

Mortality, severe morbidity and injury among long-term lone mothers in Sweden

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Background Being a lone mother often implies disadvantage in terms of both socioeconomic circumstances and health. Our aim was to examine differences in mortality, severe morbidity and injury between lone mothers and mothers living with partners, on the assumption that the disadvantaged socioeconomic circumstances contribute to poor health.

Methods The odds for receipt of hospital care or death between 1991 and 1994 were estimated for 26 619 lone mothers and 379 855 partnered mothers from data collected for the Swedish Population and Housing Census of 1990. We computed odds ratios by means of logistic regression, adjusting for confounders, mediators, and factors with an indeterminate position in various models. To control for health-selection effects, we only considered initially healthy women, as measured by non-hospitalization 4 years prior to follow-up. To reduce the impact of distress following divorce on health, we only included mothers who had been either lone or partnered for a period of ≥ 5 years.

Results Lone mothers showed increased risks of total mortality, lung cancer, suicide/suicide attempt, inflicted violence, traffic injury and other accident, psychiatric disease, and addiction. The main explanation for increased risks seems for most outcomes to lie in deficient household resources, as indicated here by receipt of social-welfare benefit and housing situation. For all the initially elevated outcomes, except for total mortality, significant risk increases remained unaccounted for even in the full model. Relationships varied according to subgroup. Lone motherhood was not related to accident, suicide and addiction among medium- and high-grade non-manual workers. Although lone mothers in general showed no increased risk of ischaemic heart disease, those receiving social benefit were exposed to a significantly increased risk.

Conclusions Our findings suggest that lone motherhood entails health disadvantages. Lack of household resources seems to play a major role in accounting for increased risks, but the risks are partly independent of socioeconomic circumstances, selection factors, and distress following divorce.

Keywords Epidemiology, diagnosis, psychiatric disorder, family, lone parent, mother, unmarried, socioeconomic status, mortality, morbidity, wound, injury

Accepted 30 May 2001

Poverty and problems of support among lone parents seem to be international phenomena. In recent decades much research

has pointed to the disadvantageous situation of lone parents, with regard to both socioeconomic circumstances and health status. Swedish lone parents seem to be in a more economically favourable situation than their counterparts in many other countries.^{1–4}

There are a range of studies reporting poor health among lone mothers, often in comparison with mothers living with a partner. Studies from Britain^{5–9} and Norway^{10,11} demonstrate poorer self-perceived health among the lone-mother group. A recent Swedish study¹² has shown that the socioeconomic conditions of lone mothers deteriorated over the period 1979–1995.

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Throughout the period lone mothers showed worse self-reported health than partnered mothers, particularly if they were unemployed or poor. Studies from Finland,¹³ North America¹⁴ and Sweden¹⁵ have reported increased risk of premature death among lone mothers.

In order fully to understand women's health and its associations with family roles, it is necessary to examine parental and marital roles in a structural context, i.e. to consider how women's family roles intersect with their material circumstances and participation in paid work.¹⁶ When efforts have been made to shed light on possible pathways from lone motherhood to health disadvantage, results consistently suggest that poor socioeconomic circumstances have a primary role to play.^{2,6,8,17}

As an alternative explanation, it has been suggested that health-selection processes are involved. Health may influence a person's marital and parental status, and unhealthy people may be less inclined to get married, stay married and remarry.^{6,10,18-21} Also, the poorer health of lone parents may to some extent reflect the negative consequences of divorce rather than from occupying the role of lone parent.¹⁷

Although research in this area is by no means sparse, attention has been drawn to the need for studies based on sufficient sample size, a wide range of background variables, clear conceptual models, and adequate statistical technique.^{6,22} The need for health measures unbiased by self-reporting has been pointed to, as too has the necessity of having longitudinal data to address questions concerning causal directions and processes. Previous research has mainly considered self-reported conditions, mainly ones indicating psychological distress. In this paper our intention is to investigate whether lone motherhood is related to more severe health conditions, both somatic and psychiatric, and also to injury and addiction. To our knowledge, no previous study has employed hospital in-patient data for this specific purpose.

