

Frequent Change of Residence and Risk of Attempted and Completed Suicide Among Children and Adolescents

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Context: In contemporary society, people change their place of residence frequently. However, large-scale population studies documenting the influence of frequent moves on mental health among children and adolescents are limited.

Objective: To evaluate the influence of frequent change of residence on risk of attempted and completed suicide among children and adolescents.

Design, Setting, and Participants: We used data from Danish longitudinal population registries to identify all children born from 1978 to 1995 in Denmark; 4160 of these children attempted suicide, and 79 completed suicide at ages 11 to 17 years. We adopted a nested case-control design and recruited 30 controls per case, matched individually on sex, age, and calendar time.

Main Outcome Measure: We used conditional logistic regression to compute the incidence rate ratio for attempted and/or completed suicide associated with the number of previous changes of residence.

Results: We observed a significantly increased risk of attempted suicide associated with changes of living address, and there was an apparent dose-response trend for this association—the more frequent incidence of moving, the higher the risk for attempted suicide. This trend remained the same after controlling for possible confounding factors at birth, ie, birth order, birthplace, link to a father, and parental age at birth. However, it was somewhat attenuated, but still significant, after controlling for the child's own psychiatric morbidity and loss of a mother or father, as well as parental psychiatric history. The observed association was neither modified by sex nor age at the time of moving. Further analyses of suicide completers demonstrated a similar association between change of residence and completed suicide.

Conclusions: Frequent change of residence may induce distress among children and, therefore, increase their risk of suicidal behavior. More research is needed to explore this association.

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PEOPLE CHANGE THEIR PLACE of residence frequently in contemporary society, and about 50% of children have moved at least once before their 10-year birthday.¹ Change of residence may result in a discontinuation of personal life in a familiar environment as well as a breakdown of the social network,²⁻⁵ which may introduce stress and adjustment problems. Therefore, frequent change of residence is a burden to most people, especially children, who often move from one place to another based on their parents' decision. Whatever inspires the move, such experiences during childhood may be traumatic or psychologically distressing and, therefore, may affect a child's physical, mental, social, and emotional well-being. Some children have difficulties coping with the change and may exhibit their distress as suicidal behavior, the last-resort response to the hardship and stress. In the literature, considerable research has documented a connection between migration and aggregate-level rates

of suicide,⁶⁻⁸ but few studies have addressed this association at an individual level and with a large-scale study population.^{9,10} In this study, we used empirical data from Danish population registries to evaluate the influence of frequent change of residence on risk for attempted and completed suicide among children and adolescents aged 11 to 17 years, an age range that is sensitive to changes in life, especially those changes beyond one's own choice and will.

METHODS

We extracted data for this study from 4 Danish longitudinal population registries, which included the Danish Civil Registration System, the National Hospital Register, the Cause of Death Register, and the Psychiatric Central Register. These 4 registries are described in detail elsewhere.¹¹⁻¹⁴

STUDY POPULATION

The Danish Civil Registration System,¹¹ established in 1968, includes the total national popu-

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lation and contains personal identification numbers (CPR [Central Population Registration] number), parents' CPR numbers, birthplace, vital status, information on current and past places of residence, etc. The CPR number is used as a key to individual information in all national registries, enabling accurate linkage of information between registries on an individual level. All citizens in Denmark are obliged to inform the authorities about changes of permanent residence within 5 days; failure to report this information will result in the inability to receive supplementary benefits. This has ensured prompt updating of personal residence, with rare exceptions. We used data from the Civil Registration System to identify all children born in Denmark from January 1, 1978, to December 31, 1995. For this study population, complete information on permanent residence was available in the Civil Registration System, along with information on loss of a mother or father, birth order (ie, order of live birth by the same biological mother), and maternal and paternal age at birth.

ASSESSMENT OF ATTEMPTED AND COMPLETED SUICIDE

The Danish National Hospital Register¹² includes the medical records of all patients treated in Danish general hospital inpatient departments since January 1, 1977, and outpatient departments since January 1, 1995, with data on patient's CPR number, reason for contacting the hospital, diagnosis, and date of visit. We identified all persons in the study population aged 11 to 17 years who visited a general hospital with a contact reason of "attempting suicide," either as an inpatient or an outpatient, for the first time from 1995 to 2006 (N=4160). We used the date of the first visit to a general hospital because of attempting suicide as the time of onset.

