ABOUT THE AUTHOR

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

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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


7 Ibid.


10 Ibid.


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 harm\(^\text{13}\). 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 future\(^\text{14}\).

Deciding to have an abortion is far more complex than simply not intending to become pregnant\(^\text{15}\). 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 ambivalence\(^\text{16}\). 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 abortion\(^\text{17}\).

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 professionals\(^\text{18}\). 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

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\(^{17}\) Ibid.

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.\textsuperscript{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 security\textsuperscript{20}. 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 happen\textsuperscript{21}.

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\textsuperscript{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 house\textsuperscript{24}.

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’…”\textsuperscript{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 partner\textsuperscript{26}, late diagnosis of pregnancy, and lack
of certainty about being pregnant\textsuperscript{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 others\textsuperscript{29}.

As noted, ambivalence about an abortion decision is common\textsuperscript{30,31}. And what is of particular concern is the relationship between ambivalence and the potential development of long-term post-abortion psychological distress\textsuperscript{32}, exacerbated by “impulsive and not fully internalized decisions”\textsuperscript{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 them\textsuperscript{34}, which might indicate the presence of coercive influences in favour of abortion\textsuperscript{35}. Studies have identified more negative post-abortion effects when women are morally opposed to abortion\textsuperscript{36}.

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 emotions\textsuperscript{37}, psychological distress\textsuperscript{38}, post-traumatic symptoms\textsuperscript{39} and somatic complaints\textsuperscript{40}. One study comparing abortion and childbirth after a diagnosis of life-limiting foetal anomaly found a significantly worse emotional outcome for women who had abortions\textsuperscript{41}. 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 identified\textsuperscript{42}.

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

\begin{thebibliography}{99}
\bibitem{29} Kirkman M et al. (2011) Op. Cit.
\bibitem{40} White-Van Mourik MCA et al. (1992) Op. Cit.
\end{thebibliography}
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 situation.

**Foetal anomaly**

Throughout Europe and Australia there has been an increase in the prevalence of foetal anomalies, mainly due to increasing maternal age. 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 Netherlands.

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). Moreover, lower socioeconomic areas in the UK appear to have lower rates of antenatal detection and also termination of Down’s syndrome.

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 recommendation. 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 decisions.

Factors that increase the chance of termination for sex chromosome anomaly included parents’ fear and anxiety about children with disabilities, as well as directive counselling. 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 specialists.

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

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50  Ibid.
Down’s syndrome in prenatal care, women are instead more interested in test safety and comprehensive information\textsuperscript{53}. 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 pregnancies\textsuperscript{54}. 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,”\textsuperscript{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 syndromes\textsuperscript{56}.

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 information\textsuperscript{57}.

**Intimate partner violence (IPV)**

IPV is a strong risk factor for abortion all over the world\textsuperscript{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 care\textsuperscript{65}.

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 miscarriage\textsuperscript{66}. The association between IPV

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and repeat abortion indicates that there is a repetitive cycle of abuse and pregnancy\(^67\).

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 abortion\(^68\). Coercion and pressure are well established risk factors for women’s psychological adjustment to abortion\(^69\).

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 services\(^70\). 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 needed\(^71\).

**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 pain\(^72\). 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 mechanisms\(^73\).

**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 UK\(^74\). The risk of sexual violence is high for these women and girls,
beginning at the point where they agree to or are forced to travel. Forced abortion is common for those trafficked into prostitution, and often provided by untrained or poorly qualified practitioners in unsafe settings. Other than abortion, trafficked women rarely have access to 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 effective77,78.

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

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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 antibiotics.82

Despite the glowing reviews of medical abortion by providers and advocates, women find medical abortion substantially more painful than surgical abortion due to uterine contractions.83 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 practice.86

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 traumatic.87 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 surgical.90 Planned Parenthood data from the US also indicates that medical and surgical

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

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 safer. 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%. 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.” 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.

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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 abortion.

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 women. 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). 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.”

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 death.

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 pregnancy. 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 deaths 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 ascertain. A recent review of research methods demonstrates that the majority of published studies of maternal mortality are of very poor quality.

