 Coleman PK *et al.* (2010) *Op. Cit.*

280 Coleman PK *et al.* (2002) *Op. Cit.*

Past psychiatric history

Several studies have made the claim that it is not abortion per se that has an adverse impact on mental health outcomes, but instead women who access abortion already have poor mental health. For example, Danish researchers showed that the incidence of first psychiatric contact did not change pre versus post abortion²⁸¹. However, there are significant weaknesses with the study, and others by the same group, that limit the conclusions that can be drawn²⁸².

Nevertheless, Nilsen *et al.* have identified a link between prior adolescent substance abuse and likelihood of having an abortion²⁸³. In addition, work by Ditzhuijzen and co-workers has likewise found that women with a history of psychiatric ill health are over-represented among those who have abortions^{284,285,286}. Even so, caution needs to be applied, as for one of these studies²⁸⁷ the response rate was just 13%, pointing to significant risk of selection bias.

Despite the controversy over this issue, some women describe their own experiences of abortion as linked to mental harm^{288,289,290,291}.

The special case of abortion for foetal abnormality

There is a solid body of evidence showing that when an abortion is undertaken for reasons of foetal abnormality the after-effects can be particularly traumatic^{292,293,294}. Health professionals need to be aware that strong and persisting grief is likely, similar to that experienced for a stillbirth, but with the additional factor that the abortion was chosen^{295,296,297}.

Most women undergoing such procedures experience a range of difficult emotions including sadness, meaninglessness, loneliness, tiredness, grief, anger and frustration, as confirmed by many studies²⁹⁸.

Prior to late termination, women report feeling guilt, fear, anguish, unreality, relief, desperation, emptiness, and other conflicting emotions. 40% of women had only negative emotions²⁹⁹.

In a major Scottish study, a majority of men and women experienced negative emotional responses and somatic complaints, including problems in their sexual relationships³⁰⁰. Among women, 40% experienced coping problems lasting more than 12 months. But the effects can last much longer. For example, Dutch researchers found that grief and post-traumatic symptoms remained between 2 and 7 years after the event³⁰¹. In the same study, greater psychological distress was experienced by women when the foetus was at a more advanced gestational age. Other researchers found that, contrary to expectations, traumatic stress at 4 years was not significantly different to that experienced at

281 Munk-Olsen T *et al.* (2011) *Op. Cit.*

282 Reardon DC (2015) Postpartum mental health study flawed by fetal loss omission. *Scandinavian Journal of Primary Health Care* 33(4):318-319.

283 Nilsen W, Olsson CA, Karevold E, O'Loughlin C, McKenzie M & Patton GC (2012) Adolescent depressive symptoms and subsequent pregnancy, pregnancy completion and pregnancy termination in young adulthood: findings from the Victorian adolescent health cohort study. *J Pediatr Adolesc Gynecol* 25(1):6-11.

284 van Ditzhuijzen J, ten Have M, de Graaf R, van Nijntzen CH, Vollebergh WA (2013) Psychiatric history of women who have had an abortion. *J Psychiatr Res* 47(11):1737-43

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287 van Ditzhuijzen J *et al.* (2013) *Op. Cit.*

288 Goodwin P & Ogden J (2007) Women's reflections upon their past abortions: an exploration of how and why emotional reactions change over time. *Psychology and Health* 22(2):231-248.

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290 Trybulski J (2006) *Op. Cit.*

291 Fergusson DM, Horwood LJ & Boden JM (2009) Reactions to abortion and subsequent mental health. *The British Journal of Psychiatry* 195:420-426.

292 Koponen K, Laaksonen K, Vehkakoski T & Vehmas S (2013) Parental and professional agency in terminations for fetal anomalies: analysis of Finnish women's accounts. *Scandinavian Journal of Disability Research* 15(1): 33-44.

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297 Salvesen KA, Oyen L, Schmidt N, Malt UF & Eik-Nes SH (1997) Comparison of long-term psychological responses of women after pregnancy termination due to fetal anomalies and after perinatal loss. *Ultrasound in Obstetrics & Gynecology* Feb, 9(2):80-5.

298 Asplin N, Wessel H, Marions L & Öhman SG (2014) Pregnancy termination due to fetal anomaly: Women's reactions, satisfaction and experiences of care. *Midwifery* 30:620-627.

299 Andersson IM, Christensson K & Gemzell-Danielsson K (2014) Experiences, feelings and thoughts of women undergoing second trimester medical termination of pregnancy. *PLOS One* Dec 29, DOI:10.1371.

300 White-Van Mourik MCA *et al.* (1992) *Op. Cit.*

301 Korenromp MJ *et al.* (2005) *Op. Cit.*

14 days³⁰². Recent research by the same group³⁰³ has shown, using functional MRI, that the neural activation pathways underlying grief in women who terminated their pregnancies because of foetal abnormality are the same as those involved in physical pain.

More recent prospective research has identified adverse experiences following abortion for foetal anomaly. At four months, 8.8% experienced grief, 45.8% showed symptoms of post-traumatic stress, 12.2% exhibited psychological malfunctioning, and 27.9% had depression³⁰⁴. These symptoms declined over the following year.

Sometimes, during medical abortion for foetal abnormality, a baby is born alive. In the UK, live births following abortion were reported in 2.2% of abortions for foetal abnormality overall, and 4.8% of abortions without prior feticide. When an infant is live born after termination, the baby is provided with comfort care until death in the delivery suite, usually around one hour after birth³⁰⁵.

