

# First-Time First-Trimester Induced Abortion and Risk of Readmission to a Psychiatric Hospital in Women With a History of Treated Mental Disorder

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**Context:** Mental health problems are associated with women's reproductive decisions and predict poor mental health outcomes after abortion and childbirth.

**Objectives:** To study whether having a first-trimester induced abortion influenced the risk of psychiatric readmission and compare findings with readmission risk in women with mental disorders giving birth.

**Design:** Survival analyses were performed in a population-based cohort study merging data from the Danish Civil Registration System, the Danish Psychiatric Central Register, and the Danish National Hospital Register from January 1, 1994, to December 31, 2007.

**Setting:** Denmark.

**Participants:** All women born in Denmark between 1962 and 1992 with a record of 1 or more psychiatric admissions at least 9 months before a first-time first-trimester induced abortion or childbirth.

**Main Outcome Measure:** Readmission at a psychiatric hospital with any type of mental disorder from 9

months before to 12 months after a first-time first-trimester induced abortion or childbirth.

**Results:** Relative risk (RR) for readmission risk 9 to 0 months before a first-trimester induced abortion was 0.95 (95% CI, 0.73-1.23) compared with the first year after the abortion. This contrasts with a reduced risk of readmission before childbirth (RR, 0.56; 95% CI, 0.42-0.75) compared with the first year post partum. Proximity to previous psychiatric admission in particular predicted re-hospitalization risks in both the abortion and the childbirth group.

**Conclusions:** Risk of readmission is similar before and after first-time first-trimester abortion, contrasting with a marked increased in risk of readmission post partum. We speculate that recent psychiatric episodes may influence women's decisions to have an induced abortion; however, this decision does not appear to influence the illness course in women with a history of treated mental disorders.

*Arch Gen Psychiatry.* 2012;69(2):159-165

**D**IVERGING RESULTS<sup>1,2</sup> EXIST as to whether induced abortions negatively influence mental health, and there is a paucity of sound studies on the topic. Previous studies<sup>1-5</sup> on abortion and mental health have had problems with low response rates often in selected study samples, high attrition rates, recall bias, and lack of precise measures of both exposures and outcomes.

Mental health problems are associated with women's reproductive decisions<sup>2,6</sup> and predict poor mental health outcomes after abortion.<sup>4,7</sup> Moreover, most abortions are a result of unintended pregnancies,<sup>8</sup> and the effects of induced abortion are often confounded with the effects of an unwanted pregnancy.<sup>9</sup>

In a recent study, we<sup>10</sup> found that risk of mental disorder was not increased after

abortion compared with 9 to 0 months before abortion. This was found among women with no records of psychiatric inpatient or outpatient contacts for at least 9 months before the abortion. However, the results also showed that women having first-trimester induced abortions constitute a subpopulation with higher levels of psychiatric morbidity before and after the abortion compared with women giving birth. Because mental health problems most likely influence women's reproductive decisions, it is highly relevant to study whether having a first-trimester abortion is associated with an increased risk of experiencing a new psychiatric episode with subsequent readmission. In the present study, we aimed to examine whether induced abortion influences the risk of psychiatric readmission, and, among women with a history

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of treated mental disorders, we investigated the following questions:

1. Is there an increased risk of psychiatric readmissions after, compared with before, a first-time first-trimester induced abortion?
2. Is the pattern of readmission risks different in women having induced abortions than in women giving birth?
3. What predicts readmission around the time of induced abortion compared with the time of childbirth?

## METHODS

### STUDY POPULATION

We created a population-based cohort using data from the Danish Civil Registration System,<sup>11</sup> which was established in 1968. All citizens are assigned a personal identification number, which is used in all registers and facilitates linkage between and within registers. The register includes information on sex, date of birth, parents' personal identification numbers, and daily updated information on vital status and migration. We included all women who had 1 or more records of psychiatric admission at least 9 months before a first-time first-trimester induced abortion or first childbirth (live-born child). The women were born in Denmark between January 1, 1962, and December 31, 1992, and were alive on their 15th birthday. The abortion or birth had to have occurred between 1994 and 2007.

