Serious Mental Illness and Disrupted Caregiving for Children: A Nationwide, Register-Based Cohort Study

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ABSTRACT

Objective: To study how often severe psychiatric disorders adversely affect a person's ability to be a parent, indicated by the child being placed in out-of-home care.

Method: This study was conducted in 2013 as a prospective, register-based cohort study covering all first-born singletons in the entire Danish population born after 1982 (N = 782,092) and their parents. Rates of out-of-home placement of children with parents diagnosed with schizophrenia, bipolar disorder, or unipolar depression, according to the criteria of the *International Statistical Classification of Diseases and Related Health Problems, 8th revision* (*ICD-8*) and *ICD, 10th revision* (*ICD-10*), were analyzed. The rates were compared with those of children with parents from the general population.

Results: A parental diagnosis of schizophrenia was the most prominent risk factor for children placed outside the home, with an accumulated risk for being placed in care at some point during childhood—40% for children with mothers with schizophrenia and 20% for children with fathers with schizophrenia. Children of mothers (incidence rate ratio [IRR] = 23.75; 95% CI, 20.94–26.93) and fathers (IRR = 7.85; 95% CI, 6.67–9.25) with a diagnosis of schizophrenia had the overall highest IRRs of placement in care. Having a mother with bipolar disorder was the second most prominent risk factor (IRR = 5.76; 95% CI, 4.50–7.36), followed by a maternal diagnosis of unipolar depression (IRR = 4.28; 95% CI, 3.73–4.90). Risks were especially high during the child's first year of life, indicating a critical period, especially for children with mothers with schizophrenia (IRR = 80.19; 95% CI, 68.09–94.43). Risks varied greatly with parents' socioeconomic factors in all diagnostic groups.

Conclusions: Parental schizophrenia is a strong risk factor for placement of children in out-of-home care.

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In multiple studies, severe psychiatric disorders are often associated with impaired parenting skills, such as poor maternal responding[1] and more negative mother-infant interactions.[2,3] Other studies find deficits in child-rearing environments,[4] reporting adverse childhood experiences, such as children having to care for their ill parents[5] or feeling unsafe at home due to parents' illness-related behavior.[6] These studies are characterized, however, by selected samples of mothers who are currently undergoing treatment. Very little research has been conducted regarding offspring of fathers with psychiatric disorders, probably due to a traditional perception of the mother-child relation as most influential. The perception that impaired caregiving is related to severe psychiatric disorders has been challenged by others. A small, observer-blinded study showed no differences in maternal responsiveness between mothers with schizophrenia and depression compared to control mothers,[7] and another study reports that some families manage well in spite of parental mental illness, thus emphasizing that children are not at inevitable risk of harm and neglect.[8] Patients caring for minor children often need support in parenting from psychiatric and human services.[9] Nevertheless, psychiatric symptoms sometimes prevent parents from providing proper care for children to such a degree that out-of-home care becomes a necessity. The extent of such more extreme cases of disrupted caregiving has not yet been investigated. Parental psychiatric disorders have been shown to be a risk factor for child placement in 1 national register-based study,[10] but this study did not distinguish between parental diagnoses, and the proportion of children placed in care was not reported. In summary, our knowledge about caregiving is restricted to small, selected samples that do not include fathers, and the prevalence of children placed in care according to parental psychiatric diagnosis has never been investigated in a national sample.

Previous research has indicated that in comparison to a diagnosis of affective disorder, schizophrenia is most often associated with impaired parenting skills. Mothers with schizophrenia are generally more remote, intrusive, and self-absorbed[11]; show less positive maternal response to infants[1]; and have less affectionate involvement with their children.[2] In addition, they are more likely to remain under social-service supervision after discharge from mother-and-baby units and to be discharged without their babies.[12,13] These results lead us to expect that in our study, more children of parents with schizophrenia will be placed in out-of-home care compared to children with parents from other diagnostic groups and from the general population.

The national Danish registers make it possible to examine out-of-home placements of children with parents with different psychiatric diagnoses in a large, representative sample. In Denmark, as in most other industrialized countries, it is the responsibility of the State to intervene if the well-being of a child is jeopardized due to unacceptable conditions for upbringing. Such conditions can be related to child neglect or abuse or to a parent that is too ill to take proper care of the child.

Clinical Points

- Clinicians should be aware that during the first years of life for children who have parents with schizophrenia, risks for disrupted caregiving are especially high, as about 20% of mothers and 10% of fathers lose custody of the child within the first year.
- Children are at a much higher risk of entering out-of-home care if the mother rather than the father suffers from a serious mental illness, especially schizophrenia.

The aim of the current study was to examine rates and predictors of placement in out-of-home care of children with parents diagnosed with schizophrenia, bipolar disorder, or unipolar depression compared to children of parents from the general population, examining rates for fathers and mothers, respectively.

METHOD

Study Population and Follow-Up

In total, 782,092 first-born singletons resulting in 9,487,215 person years at risk for first placements in out-of-home care were included in the study. We identified all children born in Denmark between 1982 and 2010 and their parents from the Danish Civil Registration System.[14] The year 1982 was chosen because information about parents' employment and education has been available only since 1982. The primary outcome measure was the child's first placement in out-of-home care, and all dependent variables concerning the parents were measured at the child's day of birth.