The Danish Cause of Death Register¹⁴ contains individual information on cause and date of all deaths in Denmark since 1967. From this register, we identified all persons in the study population who died from a completed suicide at ages 11 to 17 years from 1995 to 2006 (N=79). We considered only definite completed suicides, which were coded as E950 through E959 according to the *International Classification of Diseases, Eighth Revision*, until the year 1994 and as X60 through X84 according to the *International Classification of Diseases, 10th revision*, thereafter.

ASSESSMENT OF HISTORY OF PSYCHIATRIC ILLNESS

The Danish Psychiatric Central Register¹³ covers all psychiatric hospitals with computerized data on all psychiatric inpatient contacts since 1969 and outpatient contacts since 1995. From this register, we obtained historical information about psychiatric illness leading to a hospital contact for all study participants and their parents. Treatment at both general and psychiatric hospitals in Denmark is free to all residents, which provides equal access to everybody regardless of socioeconomic status.

STUDY DESIGN

We adopted a nested case-control design¹⁵ to create 2 separate data sets to study the risk of attempted and completed suicide associated with frequent change of residence. The first data set comprised suicide attempters and live nonattempter controls for comparison. The cases were defined as persons having their first suicide attempt at age 11 to 17 years. For each case, 30 controls of the same sex and age living in Denmark and with no record of attempted suicide at case onset were randomly drawn from the study population. With this procedure, we recruited 124 800 population controls matched on sex and age to the 4160 suicide attempters.

Using the same technique, we created the second data set of suicide completers and live controls. The cases comprised 79 children who died from a completed suicide at age 11 to 17 years. The comparison controls included 2370 live children, randomly selected from the study population and matched on sex and age to cases (30 controls per case).

VARIABLES

For each person, we obtained records of living address from the time of birth to the index date and constructed a variable summarizing the total number of residence changes during this period. A change of residence was noted when the code of street or municipality was different from the previous record. We then divided this variable into no change and changing residence 1 to 2 times, 3 to 5 times, 6 to 10 times, 11 to 15 times, or more than 15 times.

To control for possible confounding effects, we included personal information on link to a father, loss of a mother or father by index time, and birth order, as well as maternal and paternal age at birth and birthplace. We also obtained data on the history of psychiatric contacts, updated to the index time, for study participants and their parents. The child's psychiatric morbidity was classified as no psychiatric contact, 1 contact, or more than 1 contact, whereas parental psychiatric history was defined as whether the mother or father had ever visited a psychiatric hospital before the index date (yes or no).

STATISTICAL ANALYSIS

The incidence rate ratio (IRR) of attempted and/or completed suicide was estimated using conditional logistic regression with the PHREG procedure available in SAS statistical software, version 9,¹⁶ with each case forming a separate stratum. The IRRs derived from model I were adjusted for age, sex, and calendar time through the matching procedure; the IRRs derived from model II were further adjusted for birth order, link to a father, maternal and paternal age at birth, and birthplace; the IRRs derived from model III were moreover adjusted for the child's psychiatric morbidity, loss of a mother or father, and maternal and paternal psychiatric history. The potential effect modification by sex was additionally examined with a likelihood ratio test. For suicide completion, we only performed analyses for the total number of participants because of the limited number of cases. The Danish Data Protection Agency approved this study.

RESULTS

ATTEMPTED SUICIDE

We identified 4160 children and adolescents who had their first visit to Danish general hospitals because of attempting suicide at ages 11 to 17 years from 1995 to 2006. Of these first-time suicide attempters who sought medical help at hospitals, 3056 were girls (73.5%), and 1104 were boys (26.5%). The observed number of suicide attempters increased with age (**Table 1**).

Compared with adolescent children of the same age in the study cohort, suicide attempters had more often experienced frequent change of residence (**Table 2**); 55.2% of suicidal children had moved more than 3 times vs 32.0% of controls, and 7.4% of suicidal children had moved more than 10 times vs 1.9% of controls.

