SOME ASPECTS OF ADOLESCENT MOTHERHOOD IN NUNAVUT

MELISSA BEXTE
Bachelor of Science, University of Lethbridge, 2019

A thesis submitted
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

in

PSYCHOLOGY

Department of Psychology
University of Lethbridge
LETHBRIDGE, ALBERTA, CANADA

SOME ASPECTS OF ADOLESCENT MOTHERHOOD IN NUNAVUT

MELISSA BEXTE

Date of Defense: December 14, 2021

Dr. L. Barrett Thesis Supervisor	Professor	Ph.D.
Dr. S.P. Henzi Thesis Examination Committee Member	Professor	Ph.D.
Dr. D. Forrester Thesis Examination Committee Member Lethbridge College Lethbridge, Alberta	Instructor	Ph.D.
Dr. K.C. Tran Chair, Thesis Examination Committee Department of Economics Faculty of Arts and Science	Professor	Ph.D.

ABSTRACT

Since the rise of the teenage pregnancy epidemic in the United States, many policy makers and researchers throughout the industrialized world have continued to express concern about risks associated with adolescent motherhood. Here, I present a brief history of the teenage pregnancy epidemic, using the United States as an illustrative example. Then I investigate two aspects of adolescent motherhood in women from Arviat, Nunavut. Arviat differs from the United States in that it offers greater financial and relational support for adolescent mothers. I use a Bayesian statistical framework to examine the effect of adolescent motherhood on welfare use and on measures of self-reported health at midlife. I find no predictive effect of adolescent motherhood on either outcome. Instead, data presented here suggest that a context where more financial and relational support are available to support mothers, adolescent mothers seem to do as well as those who postpone their first births.

ACKNOWLEDGEMENTS

I would like to thank Stephanie Varsanyi for showing me how to upload data files to the supercomputer, as well as answering a plethora of other idiotic inquiries, all of which she approached with kindness and encouragement. I am deeply grateful for the mentorship of my committee: Louise Barrett, Peter Henzi, and Deanna. Additionally, I would like to thank Tyler Bonnell and Christina Nord for fielding my many questions, both stats-related and otherwise. Thanks also to Jessica Parker for all the contributions she made to this project before I was even a part of it. And to my fellow members of the Barrett-Henzi lab, including my pal Neil Franchuk, thank you so much for your friendship and support.

Finally, I would like to extend gratitude to my friends and family for supporting me through this endeavor, with a specific tsunami of gratitude to Uriel; thank you for listening to all my complaints and concerns, for holding space for my stress, for keeping me accountable to finishing my work, and for encouraging me to keep going when I didn't think I could. Thank you.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AFB	Age at first birth
AOUM	Abstinence only until marriage
CCB	Canada Care Benefit
CI	Credible interval
CPP	Canada Pension Plan
GST	Goods and Services Tax
PRWORA	Personal Responsibility and Work Opportunity Reconciliation Act
SES	Socioeconomic Status

CHAPTER 1: THE PROBLEM WITH ADOLESCENT MOTHERS

1.1 THE ANTI-TEEN MOM ARGUMENT

Over the past few decades, substantial policy and public health spending has been targeted at reducing teenage motherhood across industrialized nations. Through concerted efforts of sexual health education and other pregnancy prevention initiatives, coupled with increased access to and efficacy of birth control, rates of teen pregnancy have fallen from 68.3 births per one thousand women aged 15-19 in 1970 to 16.7 births per one thousand women in 2019 (Vinovskis, 2003; CDC, 2021). These sorts of statistics, when shared, tend to be offered with a tone of victory, or celebration, and a sense of accomplishment that the problem of the teenage mother has been eradicated. But is it really a cause for celebration? How did we get here?

The terms teenage, teen, and adolescent *pregnancy* typically refer to young women who become pregnant before the age of twenty years, while teen *births* refer to those who carry to term and give birth before the age of twenty. Reports of teen births underestimate the number of teen pregnancies, since some pregnancies will not come to term through abortion, miscarriage, stillbirth, or other complications. Concerns around teenage pregnancy and motherhood are often associated with reduced health outcomes for both mothers and their children. For instance, adolescent childbearing is related to, among other things, increased rates of low birth weight, placenta previa (where the placenta partially or fully covers the mother's cervix, which can lead to severe bleeding throughout the pregnancy and delivery), pregnancy-induced hypertension, and anaemia (Neiterman, 2012; Arai, 2009; Kumar et al., 2007; Stevens, 1994). Additionally, teen pregnancy is associated with higher frequencies of high-risk health behaviours, including alcohol and drug use, as well as exposure to circumstances that contribute to elevated rates of violence, stress, and reduced psychological wellbeing (Arai, 2009; Raatikainen et al., 2005; Webbink,

Martin, & Visscher, 2008; Wong et al., 2020). It has also been linked to indirect health outcomes that can harm both the mother and child, such as a lack of access to medical care and a lack of responsiveness on the part of the mother to medical advice, for example, an adolescent mother may delay seeking medical care to the detriment of herself or her child (Neiterman, 2012).

Teenage childbearing is also associated with reduced socioeconomic wellbeing. Sometimes adolescent mothers decide to withdraw from or postpone their education to raise their children. By dropping out of school, adolescent mothers reduce their competitiveness in the job market, since most industrialized societies increasingly demand a high school (or higher) education as a prerequisite for minimum-wage positions (Furstenberg, 1998; Fuller & Raman, 2017). Returning to school after having a child can prove incredibly challenging: supporting a child is already costly but adding childcare to the bill in the absence of earning an income is nearly impossible without financial or social support from family or friends. Taking all these factors into consideration, it is unsurprising that there is an extensive literature linking teenage motherhood with higher incidences of poverty compared to women who do not become pregnant in adolescence (Stevens, 1994; Hao & Cherlin, 2004).

Discussion of the costs of teenage motherhood as laid out above map onto the common narratives employed by individuals and institutions whose aim is to reduce the incidence of adolescent childbearing (and is henceforth referred to as the "anti-teen mom argument"). Taken at face value, these arguments seem both compelling and causal; they suggest that teenage pregnancy *causes* hardship that otherwise would not have occurred. They appeal to a desire to protect women and children from harm: by reducing the incidence of teenage motherhood, young girls will stay in school, thus improving their employment prospects and decreasing the odds of living poverty. By delaying pregnancy until they are "ready" – that is, until they can afford to

care for a child in the resource-intensive way that has become the norm in industrialized nations – they will experience better health and socioeconomic outcomes for themselves and their children than if they were to have a child during adolescence (Neiterman, 2012; Furstenberg, 2015).

1.1.1 A risky endeavor, or a reasonable one?

This anti-teen mom argument, as I have described it here, depicts teenage childbearing as a *risky* endeavour. A careless, immature girl—and it is always the fault of the woman, even though she did not become pregnant on her own—irresponsibly engages in premarital sex only to find her health and her future "at risk" (Neiterman, 2012).[1] Though this concern for the wellbeing of young women masquerades as a benevolent cause, the language employed in anti-teen mom arguments reflects little concern for any actual risk to the wellbeing of mothers and children, and instead suggests that what we are really concerned about is the risk that increased *costs* that will be inflicted on society should young mothers require support to raise their children (Bonnell, 2004; Neiterman, 2012). Because adolescent mothers are perceived as deviant from the social norm surrounding childbearing – that is, they are not the ideal of being a white, middle-class, married mother – they and their children are cast as being 'undeserving' of any support they may receive from the state (Neiterman, 2012).

---

1 the use of "risk" in this context more likely refers to uncertainty, as the outcome of adolescent motherhood – in this case, reduced socioeconomic status – has an unknown likelihood. Risk, when discussed in much of psychology and economics, often refers to a situation wherein the outcome is unknown, but the probability of a particular outcome is known. Alternatively, uncertainty is characterised by both an unknown outcome and an unknown probability (Knight, 1921; Luciana, Clark, & DeGroot, 2018). Since we do not know the objective probability that a young woman will experience poverty as a result of a teenage pregnancy, we are thus dealing with uncertainty. In much of life, we do not know the probabilities of the potential outcomes we face, yet find ourselves describing these circumstances in terms "risk." Often, when laymen refer to the term risk, they really mean uncertainty (Luciana et al., 2018). In the present context of the anti-teen mom argument, a careless, immature girl may irresponsibly engage in premarital sex only to find her health and her economic future are more *uncertain* than they otherwise may have been.

Not only does the anti-teen mom argument cast young women who bear children as irresponsible and undeserving, it also takes adolescent childbearing out of context. It often fails to recognize that the young women who are more likely to become mothers in adolescence differ in meaningful ways from those who are not, and several lines of research have emerged to resist the anti-teen mom argument (Geronimus, 1997; Furstenberg, 2007; Diaz & Fiel, 2016; Mollborn, 2017). For instance, research has identified that a lack of interest or engagement in school often precedes teen pregnancy (Mollborn, 2017; Diaz & Fiel, 2016). Some teenage mothers, then, were on track to dropping out of school before they conceived. It is often the case that teenage mothers come from low socioeconomic households, where the chances of moving out of poverty are unlikely even if they do not become pregnant (Gold et al., 2002; Furstenberg, 2007). Accompanying these already-difficult life prospects are increased rates of mortality among low-income communities, where people tend to die earlier and from specific causes (Williams, 2012).

When placed in these sorts of circumstances – i.e., when your life is likely to be short, and when it seems unlikely that you will be able to improve your material circumstances – there is little incentive to wait to have children, and there is also little to be lost by having them when you are young (Herrman & Waterhouse, 2011; Karney, 2021). Rather, having children early increases the likelihood that a woman reproduces successfully, and it boosts the chances that she will be able to survive long enough to see her child grow up. Regardless of her marital status or age, a poor mother often expects to bear much of the financial responsibility for her children, since it is likely that her partner also faces limited employment prospects, as well as a short lifespan himself (Karney, 2021). Further, she will likely depend on kin to care for her children when she is at work or school; postponing childbearing only increases the chance that her own children will have to compete with her aging – and likely ailing – kin for investments of time and

energy (Mollborn, 2017). Delaying childbearing also decreases the chances that the children's father will survive through much of their childhood. As such, the greatest chance of long-term labour force attachment will occur if her children's preschool years coincide with her years of peak access to social and practical support provided by relatively healthy kin. In other words, a low-income woman's best chance of receiving the support she needs is achieved by becoming a mother at a young age.

Overall, poor teens face worse life prospects compared to their middle-class counterparts, who have every reason to believe that they – and their children – will fare better if they delay childbearing. Thinking of teen pregnancy as a *risky* endeavour, as is often the case in policy discourse, tends to consider only the circumstances of middle-class adolescents and ignores the risks that low-income teens may face should they postpone childbearing (Fonda, Eni, & Guimond, 2013). Indeed, teenage childbearing may make more sense – that is, seem more rational – if it is considered as a way to maximize wellbeing when living in hard circumstances and may explain why early childbearing has persisted in disadvantaged communities, even with access to contraceptives, abortion, and while subject to public disapproval of their behavior (Sear, 2020; Dickens et al., 2010).

1.1.2 The role of race and socioeconomic status

Embedded in the characteristics of low socioeconomic status and high rates of mortality are important racial effects. In the United States, Black and Hispanic populations are disproportionately represented in low socioeconomic groups, and they experience reduced life expectancy compared to their white counterparts. For example, in the United States in 2012, Black individuals were over twice as likely than their white counterparts to live in poverty (Hokayem & Heggeness, 2014). In terms of wealth, for every dollar of wealth held by white

American households in 2016, Asian households held 83 cents, but Blacks held only 6 cents and Hispanics 7 cents (Williams, Priest, & Anderson, 2016). Accordingly, the health of minority populations in the United States tends to decline faster compared to white populations (Williams, 2012). Accordingly, Black and minority women are more likely to bear children in adolescence than are white teens, who more often delay childbearing until they have completed their education (Stevens, 1994; Karney, 2021).

The issue of teenage childbearing and motherhood, clearly, is quite complicated. And yet, it is understood much differently today than it was only a century ago. Until the early 1900s, it was not uncommon, nor was it stigmatized, for women to have children in their teens; the acceptability of teenage motherhood, however, depended on the mother being married (Vinovskis, 2003; Furstenberg, 2007; Stevens, 1994). Before proceeding further, it might be helpful to better understand how we got here: that is, how teenage pregnancy and childbearing shifted from an accepted norm to a life sentence of turmoil and economic hardship.

Teenage motherhood as a social problem first arose in the United States and looking in detail at the US offers an outline of the way that arguments surrounding adolescent motherhood tend to be framed and represents the most extreme example of how those arguments have been employed to shape both cultural understandings of and policy changes related to teenage motherhood; it is thus useful for illustrative purposes. Upon establishing the ways that adolescent motherhood is regarded within the United States, I will extend these ideas to consider adolescent motherhood in a context beyond the US – in Nunavut, Canada – and examine some of the ways that teenage motherhood both differs from and is similar to the United States, with a specific focus on the economic and health outcomes related to adolescent motherhood.

1.2 THE CURIOUS CASE OF THE TEENAGE PREGNANCY "EPIDEMIC"

1.2.1 Changing priorities – an American case study

From the late 19th and into the early 20th century in the United States, the age that women first married and subsequently had children consistently hovered around a median of 21 years (US Census Bureau, 2019; Kirmeyer & Hamilton, 2011). During this time, unmarried women were often blamed and punished for engaging in premarital sex and having children out of wedlock, and young women who failed to abstain from premarital sexual activities were cast as "fallen women" (Vinovskis, 2003; Furstenberg, 2007). As such, rates childbirth outside of marriage were relatively low. For example, among American women aged 15-29 who had their first birth between 1930 and 1934, only 8.2% of births occurred outside of marriage; for comparison, those whose first birth fell between 1990 and 1994, 40.5% occurred outside of marriage (Bachu, 1999). In the aftermath of World War II, dating, rather than a formal courtship, became more common among middle-class girls from the 1920s to the 1950s, and with this shift too came a rise in and increased acceptance of premarital sexual activity (Vinovskis, 2003). In the absence of reliable birth control, this increase in sexual activity was followed with a rise in teenage pregnancies and births.

Rates of adolescent births reached their peak in the United States in 1957, where 97.3 per 1000 births were to women aged 15-19 (Vinovskis, 2003;). Out of wedlock pregnancies were often hastily resolved with so-called "shotgun marriages" – thus allowing the high rates of teen pregnancies to avoid public attention for decades, and to keep the American ideal of the nuclear family intact. During this time, teen pregnancies that occurred outside of marriage were considered "illegitimate" and were perceived to threaten the sanctity of family life (Stevens, 1994). Young mothers who became pregnant out of wedlock were ostracized, often carrying

their child to term and giving birth away from their families. Many placed their children for adoption (Furstenberg, 2007). Since little social support was offered to teenage mothers, related welfare costs remained low throughout the 1950s and were not yet associated with adolescent childbearing (Vinovskis, 2003). This hints at the true nature of the perceived problem of adolescent motherhood: the problem is not teenage motherhood per se, the problem is with single teenage mothers who require financial support to raise their children.

The 1960s brought several important social changes: postwar manufacturing jobs were declining, the cost of postsecondary education was increasing, and the development of birth control made it easier to prevent pregnancies (Furstenberg, 2007; Furstenberg, 1998). As a result, America observed a decline in adolescent birth rates, even as premarital sex became more common (Furstenberg, 2007; Vinovskis, 2003). The young women who did give birth in adolescence during this time were much less likely to marry than adolescent mothers in previous decades. Since unintended teen pregnancies were no longer being "resolved" with a shotgun marriage, this fostered the appearance of an increase in adolescent births overall, when it was actually an increase in the number of births to unmarried adolescents. Though non-marital births were increasing for women of all ages, it was this appearance of a dramatic increase in births amongst unmarried teenagers that alerted concerned policymakers to a potential problem with teenage childbearing (Stevens, 1994; Furstenberg, 2007).

Early investigations into the issue established a link between socioeconomic status and the likelihood of teen pregnancy: young women who grew up poor were at greater risk of becoming pregnant compared to their wealthier counterparts (Vinovskis, 2003; Stevens, 1994). Since Black and other minority populations experience poverty at higher rates than white populations, it is unsurprising that, when broken down by race, rates of adolescent births were

considerably higher among Black women than white women (Furstenberg, 2007; Stevens, 1994; Karney, 2021). Thus, from the beginning, the language surrounding teenage motherhood was economically and racially coded, and Black teens were singled out as the source of the problem. This framing corrupted the understanding of teenage childbearing by morally condemning the type of women who were willing to have children in their teens; that is, poor women, many of whom were women of color (Furstenberg, 2007).

In 1965, Daniel Patrick Moynihan, a member of Lyndon Johnson's administration, published a report on the state of the Black family in America. In this report, Moynihan (1965) established the myth that teenage pregnancy causes poverty:

> A cycle is at work: too many children too early make it most difficult for the parents to finish school… Low education levels in turn produce low-income levels, which deprive children of many opportunities, and so the cycle repeats itself (Chapter 3).

These sentiments were echoed in a report by the prominent demographer Arthur Campbell in 1968, and again by the Guttmacher Institute in 1976. The Guttmacher Institute's pamphlet "Eleven million teenagers: what can be done about the epidemic of adolescent pregnancies in the United States" (Furstenberg, 2007; Vinovskis, 2003) influenced much of the media and policy discourse around teenage childbearing; it convinced its audiences that adolescent pregnancy was occurring at an epidemic scale. However, the title itself is an excellent example of the entire report's use of hyperbole: "Eleven million teenagers" refers not to the number of teenage births – which were about 600,000 – or even pregnancies, which were estimated to be less than a million in the US at the time. Rather, the figure refers to the estimated number of teenagers – both male and female – who had engaged in sex (Furstenberg, 1998).

The United States government's response to this non-existent epidemic of teen pregnancy

was two-pronged: cut welfare programs and increase sexual health education. Throughout the 1990s, presidential administrations focused on cutting public spending, where financial and social supports to young and low-income mothers were dramatically reduced (Furstenberg, 2007). The release of the Guttmacher Institute report coincided with growing complaints about the cost of the recent expansion of federal assistance programs, which covered food stamps and aid to families with dependent children. In 1984, influential voices such as political scientist, Charles Murray, claimed that the social supports available to unmarried adolescent mothers only exacerbated the problem, that they provided a disincentive to marry, and that access to family planning supports only promoted sexual promiscuity (Furstenberg, 2007; Vinovskis, 2003). Advocates for reducing teen pregnancy believed that cutting social assistance payments would decrease adolescent childbearing, since the financial support needed to help raise children would be less accessible (Furstenberg, 2007). This belief, however, rests on the assumption that the promise of welfare payments is sufficient for teenagers to carry their pregnancies to term and raise their children on their own; conversely, that without these payments, teens will be less likely to get pregnant in the first place (or more likely to terminate their pregnancy under the knowledge that they cannot afford to raise a child). This sort of reasoning emphasizes that the real concern over adolescent mothers' is the perceived burden they – specifically single adolescent mothers – place on society, as they are considered undeserving of financial support.

The second strategy was to implement sexual education programs in schools, with the intention of warning adolescents of the harms of teenage pregnancy. What emerged was abstinence-only-until-marriage (AOUM) education as standard curriculum, where community and faith-based organizations rolled out sexual health education programs that promoted ideas of chastity and self-discipline (Santelli et al., 2007). Additionally, AOUM curriculum often

perpetuates harmful gender and sexual minority stereotypes, casting moral judgement on those who engage in sexual activity outside of marriage (ASPE, 1996; Santelli et al., 2017).

AOUM is one hundred percent effective, in theory. In execution, its failure rates are quite high. Several empirical investigations have found AOUM to have little or no effect on increasing the average age at first sexual experience, nor does it reduce teenage pregnancy or birth rates (Fox, et al., 2019; Santelli et al., 2017). Further, AOUM programs tend to exclude any content regarding contraceptive methods or contraceptive use, except to describe the failure rates of various methods. Such an approach ultimately does very little to prevent teenage girls from becoming pregnant should they engage in sexual intercourse (Santelli et al., 2017). And yet, AOUM continues to be the preferred flavour of sexual education programs, even following the 2004 House Committee of Government Reform's report indicating that eleven out of the thirteen AOUM programs most widely implemented in the US contained false, misleading, or distorted information about reproductive health, misrepresentations about the effectiveness of condoms in preventing sexually transmitted infections (STIs) and pregnancy (Santelli et al., 2017).

Throughout the 1980s, teen birth rates remained low, sinking to 53 births per 1000 women aged 15-19 in 1980, only to rise slightly to 59.9 births per 1000 by 1990 (Vinovskis, 2003). This period saw a massive rise in condom use in the late 1980s and early 90s, as America responded to the HIV/AIDs epidemic (Furstenberg, 2007). Additionally, new, longer lasting, and more effective contraceptives arrived on the market in the 1990s, such as Depo Provera (Vinovskis, 2003). At the same time, the US's growing economy increasingly made room for women in the workforce and thus incentivized young girls to continue pursuing their educations (Furstenburg, 2007). It seemed as though things were improving and that the concern around teen pregnancy had begun to fade into the background.

As he began to feel the pressure of his 1996 campaign for re-election, then-president Bill Clinton needed to live up to his 1992 election promise to "end welfare as we know it." In Clinton's 1995 State of the Union address, he argued that teenage childbearing was America's "most serious social problem," though at the time of his address birth rates of women aged 15-19 were half of what they had been a few decades earlier (Furstenberg, 2007). By stoking the public's concern over the cost of adolescent motherhood – with the implication that the cost of supporting adolescent mothers in raising their children is too great a financial burden for America to bear – Clinton rallied the political support for the changes to welfare that were to come.

Clinton's response to the ongoing teenage pregnancy epidemic echoed that of his predecessors. He promised to reduce the amount of aid provided to low-income populations by reducing the number of births to unmarried women, the number of births to teens, and by providing supports to allow welfare recipients to enter the workforce, and the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996 changed the face of the federal welfare program (Chamlin & Denney, 2019). PRWORA instituted work requirements, where recipients had to find employment after two years of receiving support to continue receiving funds and imposed a five-year lifetime limit for receiving cash aid. After passing PRWORA, the number of individuals receiving federal welfare declined dramatically (ASPE, 1996; Edin & Shaefer, 2016). Though the legislation was intended to move adults into the workforce and promote family stability, there is limited evidence to suggest that those affected by PRWORA experienced an increase in their standards of living (Cassiman, 2008; Moffitt, 2015). Employment rates increased after the implementation of PRWORA, and poverty rates declined overall, but experiences of poverty rose among working families, especially those

headed by working mothers. The economic boom of the 1990s helped create the appearance of improved standards of living, but most former welfare recipients moved into jobs that were not full-time or full year, earning wages that were insufficient to support their families (Boushey, 2002; Tach & Edin, 2017). The US economy has declined in the decades following Clinton's presidency, but federal welfare supports remain in place, thus leaving families near the bottom of the income distribution struggling to survive (Edin & Shaefer, 2016).

