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# Abortion, unwanted childbearing, and mental health

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**Artículo original**

**SUMMARY**

There is a substantial literature of correlational findings from studies in developed countries where abortion is legal that are riddled with methodological problems and selective biases that exaggerate post-pregnancy mental health risks of abortion while minimizing risks for unwanted childbearing. Health professionals need to be able to critically evaluate this literature and use caution when generalizing findings across contexts differing in legal grounds for abortion. The impact of diversity in women's characteristics, circumstances, and reasons for avoiding childbirth has not been adequately incorporated in theory or research seeking to explain the variations that are found in women's post-abortion mental health. Critical reviews have established that predictors of problems after abortion or childbirth are similar. Further, when a woman has an unwanted pregnancy, i.e., a pregnancy that she does not wish to end in a term birth, the likelihood that she will have post-pregnancy mental health problems is similar regardless of pregnancy outcome (abortion *vs.* delivery). Selective sampling bias that advantages the delivery group, common risk factors, and confounding of abortion with unintended pregnancy explain the correlation of legal abortion with negative outcomes observed in the literature from developed countries. Meanwhile, documented negative effects of unwanted pregnancy and childbearing are multiple, severe, and long-lasting for mother and child. Changing societal conditions, particularly in developing countries, provide an opportunity for correcting biases and limitations of current research. High quality studies aimed at understanding the varied relationships of unintended pregnancy to mental health outcomes –both positive and negative– in the context of the diverse circumstances of women's lives are sorely needed. Such studies can inform the development of programs to reduce unwanted childbearing and promote pre- and post-pregnancy mental health for all women, regardless of how they choose to end their pregnancy.

**Key words:** Unwanted pregnancy, abortion, unwanted childbearing, reproductive health, mental health.

**RESUMEN**

Una gran cantidad de literatura reporta hallazgos correlacionales de estudios realizados en países desarrollados donde el aborto es legal. Dichos estudios presentan graves problemas metodológicos y sesgos selectivos que exageran los riesgos de salud mental asociados con el aborto, mientras que minimizan los riesgos de la maternidad no deseada. Los profesionales de la salud deben ser capaces de evaluar críticamente esta literatura y tener cuidado al generalizar los hallazgos sobre el aborto provenientes de contextos diferentes en términos legales. Aspectos como las diversas características de las mujeres, y las circunstancias y razones para evitar un nacimiento, no se han incorporado adecuadamente en la teoría o la investigación que busca explicar la variación en la salud mental tras un aborto.

Las revisiones críticas han dado cuenta de que los predictores de problemas de salud mental después de un aborto o de llevar a término el embarazo son similares. Además, cuando una mujer tiene un embarazo no deseado, la probabilidad de que pueda tener problemas de salud mental tras el embarazo es similar sin importar el resultado del mismo (aborto *vs.* nacimiento). Los sesgos de muestreo selectivo, así como factores de riesgo comunes y confundir el aborto con un embarazo no deseado, son elementos que pueden explicar la correlación existente entre el aborto legal y los resultados negativos en la salud mental observados en la literatura de los países desarrollados.

Ahora bien, los efectos negativos documentados en embarazos y maternidad no deseados son múltiples, graves y de larga duración para la madre y el niño. Las condiciones cambiantes de la sociedad, en particular en los países en desarrollo, dan una oportunidad para corregir los sesgos y limitaciones de la investigación actual. En este sentido, son necesarios estudios de alta calidad destinados a comprender las diversas asociaciones entre los embarazos no deseados y los efectos, tanto positivos y negativos, en la salud mental. Tales estudios pueden sustentar el desarrollo de programas para reducir la maternidad no deseada y promover la salud mental pre y postembarazo para todas las mujeres, independientemente de si deciden interrumpir o no el embarazo.

