

ABORTION AND WOMEN'S HEALTH

An evidence-based review for medical professionals of the impact of abortion on women's physical and mental health.

By

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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}, 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 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 sets⁵. In a Dutch cohort study, abortion history was clearly underreported, mentioned by only 1.2% of all women giving birth⁶. Underreporting of abortion leads to an underestimation of its effects⁷. Other sources of bias, expanded upon in the section on psychological effects below, include the fact that distressed women are often excluded from studies⁸, or refuse to participate. Moreover, many studies of the physical risks of abortion include only healthy women⁹, 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 standards¹⁰, or to prove that women do not benefit from pre-abortion counselling^{11,12}. However, risk and safety have subjective elements, and with regard to an abortion procedure, it is the woman herself who will interpret

- 1 “In 2015, the vast majority (98%; 181,231) of abortions were undertaken under ground C. A further 2% were carried out under ground E (3,213) and a similar proportion (1%: 1,158) under ground D, whilst Grounds A and B together accounted for about a tenth of one per cent of abortions (219). The remaining 3 cases were performed under grounds F or G.” Department of Health (2016), Abortion Statistics, England and Wales, 2015, London, UK. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/570040/Updated_Abortion_Statistics_2015.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 & Cougle JR (2005) The psychology of abortion: a review and suggestions for future research. *Psychology and Health* 20(2):237-271.
- 5 Pedersen W (2008) Abortion and depression: a population-based longitudinal study of young women, *Scandinavian Journal of Public Health* 36:424-428.
- 6 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.
- 7 Ibid.
- 8 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.
- 9 White K, Carroll E & Grossman D (2015) Complications from first-trimester aspiration abortion: a systematic review of the literature. *Contraception* 92:422-438.
- 10 Ibid.
- 11 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.
- 12 Brown S (2013) Is counselling necessary? Making the decision to have an abortion. A qualitative interview study. *Eur J Contraception and Reprod Health Care* 18:44-48.

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 about safety are inappropriate.

This review of the evidence informs medical professionals of the issues that need to be raised with patients considering abortion and is intended for use in conjunction with the information sheet for patients.

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 harm¹³. 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 of psychological harm is higher than if motivated by other reasons, like not being able to cope or fear of jeopardising her future¹⁴.

Deciding to have an abortion is far more complex than simply not intending to become pregnant¹⁵. 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 ambivalence¹⁶. Women rarely see babies themselves as a threat, and instead 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 abortion¹⁷.

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 looked after by the UK government, 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 professionals¹⁸. 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

13 Pallitto CC, García-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.

14 White-Van Mourik MCA, Connor JM & Ferguson-Smith MA (1992) The psychosocial sequelae of a second-trimester termination of pregnancy for fetal abnormality. *Prenatal Diagnosis* 12:189-204.

15 Bankole A, Singh S & Taylor H (1998) Reasons why women have induced abortions: evidence from 27 countries. *International Family Planning Perspectives* 24(3):117-152.

16 Askelson NM, Losch ME, Thomas LJ & Reynolds JC (2015), “Baby? Baby not?” Exploring women’s narratives about ambivalence towards an unintended pregnancy, *Women and Health* 55:842-858.

17 Ibid.

18 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.

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.”¹⁹

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 security²⁰. 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 happen²¹.

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 difficulties, lack of confidence as a mother, and lack of community support^{22,23}. 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 house²⁴.

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’...”²⁵

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 partner²⁶, late diagnosis of pregnancy, and lack

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- 19 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.
- 20 Stern J, Joelsson LS, Tydén T, Berglund A, Ekstrand M, Hegaard H, Aarts C, Rosenblad A, Larsson M & Kristiansson P (2015) Is pregnancy planning associated with background characteristics and pregnancy-planning behaviour? *Acta Obstetrica et Gynecologica Scandinavica* 95:182-189.
- 21 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.
- 22 Allanson S & Astbury J (1995) The abortion decision: reasons and ambivalence. *Journal of Psychosomatic Obstetrics and Gynecology* 16:123-136.
- 23 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.
- 24 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.
- 25 Gray JB (2015) “It has been a long journey from first knowing”: Narratives of unplanned pregnancy. *Journal of Health Communication* 20:736-742.
- 26 Loeber O & Wijzen C (2008) Factors influencing the percentage of second trimester abortions in the Netherlands. *Reproductive Health Matters* 16 Supplement 31:30-36.

of certainty about being pregnant^{27,28}. 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 others²⁹.