The Danish Civil Registration System was established in 1968, at which time all people alive and living in Denmark were registered and assigned a 10-digit personal identification number used in all registers. The register records information on gender, date of birth, place of birth, and vital status. *Parents* were defined as biological mothers and fathers identified in the Danish Medical Birth Registry.[15] Information on child placements was drawn from the Children and Young People Receiving Social Benefits register, which records information on all child placements since 1977.[16] Information on parents' educational level and employment status was retrieved from Statistics Denmark.[17] Educational levels were divided into 3 categories according to the International Standard Classification of Education (ISCED)[18]: (1) minimum education: no more than lower secondary education; (2) short education: upper secondary education, postsecondary education, and short-cycle tertiary education; and (3) long education: bachelor degree or equivalent, master degree or equivalent, and doctoral degree or equivalent level. Employment status was divided in 3 categories: (1) working: having a normal job, being self-employed, or studying; (2) out of work: unemployed or on sick-leave; and (3) disability pension.

Information on parents' psychiatric disorders, including substance abuse, was retrieved from the Danish Psychiatric Central Research Register,[19] which includes data on all inpatient admissions in Denmark since April 1, 1969, and outpatient contacts since 1995. We identified all parental diagnoses prior to the birth of the first child using the *International Statistical Classification of Diseases and Related Health Problems, 8th revision* (*ICD-8*) and *10th revision* (*ICD-10*). Our main diagnostic categories were schizophrenia (ICD-8: 295 [excluding 295.79]; ICD-10: F20); bipolar disorder (ICD-8: 296.19, 296.39, 298.19; ICD-10: F30, F31, F34.0, F38.0); and unipolar depression (ICD-8: 296.09, 296.29, 296.89, 296.99, 298.09, 300.49, 301.19; ICD-10: F32, F33, F34 [excluding F34.0], F38 [excluding 38.0], F39). In the analysis, a hierarchy was used if the parents had more than 1 diagnosis. Schizophrenia was at the top of the hierarchy, then bipolar disorder, and unipolar depression was lowest. The follow-up of the cohort began on January 1, 1982, or on the cohort member's birthday, whichever came last. Children were followed until first entry to care, 18th birthday, death, or December 31, 2010, whichever came first.

The study was approved by the Danish Data Protection Agency (Datatilsynet.dk) on June 7, 2012 (j.nr. 2007-58-0015).

Statistical Analyses

The outcome variable was the child's first placement in care. Data were analyzed using Poisson regression with the GENMOD procedure in SAS version 9.3 (SAS Institute Inc, Cary, North Carolina). We calculated the incidence rate of the child's entry to care as number of new cases per 1,000 years at risk. The main outcome measures were incidence rate ratios (IRRs), ie, the ratios of incidence rates in children of parents with the respective diagnoses compared with parents without any of the diagnoses in question. All analyses were adjusted for the age of the child and calendar time. Incidence rate ratios were calculated by log-likelihood estimation, and Wald 95% confidence intervals (CIs) were used.

We used the Aalen-Johansen method[20] to estimate the probability (cumulative incidence) of first placement in care. We took mortality of the children into account, although it had a limited impact on the probabilities due to the very low child mortality rates in Denmark. Aalen-Johansen survival curves were obtained using the SAS macro presented by Rosthøj and colleagues.[21]

RESULTS

The survival analysis showed the largest proportion of placements in care in the group of children with mothers who had schizophrenia, with cumulative risk reaching 20% by the child's first year of life and 40% by 18 years (Figure 1). In the group of children with fathers who had schizophrenia, the cumulative risk was considerably lower—5% by the child's first year and 20% by the child's 18th year of life (Figure 2). As indicated by the slopes of the Aalen-Johansen curves presented in Figure 1, the rates of out-of-home placements were largest in the first years of

Figure 1. Child's Removal From Home Based on Mother's Diagnosis

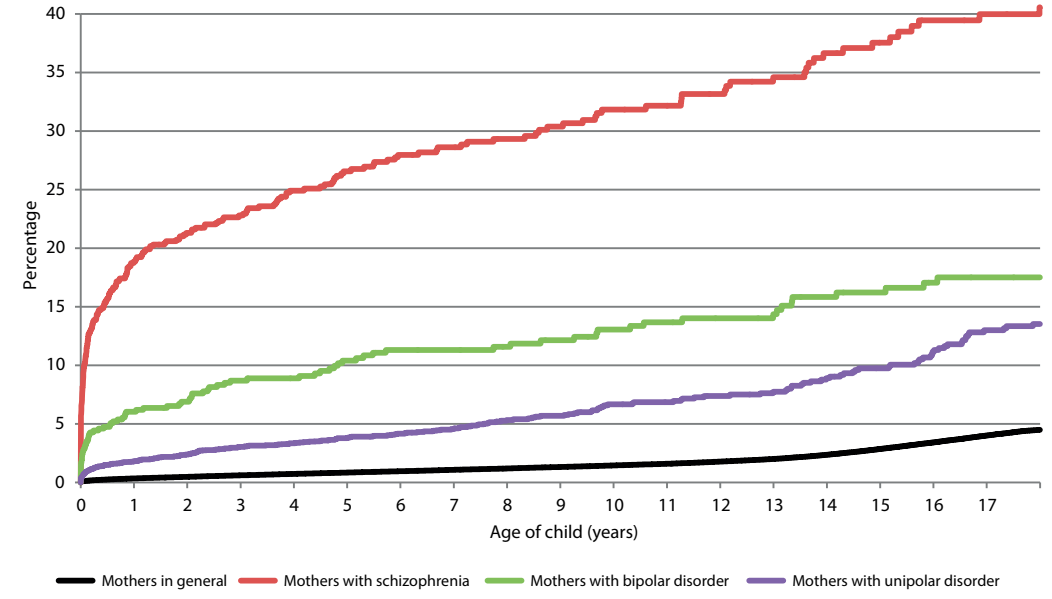
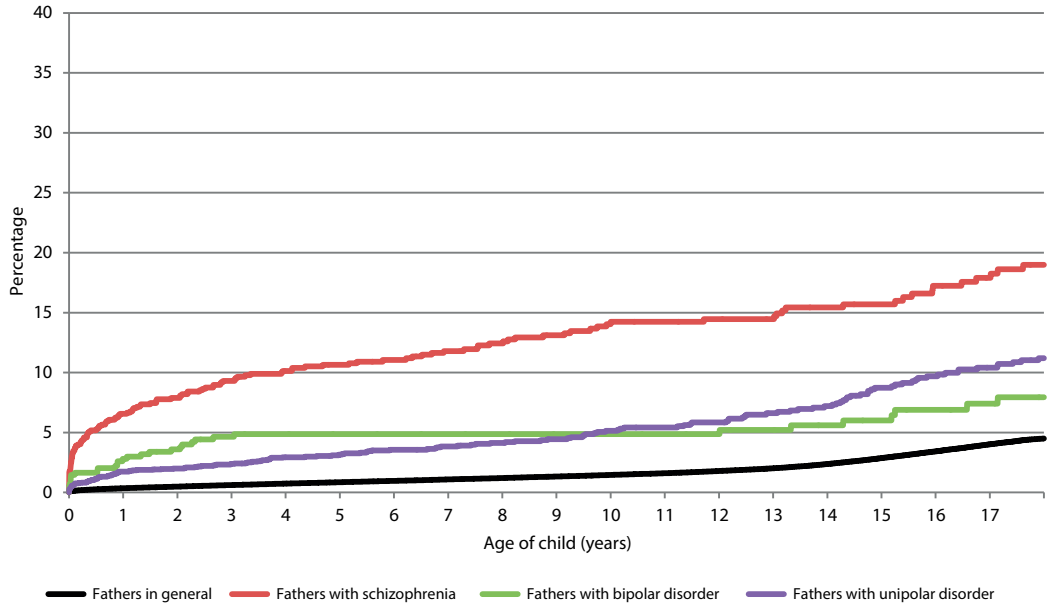