**Palabras clave:** Embarazo no deseado, aborto, maternidad no deseada, salud reproductiva, salud mental.

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## INTRODUCTION

Unintended pregnancy is a public health concern due to the host of negative physical and mental health outcomes associated with unsafe abortion and unwanted childbearing.[1-3] Around the world, a great number of women have an unmet need for family planning, and unintended pregnancy is a common occurrence. In 2008 an estimated 41% of pregnancies were unintended. Unintended pregnancy rates were higher in the poorest and least developed countries, where nearly nine out of ten of the world's unintended pregnancies occurred. The Latin American/Caribbean region accounts for 12% of the world's unintended pregnancies and 9% of the world's abortions.[2]

Abortion plays a substantial role in enabling pregnant women to time and space their births and avoid unwanted childbearing; excluding miscarriages, half of the unintended pregnancies around the world end in abortion. In 2008, out of an estimated 42 million abortions, 84% occurred in developing countries. Although most abortions occur in developing countries, where abortion is more likely to be illegal and unsafe, research on mental health risks associated with abortion is largely based on women having legal abortions in developed countries, which represent only one out of seven abortions worldwide.[2]

Generalizing research findings cross-culturally is difficult, but difficulties have been compounded by selective biases and inappropriate application of findings as a result of abortion politics in the United States. In the 1990s, the relationship of abortion to mental health engendered a controversial public policy debate after U.S. Surgeon General C. Everett Koop declined a presidential request to issue a report on health effects of abortion because of the lack of scientific evidence for negative effects.[4]

Nonetheless, antiabortion advocates have been undeterred in their pursuit of evidence for their claim that abortion is a uniquely traumatic experience that constitutes a threat to women's health and legally restricting and ultimately banning abortion is therefore warrented.[5] Consequently, the U.S. abortion research literature is riddled with methodologically flawed studies that systematically bias results in the direction of finding negative outcomes for abortion.[5-10]

What began as a tactic to restrict abortion by law in the U.S. has spread to other countries, including those in Central and Eastern Europe, the United Kingdom, New Zealand, and Switzerland. Researchers and health service providers seeking to understand how abortion is related to mental health outcomes in their specific cultural contexts need to be aware of methodological problems in the literature, particularly those likely to affect the generalization of findings cross-nationally.

This article has two main goals: 1. inform health professionals about methodological problems and sources of selective biases in research designed to show that a pregnant woman increases her mental health risk by choosing abortion rather than unwanted childbirth, and 2. summarize what is known about the relation of abortion and unwanted childbearing to mental health outcomes. The ultimate purpose is to provide information enabling researchers to identify problems for themselves as well as to conduct new methodologically rigorous and culturally-appropriate research studies able to inform program development aimed at preventing unintended pregnancy and promoting pre- and post-pregnancy mental health for all women, regardless of how their pregnancy is resolved.

## METHODOLOGICAL PROBLEMS

In-depth critical literature reviews, including reports from the American Psychological Association (APA)[6] and the Royal College of Psychiatrists (RCP),[8] have cataloged numerous methodological problems related to sampling biases; inappropriate comparison groups; failure to control for pre-pregnancy mental health status; inadequate measurement of mental health variables; inadequate confounder variable definition and control; and inappropriate interpretation and reporting of findings.[5-9] The seriousness of a particular flaw is increased when it selectively biases findings in the direction of the claim being made.[10] Review criteria and flaws for specific studies are identified in tables of recent critical reviews.[6-9] Problems that contribute unacknowledged or selective biases in the direction of finding negative outcomes for abortion are considered below.

Meta-analysis studies have been found to contribute little to understanding relative risk of abortion *vs*. delivery and can give the misleading impression of greater reliability.[11] Selective biases, heterogeneity of outcome, and poor quality of studies can skew the direction of their findings. A recent flawed attempt[12] at uncritically applying meta-analysis to this literature demonstrates the importance of evaluating individual studies before drawing conclusions about the extent and direction of the relationships between abortion and mental health outcomes.[11,13,14]

*When comparison group studies are based on data not collected for the purpose of examining specific hypotheses related to post-pregnancy mental health, they are more likely to be of poor quality and selectively biased*. Many studies are based on data collected for purposes other than examining hypotheses related to abortion and mental health. Common problems in using such data sets include inadequate assessment of reproductive history; inadequate measurement and control of key common risk factors; and failure to distinguish problems of clinical significance from transient reactions comparable to other negative life events. Because the researcher can pick and choose among a host of variables before presenting them in published analyses, selective biases can be

introduced by "cherry picking" variables that have significant relationships in the right direction.