We analysed mortality, severe morbidity and injury among lone mothers in Sweden, in comparison with partnered mothers, on the assumption that the generally poor socioeconomic status of lone mothers contributes to health differentials. We studied conditions either requiring hospital care or causing death. To control for health-selection effects we only considered initially healthy women, defined as mothers who had not received any in-patient care (except for maternity care) during the 4 years preceding follow-up. Since we wanted to examine the impact on health of the role of lone parent rather than the consequences of distress following divorce, we confined the study population to mothers who had been either lone or partnered for a period of ≥ 5 years.

Methods

This study was based on Swedish national registers containing social, economic and health information. Through the unique personal identification number assigned to each Swedish resident it was possible to effect record linkage between different data sources.

Subjects and data sources of socioeconomic status and health selection

All women living alone with children 0–15 years in 1985 and 1990 and mothers who were living with partners at both times

were identified from the Swedish Population and Housing censuses of these years. The dropout rate in the 1990 census was 2.5%. For classifying a woman as a lone mother or a partnered mother, we used a census variable concerning household type combined with further information in the census about the woman's marriage/consensual union. A household was defined as a person or group of people registered in the same dwelling. It is possible to link members of a household from census data, which enabled us to check our classification, and also to count the number of children aged 0–15 in 1990. To be included in the study population, an individual had to be alive and resident in Sweden on 1 January 1991. Altogether, we identified 36 025 long-term lone mothers and 489 045 mothers with partners in the age range 29–54 years in 1990.

We controlled for the possible selection into lone motherhood of less healthy people by excluding from the population all women with a history of former illness, i.e. those who had been in hospital between 1987 and 1990 for any reason except for maternity care (ICD-9 codes 630–679). For this purpose we used data from the Swedish Hospital Discharge Register. We ended up with 26 619 lone mothers and 379 855 mothers with partners.

Information on country of birth, age, socioeconomic group, employment status, geographical location, and housing situation (whether a mother owned or rented her home) was also obtained from the Swedish Population and Housing Census of 1990. Socioeconomic groups were defined according to the classification used by Statistics Sweden. It is largely based on occupation, but also takes typical educational level within occupation, type of production, and position at work into account.²³

Information about receipt of social welfare and unemployment benefit for each participant was obtained through record linkage to Sweden's Total Enumeration Income Survey of 1990. Data from the surveys are entered into a register, maintained by Statistics Sweden, which contains information about the taxes and incomes of all residents in Sweden. We had access to annual totals, and women who received any amount of allowance were classified as receiving social welfare or unemployment benefit.

Outcomes

We studied mortality, severe morbidity and injury among mothers over the period 1991–1994, i.e. conditions requiring hospital care or causing death. (All-cause mortality was analysed separately.) Via individual record linkage to the National Hospital Discharge Register we obtained information on all discharges from Swedish hospitals, and by linkage to the National Cause of Death Register we obtained information about deaths. Accordingly, each outcome incorporated death, hospital discharge, or both. The great majority of cases consisted of hospital discharges, since death is a rare event among women of the ages who still have children at home. For example, psychiatric morbidity was based solely on hospital records, since there were no registered cases of death from psychiatric causes. However, if death outside hospital had not been considered, 6% ($n = 28$) of cases of ischaemic heart disease would have been missed, 7% of cases ($n = 55$) of suicide, and 6% of cases ($n = 74$) of traffic injury. For all three outcomes death outside hospital was more common among partnered mothers. Information on the following outcomes was obtained for the years 1991–1994

(ICD-9): total mortality; psychiatric diseases (290–315), except for diagnoses indicating addiction (291, 292, 303–305.0); ischaemic heart disease (410–414); lung cancer (162); suicide/suicide attempt (E950–E958, E980–E988); injuries from traffic (E800–E849); injuries from violence (E960–E968, E976); other accidents (E850–E949); alcohol and drug related diagnoses (291, 292, 303–305.0, 357.5, 425.5, 535.3, 571.0–571.3, 965.0, 968.5, 969.6, 969.7, E860, E980 + 980).