Figure 2. Child's Removal From Home Based on Father's Diagnosis



life, regardless of parental diagnosis. Hereafter, the rates of out-of-home placement seemed steadily continuous through the rest of childhood, indicating a high-risk period in early childhood.

Children with mothers (IRR = 23.75; 95% CI, 20.94–26.93) (Table 1) and fathers (IRR = 7.85; 95% CI, 6.67–9.25) (Table 2) with schizophrenia had the overall highest relative risk compared to children of parents from the reference group. Rates for children with mothers (IRR = 5.76; 95% CI, 4.50–7.36) and fathers (IRR = 1.87; 95% CI, 1.22–2.88) with bipolar disorder as well as mothers (IRR = 4.28; 95% CI, 3.73–4.90) and fathers (IRR = 3.28; 95% CI, 2.78–3.88) with unipolar depression were higher than those of the reference group, although considerably lower than those of the schizophrenia group. All analyses showed stronger associations with maternal rather than paternal psychiatric disorders. Across all diagnostic categories, time since parents' last, but not first, admission to a psychiatric hospital was strongly associated with children's risk for entry to care (Tables 1 and 2).

Table 1. Risk of First-Time Placement in Care for Children Associated With Psychosocial Characteristics of Mothers With Psychiatric Disorders[a]

Psychosocial Characteristic[b]	Mothers With Schizophrenia		Mothers With Bipolar Disorder		Mothers With Unipolar Depression		Mothers in the General Population[c]	
n	823		593		5,105		775,571	
Cases[d]	246		64		211		20,595	
Person years under risk	5,383		5,381		29,825		9,446,626	
	IRR (95% CI)	IR	IRR (95% CI)	IR	IRR (95% CI)	IR	IRR (95% CI)	IR
Overall	23.75 (20.94–26.93)	45.70	5.76 (4.50–7.36)	11.89	4.28 (3.73–4.90)	7.07	1 Reference	2.18
Age of child 0 y	80.19 (68.09–94.43)	227.88	15.52 (10.46–23.01)	45.64	6.12 (4.80–7.79)	14.46	1 Reference	3.24
Age of child 1–2 y	21.94 (15.10–31.85)	25.53	11.40 (6.60–19.66)	13.64	5.69 (4.19–7.72)	5.59	1 Reference	1.30
Age of child 3–4 y	23.59 (15.48–35.93)	25.06	6.90 (3.09–15.38)	7.56	3.61 (2.27–5.75)	3.38	1 Reference	1.16
Age of child 5–6 y	13.07 (7.02–24.34)	14.44	5.24 (1.96–13.98)	5.94	2.94 (1.62–5.32)	2.92	1 Reference	1.18
Age of child 7–8 y	10.76 (5.13–22.67)	12.43	2.93 (0.73–11.75)	3.47	6.00 (3.72–9.68)	6.41	1 Reference	1.20
Age of child 9–10 y	9.73 (4.36–21.70)	13.25	6.97 (2.90–16.77)	9.75	4.84 (2.74–8.55)	6.37	1 Reference	1.40
Age of child 11–12 y	9.09 (4.33–19.09)	18.71	1.06 (0.15–7.55)	2.20	2.02 (0.91–4.51)	4.14	1 Reference	2.08
Age of child 13–14 y	5.25 (2.50–11.03)	23.17	2.90 (1.21–6.98)	12.58	2.70 (1.60–4.57)	12.02	1 Reference	4.36
Age of child 15–17 y	2.93 (1.32–6.53)	17.05	1.13 (0.37–3.52)	6.36	2.85 (1.89–4.30)	16.94	1 Reference	5.69
Parents cohabiting	20.83 (16.98–25.54)	27.65	5.69 (4.05–8.01)	8.35	4.21 (3.48–5.10)	5.01	1 Reference	1.52
Single parent status	54.79 (46.69–64.30)	76.35	15.57 (10.88–22.28)	21.81	10.78 (8.88–13.08)	12.26	3.27 (3.18–3.36)	5.11
Family status unknown[e]	21.57 (3.04–153.12)	35.33	11.36 (1.60–80.64)	19.00	5.98 (0.84–42.45)	5.93	1.61 (1.42–1.83)	2.25
Employed	14.49 (9.24–22.73)	14.52	6.41 (4.13–9.94)	6.58	3.90 (2.98–5.09)	3.33	1 Reference	1.08
Out of work	53.03 (45.72–61.51)	52.26	16.86 (12.26–23.19)	17.05	15.17 (12.86–17.89)	10.89	4.48 (4.36–4.61)	4.76
Disability pension	136.77 (102.83–181.91)	73.94	98.82 (44.35–220.21)	52.37	78.11 (44.30–137.75)	40.61	67.50 (58.48–77.91)	36.52