In particular, studies of data sets based on medical records have multiple flaws and selective bias.[9] Their large *Ns* give them the power to find statistical significance for small effects that have little clinical or practical experience. Reporting relationships of high statistical significance without regard to effect size can lead to misleading conclusions about clinical applications of study findings.[6-9]

The APA report[6] identified a number of high quality prospective longitudinal studies of abortion and mental health outcomes designed to collect prospective data expressly for testing specific hypotheses relating to variation in post-abortion mental health. These studies focus on characteristics and circumstances that can account for variation in women's responses to abortion, testing hypotheses derived from stress and coping theory,[6] and have contributed useful information for clinical applications.[15,16] However, they do not have a delivery comparison group, and do not address questions of the relative risks of abortion *vs*. delivery.

*Inherent and selective sampling biases are inadequately considered in reviews of comparison group studies*. Due to inherent design bias stemming from a lack of independence between abortion and delivery groups, selecting equivalent groups in comparison group studies does not begin from a neutral position. Characteristics of the larger social context that vary cross-nationally affect women's likelihood of becoming pregnant as well as choice of abortion.[17] In particular, legal grounds determine which pregnant women are eligible to be in the abortion group, thereby serving as a sampling selection filter in studies of abortion *vs*. delivery. All of the critical reviews cited above, including the most rigorous and recent RCP review,[8] have clearly that their analyses focused on women having legal abortions and do not take variation in abortion's legal grounds into account.

Although only 30% of the countries around the world permit abortion on request, research on abortion's mental health effects comes from developed countries where abortion is legal in most circumstances.[2] The legal status of abortion results in biases toward finding positive delivery group outcomes in these countries. When the law has few restrictions, delivery groups would be expected to have a more positive mental health profile before becoming pregnant than women in abortion groups. Such sample selection bias may be operating in studies based on medical records in Denmark,[18] and a national probability survey in the U.S.,[19] that found that before women ever become pregnant those who terminate their first pregnancy are more likely to have pre-existing mental health problems and common risk factors than those who deliver their first pregnancy.

Legal grounds for abortion vary around the world, changing the characteristics of women who deliver, obtain legal abortions, or have unsafe abortions, biasing the direction of findings in unknown ways and compounding difficulties in generalizing findings cross-nationally. Caution is warranted when generalizing correlational findings based on comparison studies without considering how differences in the larger society, including legal grounds for abortion, may influence the associations of risk factors common to abortion and negative mental health outcomes.

Selective biases is also introduced in comparison group studies when women with wanted pregnancies are included in the delivery group with no control for confounding effects of pregnancy unwantedness, e.g., as in studies based on national co-morbidity surveys in the U.S. and Canada or studies based on medical records from the U.S. and Scandinavia.[6,8,9] In such countries, a large proportion of delivery group pregnancies are wanted, elevating the mental health profile of the delivery group. The powerful role that selective sampling biases plays in disadvantaging the abortion group needs to be more adequately reflected when evaluating individual study quality.

## Comparison group appropriateness

Abortion has been compared to variously defined groups, such as women who miscarried, all women who had at least one birth (including women who never had an unwanted pregnancy), or all women in general, including women who have never been sexually active. Such groups are not representative of women facing an unwanted pregnancy, making comparisons based on them inappropriate for assessing a pregnant woman's relative risk of terminating *vs*. delivering an unwanted pregnancy.

A fatal flaw occurs in studies of first unintended pregnancy outcome (abortion *vs*. delivery) when all women who have terminated one or more subsequent pregnancies are removed only from the delivery group, making it unrepresentative of the population it comes from and reducing the proportion of women with repeated intended pregnancies in the delivery group. Selective biases against the abortion group occurs because women more likely to have pre-existing mental health problems and other common risk factors associated with negative post-pregnancy outcomes are disproportionately removed from the delivery group.

## Statistical analyses

Using comparison groups not based on random sampling from an identifiable population has implications for statistical analyses. When groups are selected based on pregnancy outcome (e.g., abortion *vs*. delivery), risk factors common to abortion and mental health outcomes are not controlled by random selection. In addition to problems caused by "cherry-picking", characteristics and distributions of control variables selected by the researcher may not meet the assumptions required by the study's analytical techniques (e.g., regression, co-variance).