1.2.2 Still searching for a cure

If we consider the "epidemic" of teenage pregnancy to refer to the relatively high rates of pregnancy among women under the age of twenty, then we can consider the epidemic to have improved as early as the early 1960s, as pregnancy and birth rates for teenage girls dropped from their all-time high. However, if we understand the epidemic to be represented by adolescent girls who become pregnant and then remain unmarried at high rates – the key characteristic that initially alerted government officials of a teen pregnancy problem – then little has changed. Demographic trends in America remain in opposition to the goals of AOUM programs: the average age that Americans marry has increased in the last several decades, yet the average age of sexual debut (i.e., first intercourse) has remained the same (Santelli, et al., 2017). Together this implies a larger interval between sexual debut and marriage, thus increasing the average amount of premarital sex. For instance, in 2006, the median age of sexual debut for women was 17.8 years, and the median age at first marriage was 26.5 years – a gap of 8.7 years between the two events. In contrast, for women born in the 1940s – who would have turned 15 between 1955 and 1964 – the average interval between first sexual experience and marriage was only 1.5 years (Santelli, et al., 2017). Today, women who find themselves pregnant outside of marriage, and who carry their pregnancies to term, are less likely to marry to "resolve" their situation,

regardless of age (Vinovskis, 2003; Furstenberg, 1998). The number of adolescents who find themselves in such a position, though, is quite small, and has been quite small for decades (Vinovskis, 2003).

Though proponents of AOUM sex education programs remain resolute in its effectiveness, little empirical evidence supports such claims. AOUM programs do not demonstrate efficacy in delaying the initiation of sexual intercourse, nor has it shown effectiveness in changing behaviours that are precursors for pregnancy, such as contraceptive use (Santelli et al., 2019). Santelli et al. (2017) notes that "in countries in which adolescents receive routine access to contraceptive education and counselling, and necessary socioeconomic resources, their [teen] pregnancy and birth rates tend to be a fraction of their peers in the US." Welfare reform has also demonstrated limited effectiveness in preventing teen pregnancies. Hao and Cherlin (2004) found no effect on adolescent pregnancies or births, even after controlling for the effects associated with increased rates of teenage pregnancy: being low-income, growing up in a single-parent household, parental welfare receipt, low parental education, and being Black.

In sum, legislative efforts enacted throughout the 1980s and '90s to reduce teenage childbearing – and which still exist, in large part, today – have demonstrated limited effectiveness in initiating its desired change over the long-term.

1.2.3 Beyond America

Though the United States provides perhaps the most explicit and extreme response to the perceived increases in adolescent motherhood throughout the 20th century, it was not the only industrialized nation that believed it faced a grave social and health problem (Neiterman, 2012). Both Canada and the United Kingdom, among other developed nations, became concerned with their country's' rates of teenage pregnancy during this period. Likewise, these nations launched

policy efforts to reduce the rate of adolescent motherhood, though these efforts differed from the United States' approach. For instance, England launched the Teenage Pregnancy Strategy in 1999, which was a wide-ranging and intersectoral intervention aimed at reducing adolescent pregnancy (Skinner & Marino, 2016). Its three main components included a whole-government approach to reducing teen pregnancy, recruiting support from the health, education, and employment departments; improved prevention efforts that embraced sex and relationship education in schools, as well as better access to effective contraception; and finally, it provided better support for pregnant teens and mothers, with the aim to help ensure adolescent mothers finished their education and had access to secure housing. Due in part to the Teenage Pregnancy Strategy, in conjunction with social and educational changes that occurred during the same period, adolescent births fell from 47 births per 1000 women in 1998 to 18.8 births per 1000 women in 2016 (Hadley, Ingham, & Chandra-Moul, 2016; Arai, 2009; Baxter et al., 2021).

Though Canada's rates of adolescent pregnancy have always tended to be below those in the US, and have declined in recent years, there continues to be a scholarly preoccupation with preventing teenage pregnancy (Guilbert & Forget, 1991; Al-Sahab et al., 2013; Baxter et al., 2021). Some Canadian researchers have even gone so far as to claim that "girls with good self-esteem and a sense of responsibility also tend to avoid adolescent pregnancies." (Al-Sahab et al., 2013). Although Canadian politicians did not deliberately cite teenage pregnancies as a threat to the wellbeing of the country in the ways that American politicians did, Canada initiated policy changes that had similar effects on adolescent mothers. Beginning in the 1980s and 1990s, Canada implemented reductions to eligibility and benefits for many social programs were introduced, as well as "privatizing" aspects of provincial social programs by contracting out responsibility for services (specifically related to children and the aged). Like the US, many cuts

to federal public spending persisted in the following four decades (Moscovitch, 2015). Canada – and other developed nations – underwent similar sociodemographic changes as the US during the late 20th and early 21st century, as emphasis on education increased, access to contraceptives became easier and more normalized, and young women experienced greater centrality of goals rather than motherhood and family formation (Singh & Darroch, 2000). As a result, between 1990 and 2010, Canada observed a 47% decrease in adolescent births from 1990 and 2010, leveling with a birth rate of 13.5/1000 (Thompson, 2016). However, within Canada, the reduction of adolescent pregnancy and births were not equivalent across each of its regions. Indeed, in 2017, birth rates among women aged 15-19 are 7.8 births per one thousand women nationally, but just 4.7 in British Columbia, 18.6 in Manitoba, and reach as high as 97.8 per one thousand women in Nunavut (Statistics Canada, 2021b). Nunavut in particular exhibits sociodemographic trends that are unique to the rest of the country.

1.3 BABES IN THE ARCTIC – INTRODUCING THE STUDY POPULATION

Nunavut is a large, sparsely populated territory in northern Canada. Approximately 85% of the population is Inuit, one of Canada's Indigenous groups (Statistics Canada, 2017c). Although part of an industrialized nation, educational achievement, incomes, and employment rates are low, food insecurity occurs at rates that far exceed the rest of the nation, and average life expectancy is approximately ten years lower than the rest of the country. The median annual income in Nunavut in 2015 was $29,743, just below the average for Canada at $30,866 (Statistics Canada, 2021a). Additionally, the cost of food in Nunavut is astronomical, as food transported in from southern Canada can end up costing multiple times its retail price in the south. For example, in 2018 a 2.5kg bag of white flower cost, on average, $4.91 across Canada;

in Nunavut, its average retail price was $13.57 (Government of Nunavut, 2018). As such, rates of food insecurity are very high – in 2016, 36.7% of households in Nunavut were food insecure, which far exceeds national rates of 8.3% (Galloway, 2017).

Life expectancy in Nunavut is nearly a decade lower than the rest of Canada. In 2015, the average Nunavut resident was expected to live 71.8 years, but the national life expectancy was 81.5 years (Conference Board of Canada, 2015). When compared to measures of wellbeing collected from other nations, Nunavut has received substandard ratings on a number of indicators of health including premature mortality, infant mortality, suicide, and mortality due to cancer and respiratory diseases (Conference Board of Canada, 2015). Fertility rates, however, are high: in 2017, total fertility rate in Nunavut is 2.91 children per woman, compared to 1.50 nationally (Statistics Canada, 2021b). As mentioned above, teen pregnancies in Nunavut are relatively common. In 2017, the age-specific fertility rate among Nunavut women aged 15-19 was 97.8 births per one thousand women, compared to the national rate of 7.8 births per one thousand women (Statistics Canada, 2021b). At the true peak of teenage childbearing in the United States, i.e., in 1957, birth rates for women aged 15-19 were around 97.3 births per one thousand women (Vinovskis, 2003). Nunavut, then, offers a sort of microcosm in which to observe the outcomes of teenage pregnancy. In this thesis, however, I will be looking at outcomes specific to residents of the hamlet of Arviat, Nunavut.

Arviat is a mostly-Inuit community located on the Western shores of Hudson Bay, about 200km north of Churchill, Manitoba. It is the second largest community in Nunavut with a population of approximately three thousand people (Arviat Hamlet Council, 2019). As with many of Canada's Indigenous peoples, the Inuit were subjected to colonization and continue to experience the lasting impacts of residential schools, Inuit relocations, and persistent systemic

discrimination (Vowel, 2016). Primary and secondary education is available within the community, but any additional training requires residents to travel significant distances (about 1300 km to either Iqaluit, the territory's capital city, or to Winnipeg, the closest city to the south).

Arviat holds potential for new insights on outcomes related to teenage childbearing. Its population experiences economic, social, and political marginalization which resembles the socially disadvantaged groups in which teenage motherhood has previously been studied, specifically urban African American populations in the United States (Geronimus, 2003; Harris, 1998; Williams, 1992). However, the present sample population differs from American contexts in an important way: Canada, and specifically Nunavut, provides more financial support to low-income individuals and families compared to the United States (Brown, 2016).

The administration of social assistance in Canada is primarily handled by its provincial and territorial governments. In Nunavut, accessing social assistance is intended for those who have exhausted all other means of financial support; its aim is to help individuals and families meet their basic needs when they are unable to provide for themselves (Tweddle & Aldridge, 2018). Taking this into consideration, in 2018, over one-fifth (21.3%) of Nunavut residents were classified as low income, whereas the average across the other Canadian provinces was 12.3% (Statistics Canada, 2021a).

A lack of affordable of housing is often assessed by determining the percentage of the population in a given area that spends 30% or more of their income on their housing costs. In Canada, this accounts for approximately one quarter (25%) of the population (Government of Nunavut, 2016). In Nunavut, however, only about 6% of residents do (Government of Nunavut, 2016). This is likely because housing in Nunavut is incredibly expensive. To support northern

residents, therefore, more than half of all housing in Nunavut is subsidized, and 95% of all welfare recipients reside in subsidized housing (George, 2019; Bell, 2019). For tenants whose annual income is $27,040 or less (which is above the median income in the territory), rent—including all utilities and auxiliary expenses—is $60 per month (Nunavut Housing Corporation, 2021). Each public housing unit, however, costs about $26,700 per year to maintain (George, 2019).

Although public housing is accessed by many Nunavut residents, the demand for units far exceeds the supply of homes, resulting in many overcrowded households in northern communities. In Arviat alone, it is estimated that over half of all households in the community are overcrowded, meaning that there are more people living in the home than there are bedrooms (Government of Nunavut, 2016). Overcrowded households in Nunavut have been linked to reduced mental health for Inuit women as well as the increased spread of transmissible diseases, such as tuberculosis (Anderson, 2015; Public Health Agency of Canada, 2007). During the COVID-19 pandemic, which was ongoing at the time of writing, Arviat was deeply affected by the virus, accounting for 325 of the 369 cases recorded in the territory (as of March 4, 2021; Tranter, 2021a). The virus's spread was likely aided by overcrowded households that made maintaining social distancing impossible (Tranter, 2021b). One way to qualify for subsidized housing and to expedite the process of gaining access to housing is to be a mother (or part of a family) with a young child or children (Moisan et al., 2017).

Through its Canada Child Benefit program (CCB), which provides monthly payments to parents with children under the age of 18 that can be spent as the guardian sees fit, Canada has child welfare policies that are more generous than those of some other industrialized nations. The amount allocated is adjusted according to the number of children in the recipient's care, the

children's ages, and the family's net income. At the time of writing, eligible households can receive up to about $6,800 annually for children under six years and $5,700 per year for children between the ages of six and seventeen (Government of Canada, 2021). The CCB has dramatically reduced the incidence of child poverty among Canadian children. In Nunavut, with the introduction of the CCB, child poverty rates fell by 14.2% between 2015 and 2017 (C2000, 2018).

In sum, it seems to be the case that young women in Arviat face a challenging paradox. As a territory that has been colonized by Western ideals, residents are subjected to ideas related to the anti-teen mom argument. Women feel pressure to postpone childbearing in favour of obtaining economic and relational stability (Archibald, 2004). At the same time, the pursuit of economic achievement is limited if they choose to stay in their community, as employment opportunities are scarce. Delaying childbearing also means postponing or forgoing priority placement on subsidized housing waitlists, a social resource that many in the community are likely to utilize. Additionally, health outcomes in Nunavut are poor, so for these women, postponing childbearing is also costly because it increases the risk of negative health outcomes for both mother and child as she grows older. The question of whether to have children (and if so, when) is very complicated for all women, but especially so for women in Nunavut.

In this thesis, I present an exploratory analysis of early motherhood in Arviat to assess whether the negative outcomes thought to be related to teenage motherhood – namely negative economic and health consequences, as identified in the anti-teen mom argument – persist when women in Arviat postpone motherhood beyond their teen years.

1.4 WHAT'S TO COME – AN OUTLINE OF THIS THESIS

Following this introduction, in Chapter Two, I present a general overview of the understood effect of adolescent motherhood on measures of socioeconomic status and consider the effect of teenage motherhood on welfare use; adolescent motherhood does not have a predictive effect on the use of welfare among the present population. In Chapter Three, I describe the work of Arlene Geronimus and the weathering hypothesis. Using Geronimus's work as inspiration, I consider the effect of adolescent motherhood on self-rated measures of perceived health at midlife and beyond, and suggest that adolescent motherhood has an uncertain, if any, effect on perceived health. Finally, in Chapter Four, I present a general discussion of my findings.

CHAPTER 2: IS RECEIPT OF GOVERNMENT WELFARE TRANSFERS ASSOCIATED WITH TEENAGE MOTHERHOOD?

2.1 INTRODUCTION

Since its emergence and characterization as a social problem, teenage motherhood has been associated with a reduction in economic potential in industrialized populations (Furstenberg, 2007; Diaz & Fiel, 2016). When a teenage girl becomes pregnant, the prevailing belief is that she is forfeiting her opportunity to complete her education, leaving her economically unstable and therefore more likely to be a financial burden on the state (Furstenberg, 1998; Neiterman, 2012).

This negative framing seldom considers the contexts of teenage childbearing nor the motivations of young women who become mothers in adolescence. One context that is worth considering is women's socio-economic status, as teenage childbearing occurs within economically-disadvantaged populations at disproportionately high rates (Vinovskis, 2003; Stevens, 1994). Within poorer populations, young women who become adolescent mothers also tend to exhibit reduced engagement with their schoolwork prior to conception, which suggests the causality here is reversed (Geronimus, 1997; Furstenberg, 2016). That is, rather than teenage motherhood being the cause of poor educational and economic outcomes, young women become pregnant because they perceive fewer opportunities for themselves. For these young women, the costs of early childbearing do not outweigh the perceived benefits of postponing (Furstenberg, 1998). Such a contextual approach to understanding teenage motherhood, however, has not been the primary perspective used to shape relevant policies in the industrialized world.

Public figures in the late 20th century, including Edward Banfield (1974) and Charles Murray (1984), employed statistics on the outcomes of teenage pregnancy to advance their argument that the poor possess different value systems to wealthier people, and, if enabled, are content to rely on government financial support (hereafter referred to interchangeably as welfare, social assistance, or government transfers) (Furstenberg, 2003; Hoffman, 1998). Such arguments also implied that public spending would be substantially reduced if teen mothers were to delay their first births (Furstenberg, 2003; Geronimus, 1997). However, there is limited empirical support for these arguments, as research indicates that young women from disadvantaged backgrounds are likely to access social assistance payments regardless of whether they are mothers or not (Geronimus & Korenman, 1992; Corcoran & Kunz, 1997; Hotz et al., 1996).

Though misleading, this kind of messaging from politicians and public figures across the political spectrum has been effective at initiating political change (Fonda et al., 2013), often by overstating the seriousness of teenage pregnancy as a social problem. For example, the Guttmacher Institute, a research organization founded in 1968 which was originally part of Planned Parenthood, published a pamphlet in 1976 entitled: "Eleven million teenagers: what can be done about the epidemic of adolescent pregnancies in the United States," where the figure of "eleven million" refers not to the number of teenage births, but represents an estimate of the number of teenagers – both male and female – who had engaged in sex (Guttmacher Institute, n.d.; Furstenberg, 1998). Additionally, former President Clinton announced in his 1995 State of the Union address that teenage childbearing was a "very significant economic and social problem" for America (C-SPAN, 1996) and argued that social assistance incentivized young women to have children instead of entering the labour market (Foster, 2008).

In the 1990s, the United States, Canada, and other industrialized nations, reduced welfare payments issued to low-income individuals and families, and made accessing payments more challenging as part of a drive to end the so-called "epidemic" of teenage childbearing (Lightman, Mitchell, & Heard, 2010). Welfare reforms in both the United States and Canada often required recipients to demonstrate that they were actively working or seeking work (Boushey, 2002). Although these policies were implemented with the intention of incentivizing recipients to return to the workforce and to prevent long-term dependence on social assistance, they often had the effect of pushing recipients into low-wage jobs that offered little opportunity for advancement, thereby forcing these individuals into a continued cycle of poverty (Boushey, 2002). For example, following the welfare reforms in the United States in the 1990s, poor families headed by single mothers were pushed deeper into poverty after welfare was reduced and became less accessible; similar findings have been found among a Canadian cohort (Porter & Dupree, 2001; Cooke, 2009).

Despite the persistent belief that teenage motherhood causes financial hardship and a reliance on government social assistance, academic research has had little success in demonstrating causation. However, to test for a causal link between teenage motherhood and poor economic outcomes, a study would need to randomly assign the "condition" of teenage motherhood within a given population, whilst appropriately controlling for factors that may predict teenage pregnancy, such as the participants' own mother beginning her reproductive career in adolescence, growing up in a single-family household, or experiencing trauma or abuse as a child (Aujoulat et al., 2010; Moisan et al., 2017; Herrman & Waterhouse, 2011). Other factors that are more difficult to measure, such as parental attitudes and willingness to be involved in childrearing, may also be required (Hoffman, 1998). Since such a design has obvious

ethical violations and would be nearly impossible to implement, Geronimus (2003) suggested instead that the question which should be asked is whether the social problems associated with teenage motherhood are alleviated if women from the same socioeconomic cohort – who are similarly likely to become teen mothers – postpone their births. Some clever experiments have been devised – including assessing differences in welfare use between sisters with different birth timing, comparing outcomes among women who had twins or singleton births, and by comparing teen mothers to women who became pregnant in their teens but miscarried – yet none of these studies have found sufficient evidence to declare a causal relationship between teenage childbearing and social assistance use (Geronimus & Korenman, 1992; Grogger & Bonars, 1993; Hotz, McElroy, & Sanders, 1997). Taking inspiration from Geronimus (2003), I sought to explore whether rates of welfare use would decline if women postponed their first births beyond their teenage years among a population that exhibits high rates of both adolescent motherhood and access to government social assistance.

In this chapter, I investigate patterns of early motherhood and welfare usage a population from Nunavut, Northern Canada. As outlined in the introduction, Arviat holds potential for new insights on outcomes related to teenage childbearing because it is at once economically disadvantaged – the median income of individual Inuit residents of Nunavut is estimated to be low: $24,768 in 2015, compared to a national average of $30,866 in the same year (Inuit Tapiriit Kanatami, 2018; Statistics Canada, 2021a) – which is similar to the subjects of previous research on adolescent motherhood (Geronimus, 2003; Harris, 1998; Williams, 1992). It is unique, however, in that low-income Nunavut residents tend to receive generous government support relative to other industrialized nations, and specifically the United States, thereby allowing for a

unique assessment of economic outcomes of adolescent motherhood in a context of relatively high economic support.

2.2 "DIFFERENT VALUES" OR MISALIGNED INCENTIVES?

Given Geronimus's ideas, plus the shifts in welfare provision in Canada, my aim is to characterize patterns of childbearing and welfare usage in a disadvantaged population in Canada. If, as Geronimus (2003) suggested, the social problems associated with teenage motherhood – in this case, the use of government assistance – decline when the same women postpone their first births, I would expect this to hold for young women in Nunavut. However, because access to housing is linked to having children, and having children provides more income than might otherwise be available, it may actually be the case that the supports in place for low-income individuals and families remove or reduce any economic disadvantage associated with teenage motherhood. Further, given the high rates of household crowding, adolescent mothers may be responding to the government supports available; women who become mothers in adolescence may have an easier time accessing state-supported housing and may be less likely to live in overcrowded or multigenerational households. As such, I will examine whether teenage motherhood has any predictive effect on welfare usage or on participants' likelihood of inhabiting overcrowded households. Finally, Inuit communities tend to share resources with family and community members in need (Harder & Wenzel, 2011). It may be those who live in densely occupied households are able to pool their available resources to get by without the need to access additional supports. Thus, I also investigate whether there is a predictive effect of household crowding on welfare use.

2.3 METHODS

I analysed survey data collected from 413 women living in Arviat, Nunavut between January and April 2017. Arviat is a small community located on the Western shores of Hudson Bay, about 200km north of Churchill, Manitoba. It is the second largest community in Nunavut, with a population of approximately 3,000 people, most of whom are Inuit (Arviat Hamlet Council, 2019). The survey was administered by three researchers (one English-speaking researcher from the University of Lethbridge, and two local Inuktitut- and English-speaking research assistants). Survey questions included basic background information on the participant's age, marital status, religion, whether she grew up in Arviat, and household composition. Questions were asked pertaining to women's child-bearing history: her age at the time of her first pregnancy and birth, the number of children she had given birth to, as well as those she had adopted, or allowed to be adopted, whether she wanted additional children, and if so, how many (See Appendix A for full questionnaire). Any participants below the age of 20 were excluded from analysis, as they still had the potential to become pregnant during adolescence, and all participants above the age of 64 - the average age of retirement in Canada in 2017 (Statistics Canada, 2021c; Government of Nunavut, n.d.; Government of Canada, 2021b) - were excluded. Participants who did not complete all the questions necessary for the current analyses were removed, resulting in a final sample size of 216 respondents.

Ethical clearance for the project and informed consent

Permission to transcribe and analyse data was provided by the University of Lethbridge's Office of Research Ethics via protocol number 2015-054. Written informed consent was obtained by all participants included in the study.

Statistical Analysis: Model Variables

Teenage mother status - Participants reported their age at the time of their first birth. All participants whose pregnancy resulted in a live birth before the age of 20 years were coded as teenage mothers. Additionally, Arviat, like many Inuit communities, participates in the adoption of children within and between families in the community. If a participant gave birth to a child before the age of 20 but the child was adopted out of her care, she was excluded from the category of teenage mother (N = 10). This allows the study to capture the effects of teenage pregnancy and birth, as well as the participant's commitment to raising a child during adolescence. However, the number of women who adopted out their first-born child in their teenage years (i.e., 10 out of 216) is not reflective of the rate that all women in the sample have adopted a child out during their reproductive careers. At the time of the survey, 131 of 216 women adopted out at least one child; and many respondents may not yet have completed their reproductive career (i.e., 120 participants in the present sample are under the age of 40 and may still have and adopt out children if they have not done so already).