Long education	29.80 (15.45–57.49)	12.17	12.98 (6.73–25.04)	5.52	5.83 (3.50–9.72)	2.25	1 Reference	0.42
Short education	97.64 (76.09–125.31)	38.67	20.65 (13.25–32.18)	8.89	11.16 (8.41–14.82)	4.12	2.00 (1.86–2.16)	0.87
Minimum education	142.15 (120.10–168.26)	58.37	57.37 (40.70–80.86)	24.61	34.88 (29.09–41.82)	13.36	11.88 (11.05–12.76)	5.50
Education unknown[e]	139.28 (66.18–293.12)	59.30	19.59 (2.76–139.22)	8.23	43.12 (21.48–86.53)	15.84	7.69 (7.02–8.42)	3.40
No substance abuse	22.72 (19.90–25.94)	43.35	5.87 (4.58–7.52)	11.96	3.82 (3.29–4.42)	6.18	1 Reference	2.14
Substance abuse	58.43 (39.46–86.52)	87.71	5.60 (0.79–39.79)	8.88	21.16 (15.04–29.78)	32.42	17.78 (16.07–19.66)	33.91
Onset of illness ≥ 5 y	23.86 (20.51–27.77)	47.28	5.43 (3.99–7.37)	11.18	4.35 (3.60–5.26)	8.03	1 Reference	2.18
Onset of illness < 5 y	23.49 (18.78–29.39)	42.57	6.45 (4.29–9.71)	13.42	4.21 (3.47–5.10)	6.30	1 Reference	2.18
Last admission ≥ 5 y	8.25 (5.38–12.66)	16.87	1.43 (0.60–3.44)	3.02	2.25 (1.63–3.09)	4.55	1 Reference	2.18
Last admission < 5 y	28.81 (25.26–32.86)	54.37	7.74 (6.00–9.99)	15.85	5.35 (4.60–6.22)	8.06	1 Reference	2.18
Diagnosis of father								
Schizophrenia	74.16 (52.97–103.82)	132.99	93.84 (48.81–180.43)	166.39	11.42 (4.28–30.43)	16.78	5.67 (4.65–6.93)	10.89
Bipolar disorder	46.26 (19.25–111.17)	85.93	34.20 (8.55–136.77)	72.90	No cases	No cases	1.30 (0.77–2.19)	2.71
Unipolar depression	26.53 (8.55–82.27)	37.09	12.76 (3.19–51.02)	24.69	9.60 (4.31–21.37)	13.15	3.15 (2.64–3.75)	5.97
Father's identity unknown[e]	77.21 (55.67–107.07)	158.08	39.44 (21.22–73.32)	75.85	15.67 (10.50–23.39)	27.79	4.30 (4.04–4.58)	8.62
General population[c]	19.30 (16.58–22.46)	35.29	4.09 (3.01–5.56)	8.06	4.01 (3.45–4.65)	6.27	1 Reference	2.08
Employment status of father								
Employed	15.79 (12.39–20.11)	20.21	4.65 (3.19–6.79)	6.57	3.55 (2.89–4.34)	3.94	1 Reference	1.49
Out of work	52.31 (43.85–62.39)	71.99	15.06 (9.91–22.87)	21.60	15.02 (12.04–18.75)	17.15	4.06 (3.94–4.18)	6.09
Disability pension	187.89 (114.96–307.06)	144.09	268.3 (100.6–715.5)	245.42*	41.94 (20.95–83.95)	31.17	21.55 (18.46–25.16)	16.64
Status unknown[e]	107.29 (77.35–148.82)	158.08	55.27 (29.73–102.76)	75.85	21.94 (14.70–32.75)	27.79	6.00 (5.64–6.40)	8.62
Educational level of father								
Long education	33.59 (18.98–59.44)	14.90	14.22 (6.75–29.93)	6.39	4.72 (2.60–8.57)	1.88	1 Reference	0.46
Short education	57.13 (43.20–75.54)	24.45	13.67 (8.56–21.83)	6.55	10.79 (8.30–14.02)	4.16	9.34 (8.65–10.09)	1.19
Minimum education	153.32 (126.73–185.49)	67.93	43.38 (28.63–65.71)	19.83	35.18 (28.41–43.56)	13.02	9.03 (8.27–9.86)	4.73
Level unknown[e]	329.38 (235.60–460.50)	158.08	165.12 (88.45–308.26)	75.85	65.36 (43.50–98.19)	27.79	18.22 (16.55–20.06)	8.62
Father without substance abuse	19.65 (16.91–22.82)	35.49	4.86 (3.66–6.46)	9.36	3.76 (3.22–4.39)	38.52	1 Reference	2.04
Father with substance abuse	90.29 (65.38–124.68)	132.12	21.68 (9.74–48.27)	49.29	28.44 (18.88–42.82)	5.78	7.17 (6.61–7.77)	14.29

[a]Adjusted for child's age and calendar time.
[b]All dependent variables concerning the parents were measured at the child's day of birth.
[c]Mothers without schizophrenia, bipolar disorder, or unipolar depression.
[d]Cases represent the incidence rate of the child's entry to care as number of new cases per 1,000 years at risk.
[e]The information in question was not available from the registers.
Abbreviations: CI = confidence interval, IR = incidence rate, IRR = incidence rate ratio.

