

Fertility trends among adolescent girls with major mental illness

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Overview

The issue. Adolescent girls with major mental illness have multiple risk factors for teen pregnancy – rates have not been examined

What this study accomplished. Observed that teen girls with major mental illness have fertility rates almost 3x higher than girls without major mental illness – and that this gap has widened over time

How we got there. Population-based repeated annual cross-sectional study in Ontario, Canada (1999 to 2009)

Next steps. Attention to this issue in interventions to reduce teen pregnancy and in research to identify how to optimize outcomes of teenage girls with major mental illness who become parents

Rationale

- Adolescents are a vulnerable group with respect to pregnancy outcomes – physical and psychological for mother and child
- Pregnancy prevention for teens includes public health, school and community-based interventions
 - Reduction in teenage pregnancy rates of up to 35% in Canada, U.S. and U.K over the past several years

Rationale

- Certain groups of adolescents remain at risk for pregnancy – e.g. certain minority groups, those with family and/or economic instability, girls with childhood trauma
- Adolescent girls with depression, bipolar disorder and psychotic disorders have many of these risk factors

Fertility rate trends in this group had not been documented

Rationale

- Among adults, major mental illness is associated with a higher rate of adverse pregnancy outcomes --- and the impact of maternal mental illness on child psychopathology and development is substantial.
- Given that adolescents are also at high risk for such outcomes, children of adolescents with major mental illness may be “doubly” vulnerable

Rationale

- Knowledge in this area will have key implications for clinical care, research and public policy
 - Inform development of interventions targeting pregnancy prevention and optimization of outcomes for adolescent mothers and their children
 - If fertility rates are high, this will underscore the importance of future research to quantify the level of risk for these mothers and their children

Our research goal

- Primary Objective
 - To examine age-specific fertility rates (ASFRs; live births per 1000 girls ages 15–19 years) over a 10-year period, comparing adolescent girls with and without major mental illness diagnosed before pregnancy
- Secondary objective
 - To identify factors that could explain observed differences between groups

Overview



- **Study Design:** Repeated annual cross-sectional study using Ontario population-based administrative health service use databases
- **Sample:** Annual samples of Ontario girls aged 15 to 19 at the mid-point of each 12-month period from April 1, 1999 to April 1, 2009
- **Primary Outcome:** Age-specific fertility rate (ASFR) in each fiscal year
- **Main Comparisons:**
 1. Major mental illness vs. No major mental illness
 2. Change over time within each group

Data Sources

- Ontario health administrative data sources at the Institute for Clinical Evaluative Sciences (ICES)

Patient level records anonymously linked through a unique identifier for every Ontario resident with a health care number.

MOMBABY datafile used to identify births using a main patient service code for “obstetric delivery” +/- hospital diagnostic codes

- Identifies live births and stillbirths > 20 weeks gestation
- < 0.1% of deliveries provincially occur outside of hospital

Additional Datasets

Registered Persons Database (RPDB) Health card number, date of birth, sex and postal code associated with the carrier of each valid health card.

Canadian Institutes of Health Information Discharge Abstract Database (CIHI-DAD) All hospitals submit demographic and clinical information about all hospital admissions and discharges to CIHI using standard diagnosis (ICD-9 and ICD-10-CA) and procedure/intervention codes (CCP and CCI)

Ontario Mental Health Reporting System (OMHRS) Contains mental health clinical and administrative data on adult patients from 2005 onward in all facilities in the province of Ontario with designated inpatient mental health beds

Ontario Health Insurance Plan (OHIP) In Ontario, physicians are reimbursed after submitting claims to OHIP for each service provided. This covers all aspects of ambulatory and hospital care

Cohort

- For a previous study, we created annual samples of Ontario women aged 15 to 49 years at the midpoint of each 12-month period starting from April 1, 1999, until April 1, 2009 Vigod et al. Schizophrenia Research 2012
- For this study, we restricted the cohort to adolescent girls aged 15 to 19 years
 - The number of adolescent girls in each fiscal year ranged from a minimum of 379 303 to a maximum of 437 534
 - This resulted in a total of 4 556 545 person-years for the overall study period

Exposures

- For the primary analysis, we combined girls with severe major depression, bipolar disorder, and psychotic disorders into 1 category of major mental illness
 - Psychiatric diagnoses are fluid between these categories for teens
 - Secondary analysis separated mood and psychotic disorders
- For each 12-month period, an adolescent was assigned to the major mental illness group if, within the previous 5 yrs:
 - 1) Hospitalized for any of the above (ICD-9 295 to 298 ICD-10-CA F20,F22 to F25, or F28 to F33); OR
 - 2) OHIP service claim for these disorders (OHIP codes 295–298)