Appendix B presents results from analysis that repeats the primary analysis completed in the body of this thesis, but that considers three categories of adolescent mother status: those who were adolescent mothers (as described above), those who gave birth to a child in adolescence but adopted it out (i.e., those who are excluded from the present analysis), and those who did not give birth to a child during their adolescence.

Employment status - Participants reported whether they had received employment income in the twelve months prior to the survey administration. All participants who responded "yes" to this question were coded as employed. This measure certainly has limitations: it does not distinguish between full-time, part-time, and seasonal employment; participants who worked only one of the

previous twelve months (or less) can be considered “employed” in the current survey, which may indicate that this measure over-estimates employment in the current sample. Efforts were made by the researchers to collect self-reported information about participants’ income, but responses often lacked enough detail to estimate annual income (e.g., many participants reported an hourly wage but failed to specify the number of hours worked per unit of time; others reported receiving larger sums of money but did not acknowledge over what time frame it was earned).

Government transfer receipt - Participants were asked to report receipt of any income in addition to, or in the absence of, their employment income, and to specify the source of such income. If respondents reported receiving any one of employment insurance, income support, or funding from a similar program, then the participant was coded as receiving government transfers. The government programs excluded from the category include the Canada Child Benefit (CCB), as the eligibility requirements do not stipulate a limited income or employment. Rather, they are distributed to all parents in Canada, and including such a program would overrepresent the receipt of government support. Further, the goods and service tax (GST) credits were exempt as it was infrequently reported, though many respondents likely would have met the income threshold to receive it (Government of Canada, 2021). Old age security and government pension (such as Canada Pension Plan, CPP) were also excluded, as these are age-related benefits rather than income-related supports.

Years of education completed - the total number of years of education that each participant reported having completed at the time the survey was distributed, used here as a proxy for income.

Fertility – Participants reported the number of children to whom they had given birth. This number therefore does not include non-biological children that mothers may have adopted into the household but does include biological children that may have been adopted out.

Household size – Participants reported the number of individuals residing in their homes, including the participants themselves.

Household crowding ratio – Participants reported the number of individuals residing in their homes as well as the total number of rooms in the home (specified in the survey as the sum of all bedrooms plus the kitchen and living area). The crowding ratio is calculated as the proportion of household occupants divided by the bedrooms (assumed to be total rooms subtracted by two) in the house.

Age – The age, in years, of each respondent at the time of the interview was recorded. If she had given birth to any children, her age at her first birth was also recorded.

Data Analysis

I analyzed my data using a Bayesian framework, using the "brms" (Bürkner, 2017) package in R 3.5.2 (R Core Team, 2018). I ran four chains for 2000 iterations, and convergence of the chains ($\hat{R} = 1.0$) was confirmed in each case. I set weakly informative priors centred on zero (i.e., normal (0,1)) for the main effects and used the 'posterior predictive check' (pp_check) function to assess how well the model performed.

To examine the effect of adolescent motherhood on the receipt of government transfer, where the response is a dichotomous "yes" or "no", I ran a logistic regression, specifying the 'Bernoulli' family. Government transfer receipt was the response variable, with teenage motherhood, number of births, and years of completed education as the predictors.

To investigate the effect of adolescent motherhood on the household crowding ratio, which has a continuous response variable, I ran generalized linear model, specifying the "normal" or Gaussian family. The household crowding ratio was the response variable, with teenage motherhood, household size, and years of education completed variables set as predictor variables.

In investigating the effect of household crowding on welfare use, I ran a logistic regression, specifying the "Bernoulli" family. Government transfer receipt was the response variable, with household crowding ratio, employment status, perceived health, and household size as the predictors. For all analyses, continuous variables, including years of completed education, number of births, household size, and household crowding ratio were scaled using a mean-centred approach with a mean of 0 and a standard deviation of 1 to standardize the parameters and interpret the results meaningfully.

In addition, for all analyses, posterior density distributions and other graphical outputs were generated with the "bayesplot" package. I used the "bayestestR" package to generate 'probability of direction' (PD) estimates for the independent variables (Makowski et al., 2019). These estimates range from 0.5 to 1.0 and are generated from the posterior distributions to indicate the certainty of the direction (negative or positive) of an effect. Represented as percentages, these probability of direction estimates are interpretively helpful because they are closely correlated with commonly used frequentist p-values, where PD ~ 97.5%, PD ~ 99.5%, and PD ~ 99.95% corresponding to weak, moderate, and strong evidence for an effect, respectively. Probability of direction estimates were used along with posterior density distributions to indicate uncertainty about the estimated magnitude of an effect and the precision with which it could be estimated.

2.4 RESULTS – DESCRIPTIVE STATISTICS

2.4.1 Understanding the current sample – representativeness and correlates of adolescent motherhood

I first calculated descriptive statistics to gain further understanding of the nature of the sample population and to examine its ecological validity. Table 1 and Table 2 below offer a summary of the current sample, distinguishing between the entire sample, and those who were and were not adolescent mothers. Those who were classified as "unknown" reported giving birth to children but did not disclose information that would enable estimation of the participants' age at birth. These participants are removed from the dataset in later analyses but are included here to provide a comprehensive representation of the sample population.

Table 1

Descriptive statistics of the present sample (N_{all} = 412; $N_{adolescent\ mother}$ = 182; $N_{non\text{-}adolescent\ mother}$ = 183; $N_{unknown}$ = 47). The terms "adolescent mothers" and "not adolescent mothers" refer in this context to women who were adolescent mothers and who were not adolescent mothers, respectively, but who are past their teen years by the time of the survey.

Demographics	***All participants***	***Adolescent mothers***	***Not adolescent mothers***
Age			
Mean	38.01	38.21	38.14
SD	12.27	14.06	13.88
Median	36	36	37
Min	16	17	16
Max	86	86	77
Fertility			
Mean	3.78	3.86	3.93
SD	2.31	2.66	2.79
Median	4	3	4
Min	0	0	0
Max	14	12	14
Age at first birth			
Mean	19.91	17.62	22.70
SD	3.50	1.18	3.42
Median	19	18	22
Min	13	13	20
Max	39	19	39
Years of education			
Mean	10.99	10.58	11.27
SD	1.98	2.15	1.85
Median	11	11	12
Min	3	3	4
Max	14	14	14
Food (in)security score			
Mean	2.71	2.83	2.79
SD	2.87	2.80	2.95
Median	2	2	2
Min	0	0	0
Max	8	8	8
Household size			
Mean	5.95	6.20	5.60
SD	2.54	2.60	2.66
Median	6	6	5
Min	1	1	1
Max	15	14	15

Table 2

Additional descriptive statistics for the sample population, (N_{all} = 412; $N_{adolescent\ mother}$ = 182; $N_{non\text{-}adolescent\ mother}$ = 183; $N_{unknown}$ = 47). The terms "adolescent mothers" and "not adolescent mothers" refer in this context to women who were adolescent mothers and who were not adolescent mothers, respectively, but who may be past their teen years by the time of the survey.

	All		***Adolescent mothers***		***Non-adolescent mothers***	
	Count	***%***	***Count***	***%***	***Count***	***%***
Marital Status						
Married	173	42.0	71	39.0	80	43.7
Committed Partnership	87	21.1	47	25.8	30	16.4
Single	122	29.6	48	26.4	60	32.8
Separated	8	1.9	3	1.7	4	2.2
Widow	17	4.2	11	6.0	6	3.3
Other	5	1.2	2	1.1	3	1.6
Employment status						
Employed	238	57.8	102	56.0	111	60.7
Unemployed	173	42.0	80	44.0	71	38.8
Did not answer	1	0.2	0	0.0	1	0.5
Government transfer receipt						
Yes	157	38.1	66	36.3	73	39.9
No	169	41.0	80	44.0	74	40.4
Did not answer	86	20.9	36	19.7	36	19.7
Perceived Health						
Poor	13	3.2	7	3.8	6	3.3
Fair	61	14.8	25	13.8	29	15.8
Good	239	58.1	116	63.7	93	50.8
Very good	54	13.2	20	11.0	29	15.8
Excellent	35	8.5	12	6.6	19	10.5
Did not answer	9	2.2	2	1.1	7	3.8
Smoking Frequency						
Daily	307	74.5	140	76.9	134	73.2
Occasionally	69	16.8	14	7.7	10	5.5
Never	26	6.3	27	14.9	38	20.8
Did not answer	10	2.4	1	0.5	1	0.5

2.4.2 Fertility

Respondents, on average, have very high fertility of 3.78 children per woman, which is over twice the 2016 Canadian national total fertility rate of 1.54 (Table 1, Provencher et al., 2018). Because women are biologically constrained in their fertility – that is, the window in which a

woman is fertile begins in her early teens with the onset of puberty and drops precipitously around the age of 35 years – it is often necessary to start early in order to have many children. This seems to be the case in the present population. Figure 1 depicts the distribution of participants' age at first birth (AFB). The mean AFB for the current sample is 19.91 years, represented by the solid vertical line. In contrast, the average age at first birth in Canada, which in 2016 was 29.2 years, is represented by the dotted vertical line (Provencher et al., 2018).

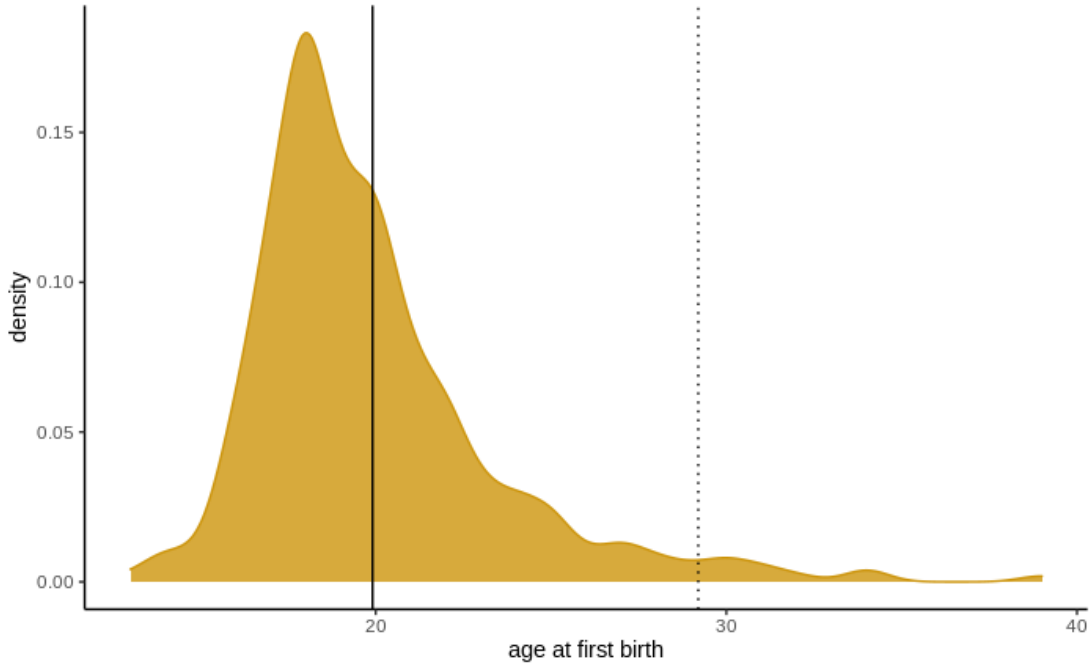

Figure 1: Density plot of the age at first birth (AFB) for the sample population (N=365). Mean AFB for the sample, as represented by the vertical line, is 19.91 years. This is much lower than the 2016 Canadian average AFB of 29.2 years, represented by the dotted vertical line.

Among the sample, 44.2% of respondents would be categorized as adolescent mothers, based on their reported reproductive history (see Figure 2 below). Comparable national statistics are difficult to find, but estimates from research across Canada in 2006 indicate that approximately three percent of women would fall into the category of teenage motherhood (Tamim, Al-Sahab, & Connolly, 2014).

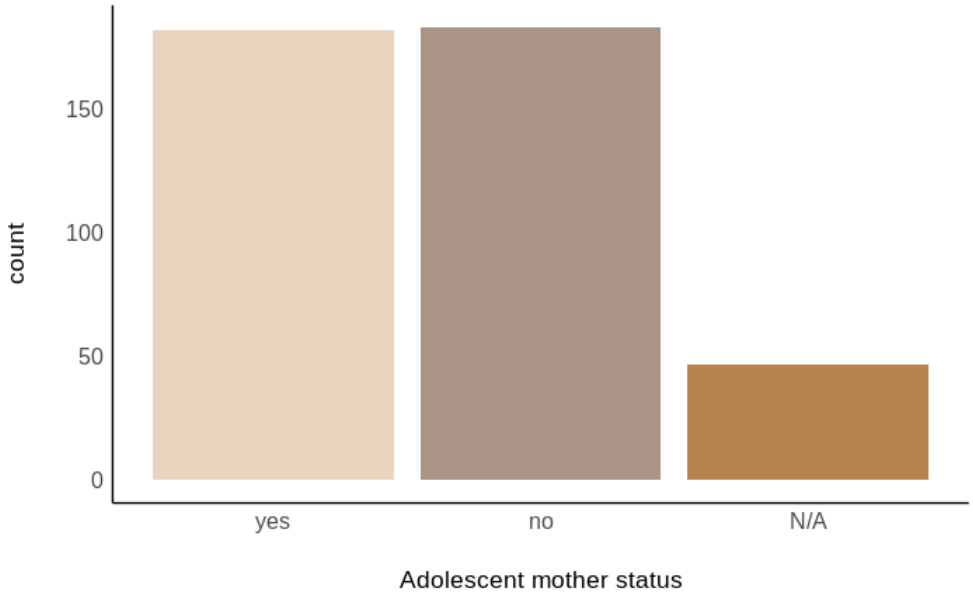

Figure 2: Bar plot representing the proportion of respondents who reported their first birth before the age of 20. There are 182 of 412 respondents (or 44.2%) who would be classified as adolescent mothers. The column "N/A" refers to participants whose status as an adolescent mother is unknown.

2.4.3 Economic indicators

Compared to Canadian women, women in the present sample demonstrate a low level of educational achievement. On average, survey participants completed eleven years of school (Table 1). As demonstrated in Figure 3, 52.4% of the present sample have not completed their high school diploma (which would require twelve years of education), compared to only 10% of Canadian women, based on data from the 2016 census (Statistics Canada, 2017). Nearly 67% of women in Canada have completed some post-secondary education; less than half of that, 30.7%, of women in the present sample have (Statistics Canada, 2017).

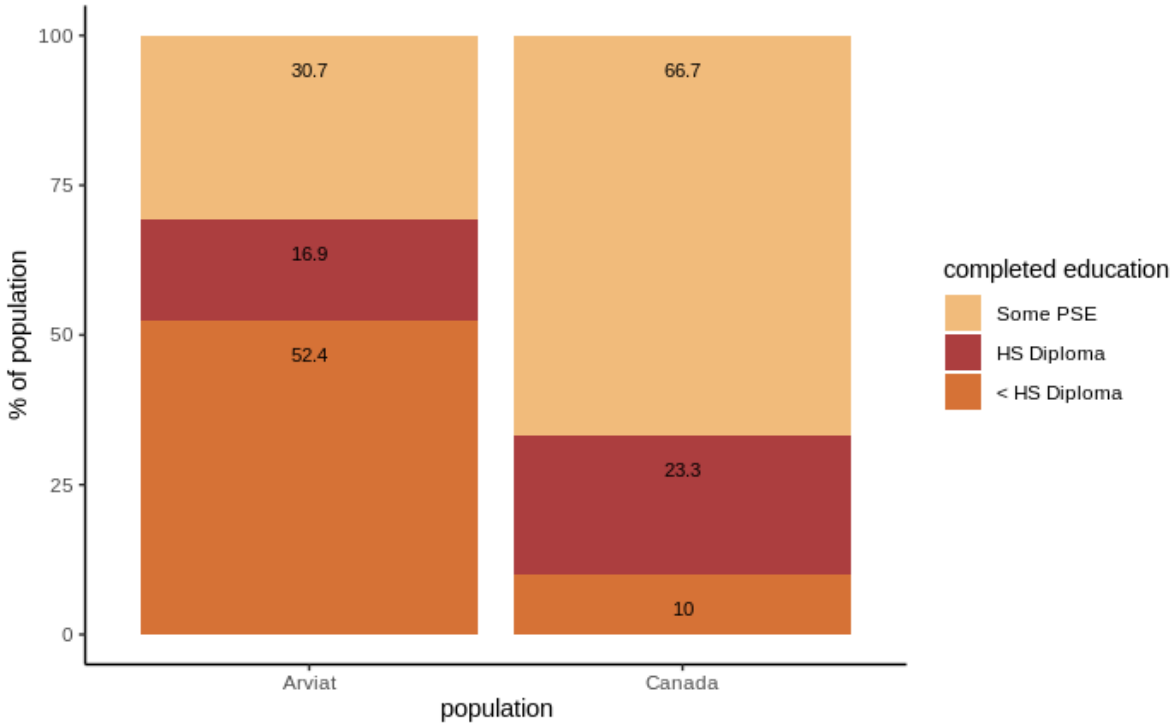

Figure 3: Stacked bar chart depicting the educational achievement of women from the current sample (N=378) and from Canadian women. 66.7% of Canadian women reported completing some post-secondary education (PSE), compared to only 30.7% of women in the present sample. Comparatively, 52.4% of women in Arviat have not achieved a high school diploma, whereas only 10% of women in Canada have not completed high school. Data for Canadian educational completion was taken from 2016 Statistics Canada census results (Statistics Canada, 2017).

Educational achievement is very low among the present population, lower even than previous data collected within Nunavut. Results from the 2016 census indicated that 41% of Nunavut's population had not completed high school (Statistics Canada, 2017), but 69.3% of the present sample has not done so (Figure 3). In many industrialized nations, education is believed to be the pathway by which individuals secure employment (Furstenberg, 1998; Fuller & Raman, 2017). In this population, however, this does not necessarily seem to be the case, as 42% of the sample reported that they were unemployed within the last twelve months at the time of the survey (Table 1), and Figure 4 demonstrates the distribution of completed education across employed and unemployed respondents. Although those who reported employment appear to have more

education, it is a small difference between groups – a difference of, on average, one additional year of schooling. These employment statistics are consistent with previous data as well – in 2016, 18% of Nunavummiut were unemployed and another 37% were not in the labor force (Government of Canada, 2018), and in 2017, 40% of Nunavummiut relied on income assistance (McKay, 2020). Similarly, 38.1% of participants in this study reported income via government transfers.

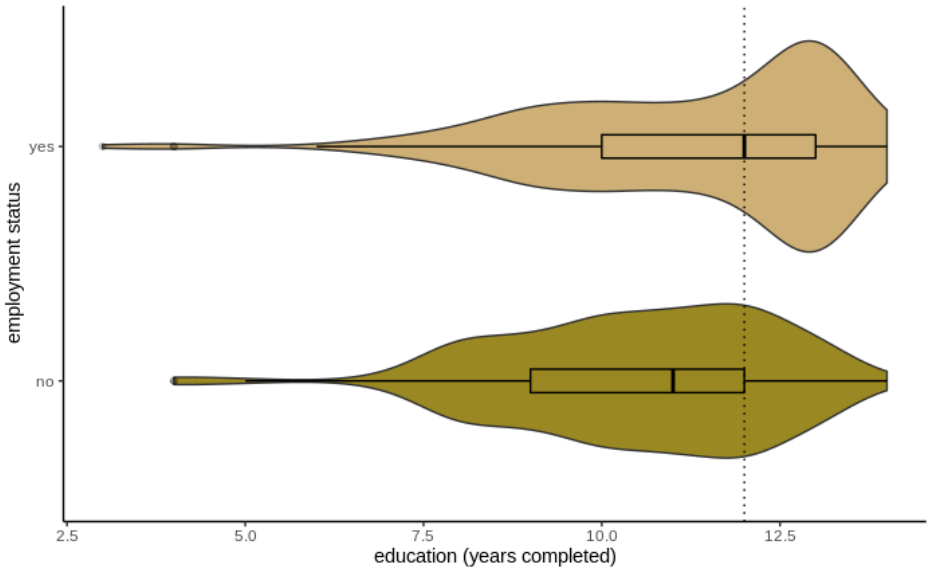

Figure 4*:* Violin plot depicting the distribution of years of completed education (x-axis) across employment groups (i.e., unemployed vs. employed in the year prior to the survey). It appears that education is slightly higher among those who are employed (*N* = 219; mean education = 11.32 years) compared to the unemployed (*N* = 156; mean education = 10.51 years).

2.4.4 Health indicators

Perceived health, a subjective rating of participant's understanding of their own health, is much lower in the present sample than rates reported for the territory. In 2014, 38.1% of Nunavut residents reported being in "very good" or "excellent" health (Wallace, 2014); only 21.7% of the present sample rated their health in these two categories (Table 2; pictured in Figure 5). Further, rates of smoking within the territory are very high, and in 2012, 73% of Nunavut residents

reported smoking at least some of the time (i.e., “daily” or “occasionally”; Statistics Canada, 2017). Indeed, 91.3% of the present sample reports smoking at least some of the time (Table 2).

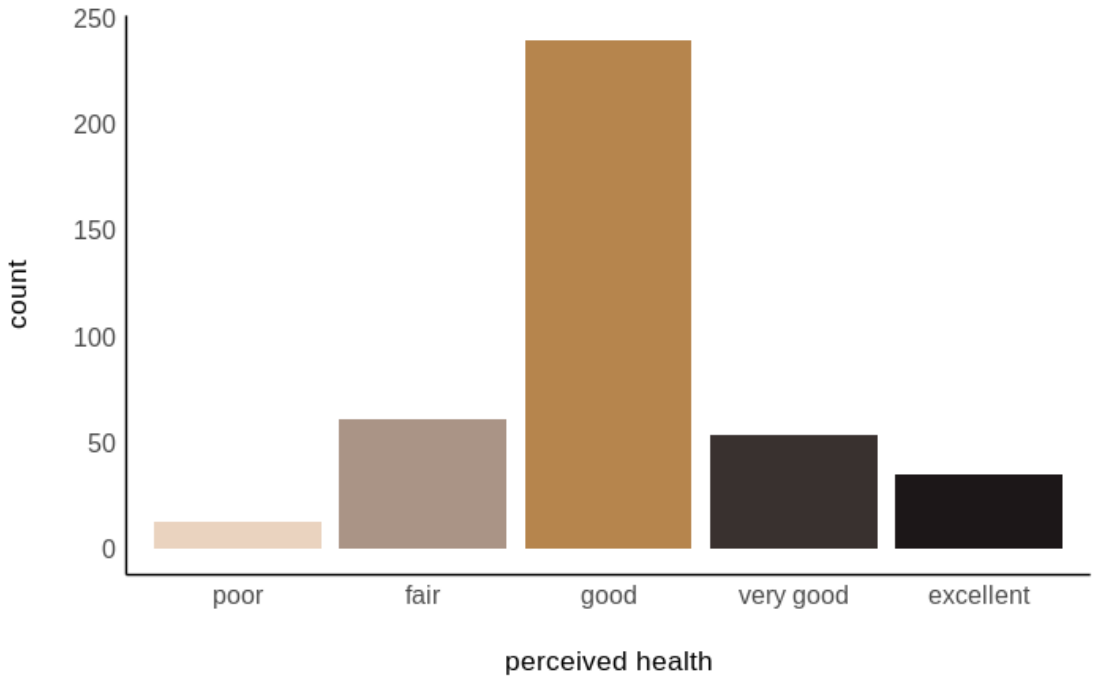

Figure 5: Bar plot representing the distribution of self-reported health. Overwhelmingly, (i.e., 58.1%) participants reported being in “good” health.

