

# Mortality in single fathers compared with single mothers and partnered parents: a population-based cohort study



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## Summary

**Background** Single parent families, including families headed by single fathers, are becoming increasingly common around the world. Previous evidence suggests that single parenthood is associated with adverse health outcomes and increased mortality; however, most studies have focused on single mothers, with little known about the health of single fathers. This study aimed to examine mortality in a large population-based sample of Canadian single fathers compared with single mothers and partnered fathers and mothers.

**Methods** We used a representative sample of 871 single fathers, 4590 single mothers, 16 341 partnered fathers, and 18 688 partnered mothers from the Canadian Community Health Survey (cycles 2001–12; earliest survey date: Sept 5, 2000; latest survey date: Dec 24, 2012). We anonymously linked survey participants to health administrative database records to ascertain health status at baseline and mortality from survey date up to Oct 28, 2016. We included individuals who were aged 15 years or older, living in a household with one or more biological or adopted child younger than 25 years, and living in Ontario, and we excluded those who left Ontario during the study period or had data discrepancies. Single parents were defined as those who were divorced, separated, widowed, or single, never-married, and non-cohabitating, and partnered parents were defined as those who were married or common-law partners. We investigated differences in mortality using Cox proportional hazards models with adjustment for sociodemographic, lifestyle, and clinical factors.

**Findings** Median follow-up was 11·10 years (IQR 7·36–13·54). Mortality in single fathers (5·8 per 1000 person-years) was three-times higher than rates in single mothers (1·74 per 1000 person-years) and partnered fathers (1·94 per 1000 person-years). Single fathers had a significantly higher adjusted risk of dying than both single mothers (hazard ratio [HR] 2·49, 95% CI 1·20–5·15;  $p=0\cdot01$ ) and partnered fathers (2·06, 1·11–3·83;  $p=0\cdot02$ ).

**Interpretation** In this first head-to-head comparison of mortality across single and partnered parent groups, we found that single fathers had the least favourable risk factor profile and greatest risk of mortality. Social histories might help physicians identify these high-risk patients. Further work is needed to understand the causes of this high mortality risk and how clinical and public health interventions can improve lifestyle and behavioural risk factors.

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## Introduction

Single-parent families headed by fathers are a growing demographic in many regions of the world, which is largely due to increasing rates of divorce, separations, and non-marital childbearing.<sup>1–3</sup> In 2011, more than 2·6 million households in the USA (a nine-times increase since the 1960s) and approximately 330 000 (3·5%) of all census households in Canada were headed by single fathers.<sup>4,5</sup> There are nearly 3 million single parent families in the UK, of which approximately 10% are single fathers with dependent children.<sup>6</sup> Although parental status might not be directly modifiable by clinicians, single parenthood is readily ascertainable and is an important social factor that has been shown to adversely affect health.<sup>7–9</sup> To date, research on single parents has largely focused on single mothers. Single mothers generally have lower socioeconomic status, poorer self-rated health and mental health, higher levels of psychological distress, and more health-related problems and hospital admissions than

the general population.<sup>7–10</sup> Emerging evidence shows that single fatherhood is also associated with some of these sociodemographic and health-related disparities.<sup>9,11</sup> Findings from an earlier study<sup>11</sup> by our group showed that single fathers were twice as likely to report poor self-rated health and mental health than single mothers, but were only half as likely to access health services. However, data on the health profiles and mortality risk in single fathers are scarce. Such information could be relevant to physicians, who are often aware of their patient's marital and parental status as part of their social history.

Previous studies<sup>7,8,10</sup> have shown that single mothers have a 1·2 to 1·7-times greater mortality than partnered mothers when followed up for up to two decades, which might be associated with inadequate household resources, social assistance, and employment status. Only one study<sup>11</sup> has examined the association between single fatherhood and mortality, and found that single fathers had a 30% greater risk of mortality than partnered fathers. However, it

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### Research in context

#### Evidence before this study

Much research has investigated the health outcomes of single mothers; however, the impact of single fatherhood on mortality remains unclear. On Feb 26, 2017, we searched Embase, MEDLINE, PsychInfo, and PubMed for articles with the search terms “mortality”, “death”, “single mother”, “single father”, “lone mother”, “lone father”, “single parent”, and “lone parent”. The search results found numerous studies showing that single mothers have a greater risk of mortality than partnered mothers; however, only one study examined the association between single fatherhood and mortality. Although single fathers had a greater risk of mortality than partnered fathers, evidence on their risk of mortality compared with single mothers is scarce.