When analyzing the data with conditional logistic regression, we observed a significantly increased risk for

Table 1. Age Distribution of 4160 Suicide Attempters and 79 Suicide Completers

	Age, y							Total
	11	12	13	14	15	16	17	
Suicide attempters								
Girls	14	93	299	608	708	677	657	3056
Boys	17	34	60	120	208	297	368	1104
Total	31	127	359	728	916	974	1025	4160
Suicide completers								
Girls	2	0	0	2	2	7	7	20
Boys	2	3	5	6	11	14	18	59
Total	4	3	5	8	13	21	25	79

Table 2. Changes of Residence and Associated IRR for Attempted Suicide

No. of Changes of Residence	No. (%) of Participants ^a		IRR (95% CI)		
	Cases	Controls	Model I ^b	Model II ^c	Model III ^d
All participants	4160 (100)	124 800 (100)	NA	NA	NA
0	631 (15.2)	36 334 (29.1)	1 [Reference]	1 [Reference]	1 [Reference]
1-2	1235 (29.7)	48 554 (38.9)	1.47 (1.33-1.62)	1.44 (1.31-1.59)	1.36 (1.23-1.50)
3-5	1166 (28.0)	27 362 (21.9)	2.46 (2.23-2.72)	2.31 (2.08-2.55)	1.97 (1.78-2.19)
6-10	820 (19.7)	10 225 (8.2)	4.65 (4.18-5.17)	4.01 (3.58-4.49)	3.03 (2.69-3.40)
11-15	226 (5.4)	1831 (1.5)	7.21 (6.14-8.45)	5.69 (4.82-6.72)	4.00 (3.36-4.77)
>15	82 (2.0)	494 (0.4)	9.66 (7.55-12.37)	7.17 (5.56-9.24)	4.70 (3.59-6.15)
Girls	3056 (100)	91 680 (100)	NA	NA	NA
0	460 (15.1)	26 552 (29.0)	1 [Reference]	1 [Reference]	1 [Reference]
1-2	915 (29.9)	35 793 (39.0)	1.48 (1.32-1.65)	1.45 (1.29-1.62)	1.37 (1.22-1.54)
3-5	861 (28.2)	20 088 (21.9)	2.49 (2.21-2.79)	2.31 (2.05-2.61)	1.99 (1.76-2.25)
6-10	597 (19.5)	7557 (8.2)	4.60 (4.06-5.21)	3.94 (3.45-4.50)	2.99 (2.60-3.43)
11-15	161 (5.3)	1327 (1.4)	7.10 (5.88-8.57)	5.53 (4.55-6.73)	3.88 (3.15-4.77)
>15	62 (2.0)	363 (0.4)	10.01 (7.53-13.31)	7.35 (5.48-9.87)	4.60 (3.35-6.30)
Boys	1104 (100)	33 120 (100)	NA	NA	NA
0	171 (15.5)	9782 (29.5)	1 [Reference]	1 [Reference]	1 [Reference]
1-2	320 (29.0)	12 761 (38.5)	1.44 (1.19-1.73)	1.43 (1.18-1.73)	1.32 (1.10-1.60)
3-5	305 (27.6)	7274 (22.0)	2.40 (1.99-2.91)	2.28 (1.87-2.78)	1.93 (1.58-2.35)
6-10	223 (20.2)	2668 (8.1)	4.80 (3.91-5.88)	4.17 (3.36-5.18)	3.21 (2.57-4.01)
11-15	65 (5.9)	504 (1.5)	7.48 (5.54-10.10)	6.16 (4.49-8.44)	4.33 (3.13-5.99)
>15 times of change	20 (1.8)	131 (0.4)	8.73 (5.33-14.29)	6.60 (3.96-11.00)	4.51 (2.68-7.60)

Abbreviations: CI, confidence interval; IRR, incidence rate ratio; NA, not applicable.

^aPercentages may not total 100 because of rounding.

^bThe IRRs derived from model I were adjusted only for age (and sex for the total) and calendar time through matching.

^cThe IRRs derived from model II were further adjusted for birth order, link to a father, maternal and paternal age at birth, and birthplace.