For each individual only primary diagnosis at first discharge or underlying cause of death during the follow-up period was employed for most outcomes. Contributory diagnoses were used solely for alcoholism and drug addiction.

Statistical methods and conceptual framework

Odds ratios (OR) with 95% CI were used as estimates of the effects of lone motherhood on the different outcomes, using women living with a partner as the reference group. Multivariate logistic regression analyses were performed with mortality, severe illness, injury and addiction (as indicated by inpatient or cause-of-death data) as dependent variables. Age was entered as a continuous, independent variable into all models. To avoid underestimating true effects we tried to distinguish between variables referring to conditions pre-dating the operation of the independent variable (confounders) and those that operated between family position and the health measure in question (mediators). For example, adjusting for different measures of income might control for circumstances resulting from lone motherhood that explain some of the ways in which lone motherhood influences health. A mediator provides a way of explaining a relationship; by contrast, controlling for confounders is necessary to dismiss a spurious association.²² Although making such distinctions in real life is rarely self-evident, we decided to treat variables such as age, socioeconomic group, living in a big city, and country of birth as confounders. We believe, for example, that style of living in a city leads to an increase in the number of lone mothers, rather than that becoming a lone mother leads to urban migration.

By contrast, employment status, unemployment benefit and number of children were regarded as occupying a more indeterminate causal position. That is, it is conceivable both that being unemployed is a predisposing factor for lone motherhood and that being a lone mother makes it more difficult to find and maintain a job (especially in times of recession). Receiving social benefit and renting/owning one's home were seen as measures of household resources, and treated as mediators. Many previous findings point to the poor financial situation in which lone parents find themselves as a consequence of being the sole supporter of a family. Hence, they also can be expected to have poorer prospects of becoming a homeowner.

All the variables were classified as shown in Table 1, and then entered into the models as dichotomous, independent variables. First, we examined the effects on morbidity of adjusting for each factor separately. At a second step, adjustments were made for different groups of variables. For the first model adjustments were made for age and the confounders. The second model included the variables regarded as having an indeterminate causal position. Finally, the variables treated as mediators were added to make up a third model.

We also assessed the modifying effects of each factor on the association between lone motherhood and severe morbidity/

injuries. For this purpose we adjusted for the confounders and the variables with an indeterminate causal position (taken together).

SAS version 8.1 was employed for the statistical analyses.

Results

Characteristics of lone mothers and mothers with partners

Lone mothers were slightly younger than mothers with partners (Table 1). Average age in 1990 was 38.6 for lone mothers, and 39.0 years for mothers with partners. Lone mothers had fewer children, were somewhat more often manual workers and (to a minor extent) high- or medium-grade non-manual workers, and were more likely to lack an occupation. A higher proportion of lone mothers lived in one of the three largest cities in Sweden (Stockholm, Gothenburg, and Malmö), and most rented their homes; by contrast, more than 85% of mothers with partners owned their homes. It was slightly less common for lone mothers to be employed (90.1% compared with 91.6% among partnered mothers). Of the lone mothers, 17% received social-welfare benefit during 1990 in contrast to only 2% of mothers with partners. It was twice as common for lone mothers to have been claiming unemployment benefit (Table 1).

Analyses

Lone mothers suffered from significantly elevated risks for all studied outcomes with the exception of ischaemic heart disease (Table 2, first column); the risk of dying within a 4-year period was 50% higher for lone mothers than for partnered mothers following adjustment for age. The OR for psychiatric disease and suicide/suicide attempt were about 2.5, and the odds for lung cancer were more than doubled. The most pronounced increased risks were for diagnoses indicating drug or alcohol abuse (more than a fourfold increased risk) and inflicted violence (more than a sixfold increased risk). For the latter outcome, however, there were very few cases (Table 3).