Relative to available statistics for Canada and Nunavut, the present sample of women have many children; to do so, women begin their reproductive careers early, have low levels of education – lower than national and provincial averages – and high levels of residents who are not employed. As such, many residents rely on social assistance to live. Additionally, ratings of perceived health were worse, and rates of smoking were slightly higher than existing statistics suggest. Overall, life for this population seems difficult. But do outcomes vary for women who became mothers in adolescence? And, if they do vary, are they consistent with those predicted by the anti-teen mom argument?

2.5 RESULTS – ANALYSIS

To complete the analysis, I implemented the exclusion criteria outlined in the methods above, removing participants younger than twenty years of age and older than 64 and omitting those who did not complete the questions necessary for analysis. Table 3 describes the distribution of participant age, fertility, and years of education completed; the median age of participants at the time that the survey was distributed was 38 years, the median number of children birthed by participants was 4, and women in the sample had, on average, 11 years of completed education (N = 216). Table 4 reports the proportion of respondents who were recorded as teenage mothers and those who detailed receiving government financial support. The median age at first birth for the sample was 19 years, and 32.4% of respondents had their first birth before the age of 20, consistent with the median age at first birth for the whole sample (Table 1 and Table 2, respectively). I wanted to explore whether there was overlap between these categories (i.e., that it was not the case that the 71 participants categorized as having been adolescent mothers were all receiving government transfers) and used a Sankey plot to visualize the pattern of responses (Figure 6). This confirmed crossover between the categories of teen motherhood and government transfer receipt.

Table 3

Descriptive statistics of the present sample (N = 216). Rows whose titles include an Asterix (*) indicate statistics for the full sample.

	Mean	SD	Median	Min	Max
Basic demographics					
Age*	**38.70**	**10.46**	**38**	**20**	**63**
Teenage mothers	*40.63*	*10.76*	*40*	*20*	*62*
Non-teenage mothers	*37.75*	*10.21*	*36*	*21*	*63*
Years of education*	**10.84**	**1.88**	**11**	**4**	**14**
Teenage mothers	*10.27*	*1.99*	*10*	*4*	*9*
Non-teenage mothers	*11.12*	*1.77*	*11*	*7*	*14*
Fertility*	**4.20**	**2.34**	**4**	**0**	**14**
Teenage mothers	*5.21*	*2.43*	*5*	*1*	*14*
Non-teenage mothers	*3.71*	*2.14*	*3*	*0*	*10*
Age at first birth*	**20.06**	**3.64**	**19**	**13**	**39**
Teenage mothers	17.90	1.23	18	14	19
Non-teenage mothers	21.13	3.96	20	20	39
Household composition*	**6.21**	**2.39**	**6**	**2**	**15**
Teenage mothers	*6.87*	*2.44*	*7*	*3*	*14*
Non-teenage mothers	*5.89*	*2.30*	*5*	*2*	*15*
Household crowding ratio*	**3.00**	**1.66**	**2.50**	**0.60**	**12**
Teenage mothers	*3.03*	*1.67*	*2.50*	*0.60*	*9*
Non-teenage mothers	*2.99*	*1.66*	*2.50*	*0.67*	*12*

Table 4

Distribution of adolescent motherhood and government transfer receipt among the present sample (N = 216)

	Count	%
Adolescent mothers		
Yes	71	32.9%
No	145	67.1%
Government transfer receipt		
Yes	106	49.1%
No	110	50.9%

Figure 6: Sankey plot depicting the flow from adolescent motherhood to welfare receipt across a subset of the sample population (N = 216). The plot indicates crossover between those who were teen mothers and those who were not, and those who were receiving government transfers and those who were not.

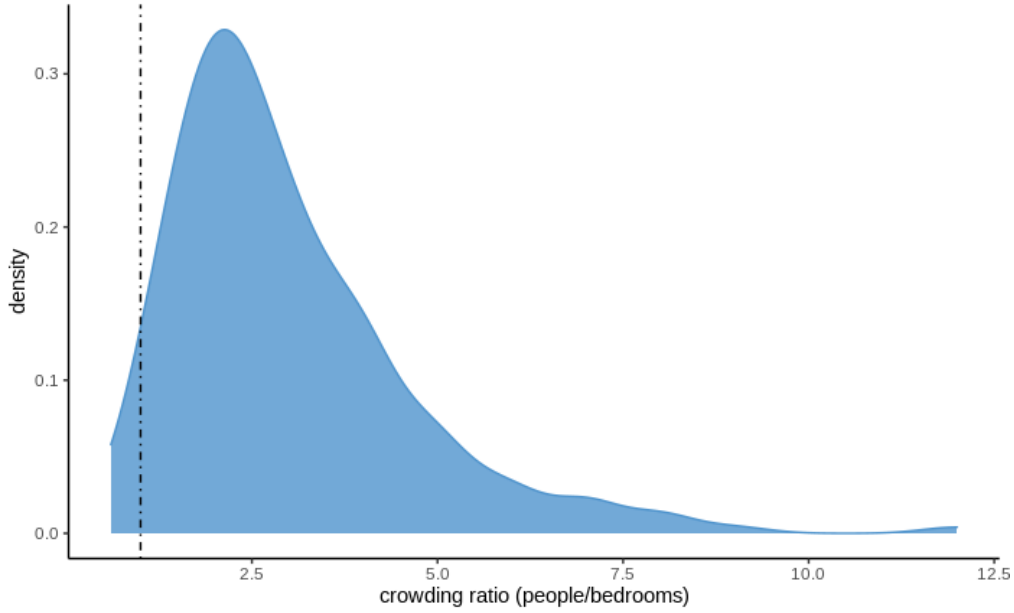

Figure 7: Density plot representing the distribution of household crowding among the subset of the sample population (N = 216). The household crowding ratio is calculated as a proportion of household occupants divided by the number of bedrooms. The vertical line represents a 1:1 occupant:bedroom ratio.

2.5.1 Model 2.1: Effect of adolescent motherhood on welfare receipt

Adolescent motherhood had no effect on whether participants received government transfers at the time of the survey, as the estimated standard error of the effect (0.98) far exceeds the estimated effect itself (-0.01). Additionally, the credible interval broadly crosses zero and the probability of direction estimate suggests no certainty in the direction of an effect (PD = 51.30%, Table 5). Similarly, I found no effect of fertility, employment, or age on government transfer receipt (PD = 50.50%, PD = 50.05%, and PD = 51.00%, respectively; Table 5). Probability of direction estimates are visualized in Figure 8 below.

Table 5
Bernoulli logistic regression examining the effect of teenage motherhood on the receipt of government transfers (N = 216). "CI" indicates the ends of the 95% credible intervals, which capture the uncertainty of the parameters.

Effect	Estimate	Std Error	Lower 95 CI	Upper 95 CI	PD
Intercept	0.00	1.24	-2.33	2.44	50.35%
Adolescent mother (yes)	-0.01	0.98	-1.85	1.94	51.30%
Fertility	0.01	1.02	-1.96	1.99	50.50%
Employment (yes)	-0.00	1.01	-1.95	1.93	50.05%
Age	-0.02	0.98	-1.93	1.90	51.00%

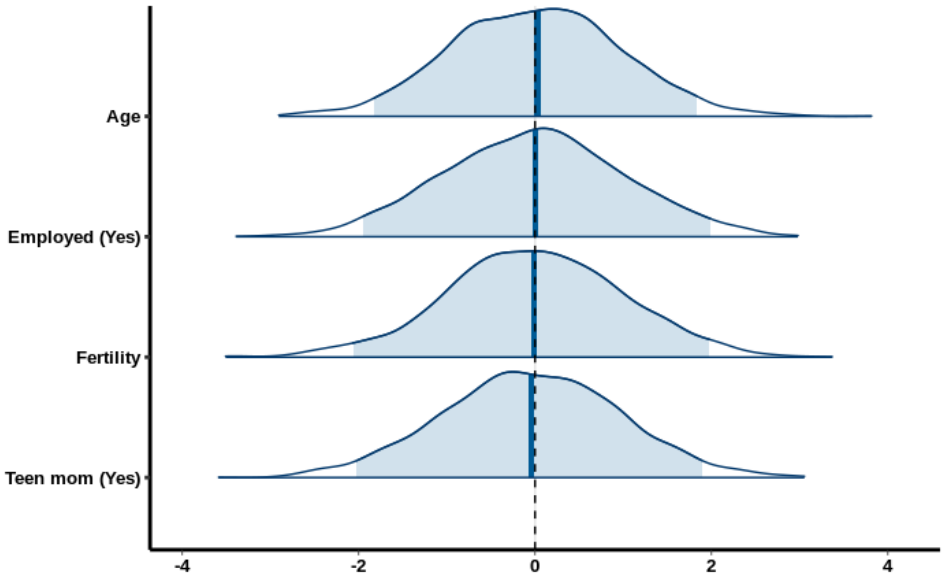

Figure 8: Posterior estimates of the effects of Age, Employment status (Ref: No), Fertility, and maternal status (Ref: No) on the receipt of government transfers.
Note: Posterior density plots present the estimated direction and certainty of the effect of predictor variables on the model outcome. Specifically, the position of the curve to the left or right of zero (represented by the vertical dashed line) indicates the direction of an effect (i.e., negative or positive, respectively) and the spread of the curve illustrates the uncertainty of an effect, where wider curves suggest greater uncertainty.

2.5.2 Model 2.2: Effect of adolescent motherhood on living in an overcrowded household

There was no effect of teenage motherhood on the household crowding ratio at the time of the survey, as the confidence interval spanned widely across zero and the probability of direction estimate was uncertain (PD = 51.30%, Table 6; visualised in Figure 9 below); nor were there any effects of household size or years of education completed on household crowding (PD = 51.25%; PD = 50.45%, Table 6).

Table 6
Gaussian generalized linear model examining the effect of teenage motherhood on household crowding (N = 216). "CI" indicates the ends of the 95% credible intervals, which capture the uncertainty of the parameters.

Effect	Estimate	Std Error	Lower 95 CI	Upper 95 CI	PD
Intercept	-0.00	1.06	-2.15	1.98	50.70%
Adolescent mother (yes)	-0.01	1.01	-2.11	1.97	51.30%
Household size	-0.02	1.01	-2.00	2.00	51.25%
Years of school completed	0.01	0.99	-1.88	1.94	50.45%

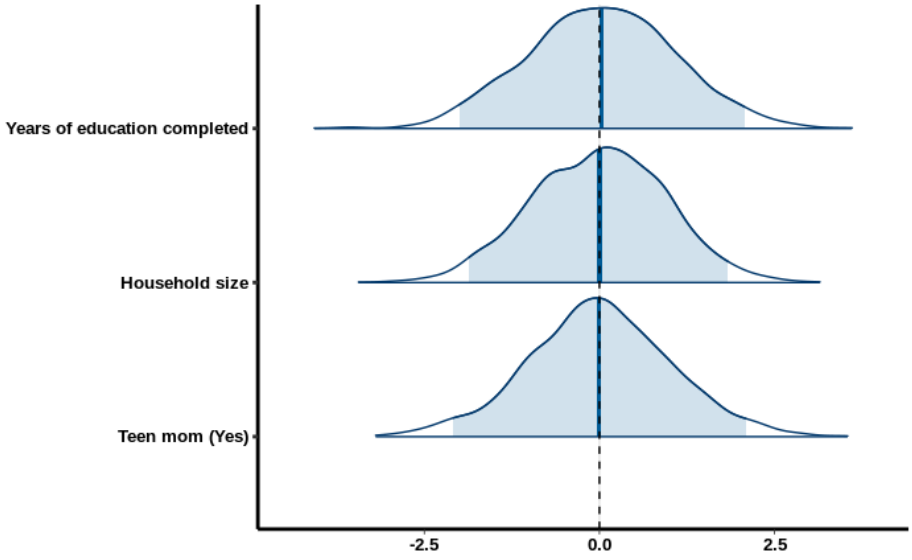

Figure 9: Posterior estimates of the effects of education, household size, and adolescent motherhood (Ref: No) on household crowding.
Note: Posterior density plots present the estimated direction and certainty of the effect of predictor variables on the model outcome. Specifically, the position of the curve to the left or right of zero (represented by the vertical dashed line) indicates the direction of an effect (i.e., negative or positive, respectively) and the spread of the curve illustrates the uncertainty of an effect, where wider curves suggest greater uncertainty.

2.5.3 Model 2.3: Effect of household crowding on welfare use

There was no effect of participants' household crowding ratio on the use of social assistance at the time of the survey, as again we see an estimated standard error value (0.96) that far exceeds the estimated effect size (0.01), with confidence intervals that span across zero in an

indeterminate direction (PD = 50.65%, Table 7). Further, there were not any effects of employment status, household size, or perceived health on welfare use (PD = 50.65%; PD = 50.35%; PD = 51.45%; PD = 50.15%; PD = 50.55%; PD = 52.70% for the break points between the categories of "Poor" and "Fair" health, "Fair" and "Good" health, "Good" and "Very good" health, and "Very good" and "Excellent" health, respectively). The probability of direction estimates are visualized in Figure 10 below.

Table 7
Bernoulli logistic regression examining the effect of household crowding on social assistance use (N = 216). "CI" indicates the ends of the 95% credible intervals, which capture the uncertainty of the parameters. Health status thresholds represent the break points – or intercepts – between two health or wealth status categories. E.g., "Poor | Fair" indicates the intercept between the "Poor" and "Fair" health status categories.

Effect	Estimate	Std Error	Lower 95 CI	Upper 95 CI	PD
Intercept	-0.01	1.19	-2.46	2.37	50.65%
Household crowding	0.01	0.96	-1.82	1.87	50.65%
Employment status (yes)	0.00	1.00	-1.95	1.92	50.65%
Household size	-0.01	1.01	-1.98	1.96	50.35%
Perceived health					
Poor | Fair	-0.02	1.02	-2.01	1.97	51.45%
Fair | Good	0.02	1.04	-1.98	2.03	50.15%
Good | Very good	-0.01	1.01	-1.91	1.96	50.55%
Very good | Excellent	0.05	0.99	-1.92	2.03	52.70%

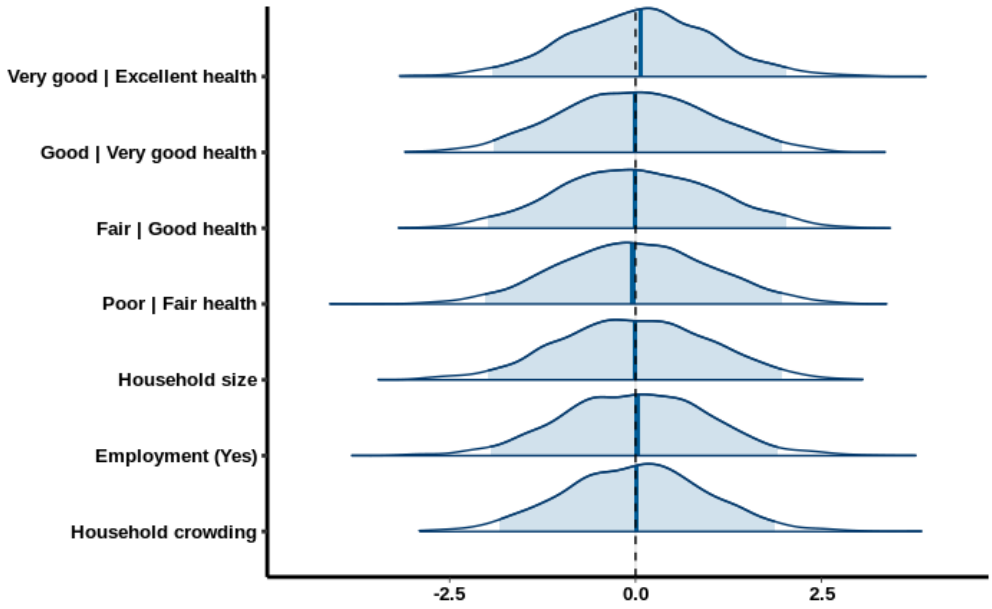

Figure 10: Posterior estimates of the effects of perceived health, household size, employment status (Ref: No), and household crowding ratio on the receipt of government transfers. *Note:* Posterior density plots present the estimated direction and certainty of the effect of predictor variables on the model outcome. Specifically, the position of the curve to the left or right of zero (represented by the vertical dashed line) indicates the direction of an effect (i.e., negative or positive, respectively) and the spread of the curve illustrates the uncertainty of an effect, where wider curves suggest greater uncertainty.

2.6 DISCUSSION

Of the sample population, 49.1% reported receiving government transfers at the time of the survey, and nearly one third were teen mothers. There is, however, no effect of being a teenage mother on the likelihood of utilizing social assistance, and adolescent motherhood has no predictive effect on household crowding. Put differently, women who postponed childbearing to the age of 20 or later were no less likely to access welfare payments or inhabit overcrowded households than were participants who were teen mothers. However, the average age at first birth for the sample population overall is very young compared to Canadian national statistics: three quarters of the present sample reporting having their first birth before the age of 21 years. The average age at first birth for Canadian women is 29.2 years (Provencher et al., 2018). The timing

of participants' first births is so concentrated around the late teens and early twenties among the present population, the classification of "teen mother" may not really be a distinctive category.

Experiences of poverty—and thus the need to rely on social assistance—within industrialized nations are thought to be the result of one or more intersecting factors including, but not limited to, a lack of education, precarious or limited employment, illness, or disability (Brady, 2019). The present sample of women face many of these factors. Previous research also suggests that many Indigenous people face barriers to achieving financial literacy and stability (Prosper Canada, 2015; Collin, 2011). Historically, Inuit populations utilized trading, bartering, and other communal distributions of wealth in the allocation of food and other resources (Harder & Wenzel, 2012). These customs were disrupted by colonization and assimilation policies and practices that forced a monetary economic model on northern communities. Today, money is often treated in the same way that Inuit people used their unpredictable resource supplies in the past: it tends to be spent to address immediate needs and is less often used as a means of storing value against future needs, as is in the Western economic model (Harder & Wenzel, 2012). It is not surprising, therefore, that Inuit communities such as Arviat experience higher rates of poverty and tend to utilize government transfers more often than the rest of Canada. The circumstances that result in a need for social assistance are not caused by—nor are they exclusive to—teen motherhood. Rather, the difficult financial circumstances of Nunavut residents are widespread.

Generally, early childbearing is accepted and celebrated among Inuit communities, and it is more common and less of a stigma for young Inuit women to withdraw from school to care for their children than it is for non-Inuit women (Archibald, 2004; Moisan et al., 2017). During fieldwork, the researchers of the present study noted that a common expression from participants

was that “children are a blessing”, even when they are born to young mothers. Despite this, previous research has also found that members of some Indigenous communities, including those living in Nunavut, uphold some of the same stigma surrounding teenage mothers that persist throughout industrialized nations. Specifically, there is a belief among some individuals that a portion of teenage girls become pregnant with the specific intent to receive government benefits (Furstenberg, 2007). For example, a study by the Ontario Federation of Indian Friendship Centres (OFIFC, 2002) asked urban Indigenous women why they thought that rates of teenage childbearing were so high in their communities. About 15% of participants attributed high rates of adolescent pregnancy to a desire to seek money.

Welfare, CCB, and housing subsidies were surely established with the best intentions for its recipients and have had demonstrably beneficial impacts on the quality of life for Nunavut communities. For example, the introduction of the CCB reduced child poverty by over 14% within the first few years of its establishment (C2000, 2018). And yet, in the absence of other options – i.e., employment or higher education – these supports might have simultaneously created an unintended consequence which rewards pregnancy, regardless of when one’s first birth occurs. What is not known, however, is if social supports issued to poor individuals and families were removed, whether rates of teenage childbearing would decrease. The outcomes of welfare reforms that occurred throughout industrialized nations in the 1990s indicate cutting funding to poor people and families does little to affect patterns of childbearing, and instead can sometimes further their financial precarity (Hao & Cherlin, 2004; Acs & Koball, 2003). Thus, if the supports that low-income Nunavut individuals and parents receive were to be removed, it is unlikely that teenage mothers would fare as well as they currently do, simply because they have limited opportunities or further safety nets to fall back on.

Not only has adolescent motherhood been linked to reduced economic wellbeing, but there also exists a line of discourse that is concerned about the health risks of teenage motherhood. As such, the consequences of adolescent motherhood on women's health will be the focus of the next chapter.

CHAPTER 3: THE LONG-TERM EFFECTS OF TEENAGE MOTHERHOOD - EXAMINING MATERNAL HEALTH AT MIDLIFE

3.1 INTRODUCTION

The concerns expressed about teenage pregnancy by media and policy makers often focus on the reduced economic potential of teen mothers. There is also a line of argument that stresses the health risks and consequences associated with adolescent childbearing. This includes work by Cavazos-Rehg et al. (2015) who found that pregnant women aged 15-19, in the United States, had increased odds ratios for preterm delivery, chorioamnionitis (a bacterial infection of the membranes and amniotic fluid which surround the fetus, often requiring premature delivery), endometritis (inflammation of the inner lining of the uterus), and mild preeclampsia (characterised by high blood pressure and signs of damage within other organ systems – most often the liver and kidneys – which can lead to serious or fatal complications) compared to pregnant women aged 25-29. The authors concluded that there is a need for women to be aware of the risks associated with bearing children at "extreme" ages (Cavazos-Rehg, et al., 2015). Similarly, Wong et al. (2020) determined that infants born to teenage mothers were more likely to have lower Apgar scores, an indicator of infant health. However, earlier work by Makinson (1985) noted that, although teenage mothers were more likely to endure pregnancy and childbirth complications and suffer from higher maternal mortality, many of these differences could be explained by socioeconomic differences and the inadequate prenatal care received by teenage mothers, rather than maternal age per se.