^dThe IRRs derived from model III were moreover adjusted for the child's psychiatric morbidity, loss of a mother or father, and maternal and paternal psychiatric history.

attempted suicide with increasing changes of residence, an apparent dose-response relationship between the frequency of change and the risk for attempted suicide (Table 2; model I). This trend remained the same after adjustment for possible confounding factors at birth, including birth order, birthplace, link to a father, and parental age at birth (model II). However, the effect was somewhat attenuated, but still significantly present, after moreover controlling for the child's own psychiatric morbidity, loss of a mother or father, and parental psychiatric histories (model III).

Meanwhile, we noted that the risk associated with frequent changes of residence was not modified by sex (χ^2 test for sex interaction, 1.19; $P = .95$), indicating that the influence was equally strong for both boys and girls (Table 2). Through examination of the effect by age at moving (splitting the number of changes of residence ac-

cording to the age at moving: 0-5, 6-10, or 11-17 years), we observed that the increased risks associated with frequent change of residence were equally strong regardless of the age at moving (data not shown).

COMPLETED SUICIDE

In the study population, we noted 79 children and adolescents (20 girls and 59 boys) aged 11 to 17 years who died from completed suicide from 1995 to 2006 (Table 1). Compared with sex- and age-matched live peers, children who completed suicide changed residence more frequently (Table 3).

When modeling the data with conditional logistic regression analysis (Table 3), we observed an increasing risk for completed suicide associated with increasing residential mobility (model I), which was similar to the dose-response as-

Table 3. Changes of Residence and Associated IRR for Completed Suicide

No. of Changes of Residence	No. (%) of Participants ^a		IRR (95% CI)		
	Cases (n=79)	Controls (n=2370)	Model I ^b	Model II ^c	Model III ^d
0	15 (19.0)	665 (28.1)	1 [Reference]	1 [Reference]	1 [Reference]
1-2	19 (24.1)	938 (39.6)	0.91 (0.46-1.79)	1.02 (0.51-2.04)	0.95 (0.47-1.92)
3-5	24 (30.4)	516 (21.8)	2.07 (1.07-3.99)	2.28 (1.13-4.59)	1.96 (0.95-4.03)
6-10	16 (20.3)	199 (8.4)	3.61 (1.75-7.45)	3.56 (1.62-7.82)	2.94 (1.26-6.83)
>10	5 (6.3)	52 (2.2)	4.35 (1.51-12.51)	3.28 (1.03-10.51)	3.07 (0.92-10.25)

Abbreviations: CI, confidence interval; IRR, incidence rate ratio.

^aPercentages may not total 100 because of rounding.

^bThe IRRs derived from model I were adjusted only for age (and sex for the total) and calendar time through matching.

^cThe IRRs derived from model II were further adjusted for birth order, link to a father, maternal and paternal age at birth, and birthplace.

^dThe IRRs derived from model III were moreover adjusted for the child's psychiatric morbidity, loss of a mother or father, and maternal and paternal psychiatric history.

sociation observed for attempted suicide. This trend remained almost the same after further adjustments for possible confounding factors at birth and during upbringing (models II and III), although the estimated IRR in the last model was statistically significantly higher only for individuals who had moved 6 to 10 times (Table 3; model III).

COMMENT

In this study, we only included children who visited general hospitals for a reported contact reason of "attempting suicide." Therefore, we may have missed some children who attempted suicide. The contact reason is the first observation describing a patient's condition as an illness, accident, or injury before further medical examination and is often based on family reports. Patients admitted for poisoning or self-destructive injury could be considered to have had accidents unless their families were aware of signs of suicide. In addition, we were unable to take into account children with severe suicidal ideation or suicide attempts that did not lead to a hospital contact, which may have also led to an underreporting of cases. We did not include visits to psychiatric hospitals because of attempting suicide in this analysis, but our examination of data in the Danish Psychiatric Central Register indicated that patients were rarely admitted to a psychiatric hospital primarily because of attempting suicide.

Benefiting from the availability of data in the source registries, we were able to adjust the data for a number of possible confounding factors at birth and during upbringing. However, we were unable to consider some important data that were not available in the source registries. For instance, the child's psychiatric morbidity did not cover psychiatric illnesses that only involved contacts with a primary care provider, such as a general practitioner, psychologist, or social consultant. Early studies have suggested that about three-fourths of completed suicide victims had contacts with primary care providers within a year of the suicide,¹⁷ but such information is not available in our source registries.