Outcomes

- Age-Specific Fertility Rate (ASFR) for age 15-19
 - Number of live births per unit population (WHO)
 - Takes into account age structure of the population
 - Ages 13-14 not usually included but represent few births
- By definition, the ASFR includes only live births, such that it is not a perfect reflection of pregnancy rates.
 - We measured stillbirth rates for secondary analysis

Baseline Characteristics

- Adolescents with previously diagnosed major mental illness represented 1.1% to 1.4% of the sample for any given fiscal year
- Compared to unaffected girls, girls in the major mental illness group were:
 - More likely to be multiparous (3.6% vs 1.4%)
 - Similar on SES (~20% lowest income quintile)
 - Similar on place of residence (~87% urban)

Almost 1 in 25 teenage births was to a girl with a previously diagnosed major mental illness (3.8%)

TABLE 1 ASFRs Among Adolescents With and Without Psychotic Disorders, Bipolar Disorder, and Major Depressive Disorder in Ontario (1999–2009)

Fiscal Year	Adolescent Girls With Major Mental Illnesses ^a			Adolescent Girls Without Major Mental Illnesses			ASFR Ratio ^c (95% CI)
	Total Number	Number of Live Births	ASFR ^b (95% CI)	Total Number	Number of Live Births	ASFR ^b (95% CI)	
1999	4252	228	53.6 (46.9–61.1)	375 051	7 165	19.1 (18.7–19.6)	2.81 (2.46–3.20)
2000	4584	245	53.4 (47.0–60.6)	384 349	6 810	17.7 (17.3–18.1)	3.02 (2.66–3.43)
2001	5041	241	47.8 (42.0–54.2)	392 163	6 546	16.7 (16.3–17.1)	2.86 (2.52–3.26)
2002	5244	249	47.5 (41.8–53.8)	400 483	6 264	15.6 (15.3–16.0)	3.04 (2.67–3.45)
2003	5371	219	40.8 (35.6–46.5)	406 952	6 185	15.2 (14.8–15.6)	2.68 (2.34–3.07)
2004	5565	227	40.8 (35.7–46.5)	412 786	5 835	14.1 (13.8–14.5)	2.89 (2.53–3.29)
2005	5780	223	38.6 (33.7–44.0)	421 449	5 822	13.8 (13.5–14.2)	2.79 (2.44–3.19)
2006	5965	243	40.7 (35.8–46.2)	421 571	6 022	14.3 (13.9–14.7)	2.85 (2.51–3.24)
2007	6012	283	47.1 (41.7–52.9)	422 635	6 032	14.3 (13.9–14.6)	3.30 (2.93–3.72)
2008	6146	272	44.3 (39.2–49.8)	427 612	5 991	14.0 (13.7–14.4)	3.16 (2.80–3.57)
2009	6268	277	44.2 (39.1–49.7)	431 266	5 719	13.3 (12.9–13.6)	3.33 (2.95–3.76)
All years	60 228 person-years	2707	44.9 (43.3–46.7)	4 496 317 person-years	68 391	15.2 (15.1–15.3)	2.95 (2.84–3.07)

^a Major mental illnesses include psychotic disorders, bipolar disorder, or major depressive disorder.

^b ASFR per 1000 eligible girls.

^c Compares girls with psychotic disorders, bipolar disorder, and major depressive disorder with girls without these major mental illnesses.

Covariate adjustment

- Study covariates explained some of the difference in ASFRs between groups.
 - Multiparity, SES and living in a rural area all associated with increased birth rates
 - Inclusion of these covariates reduced the ASFR ratio to 1.87 (95% CI: 1.77–1.96)

Time (3-year moving averages)