As noted, ambivalence about an abortion decision is common^{30,31}. And what is of particular concern is the relationship between ambivalence and the potential development of long-term post-abortion psychological distress³², exacerbated by “impulsive and not fully internalized decisions”³³.

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 them³⁴, which might indicate the presence of coercive influences in favour of abortion³⁵. Studies have identified more negative post-abortion effects when women are morally opposed to abortion³⁶.

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 emotions³⁷, psychological distress³⁸, post-traumatic symptoms³⁹ and somatic complaints⁴⁰. One study comparing abortion and childbirth after a diagnosis of life-limiting foetal anomaly found a significantly worse emotional outcome for women who had abortions⁴¹. 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 identified⁴².

Social support is of vital importance in the context of unexpected pregnancy or when a pregnant woman

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- 27 Ingham R, Lee E, Clements SJ & Stone N (2008) Reasons for second trimester abortions in England and Wales, *Reproductive Health Matters* 16(31) Supplement, 18-29.
- 28 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.
- 29 Kirkman M et al. (2011) Op. Cit.
- 30 Törnblom M, Ingelhammar E, Lilja H, Svanberg B & Möller A (1999) Decision-making about unwanted pregnancy. *Acta Obstetrica et Gynecologica Scandinavica* 78:636-641.
- 31 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.
- 32 Söderberg H, Janzon L & Sjöberg NO (1998) Emotional distress following induced abortion. A study of its incidence and determinants among abortees in Malmö, Sweden. *European Journal of Obstetrics & Gynecology and Reproductive Biology* 79:173-8.
- 33 Korenromp MJ, Christiaens GC, van den Bout J, Mulder EJ, Hunfeld JA, Bilardo CM, Offermans JP & Visser GH (2005) Long-term psychological consequences of pregnancy termination for fetal abnormality: a cross-sectional study. *Prenatal Diagnosis* 25:253-260.
- 34 Allanson S & Astbury J (1995) Op. Cit.
- 35 Adamczyk A (2008) The effects of religious contextual norms, structural constraints, and personal religiosity on abortion decisions. *Social Science Research* 37:657-672.
- 36 Rue VM, Coleman PK, Rue JJ & Reardon DC (2004) Induced abortion and traumatic stress: a preliminary comparison of American and Russian women. *Medical Science Monitor* 10(10):SR5-16.
- 37 White-Van Mourik MCA et al. (1992) Op. Cit.
- 38 Davies V, Gledhill J, McFadyen A, Whitlow B & Economides D (2005) Psychological outcome in women undergoing termination of pregnancy for ultrasound-detected fetal anomaly in the first and second trimesters: a pilot study. *Ultrasound in Obstetrics & Gynecology* 25:389-392.
- 39 Korenromp MJ et al. (2005) Op. Cit.
- 40 White-Van Mourik MCA et al. (1992) Op. Cit.
- 41 Cope H, Garrett M, Gregory S, Ashley-Koch A (2015) Pregnancy continuation and organizational religious activity following prenatal diagnosis of a lethal fetal defect are associated with improved psychological outcome. *Prenatal Diagnosis* 35: 761-768.
- 42 Rowe HJ, Fisher JRW & Quinlavin JA (2006) Are pregnant Australian women well informed about prenatal genetic screening? A systematic investigation using the Multidimensional Measure of Informed Choice. *Australian and New Zealand Journal of Obstetrics and Gynaecology* 46:433-439.

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 situation⁴³.

Foetal anomaly

Throughout Europe and Australia there has been an increase in the prevalence of foetal anomalies, mainly due to increasing maternal age^{44,45}. 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, compared with 84% in France, and 26% in the Netherlands⁴⁶.

An estimated 99% of babies with Down's syndrome are terminated in England and Wales (Department of Health statistics on abortion for foetal anomaly may be unreliable, for example reporting only 49% of all terminations for Down's syndrome)⁴⁷. Moreover, lower socioeconomic areas in the UK appear to have lower rates of antenatal detection and also termination of Down's syndrome⁴⁸.

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 recommendation⁴⁹. 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 decisions⁵⁰.

Factors that increase the chance of termination for sex chromosome anomaly included parents' fear and anxiety about children with disabilities, as well as directive counselling⁵¹. Nevertheless, some women are more likely to resist social norms and refuse termination for Down's 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's 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 specialists⁵².

