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Article

Maternal age and offspring health and health behaviours in late adolescence in Sweden

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ABSTRACT

In this study we investigate the relationship between maternal age at the time of birth and a variety of health behaviours and measures of health amongst young adults in contemporary Sweden. Previous research has shown that those born to younger and older mothers tend to have worse perinatal outcomes, and worse health in middle- and later adulthood. However, previous work has not examined health in early adulthood, and no studies have explored whether maternal age is related to health behaviours. Using survey data on 1236 19-year olds born in Sweden in 1990, we find that those born to older mothers have lower self-rated health, are more likely to smoke, more likely to drink alcohol regularly, and less likely to exercise regularly. We discuss potential explanations for these findings, such as older parents exerting lower social control due to greater levels of workplace responsibilities and time demands, long-term consequences of the poor peri-natal outcomes of those born to older mothers, as well as the potential role of parental health behaviours. Our findings suggest that health behaviours may play an important mediating role in explaining the worse long-term health of those born to younger and older mothers.

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Introduction

Over the past decades there has been an increase in the mean age of childbearing across much of the developed world (OECD, 2014). In Sweden the mean age of first birth increased by approximately four years, to age 28, between 1970 and 2011, and in 2013 the majority of all births were to women aged 30 or older (Statistics Sweden). Research that has attempted to isolate the impact of maternal age at the time of birth on long-term offspring outcomes has generally shown a non-linear relationship where the children of younger and older mothers are shorter, have higher rates of obesity, lower self-rated health, higher mortality (Myrskylä & Fenelon, 2012), and higher rates of diabetes (Cardwell et al., 2010), and cancer (Hemminki & Kyrrönen, 1999). Both physiological and social explanations have been developed to

account for this relationship, including a decline in oocyte quality with increasing maternal age (Navot et al., 1991), as well as how children of older mothers are at an increased risk of losing their mother to death at a young age, thereby potentially receiving less support and investment from their parents (Myrskylä, Elo, Kohler, & Martikainen, 2014).

While most previous research has examined either birth outcomes, or health outcomes in middle and older adulthood, this study examines the relationship between maternal age at the time of birth and both health and health behaviours of the offspring in the late teenage years, at age 19. While health measures such as height and obesity have been examined before, we are not aware of previous research that has examined the relationship between maternal age and offspring health behaviours. The measures we examine include height, being overweight, being obese, alcohol consumption, smoking behaviour, taking regular exercise, and self-rated health. In this study we show that health and health behaviours in late adolescence are associated with maternal age, with the offspring of both younger and older mothers typically exhibiting worse outcomes. This pattern of results indicates that shorter lifespan overlap is not the sole explanation for the

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relationship between advanced maternal age and offspring mortality in adulthood.

The physiological explanations for why advanced maternal age carries an increased risk are well documented. Female fecundity declines with age, and the difficulty of conceiving, rates of spontaneous abortion, and adverse perinatal outcomes such as stillbirth, pre-term birth, and low birth weight increase exponentially with maternal age (Schwartz & Mayaux, 1982; Andersen, Wohlfahrt, Christens, Olsen, & Melbye, 2000). Both pre-term birth and low birth weight are associated with lower cognitive ability in adulthood as well as other negative sequelae (Black, Devereux, & Salvanes, 2007; Saigal & Doyle, 2008). Childbearing at young ages is also associated with worse offspring outcomes. While this may be attributable to physiological underdevelopment (Fraser, Brockert, & Ward, 1995), it may also be due to the fact that teenage mothers tend to be drawn from low socioeconomic status backgrounds, and that early childbearing disrupts opportunities to increase socioeconomic attainment (Furstenberg, 2003).

The long-term socioeconomic consequences of being born to an older mother are not entirely clear. For one, older parents tend to have greater financial and social resources, which would benefit their offspring. On the other hand, older parents will typically have a shorter lifespan overlap with their children, as a mother who is 40 at the time of birth would *ceteris paribus* die twenty years before a woman who was age 20 at the time of birth. Recent research has indicated that a shorter lifespan overlap between the child and the mother may be the main explanation for the relationship between advanced maternal age and higher offspring mortality (Myrskylä & Fenelon, 2012; Myrskylä et al., 2014). A shorter lifespan overlap means that children may receive less parental investment, and some may be scarred by the trauma of losing a parent at a relatively young age (Rostila & Saarela, 2011). Alternatively, a short lifespan overlap may be evidence of shared frailty within the family, or a shared hazardous environmental exposure.