Other researchers disagree that early childbearing inherently carries significant health risks. A cross-cultural review of teenage pregnancy outcomes by Kramer and Lancaster (2010)

described vast inconsistencies across studies. The only persistent trend they noted was that Caesarean sections and other delivery complications were less common among teen mothers (i.e., age 15-19) than older mothers (Kramer & Lancaster, 2010). Lawlor and Shaw (2002) note that many teenage pregnancies are low risk, but that this fact tends to be omitted from research and policy documents and statements. They suggest instead that the negative health outcomes experienced by teen mothers are, to an extent, a reflection of the prevailing values of health care professionals and society in general (Lawlor & Shaw, 2002). In other words, if harmful health outcomes are experienced by adolescent mothers, these are likely due to living in a society that does not believe in or support the types of women who are more likely to become teen mothers, regardless of whether or not such women have children during their teenage years.

In 1992, Arlene Geronimus observed that differences in infant birthweight—an indicator of both maternal and infant health (Wilcox & Russell, 1983)—between white and Black mothers in the United States widened with increasing maternal age. She found that Black infants were increasingly likely to be of low birthweight as maternal age rose, whereas white infants tended to be of higher birthweight across the same maternal age trajectory. Geronimus (1996) later determined that rates of neonatal mortality increased between the late teens and early twenties among Black infants but decreased for white infants. These findings contradicted the general belief that teen mothers and their children would be better off if mothers postponed their first births. As such, Geronimus (1996) proposed that the deteriorating outcomes for Black mothers were effects of social inequalities on health, which tend to compound with age. Due to prolonged exposure to social and environmental stressors, the health status of Black (and other marginalized) women begins to decline in detectable ways not experienced by their white counterparts (Geronimus et al., 2007; Geronimus, 1997; Buescher & Mittal, 2006; Fishman,

2020; Warren-Findlow, 2006; Forde et al., 2019).

Further research has suggested that, although race is an intersecting contributor to accelerated aging, these effects are largely reflective of low socioeconomic status (Simons et al., 2016; Rich-Edwards et al., 2003). A study of women living in Chicago found that, when socioeconomic status and other risk factors were adjusted for, the incidence of LBW increases with maternal age more rapidly among disadvantaged mothers, regardless of their racial affiliation (Rich-Edwards et al., 2003). This early health deterioration—termed "the weathering hypothesis"—was used by Geronimus and others to resist narratives, within the United States and other industrialized nations, that insisted teenage mothers would find themselves in worse economic, social, and physical health than if they had postponed their pregnancies (Geronimus, 1996; Vinovskis, 2003). Rather, the weathering hypothesis indicated that some women, particularly disadvantaged women, might fare better by having children relatively early, possibly even during their teenage years.

Such findings raise the obvious question of why the health of low-income individuals tends to decline faster. First, people from disadvantaged populations are more likely to be subjected to environmental factors that can have a negative impact on people's health (Pepper & Nettle, 2014). For example, being poor increases the chance of exposure to neighbourhoods with high levels of air pollution or crime, or apartments with lead paint. A lack of financial resources also prevents individuals from being able to move elsewhere and encountering more favourable living conditions (Pepper & Nettle, 2017). Over time, these environmental hazards increase the likelihood of experiencing illness, injury, and death (Khullar & Chokshi, 2018). Additionally, poor people face systemic barriers that can have negative effects on their health. For example, low-income people tend to have a harder time accessing medical care, whether through a lack of

health care coverage or an inability to take time off work to see a medical professional (Khullar & Chokshi, 2018).

Second, low-income individuals tend to exhibit a cluster of behaviours that increase an individual's chances of disease and disability—behaviours that are less frequently observed among wealthier and better-educated cohorts (Pepper & Nettle, 2017; Buck & Frosini, 2012). Poor people are more likely to smoke, drink, use and abuse substances, maintain unhealthy diets, and have sedentary lifestyles (Khullar & Chokshi, 2018; Buck & Frosini, 2012). Some of these behaviors, such as consuming unhealthy food, make sense: across many industrialized nations, it costs more to purchase high quality, nutrient-rich food (e.g., fruits and vegetables, whole grains), so people with limited incomes tend to favor food options that provide more calories per dollar (Drewnowski, 2009; Darmon & Drewnowski, 2015). This means that many low-income individuals end up consuming foods high in fat and sugar, and, over the long term, are more likely to experience adverse health effects such as hypertension or diabetes (Di Cesare et al., 2016; Drewnowski, 2009). Other behaviours, like smoking and drinking, might seem counterintuitive to poor people's circumstances, as taking part in these behaviours is also associated with monetary expense (Pepper & Nettle, 2017; Barlow et al., 2016). For example, it costs more to smoke and consume alcohol than it does to abstain, and prolonged or excessive use can harm an individual's health in the long term (Di Cesare et al., 2016; Bickel et al., 2014). Scholars such as Pepper and Nettle (2017) posit that people who experience high rates of extrinsic mortality, like many poor people, are less averse to behavior that may negatively impact health, and instead tend to discount the damaging effects their behavior may have. Indeed, they may exhibit negative health behaviors, such as smoking, as an immediate source of stress relief from the many adversities associated with being poor (Bickel et al., 2014).

Finally, there is a negative feedback loop at play: those who are low income are more likely have poor health, whether as a result of being subject to environmental risks and barriers or by partaking in behaviors that diminish their health. Further, those in poor health are also more likely to experience low or reduced income; as their ability to work declines, they may see reduced economic opportunities and find completing education to be more difficult (Khullar & Chokshi, 2018). As a result, low-income people may be more likely to find themselves in a poverty trap, especially upon the loss of their health.

Although the weathering hypothesis posits that socially disadvantaged women may experience better outcomes by beginning their reproductive careers early, there is little empirical support to suggest that such advantages persist into a woman's later years. Among the limited body of work that has examined this, methods and results vary. Patel and Sen (2012) found that teenage mothers in the United States scored lower on measures of self-reported physical and mental health compared to women who either became pregnant as a teen but whose pregnancy did not result in a live birth or who had engaged in unprotected sex in adolescence. Spence (2008) concluded that early childbearing increased the likelihood that women experienced physical disabilities, which then limited their activities of daily living later in life, but that this effect was weaker for Black women than white women. Additionally, Fletcher (2012) found that teenage motherhood may have protective effects on health behaviours including rates of drug use and binge drinking; the authors speculate that teenage motherhood reorients young women's priorities and results in the pursuit of fewer unhealthy activities.

Not only is there a lack of consensus on the long-term outcomes of adolescent motherhood, but little research has tested the weathering hypothesis among Indigenous populations (Heck et al., 2021). Peterson et al. (2019) described disparities of pregnancy-related

maternal mortality among American Indian and Alaskan Native women compared to white women, where such disparities increased with age. Additionally, evidence from nationally representative Canadian survey data indicates that Indigenous people are more likely to experience pain and functional limitations in midlife and beyond compard to their white counterparts, even after considering sociodemographic and SES controls that might otherwise account for racial group differences in health aging (Vang et al., 2021). To contribute to the limited work in this area, in this chapter I present an exploratory analysis on the effects of adolescent motherhood on perceived health at midlife. Using reports of perceived health and self-reported smoking behavior as an indicator of health behavior, I investigate whether negative outcomes thought to be associated with teenage motherhood persist into midlife for women in Arviat, Nunavut.

3.2 WHAT'S THE WEATHER(ING) LIKE UP NORTH?

The experiences of social inequality and fertility patterns among the present population are not unlike the African-American populations studied by Geronimus: Inuit people are a racial minority within Canada who are over-represented in lower socioeconomic classes, experience inequalities in health which dramatically shorten their expected lifespans, and also exhibit fertility rates that are higher than the white racial majority (Williams, 2012; Hokayem & Heggeness, 2014; Mathews & Hamilton, 2019). As such, we may also expect to see indicators of weathering among the Arviat sample population. If it holds true that maternal health is declining at an accelerated pace among groups in society who are marginalized and disadvantaged—such as the Canadian Inuit—and that this accelerated decline in health leads to complications when childbearing is postponed even by a few years, then I predict that women who began their

reproductive careers later will perceive themselves to be in relatively worse health at midlife compared to women who began childbearing earlier whereas women who began their reproductive careers in their teens should report better health at midlife.

Additionally, I hypothesize that teenage motherhood is a very stressful undertaking, and particularly so in the relative deprivation of Arviat. As such, I predict that women who became mothers early will exhibit higher rates of smoking at the time of the interview compared to those with a later age at first birth. This would be consistent with work by Webbink, Martin, and Visscher (2008), who found that young women who became mothers in their teens were more likely to smoke and to have smoked for longer throughout the course of their lives compared to twin sister controls who did not become mothers in adolescence.

3.3 METHODS

I analysed survey data collected from women living in Arviat, Nunavut between January and April 2017. The survey was administered to 413 women in Arviat by three researchers (one English-speaking researcher from the University of Lethbridge, and two local Inuktituk and English-speaking research assistants). Survey questions included basic background information on the participant's age, marital status, child-bearing history, and perceived health (for the full survey, see Appendix A). For the present analysis, 40 years was selected as the threshold for midlife, since most childbearing is complete by this age, and it lies beyond the midpoint of Nunavut's average life expectancy (approximately 71 years: Conference Board of Canada, 2015). All participants under the age of forty years at the time of interview were removed from the sample (N = 241). Additionally, any participant who did not complete all necessary questions were excluded from the final analysis (N = 64), resulting in a sample size of 108.

Ethical clearance for the project and informed consent

Permission to enter and analyse data has been approved by the University of Lethbridge's Office of Research Ethics via protocol number 2015-054. Written informed consent was obtained by all participants included in the study.

Statistical Analysis: Model Variables

Adolescent mother status - Participants reported their age at first birth (AFB). All participants whose pregnancy resulted in a live birth before the age of 20 years were coded as teenage mothers. Additionally, Arviat, like many Inuit communities, participates in the adoption of children within and between families in the community. If a participant gave birth to a child before the age of 20 but the child was adopted out of her care, she was excluded from the category of teenage mother. This allows the study to capture the effects of teenage pregnancy and birth, as well as the participant's commitment to raising a child during adolescence. Among the present sample, 12 participants reported adolescent pregnancies but adopted out their child. Appendix B presents results from analysis that repeats the primary analysis completed in the body of this thesis, but that considers three categories of adolescent mother status: those who were adolescent mothers (as described above), those who gave birth to a child in adolescence but adopted it out (i.e., those who are excluded from the present analysis), and those who did not give birth to a child during their adolescence.

Fertility – Participants reported the number of children to which they had given birth. This number therefore does not include non-biological children that mothers may have adopted into the household but does include biological children that may have been adopted out.

Perceived health – Participants indicated their perceived health on a Likert scale from poor to

excellent. A meta-analysis by DeSalvo et al. (2006) on the relationship between the response to a single-question survey on perceived health and mortality found a statistically significant relationship between lower reported health and increased risk of death. Thus, it appears that a single-question measure of health may provide some summative information about the various domains of health, as viewed by the individual. However, self-reported measures are known to exhibit response biases, which is a potential limitation of this measurement (Rosenman, Tennekoon, & Hill, 2011).

Smoking frequency – Participants were asked the frequency that they smoked cigarettes, categorizing the frequency of this behavior as one of "never", "occasionally", or "daily".

Smoking quantity – A follow up to the smoking frequency question requested participants describe the quantity of cigarettes that they smoked per month, in number of packs (where a pack contains, on average, twenty cigarettes). However, the response rate to this question was lower than the frequency question. As such, the model that included this measure (Model 5) had a reduced participant size (N = 64).

Years of education completed - the total number of years of education that each participant reported having completed at the time the survey was distributed, used here as a proxy for income. Since income is linked to health (Drewnowski, 2009), this will be employed as a control in analysis.

Food insecurity – For this analysis, an eight-item Household Food Security scale, similar to the survey developed by the National Center for Health and Statistics (NCHS) in the United States (Denney, Kimbro, Heck, & Cubbin, 2017), was administered to participants. All questions referenced the extent of the participant's food supplies and eating behavior over the last 12 months and included queries such as "the food I bought just didn't last," or "I couldn't afford to

eat healthy meals" (See Appendix A). Participants scored the frequency of such events occurring as "sometimes", "often", or "never". Our survey differed from the NCHS survey because it included items that assessed the availability of both country and store food, questions that are irrelevant to populations outside of the Inuit Nunangat, or Inuit territory. If participants answered "sometimes" or "often" to the survey questions, this was coded as "yes", indicating that the household had experienced food insecurity. Households who reported "yes" to any of the food security questions were given a numerical score of one, where "no" responses were coded as zero. The numerical responses from all the food insecurity questions were summed to provide a score ranging from 0 to 8, where higher scores indicate more severe food insecurity (Denney, Kimbro, Heck, & Cubbin, 2017; Proof, 2014).

In this context, food insecurity serves as an indicator of nutritional status at the time of the interview. That is, it is a measure of whether participants have access to sufficient quantities of food, as an assessment of the quality or the "healthfulness" per se of participants' diets was beyond the scope of the present survey. Since people with higher incomes are more likely to be able to afford sufficient nutrition, food insecurity scores may also capture socioeconomic status. However, the utility of food insecurity as a measure of SES is not ideal here, because within northern communities it is common for community and family members to share food within social networks as it is needed, and patterns of food sharing were not accounted for in the present survey. Thus, to reiterate, the measure of food insecurity is intended to capture nutritional status, and years of education is employed as a proxy for income in the present analysis.

Data Analysis

I analyzed my data using a Bayesian framework, using the "brms" (Burkner, 2017) package in R 3.5.2 (R Core Team, 2018). I ran four chains for 2000 iterations, and convergence

of the chains ($\hat{R}$ = 1.0) was confirmed in each case. I set weakly informative priors centred on zero (i.e., normal (0,1)) for the main effects and used the 'posterior predictive check' (pp_check) function to assess how well the model performed. For all analyses, fixed, continuous variables, including years of completed education and number of births were scaled using a mean-centred approach with a mean of 0 and a standard deviation of 1 to standardize parameters and assist in meaningful interpretation of results.

To examine the effect of teenage motherhood on perceived health at midlife (Model 1), where responses are rated across five categories from "poor" to "excellent", I ran an ordered logit regression. Perceived health was the response variable, teenage motherhood, food insecurity score (representing nutritional status), number of births, years of education completed (proxy for income), and smoking frequency were used as the predictors, specifying the 'logit' family. Upon examination of my results, however, I noticed that fifty percent of the present sample had their first birth between the ages of 18 and 22 years. Because so many participants had their first child within a two-year interval of the cut-off age to be considered an adolescent mother, I wondered if the classification of adolescent motherhood might be particularly meaningful within the present population. I wondered instead if more variation would be observed if I reran the analysis in Model 1 using the same variables, but if I assessed only the participants in the outer two quartiles of AFB (i.e., those whose first births were before 18 years and after 22 years). The results are shown in Model 2. I then followed with a model to assess the effect of fertility (i.e., number of live offspring produced) – rather than adolescent motherhood – on perceived health (Model 3), as high fertility often requires an early start to reproduction. That is, it may be overall levels of fertility affect perceived health rather than birth timing per se. In Model 3, I ran an ordered logit regression with the same response variable as above (perceived health), including fertility, years

of education completed, and smoking frequency as predictors.

For the analysis assessing the effect of adolescent motherhood on smoking at midlife, I ran two ordered logit regressions. First, smoking frequency was the response variable, and teenage motherhood, fertility, and years of education completed were used as predictors, specifying the 'logit' family (Model 4). Frequency captures how often participants smoke, but it does not provide information regarding the quantity they consume. Data was available regarding participants' smoking quantity, but it dramatically reduced the sample size from, 108 respondents to 64. As such, I subsequently reran Model 4 but substituted smoking quantity as the response variable (Model 5) to see if there was a difference across the metrics.

In all analyses, posterior density distributions and other graphical outputs were generated with the "bayesplot" package. Further, I used the "bayestestR" package to generate 'probability of direction' (PD) estimates for the independent variables (Makowski et al., 2019). These estimates range from 0.5 to 1.0 and are generated from the posterior distributions to indicate the certainty of the direction (negative or positive) of an effect. Represented as percentages, these probability of direction estimates are interpretively helpful because they are closely correlated with commonly used frequentist p-values, where PD ~ 97.5%, PD ~ 99.5%, and PD ~ 99.95% corresponding to weak, moderate, and strong evidence for an effect, respectively. Probability of direction estimates were used along with posterior density distributions to indicate uncertainty about the estimated magnitude of an effect and the precision with which it could be estimated.

3.4 RESULTS

In the present sample (N = 108), 40.7% of respondents had their first birth before the age of 20 and the median age at first birth was 19, which is consistent with the median age at first

birth for the whole sample (visualised in Figure 1, Table 1). The mean age of participants at the time of interview was 51.29 years (SD = 9.10, Table 1). Table 1 also describes the distribution of food insecurity—the proxy used to measure nutritional status—as well as years of completed education and number of children. Compared to the entire sample of respondents, the subset of those aged 40 and older appear to be slightly more food insecure: the whole sample reported a mean food insecurity score of 2.71 compared to a mean score of 3.14 for the present subsample (Table 1). Presented in Table 2 are rates of smoking and perceived health. A greater percentage of the subsample report "Never" smoking (14.82%, compared to only 6.4% of the entire sample population), and fewer participants reported themselves as being in "Excellent" health (1.85% compared to 8.7% of the whole sample) (Table 2).

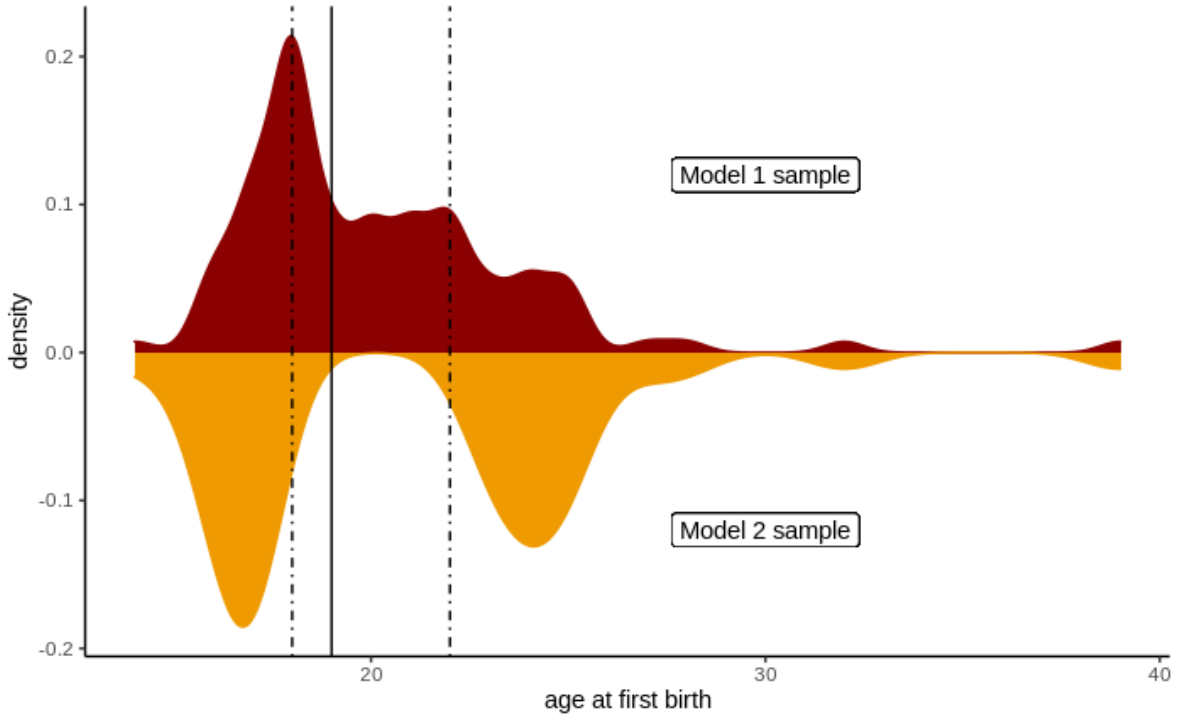

Figure 11: Density plot comparing the distribution of age at first birth (AFB) for the sample population used in Model 1 (red, top panel, N=108). The median age at first birth for Model 1 subset was 19 years (indicated by the solid vertical line). The outer quartiles of the Model 1 sample are indicated by the vertical dotted lines and lie at ages 18 and 22 years. The respondents whose AFB fell into the outer quartiles were used in analysis in Model 2 (yellow, bottom panel, N = 64).

Table 8

Descriptive statistics of the present subsample, with differentiation for adolescent and non-adolescent mothers (N_{all} = 108; $N_{adolescent\ mothers}$ =44; $N_{non\ adolescent\ mother}$ =64).

	Mean	**SD**	**Median**	**Min**	**Max**
Basic demographics					
Age	**51.29**	**9.10**	**49**	**40**	**77**
Adolescent mothers	*51.20*	*8.70*	*48*	*41*	*75*
Non-adolescent mothers	*51.34*	*9.43*	*50*	*40*	*77*
Years of education	**10.69**	**2.26**	**11**	**3**	**14**
Adolescent mothers	*10.52*	*2.09*	*11*	*4*	*14*
Non-adolescent mothers	*10.80*	*2.39*	*11*	*3*	*14*
Food (in)security	**3.14**	**2.97**	**2**	**0**	**8**
Adolescent mothers	2.86	2.92	2	0	8
Non-adolescent mothers	3.33	3.00	3	0	8
Fertility	**5.16**	**2.61**	**5**	**0**	**14**
Adolescent mothers	*5.14*	*2.74*	*5*	*0*	*12*
Non-adolescent mothers	*5.17*	*2.53*	*5*	*0*	*14*
Age at first birth	**20.06**	**3.54**	**19**	**13**	**39**
Adolescent mothers	17.73	1.04	18	14	19
Non-adolescent mothers	21.77	3.71	22	20	39

Table 9

Descriptive statistics for the subset of the sample population, including only those aged 40 years and above, with differentiation for adolescent and non-adolescent mothers (N_{all} = 108; $N_{adolescent\ mothers}$ =44; $N_{non\ adolescent\ mother}$ =64).

	All		***Adolescent mothers***		***Non-adolescent mother***	
	Count	***%***	***Count***	***%***	***Count***	***%***
Perceived Health						
Poor	4	3.70	1	2.27	3	4.69
Fair	22	20.38	7	15.91	15	23.44
Good	63	58.33	27	61.36	36	56.24
Very good	17	15.74	7	15.91	10	15.63
Excellent	2	1.85	2	4.55	0	0
Smoking frequency						
Daily	88	81.48	37	84.09	51	79.69
Occasionally	4	3.70	2	4.55	2	3.12
Never	16	14.82	5	11.36	11	17.19

3.4.1 Model 3.1: Effect of adolescent motherhood on perceived health at midlife

The effect of adolescent motherhood on perceived health at midlife is uncertain: the estimate suggests a positive effect, but the credible interval crosses zero, and the probability of direction for this finding is too low to confirm the existence of an effect (PD = 85.50%, Table 10).