For children in the general population, we found a marked increase in the incidence rates of placement in care in the years of adolescence (incidence rate [IR] = 5.69 at age 15–17 years) compared to early childhood (IR = 1.16 at age 3–4 years) (Table 1). Children of parents with severe psychiatric disorders did not show the same pattern of sharply increased incidence rates of placement in care during adolescence (Table 1 and 2). The association between risk for placement in care and mother's diagnosis varied significantly with the child's age in that we found particularly high rates of placement in the first year of life for children of mothers with schizophrenia (IRR = 80.19; 95% CI, 68.09–94.43) (Table 1).

Generally, there was a strong association across diagnostic groups between social factors and risk of child placement (Tables 1 and 2). Single parent status compared to cohabiting status was associated with higher relative risk,

Table 2. Risk of First-Time Placement in Care for Children Associated With Psychosocial Characteristics of Fathers With Psychiatric Disorders[a]

Psychosocial Characteristic[b]	Fathers With Schizophrenia		Fathers With Bipolar Disorder		Fathers With Unipolar Depression		Fathers in the General Population[c]	
n[d]	1,069		489		2,757		765,565	
Cases[e]	144		21		138		19,699	
Person years under risk	9,460		5,299		21,878		9,328,188	
	IRR (95% CI)	IR	IRR (95% CI)	IR	IRR (95% CI)	IR	IRR (95% CI)	IR
Overall	7.85 (6.67–9.25)	15.22	1.87 (1.22–2.88)	3.96	3.28 (2.78–3.88)	6.30	1	2.11
Age of child 0 y	26.12 (20.56–33.20)	70.65	5.98 (2.99–11.97)	17.1244	6.27 (4.60–8.53)	15.84	1	2.97
Age of child 1–2 y	13.42 (9.11–19.77)	15.15	13.42 (9.11–19.77)	8.3179	2.73 (1.58–4.71)	2.95	1	1.23
Age of child 3–4 y	7.25 (4.01–13.13)	7.5883	1.21 (0.17–8.61)	1.3430	3.56 (2.06–6.14)	3.67	1	1.13
Age of child 5–6 y	5.96 (2.97–11.94)	6.4413	No cases	No cases	3.64 (2.01–6.59)	3.95	1	1.14
Age of child 7–8 y	6.87 (3.43–13.77)	7.6054	No cases	No cases	3.18 (1.58–6.37)	3.57	1	1.15
Age of child 9–10 y	5.05 (2.27–11.27)	6.7526	No cases	No cases	4.02 (2.16–7.48)	5.46	1	1.37
Age of child 11–12 y	0.66 (0.09–4.67)	1.3224	1.00 (0.14–7.09)	2.05	3.45 (1.91–6.25)	7.17	1	2.04
Age of child 13–14 y	1.83 (0.76–4.39)	7.7676	0.53 (0.08–3.78)	2.28	2.73 (1.67–4.46)	12.17	1	4.29
Age of child 15–17 y	2.40 (1.29–4.46)	13.5939	1.01 (0.33–3.15)	5.69	1.55 (0.94–2.58)	9.20	1	5.61
Parents cohabiting	7.40 (5.76–9.50)	10.25	2.08 (1.18–3.66)	3.16	3.13 (2.46–4.00)	4.30	1	1.51
Single parent status	16.99 (15.34–18.83)	24.48	3.18 (1.52–6.67)	4.80	7.39 (5.82–9.38)	10.41	3.16 (3.07–3.25)	4.91
Family status unknown[f]	No cases	No cases	28.44 (7.11–113.74)	42.04	15.10 (6.28–36.29)	23.64	1.96 (1.76–2.19)	2.80
Employed	4.07 (2.73–6.07)	6.04	1.47 (0.76–2.82)	2.23	3.12 (2.46–3.96)	4.29	1	1.50
Out of work	15.93 (13.03–19.47)	23.35	5.56 (2.89–10.69)	10.88	7.97 (6.16–10.32)	10.88	4.08 (3.97–4.20)	6.16
