

# A Reanalysis of Mental Disorders Risk Following First-Trimester Abortions in Denmark

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## Abstract

**Background:** A previous study of Danish medical records reported that the monthly rate of first-time psychiatric contact following a first induced abortion was greater than the rate following a first live birth but not dissimilar to the average monthly rate nine months prior to the induced abortions. The research team therefore concluded that abortion has no independent effect on mental health and the differences between psychiatric contacts after abortion and delivery were entirely attributable to pre-existing differences in prior mental health. These conclusions are inconsistent with similar studies published before and after this Danish analysis, and its methodology was arguably inferior in a number of important ways. Most importantly, there is a need to reanalyze the data provided over a longer period of time in order to account for effects that may be missed when the time periods of analyses are too short.

**Method:** Monthly and tri-monthly data was extracted from the original study and configured to allow analyses of the cumulative effects over nine- and twelve-months post-abortion.

**Results:** Across all psychiatric diagnoses, first-time psychiatric contact increased from an odds ratio of 1.12 (95% CI: 1.02 to 1.22) to 1.49 (95% CI: 1.37 to 1.63) for the cumulative post-abortion periods of 9 months and 12 months, respectively, as compared to the 9 months pre-abortion. At 12 months post-abortion, the rates of psychiatric diagnosis were significantly higher across all four diagnostic groupings and most strongly for personality or behavioral disorders (OR=1.87; 95% CI: 1.48 to 2.36) and neurotic, stress related, or somatoform disorders (OR=1.60; 95% CI: 1.41 to 1.81).

**Conclusions:** When analyzed over longer time frames, results from the Danish data are now consistent with the larger body of both record-based and survey-based studies. Analyses of mental health effects associated with abortion should include observation periods of no less than nine months and preferably over one year in order to encompass both anniversary reactions and the exhaustion of coping mechanisms which may delay observation of post-abortion effects.

## Background

Research regarding the mental health effects of abortion has been plagued by political controversy and selective reporting of results.[1] One frequently cited study in this field is an analysis of Danish medical records which reported a 127% elevated risk of first-time treatment for psychiatric disorders among women following a first induced abortion (15.2 cases per 1000 person years, 95% CI: 14.4 to 16.1) as compared

to women having a first live birth (6.7 cases per 1000 person years, 95% CI: 6.4 to 7.0).[2] Despite this finding of higher rates of mental health care following abortion, the authors concluded that abortion does not increase the risk of mental illness based on their additional analyses of first-time contact for psychiatric treatment in the nine months prior to these pregnancy outcomes. Based on those analyses, the authors concluded that the women who are most likely to have abortions were simply at greater risk of first-time psychiatric treatment contact prior to their abortions, and therefore the elevated rate of mental health issues observed after abortion is simply an incidental continuation of pre-existing mental health risks. In short, they suggested, women who are predisposed to mental health issues are more likely than others to have abortions. Therefore, their main finding of higher rates of mental health disorders among aborting women, as compared to delivering woman, can and should be ignored; abortion has no independent mental health effects.

This study was widely criticized for several methodological issues. For example, similar records-based studies of mental health treatment rates before and after abortion had controlled for twelve months of prior mental health[3,4] whereas the Danish study inexplicably examined only nine months. The selection of nine months prior to the pregnancy outcome also meant that they were comparing women who carried to term during only the time they were pregnant to women who had abortions who were only pregnant for approximately two to three months prior to their abortions and were not pregnant during the other six months. A better methodological baseline, as used in other studies, would have been to control for mental health history for a full year prior to conception of the index pregnancy. Moreover, while the prior studies had excluded women with a history of abortion from the control group of women who carried to term, the Danish study included women with one or even multiple abortions into the group of delivering women once they had a first live birth. In other words, they were comparing women who had a first abortion against a mixed group of women who had one or more abortions prior to their first live birth, women who had miscarriages prior to a first live birth, and women whose first pregnancy ended in a first live birth. This admixture would clearly tend to obscure rather than clarify the interpretation of their findings. A request sent to the lead author (Munk-Olsen) for a breakdown of the number of first-time mental health treatment cases in the delivery group based on prior exposure to abortions by the author of this reanalysis was refused. In my experience, that refusal was atypical. When I have made similar queries of other authors, they have been quick to provide such clarifications of their findings. An additional shortcoming is that unlike prior studies,[3,4] the Danish study failed to segregate their results relative to inpatient and outpatient treatments, even though this would have been an excellent way to distinguish between the severity of mental illnesses. Yet another problem was that the researchers chose to exclude women who died during the year following their pregnancy outcomes, which is problematic since abortion is associated with increased rates of suicide and deaths from other self-destructive behaviors, which are clearly markers of psychiatric distress.[5] Finally, in addition to using a shorter pre-abortion period of investigation, the investigators limited their post-abortion period to just one year. This was another step back from the methodological strength of the prior record-linkage studies that examined treatment rates over a period of four years following an index pregnancy outcome.[3,4] A longer period of follow up is important in consideration of the literature indicating that the most severe reactions to abortion can be delayed until after coping mechanisms are exhausted and may be related to anniversary reactions and other triggers such as a subsequent pregnancy.[6–10] By limiting the investigation to one year, the Danish research team would likely miss some of the reactions associated with the one year anniversary, if they fell just outside the anniversary date, in addition to any other delayed reactions.