Further, at times researchers have not chosen to control for critical confounding variables and common risk factors, such as pregnancy wantedness, pre-existing mental health, adverse childhood experience, or partner violence, even when available in the data set.[6,8,9] Analyses are most often linear and do not test for interaction effects: Given that violence has been found to lead to both unintended pregnancy and unsafe abortion in developing countries where abortion is illegal, the compounded effects of common risk factors associated with gendered violence and unsafe abortion raise serious concerns.[20]

## Conceptual and definitional issues

Conceptual issues are challenging because poor physical and mental health as well as adverse social conditions are causes as well as consequences of unintended pregnancy. Understanding the interacting and independent effects of common risk factors for unintended pregnancy and negative outcomes for women requires theorizing the dynamic interaction of biological, psychological, social, economic, and contextual factors that vary across a woman's life cycle and over time.[5,17,21]

Widespread problems stem from the homogenization of diverse experiences under problematic variable labels, particularly when variable construction is based on survey or medical record data not collected for the purpose of studying pregnancy outcome or mental health effects. Imprecise variable definitions that encompass diverse circumstances with different pre-pregnancy risk levels for mother and child muddy the interpretation of findings aimed at assessing post-pregnancy risk.

The labels "abortion" and "delivery" represent a wide variety of experiences with different implications for both physical and mental health outcomes that depend on the societal context. For example, some abortions occur early in gestation, while others occur later, which means different procedures are used, with later-term abortions associated with more pain and higher likelihood of complications.[3] Studies of abortion in developed countries where abortion is legal and conducted with safe and effective methods are not investigating the same experience that occurs in developing countries where abortion is illegal and unsafe.[3,5]

Variation in the experience of delivery also has profound implications for physical and mental health post-pregnancy outcomes for mother and child.[21] Risk for negative mental health outcomes resulting from childbirth is substantially higher in developing countries where childbirth complications are numerous and severe,[22,23] particularly for adolescents.[24] Complications involving stigma, such as infertility or obstetric fistula,[24] may compound implications for mental health after delivery. Such complications may be nonexistent in the developed world, with little implication for post-delivery mental health.

## Pregnancy wantedness

Definitions of pregnancy wantedness are inconsistent across studies, making interpretation of findings problematic.[25] For example, in some studies that control wantedness, a bivariate variable (wanted/unwanted) is constructed by asking pregnant women if they want to have a child at that time or any future time. But "unwantedness" is not an all-or-none phenomenon. It is reasonable to assume that there is something different about women who have unwanted pregnancies and opt for abortion over delivery. Some studies suggest women who have unintended pregnancies are more likely to have multiple and severely negative life events; in turn, they are more likely to have abortions.[6,8] It may also be that women who are more intensely distressed at the thought of giving birth are more likely to choose abortion. Whatever the underlying reason, using a bivariate variable to control for unwantedness does not completely capture the effects of pregnancy unwantedness in an analysis of the relation of abortion to mental health. Therefore, studies that control for wantedness in this fashion cannot assume they have completely eliminated biases in the direction of finding a relation between abortion and negative mental health outcomes.

In other comparison group studies, unwantedness may or may not be determined. Assuming that most pregnancies in the delivery group are planned while most pregnancies in the abortion group are unwanted is reasonable in developed countries. However, in developing countries with an unmet need for contraception and no access to legal abortion, such assumptions are highly questionable.

The mental health implications of a particular woman's reasons for viewing a pregnancy as unwanted are insufficiently acknowledged in studies of mental health outcomes of abortion. Under conditions of legal abortion, insofar as life circumstances leading a pregnant woman to choose abortion over delivery also entail risk for negative mental health problems, a study will be biased in favor of finding higher rates of mental health problems in the abortion group.

The reasons women choose abortion provide a window into unrecognized aspects of women's lives that serve as common risk factors for both unintended pregnancy and negative health outcomes.[17,21,26] Although women who have abortions are sometimes viewed as selfish, rejecting the role of motherhood, or somehow inadequate as women, their reasons for seeking abortion belie those stereotypes. Around the world, postponing or limiting childbearing is the largest category of reasons women give for having an abortion, followed by socioeconomic concerns.[26]

Desire to fulfill family obligations and be a good mother is reflected in the reasons women have for wanting to avoid giving birth, which involve negative life events and circumstances associated with higher risk for physical and mental health problems.[26,27] Timing, spacing, and number of births

involve common risk factors for pregnancy unwantedness and negative physical and mental health implications.[21] A woman may already have one or more children in diapers or too many children to feed adequately. She may be caring for a chronically ill child, husband, or other family member. She may be the sole support of the family and fear that having a baby would compromise her ability to obtain an education or to earn the income needed for family survival. She may be divorced or widowed, or at the end of her reproductive years.