International research shows that while health professionals tend to value accuracy and early testing for

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- 43 Gray J (2014) Social support communication in unplanned pregnancy: Support types, messages, sources, and timing. *Jnl Health Communication* 19:1196-1211.
- 44 Loane M, Morris JK, Addor MC, Arriola L, Budd J, et al. (2013) Twenty-year trends in the prevalence of Down syndrome and other trisomies in Europe: impact of maternal age and prenatal screening. *European Journal of Human Genetics* 21:37-33.
- 45 Maxwell S, Bower C & O'Leary P (2015) Impact of prenatal screening and diagnostic testing on trends in Down syndrome births and terminations in Western Australia 1980-2013. *Prenatal Diagnosis* 35:1324-1330.
- 46 Vassy C, Rosman S & Rousseau B (2014) From policy making to service use. Down's syndrome antenatal screening in England, France and the Netherlands. *Social Science and Medicine* 106:67-74.
- 47 Morris JK, Grinstead M & Springett AL (2015) Accuracy of reporting abortions with Down syndrome in England and Wales: a data linkage study. *Journal of Public Health* 38(1):170-174.
- 48 Budd JLS, Draper ES, Lotto RR, Berry LE & Smith LK (2015) Socioeconomic inequalities in pregnancy outcome associated with Down syndrome: a population-based study. *Arch Dis Child Fetal Neonatal Ed* 100:F400-F404.
- 49 Aune I & Moller A (2012) 'I want a choice, but I don't want to decide' - a qualitative study of pregnant women's experiences regarding early ultrasound risk assessment for chromosomal anomalies. *Midwifery* 28:14-23.
- 50 Ibid.
- 51 Jeon KC, Chen LS & Goodson P (2012) Decision to abort after a prenatal diagnosis of sex chromosome abnormality: a systematic review of the literature. *Genetics in Medicine* 14(1):27-38.
- 52 Choi H, Van Riper M & Thoyre S (2012) Decision making following a prenatal diagnosis of Down Syndrome: An integrative review. *Jnl Midwifery and Women's Health* 57:156-164.

Down's syndrome in prenatal care, women are instead more interested in test safety and comprehensive information⁵³. 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 pregnancies⁵⁴. 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."⁵⁵ A recent study of 45 women receiving prenatal testing in London found that while they understood the testing, they had a poor understanding of Down's syndrome, no knowledge of Edwards and Patau syndromes, and few knew someone with these syndromes⁵⁶.

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 information⁵⁷.

Intimate partner violence (IPV)

IPV is a strong risk factor for abortion all over the world^{58,59,60,61,62,63,64}. 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 care⁶⁵.

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 miscarriage⁶⁶. The association between IPV

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- 53 Hill M, Johnson JA, Langlois S, Lee H, Winsor S, et al. (2016) Preferences for prenatal tests for Down syndrome: an international comparison of the views of pregnant women and health professionals. *European Journal of Human Genetics* 24:968-975.
- 54 Asplin N, Wessel H, Marions L & Öhman SG (2013) Pregnant women's perspectives on decision-making when a fetal malformation is detected by ultrasound examination. *Sex Reprod Healthcare* 4:79-84.
- 55 Benute GR, Nomura RM, Liao AW, Brizot Mde L, De Lucia MC & Zugaib M (2012) Feelings of women regarding end-of-life decision making after ultrasound diagnosis of a lethal fetal malformation. *Midwifery* 28:472-475.
- 56 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.
- 57 Choi H et al. (2012) Op. Cit.
- 58 Pallitto CC, García-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.
- 59 Hedin LW & Janson PO (2000) Domestic violence during pregnancy: the prevalence of physical injuries, substance use, abortions and miscarriages. *Acta Obstetrica et Gynecologica Scandinavica* 79:625-630.
- 60 Taft AJ & Watson LF (2007) Termination of pregnancy: associations with partner violence and other factors in a national cohort of young Australian women. *Australian and New Zealand Journal of Public Health* 31(2):135-142.
- 61 Coker AL (2007) Does physical intimate partner violence affect sexual health? A systematic review. *Trauma, Violence, and Abuse* 8:149-177.
- 62 Fanslow F, Silva M, Whitehead A & Robinson E (2008) Pregnancy outcomes and intimate partner violence in New Zealand. *Australian and New Zealand Journal of Obstetrics and Gynaecology* 48:391-397.
- 63 Coleman PK, Maxey CD, Spence M & Nixon CL (2009) Predictors and Correlates of Abortion in the Fragile Families and Well-Being Study: Paternal Behavior, Substance Use, and Partner Violence. *International Journal of Mental Health and Addiction* 7(3):405-422.
- 64 Silverman JG, Decker MR, McCauley HR, Gupta J, Miller E, Raj A & Goldberg AB (2010) Male perpetration of intimate partner violence and involvement in abortions and abortion-related conflict. *American Journal of Public Health* 100 (8):1415-1417.
- 65 Wokoma TT, Jampala M, Bexhell H, Guthrie K & Lindow S (2014) A comparative study of the prevalence of domestic violence in women requesting a termination of pregnancy and those attending an antenatal clinic. *BJOG* 121:627-633.
- 66 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.