Disability pension	23.09 (15.45–34.49)	18.00	10.30 (1.45–73.11)	8.06	17.15 (7.70–38.21)	13.20	24.41 (20.88–28.54)	19.28
Employment unknown[f]	No cases	No cases	17.17 (4.29–68.66)	23.72	14.28 (6.41–31.80)	23.74	2.17 (1.90–2.48)	3.09
Long education	5.81 (1.87–18.07)	2.75	6.74 (2.52–18.00)	3.30	3.43 (1.54–7.67)	1.58	1	0.47
Short education	19.19 (13.66–26.94)	9.17	2.94 (1.10–7.85)	1.47	10.31 (7.63–13.94)	4.68	2.41 (2.23–2.61)	1.20
Minimum education	55.02 (44.66–67.77)	24.91	12.25 (6.10–24.58)	6.30	22.50 (17.79–28.47)	10.36	9.21 (8.53–9.93)	4.76
Education unknown[f]	24.38 (10.11–58.75)	10.02	120.47 (49.98–290.33)	54.88	19.43 (10.41–36.27)	9.74	8.97 (8.22–9.78)	4.59
No substance abuse	6.93 (5.74–8.36)	13.42	1.73 (1.09–2.75)	3.61	2.70 (2.21–3.29)	5.06	1	2.06
Substance abuse	16.48 (11.82–22.96)	26.17	5.84 (1.88–18.10)	9.47	8.58 (6.30–11.71)	16.00	7.47 (6.88–8.11)	15.15
Onset of illness ≥ 5 y	7.67 (6.33–9.30)	15.18	1.89 (1.16–3.08)	4.09	3.74 (3.07–4.56)	8.02	1 Reference	2.11
Onset of illness < 5 y	8.36 (6.13–11.41)	15.32	1.84 (0.76–4.42)	3.60	2.50 (1.82–3.42)	4.09	1 Reference	2.11
Last admission ≥ 5 y	1.91 (0.96–3.82)	4.28	0.70 (0.17–2.78)	1.68	2.54 (1.65–3.89)	4.84	1 Reference	2.11
Last admission < 5 y	9.91 (7.78–12.62)	19.41	2.12 (1.01–4.45)	5.38	3.32 (2.40–4.61)	5.99	1 Reference	2.11
Diagnosis of mother								
Schizophrenia	74.16 (52.97–103.82)	132.99	93.84 (48.81–180.43)	166.39	11.42 (4.28–30.43)	16.78	5.67 (4.65–6.93)	10.89
Bipolar disorder	46.26 (19.25–111.17)	85.93	34.20 (8.55–136.77)	72.90	No cases	No cases	1.30 (0.77–2.19)	2.71
Unipolar depression	26.53 (8.55–82.27)	37.09	12.76 (3.19–51.02)	24.69	9.60 (4.31–21.37)	13.15	3.15 (2.64–3.75)	5.97
General population[c]	19.30 (16.58–22.46)	35.29	4.09 (3.01–5.56)	8.06	4.01 (3.45–4.65)	6.27	4.30 (4.04–4.58)	8.62
Employment status of mother								
Employed	4.11 (2.62–6.45)	4.314	1.88 (0.89–3.94)	2.011	2.62 (1.88–3.65)	2.586	1	1.06
Out of work	25.99 (21.58–31.30)	23.116	7.61 (4.50–12.86)	7.736	13.49 (11.07–16.46)	11.982	4.43 (4.30–4.56)	4.61
Disability pension	141.51 (80.27–249.50)	71.734	No cases	No cases	91.31 (34.24–243.48)	48.164	68.17 (59.40–78.25)	36.21
Educational level of mother								
Long education	7.73 (3.46–17.26)	3.24	2.70 (0.67–10.80)	1.15	2.78 (1.24–6.20)	1.13	1	0.41
Short education	15.55 (10.08–23.99)	6.36	4.63 (1.73–12.36)	1.95	8.30 (5.69–12.10)	3.28	2.03 (1.88–2.19)	0.86
Minimum education	70.40 (57.36–86.40)	28.88	24.19 (14.26–41.03)	10.92	33.68 (27.32–41.52)	14.08	11.75 (10.92–12.64)	5.33
Level unknown[f]	49.99 (28.89–86.49)	18.47	9.09 (1.28–64.64)	4.24	12.46 (5.17–30.03)	4.89	7.38 (6.72–8.11)	3.21
Mother without substance abuse	7.35 (6.18–8.73)	13.96	1.91 (1.24–2.93)	3.97	3.05 (2.56–3.64)	5.76	1	2.08
Mother with substance abuse	48.64 (28.80–82.15)	94.69	No cases	No cases	3.05 (2.56–3.64)	79.24	16.99 (15.34–18.83)	30.81