### ASSESSMENT OF MENTAL DISORDERS

The study population was linked to the Danish Psychiatric Central Register<sup>12</sup> to obtain information on mental disorders. The register holds information on all admissions to psychiatric inpatient facilities in Denmark and has been computerized since 1969. At present, the register holds information on approximately 450 000 persons having 1 700 000 admissions to psychiatric hospitals. The diagnostic system used was the *International Classification of Diseases*, eighth revision (ICD-8)<sup>13</sup> from 1969 to 1993, and ICD-10<sup>14</sup> from 1994 to the present. Women were classified as having a mental disorder if they had records of inpatient contacts at psychiatric facilities in Denmark with any type of mental disorder earlier than 9 months before an abortion or childbirth. Similarly, inpatient contacts at psychiatric facilities in Denmark with any type of mental disorder were used to define mental disorders among the parents of the women.

Readmissions included patients who had a recurrence or relapse of a mental disorder and were defined to include all readmissions regardless of whether the diagnoses were the same. Time since previous admission was calculated as the number of days since the date of discharge at the last admission earlier than 9 months before the abortion. Readmission to a psychiatric hospital within 14 days after discharge from a psychiatric hospital was counted as 1 admission, in line with a previous study.<sup>15</sup>

### ASSESSMENT OF INDUCED ABORTIONS

In Denmark, all women 18 years or older may have a termination of a pregnancy within the first 12 weeks of gestation. Termination of pregnancy in women younger than 18 years is possible if permission from the parents or legal guardians is granted. Approximately 5% of all induced abortions are performed after 12 completed weeks of gestation; these are granted mainly on the basis of medical or social indications after application to the regional health and social authorities.

The study population was linked to the Danish National Hospital Register,<sup>16</sup> which contains data on all admissions to Danish (somatic) hospitals since 1977 and outpatient contacts since 1995. The register contains information on all induced abortions in Denmark. Public hospitals accounted for more than 99% of induced abortions in 2005 and 97% in 2006.<sup>17</sup> We obtained information through the register on dates of first-trimester medically or surgically induced abortions (ICD-10 diagnostic code O04). Two abortion diagnoses within 84 days were treated as 1 abortion, with the date of abortion being the latest of the 2 records. If dates for abortion procedures were unknown, we defined the dates as the last contact date (day of discharge). Women with records of induced abortions (inpatient contacts with ICD-8 diagnostic codes 640, 641, and 642) before January 1, 1994, were excluded from the study to include only first-time induced abortions. We also excluded women with records of second-trimester induced abortions between 1994 and 2008 (ICD-10 diagnostic codes O05 and O06).

### STUDY DESIGN

Based on information extracted from the registers, we followed up the largest possible homogeneous population for which we had complete information on first-time first-trimester induced abortion and first childbirth as well as complete records of admissions to psychiatric hospitals in Denmark.

Women with records of at least 1 psychiatric admission at least 9 months before having a first-time first-trimester induced abortion were followed up individually from the women's 15th birthday or January 1, 1994, whichever came later, until readmission with a mental disorder, 12 months after first-time first-trimester induced abortion, death, emigration, or December 31, 2007, whichever came first. The outcome of interest was readmission to a psychiatric hospital in Denmark with any type of mental disorder from 9 months before to 12 months after the abortion. A similar procedure was used for women giving birth. Overall, the present study used a design similar to that of our previous study<sup>10</sup> but with a complementary sample of women with records of psychiatric treatment 9 months before either an abortion or childbirth. The abortion and childbirth groups were not mutually exclusive, resulting in 952 women being included in both groups. Adjustments were made to account for this potential bias. Regardless of the group, all women were censored from the study at the date of readmission during the period of 9 months before to 12 months after the abortion or birth. The study was approved by the Danish Data Protection Agency.

### STATISTICAL ANALYSIS

The longitudinal data were analyzed in a survival analysis using log-linear Poisson regression with the use of commercially available software (SAS GENMOD, version 9.2; SAS Institute, Inc, Cary, North Carolina),<sup>18,19</sup> with each woman being followed up individually. The main outcome measures were incidence rates and incidence rate ratios, and the latter can be interpreted as relative risks (RRs). Covariates included in the analyses were age, calendar period, time since previous admission, reproductive history (previous childbirth or abortion), and mental disorders in the women's parents; these were treated as time-dependent variables. Time-independent covariates were the number of previous psychiatric admissions and previous psychiatric diagnosis.<sup>20</sup> The incidence rate ratios were calculated by maximum likelihood, and Wald 95% CIs were used.