The Danish researchers' conclusions have also been called into question by both prior studies which employed better methodologies,[3,4] and subsequent studies.[11–14] For example, an analysis of the National Longitudinal Study of Adolescent to Adult Health (Add Health) which controlled 25 confounding factors, including prior mental health and exposure to violence, found that each exposure to abortion increased the risk of subsequent mental health disorders, a finding that could not be explained by prior mental health.[11] In addition, the subset of women who reported aborting a wanted child experienced a 122% higher rate of depression and a 244% higher rate of suicidality.[14]

Two other studies, based on medical records of nearly 5,000 women continuously covered by Medicare from

the age of 16 forward, examined mental health treatment rates both prior to and after each woman's first pregnancy outcome.[12,13] These studies found that the change in the rate of mental health treatments per patient per year from before to after a first pregnancy outcome was highest among women who had abortions, compared to both women who carried to term[12] and women who had natural losses.[13] This was also true for both outpatient treatments and inpatient treatments. It was also true relative to the length of hospitalization for inpatient care, which is an excellent marker for a difference in the severity and complexity of mental health issues.

Given the discontinuity between the Danish authors' conclusions and the findings of prior and subsequent studies of a similar nature, the purpose of this reanalysis is to determine if the Danish data can be reconciled with the direction of findings of other studies over the full time period of the data presented.

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Given the discontinuity between the Danish authors' conclusions and the findings of prior and subsequent studies of a similar nature, the purpose of this reanalysis is to determine if the Danish data can be reconciled with the direction of findings of other studies over the full time period of the data presented.

## Method

Data was extracted from Table 1 of the Danish study to identify the total number of specific diagnoses, and total diagnoses for the periods of nine months prior to an abortion, the first nine months following an abortion, and the first twelve months following an abortion. Notably, due to the Danish researcher's methodology, this data excluded any women who had inpatient treatments prior to their first abortion, and any women who died in the year following their first abortion.

Analyses were conducted in Microsoft Excel. Institutional review was not required since this reanalysis is based on only previously published aggregate data.

## Results

Table 1, below, shows the number of women from a total of 84,620 Danish women who had a first-time, first-trimester abortion who received either a first-time inpatient or outpatient treatment in each of the time frames reported in the original paper, plus the cumulative data during the first nine months after their abortions, or within twelve months after their abortions. A total of 868 women had a first psychiatric contact in the nine months before their abortions, leaving total of 83,752 women, of whom 1,277 had had psychiatric contact during the subsequent twelve months. For each row of Table 1, the rate is calculated as the average rate of psychiatric contact per month per ten thousand women (yes divided by no times ten thousand). The increase in rate relative to the baseline was greatest relative to psychiatric contact for personality or behavioral disorders followed by neurotic, stress related, or somatoform disorders. Overall, the average rate of first-time psychiatric contact in terms of cases per month per 10,000 women was 11.52

prior to a first abortion and 12.90 cases afterwards as cumulatively measured over the full course of the 12 months examined.

**Table 1: Number and average rates per month per 10,000 women of first-time psychiatric contact before and after an abortion**

Time Frame	Psychiatric Contact for Affective Disorder	Psychiatric Contact for Aff
	<b>yes</b>	<b>no</b>
During the 9 months prior to abortion	174	84,446
1 month after abortion	14	84,432
2 months after abortion	23	84,409
3 months after abortion	20	84,389
4-6 months after abortion	60	84,329
7-9 months after abortion	49	84,280
10-12 months after abortion	51	84,229
0-9 months after abortion	166	84,280
0-12 months after abortion	217	84,229

Table 2 shows the odds ratios and 95% confidence intervals for the cumulative number of first-time psychiatric treatments for the first nine months following an abortion and the first twelve months as compared to the nine months preceding an abortion. Most notably, the degree of difference and the level of significance increased with increased time of observation across every diagnostic category. Over the full twelve months examined, there was an 87% increased risk of personality or behavioral disorders, a 60% increased risk of neurotic, stress related, or somatoform disorders, and a 49% increased risk over all diagnoses.

**Table 2: Odds Ratios and significance level (p) for two post-abortion periods compared to the pre-abortion period**

Time period	Psychiatric Contact for Affective Disorder	Psychiatric Contact for Aff
	OR (95% CI)	p
During the 9 months prior to abortion	ref	
0-9 months after abortion	0.96 (0.77-1.18)	ns
0-12 months after abortion	1.25 (1.02-1.53)	0.0283

## Discussion

Reanalysis of the differences between pre- and post-abortion first-time psychiatric contact in the Danish medical records revealed that in the full one-year period following abortion the rate at which women sought mental health care after an abortion was 1.49 times higher (95% CI: 1.37 to 1.63) than the rate in the nine months prior to an abortion. Statistical significance was also noted when the time frame of consideration was nine months, a period equal to the pre-abortion observation period.

These findings suggest that abortion’s effect size on mental health is relatively small and can be easily missed when analyses are restricted to shorter time periods. The Danish research team’s methodology was almost entirely focused on short time periods, even as short as a single month. This was an oversight since the best evidence indicates that most women will be able to successfully repress abortion related stresses for at least a moderate period of time.[1,8–10]

This reanalysis confirms that the Danish data, when examined over periods of at least nine months, is consistent with the findings of both records-based[3,4,12,13] and survey-based studies.[1,11,14–18] Therefore,

the authors of the original study erred in their conclusion that first-time contact rates before and after an abortion are not significantly different in Danish medical records.[2] The differences *are* significant. Moreover, our reanalysis shows that these differences are likely to become increasingly evident when the period of follow-up is extended beyond one year. Inclusion of cases beyond one year is advisable to encompass both anniversary reactions and the exhaustion of repression and other coping mechanisms which may delay the most significant post-abortion reactions.

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