How and where a pregnancy occurs has implications for mental health outcomes. Pregnancy may result from rape or incest or involve fetal impairment. In some cultures, being pregnant, whether by rape or taboo relationship (e.g., incestual, unmarried, or adulterous), can be a cause of shame and ostracism. It can even be used to justify being stoned, whipped, or put to death.[20]

Violence and adversity are highly associated with unintended pregnancy as well as with poor physical and mental health.[20] A pregnant woman may have an abusive or violent partner and fear for herself or her children. Her living conditions may prevent her from providing for or protecting her children from harm. They may involve famine, armed conflict, or natural disaster. A woman may have been raped as an act of war or forced into slavery or prostitution. She may live in extreme poverty, on the streets, or in a refugee/displaced persons camp.

Although unwantedness is defined from the women's point of view in this literature, in patriarchal societies, a married woman may not have control over her reproductive decisions and cannot refuse sex, use contraception, or have a choice over pregnancy outcome. Pregnant women may be forced to have a child or to have an abortion to comply with the wishes of someone else, such as her partner, a parent, or some other powerful family figure. A study in Tamil Nadu, India, found that nearly one out of ten women who had an abortion reported having been compelled to do so by their husbands or in-laws.[28]

One of the biggest challenges for researchers seeking to understand the relation of abortion and mental health is dealing with the heterogeneity of characteristics and life circumstances leading a woman to define her pregnancy as unwanted. Some combinations of characteristics and life circumstances have more profound mental health implications than others. Given the importance of life stage, violence, and socioeconomic circumstances in reasons for abortion as well as risk for mental health outcomes, generalizing findings from the current literature to developing countries is not warranted.

## Pregnancy-related mental health outcomes

Although the literature is filled with flawed studies, selective biases, and inconsistent findings, high-quality scientific studies do exist, and even findings based on flawed research can be useful if they are interpreted and generalized according to scientific protocol. Keeping the methodological issues in mind and focusing on the more rigorous scientific studies, several conclusions can be drawn from this literature.

*A pregnant woman does not have an increased likelihood of having mental health problems if she terminates an unwanted pregnancy rather than carrying it to term*.[5-10] Evidence does not support the view that a legal abortion is a traumatic experience per se. Rather, it points to unintended pregnancy as at the root of correlations between abortion and negative mental health outcomes. Women who end unintended pregnancies by abortion do not have higher rates of mental health problems than comparable women who give birth. Risk factors common to unintended pregnancy, abortion, and poor mental health largely account for associations between abortion and negative mental health outcomes seen in some of the current literature.[8]

*A woman's responses after abortion reflect her personal characteristics and reasons for abortion, as well as the pre-existing, co-occurring, and subsequent social and societal context of the abortion*. When pre-existing and co-occurring risk factors are not adequately controlled, associations between abortion history and mental health problems may emerge and be wrongfully attributed to having an abortion.[5-9] The APA report considered a wider range of post-abortion emotional responses than the RCP-sponsored report, which chose to focus on more serious and long-lasting outcomes and thus reviewed only studies with a follow-up period of at least 90 days.[8] Whether or not the post-abortion responses were mild and transitory or long-standing and severe, however, the critical reviews agreed that the largest and most consistent predictor of post-abortion mental health is mental health before the abortion.[6,8]

The RCP reported a range of predictors with inconsistent results, concluding there was limited evidence that life events, negative attitudes toward abortion, pressure from a partner, and negative reactions to abortion, such as grief or doubt, may have a negative impact on mental health. They suggested there may be a wide range of both predictors and outcomes following an abortion, including some not included on their list.