## RESULTS

A total of 2838 women with records of mental disorders had a first-time first-trimester induced abortion between January 1, 1994, and December 31, 2007. During the period from 9 months before to 12 months after the abortion, 321 of these women were readmitted. In comparison, 5293 women with records of mental disorders gave birth to their first live-born child during the same study period, and, during the period from 9 months before to 12 months after the delivery, 273 of these women were readmitted.

### READMISSION RISK BEFORE AND AFTER ABORTION

The crude readmission risk in the abortion group declined notably, from 211 per 1000 person-years 9 months before to 39 per 1000 person-years 12 months after the abortion (**Figure 1**). Because the calculated incidence rates were unadjusted, we conducted additional analyses to study whether potential confounders for readmission explained this pattern (discussed in the next subsections).

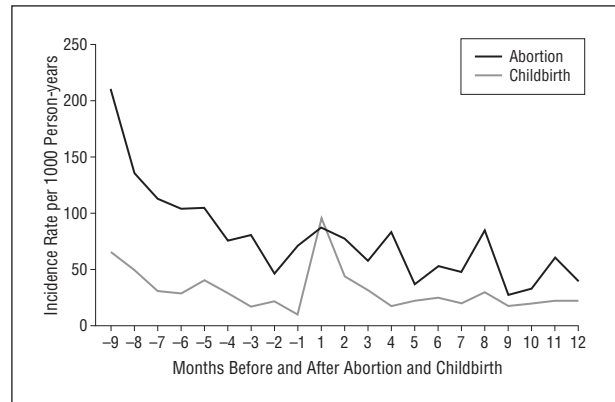
### COMPARING THE READMISSION PATTERN BETWEEN THE ABORTION AND CHILDBIRTH GROUPS

Crude incidence rates of readmission comparing the abortion vs childbirth groups are shown in **Figure 1**. Women's readmission risk in the abortion group declined from before to after abortion. In contrast, women's readmission risk in the childbirth group increased markedly in the first postpartum month. Overall, incidence rates of readmission were markedly higher in women having abortions compared with the rates in women giving birth, both before and after the event. The only exception was the first month after the abortion or childbirth, during which rates of readmission in women giving birth were higher (97 per 1000 person-years vs 87 per 1000 person-years).

### PREDICTORS FOR READMISSION AROUND THE TIME OF ABORTION AND CHILDBIRTH

Predictors for readmission around the time of abortion are presented in **Table 1**. The readmission risk declined with a longer time since the previous admission but remained increased for every period up to more than 5 years since the previous admission (reference category), and the highest observed risk for rehospitalization was within the first month after the previous admission (RR, 37.05; 95% CI, 14.29-96.07). The covariate for time since previous admission/date of discharge was calculated as the number of days since the previous discharge earlier than 9 months before the abortion.

Diagnoses before the abortion were studied to describe other possible predictors for readmission (**Table 1**). There was no observed increased readmission risk for any of the diagnostic groups compared with readmission risk



**Figure 1.** Crude incidence rates per 100 person-years of readmission among women with records of preexisting mental disorders who have had first-time first-trimester induced abortions or given birth.

in the reference category (women with unipolar affective disorders). Parental history of mental disorders was associated with an increased risk of readmission (RR, 1.33; 95% CI, 1.05-1.68), whereas risk of readmission was reduced in women with 1 or more children at the time of abortion (RR, 0.63; 95% CI, 0.48-0.82) (**Table 1**).

As a comparison, predictors for readmission around the time of childbirth are presented in **Table 2**. The readmission risk declined with increasing time since the previous psychiatric admission. Similar to women having abortions, the time since previous admission in women giving birth significantly predicted readmission risk around the time of delivery, with the highest observed risk of rehospitalization observed within the first month after the previous admission (RR, 70.74; 95% CI, 22.79-219.53) (**Table 2**). In contrast to women having abortions, women with bipolar affective disorder or schizophrenialike disorders had an increased readmission risk around the time of birth (RR, 2.99; 95% CI, 1.62-5.51 vs RR, 2.28; 95% CI, 1.43-3.66) compared with readmission risk in the reference category (women with unipolar affective disorders, **Table 2**). Parental history of mental disorders was associated with an increased readmission risk around the time of childbirth similar to the risk observed in the abortion group (RR, 1.36; 95% CI, 1.06-1.75), whereas there was a smaller, nonstatistically significant readmission risk around the time of childbirth in women with records of 1 or more abortions (RR, 0.69; 95% CI, 0.47-1.02) (**Table 2**).