Adjusting for socioeconomic group, living in a big city, country of birth, employment status, unemployment benefit, and number of children, each in separate analyses, resulted in only modest attenuations of the increased risks, and in some cases even a slight increase in the OR (Table 2). However, the OR for lone mothers (compared with mothers with partners) tended to fall after adjusting for housing situation and social benefit. Attenuations in OR were most apparent in the cases of addiction, inflicted violence, and suicide/suicide attempt.

As the variables considered as confounders, indeterminate factors and mediators were added stepwise to the model (Table 3), it became apparent that the OR fell most in response to introduction of the mediating factors. In order to estimate how much of the health differential was accounted for by mediators we used the significantly elevated OR from Model II and Model III $[(OR - 1) - (OR' - 1)/(OR - 1)]$. We found that housing situation and social benefits accounted for 46% of the difference in all-cause mortality between lone mothers and mothers with partners. Corresponding figures for the other outcome variables were as follows: lung cancer 25%; suicide/suicide attempt 60%; violence 64%; non-traffic accidents 39%; psychiatric morbidity 39%; and alcohol and drug-related diagnoses 75%. The OR for traffic accidents increased somewhat after the adjustments, which might indicate that fewer lone mothers had access to a car.

Table 1 Characteristics of the mothers investigated

	Lone mothers		Partnered mothers	
	N	%	N	%
Age (years) 1990				
29–34	6923	26.0	84 750	22.3
35–39	8645	32.5	119 737	31.5
40–44	6927	26.0	113 321	29.8
45–49	3280	12.3	51 365	13.5
50–54	844	3.2	10 682	2.8
No. of children				
1–2	25 044	94.1	307 675	81.0
3+	1575	5.9	72 180	19.0
Socioeconomic group				
Manual workers	9990	37.5	135 606	35.7
Low-grade non-manual workers	5370	20.2	72 443	19.1
High- and medium-grade non-manual workers	7086	26.6	112 954	29.7
Self-employed	514	1.9	16 685	4.4
Others ^a	3659	13.8	42 167	11.1
Country of birth				
Sweden	22 626	85.0	344 023	90.6
Other Nordic country	2128	8.0	17 985	4.7
Other Europe	1266	4.8	11 131	2.9
Other world	599	2.2	6716	1.8
Living in a big city^b				
Yes	12 913	48.5	253 239	33.3
No	13 706	51.5	126 616	66.7
Housing				
Owens	8081	30.4	324 643	85.5
Rents, and others	18 538	69.6	55 212	14.5
Employment status				
Employed	23 975	90.1	348 072	91.6
Unemployed	2644	9.9	31 783	8.4
Received social welfare 1990				
Yes	4558	17.1	7080	1.9
No	22 061	82.9	372 775	98.1
Received unemployment benefit 1990				
Yes	2405	9.0	15 862	4.2
No	24 214	91.0	363 993	95.8
Total	26 619	100.0	379 855	100.0

^a Including subjects without an occupation.

^b Stockholm, Göteborg, and Malmö cities, plus surrounding municipalities.

However, for all initially elevated outcomes, except for total mortality, significant risk increases remained unaccounted for even in the fully adjusted model.

Effect modification

We next assessed whether the effect of being a lone mother remained in different subgroups after inclusion of the interaction variables. Table 4 shows significant effect modifications between groups. An important finding was that among high- and medium-grade non-manual workers, lone motherhood was not associated with an increased risk for suicide/suicide attempt, accident, or addiction. Among manual workers, however, the effects remained.

A relationship was found between lone motherhood and ischaemic heart disease among the women receiving social benefits. Among those who did not, and also for the entire group, no such relation was found (Table 3). However, this result was based on rather few cases. Only 35 of the lone mothers either died from or were discharged from hospital with coronary heart disease; of these, 13 were social-benefit recipients.

Employment status modified the effects of lone motherhood on accidents and lung cancer. Among the non-employed, lone motherhood implied a marked risk increase—especially so in the case of lung cancer (OR = 11.17, 95% CI: 2.98–41.91) (Table 4).