and repeat abortion indicates that there is a repetitive cycle of abuse and pregnancy⁶⁷.

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 abortion⁶⁸. Coercion and pressure are well established risk factors for women's psychological adjustment to abortion⁶⁹.

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 services⁷⁰. RCOG guidelines 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 needed⁷¹.

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 foetus will experience pain⁷². 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 6-7th weeks), due to maturation of particular neural structures as well as the lack of pain inhibition mechanisms⁷³.

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, domestic servitude, and as 'wives', even in the UK⁷⁴. The risk of sexual violence is high for these women and girls,

67 Hall M, Chappell LC, 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.

68 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.

69 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.

70 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.

71 O'Doherty L, Hegarty K, 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.

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

73 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.

74 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.

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 health care.

In a study of 107 survivors of sex trafficking in the USA, the women reported a total of 114 abortions, many forced⁷⁵. 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

Medical abortion is rapidly becoming more common than surgical abortion around the world. In 2014, medical abortions overtook surgical abortions in England and Wales for the first time⁷⁶.

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^{77,78}.

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."⁷⁹ A 2015 systematic review, co-authored by a Danco consultant, concluded that outpatient medical abortion regimens up to 70 days gestation are highly effective and severe adverse events are uncommon⁸⁰.

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 outcomes⁸¹. Planned Parenthood has improved safety in its administration of medical abortion after noting several deaths from

75 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.

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

77 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.

78 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.

79 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.

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

81 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.

infection, and after 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 a vaginal route or no antibiotics⁸².

Despite the glowing reviews of medical abortion by providers and advocates, women find medical abortion substantially more painful than surgical abortion due to uterine contractions⁸³. High levels of pain are experienced by women in the days following their abortions, yet pain is an issue neglected 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^{84,85}. 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 practice⁸⁶.

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 traumatic⁸⁷. Medical abortion requires more patient participation than a surgical abortion, and women are more aware of the physical aspects of the process^{88,89}.

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 surgical⁹⁰. Planned Parenthood data from the US also indicates that medical and surgical

82 Trussell J et al. (2014) Op. Cit.

83 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.

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

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

86 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.

87 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.

88 Bartz D & Goldberg A (2009) Op. Cit.

89 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.

90 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.

abortion in the first trimester have equivalent levels of safety and efficacy⁹¹. Surgical evacuation is still required for 2-8% of women after a medical abortion⁹².

In the UK context for 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 safer⁹³. 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 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. 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%⁹⁴. 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.”⁹⁵ 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^{96,97,98}.

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- 91 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.
- 92 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.
- 93 Lyus R, Robson S, Parsons J, Fisher J & Cameron M (2013) Second trimester abortion for fetal abnormality. *BMJ* 347:f4165.
- 94 White K, Carroll E & Grossman D (2015) Complications from first-trimester aspiration abortion: a systematic review of the literature. *Contraception* 92:422-438.
- 95 World Health Organization (2004) *Definitions of Maternal Death. Beyond the numbers: Reviewing maternal deaths and complications to make pregnancy safer*, Geneva, 2004.
- 96 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.
- 97 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.
- 98 Gissler M, Hemminki E & Lönnqvist J (1996) Suicides after pregnancy in Finland, 1987-94: register linkage study. *British Medical Journal* 313:1431-4.

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 abortion⁹⁹.

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 women¹⁰⁰. 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)¹⁰¹. 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.”¹⁰²

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 perinatal losses were associated with greater risks of death¹⁰³.