[a]Adjusted for child's age and calendar time.
[b]All dependent variables concerning the parents were measured at the child's day of birth.
[c]Fathers without schizophrenia, bipolar disorder, or unipolar depression.
[d]For 12,212 children, the register does not contain information about the fathers.
[e]Cases represent the incidence rate of the child's entry to care as number of new cases per 1,000 years at risk.
[f]The information in question was not available from the registers.
Abbreviations: CI = confidence interval, IR = incidence rate, IRR = incidence rate ratio.

especially if the mother was diagnosed with schizophrenia (IRR = 54.79; 95% CI, 46.69–64.30). Risks were much higher if a mother with a diagnosis of schizophrenia received disability pension (IRR = 136.77; 95% CI, 102.83–181.91) than if she was employed (IRR = 14.49; 95% CI, 9.24–22.73). Both employment status and educational level of the other parent were also associated with children's placement in care. For a child with a mother with schizophrenia, rates were substantially reduced if the father was employed (IRR = 15.79; 95% CI, 12.39–20.11) rather than if he received disability pension at the time of the child's birth (IRR = 187.89; CI, 114.96–307.06). Parents' level of education modified child's

Table 3. Risk of Child Placement According to Family Status of Mothers With Schizophrenia[a]

	Cohabitating Mothers With Schizophrenia		Single Mothers With Schizophrenia		Cohabitating Mothers in the General Population[c]		Single Mothers in the General Population[c]	
Variable[b]	IRR (95% CI)	IR	IRR (95% CI)	IR	IRR (95% CI)	IR	IRR (95% CI)	IR
Overall	20.83 (16.98–25.54)	27.65	54.79 (46.69–64.30)	76.35	1 Reference	1.52	3.27 (3.18, 3.36)	5.11
Diagnosis of father								
Schizophrenia	63.38 (38.20–105.17)	97.05	198.63 (126.58–311.68)	187.86	5.31 (3.93–7.16)	7.25	12.61 (9.65–16.47)	18.13
Bipolar disorder/ unipolar depression	41.95 (17.46–100.83)	48.50	70.75 (22.81–219.42)	83.35	2.89 (2.30–3.63)	3.99	5.89 (4.63–7.49)	8.50
Father's identity unknown[d]	No cases	No cases	108.77 (78.41–150.88)	163.26	7.23 (6.08–8.60)	10.00	5.80 (5.42–6.21)	8.45
General population[c]	18.19 (14.45–22.89)	23.56	41.34 (33.78–50.59)	57.17	1 Reference	1.50	3.05 (2.96–3.14)	4.68
Employment status of father								
Employed	15.78 (11.21–22.22)	14.88	29.59 (21.02–41.66)	31.53	1 Reference	1.14	2.87 (2.76–2.98)	3.35
Out of work	44.47 (33.85–58.41)	48.58	111.13 (88.25–139.96)	109.65	3.99 (3.83–4.15)	22.34	8.14 (7.82–8.48)	9.52
Disability pension	219.12 (109.48–438.57)	135.22	264.09 (131.92–528.65)	154.20	22.30 (17.98–27.66)	13.36	36.42 (29.26–45.35)	22.34
Educational level of other parent								
Long education	36.21 (17.17–76.37)	12.63	49.34 (20.44–119.07)	19.90	1 Reference	0.37	2.41 (2.05–2.84)	0.98
Short education	36.19 (23.14–56.60)	12.75	155.46 (109.26–221.18)	55.11	2.34 (2.13–2.57)	0.93	6.47 (5.86–7.15)	2.64
Minimum education	155.00 (118.77–202.29)	56.55	230.06 (177.27–298.58)	84.06	8.27 (7.54–9.08)	5.45	20.88 (19.02–22.92)	8.67
Father without substance abuse	18.29 (14.57–22.95)	23.59	42.64 (34.95–52.02)	57.81	1 Reference	1.47	3.04 (2.95–3.13)	4.59
Father with substance abuse	89.97 (56.66–142.87)	102.01	192.44 (122.64–301.95)	183.42	7.81 (6.96–8.76)	11.29	13.43 (11.98–15.05)	19.36

[a]Adjusted for child's age and calendar time.
[b]All dependent variables concerning the parents were measured at the child's day of birth.
[c]Without schizophrenia, bipolar disorder, or unipolar depression.
[d]The information in question was not available from the registers.
Abbreviations: CI = confidence interval, IR = incidence rate, IRR = incidence rate ratio.

risk for placement in care in that rates were much higher when mothers with schizophrenia had a minimum education (IRR = 142.15; 95% CI, 120.10–168.26) rather than a long education (IRR = 29.80; 95% CI, 15.45–57.49).

To further examine the role of fathers' characteristics as risk factors and protective factors when the mother was diagnosed with schizophrenia, we split the sample into 2 groups of single and cohabiting mothers, respectively (Table 3). Single parent status was always associated with higher risks, even if the father had unfavorable characteristics such as substance abuse or a psychiatric disorder. The lowest risk was found in families of cohabiting parents in which the father was employed (IRR = 15.78; 95% CI, 11.21–22.22) (Table 3).

DISCUSSION

Key Findings

This study has shown a strong association between parents' psychiatric disorders and placement of children in out-of-home care. Having a parent suffering from schizophrenia was the most prominent risk factor for placement in care, and children with mothers suffering from schizophrenia were at highest risk. The study also identified a critical period during the child's first year of life in which risk of placement in care was especially high. In all diagnostic groups, risk factors related to mothers were more prominent than those related to fathers. Our findings show a great variability in the rates of placement depending on factors other than parental diagnosis, such as employment status and educational status. The psychosocial characteristics of the nonpatient parent also seem to substantially modify the impact of the other parent's illness. Contrary to the pattern seen for children in the general population, incidences of placement in care of children with parents with a severe psychiatric disorder did not show a marked peak during the adolescent years.

Psychiatric disorders, including alcohol abuse and suicide attempt, have previously been shown to be a prominent risk factor for out-of-home placement.[22] This study, however, did not distinguish between diagnoses and which parent was ill. Parental psychiatric disorder, as a single category, has been reported to be among the most common reasons for children to enter care, and similar to our findings, mothers' rather than fathers' psychiatric disorder was a more prominent risk factor.[23] Epidemiologic studies examining risk factors for children entering care have identified similar factors to those in our study, including single parent status, unemployment, low educational level, and parents receiving disability pension.[22,24–26]

The differences in risks depending on the gender of the ill parent can be interpreted as such: when the mother is ill, the father generally compensates less for the mother's lack of nurturance than the mother does when the father is ill. A possible explanation for this could be that fewer fathers are present in the children's lives because more women than men live alone with children. If the father is estranged from the family when problems arise, he could be less inclined to take on the responsibility of the child. Traditionally, the mother-child relation is perceived as the most salient in respect to nurturance, and in present day, Danish mothers still spend more time with children, suggesting a stronger relationship at least by judging time spent together.[27] However, the gender differences might also be explained by dissimilar expectations about fathers' and mothers' parenting, respectively, in that psychiatric

symptoms and having a psychiatric illness in general are most contradictory to what is perceived by social workers and others as acceptable mothering behavior.