Table 2 Odds ratios for mortality, severe morbidity and injury (1991–1994) among lone mothers compared with partnered mothers (1990), with separate adjustments for each explanatory factor (95% CI in brackets)

	Age	Age + socio-economic group	Age + living in a big city	Age + country of birth	Age + employment status	Age + unemployment benefit	Age + no. of children 0–15 years	Age + housing situation	Age + social benefit
Total mortality	1.52 (1.19–1.92)	1.49 (1.17–1.89)	1.53 (1.20–1.94)	1.52 (1.20–1.93)	1.50 (1.18–1.90)	1.52 (1.20–1.93)	1.48 (1.16–1.88)	1.26 (0.97–1.63)	1.45 (1.13–1.85)
Ischaemic heart disease	1.16 (0.82–1.64)	1.15 (0.82–1.63)	1.18 (0.84–1.67)	1.14 (0.81–1.61)	1.15 (0.82–1.63)	1.14 (0.81–1.61)	1.14 (0.81–1.62)	0.90 (0.62–1.29)	1.04 (0.73–1.48)
Lung cancer	2.31 (1.34–3.98)	2.28 (1.32–3.93)	2.35 (1.36–4.06)	2.33 (1.35–4.02)	2.31 (1.34–3.98)	2.33 (1.35–4.02)	2.28 (1.32–3.94)	2.08 (1.14–3.79)	2.17 (1.24–3.81)
Suicide/suicide attempt	2.53 (2.08–3.09)	2.49 (2.04–3.03)	2.45 (2.01–2.99)	2.40 (1.96–2.92)	2.50 (2.05–3.05)	2.51 (2.05–3.06)	2.52 (2.07–3.08)	1.90 (1.52–2.37)	1.76 (1.42–2.19)
Violence	6.38 (4.11–9.90)	6.08 (3.91–9.43)	6.20 (3.98–9.67)	5.73 (3.68–8.92)	6.29 (4.06–9.77)	5.87 (3.76–9.16)	6.21 (3.98–9.71)	3.49 (2.10–5.78)	3.75 (2.26–6.20)
Traffic injuries	1.45 (1.20–1.77)	1.45 (1.20–1.77)	1.46 (1.20–1.78)	1.44 (1.18–1.75)	1.45 (1.20–1.77)	1.44 (1.18–1.75)	1.46 (1.20–1.77)	1.54 (1.24–1.90)	1.43 (1.17–1.75)
Other accidents	1.35 (1.23–1.49)	1.35 (1.23–1.49)	1.33 (1.21–1.46)	1.35 (1.23–1.48)	1.35 (1.23–1.49)	1.34 (1.22–1.48)	1.37 (1.25–1.51)	1.26 (1.14–1.40)	1.24 (1.12–1.37)
Psychiatric disease	2.49 (2.23–2.80)	2.43 (2.17–2.73)	2.51 (2.24–2.81)	2.45 (2.18–2.74)	2.46 (2.19–2.75)	2.46 (2.20–2.76)	2.50 (2.23–2.80)	2.03 (1.79–2.31)	1.98 (1.75–2.24)
Addiction	4.17 (3.45–5.04)	4.06 (3.36–4.91)	3.95 (3.26–4.78)	4.03 (3.33–4.87)	4.10 (3.39–4.95)	4.04 (3.34–4.89)	4.18 (3.45–5.06)	2.52 (2.04–3.13)	2.35 (1.90–2.91)

Discussion

Our study of more than 400 000 initially healthy mothers showed increased risks for lone mothers, compared with mothers with partners, over a 4-year period for a variety of unfavourable outcomes. Total mortality, lung cancer, suicide/suicide attempt, inflicted violence, traffic injury and other accident, psychiatric disease, and addiction were all considered. The most elevated risks are found mainly among outcomes in the mental health sphere—psychiatric disease, addiction and suicide. Among the few physical outcomes studied, the risk of lung cancer was markedly elevated while ischaemic heart disease did not seem to be related to lone motherhood when we studied the entire group of mothers.