ABORTION STATISTICS FOR NEW ZEALAND

In 2016 (the most recent statistics available), there were 12,823 abortions in NZ, approximately 10% of which were for non-residents.³⁰⁶ This translates to an age-standardised abortion rate of 13.5 per 1000 women of reproductive age (15 - 44 years old). There has been a steady decline from a peak of 18,382 abortions in 2007, with the most significant decline for women under the age of 25. The reasons for the decline are disputed. A significant percentage (43%) of all abortions in NZ occur where contraception has been used, most commonly condoms and the oral contraceptive pill.

A majority of women having abortions had a previous live birth (57%), and 36% had already had 1 or more abortions. There were 595 who had previously had 3 or more abortions (4.6%).

Most abortions occur in the first trimester (89.8%), by surgical means (84.3%), and the formal reason for the overwhelming majority of abortions falls within the category 'danger to mental health' (97%). 231 abortions (1.8%) involved a handicapped child, 72 (0.6%) involved danger to the life and/or physical health of the mother, and 4 (0.03%) involved a criminal offence such as rape or incest.

In approximately 0.4% of abortions there were complications adversely affecting the mother's health, such as retained placenta or foetus, haemorrhage, or perforation of the uterus.

SUMMARY

Abortion is associated with a wide range of adverse physical and psychological outcomes. While research proving causality is limited, and much research in this field is yet to be conducted, there is already a large body of evidence describing the adverse outcomes. Women are entitled to be made aware of all the associated risks. Furthermore, because women who present for abortion are often ambivalent, and ambivalence is a known risk factor for later adverse effects, it is imperative that health professionals provide all relevant information. The nature of abortion, with its complex medical, social, legal and ethical dimensions demands extra care on the part of health professionals.



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303 Kersting A, Ohrmann P, Pedersen A, Kroker K, Samberg D et al. (2009) Neural Activation Underlying Acute Grief in Women After the Loss of an Unborn Child. *American Journal of Psychiatry* 166:1402-1410.

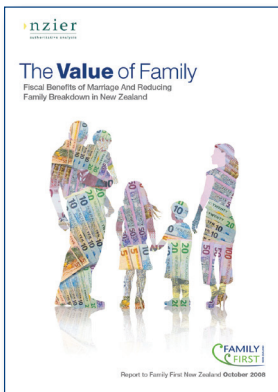
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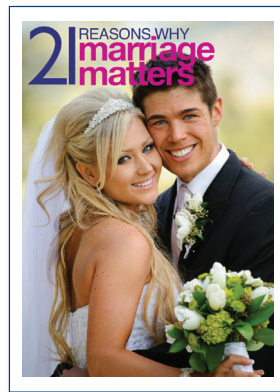
306 Report of the Abortion Supervisory Committee 2017.

See <https://www.justice.govt.nz/assets/Documents/Publications/asc-annual-report-2017.pdf>

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Family Breakdown
2008



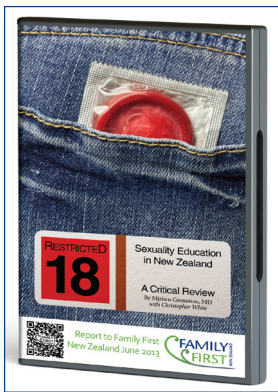
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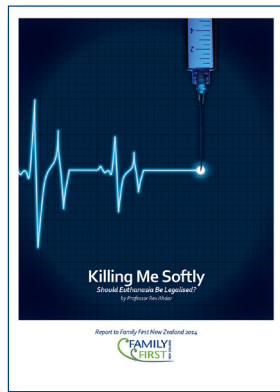
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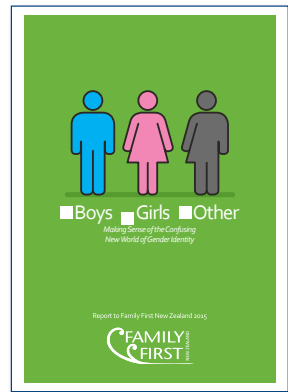
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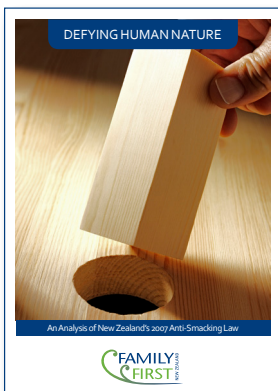
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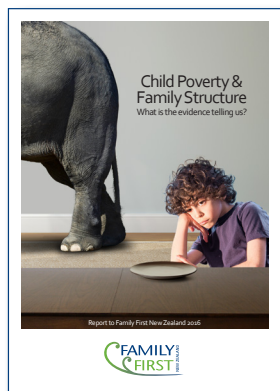
Screentime
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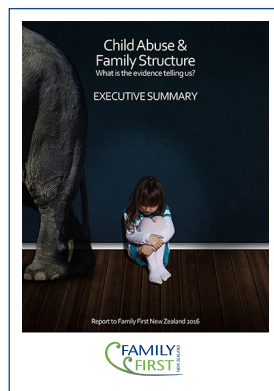
Gender Identity
2015



Anti-Smacking Law
2016



Child Poverty
2016



Child Abuse
2016