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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, Tuncapel O, Moller AB et al. (2014) Global causes of maternal death: a WHO systematic analysis. Lancet Glob Health 2:e323-33.

poor quality; most problematic is the conflation of induced and spontaneous abortion data\textsuperscript{107}. Even global WHO data on maternal mortality has been criticised for errors, its figures being called “implausibly low” due to underreporting\textsuperscript{108}. 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 annually\textsuperscript{109}. 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 estimate\textsuperscript{110}.

Risk of death resulting directly from complications during abortion is low, but increases with each week of gestation\textsuperscript{111}. 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 sources\textsuperscript{112}. 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 certificates\textsuperscript{113}. 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 health\textsuperscript{114}. 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 death\textsuperscript{115}.

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

should be viewed as a flag for women who might need assistance in various areas of their lives. The Finnish government has acted upon this and achieved a small reduction in post-abortion mortality by providing such post-abortion 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 delivery117,118,119,120,121,122,123,124,125.

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

of the cervix prior to surgical abortion\textsuperscript{130}.

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 outcomes\textsuperscript{131}.

Other studies have not found any association between abortion and subsequent premature birth\textsuperscript{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 relationship\textsuperscript{135}.

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 pregnancies\textsuperscript{136}.

**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\textsuperscript{137,138,139,140,141,142,143,144,145} and some showing


\textsuperscript{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.


The field remains in dispute, 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 settled.

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. 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 causality.

**Reviews**

Reviews have arrived at disparate conclusions, highlighting that the field is riven with...
disagreement\textsuperscript{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 stillbirth\textsuperscript{166}. Nevertheless, some reviews advance a very strong view that there is no link\textsuperscript{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 harm\textsuperscript{169}.

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.”\textsuperscript{170}

\textbf{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\textsuperscript{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 not\textsuperscript{176}. This is not to deny that where other comparisons have been made, useful and informative data nonetheless exists.

\begin{footnotes}
\item[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
\end{footnotes}
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 responses178,179, perceived stress and emotional support180, substance use and/or abuse181,182,183,184, self-esteem or life satisfaction185, partner relationship186,187, depression, anxiety and post-traumatic stress188,189,190,191, and aspirational plans192.

177 For a full list, see https://www.ansirh.org/research/abortion
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 abortion\(^{193}\), 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 participate\(^{196}\).

Another important aspect of research design involves the timing of when surveys are conducted. For example, in a study by Toffol and coworkers\(^{197}\), 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 out\(^{198}\), 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 frame\(^{199}\). Phenomenological research suggests that

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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/


women may cope well initially, but years later reappraise the event negatively\textsuperscript{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 relive\textsuperscript{202}.

**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\textsuperscript{203,204,205,206,207,208}. However, some studies also identify positive reactions like relief, happiness and satisfaction\textsuperscript{209}. 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 made\textsuperscript{210}. 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 abortion\textsuperscript{211}.

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 decision\textsuperscript{212}. 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 miscarried\textsuperscript{213}. In contrast, in a pilot study, Canario and co-workers found there to be no difference in emotional adjustment between


women who had a miscarriage, induced abortion, or abortion for foetal anomalies\textsuperscript{214}. 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”\textsuperscript{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 study\textsuperscript{216} on mental health and abortion confirm other work showing a link between the two\textsuperscript{217}. 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 confirmed\textsuperscript{218}. 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 disorders\textsuperscript{219}. Other researchers have also found a link between abortion and depression\textsuperscript{220,221,222}, as well as anxiety\textsuperscript{223}, although some groups have not been able to confirm this\textsuperscript{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


\textsuperscript{223} Broen AN et al. (2005) Op. Cit.


abortion itself\textsuperscript{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 anxiety\textsuperscript{231}. Sullins, like Coleman et al.\textsuperscript{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 one\textsuperscript{233}.