The predominant explanation for these increased risks appears to be related to lack of household resources, as indicated by receipt of social-welfare benefit and housing situation. These seem to be the circumstances that serve as intermediate paths through which lone motherhood impacts on health, and they seem to explain more of the mental health differentials and less of the physical health differentials. More modest contributions are made by the factors we assumed to pre-date prevailing family situation (such as socioeconomic group, living in a big city, country of birth) and those with a more indeterminate position (employment status, unemployment benefit, number of children). Only including women with no previous inpatient history over the 4 years preceding follow-up counteracted the possible confounding influence of health selection. In the same way, the inclusion only of women who were lone mothers in two consecutive censuses reduced the impact on health of distress following divorce.

The relationship between lone motherhood and the different health outcome seems to vary between subgroups.

Among high- and medium-grade non-manual workers, lone motherhood was found not to be associated with increased risks for suicide, addiction or accident. Among mothers receiving social-welfare benefits, lone mothers seemed to suffer from an increased risk of ischaemic heart disease. Such an association was not found for the entire group of mothers.

Our findings that health differences mirror variations in socioeconomic circumstances are in line with the results of previous analyses. Hope and colleagues,¹⁷ on measuring self-reported psychiatric distress among British lone mothers, found the predominant explanation for excess psychological symptoms lay in financial hardship, with more modest contributions being made by social support, employment, and number and age of children. Also in a British study, Benzeval⁶ found that controlling for differences in household resources, such as access to a car, ownership of a wide range of consumer durables, housing tenure, employment status, and disposable family income, reduced the gap of self-perceived general health between lone and partnered mothers to a half or a third of its original size. In a Swedish study² of self-perceived general health and limiting long-standing illness (1992–1995), 5% and 13%, respectively, of the health differential found was accounted for by poverty and joblessness. Lack of resources (according to the definition above) seemed to explain much less of the variation in self-reported health than was explained by social benefit and housing situation in relation to severe morbidity in our study. However, in all the studies referred to above, the selected explanatory

Table 3 Multivariate models for mortality, severe morbidity and injury (1991–1994) for lone mothers, compared with partnered mothers (1990)

	No. of cases among lone mothers/ partnered mothers	Model I		Model II		Model III	
		OR	95% CI	OR	95% CI	OR	95% CI
Total mortality	75/730	1.50	1.18–1.91	1.46	1.15–1.86	1.25	0.96–1.63
Ischaemic heart disease	35/446	1.15	0.81–1.63	1.14	0.80–1.61	0.88	0.61–1.28
Lung cancer	15/96	2.33	1.35–4.03	2.33	1.34–4.03	2.00	1.08–3.70
Suicide/suicide attempt	116/653	2.30	1.88–2.81	2.27	1.85–2.78	1.51	1.19–1.91
Violence	29/64	5.47	3.49–8.56	4.91	3.11–7.77	2.39	1.37–4.16
Traffic injury	111/1097	1.45	1.19–1.77	1.44	1.18–1.76	1.53	1.23–1.90
Other accident	484/5171	1.32	1.20–1.45	1.33	1.21–1.46	1.20	1.08–1.33
Psychiatric disease	351/2035	2.41	2.15–2.71	2.38	2.12–2.67	1.84	1.61–2.10
Addiction	139/480	3.70	3.06–4.49	3.58	2.95–4.36	1.65	1.30–2.08

Model I: Adjusted for age, socioeconomic group, living in a big city, and country of birth.

Model II: Model I, plus adjustments for employment status, unemployment benefit, and number of children.

Model III: Model II, plus adjustments for housing situation and social benefit in 1990.