### FULLY ADJUSTED RRs OF READMISSION AROUND THE TIME OF ABORTION AND CHILDBIRTH

The exposure to first-time first-trimester induced abortion was studied, adjusting for the confounders reported in **Table 1**. Fully adjusted RRs of readmission around the time of abortion are shown in **Figure 2A**. During the months preceding and the months after the abortion, there was no increased risk of readmission with any type of mental disorder, as all CIs overlapped 1.00 (reference category: women having abortions 11-12 months earlier). Overall, the RR for readmission 9 to 0 months before the abortion was 0.95 (95% CI, 0.73-

**Table 1. Risk Factors for Readmission Before and After First-Time First-Trimester Induced Abortion Among Women With 1 or More Previous Admissions<sup>a</sup>**

| Risk Factor                                             | No. of Cases | Rate per 1000 Person-years | Relative Risk (95% CI) |
|---------------------------------------------------------|--------------|----------------------------|------------------------|
| Diagnosis before abortion                               |              |                            |                        |
| Adjustment disorder                                     | 55           | 61.29                      | 0.92 (0.59-1.44)       |
| Behavioral disorder                                     | 15           | 53.61                      | 0.65 (0.35-1.22)       |
| Bipolar affective disorder                              | 15           | 196.81                     | 1.12 (0.60-2.11)       |
| Personality disorder                                    | 68           | 98.58                      | 1.04 (0.68-1.61)       |
| Schizophrenialike disorder                              | 63           | 158.99                     | 1.20 (0.77-1.88)       |
| Substance abuse                                         | 27           | 94.48                      | 1.04 (0.61-1.76)       |
| Unipolar affective disorder                             | 32           | 82.99                      | 1 [Reference]          |
| Other disorders                                         | 46           | 43.46                      | 0.94 (0.58-1.50)       |
| Parity status at time of abortion                       |              |                            |                        |
| ≥1 Children                                             | 104          | 50.97                      | 0.63 (0.48-0.82)       |
| No children                                             | 217          | 106.96                     | 1 [Reference]          |
| Parental history of mental disorder at time of abortion |              |                            |                        |
| Yes                                                     | 118          | 89.58                      | 1.33 (1.05-1.68)       |
| No                                                      | 203          | 73.76                      | 1 [Reference]          |
| Time since previous discharge                           |              |                            |                        |
| 0-29 d <sup>b</sup>                                     | 6            | 2117.33                    | 37.05 (14.29-96.07)    |
| 30-59 d                                                 | 6            | 718.22                     | 15.46 (6.13-38.96)     |
| 60-89 d                                                 | 11           | 862.89                     | 21.89 (10.54-45.46)    |
| 90-179 d                                                | 23           | 401.83                     | 10.43 (5.89-18.47)     |
| 180-364 d                                               | 55           | 280.18                     | 8.02 (5.10-12.63)      |
| 1-2 y                                                   | 72           | 125.87                     | 4.07 (2.71-6.13)       |
| >2-5 y                                                  | 106          | 76.78                      | 2.81 (1.94-4.07)       |
| >5 y                                                    | 42           | 22.84                      | 1 [Reference]          |
| No. of previous admissions                              |              |                            |                        |
| 1                                                       | 149          | 49.78                      | 1 [Reference]          |
| 2                                                       | 63           | 102.79                     | 1.81 (1.34-2.45)       |
| 3-5                                                     | 73           | 197.41                     | 2.94 (2.16-4.00)       |
| >5                                                      | 36           | 384.76                     | 3.40 (2.24-5.18)       |

<sup>a</sup>Readmission risk from 9 months before abortion to 12 months after abortion, adjusted for age and calendar period.

<sup>b</sup>Note that readmissions with less than 14 days from last date of discharge to date of readmission were counted as 1 readmission.

1.23) compared with the first year after the abortion (results presented in text only).