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 pregnancy¹⁰⁴. 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 deaths¹⁰⁵ 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 ascertain¹⁰⁶. A recent review of research methods demonstrates that the majority of published studies of maternal mortality are of very

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- 99 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.
- 100 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.
- 101 Gissler M et al. (2004) Op. Cit.
- 102 Karalis E et al. (2016) Op. Cit.
- 103 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.
- 104 Raymond EG & Grimes DA (2012) The comparative safety of legal induced abortion and childbirth in the United States. *Obstet Gynecol* 119:215-9.
- 105 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.
- 106 Coleman PK et al. (2012) Op. Cit.

poor quality; most problematic is the conflation of induced and spontaneous abortion data¹⁰⁷. Even global WHO data on maternal mortality has been criticised for errors, its figures being called “implausibly low” due to underreporting¹⁰⁸. 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 annually¹⁰⁹. 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 estimate¹¹⁰.

Risk of death resulting directly from complications during abortion is low, but increases with each week of gestation¹¹¹. 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 sources¹¹². Using just one of these sources will lead to underestimation. Gerdts 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 stigmatized abortion leads to women being unwilling to seek help for complications. And even in the USA where abortion is widely practiced and accepted, doctors fail to report recent or current pregnancies on a minimum of 50% of death certificates¹¹³. 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 health¹¹⁴. 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 death¹¹⁵.

Overall, the evidence points to common risk factors for both death and abortion. An abortion request

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- 107 Gerdts C, Vohra D & Ahern J (2013) Measuring unsafe abortion-related mortality: a systematic review of the existing methods. *PLOS One* 8(1):e53346.
- 108 Gerland P, Masquelier B, Helleringer S, Hogan D, Mathers CD et al. (2015) Correspondence: Maternal mortality estimates. *The Lancet* 384(9961):2211.
- 109 Say L et al. (2014) Op. Cit.
- 110 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.
- 111 Diedrich J & Steinauer J (2009) Complications of surgical abortion. *Clinical Obstetrics and Gynecology* 52(2):205-212.
- 112 Gerdts C, Tunçalp O, Johnston H & Ganatra B (2015) Measuring abortion-related mortality: challenges and opportunities. *Reproductive Health* 12:87.
- 113 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.
- 114 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.
- 115 Reardon DC et al. (2002) Op. Cit.

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 support¹¹⁶.

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^{117,118,119,120,121,122,123,124,125}.

Brazil has a high rate of preterm birth and a large multicentre case control study has found that previous abortion is a risk factor¹²⁶. 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)¹²⁷.

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 women¹²⁸. 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 pregnancy¹²⁹. 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

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- 116 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.
- 117 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.
- 118 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.
- 119 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.
- 120 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.
- 121 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.
- 122 Van Oppenraaij RH et al. (2009) Op.Cit.
- 123 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.
- 124 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.
- 125 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.
- 126 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.
- 127 Makhoul 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.
- 128 Kmietowicz Z (2015) Dilatation and curettage procedure raises risk of premature birth in subsequent pregnancies, study finds. *BMJ News* 350:h3261.
- 129 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.

of the cervix prior to surgical abortion¹³⁰.

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 outcomes¹³¹.

Other studies have not found any association between abortion and subsequent premature birth^{132,133,134}.

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 relationship¹³⁵.

In later pregnancies, a study of Finnish Registry Data 1983-2007 found abortion to be associated with smoking after the first trimester, and being overweight during pregnancy; the authors recommend that doctors performing abortions should inform their patients about the importance of adequate prenatal care in subsequent pregnancies¹³⁶.

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^{137,138,139,140,141,142,143,144,145} and some showing

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- 130 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).
- 131 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.
- 132 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.
- 133 Reime B, Schücking BA & Wenzlaff P (2008) Reproductive outcomes in adolescents who had a previous birth or induced abortion compared to adolescent's first pregnancies. *BMC Pregnancy Childbirth* 8:4.
- 134 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.
- 135 Basso O (2015) Invited Commentary: Induced abortion and the risk of preeclampsia in a subsequent pregnancy. *American Journal of Epidemiology* 182(8):670-672.
- 136 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.
- 137 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.
- 138 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.
- 139 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.
- 140 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.
- 141 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.
- 142 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.
- 143 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.
- 144 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.
- 145 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 Udupi District. *Indian J Community Med* 38(2):95-99.

none^{146,147,148,149,150}. The field remains in dispute^{151,152}, 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 settled¹⁵³.

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^{154,155}. 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 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 causality¹⁵⁶.