The effect of education, food insecurity scores, and fertility on perceived health were very similar to each other. For each of these variables, the confidence intervals were similarly narrow, although they still crossed zero. There appears to be a small negative effect of each education, food insecurity, and fertility (Figure 12), but the probability of direction lies below the threshold which would indicate a weak effect (PD = 86.75%, PD = 89.42%, and PD = 84.12% for education, food insecurity, and fertility, respectively, Table 10). Thus, the effects of these three variables are uncertain, but not non-existent.

Finally, the effect of smoking on perceived health at midlife is also uncertain. The confidence intervals for the "Never | Occasionally" and "Occasionally | Daily" categories both cross zero, indicating little certainty in the direction of the effect. However, the PD values are higher relative to the other variables included in the model (PD = 94.10% for the break point between the categories of "Never" and "Occasionally"; and PD = 92.83% for the break point between "Occasionally" and "Daily", Table 10), suggesting that the effect of smoking on health, too, is not non-existent but remains largely uncertain.

Table 10

Ordered logit regression for Model 3.1 (n = 108). Values refer to the average probability on the logit scale. Perceived health thresholds and smoking frequency categories represent the break points - or intercepts - between categories. E.g., "Poor | Fair" indicates the intercept between the "Poor" and "Fair" health status categories. "CI" indicates the ends of the 95% credible intervals, which capture the uncertainty of the parameters.

Effect	Estimate	Std Error	Lower 95 CI	Upper 95 CI	PD
Perceived health thresholds:					
Poor | Fair	-3.34	0.47	-4.32	-2.45	100%
Fair | Good	-1.57	0.36	-2.31	-0.87	100%
Good | Very good	1.09	0.35	0.42	1.79	99.92%
Very good | Excellent	2.89	0.49	1.98	3.89	100%
Adolescent mother (yes)	0.37	0.35	-0.32	1.07	85.50%
Education (years completed)	-0.21	0.19	-0.59	0.16	86.75%
Food (in)security score	-0.22	0.18	-0.57	0.13	89.42%
Fertility	-0.19	0.18	-0.55	0.17	84.12%
Smoking frequency					
Never | Occasionally	-0.52	0.33	-1.20	0.13	94.10%
Occasionally | Daily	-0.86	0.60	-2.02	0.30	92.83%

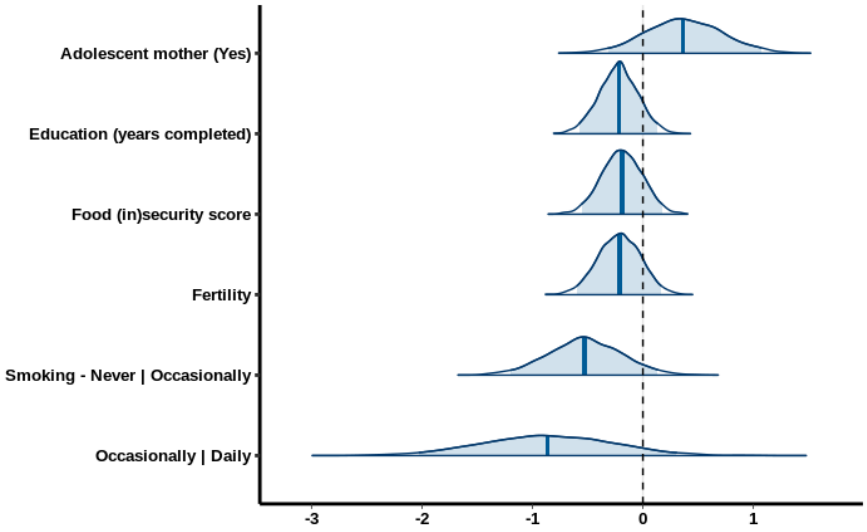

Figure 12: Posterior density distribution of Model 3.1, using Bayesian ordered logistic regression with a weak non-informative prior, centred on zero.

Note: Posterior density plots present the estimated direction and certainty of the effect of predictor variables on the model outcome. Specifically, the position of the curve to the left or right of zero (represented by the vertical dashed line) indicates the direction of an effect (i.e., negative or positive, respectively) and the spread of the curve illustrates the uncertainty of an effect, where wider curves suggest greater uncertainty.

3.4.2 Model 3.2: Effect of adolescent motherhood on perceived health at midlife – outer quartiles of sample

The effect of adolescent motherhood on perceived health at midlife among the outer quartiles of first birth timing is uncertain. Though the estimate indicates a positive effect, the estimated effect size is quite small (0.38), and the estimated standard error (0.56) is larger than the effect size (Table 11). Further, the credible interval of the effect crosses zero, and the probability of direction for this finding illustrates that any positive effect present is uncertain (PD = 71.15 %, Table 11).

Here, the effect of education was more certain than Model 1, where there appears to be a negative effect of education on perceived health, yet there remains uncertainty as the probability of direction estimate does not surpass the threshold to be considered a weak effect (PD = 90.55%, Table 11). Like Model 1, the effect of food insecurity scores and fertility on perceived health were very similar to each other yet are uncertain (illustrated in Figure 13). Although there is some suggestion of a negative effect of both food insecurity and fertility, the confidence intervals for each variable cross zero and are uncertain (PD = 82.45%, and PD = 69.17% for food insecurity and fertility, respectively, Table 11).

Within the present subset of data, there was only one participant who reported smoking "occasionally," and this datapoint was thus considered an outlier and removed from this analysis. This left only "Daily" and "Never" as smoking frequency categories. The effect of smoking on perceived health at midlife among this subset is negative, though uncertain, as its confidence intervals reach across zero and the PD is 90.22% (Table 4).

Comparatively, there were limited differences between Model 1 and Model 2 regarding the effects of adolescent motherhood on perceived health at midlife.

Table 11

Ordered logit regression examining Model 3.2 (n =42). Values refer to the average probability on the logit scale. Perceived health thresholds and smoking frequency categories represent the break points - or intercepts - between categories. E.g., "Poor | Fair" indicates the intercept between the "Poor" and "Fair" health status categories. "CI" indicates the ends of the 95% credible intervals, which capture the uncertainty of the parameters.

Effect	Estimate	Std Error	Lower 95 CI	Upper 95 CI	PD
Perceived health thresholds:					
Poor | Fair	-2.91	0.57	-4.07	-1.86	100%
Fair | Good	-1.15	0.41	-1.95	-0.38	99.75%
Good | Very good	1.38	0.40	0.58	2.17	100%
Very good | Excellent	2.42	0.53	1.44	3.54	100%
Adolescent mother (yes)	0.38	0.56	-0.76	1.43	71.15%
Education (years completed)	-0.39	0.38	-0.93	0.56	90.55%
Food (in)security score	-0.28	0.30	-0.98	0.20	82.45%
Fertility	-0.28	0.30	-0.87	0.29	69.17%
Smoking frequency					
Never | Daily	-0.61	0.47	-1.56	0.29	90.22%

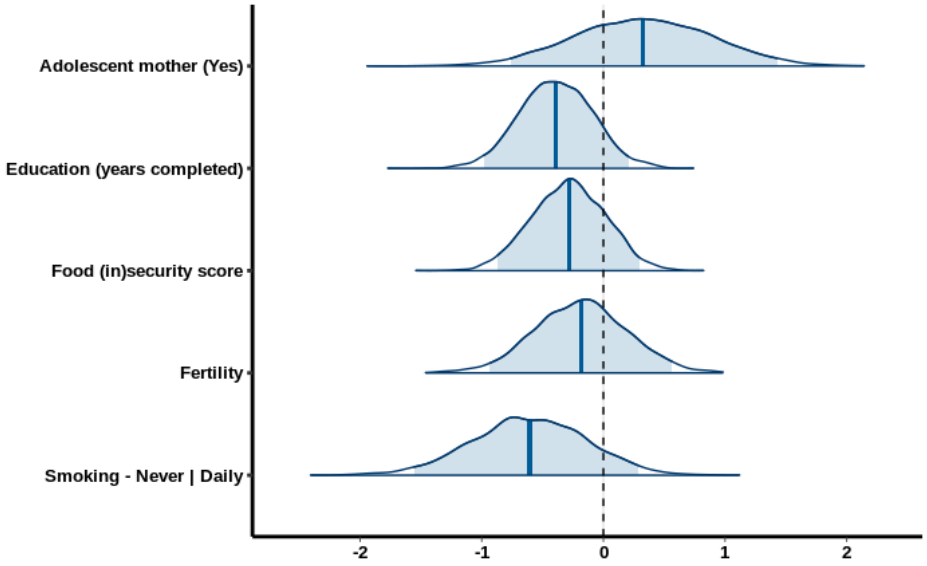

Figure 13: Posterior density distribution of Model 3.2 using Bayesian ordered logistic regression with a weak non-informative prior, centred on zero.

Note: Posterior density plots present the estimated direction and certainty of the effect of predictor variables on the model outcome. Specifically, the position of the curve to the left or right of zero (represented by the vertical dashed line) indicates the direction of an effect (i.e., negative or positive, respectively) and the spread of the curve illustrates the uncertainty of an effect, where wider curves suggest greater uncertainty.

3.4.3 Model 3.3: Effect of fertility on perceived health

Fertility has an uncertain effect on perceived health at midlife, though results suggest a slight negative effect. The estimated effect size is quite small (-0.17), and the estimated standard error (0.18) is larger – thought only slightly – than the effect size (Table 12). Further, the credible interval of the effect crosses zero, and the probability of direction for this finding indicates the effect is uncertain, though not non-existent (PD = 81.62 %, Table 12; illustrated in Figure 14).

Similar to Models 1 and 2 above, the effect of education on perceived health was negative yet uncertain (PD = 89.53 %, Table 12). Additionally, the effect of smoking frequency on perceived health at midlife among this subset is negative, though uncertain, as its confidence intervals reach across zero and the PD is 95.40 % and 91.70 % for the categories "Never | Occasionally" and "Occasionally | Never," respectively (Table 12, pictured in Figure 14).

Table 12
Ordered logit regression examining Model 3.3 (n =108). Values refer to the average probability on the logit scale. Perceived health thresholds and smoking frequency categories represent the break points - or intercepts - between categories. E.g., "Poor | Fair" indicates the intercept between the "Poor" and "Fair" health status categories. "CI" indicates the ends of the 95% credible intervals, which capture the uncertainty of the parameters.

Effect	Estimate	Std Error	Lower 95 CI	Upper 95 CI	PD
Perceived health thresholds:					
Poor | Fair	-3.47	0.47	-4.39	-2.58	100%
Fair | Good	-1.70	0.34	-2.38	-1.05	100%
Good | Very good	0.89	0.33	0.25	1.54	99.62%
Very good | Excellent	2.67	0.48	1.79	3.65	100%
Fertility	-0.17	0.18	-0.51	0.17	81.62%
Education (years completed)	-0.22	0.18	-0.57	0.14	89.53%
Smoking frequency					
Never | Occasionally	-0.56	0.33	-1.18	0.09	95.40%
Occasionally | Daily	-0.85	0.61	-2.03	0.36	91.70%

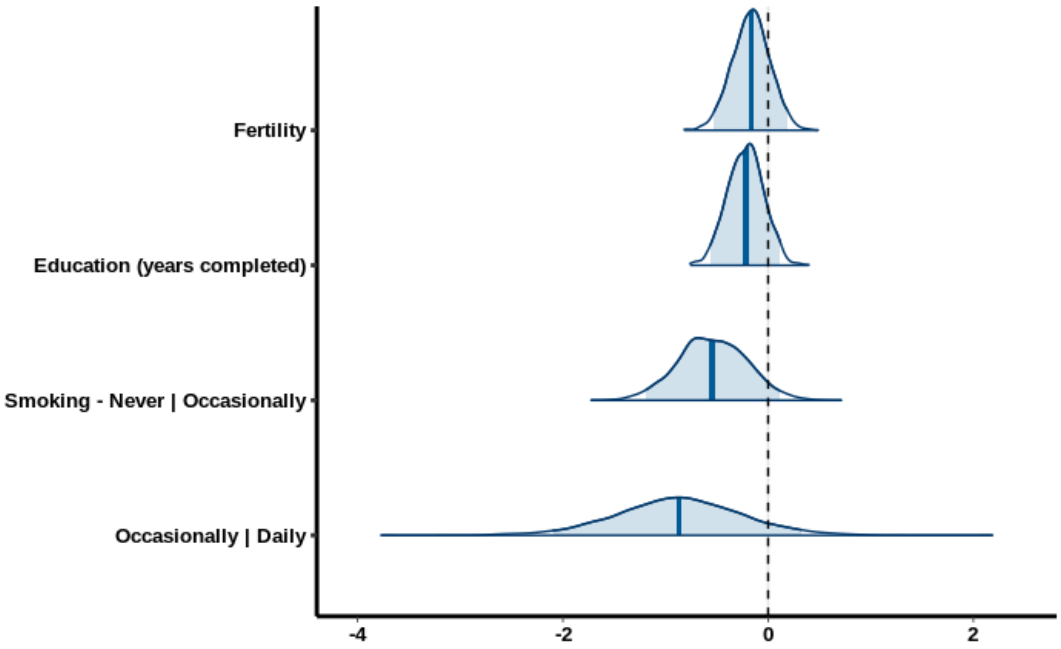

Figure 14: Posterior density distribution of Model 3.3 using Bayesian ordered logistic regression with a weak non-informative prior, centred on zero.
Note: Posterior density plots present the estimated direction and certainty of the effect of predictor variables on the model outcome. Specifically, the position of the curve to the left or right of zero (represented by the vertical dashed line) indicates the direction of an effect (i.e., negative or positive, respectively) and the spread of the curve illustrates the uncertainty of an effect, where wider curves suggest greater uncertainty.

3.4.4 Model 3.4: Effect of adolescent motherhood on smoking frequency at midlife

Results of Model 4 indicate that adolescent motherhood has an uncertain effect on smoking frequency at midlife, as the standard error of the effect (0.45) is larger than the estimated effect itself (0.27). In addition, the credible interval is wide, crosses zero, and the probability of direction is 71.70% (Table 13), thus indicating uncertainty in both the direction of the effect and its magnitude. As such, there is no discernable effect of adolescent motherhood on frequency of smoking at midlife.

Additionally, there was no effect of either education or fertility on smoking frequency. Both variables have small estimated effects (0.09 and 0.04, respectively, Table 13) which are smaller than the standard errors (0.23 for each education and fertility, Table 13). Illustrated in

Figure 15, the credible intervals for each variable cross zero, and probabilities of direction remain low, at 64.72% and 57.03% for education and fertility (Table 13).

Table 13
Ordered logit regression for Model 3.4 (n = 108). Values refer to the average probability on the logit scale. Health status thresholds represent the break points - or intercepts - between two health status categories. E.g, "Poor | Fair" indicates the intercept between the "Poor" and "Fair" health status categories. "CI" indicates the ends of the 95% credible intervals, which capture the uncertainty of the parameters.

Effect	Estimate	Std Error	Lower 95 CI	Upper 95 CI	PD
Smoking frequency:					
Never | Occasionally	-1.56	0.30	-2.18	-1.00	100%
Occasionally | Daily	-1.26	0.28	-1.84	-0.71	100%
Adolescent mother status (yes)	0.27	0.45	-0.59	1.15	71.70%
Education (years completed)	0.09	0.23	-0.36	0.53	64.72%
Fertility	0.04	0.23	-0.42	0.50	57.03%

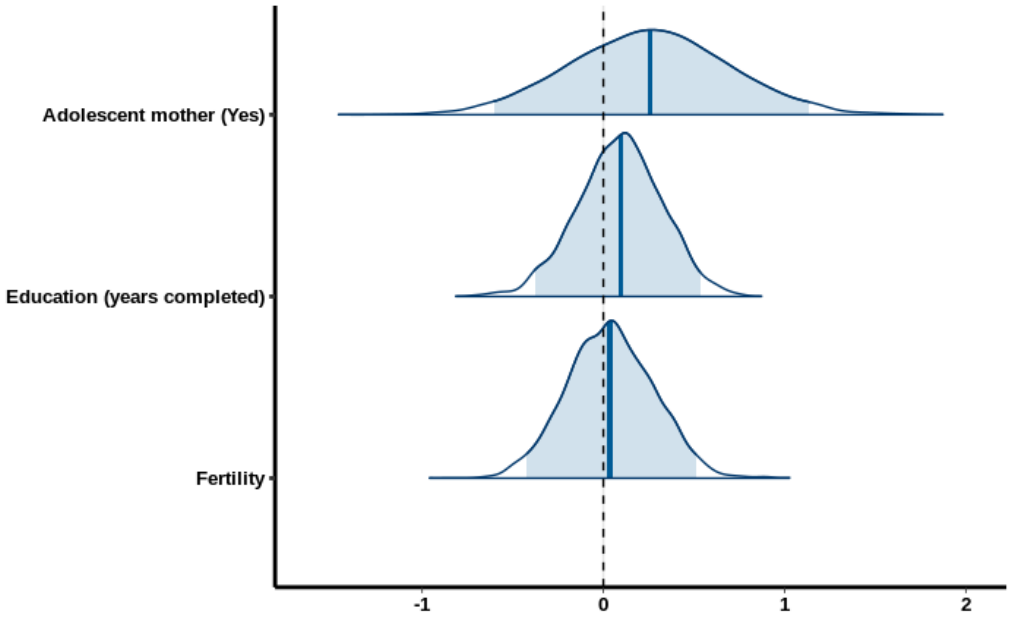

Figure 15: Posterior density distribution of Model 3.4 using Bayesian ordered logistic regression with a weak non-informative prior, centred on zero.
Note: Posterior density plots present the estimated direction and certainty of the effect of predictor variables on the model outcome. Specifically, the position of the curve to the left or right of zero (represented by the vertical dashed line) indicates the direction of an effect (i.e., negative or positive, respectively) and the spread of the curve illustrates the uncertainty of an effect, where wider curves suggest greater uncertainty.

3.4.5 Model 3.5: Effect of adolescent motherhood on smoking quantity at midlife

Table 14 presents descriptive statistics regarding the average number of cigarette packs smoked by participants per month (where a pack, on average, includes twenty cigarettes). Results indicate that adolescent motherhood appears to have a negative effect on smoking quantity, though the effect appears uncertain, as the confidence intervals broadly span zero and the probability of direction sits at 87.88% (Table 15). Posterior density distributions for predictor variables are illustrated in Figure 16.

Additionally, there seems to be a positive effect of education, though the probability of direction does not surpass the threshold to be considered a weak effect (PD = 94.95%, Table 15). Fertility continues to have an uncertain – though not non-existent – effect on smoking quantity (PD = 80.00%, Table 15).

Table 14
Descriptive statistics for the subset of the sample population, including only those aged 40 years and above and who responded to the question regarding smoking quantity, with differentiation for adolescent and non-adolescent mothers (N_{all} = 64; $N_{adolescent\ mothers}$ =25; $N_{non\ adolescent\ mother}$ =39).

	All		***Adolescent mothers***		***Non-adolescent mother***	
	Count	***%***	***Count***	***%***	***Count***	***%***
Smoking quantity (monthly)						
1-2 packs	8	12.50	5	20.00	3	7.69
3-5 packs	29	45.31	12	48.00	17	43.59
6-10 packs	18	28.13	4	16.00	14	35.90
More than 10 packs	9	14.06	4	16.00	5	12.82

Table 15

Ordered logit regression examining Model 3.5 (N = 64). Values refer to the average probability on the logit scale. Health status thresholds represent the break points - or intercepts - between two health status categories. E.g, "1-2 packs | 3-5 packs" indicates the intercept between the "1-2 packs" and "3-5 packs" categories. "CI" indicates the ends of the 95% credible intervals, which capture the uncertainty of the parameters.

Effect	Estimate	Std Error	Lower 95 CI	Upper 95 CI	PD
Smoking quantity (monthly):					
1-2 packs | 3-5 packs	-2.11	0.39	-2.90	-1.38	100%
3-5 packs | 6-10 packs	0.10	0.28	-0.46	0.67	64.28%
6-10 packs | more than 10 packs	1.60	0.35	0.95	2.31	100%
Adolescent mother (yes)	-0.51	0.43	-1.34	0.33	87.88%
Education (years completed)	0.37	0.23	-0.07	0.81	94.95%
Fertility	0.20	0.23	-0.25	0.65	80.00%

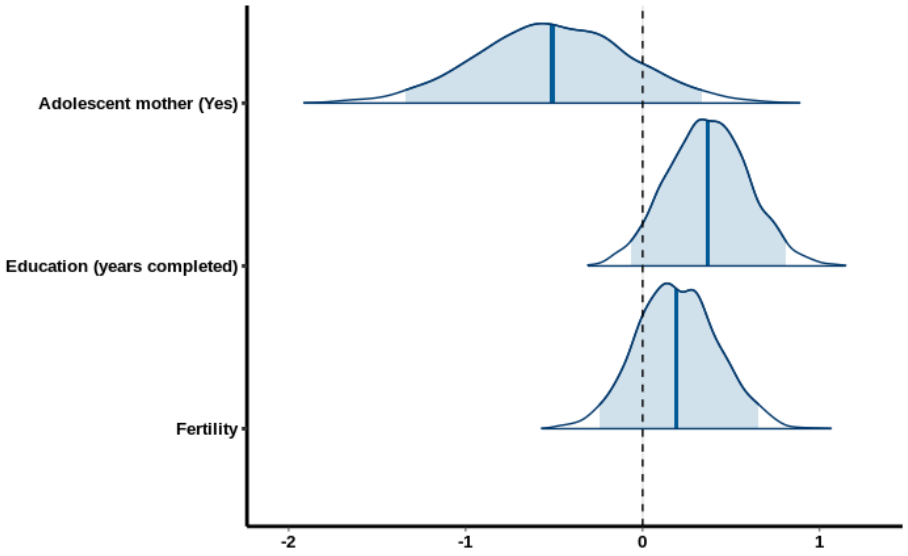

Figure 16: Posterior density distribution of Model 3.5 using Bayesian ordered logistic regression with a weak non-informative prior, centred on zero.

Note: Posterior density plots present the estimated direction and certainty of the effect of predictor variables on the model outcome. Specifically, the position of the curve to the left or right of zero (represented by the vertical dashed line) indicates the direction of an effect (i.e., negative or positive, respectively) and the spread of the curve illustrates the uncertainty of an effect, where wider curves suggest greater uncertainty.