Of the factors identified in literature, prior history of mental health problems is the strongest and most consistent predictor of post-pregnancy mental health.[5,6,8] Other factors considered in the literature[5,6] include systemic, social, and personal risk factors common to unintended pregnancy, such as:

- *poverty and gender-based violence*, including childhood sexual abuse, rape, and intimate partner violence;
- *history of risk-taking and problem behaviors*, such as smoking, alcohol and drug use, and risky sexual behavior;
- *personal factors*, such as problems with emotional regulation and use of avoidant forms of coping.

In addition, effects have been reported for:

- *characteristics of the pregnancy*, including meaningfulness, unwantedness, and commitment to the pregnancy;
- *personal attributes* related to vulnerability to stressors, including low self-esteem, pessimism, low perceived control; and low expectations for being able to cope with having an abortion;
- *contextual factors*, including low social support; stigma associated with abortion; and need for secrecy regarding the abortion.

Many predictors of negative post-abortion mental health do not uniquely predict responses after abortion; they also predict outcomes for a variety of stressful life events, including birth.[5,8]

The RCP paper[8] emphasized this point by summarizing the results of a recent governmental report focusing on risks of childbirth that identified risk factors for a range of antenatal and postnatal mental health problems.[29] These include a history of mental health problems before and during pregnancy; exposure to recent negative life events; low self-esteem; childcare difficulties; relationship status; marital discord; low social support; age at time of pregnancy; and socioeconomic status. Birth complications and obstetric factors were also mentioned.[8]

## Global statements about the psychological effects of abortion should be made with caution

Given heterogeneity in the experience of abortion and in birth, as well as the diversity of the reasons and circumstances that both affect a woman's mental health and lead her to seek to terminate an unwanted pregnancy, global statements about the psychological effects of "abortion" can be misleading, particularly when applied cross-culturally. In considering factors that shape the experience of abortion (e.g., reason for the abortion, procedure used, length of gestation, quality of health care, complications of abortion, abortion stigma), the importance of keeping in mind that these research findings are based on *legal* abortion in *developed* countries cannot be overemphasized.

## Future research and program development should focus on mental health needs associated with unintended and unwanted pregnancy, rather than narrowly focusing on abortion

The current ideologically-driven, single-minded focus on identifying the negative effects of legal abortion in developed countries has been shown to contribute little to either clinical applications or policy debates.

Most women who have abortions in the U.S. do not have mental health problems.[5,6] The focus on abortion has led to neglecting other dimensions of unintended pregnancy, and a failure to consider needs of women who deliver. Further, given the historical silencing of women experiencing gender-based violence, the risk of misattribution of the effects of a woman's experiencing of violence to her experience of abortion is a considerable concern.[20]

Not all unintended pregnancies are unwanted, and it may be that refining the measurement of pregnancy unwantedness is necessary to understand the combined and independent effects of common risk factors and pregnancy unwantedness on mental health outcomes. Identifying pregnant women who may be at risk for mental health problems and in need of support is an important first step in the process of developing culturally-appropriate and effective programs for the prevention of unintended pregnancy as well as negative mental health outcomes.

In fact, the monocular focus on abortion may lead to misattribution of mental problems to abortion rather than to the actual sources of a problem. For example, the high levels of violence in the lives of women who have abortions are also found in the lives of women who deliver unwanted pregnancies. Emphasizing abortion as a screening factor for mental health problems may lead to overlooking the real source of the problem, i.e., violence, as well as neglecting this problem in women who deliver.[20]

## Women's varied experiences of abortion need to be understood and validated without judgment or stigma

Women have both positive and negative experiences after abortion, and report benefiting from their abortion more than being harmed from it.[5,6] The extent to which a woman feels stigmatized from having an abortion may affect whether abortion functions as an acute stressor, with transitory effects, or becomes internalized and transformed into a more serious and chronic stressor capable of producing negative effects.[5]

Disclosing stressful life events is part of the coping process. Stigma associated with stressful life events can affect women's willingness to seek help for coping, undermine their mental health, and increase the risk for psychological problems.[5] Where disclosure of abortion could result in social rejection, exclusion, jail, violence, or death, stigma management becomes a highly stressful endeavor.