Reviews

Reviews have arrived at disparate conclusions^{157,158,159,160,161,162,163}, highlighting that the field is riven with

- 146 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.
- 147 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.
- 148 Beral V et al. (2004) Op. Cit.
- 149 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.
- 150 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.
- 151 Brind J (2009) The abortion-breast cancer connection. *Specialty Law Digest. Health Care Law* 340:9-35.
- 152 Rowlands S (2011) Misinformation on abortion. *European Journal of Contraception and Reproductive Health Care* 16(4):233-40.
- 153 Phillips KA, Bruinsma FJ & Milne RL (2014) Abortion and breast cancer risk for Australian women. *MJA* 201(7):381.
- 154 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.
- 155 Russo IH & Russo J (2011) Pregnancy-induced changes in breast cancer risk. *Journal of Mammary Gland Biology and Neoplasia* 16(3):221-33.
- 156 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.
- 157 American Psychological Association (2008) Report on the Task Force on Mental Health and Abortion. Washington DC.
- 158 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.
- 159 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.
- 160 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.
- 161 Cameron S (2010) Induced abortion and psychological sequelae. *Best Practice & Research Clinical Obstetrics and Gynaecology* 24:657-665.
- 162 Casey PR (2010) Abortion among young women and subsequent life outcomes. *Best Practice & Research Clinical Obstetrics and Gynaecology* 24:491-502.
- 163 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.

disagreement^{164,165}, 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 occurring by miscarriage, induced abortion, or stillbirth¹⁶⁶. Nevertheless, some reviews advance a very strong view that there is no link^{167,168}, 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 harm¹⁶⁹.

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.”¹⁷⁰

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^{171,172,173,174,175}. 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 not¹⁷⁶. This is not to deny that where other comparisons have been made, useful and informative data nonetheless exists.

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- 164 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
- 165 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.
- 166 Bellieni CV & Buonocore G (2013) Abortion and subsequent mental health: Review of the literature. *Psychiatry and Clinical Neurosciences* 67:301–310.
- 167 Stotland NL (2011) Induced abortion and adolescent mental health. *Curr Opin Obstet Gynecol* 23:340–3.
- 168 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.
- 169 Kelly K (2014) The spread of ‘Post Abortion Syndrome’ as social diagnosis. *Social Science and Medicine* 102:18–25.
- 170 Coleman PK (2012) Author reply to “Abortion and mental health: guidelines for proper scientific conduct ignored.” *The British Journal of Psychiatry* 200:74–83.
- 171 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.
- 172 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.
- 173 Barrett G & Wellings K (2002) What is a ‘planned’ pregnancy? empirical data from a British study. *Social Science and Medicine* 55:545–557.
- 174 Kirkman M et al. (2010) Op. Cit.
- 175 Williams L, Piccinino L, Abma J & Arguillas F (2001) Pregnancy wantedness: attitude stability over time. *Social Biology* 48(3):212–233.
- 176 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 papers¹⁷⁷.

In brief, the primary finding of the study, and contrary to the finding of 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 effects on emotional responses^{178, 179}, perceived stress and emotional support¹⁸⁰, substance use and/or abuse^{181,182,183,184}, self-esteem or life satisfaction¹⁸⁵, partner relationship^{186,187}, depression, anxiety and post-traumatic stress^{188,189,190,191}, and aspirational plans¹⁹².

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

178 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.

179 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.

180 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).

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

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

183 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.

184 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.

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

186 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.

187 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.

188 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.

189 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.

190 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.

191 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.

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

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 abortion¹⁹³, 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 dropout yielding 22% participation at 5 years. It would be unsurprising if 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^{194,195}, 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 participate¹⁹⁶.

Another important aspect of research design involves the timing of when surveys are conducted. For example, in a study by Toffol and coworkers¹⁹⁷, 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 out¹⁹⁸, 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 frame¹⁹⁹. Phenomenological research suggests that

15:102.

193 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/>

194 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.

195 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.

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

197 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.

198 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.

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

women may cope well initially, but years later reappraise the event negatively^{200,201}. 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 relive²⁰².

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^{203,204,205,206,207,208}. However, some studies also identify positive reactions like relief, happiness and satisfaction²⁰⁹. 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 made²¹⁰. 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 abortion²¹¹.