Recently, there were debates about the reliability of registered suicide attempts among children younger than 10 years.¹⁸ Hence, we chose to focus only on children aged 11 to 17 years in this study. We believe that children of these

ages, while legally dependent on their parents, are old enough to take actions of this gravity with intent. On the other hand, children and adolescents in this age group are in a transitional stage of human development that occurs between childhood and adulthood, along with puberty and the process of sexual maturation. This transition involves biological (ie, pubertal), social, and psychological changes, including notable changes in behavior, such as mood swings.¹⁹ Any cognitive, emotional, and attitudinal changes taking place during this period may cause conflict on one hand or positive personality development on the other. Therefore, at this age, attempting suicide and/or eventual fatal suicide often indicates the hardship and distress experienced by the child and may influence future life if no support and intervention follows the episode.

To our awareness, this study is the first one to use longitudinal population data to address a highly relevant topic for children and adolescents in developed countries, where mobility for either positive or negative reasons is common. The unique data resources provide us the opportunity to quantify the effect of changes of residence on risk for attempted and completed suicide among children and adolescents while also controlling for the confounding effects of a number of factors. Our analyses demonstrated a significantly increased risk for attempted suicide associated with residential mobility and an apparent dose-response trend for this association—the more frequent the incidence of moving, the higher the risk of attempted suicide. This effect was neither modified by sex nor by age at the time of moving and could not be explained by possible confounding effects from other factors, such as birth order, birthplace, parental age at birth, loss of parents, the child's psychiatric morbidity, and parental psychiatric status. Additional analyses for completed suicide demonstrated a similar dose-response association between change of residence and risk of completed suicide, and this trend remained present after further adjustments for possible confounding factors at birth and during upbringing. These results are evidence of a true association between residential mobility and risk for suicidal behavior among children and adolescents.

In most cases, children and adolescents are living at home with their parents, so they move from one place to another based on their parents' decision. Although the choice

of where to live is usually determined by a combination of economic constraints and personal preferences, parents may decide to move for many reasons, such as a career opportunity, dissatisfaction with the current living place, or changes in marital status or partner relationship. Whether the reason for the move is positive or negative, small children move passively with their parents, leading to some degree of instability and insecurity in their living conditions. The breakdown of connections with peers, discontinuation of group activities, distress, and worries related to the new environment are potentially psychologically distressing events for young children.^{4,10,20,21} Frequent exposures to these events can be stressful and confusing and may affect their psychosocial well-being, thus increasing their intention toward ending their life if they are unable to cope.^{3,9,10} On the other hand, hardship and stress that parents face during resettlement affect their own well-being as well as how they care for their children.²⁰ They may not be able to provide sufficient care and may not be aware of their children's psychosocial needs.²⁰ Children may feel ignored and have no one to communicate with. A suicide attempt may, to some extent, express the need for more attention from their parents.

Although we could not distinguish whether frequent change of residence was a causal risk factor or merely an intermediate variable of other risk factors for suicidal behavior, the findings from this study suggest the importance of stability on children's psychosocial well-being. They also raise a few critical questions for parents who move frequently, such as whether they have to move and, if so, how to minimize the adverse influence on adolescent children. While considering moving, it is important to consider children and their interests. It is always good to involve children, as much as possible, in the process of moving, motivating their participation in all decisions, plans, and practical work. Meanwhile, prompt efforts in re-establishing stable family life and schooling, as well as structured group activities, would advance children's psychosocial development and strengthen protective factors, thus helping them to cope with the new environment. Last, but not least, parents, caretakers, and schools should be aware of the psychosocial needs of children who have recently moved and be ready to help them resolve their distress together or through professional assistance. Those who have recently moved and have a history of many prior moves should be given additional attention or services when feasible.