3.5 DISCUSSION

3.5.1 Results of adolescent motherhood and fertility on perceived health

My results suggest the potential for a small, positive – but largely uncertain – effect of teenage motherhood on perceived health at midlife, even when examined using a more restrictive definition of adolescent motherhood. This conclusion is not consistent with my initial predictions, though it does not fully contradict them, either. At the time of writing, there are mixed findings on the long-term health effects of adolescent motherhood. For example, Henretta (2007) found that cohorts of American women born between 1931 and 1941 experienced a 42% increase in mortality risk from the age of 50 onwards if they had given birth during their teens. Further, a comparison of three modern populations in the UK, USA, and Norway found that mortality risk increased from 21-57% between the ages of 50 and 70 who had their first child as a teenager (Grundy, 2009; via Hayward, Nenko, & Lummaa, 2015). Additionally, both Spence (2008) and Patel and Sen (2013) found that early childbearing was significantly and positively associated with the likelihood of being disabled or in poor health later in life. However, Makinson (1985), among others, suggest that the bulk of adverse consequences experienced by adolescent mothers are likely to be of social and economic origin rather than to the effects of young age per se (Kramer & Lancaster, 2010). I wondered whether something similar may be happening in the present sample: perhaps early motherhood is leading to increased fertility overall. High fertility requires an early start to reproduction (given the finite length of the female fertile period, and reduced variation in age at menopause), and as such it might be high fertility, rather than early reproduction, that contributes to reduced health and thus obscures any evidence for the weathering hypothesis. Upon analysis, and as shown in Model 3, my results suggest that there is a negative effect of fertility on health at midlife, though this too is uncertain.

It seems the jury is still out on the effect of adolescent motherhood on health at midlife, and there is little evidence that the weathering hypothesis is observed over the long-term amongst the present population. In the years following a mother's first birth, her life experiences may impact her health in both positive and negative ways, and any effects of first birth timing may eventually be concealed (Mollborn, 2017), and it is reasonable to suppose the same may be true for this sample.

Alternatively, it might be that the present analyses do not account for additional factors that may be having an effect – some of which are specific to the northern context and were not adequately captured in the present survey. For example, I considered the variable "fertility" in the present analysis, defined as the number of offspring produced, and which represents the physical cost of bearing a child. However, as described earlier in this thesis, the practice of Inuit adoption is common among the present population, and many respondents adopted out children to whom they gave birth to and adopted in non-biological children. The survey asked participants to report the number of children they have, and it required them to declare whether a child was adopted in or out, but it did not inquire as to *when* each child was adopted (see Appendix A). As a result, participants may have cared for a biological child for years before adopting it out or they may have adopted it out upon its birth – there is no way to know from the survey. Thus, it is not possible to capture the extent to which participants invested time and energy into raising children, investments which may contribute to their health later in life but are challenging to demonstrate empirically (Grundy & Tomassini, 2015; Hayward, Nenko, & Lummaa, 2015; Mace, 2007; Mittledorf, 2009).

Among the present population, it is also possible that birth timing – specifically adolescent motherhood – and/or fertility do, in fact, have a meaningful effect on women's

perceptions of their own health, but the concept of "health" was interpreted by the survey participants in a way that differs from western conceptions of the term. Self-reported perceived health, as measured in the present study, has previously been shown to predict chronic conditions that contribute most to midlife health disparities, including arthritis, coronary heart disease, lung disease, and stroke among western study populations (Latham & Peek, 2013; Maslowsky, Hendrick, & Stritzel, 2021). However, conceptualizations of "good health" may shift across age groups and cultural contexts, as respondents tend to perceive any health self-assessment scale as a relative rather than an absolute measure (Jürges, 2007). On an absolute level, residents of Nunavut experience disproportionately high rates of cancer compared to southern Canadians – specifically salivary gland and lung cancers (Sheehy, Roache, & Sharma, 2013), but access to medical care is limited across the territory, and diagnosis and treatment often occurs in late stages of disease (Galloway et al., 2020). In Arviat in particular, there is not a resident physician within the community; rather, there is only a community health centre where a nurse is available to answer health-related questions and provide contraceptives. In order to access anything more than the most basic medical services, residents must either journey thousands of kilometers by aeroplane or wait until travelling physicians visit the community. If participants are rating their own health relative to those around them, they may perceive themselves as doing just as well as their family and community members, and they may therefore overestimate their perceived health compared to the average Canadian, especially given the prevalence of non-communicable disease in Nunavut. Thus, this measurement lacks the objectivity that would allow for comparison between different populations.

The meaning of health, particularly in a circumpolar and Indigenous context, can also be much broader than an absence of disease or measures of social determinants of health, which are

often used to describe health within Canadian and other industrial populations (Health Canada, 2016; Government of Canada, 2020). For example, factors such as culture and language, traditional knowledge, and environmental health have been recommended for inclusion in measures of Inuit health but were not included in the survey (Hayward et al., 2020; Healey & Meadows, 2007). Given that we are missing both objective data, as well as culturally relevant criteria for health, the present survey may not accurately reflect health as it is understood in the study population. To improve in the future, it may be useful to prioritize collecting objective measures of health over an extended period. Forde et al. (2019), in a review of 41 studies that aimed to observe the weathering hypothesis at work in a range of socially or economically disadvantaged populations, suggested that such a format is preferable because it enables comparison across populations, while longitudinal studies beginning in early life allow for better characterization of how disadvantage and health coevolve over the life course.

Another relevant factor is that the perceived health status question does not provide any distinction between mental and physical health – the respondent is simply asked to rate their "health" (see Appendix A). Future research may benefit by considering both physical and mental health, as previous studies have found that teen mothers experience psychological distress (Aujoulat et al., 2010; Patel & Sen, 2012; Conference Board of Canada, 2015; Healey & Meadows, 2007). Additionally, rates of mental illness, intentional self-harm, and deaths by suicide are disproportionately high among Canadian Inuit populations (Hayward et al., 2020; Kral, 2016). Including a survey question or component targeted towards mental health would enable future analyses to distinguish between mental and physical health effects of adolescent motherhood, and, more broadly, it would provide data about women's mental health in Arviat.

Additionally, result from Models 1 to 3 indicate that the effects of each income,

nutritional status, fertility, and smoking on perceived health are negative, though ultimately uncertain. The result regarding the relationship between income (proxied by years of completed education) and health at midlife was unexpected. The weathering hypothesis posits that within disadvantaged populations there will be a positive effect of socioeconomic status on health (Geronimus, 1997), as it may enable an increase in access to medical care, increased ability to purchase food (and thus improved nutritional status), and decreased likelihood of taking part in behaviours that are both associated with being low income and with directly reducing health. My results, however, suggest a negative – though largely uncertain – relationship between income and perceived health, so it is not possible to draw any sweeping conclusions about this relationship, other than to point out its unexpected nature. Rather, this finding indicates that additional investigation is needed to better understand the relationship between income and health among Inuit women – if a relationship exists at all. This could be done by collecting more rigorous data on income, such as the use of tax documents to determine annual income, or by determining the percentage of income that is provided by the government.

3.5.2 Results of adolescent motherhood on smoking frequency and quantity

My second section of analysis indicates that smoking, like health, is affected to an uncertain degree by adolescent motherhood. However, it seems to be the case that adolescent motherhood may positively affect the frequency of smoking but negatively affect the quantity of cigarettes consumed per month. Put differently, adolescent mothers may be more likely to smoke more often, but they are also likely to be smoking fewer cigarettes.

These results hint at an existing idea that early motherhood reduces risky behavior. For example, Palacios et al. (2012) found that adolescent motherhood is associated with a reduction in high-risk health behaviors such as smoking, binge drinking, frequent unprotected sex with

multiple partners, and being overweight or obese. The authors concluded that this shift in priorities was likely due to young women gaining a sense of maturity and responsibility upon finding out that they are to become mothers. Others, however, have found that adolescent motherhood leads to more adverse health behaviors: work by Webbink, Martin, and Visscher (2008) determined that adolescent mothers tended to smoke 2.6-4 more years of their lives and are less likely to quit than their twin sisters. Perhaps both scenarios exist in Arviat, as teenage mothers may feel the additional pressures of taking on a parental role at a young age and begin smoking to cope with stress. At the same time, they may have also internalized a greater sense of responsibility in early parenthood that serves to limit the amount that they consume. This, however, is speculation, as the present survey did not assess when participants started smoking, their perceived stress levels or factors that contributed to taking up smoking, or how their consumption habits may have changed with time. These patterns may also shift depending on the type of health behavior being assessed.

Although I included the "risky" health behavior of smoking in the present analysis as a way of representing behavior known to affect health directly and negatively, smoking is not the only metric that could be used to capture this. Alcohol use in Nunavut is prevalent; alcohol and substance abuse and exposure has been identified as a health disparity experienced by women in Nunavut (Healey, 2008). From 2017-2018, 19.9% of women in Nunavut were reported to be heavy drinkers – defined as consuming 4 or more drinks on one occasion, 12 or more times over the past year – compared to 15.1% of Canadian women (CIHI, 2021). Examining alcohol consumption may have captured risky health-related behavior among the present population that is not represented in the smoking question set. Further research into smoking or the engagement in other "risky" behavior – such as alcohol or other drug consumption, or rates of unprotected

sex – may provide greater insights into how adolescent mothers conceptualize health risks and the impact such health behavior has on their self-perceived health.

CHAPTER 4: DISCUSSION

This thesis presents an exploratory investigation of the socioeconomic and health outcomes of adolescent motherhood among a group of women living in Arviat, Nunavut. I hypothesized that women who became mothers in their teen years would experience relatively worse economic outcomes than those who were not adolescent mothers. Additionally, and with inspiration from work by Geronimus (1996), I predicted that adolescent mothers would rate their health at midlife better relative to those who postponed their first births. My results suggest that adolescent motherhood has little predictive effect on economic outcomes nor on perceived health at midlife among the present population. These results contradict both my predictions and the anti-teen mom argument outlined in the introduction. They also provide insight into the present study's limitations and directions for future research.

4.1 LIMITATIONS AND FUTURE DIRECTIONS

4.1.1 The limits of cross-sectional data

Due to the cross-sectional nature of the survey data, the present study only captures how participants were faring at the time of the interview; it does not reflect how their economic and health conditions may have changed over the course of their lives. For instance, there was no data collected regarding participants' socioeconomic status or health prior to the conception of their first child. As such, it is not possible to determine whether participants experienced a change in these variables over the course of their reproductive careers. We do not know if women in the present study who reported being in "poor" or "fair" health at the time of the survey would have rated their health higher before the start of their reproductive careers, or if they instead have fragile health and have always considered themselves to be in a state of poor or

precarious wellbeing. A similar limitation exists in terms of income and employment, where we do not know whether and how these variables have fluctuated over the course of participants' reproductive lives (in terms of both magnitude and direction of change) (Ruspini, 2000). This is not to say that the measure used here is uninformative; rather, it is an acknowledgement that the survey only reflects participants' experiences at the time the data was collected.

Since the aim of this research was to interrogate whether an event that occurs early in life – i.e., adolescent motherhood – has an impact on aspects of respondents lives *over time,* longitudinal or retrospective data collection would prove more informative. However, longitudinal research is expensive and time-consuming to complete and was incompatible with the present research project. It may instead be a fruitful methodology for future research programs looking to glean further insights amongst a similar population.

4.1.2 Important, yet unknown: marital status at birth

As awareness of the "epidemic" of teenage pregnancy rose within many industrialized nations, much of the subsequent concern was not with adolescent motherhood per se – as women had been bearing children during their teenage years for decades– it was with women bearing children during adolescence *while remaining unmarried*. This is made most clear when considering that, in the United States, rates of adolescent pregnancy peaked in the 1950s but came to the attention of public officials in the 1970s; by that time teenage pregnancies had fallen from 97.3 per one thousand women in 1957 to 68.3 per one thousand in 1970 (Vinovskis, 2003), but rates to unmarried women had dramatically increased. In the 1950s, 13.4% of births among women aged 15-19 were out of wedlock; this statistic had more than doubled to about 30% by the 1970s (Vinovskis, 2003).

Although this thesis aims to capture the long-term effects of early childbearing, the

survey did not ask participants about their marital status at the time of their first birth; it only requested participants' marital status at the time of survey completion. Because of this, it is not possible to test whether being married affects the health or economic outcomes of adolescent mothers in the present population. As such, this is important criteria to include in future research that aims to consider the outcomes of adolescent motherhood as it relates to the teenage pregnancy epidemic.

4.1.3 Imprecise measures of socioeconomic status

My results show no predictive effect of adolescent motherhood on indicators of socioeconomic status at the time the survey was distributed. However, some of the proxies used to represent socioeconomic status may collapse a lot of information regarding participant income into yes/no questions, thereby lacking nuance. The survey does this in a few instances. First, the measure of employment lacked precision: participants were not asked to specify the nature of their employment (e.g., full-time, part-time, etc.). Instead, they were only asked whether they had worked for income over the preceding year (see Appendix A). As such, participants who were employed full-time, part-time, seasonally, or who may have labored to receive cash payments through odd jobs could all have responded "yes" to the prompt. Future research would be well served to distinguish between differing categories of participant employment.

Second, participants were asked to report their income, but the question was phrased in such a way that participants did not need to specify a time frame for their reported earnings (see Appendix A). As a result, some participants reported their hourly wage without describing the average number of hours they worked in any given period, while some reported the amount they received from biweekly paychecks, and others provided no context for the figures they reported. Thus, it was not possible to standardize a measure of income, and I did not have access to any

records that might be used to verify participants' reported earnings. No currency-based measure of income could be used in analysis.

Finally, the survey suffered the same limitation on the question regarding the amount of government assistance received by each participant as the amount of income earned. As such, we do not have reliable information regarding the monetary amount received via government transfer. Without a sense of what participants' employment and social assistance income was, it is unclear to what extent welfare payments contributed to their overall income. Having access to more detailed information regarding participants' income, the sources of their income, and the proportion that their income is comprised of social assistance payments may enable future research to better tease apart the relationship between adolescent motherhood and economic indicators, if one exists at all. Though I have suggested the value of objective, quantitative measures of socioeconomic status in order to generate more robust data in future research, there is also value in subjective assessments, and this is specifically true with respect to measures of health within the present context.

4.1.4 The potential information held in health behavior data

Collecting data on health behaviors, such as smoking, can provide information regarding the types of habits and behaviors that individuals engage in, which has significant influence on individual health and wellbeing. Though Nunavut has the highest proportion of smokers over the age of twelve in Canada (Healey & Meadows, 2007; Wallace, 2014) – which may influence participants' rating of their health – I did not have data that considered other health behaviors, such as alcohol consumption, drug use, or prevalence of obesity: measures which may further imply their overall health (Wallace, 2014). These variables – smoking, drinking, drug use – largely relate to factors which have a negative influence on health; future studies may find it

prudent to include health behaviors that are positively associated with Inuit people's health, including the frequency that participants are able to go out on the land or practice traditional cultural activities (Greenwood & Lindsay, 2019). Since many Inuit individuals have limited access to and negative experiences with western medical care systems (Oosterveer & Young, 2015; Hayward et al., 2020; Wallace, 2014), incorporating indicators of health that lie beyond formal diagnoses is likely to capture a more robust measure of perceived health.

Not only can health behaviors serve as an indicator of individual health at a given point in time, but the collection of health behavior data over time can allow for the observation of a shift in priorities. For example, previous research has found that adolescent mothers are more likely to smoke or drink prior to conception compared to non-adolescent mothers (Fletcher, 2012; Wong et al., 2020; Webbink, Martin, & Visscher, 2008), and qualitative research has described reports of women who, after becoming mothers in adolescence report dramatic shifts in their priorities, in the form of "straightening out" (Kirkman, 2001; Palacios et al., 2012). However, there is much less empirical work demonstrating the existence of these shifts in the long run (Fletcher, 2012; Zito, 2016). Longitudinal work that includes both measures of perceived health and patterns of health behavior may offer more robust insight into whether women in the present population experience adolescent motherhood as an event that serves to "straighten" them out and may be an intriguing area of future research.

4.1.5 Incomplete representation of adoption practices

An additional limitation of the present study is that there was a restricted ability to fully represent the dynamics of Inuit custom adoption practices. Canadian Inuit tend to practice adoption differently compared to other industrial societies. Rather than remove children from unfit households, it is common for birth parents to "donate" or "transfer" children to members of

the community, whether that be with the intention of showing respect to elders, to even out an unbalanced sex ratio among children, or by offering a child to couples who are not able to conceive their own offspring (Decaluwe, et al., 2015; Archibald, 2004).

Accounting for adoption is relevant to the present research in order to accurately reflect the responsibility of childrearing; when a woman adopts a child out of her care she is, from that point on, relieved of the economic and energetic cost of raising the child. This, in theory, may allow her to focus on and improve her economic and physical wellbeing. If this were the case, then we might expect to see specific, nuanced outcomes between those who were adolescent mothers, those who had children in adolescence but adopted them out, and those who did not conceive during their teenage years. Although I chose to focus my analysis on the effect of adolescent motherhood (and not childbearing per se), I present additional results in Appendix B that include these distinct categories; these results do not suggest any meaningful difference in outcomes between those who had an adolescent pregnancy, were adolescent mothers, or who experienced neither circumstance. However, the limitation of how the present survey captured adoption information persists.

Of the total present sample population (N = 413), 66 participants gave birth to their first child during their teenage years but adopted that child out. These women were excluded from my primary analyses because they did not raise the child(ren) they gave birth to in their teen years. This exclusion criteria, however, relies on the assumption that the adolescent mother adopted her child out immediately following its birth, as the survey did not collect information regarding when any adoptions took place. Put a bit differently, it is unknown whether a child was adopted immediately after it was born, within the first few years of their lives, or later. As such, a participant may have given birth to a child in her adolescence, cared for the child for several

years, then adopted the child out. Upon completing the present survey, this participant would be excluded from the analysis (or characterized as having had an adolescent pregnancy) even though her circumstances indicate that she mothered a child in her adolescence. If it is a common practice within this sample population that women care for their children for a period of time before adopting them out, then this may mean that both the primary analysis and the results in Appendix B underrepresent the incidence of adolescent motherhood. Going forward, research on populations that practice Inuit custom adoption ought to take great care in considering the dynamics and timing of adoption.

4.1.6 Beyond the scope – interbirth intervals

It may be the case that other factors related to participants' fertility patterns are also influencing the observed long-term effects of adolescent motherhood. One example is interbirth intervals (or IBIs, i.e., the length of time between successive births of surviving offspring) are important for allowing mothers to sufficiently recover from the physiological strain of childbearing. Closely spaced successive births may increase physiological, social, and psychological stress, which may lead to health issues and reduced mortality (Grundy & Tomassini, 2005; Blurton Jones, 2016). It may be the case among the present sample that by starting their reproductive careers early, mothers are able to lengthen their IBIs while maintaining high fertility. Examining the effects of IBIs on health may indicate that women in the present sample are timing their births in a way that contributes to overwhelmingly "good" maternal health status at midlife and beyond. In the present study, it is possible to extrapolate IBIs from the ages of participants' children, but these estimates would be too crude to be informative. For example, if a participant reported having two children, one aged five years and another aged three at the time of the survey, we could estimate that the IBI between these

children is two years. However, since we do not know exact birthdates of children, these IBIs may range from nearly one to three years apart, depending on when each birthdate falls. This may be a key consideration for future research on long-term health effects of childbearing.

4.1.7 Beyond the scope – alloparenting

For some women, short IBIs may occur, even in the presence of potential negative health consequences, due to help from others. Cooperative breeding, a process in which non-parental individuals assist in rearing offspring who are not their own (Forrester, 2019, Newson & Richerson, 2013; Kramer, 2010), reduces the energy that mothers must expend to care for their children, which can help to offset the physiological costs of shorter inter-birth intervals. Given that the present population exists in a context that communally distributes resources (Wenzel, 1995; Dombrowki et al., 2013; Collings, et al., 2016), it may be the case that women who begin reproduction in their teens – and who tend to have many children, regardless of the intervals between them – are faring as well as the rest of the community because they are receiving help from others. As such, this may be an interesting consideration to be included in future research with Inuit populations.

In sum, there are many promising areas for future research with respect to adolescent motherhood generally, and adolescent motherhood in Inuit communities specifically, but additional care in data collection must be completed to account for help received from family and community members, precision in collecting children's birth dates and adoption timing, as well as adapting indicators of socioeconomic status and health to better represent Inuit contexts.

4.2 KEY TAKEAWAYS

Despite the limitations noted above, this thesis has important insights to offer. That I found no predictive effect on the socioeconomic or long-term health outcomes of adolescent

motherhood within this population implies less about whether it is good or bad to for women to bear children in their teenage years, and instead speaks to women's ability to make motherhood work when provided with some financial resources, regardless of its timing.

For women in Arviat, adolescent motherhood offers a way to have children while avoiding some of the health risks that arise with age, and given the limited economic opportunities in their community, they tend do so with little economic sacrifice. These circumstances mirror the experiences of many poor women across industrialized nations. What is distinct about Nunavut, however, is that federal and territorial governments provide more financial support than what is often offered to women in similar economic contexts in other industrialized nations. Additionally, adolescent childbearing is common in Nunavut and is generally accepted among Inuit populations, unlike the stigma that persists throughout much of the industrialized world. As a consequence, it seems, adolescent mothers in Nunavut fare just as well as their counterparts who begin childbearing later; a reality that contradicts the anti-teen mom argument and the way that the industrialized world tends to perceive adolescent motherhood.

The anti-teen mom argument perpetuates the idea that adolescent mothers, due to their immaturity and lack of educational or economic achievement, are unable to provide for their children in the resource-intensive way that is the norm in industrialized societies. As a result, they are perceived as a financial cost to society, and it was this particular concern that motivated widespread welfare cuts across industrialized societies in the 1990s, under the premise that cutting available funding would disincentivize teenage pregnancies and motherhood. It seems to be the case, however, that it is not adolescent mothers per se, but rather the types of women who are more likely to be adolescent mothers (i.e., poor women and unmarried women), who tend to

require government support throughout their lives (Furstenberg, 2007). As such, differences in outcomes observed between those who are adolescent mothers and those who are not are thought to be due to the ways that society treats poor and single women and is not the fault of teenage mothers themselves.

Although residents of Nunavut experience an environment that better supports adolescent motherhood relative to the rest of Canada and other industrialized nations, there may be shifting perceptions of adolescent motherhood among the present population. During this survey, participants were asked what they thought about women in their communities becoming pregnant in their teens. Although the overwhelming response was that "children are a blessing," there were some comments that regarded teenage childbearing as irresponsible and that young women ought to complete their education before becoming mothers. This included sentiments like: "graduate first, get married, look for perfect job, get a house" (Participant 22), or "they should finish school but they're out there looking after kids" (Participant 401). Others simply expressed their disapproval through comments like "I think it is unbelievable" (Participant 322). Historical records of fertility in pre-contact Inuit populations have been challenging to establish, but previous research has suggested that Inuit people, generally, believe that children are a blessing and tend to have many of them relative to contemporary industrial societies (Scheffel, 1988). This is consistent with most respondents' beliefs about adolescent childbearing. However, the participant comments criticizing early childbearing also hint at the influence of the values held by western industrial societies (Vowel, 2016) and may be suggesting an increased adherence to beliefs consistent with the anti-teen mom argument.