#### Added value of this study

To our knowledge, this is the first population-based cohort study to investigate the risk of mortality associated with single fatherhood compared with single mothers, partnered mothers,

and partnered fathers. Our study shows that single fathers had the least favourable risk factor profile and a mortality rate three-times higher than that of single mothers and partnered fathers. Single fathers also had a two-times higher adjusted hazard of death compared with both single mothers and partnered fathers.

#### Implications of all the available evidence

We found that single fathers, a growing population that has been largely understudied, have a poor behavioural and lifestyle risk factor profile, and higher risk of mortality than single mothers, partnered mothers, and partnered fathers. This research highlights single fathers as a high-risk group requiring close monitoring and management of lifestyle factors. Public health policies and clinical strategies might be needed to help identify and manage risk factors in single fathers. Further research is needed to understand the causes of their higher risk of mortality and to evaluate differences across study settings to help mitigate risk in this vulnerable population.

remains unclear how mortality in single fathers compare with single mothers and whether any difference can be explained by socioeconomic factors, lifestyle factors, health services, and other determinants of mortality.

The objectives of this study were to estimate mortality in a population-based sample of single fathers compared with partnered fathers and single and partnered mothers; and to explore whether any observed differences could be explained by measured determinants of health.

## Methods

### Study population

Our study population was derived from Statistics Canada's cross-sectional Canadian Community Health Survey (CCHS) pooled cycles from 2001 to 2012 (response rate 67·0–84·7%; earliest survey date: Sept 5, 2000; latest survey date: Dec 24, 2012).<sup>12</sup> Details about the CCHS methodology have been described elsewhere.<sup>13,14</sup> Briefly, the CCHS is a nationally representative survey, which uses a consistent, multistage, stratified cluster sampling strategy to collect self-reported sociodemographic and health-related information from a representative sample of people in private dwellings. This study was approved by the research ethics board at Sunnybrook Health Sciences Centre. Informed consent was obtained from all study participants for administrative data linkages.

### Exposures and outcomes

The CCHS defined single parents as divorced, separated, widowed, or single never married, non-cohabitating men (single fathers) or women (single mothers) aged 15 years or older living in a household with one or more biological or adopted child younger than 25 years and no other adults. Partnered parents were defined as married or common-law men (partnered fathers) or women

(partnered mothers) aged 15 years or older living in a household with one or more biological or adopted child younger than 25 years.

Using unique encoded identifiers (encrypted health card numbers), we anonymously linked the CCHS respondents to Ontario health administrative databases held at the Institute for Clinical Evaluative Sciences. We obtained vital statistics and death dates from the Ontario Registered Persons Database and cause-specific mortality from the Office of the Registrar General Vital Statistics Death Database. We grouped causes of death into International Classification of Diseases (ICD)-9 classifications: neoplasms, diseases of the circulatory system, external causes of injury and poisoning, mental health-related causes, diseases of the respiratory system, and other causes.

Sociodemographic characteristics included in this study were age, urban dwelling, white ethnicity, marital status, and education. Psychosocial stressor variables included were household income (<CAN\$30 000, \$30 000–59 999, ≥\$60 000), unemployment in the past year, not owning a home, living with at least one child younger than 6 years, living with at least one child between 6 and 11 years, and household size of three people or higher. Lifestyle factors included were current smoking, low fruit and vegetable consumption (<3 times per day), physical inactivity (energy expenditure <1·5 kcal/kg per day), obesity (body-mass index ≥30 kg/m<sup>2</sup>), and monthly binge drinking (≥5 drinks in a sitting at least once a month). We also examined an indicator of social support, categorised as somewhat weak or very weak sense of belonging to a local community and very strong or somewhat strong sense of belonging (reference group). We linked the survey data to administrative databases to ascertain baseline prevalent medical conditions (cardiovascular disease, cancer,

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