This study also underscores the need for further investigation. For instance, to what extent are these findings influenced by parental personality traits that increase their offspring's risk of suicidal behavior and the likelihood of parental change of residence? In what proportion are the frequent changes of residence a result of children who are having psychological problems and may be suicidal, so the parents try to cope with the child's problems by moving to a new location with possibly better treatment or resources? How, and to what degree, does parental socioeconomic status differentiate the observed association between residential mobility and risk for suicidal behavior among children and adolescents? Have suicidal children, compared with their peers, experienced more life events associated with suicide, which would confound the observed results? And, more important, how many children

who move frequently are actually living with their parents, and what is the most critical time for children after moving to a new location? Answers to these questions will provide important insights on this association and will be useful for creating strategies to prevent suicidal behavior among this high-risk group of children, and, thus, warrant more research.

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REFERENCES

1. Pedersen CB, Mortensen PB. Evidence of a dose-response relationship between urbanicity during upbringing and schizophrenia risk. *Arch Gen Psychiatry*. 2001; 58(11):1039-1046.
2. Pettit B. Moving and children's social connections. *Social Forum*. 2004;19:285-311.
3. Stack S. The effects of interstate migration on suicide. *Int J Soc Psychiatry*. 1980; 26(1):17-26.
4. South SJ, Haynie DL. Friendship networks of mobile adolescents. *Soc Forces*. 2004;83(1):315-350.
5. Tucker CJ, Marx J, Long L. "Moving on." *Social Educ*. 1998;71(2):111-129.
6. Baller RD, Richardson KK. Social integration, imitation and geographic patterning of suicide. *Am Sociol Rev*. 2002;67(1):873-889.
7. Stack S. Suicide. *Suicide Life Threat Behav*. 2000;30(2):163-176.
8. Trovato F. Interprovincial migration and suicide in Canada, 1971-78. *Int J Soc Psychiatry*. 1986;32(1):14-21.
9. Potter LB, Kresnow MJ, Powell KE, Simon TR, Mercy JA, Lee RK, Frankowski RF, Swann AC, Bayer T, O'Carroll PW. The influence of geographic mobility on nearly lethal suicide attempts. *Suicide Life Threat Behav*. 2001;32(1)(suppl):42-48.
10. Haynie DL, South SJ, Bose S. Residential mobility and attempted suicide among adolescents: an individual-level analysis. *Sociol Q*. 2006;47(4):693-721.
11. Pedersen CB, Gotzsche H, Moller JO, Mortensen PB. The Danish Civil Registration System: a cohort of eight million persons. *Dan Med Bull*. 2006;53(4):441-449.
12. Andersen TF, Madsen M, Jorgensen J, Mellemkjoer L, Olsen JH. The Danish National Hospital Register. *Dan Med Bull*. 1999;46(3):263-268.
13. Munk-Jørgensen P, Mortensen PB. The Danish Psychiatric Central Register. *Dan Med Bull*. 1997;44(1):82-84.
14. Juel K, Helweg-Larsen K. The Danish registers of causes of death. *Dan Med Bull*. 1999;46(4):354-357.
15. Clayton D, Hills M. *Statistical Models in Epidemiology*. Oxford, England: Oxford University Press; 1993.
16. SAS Institute Inc. The PHREG procedure. In: *SAS/STAT User's Guide, Version 8*. Cary, NC: SAS Institute Inc; 1999:2569-2657.
17. Luoma JB, Martin CE, Pearson JL. Contact with mental health and primary care providers before suicide. *Am J Psychiatry*. 2002;159(6):909-916.
18. Helweg-Larsen K. *Selv mord i Danmark: Markant fald i selvmord, men stigende antal selvmordsforsøg hvorfor?* Copenhagen, Denmark: The National Institute of Public Health; 2006.
19. Blum RW, Garell D, Hodgman C, Jorissen TW, Okinow NA, Orr DP, Slap GB. Transition from child-centered to adult health-care systems for adolescents with chronic conditions. *J Adolesc Health*. 1993;14(7):570-576.
20. Gould MS, Greenberg T, Velting DM, Shaffer D. Youth suicide risk and preventive interventions. *J Am Acad Child Adolesc Psychiatry*. 2003;42(4):386-405.
21. Brent DA, Perper JA, Goldstein CE, Kolko DJ, Allan MJ, Allman CJ, Zelenak JP. Risk factors for adolescent suicide. *Arch Gen Psychiatry*. 1988;45(6):581-588.