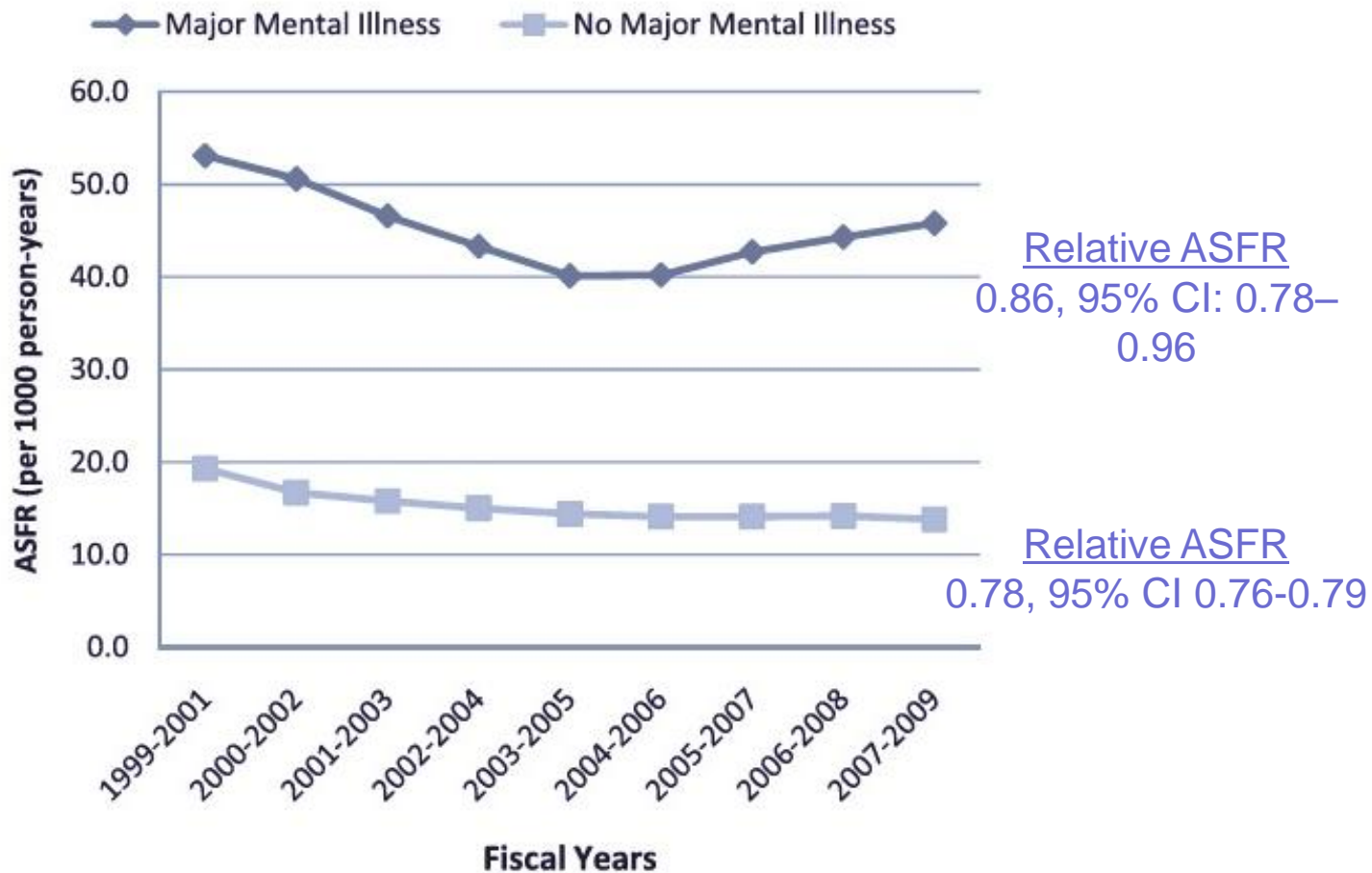


FIGURE 1

ASFRs for adolescent girls with and without major mental illness using 3-year moving averages.

Secondary analyses

- No difference between primary psychotic disorder (ASFR: 45.0; 95% CI: 41.9–48.3) and primary mood disorder (ASFR: 44.9; CI: 42.9–47.0)
- Stillbirth rate was 7.04 per 1000 births among girls with major mental illness (95% CI: 5.43–8.66) compared with 6.61 per 1000 births (95% CI: 6.30–6.92) among unaffected girls, a non-significant difference

What did we learn?

- Results highlight an issue of broad societal concern given implications for maternal & child outcomes
 - Almost 1 in 25 teenage births is to a girl with major mental illness ---- Birth rates 3x higher in this group
 - Fertility rates decreased over time, but less than for unaffected girls --- 14% compared to a 22% reduction

Implications

- Informs policy and clinical care:
 - Need to attend to reproductive health and decision-making for adolescent girls with mental illness;
 - Need to ensure that antenatal and postnatal programs for adolescents attend to mental health issues
- Interventions that systematically integrate adolescent mental health and reproductive care may help reduce adolescent fertility rates and optimize outcomes
- Future research can identify specific health disparities to target for this “doubly vulnerable” population.

Thank you