Even when abortion is legal, it can be stigmatized. In the U.S., a "pro-voice" movement has emerged in response to the increasing stigmatization of abortion. This countermovement is aimed at creating a social climate recognizing that abortion is a unique experience for women and needs to be supported, respected, and freed from stigma. In this sense, Exhale, a grassroots organization, is a leader

in this movement (https://exhaleprovoice.org/pro-voice). Another example is the "1 in 3" [Women Have Abortions] campaign of Advocates for Youth (http://www.advocatesforyouth.org/blogs-main/advocates-blog/1864-a-new-conversation-about-abortion-this-is-my-story). The efficacy of such efforts has not been evaluated, nor is it clear how well they would transfer to developing countries where abortion is illegal.

## Pitfalls in applying pregnancy outcome research findings cross-nationally

Societal context is arguably the most important determinant of pre- and post-pregnancy physical and mental health, regardless of pregnancy outcome. Level of societal development, unmet need for contraception, legality of abortion, quality of health care, and gender-based violence play large roles in determining a woman's physical and mental health outcomes after abortion or delivery.[3,20,23] These factors are largely unacknowledged in pregnancy outcome research in developed countries where legal abortions have low risk for death or other negative health outcomes. With the exception of a flurry of repudiated studies asserting a link between abortion and breast cancer,[30] health issues have not played a significant role in U.S. abortion policy debates that have stimulated a large proportion of studies in the current literature.

Physical and mental health are undeniably interrelated. Because abortion is typically safe and legal in developed countries, current research does not provide a full picture of the potential mental health effects of unsafe and illegal abortion. Such effects may be the most powerful determinants of pre- and post-pregnancy physical and mental health in developing countries. Of the estimated 43 million abortions performed each year around the world, nearly half of them (21.6 million) are unsafe.[3]

The majority of countries that restrict abortion under most conditions are in developing regions, particularly in Africa and Latin America, where 92% to 97% of the women live under restrictive laws.[2] These are also the places with the highest rates of unsafe abortion, lowest rates of access to quality health care, and greatest likelihood of severe and negative physical and mental health outcomes.[2,3] On average, risk of death and injury to women seeking abortion in countries where abortion is illegal is 30 times higher than in countries where abortion is permitted on some legal grounds.[31] Health professionals in developing countries need to consider the mental health implications of the problems created when abortion is illegal and unsafe that are not found in developed countries to the same extent, such as the mental health effects of stigmatizing abortion. Mental health effects from common complications of unsafe abortion that are not typically found for legal abortion in developed countries (e.g., infertility) need to be considered as well.

Death is the most extreme and severe pregnancy outcome. In the U.S., when an abortion meets medical standards and is legally performed, the maternal death ratio (MDR) is 0.6 deaths in 100 000 abortions, safer than a penicillin shot.[3] In developing countries where abortion is restricted by law, maternal death rates are substantially higher. For example, in Africa, where abortion is highly restricted in nearly all countries, there are 650 deaths for every 100 000 procedures.[3] The characteristics of women who survive an abortion or delivery under such conditions are likely to vary widely in comparison to the characteristics of women who survive abortion when maternal mortality risk is low.

Consequently, studies of mental health effects of legal abortion *vs.* delivery under safe conditions in developed countries tell us little about the mental health effects of unsafe abortion.

## Unwanted childbearing

In developing countries, when a woman is denied abortion and forced to bear an unwanted child, she experiences physical health risks associated with giving birth which are substantially higher than risks associated with legal abortion. Although progress has been made, every two minutes a woman dies from complications related to pregnancy and childbirth. For every woman who dies, 20 or more experience serious complications.[32]

Physical and mental health risks of childbirth vary depending on the life stage and status of the woman as well as her social and economic conditions. In particular, childbirth entails higher risk when women are young and poor.[24] Risks in the developing world are compounded by insufficient economic resources, inadequate health and social service systems, and larger family sizes. Fulfilling women's unmet need for contraception (thereby reducing numbers of unintended pregnancy deaths) would lower the number of children who would otherwise become orphans in Sub-Saharan Africa by an estimated 59%.[2]

In developing countries, unwanted childbirth occurs in the context of high infant mortality: 99% of the deaths during the first month of life occur in developing nations. Individual wealth makes a difference, however. Infants are more likely to die in poor households than rich ones in every region of the world.[33]