Table 4 Odds ratios^a (OR) for lone mothers compared with partnered mothers. Significant inter-group effect modifications (95% CI in brackets)

Outcome	Manual workers OR	High- and medium-grade non-manual workers OR	Interaction term
Suicide/suicide attempt	2.53 (1.88–3.41)	0.96 (0.51–1.83)	0.38 (0.19–0.77)
Other accident	1.44 (1.24–1.67)	1.12 (0.92–1.36)	0.78 (0.61–0.99)
Addiction	4.26 (3.19–5.69)	1.79 (0.95–3.35)	0.42 (0.21–0.84)
	Social benefit OR	No social benefit OR	
Heart disease	2.64 (1.11–6.24)	0.83 (0.54–1.27)	0.31 (0.12–0.82)
	Non-employed OR	Employed OR	
Lung cancer	11.17 (2.98–41.91)	1.81 (0.97–3.41)	0.16 (0.04–0.70)
Other accident	1.94 (1.50–2.51)	1.26 (1.14–1.40)	0.65 (0.49–0.85)
	Not living in a big city OR	Living in a big city OR	
Addiction	4.41 (3.37–5.76)	2.94 (2.24–3.88)	0.67 (0.46–0.98)

^a Adjusted for age, socioeconomic group, living in a big city, country of birth, employment status, unemployment benefit, and number of children.

variables did not account for the entire differential regarding either psychological distress or general health condition.

Strengths and weaknesses of the study

The main strengths of this register-based study lie in its complete population coverage of an entire country and the potential it offers to adopt a longitudinal approach with a low dropout rate. Using deaths and hospital discharge records means that our health measure is not biased by self-reporting, and can be expected to cover most serious morbidity outcomes. However, a diagnosis on a hospital record does not include any information about degree of severity of disease or injury. If lone mothers are more likely to be admitted to hospital for less serious conditions, their OR will be overestimated. This is conceivable, since hospital admission might be more likely for a person who does not live with another adult capable of providing care in case of accident or illness. A possible indicator that this factor applied in the case of this study is that a greater proportion of partnered mothers were found to have died without being admitted to hospital. On the other hand, a partner at home might also serve

as a trigger to seek hospital care, and also simplify admission by enabling young children to be taken care of at home.

We had access to information about family situation only at two points of time over a 5-year period. Since personal relationships change, some of the mothers might not have been either alone or cohabiting over the entire study period. Our intention to concentrate on the role of lone parent rather than stress from divorce/separation might not have been completely fulfilled.

The likelihood that a woman is married or cohabiting may be influenced by her health status or previous history of illness. To control for this potential bias, we checked whether the women had been admitted to hospital at any time during the 4 years preceding the follow-up period, and excluded those who had from the study population. Nevertheless, this period may have been too short, and in-patient history, in any case, is only a crude indicator of overall health status. We had no information about health problems not requiring in-patient attention, and information about further previous hospital discharges was not available. For long-term lone mothers, hospital admission pre-dating the follow-up period might have been relatively

more common due to the stresses of lone motherhood. In such cases, excluding these individuals from the study population would have resulted in an underestimation of the effect of lone motherhood on health. Selection may be based on other factors that influence the risks of future ill-health and lone motherhood. Women in poorer socioeconomic conditions have for instance been found to be more prone to separate.²⁴ Lack of material resources may in our study in fact precede lone motherhood, and this may have relevance to timing of possible interventions, but we cannot measure this because of lack of data.

For most lone mothers the father of the child/children is at least to some degree accessible, and data show that responsibility as a parent usually persists even if the inter-adult relationship ruptures. In the registers we used, any child in a lone-parent household was recorded as living with just one parent, usually the mother, even if the child resided for equal time with each parent (an arrangement which has become more frequent in recent years). Nevertheless, 16% of children living in lone-parent families have no contact at all with the absent parent,²⁵ usually because that parent lives abroad, has died, or is unknown. To obtain a more complete picture of the burdens (and also benefits) of lone parenthood it would be necessary to distinguish mothers who share responsibilities and expenses for their child or children with another committed adult from those who stand entirely alone or are in conflict with the father.