**Post-traumatic stress**

A small proportion of women develop post-traumatic stress disorder (PTSD) following abortion\textsuperscript{234,235}. This may be related to cultural factors\textsuperscript{236}. More recent studies have confirmed an elevated risk of PTSD after abortion, which weakened but persisted after controlling for confounders\textsuperscript{237,238}. In one of these studies, abortions later in pregnancy were associated with higher PTSD scores\textsuperscript{239}, and in a separate study, PTSD symptoms remained elevated after 3 years\textsuperscript{240}. Incidence of first psychiatric contact for neurotic, stress-related or somatoform disorder was elevated 2-3 months after an abortion\textsuperscript{241}.

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 pregnancies\textsuperscript{242}. In their review of 48 studies, Daugirdaite et al.\textsuperscript{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.

\begin{thebibliography}
\footnotesize
\setlength{\itemsep}{0pt}
\item \textsuperscript{231} Sullins DP (2016) Op. Cit.
\item \textsuperscript{232} Coleman PK (2011) Op. Cit.
\item \textsuperscript{234} Rue VM et al. (2004) Op. Cit.
\item \textsuperscript{236} Rue VM et al. (2004) Op. Cit.
\item \textsuperscript{237} Mota NP et al. (2010) Op. Cit.
\item \textsuperscript{239} Coleman PK et al. (2010) Op. Cit.
\end{thebibliography}
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 loss249,250,251. It may be that of all the mental health problems related to abortion, substance abuse might contribute most to the community mental health burden252,253,254.

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 abuse255,256,257,258. 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

abortion are at higher risk of psychiatric admission compared with women who carried to term\textsuperscript{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 disorders\textsuperscript{262}. Nevertheless, a major UK study did not identify a difference in total psychiatric disorders between aborting women and those who carried to term\textsuperscript{263}. With regard to bipolar disorders, some researchers have found an association\textsuperscript{264}, while others have not\textsuperscript{265}. Sleep disorders and disturbances are also more common in women with a history of abortion\textsuperscript{266}.

Several studies have identified relationship problems between couples where there has been a history of abortion, manifesting as sexual dysfunction\textsuperscript{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 abortion\textsuperscript{271}.

**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 abortion\textsuperscript{272}. However, there are significant weaknesses with the study, and others by the same group that limit the conclusions that can be drawn\textsuperscript{273}.

Nevertheless, Nilsen et al have identified a link between prior adolescent substance abuse and likelihood of having an abortion\textsuperscript{274}. 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\textsuperscript{275,276,277}. Even


\textsuperscript{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.


so, caution needs to be applied, as for one of these studies\textsuperscript{278} 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\textsuperscript{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\textsuperscript{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\textsuperscript{286,287,288}.

Most women undergoing such procedures experience a range of difficult emotions including sadness, meaningfulness, loneliness, tiredness, grief, anger and frustration, as confirmed by many studies\textsuperscript{289}.

Prior to late termination, women report feeling guilt, fear, anguish, unreality, relief, desperation, emptiness, and other conflicting emotions. 40% of women had only negative emotions\textsuperscript{290}.

In a major Scottish study, a majority of men and women experienced negative emotional responses and somatic complaints, including problems in their sexual relationships\textsuperscript{291}. 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 event\textsuperscript{292}. 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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\begin{itemize}
\item \textsuperscript{278} van Ditzhuijzen J et al. (2013) Op. Cit.
\item \textsuperscript{284} Lafarge C, Mitchell K & Fox P (2013) Women’s experiences of coping with pregnancy termination for fetal abnormality. Qualitative Health Research 23(7):924-936
\item \textsuperscript{290} Andersson IM, Christensson K & Gremzell-Danielsson K (2014) Experiences, feelings and thoughts of women undergoing second trimester medical termination of pregnancy. PLOS One Dec 29, DOI:10.1371.
\item \textsuperscript{291} White-Van Mourik MCA et al. (1992) Op. Cit.
\item \textsuperscript{292} Korenromp MJ et al. (2005) Op. Cit.
\end{itemize}
\end{footnotesize}
years was not significantly different to that experienced at 14 days\textsuperscript{293}. Recent research by the same group\textsuperscript{294} 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 depression\textsuperscript{295}. 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 birth\textsuperscript{296}.

\textbf{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.’\textsuperscript{297}

\textbf{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.