## Unwanted childbearing results in disadvantaged children

Being unwanted during pregnancy does not necessarily mean the resulting child will always be unwanted. Nonetheless, prospective studies have found that if a pregnant woman identifies a pregnancy as unwanted, her subsequent child will be at risk for a wide range of negative outcomes, including deficits in cognitive, emotional, and social pro-

cesses. These effects can begin prenatally, emerge at different stages over the life cycle, and be transmitted intergenerationally.[34-38]

These associations are found even for couples who live in developed countries where the disadvantages of unwantedness are not compounded by extreme poverty, experiences of war, pervasive violence, famine, and other conditions of severe privation. Even when abortion is legal and accessible, unwanted children have a higher risk for premature birth, low birth weight, and fetal malformation, among other negative outcomes.[39,40]

A child who was unwanted during pregnancy also has a higher risk for negative long-term outcomes in adulthood. As adults, individuals born to women who had unwanted pregnancies but did not seek abortion have been found to be at higher risk for a variety of mental health problems, some of them uncommon, but nonetheless severe. Separate studies in Sweden and Finland found being unwanted during pregnancy was associated with higher risk for schizophrenia,[41,42] even when confounding variables were controlled.[42] The proportion of alexithymia has been found to be nearly double in unwanted individuals (11.6% *vs*. 6.9%).[38]

The most powerful documentation of the effects of unwanted childbirth is provided by longitudinal research from the former Czechoslovakia on the disadvantages of being born unwanted that compared matched controls with children born to women who applied for and were twice denied abortion.[35]

In childhood, being unwanted was linked to lower likelihood of having a secure family life and higher likelihood of poor school performance and rejection by peers. In adulthood, being unwanted was linked to higher likelihood of engaging in criminal behavior, being on welfare, having an unstable marriage, and receiving psychiatric services. Offspring of the unwanted group were also likely to have problems as well, suggesting that an unwanted child's risk for negative outcomes can be transmitted to future generations.[35]

These studies are based on studies of unwanted childbearing in developed countries. The characteristics and motivations for avoiding childbearing differ cross-nationally.[26] Caution when generalizing findings across countries with differing age structures, levels of development, unmet need for family planning, and legal grounds of abortion is warranted.

## CONCLUSION

The proliferation of low-quality studies reporting an association between abortion and mental health problems has resulted in widespread "validation by cross-quotation" of selectively biased and fatally flawed research aimed at portraying abortion as causing mental health problems in women. Consequently, health professionals who seek information to help develop programs and policies to improve women's mental health must pay vigilant attention to study details, become knowledgeable about flaws that selectively bias findings in favor of one comparison group over another, and be aware of corrections in the literature that invalidate findings of specific studies.

There are grand ironies in the debate about abortion's mental health outcomes. It is argued that abortion should be legally restricted because it is unsafe, while in fact making abortion illegal is what makes it unsafe. It is argued that women should be warned about unproven mental health risks of abortion – but this unwarranted argument may itself increase those risks by stigmatizing abortion and undermining a woman's belief in her coping abilities.

Studies of abortion's relation to mental health are largely based on women living in developed countries under conditions of legal abortion. To generate and apply valid findings cross-nationally, researchers need to be aware of problems in the abortion literature, particularly with regard to methodological issues most likely to affect the generalization of research findings. The multilevel factors that constitute the context for an unwanted pregnancy have profound implications for pre- as well as post-pregnancy mental health, whether the pregnancy ends in abortion or childbirth. The high rates of abortion despite restrictive and punitive legal environments suggest that focusing on preventing unintended pregnancy and thereby reducing women's reasons for wanting to avoid childbirth is a necessary condition for reducing women's need for abortion.

A broadened re-focusing on unintended pregnancy outcomes will also give needed attention to negative effects of unintended pregnancy on women who bear unwanted children. Such women account for a larger proportion of unintended pregnancies in developing countries with an unmet need for family planning. The wide variation in pregnant women's lives and contexts as well as their personal perspectives on the meanings of their life events should be considered when designing and interpreting unintended pregnancy research. Future research will hopefully avoid the biases and limitations found in current studies and focus on better understanding the relation of unintended pregnancy decision-making to mental health outcomes –both positive and negative– under changing societal conditions.

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