In comparison, the exposure to childbirth was studied adjusting for confounders reported in Table 2, and the results are presented in Figure 2B. Unlike the observed stable risk of readmission before and after abortion, risk of readmission after childbirth was significantly increased the first month post partum (RR, 3.10; 95% CI, 1.76-5.45) (Figure 2B) compared with the reference category (11-12 months post partum). Overall, the RR for readmission 9 to 0 months before delivery was 0.56 (95% CI, 0.42-0.75) compared with the first year after the birth (not depicted in Figure 2).

## COMMENT

### ASSESSMENT OF MENTAL DISORDERS

In the present study, we found that women with a history of psychiatric admissions had higher rates of psychiatric readmissions in the 9 months before as well as in the 12 months after a first-time first-trimester induced abortion compared with a first-time childbirth. However, the crude incidence rates of readmission declined from before to after abortion and increased from before to after childbirth. Moreover, a woman's risk of

readmission was higher at 1 month after a childbirth compared with 1 month after an abortion.

We also examined what predicts readmission risk in the time around a first-time first-trimester induced abortion and childbirth. The time since last admission and the number of previous admissions were strong predictors for readmission in both groups. Although readmission risks were similar for all previous types of mental disorders in the abortion group, there were differences in readmission risk by previous type of mental disorder for the childbirth group. Women who previously had bipolar affective disorder or schizophrenialike disorders were more likely to be readmitted around the time of childbirth compared with women who had unipolar affective disorders.

Psychological responses among women having first-trimester induced abortions were studied by Major et al.<sup>4</sup> Most women did not have psychological problems after abortion; those who did tended to have a history of depression. However, previous depression was measured with a single self-reported dichotomous measure (past history of depression: yes/no). The mutually adjusted analysis in the present study indicates that the number of days since discharge from a previous psychiatric admission was a highly significant predictor of readmission. Consequently, our results demonstrate that studies investigating risk of rehospitalization may be biased from uncontrolled confounding if proximity to the last



**Table 2. Risk Factors for Readmission Before and After Childbirth Among Women With 1 or More Previous Admissions<sup>a</sup>**

| Risk Factor                                               | No. of Cases | Rate per 1000 Person-years | Relative Risk (95% CI) |
|-----------------------------------------------------------|--------------|----------------------------|------------------------|
| Diagnosis before childbirth                               |              |                            |                        |
| Adjustment disorder                                       | 44           | 24.06                      | 0.90 (0.55-1.48)       |
| Behavioral disorder                                       | 3            | 3.56                       | 0.19 (0.06-0.64)       |
| Bipolar affective disorder                                | 20           | 147.32                     | 2.99 (1.62-5.51)       |
| Personality disorder                                      | 53           | 32.90                      | 0.91 (0.56-1.47)       |
| Schizophrenialike disorder                                | 68           | 86.98                      | 2.28 (1.43-3.66)       |
| Substance abuse                                           | 17           | 32.86                      | 0.81 (0.43-1.51)       |
| Unipolar affective disorder                               | 26           | 33.09                      | 1 [Reference]          |
| Other disorders                                           | 42           | 19.32                      | 0.99 (0.60-1.64)       |
| Abortion status at time of childbirth                     |              |                            |                        |
| ≥1 Abortions                                              | 30           | 23.53                      | 0.69 (0.47-1.02)       |
| No abortions                                              | 243          | 32.83                      | 1 [Reference]          |
| Parental history of mental disorder at time of childbirth |              |                            |                        |
| Yes                                                       | 99           | 40.26                      | 1.36 (1.06-1.75)       |
| No                                                        | 174          | 27.99                      | 1 [Reference]          |
| Time since previous discharge                             |              |                            |                        |
| 0-29 d <sup>b</sup>                                       | 4            | 1212.02                    | 70.74 (22.79-219.53)   |
| 30-59 d                                                   | 5            | 505.61                     | 25.92 (9.38-71.65)     |
| 60-89 d                                                   | 6            | 369.76                     | 22.95 (9.12-57.75)     |
| 90-179 d                                                  | 16           | 208.23                     | 13.90 (7.37-26.23)     |
| 180-364 d                                                 | 33           | 117.13                     | 8.41 (5.19-13.61)      |
| 1-2 y                                                     | 68           | 67.09                      | 5.00 (3.41-7.34)       |
| >2-5 y                                                    | 84           | 29.05                      | 2.19 (1.54-3.10)       |
| >5 y                                                      | 57           | 13.00                      | 1 [Reference]          |
| No. of previous admissions                                |              |                            |                        |
| 1                                                         | 118          | 18.89                      | 1 [Reference]          |
| 2                                                         | 49           | 34.52                      | 1.53 (1.09-2.15)       |
| 3-5                                                       | 65           | 78.52                      | 2.59 (1.87-3.59)       |
| >5                                                        | 41           | 220.27                     | 4.05 (2.70-6.10)       |

<sup>a</sup>Readmission risk from 9 months before abortion to 12 months after childbirth, adjusted for age and calendar period.