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 decision²¹². 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 and those of 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 miscarried²¹³. In contrast, in a pilot study, Canario and co-workers found there to be no difference in emotional adjustment between

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- 200 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.
- 201 Trybulski J (2006) Women and abortion: the past reaches into the present. *Journal of Advanced Nursing* 54(6):683-690.
- 202 Keys J (2010) Running the gauntlet: women's use of emotion management techniques in the abortion experience. *Symbolic Interaction* 33(1):41-70.
- 203 Kero A et al. (2001) Op. Cit.
- 204 Kero A et al. (2004) Op. Cit.
- 205 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.
- 206 Fergusson DM et al. (2009) Op. Cit.
- 207 Hess RF (2004) Dimensions of women's long-term postabortion experience. *The American Journal of Maternal Child Nursing* 29(3):193-198.
- 208 Korenromp MJ et al. (2005) Op. Cit.
- 209 Fergusson DM et al. (2009) Op. Cit.
- 210 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.
- 211 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.
- 212 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.
- 213 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.

women who had a miscarriage, induced abortion, or abortion for foetal anomalies²¹⁴. 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"²¹⁵. 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 study²¹⁶ on mental health and abortion confirm other work showing a link between the two²¹⁷. 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 confirmed²¹⁸. 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 inferring 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 disorders²¹⁹. Other researchers have also found a link between abortion and depression^{220,221,222}, as well as anxiety²²³, although some groups have not been able to confirm this^{224,225,226,227}. 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

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- 214 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.
- 215 Kimport K (2012) (Mis)Understanding abortion regret. *Symbolic Interaction* 35(2):105-122.
- 216 Fergusson DM et al. (2006) Op. Cit.
- 217 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.
- 218 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.
- 219 Fergusson DM et al. (2009) Op. Cit.
- 220 Pedersen W (2008) Op. Cit.
- 221 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.
- 222 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.
- 223 Broen AN et al. (2005) Op. Cit.
- 224 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.
- 225 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.
- 226 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.
- 227 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.

abortion itself^{228,229,230}.

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 anxiety²³¹. Sullins, like Coleman et al.²³², 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 one²³³.

Post-traumatic stress

A small proportion of women develop post-traumatic stress disorder (PTSD) following abortion^{234,235}. This may be related to cultural factors²³⁶. More recent studies have confirmed an elevated risk of PTSD after abortion, which weakened but persisted after controlling for confounders^{237,238}. In one of these studies, abortions later in pregnancy were associated with higher PTSD scores²³⁹, and in a separate study, PTSD symptoms remained elevated after 3 years²⁴⁰. Incidence of first psychiatric contact for neurotic, stress-related or somatoform disorder was elevated 2-3 months after an abortion²⁴¹.

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 pregnancies²⁴². In their review of 48 studies, Daugirdaite et al.²⁴³ 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.

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- 228 Steinberg JR & Russo NF (2008) Abortion and anxiety: what's the relationship? *Social Science & Medicine* 67(2):238-52. Epub 2008 May 28.
- 229 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.
- 230 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.
- 231 Sullins DP (2016) Op. Cit.
- 232 Coleman PK (2011) Op. Cit.
- 233 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.
- 234 Rue VM et al. (2004) Op. Cit.
- 235 Broen AN, Moum T, Bødtker AS & Ekeberg O (2004) Psychological impact on women of miscarriage versus induced abortion: a 2-year follow-up study. *Psychosomatic Medicine* 66:265-271.
- 236 Rue VM et al. (2004) Op. Cit.
- 237 Mota NP et al. (2010) Op. Cit.
- 238 Coleman PK, Coyle CT & Rue VM (2010) Late-Term Elective Abortion and Susceptibility to Posttraumatic Stress Symptoms. *Journal of Pregnancy* 2010:1-10.
- 239 Coleman PK et al. (2010) Op. Cit.
- 240 Curley M & Johnston C (2013) Op. Cit.
- 241 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.
- 242 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.
- 243 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.

Substance abuse and self-harm

In 1995, a UK study identified an increase in deliberate self-harm after abortion, which includes substance abuse.²⁴⁴ This was corroborated more recently in the study by Sullins²⁴⁵ and also by Olsson et al.²⁴⁶. 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 unintended pregnancy to term²⁴⁷. 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 pregnancy²⁴⁸. Other research has confirmed the relationship between abortion and substance abuse, perhaps as an attempt to cope with emotional loss^{249,250,251}. It may be that of all the mental health problems related to abortion, substance abuse might contribute most to the community mental health burden^{252,253,254}.