In a comparative perspective, life expectancy is high in Sweden, meaning that even a mother who gives birth at the very advanced age of 50 would be overwhelmingly likely to still be alive when her child is aged 19. Over 80% of women born in Sweden in the 1940 cohort were still alive by age 70 (Statistics Sweden, 2010). By examining self-reported health, biomarkers of health, and the health behaviours of the offspring in late adolescence we are able to test whether maternal age is associated with health before considerations regarding lifespan overlap are relevant for most respondents. Although the parents of most teenage respondents will not have died, it is likely that the oldest mothers and fathers would already have declining health. Seeing one's parent with cancer or developing Alzheimer's disease could clearly be a stressful and distressing experience that could in turn have a negative impact on the child. Even if there was not a direct impact upon the physical health of the child, such an experience might increase the likelihood of the offspring suffering from anxiety or depression (Compas et al., 1994; Armistead, Klein, & Forehand, 1995), which may increase the risk of engaging in negative health behaviours like excessive alcohol consumption (Dixit & Crum, 2000).

Parenting style is likely to vary by the age of the mother, even if this is largely explained by selection. Older parents are more likely to have elected to have a child, and may also be happier than younger parents (Myrskylä & Margolis, 2014). On the other hand, research indicates that older parents spend less time with their children (Sayer, Bianchi, & Robinson, 2004). Time use data from the United States suggests that mothers who are aged 45–54 spend 30 min less time per day with their children than parents who are aged 25–34, and parents who are aged 55–64 spend 40 min less time per day after adjusting for number of children and the presence of pre-school children (Sayer et al., 2004). These are quite substantial differences when considering that parental time and attention are critically

important dimensions of investment in children (McLanahan & Sandefur, 1994), and will be related to the ability of the parents to encourage healthy behaviours, and discourage unhealthy ones (Barnes, Reifman, Farrell, & Dintcheff, 2000).

Smoking, excessive alcohol consumption, and poor cardiovascular fitness are all strongly associated with mortality (Blair et al., 1996; Ezzati & Lopez, 2003; Fuller, 2011). Furthermore, due to their addictive nature, patterns of cigarette and alcohol consumption are correlated over the life course, and cohort studies often show a rise in consumption with increasing age (Grant & Dawson, 1997; Faggiano, Versino, & Lemma, 2001). Patterns of exercise and sedentary activities are also correlated over the life course (Biddle, Pearson, Ross, & Braithwaite, 2010; Midlöv, Leijon, Sundquist, Sundquist, & Johansson, 2014). This previous research suggests that habits and behaviours can become ingrained over time. Although we do not have longitudinal data, this means that if maternal age is associated with health behaviours in late adolescence we can speculate that these behaviours may mediate the relationship between maternal age at the time of birth and health outcomes in later adulthood for the offspring.

Data

The data used for this study come from a panel survey collected by telephone interview in Sweden in 2009. The survey was collected as part of a project called LIFEINCON. The main focus of this project has been on contextual factors, such as social networks and neighbourhoods, explaining differences in young adults' life chances in a longitudinal perspective. According to a consulting statement (2008/580-31), the Ethical Review Board (EPN) in Stockholm approved the application for ethical approval. The sample is based on three different groups of Swedes, differentiated by the parental country of birth, born in 1990: (a) all individuals with at least one parent born in Iran, (b) 50% of all individuals with at least one parent born in the former Yugoslavia, and (c) a random sample of 2500 individuals with two Swedish born parents. In Sweden immigrants of Iranian and Yugoslavian descent make up a substantial portion of the population of non-Nordic origin. The goal of this sampling approach was to be able to examine the life opportunities of these specific groups of immigrants, or descendants of immigrants, more carefully.

The survey sampled 5695 Swedish youths, who were aged 19 in 2009, and a total of 2942 interviews were successfully conducted by Statistics Sweden, giving a response rate of 51.7%. The most common reason for non-response, 77%, was that the interviewers could not get in contact with the individual, primarily due to the prevalence of pay-as-you-go phone users in this age group. In these cases, names are not registered to particular phone numbers. The effective sample was slightly biased. Information provided by Statistics Sweden showed that the rate of response was lower amongst those living in urban areas, with lower grades, no upper-secondary education, those who had not completed secondary education, and those whose parents' had lower levels of educational attainment.

In this study we restrict our analyses to the random sample of 2500 individuals with two Swedish born parents. After considering non-response on some items, we have data on 1236 individuals for our analyses. We choose to focus upon respondents with two Swedish born parents so that we could comprehensively adjust for the socioeconomic status of the parents; that data was less available for respondents with an Iranian or Yugoslavian national origin. To this effect the survey data is bolstered by linkages to the Swedish administrative registers, including the occupational class of the father in 1990, the educational attainment of the mother in 2009 (the year of the survey), and the

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