<sup>b</sup>Note that readmissions with less than 14 days from last date of discharge to date of readmission were counted as 1 readmission.

psychiatric contact is not included appropriately in the analysis. However, it is not clear whether proximity to the last psychiatric contact/episode would have a similar influence on risk of repeated outpatient treatment or recurrence of self-reported symptoms of, for example, depression. This makes proximity to previous psychiatric episodes an important focus for future studies.

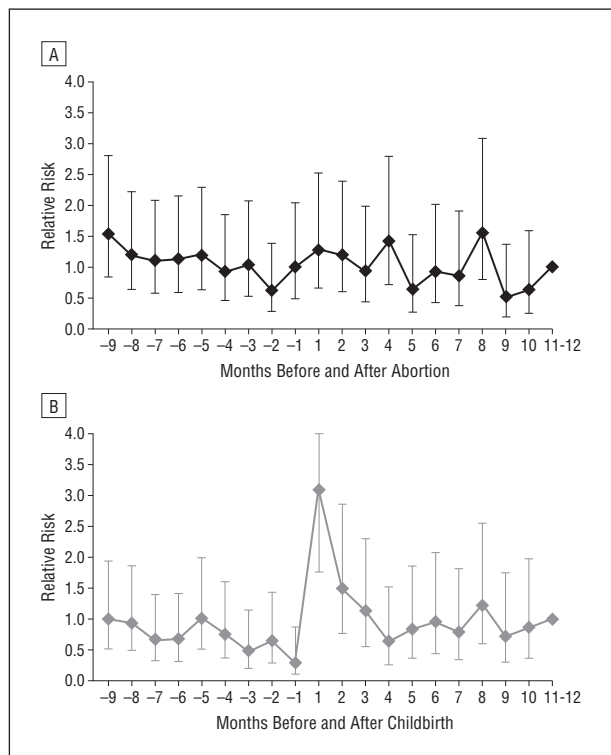
Women with mental disorders have lower birth rates compared with healthy women,<sup>21,22</sup> which could be explained by fewer intended pregnancies<sup>23</sup> and higher rates of induced abortions. However, this was not found in a recent study by Laursen and Munk-Olsen.<sup>21</sup> In terms of incidence rates, we found a higher level of psychiatric morbidity in women having induced abortions than in women giving birth (Figure 1). However, we interpret the observed difference in overall incidence rates of psychiatric readmissions as unrelated to the abortion but as a selection phenomenon. The selection will be present when especially vulnerable women choose to terminate their pregnancies because of their life circumstances, including mental health problems around the time of the induced abortion. With the results of this study, we speculate that a recent psychiatric episode may influence a woman's decision to have an abortion. However, regardless of the reason women chose to terminate a pregnancy, the decision to undergo the induced abortion did not appear to influence the subsequent illness course in our study population.

Diagnosis-specific analyses were made in the present study (Tables 1 and 2). Readmission risks around the time of abortion were not significantly elevated for any diagnostic category. In contrast, childbirth was associated with a marked increased risk of readmission restricted to the first postpartum month, and readmission risks post partum were especially increased in women with bipolar affective disorders and schizophrenialike disorders; this finding was shown in a previous study.<sup>15</sup>

Risk of readmission was decreased among women with 1 or more children at the time of the abortion compared with women with no children (Table 1). Although women in the abortion group and the childbirth group may have similar levels of severity of mental disorders, it is possible that having a child to care for may restrict some women from being admitted to a psychiatric unit. We cannot rule out the possibility that psychiatrists may hesitate to admit mothers to psychiatric facilities, which could explain the decreased readmission risk in this group of women.