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^{255,256,257,258}. 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 to the Turnaway Study²⁵⁹, managing to recruit only 18.3% of women asked to participate. As with the Turnaway Study, 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

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- 244 Gilchrist AC, Hannaford PC, Frank P & Kay CR (1995) Termination of pregnancy and psychiatric morbidity. *British Journal of Psychiatry* 167:243-8.
- 245 Sullins DP (2016) Op. Cit.
- 246 Olsson CA (2014) Op. Cit.
- 247 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.
- 248 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.
- 249 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.
- 250 Pedersen W (2007) Childbirth, abortion and subsequent substance use in young women: a population-based longitudinal study. *Addiction* 102(12):1971-8.
- 251 Coleman PK et al. (2009) Op. Cit.
- 252 Fergusson DM et al. (2009) Op. Cit.
- 253 Coleman PK et al. (2009) Op. Cit.
- 254 Mota NP et al. (2010) Op. Cit.
- 255 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.
- 256 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.
- 257 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.
- 258 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.
- 259 Holmlund S, Kaljonen A, Junttila N, Räihä H, Mäkinen 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.

abortion are at higher risk of psychiatric admission compared with women who carried to term^{260,261}. In a Californian study, women who had an abortion were over-represented in treatment categories that included bipolar disorder, neurotic depression and schizophrenic disorders²⁶². Nevertheless, a major UK study did not identify a difference in total psychiatric disorders between aborting women and those who carried to term²⁶³. With regard to bipolar disorders, some researchers have found an association²⁶⁴, while others have not²⁶⁵. Sleep disorders and disturbances are also more common in women with a history of abortion²⁶⁶.

Several studies have identified relationship problems between couples where there has been a history of abortion, manifesting as sexual dysfunction^{267,268,269,270}. 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 abortion²⁷¹.

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 abortion²⁷². However, there are significant weaknesses with the study, and others by the same group that limit the conclusions that can be drawn²⁷³.

Nevertheless, Nilsen et al have identified a link between prior adolescent substance abuse and likelihood of having an abortion²⁷⁴. 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^{275,276,277}. Even

260 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.

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

262 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.

263 Gilchrist AC et al. (1995) Op. Cit.

264 Coleman PK et al. (2009) Op. Cit.

265 Mota NP et al. (2010) Op. Cit.

266 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.

267 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.

268 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.

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

270 Coleman PK et al. (2010) Op. Cit.

271 Coleman PK et al. (2002) Op. Cit.

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

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

274 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.

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

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so, caution needs to be applied, as for one of these studies²⁷⁸ 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^{279,280,281,282}.

The Special Case of Abortion for Foetal Anomaly

There is a solid body of evidence showing that when an abortion is undertaken for reasons of foetal anomaly the after-effects can be particularly traumatic^{283,284,285}. 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^{286,287,288}.

Most women undergoing such procedures experience a range of difficult emotions including sadness, meaninglessness, loneliness, tiredness, grief, anger and frustration, as confirmed by many studies²⁸⁹.

Prior to late termination, women report feeling guilt, fear, anguish, unreality, relief, desperation, emptiness, and other conflicting emotions. 40% of women had only negative emotions²⁹⁰.

In a major Scottish study, a majority of men and women experienced negative emotional responses and somatic complaints, including problems in their sexual relationships²⁹¹. 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 event²⁹². 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

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- 291 White-Van Mourik MCA et al. (1992) Op. Cit.
- 292 Korenromp MJ et al. (2005) Op. Cit.

years was not significantly different to that experienced at 14 days²⁹³. Recent research by the same group²⁹⁴ has shown, using functional MRI, that the neural activation pathways underlying grief in women who terminated their pregnancies because of foetal anomaly 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 depression²⁹⁵. These symptoms declined over the following year.

Sometimes, during medical abortion for foetal anomaly, a baby is born alive. In the UK, live births following abortion were reported in 2.2% of abortions for foetal anomaly 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 birth²⁹⁶.

ABORTION STATISTICS FOR ENGLAND AND WALES 2016

The age-standardised abortion rate was 16 per 1000 women of reproductive age. 98% of abortions were funded by the NHS, and 68% took place in the independent sector. 92% took place before 13 weeks gestation, 80% under 10 weeks. Medical abortions account for 55% of the total, more than double the proportion in 2005. 2% were carried out on the grounds that the child would be born ‘seriously handicapped.’²⁹⁷

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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Society for the **Protection**
of Unborn Children

2017

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Code: AWH0517