Most studies of lone parents deal with self-reported impaired health or limiting illness, conditions that are frequent in the studied population. Since we analysed quite rare events for people in the studied age groups (mortality and severe morbidity), one must wonder whether our reported outcomes reflect processes of marginalization or social exclusion among sufferers rather than being descriptors of actual risks for the population of lone mothers. The markedly elevated risks of addiction and violence found in our study might indicate this to be the case, as too might the finding that there is an increased risk of ischaemic heart disease exclusively among lone mothers receiving social-welfare benefit. However, many employed lone mothers in Sweden receive public support in addition to income from employment to make up for relatively low wages.² The exclusion of all previously hospitalized women plus the fact that increased risks remain for most outcomes, even after adjustments for different socioeconomic circumstances, mediates against the marginalization interpretation. Nevertheless, since measurements on socio-demographic variables were taken at one point in time, and given that these variables are largely seen here as indicators of socioeconomic situation, the instruments may be too blunt to form a true picture of mothers' social and financial situations.

Alternative explanations

In the everyday life of lone mothers with dependent children there are, no doubt, many ingredients that may be injurious to health and cause elevated levels of psychological distress. Bringing up a child alone with weak material and social resources may take its toll on health. Lack of social support has been

suggested as one of many potential explanations for the health disadvantage of lone mothers,^{2,17,18} and may influence health both directly or indirectly by increasing vulnerability to life events and adversities.²⁶ In his analyses of Swedish data, Gähler²⁷ found that divorced women experience less access to social support than other women. Another Swedish study²⁸ reported that lone mothers perceive lower quality in their social networks. Health-related behaviour among lone mothers may be an additional factor involved. Although based on small numbers, one of the Swedish studies referred to above²⁸ also reported that lone mothers were more likely to be daily smokers and take less exercise than their partnered counterparts. Self-report data from the Swedish Survey of Living Conditions (ULF) indicate that, among lone mothers aged 16–44 years in 1996/1997, 50% were daily smokers and 6% could be regarded as high-alcohol consumers. The corresponding percentages for partnered mothers were 25% and 2%. This doubled prevalence of smoking reflects the more than doubled risk of lung cancer found among lone mothers in the current study (which remained double even after adjusting for variables highly associated with smoking).

There is a growing body of research into the effects on health of the multiple roles occupied by many women—related to employment, marriage and motherhood.^{13,29} Longitudinal data in this field indicate that involvement in a number of different role relationships is generally associated with good mental and physical health, because multiple roles provide a variety of benefits—more sources of social support, improved financial resources, etc. These benefits may be regarded as outweighing possible disadvantages.^{13,30} However, in the case of lone parents, there are studies indicating that lone mothers employed full-time seem to suffer from role overload.^{8,11,13,14} It is tentatively suggested that this is because of the strain of combining work and parental roles without the emotional or financial support that a partner can provide.

Whitehead and colleagues² have suggested that lone mothers suffer from what they call 'time poverty'. Our data show that about 90% of both lone and partnered mothers are employed (Table 1). According to Hobson and Takahashi,³¹ 66% of Swedish lone mothers were in full-time employment in 1991, compared with 51% of partnered mothers. Their average working week, which includes both paid and unpaid work, was estimated to be >54 hours, compared with 51 hours for mothers with partners.

It goes without saying that lone mothers on average have less time for leisure, and also less time to spend with their children. Swedish social policy has been to integrate lone mothers into the framework developed for working parents in general. That is, policy has not focused on targeted and categorical benefits specifically for lone parents. It has been suggested that this principle may have made the economic and social pressures placed upon lone parents as sole breadwinner and carer in the family invisible, albeit with the benefit that lone mothers have not been stigmatized or singled out as a deviant group.³¹ The expectation of paid employment, despite a relatively weak position on the labour market and often in a poor quality job, alongside caring responsibilities may be a factor that contributes to lone mothers' poorer health.²

KEY MESSAGES

- In a comparison with partnered mothers, lone mothers seem to suffer from elevated risks of total mortality, lung cancer, suicide/suicide attempt, inflicted violence, traffic and other accidents, psychiatric disease and addiction.
- Lack of household resources seems to play a major role in accounting for increased risks, but the risks are partly independent of socioeconomic circumstances, selection factors and distress following divorce.

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