## METHODOLOGIC CONSIDERATIONS

Several studies<sup>3,4</sup> on abortion and subsequent mental health problems have relied on self-reported information on both exposure and outcome (abortion and mental health) and had high attrition rates. Neither of these factors was a limitation in the present study, since infor-



**Figure 2.** Fully adjusted relative risk of readmission. A, Readmission risk before and after first-time first-trimester induced abortions in women with 1 or more previous admissions. Adjusted for age, calendar period, previous diagnoses, number of previous admissions, time since previous discharge, family history of mental disorders, and parental status. Readmission risk from 9 months before the abortion to 12 months after the abortion is shown; the reference category is risk of readmission in women having an abortion 11 to 12 months earlier. Limit lines indicate 95% CIs. B, Readmission risk before and after birth of live-born child in women with 1 or more previous admissions. Adjusted for age, calendar period, previous diagnoses, number of previous admission, time since previous discharge, family history of mental disorders, and abortion status. Readmission risk from 9 months before giving birth to 12 months after giving birth is shown; the reference category is risk of readmission in women giving birth 11 to 12 months earlier. Limit lines indicate 95% confidence intervals.

mation on abortions and mental health was obtained from registers and the only women lost to follow-up were those who emigrated or died.

Adjusting for prepregnancy mental health, which is a major predictor for current and future mental health, is critical to isolating the effects of abortion on mental health.<sup>1</sup> However, many studies reviewed by Charles et al<sup>1</sup> used different methods to control for previous mental health, some of which were not optimal. In the present study, we included only women with preexisting mental disorders to examine the possible association between induced abortion and the risk of mental disorder in a population of women with preexisting mental disorders. This restriction in our sample ensured that we did not mix incident and prevalent cases, which improved the validity of the study.

Studies on mental health problems after abortions should distinguish emotions from clinically significant disorders. Because the main outcome in the present study was readmission to psychiatric hospitals, our results reflect patterns of rehospitalization with relatively severe mental disorders among women seeking psychiatric care.

Information on pregnancies and on whether they were planned or unplanned is not available in the register. Women with unwanted pregnancies are more likely to experience concurrent life stressors, such as relationship problems and poor coping capacity, which can increase the risk of poor mental health regardless of the pregnancy outcome.<sup>9</sup> Women having abortions are also more likely to experience life circumstances that influence their decisions regarding pregnancy. Such circumstances include being victims of violence,<sup>5</sup> for which no information was available in the present study. Many women experience mixed emotions about abortion, and having numerous negative emotions about abortion predicts poor mental health outcomes after the procedure.<sup>24</sup> Unfortunately, information on emotions regarding the abortion is not recorded in the registers. Similarly, there was no information on reasons for the abortion, which has been shown to influence negative psychological responses after abortion.<sup>25</sup>

## CONCLUSIONS

In the present study, we found that first-time first-trimester induced abortion does not influence the risk of readmission to psychiatric facilities. This result was found despite the study population that included potentially vulnerable women with records of at least 1 previous psychiatric admission. Risk of rehospitalization was significantly predicted by the number of days since previous discharge; future studies should adjust for this important confounder. Failing to do so sufficiently may introduce bias due to uncontrolled confounding when studying rehospitalization risks.

Risk of readmission is similar before and after a first-trimester induced abortion, contrasting with a marked increased readmission risk within the first month after childbirth. Other diverging results were observed between the 2 groups of women with different pregnancy outcomes, since we observed similar readmission risks around the time of abortion for all diagnostic groups and different from marked readmission risks around the time of childbirth for women with bipolar affective disorders and schizophrenialike disorders.

Our results demonstrated that women with preexisting mental disorders having abortions had higher levels of psychiatric morbidity measured as incidence rates before, as well as after, the abortion compared with women giving birth. This result suggests that women having abortions are a selected segment of the population in studies of psychiatric morbidity in general. We speculate that recent psychiatric episodes, possibly combined with other life circumstances, may influence women's decisions to have an induced abortion. However, this decision did not appear to influence the illness course in women with a history of treated mental disorders.

**Submitted for Publication:** February 3, 2011; final revision received August 10, 2011; accepted August 21, 2011.

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**Financial Disclosure:** Dr Laursen and Messrs Pedersen and Mortensen are funded by the Stanley Medical Research Institute. Mr Lidegaard receives lecture fees and research funding from Bayer Schering Pharma.

**Funding/Support:** This project was sponsored by a grant from the Susan Thompson Buffett Foundation and The Danish Medical Research Council (reference No. 09-063642/FSS).

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