The differences in the rates of placement in care between children with parents in the 3 diagnostic groups may be ascribed to differences in parenting capacities reported by other studies, which show the least capacities among mothers with schizophrenia.[2] Cases of child placement are based on evaluations of parenting capacities and the child's well-being, while in our study, we did not have information about such evaluations. Our finding that the risk of out-of-home placement of children with parents suffering from severe psychiatric disorders is especially high during the child's first year of life could indicate that social workers and mental health staff make sure to place children of the most severely ill parents shortly after the child's birth. New mothers undergo considerable monitoring by health care professionals during antenatal and postnatal care, perhaps making it easier to discover problems during this particular period of time. Taking care of an infant is highly demanding both physically and mentally as parents must be constantly involved in fulfilling the baby's needs such as sleep, feeding, stimulation, and emotional regulation to ensure normal development. This being a critical time for both parents and children, things may more easily go wrong at this point. Furthermore, studies have suggested that hormonal changes in women in relation to pregnancy and childbirth are likely to trigger psychiatric symptoms in mothers,[28] who will, in turn, be less capable of taking care of infants. Although these studies stem from the general population, the role of hormonal changes in our cohort can still be hypothesized.

We did not find that children with parents suffering from psychiatric disorders were at excess risk of out-of-home placement during adolescence. One reason for this could be that social services tend to place younger children in care due to parents' problems, whereas teenagers are more likely to enter care because of problems of their own, eg, behavioral problems.[22]

The great variability in rates according to psychosocial factors identified by our study support the findings of other studies that some families are doing quite well despite mental health problems.[8] Social factors such as employment and education are probably also indicative of the parent's level of psychopathology and general functioning, which in turn is related to parenting capacities. We found that risks were considerably reduced if parents had not been admitted to a psychiatric hospital the last 5 years, which is probably because these parents are less ill than the more recently admitted, and multiple research does imply that parenting improves when symptoms of psychiatric illness decline.[29,30] However, this result may also be partly explained by less monitoring of families when parents are not admitted. The fact that the characteristics of the nonpatient parent act as important risk or protective factors for child placement is probably explained by the fact that most resourceful parents are more likely to take over child care when the ill parent cannot provide it and can also be ascribed to the assortative mating phenomenon in which individuals with similar traits or resources seek each other out when forming relationships. In our study, for example, the educational level of a child's father could be indicative of the mother's resources and vice versa, and parents can be regarded as a unified system with a shared amount of resources making disrupted caregiving more or less likely. For children who have mothers with schizophrenia, risks for out-of-home placement were always higher if the mother lived alone with the child. Also, the father seems to contribute positively when living in the family in spite of unfavorable characteristics such as substance abuse or psychiatric disorders. This finding might be explained by higher levels of functioning in the families that manage to stay together, due to better resources relating to personality, intelligence, or other factors about which the registers do not provide information. Results could also be confounded by different levels of severity of mothers' psychiatric disorder and fathers' substance abuse in the single versus cohabiting group that we were not able to adjust for.

Our results indicate that very intensive, early treatment service and counseling are needed, especially in the first years of the child's life, including cross-sectional teamwork between staff from child psychiatry, adult psychiatry, and social workers from the community to ensure an integrated intervention. Parents with schizophrenia have specific needs, and, as mentioned by Seeman,[31] it is important that both the physical health and the mental health of the mother are taken care of. Other components in an integrated early intervention should include psychoeducation of early signs of relapse, crisis plans, mapping of social contacts and resources in the network, parenting skill training, and training in practical household issues. However, the effectiveness of psychosocial interventions is very scarce, and more research is needed.[32] The balance of both maintaining family cohesion but also removing children from harmful environments when necessary is crucial. Sometimes the reasons for placement in care are more obvious than others, and the instruments used to make such decisions are inadequate.[31] The long-term effects of out-of-home placements in terms of the future well-being of the children are unclear and difficult to measure as, for example, it would not be ethical to randomize children to placement in a controlled trial. A quasi-experimental study showed that the quality of foster care facilities has long-term effects on children's adult lives in terms of mental and physical health.[33] Future goals must be to improve our instruments and scientific foundations for decision making about foster care, for the quality of inpatient and outpatient interventional programs, and for interventions in terms of out-of-home placements. Longitudinal studies of long-term effects are needed.

Strengths and Limitations

This study is, to the best of our knowledge, the first to examine rates of placement in out-of-home care of children of parents with psychiatric disorders, examining

both mothers and fathers in different diagnostic groups in a nationwide, unbiased sample that was followed over a long period of time.

While it is an advantage that the registers provide information for the entire population, using the registers only allows crude measures of the factors examined in this study. In the first place, although social services evaluate parenting capacities in child placement cases, data on these factors were not accessible for our study. In addition, as we examine risks for child placement only when parents were diagnosed after the child's birth, we cannot describe the role of parental mental illness that commences during the child's life—for instance, in cases in which mothers experience postpartum depression. Furthermore, we examine only incidences of the child's first entry to care and not the further course of events for the children—for example, their time spent in care or the proportion of children who return home or leave and reenter out-of-home care numerous times.

Another limitation to the study is that we have information from the registers about psychiatric admissions only from 1969, so if the parents have a psychiatric admission or contact before 1969, we have no record of it. However, we have more than 40 years of follow-up (1969 to 2010) in which we can find readmissions and contacts of those parents with a first admission before 1969. Thus, we believe this issue has no influence on the results. A final limitation to our study is the unknown extent to which our results can be applied to other countries. While the rates of child placement vary between countries,[10] insufficient caregiving related to parental psychiatric disorders is probably more common across countries. In the same vein, rates of out-of-home placement differ according to the investigative nature of social services. As such, some children who had been removed from their families in this Danish study might not have been removed in other countries. Presumably, however, if the social services had the same information, they would have been removed, even in these other countries.

In conclusion, the results of the current study emphasize the need for all human services to be aware of the well-being of children who have parents with severe psychiatric disorders, especially schizophrenia. Although we were unable to retrieve direct information on social services' evaluations of parenting capacities, our results show considerable risks of disrupted care of children who have parents with a diagnosis of schizophrenia in a large, unbiased sample.

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