As Inuit populations continue their exposure to western ideals, it may be possible to observe a rise in the popularity of anti-teen mom sentiment. Like poor populations in the United

States, however, without changes to their economic opportunity and mortality risk, high rates of adolescent motherhood in Inuit communities may nonetheless persist (Sear, 2020; Dickens et al., 2010). This may create an interesting avenue for future research, as changes in beliefs around adolescent motherhood may impact the outcomes that women and children experience. Future research may simultaneously target the limitations highlighted above, including longitudinal work to establish a better understanding of the effect of adolescent motherhood across the life course or in determining the nature of help and support provided by family and community members in raising children. Much of the existing research on adolescent mothers, however, has concentrated on populations outside of Nunavut and who tend to enjoy much less support in raising their children. Research in communities who do not have the same kinds of support may examine ways in which financial and relational help may be implemented to help improve outcomes for adolescent mothers and their children.

Finally, valuable work lies in understanding ways to reduce the stigma surrounding adolescent motherhood. There is no right way to do motherhood, but our persistent fascination with the potential risks in pursuing this one version of it continues to condemn the women who begin their reproductive careers early. Instead, we ought to be concerned about the ways we can help to lift them up.

REFERENCES

Acs, G., & Koball, H. (2003). TANF and the status of teen mothers under age 18. *Urban Institute,* 62. http://webarchive.urban.org/publications/310796.html

Al-Sahab, B., Heifetz, M., Tamim, H., Bohr, Y., Connolly, J. (2013). Prevalence and characteristics of teen motherhood in Canada. *Maternal & Child Health,* 16, 228-234. DOI: 10.1007/s10995-011-0750-8

Anderson, T. (2015). The Social Determinants of Higher Mental Distress among Inuit Statistics Canada. Downloaded on May 28, 2021, from: http://www.statcan.gc.ca/pub/89-653-x/89-653-x2015007-eng.htm

Arai, L. (2009). What a difference a decade makes: Rethinking teenage pregnancy as a social problem. *Social Policy & Society, 8*(2), 171-183. doi:10.1017/S1474746408004703

Archibald, L. (2004). Teenage pregnancy in Inuit communities: Issues and perspectives. Pauktuutit Inuit Women's Association & Health Canada. April 2004.

Arviat Hamlet Council (2019). History of Arviat. Retrieved on February 10, 2020, from https://www.arviat.ca/

Aujoulat, I., Libion, F., Berrewaerts, J., Noirhomme-Renard, F., Deccache, A. (2010). Adolescent mothers' perspectives regarding their own psychosocial health needs: A qualitative exploratory study. *Patient Education and Counseling,* 81, 448-453. doi:10.1016/j.pec.2010.10.028

ASPE. (1996). The Personal Responsibility and Work Opportunity Reconciliation Act of 1996. Office of the Assistant Secretary for Planning and Evaluation. August 31, 1996. https://aspe.hhs.gov/reports/personal-responsibility-work-opportunity-reconciliation-act-1996

Bachu, A. (1999). Trends in premarital childbearing, 1930 to 1994. *Current Population Reports, October 1999.* U.S. Census Bureau.

Barlow, P., Reeves, A., McKee, M., Galea, G., Stuckler, D. (2016). Unhealthy diets, obesity and time discounting: A systematic literature review and network analysis. *Obesity Reviews,* 17, 810-819. doi: 10.1111/obr.12431

Baxter, A.J., Dundas, R., Popham, F., Craig, P. (2021). How effective was England's teenage pregnancy strategy? A comparative analysis of high-income countries. *Social Science & Medicine,* 270. https://doi.org/10.1016/j.socscimed.2021.113685.

Bell, J. (2019). Minus housing costs, Nunavut welfare incomes look like southern Canada's. Nunatsiaq News. November 19, 2019. https://nunatsiaq.com/stories/article/minus-

housing-costs-nunavut-welfare-incomes-look-like-southern-canadas/

Banfield EC. 1974. The Unheavenly City Revisited. Boston: Little, Brown

Bickel, W.K., Moody, L., Quisenberry, A.J., Ramey, C.T., Sheffer, C.E. (2014). A competing neurobehavioral decision systems model of SES-related health and behavioral disparities. *Preventive Medicine*. 0, 37-43. doi:10.1016/j.ypmed.2014.06.032.

Blurton Jones, N. G. (2016). *Demography and evolutionary ecology of Hadza hunter-gatherers* (Vol. 71). Cambridge University Press.

Boushey, H. (2002). The Effects of the Personal Responsibility and Work Opportunity Reconciliation Act on Working Families - Viewpoints (Commentary). *Economic Policy Institute.* https://www.epi.org/publication/webfeatures_viewpoints_tanf_testimony/

Brady, D. (2019). Theories of the causes of poverty. *Annual Review of Sociology*, 45, 155-175. https://doi.org/10.1146/annurev-soc-073018- 022550

Bonnell, C. (2004). Why is teenage pregnancy conceptualized as a social problem? A review of quantitative research from the USA and UK. *Culture, Health & Sexuality, 6*(3), 255-272.

Brown, T.K. (2016). How US welfare compares around the globe. BBC News. August 26, 2016. https://www.bbc.com/news/world-us-canada-37159686

Buck, D. & Frosini, F. (2012). Clustering of unhealthy behaviours over time: Implications for policy and practice. The King's Fund. Available online at http://www.kingsfund.org.uk/ sites/files/kf/field/field_publication_file/clustering-of-unhealthy-behaviours-over-time-aug-2012.pdf

Buescher P.A., Mittal M. (2006). Racial disparities in birth outcomes increase with maternal age: recent data from North Carolina. *North Carolina Medical Journal*, *67*(1),16-20.

Bürkner, P.C. (2017). brms: An R package for Bayesian multilevel models using Stan. *Journal of Statistical Software*, 80, 1-28.

Campaign 2000. (2018). Report Card on Child and Family Poverty in Canada 2018. https://campaign2000.ca/wp-content/uploads/2018/11/C2000NationalEnglishReport-CardNov2018.pdf

Cavazos-Rehg, P.A., Krauss, M.J., Spitznagel, E.L., Bommarito, K., Madden, T., Olsen, M.A., Subtramaniam, H., Peipert, J.F., Bierut, L.J. (2015). Maternal age and risk of labor and delivery complications. *Maternal & Child Health Journal, 19*(6), 1202-1211. doi:10.1007/s10995-014-1624-7.

Cassiman, S.A. (2008). Resisting the neo-liberal poverty discourse: On constructing deadbeat dads and welfare queens. *Sociology Compass, 2*(5), doi: 1690-1700, 10.1111/j.1751-

9020.2008.00159.x

CDC. (2021). About teen pregnancy. Centers for Disease Control and Prevention. Accessed at: https://www.cdc.gov/teenpregnancy/about/index.htm

Chamlin M.B., Denney, J.E. (2019). An impact assessment of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996. *Journal of Crime and Justice, 42*(4), 382-392. DOI: 10.1080/0735648X.2019.1580603

CIHI. (2021). An In-Depth Look at the Nunavut Health Care System. Canadian Institution for Health Information. https://www.cihi.ca/en/an-in-depth-look-at-the-nunavut-health-care-system

Collin, D. (2011). Aboriginal Financial Literacy in Canada. Task Force on Financial Literacy. February 9, 2011. https://epe.lac-bac.gc.ca/100/200/301/taskforce_fin_literacy/aboriginal_financial-e/F2-201-2011-eng.pdf

Collings, P., Martin, M.G., Pearce, T., & Young, A.G. (2016). Country food sharing networks, household structure, and implications for understanding food insecurity in Arctic Canada. *Ecology of Food and Nutrition, 55*(1), 30-49. doi: 10.1080/03670244.2015.1072812

Conference Board of Canada. (2015). Poor Socioeconomic Conditions in Canada's Territories Contribute to Low Grades on Health Report Card. News Room. Retrieved on March 18, 2019 from https://www.conferenceboard.ca/

Cooke, M., Gazco, A. (2009). Taking a life course perspective on social assistance use in Canada: A different approach. *The Canadian Journal of Sociology, 34*(2), 349-372.

Corcoran, M.E., Kunz, J.P. (1997). Do Unmarried Births among African American Teens Lead to Adult Poverty? *Social Service Review. 71*(2), https://doi.org/10.1086/604251

C-SPAN (1996). Teen Pregnancy. January 29, 1996. https://www.c-span.org/video/?69614-1/teen-pregnancy

Darmon, N. & Drewnowski, A. (2015). Contribution of food prices and diet cost to socioeconomic disparities in diet quality and health: a systematic review and analysis. *Nutrition Reviews, 73*(10), 643-660. doi: 10.1093/nutrit/nuv027

Decaluwe, B., Jacobson, S.W., Poirier, M., Forget-Dubois, N., Jacobsen, J.L., Muckle, G. (2015). Impact of Inuit customary adoption on behavioral problems in school-age Inuit children. *American Journal or Orthopsychiatry, 85*(3), 250-258. doi:10.1037/ort0000071.

DeGroot, K., Thurik, R. (2018). Disentangling risk and uncertainty: When risk-taking measures are not about risk. *Frontiers in Psychology*, 9, 2194. 10.3389/fpsyg.2018.02194.

Denney, J.T., Kimbro, R.T., Heck, K., & Cubbin, C. (2017). Social cohesion and food

insecurity: Insights from the geographic research on wellbeing (GROW) study. *Maternal & Child Health. 21*(2), 343-350. https://doi.org/10.1007%2Fs10995-016-2119-5

DeSalvo, K.B., Bloser, N., Reynolds, K., He, J., Munter, P. (2006). Mortality Prediction with a Single General Self-Rated Health Question. *Journal of General Internal Medicine, 21*(3), 267-275. https://doi.org/10.1111/j.1525-1497.2005.00291.x

Diaz, C.J. & Fiel, J.E. (2016). The effects(s) of teen pregnancy: Reconciling theory, methods, and findings. *Demography*, 53, 85-116. DOI 10.1007/s13524-015-0446-6

Di Cesare, M., Khang, Y., Blakely, T., Cowan, M.J., et al. (2016). Inequalities in non-communicable diseases and effective responses. *Lancet*, 381, 585-597. http://dx.doi.org/10.1016/ S0140-6736(12)61851-0

Dickins, T. E., Johns, S. E., & Chipman, A. (2012). Teenage pregnancy in the United Kingdom: A behavioural ecological perspective. *Journal of Social, Evolutionary and Cultural Psychology*, 6, 344–359.

Dombrowski, K., Channell, E., Khan, B., Moses, J., Misshula, E. (2013). Out on the land: Income, subsistence activities, and food sharing networks in Nain, Labrador. *Journal of Anthropology*, 2013, ID 185048, http://dx.doi.org/10.1155/2013/185048.

Drewnowski, A. (2009). Obesity, diets, and social inequalities. *Nutrition Reviews*, 67(Suppl. 1), S36-S39. https://doi-org.ezproxy.uleth.ca/10.1111/j.1753-4887.2009.00157.x

Edin, K.J., & Shaefer, H.L. (August 2016). 20 years since welfare 'reform.' The Atlantic. August 22, 2016. https://www.theatlantic.com/business/archive/2016/08/20-years-welfare-reform/496730/

Fishman, S. (2020). An extended evaluation of the weathering hypothesis for birthweight. *Demographic Research*, 43, 929-968.

Fletcher, J.M. (2012). The effects of teenage childbearing on the short- and long-term health behaviors of mothers. *Journal of Population Economics*, 25, 201-218. DOI:10.1007/s00148-011-0381-9

Fonda, M., Eni, R., Guimond, E. (2013). Socially constructed teen motherhood: A review. *The International Indigenous Policy Journal, 4*(1). DOI: 10.18584/iipj.2013.4.1.8

Forde, A.T., Crookes, D.M., Suglia, S.F., Demmer, R.T. (2019). The weathering hypothesis as an explanation for racial disparities in health: A systematic review. *Annals of Epidemiology*. 33, 1-18. https://doi.org/10.1016/j.annepidem.2019.02.011

Foster, C. (2008). The welfare queen: Race, gender, class, and public opinion. *Race, Gender & Class*, *15*(3/4), 162-179. Retrieved June 17, 2021, from http://www.jstor.org/

stable/41674659

Fox, A.M., Himmelstein, G., Khalid, H., and Howell, E.A. (2019). Funding for abstinence-only education and adolescent pregnancy prevention: Does state ideology affect outcomes? *American Journal of Public Health, 109*(3), 497-504. doi: 10.2105/AJPH.2018.304896

Fuller, J.B., Raman, M. (2017). Dismissed By Degrees. Published by Accenture, Grads of Life, Harvard Business School.

Furstenberg F.F. (1998). When will teenage childbearing become a problem? The implications of the western experience for developing countries. *Studies in Family Planning*, *29*(2):246–53.

Furstenberg, F.F. (2003). Teenage childbearing as a public issue and a private concern. *Annual Review of Sociology*, *29*, 23-39. doi: 10.1146/annurev.soc.29.010202.100205.

Furstenberg, F.F. (2007). History of Teenage Motherhood as a Social Problem. In Destinies of the Disadvantaged: The Politics of Teen Childbearing. Sage.

Furstenberg, F.F. (2015). Will marriage disappear? *Proceedings of the American Philosophical Society, 159*(3), 241-246.

Furstenberg, F.F. (2016). Reconsidering teenage pregnancy and parenthood. *Societies*, *6*(33), 1-8. doi:10.3390/soc6040033

Galloway, T., Horlick, S., Cherba, M., Cole, M., Woodgate, R.L., Healy Akearok, G. (2020). Perspectives of Nunavut patients and families on their cancer and end of life care experiences. *International Journal of Circumpolar Health. 79*(1), 1766319. doi: 10.1080/22423982.2020.1766319

Galloway, T. (2017). Canada's northern food subsidy *Nutrition North Canada:* a comprehensive program evaluation. *International Journal of Circumpolar Health*, *76*(1), 1279451, doi: 10.1080/22423982.2017.1279451

George, J. (2019). Nunavut Housing Corp. seeks ways to trim costs. Nunatsiaq News. March 19, 2019. https://nunatsiaq.com/stories/article/nunavut-housing-corp-seeks-ways-to-trim-costs/

Geronimus, A.T. (1992). The weathering hypothesis and the health of African-American women and infants: evidence and speculations. *Ethnicity & Disease, 2*(3), 207-221.

Geronimus, A. T. (1996). Black/white differences in the relationship of maternal age to birthweight: A population-based test of the weathering hypothesis. *Social Science & Medicine,* 42, 589–597.

Geronimus, A. (1997). Teenage childbearing and personal responsibility: An alternative view.

Political Science Quarterly, 112, 405-430.

Geronimus, A. (2003). Damned if you do: culture, identity, privilege, and teenage childbearing in the United States. *Social Science & Medicine,* 57, 881-893.

Geronimus, A., Korenman, S. (1992). The socioeconomic consequences of teen childbearing reconsidered. *The Quarterly Journal of Economics*, *107*(4), 1187-1214. https://doi-org.ezproxy.uleth.ca/10.2307/2118385

Gold, R., Kennedy, B., Connell, F., Kawachi, I. (2002). Teen births, income inequality, and social capital: developing an understanding of the causal pathway. *Health & Place,* 8, 77-83.

Government of Canada (2018). Nunavut Inuit labor force analysis report: Executive summary. Employment and Social Development Canada. August 2018. https://www.canada.ca/en/employment-social-development/corporate/reports/research/nunavut-inuit-labour-force-analysis-summary.html

Government of Canada (2021a). Canada child benefit: How much you can get. https://www.canada.ca/en/revenue-agency/services/child-family-benefits/canada-child-benefit-overview/canada-child-benefit-we-calculate-your-ccb.html

Government of Canada (2021b). Nunavut Inuit Labour Force Analysis report: Executive Summary. Accessed on July 21, 2021. https://www.canada.ca/en/employment-social-development/corporate/reports/research/nunavut-inuit-labour-force-analysis-summary.html

Government of Nunavut (2016). Health Profile Nunavut: Information to 2014. Department of Health. https://www.gov.nu.ca/sites/default/files/files/health_profile_nunavut.pdf

Government of Nunavut (n.d.). *Income Assistance (IA)*. Department of Family Services. https://www.gov.nu.ca/family-services/programs-services/income-assistance

Government of Nunavut (2018). StatsUpdate: 2018 Nunavut Food Price Survey. Nunavut Bureau of Statistics. July 2018. Accessed on July 21, 2021. https://www.gov.nu.ca/sites/default/files/food_price_survey_statsupdate_2018.pdf

Greenwood M, Lindsay NM. (2019). A commentary on land, health, and Indigenous knowledge(s). *Global Health Promotion*. 2019;26(3_suppl):82-86. doi:10.1177/1757975919831262

Grogger, J., Bonars, S. (1993). The socioeconomic consequences of teenage childbearing: Findings from a natural experiment. *Family Planning Perspectives*, *25*(4), 156-161.

Grundy, E. (2009). Women's fertility and mortality in late mid-life: A comparison of three contemporary populations. *American Journal of Human Biology*, *21*(4), 541-547.

doi: 10.1002/ajhb.20953

Grundy, E., Tomassini, C. (2005). Fertility history and health in later life: A record linkage study in England and Wales. Social Science & Medicine, 61: 217-228. doi: 10.1016/j.socscimed.2004.11.046.

Guilbert, E., Forget, G. (1991). Teenage pregnancy in Canada and Quebec. *Canadian Family Physician, 37*, 1184-1192.

Guttmacher Institute. (n.d.). History. Accessed July 1, 2021. https://www.guttmacher.org/about

Hadley, A. Ingham, R., & Chandra-Mouli, V. (2016). Implementing the United Kingdom's ten-year teenage pregnancy strategy for England (1999-2010): How was this done and what did it achieve? *Reproductive Health, 13*(139). doi: 10.1186/s12978-016-0255-4

Hao, L. & Cherlin, A. (2004). Welfare reform and teenage pregnancy, childbirth, and school dropout. *Journal of Marriage and Family, 66*(1), 179-194. DOI:10.1111/j.0022-2445.2004.00012.x-i1

Harder, M.T., Wenzel, G.Q. (2012). Inuit subsistence, social economy and food security in Clyde River, Nunavut. *Arctic, 65*(3), 305-318.

Hayward, A., Cidro, J., Dutton, R., Passey, K. (2020). A review of health and wellness studies involving Inuit of Manitoba and Nunavut. *International Journal of Circumpolar Health, 79*(1). DOI: 10.1080/22423982.2020.1779524

Hayward, A.D., Nenko, I., & Lummaa, V. (2015). Early-life reproduction is associated with increased mortality risk but enhanced lifetime fitness in pre-industrial humans. *Proceedings of the Royal Society B*, 282, 20143053. doi: 10.1098/rspb.2014.3053

Healey, G. (2008). Tradition and culture: An important determinant of Inuit women's health. *International Journal of Indigenous Health, 4*(1), 25-33.

Healey, G., Meadows, L.M. (2007). Inuit women's health in Nunavut, Canada: a review of the literature. *International Journal of Circumpolar Health, 66*(3), 199-216.

Heck, J.L., Jones, E.J., Bohn, D., McCage, S., Goforth Parker, J., Parker, M., Pierce, S.L., Campbell, J. (2021). Maternal mortality among American Indian/Alaska Native women: A scoping review. *Journal of Women's Health, 30*(2), 220-229. DOI: 10.1089/jwh.2020.8890.

Henretta, J.C. (2007). Early childbearing, marital status, and women's health and mortality after age 50. *Journal of Health and Social Behavior*, 48, 254-266.

Herrman, J.W., Waterhouse, J.K. (2011). What do adolescents think about teen parenting? *Western Journal of Nursing Research, 33*(4), 577-592. DOI: 10.1177/0193945910381761

Hoffman, S. (1998). Teenage childbearing is not so bad after all… or is it? A review of the new literature. *Perspectives on Sexual and Reproductive Health, 30*(5), 236-243. https://doi.org/10.1363/3023698

Hokayem, C., Heggeness, M.L. (2014). Living in near poverty in the United States: 1966-2012. Current Population Reports, May 2014. P60-248. U.S. Census Bureau.

Hotz, V.J., McElroy, S.W., Sanders, S.G. (2005). The Costs and Consequences of Teenage Childbearing for Mothers. Chicago Policy Review 1 (Fall 1996): 55-94.

Inuit Tapiriit Kanatami. (2018). Inuit Statistical Profile 2018. Inuit Tapiriit Kanatami. Retrieved from https://www.itk.ca/wp-content/uploads/2018/08/Inuit-Statistical-Profile.pdf

Jones Harris J.L. (1998). Urban African American adolescent parents: Their perceptions of sex, love, intimacy, pregnancy, and parenting. *Adolescence, 33*(132), 833-44.

Jürges, H. (2007). True health vs response styles: exploring cross-country differences in self-reported health. *Health Economics, 16*(2), 163-178. DOI: 10.1002/hec.1134

Karney, B.R. (2021). Socioeconomic status and intimate relationships. *Annual Reviews in Psychology, 72,* 391-414. 10.1146/annurev-psych-051920-013658

Khullar, D., Chokshi, D.A. (2018). Health, income, and poverty: where we are and what could help. Health Policy Brief. *Culture of Health*. October 2018. doi: 10.1377/ hpb20180817.901935

Kirkman, M., Harrison, L., Hillier, L., Pyett, P. (2001). 'I know I'm doing a good job': canonical and autobiographical narratives of teenage mothers. *Culture, Health & Sexuality,* 3(3), 279-294.

Kirmeyer, S.E., Hamilton, B.E. (2011). Childbearing Differences Among Three Generations of U.S. Women. NCHS Data Brief, No. 68. U.S. Department of Health and Human Services, Centers for Disease and Control. National Center for Health Statistics.

Knight, F.H. (1921). *Risk, Uncertainty and Profit*. New York, NY: Sentry Press.

Kral, M.J., Idlout, L., Minore, J.B., Dyck, R.J., Kirmayer, L.J. (2016). *Unikkaartuit:* Meanings of well-being, unhappiness, health, and community change among Inuit in Nunavut, Canada. *American Journal of Community Psycholog,*. 48, 426-438. DOI 10.1007/s10464-011-9431-4.

Kramer, K.L. (2010). Cooperative breeding and its significance to the demographic success of humans. *Annual Review of Anthropology, 39,* 417-436. DOI: 10.1146/annurev. anthro.012809.105054

Kramer, K.L., Lancaster, J.B. (2010). Teen motherhood in cross-cultural perspective. *Annals of Human Biology, 37*(5), 613-628. DOI: 10.3109/03014460903563434

Kumar, A., Singh, T., Basu, S., Pandey, S., Bhargava, V. (2007). Outcome of teenage pregnancy. *Indian Journal of Pediatrics,* 74, 927-931.

Latham, K. and Peek, C.W. (2013) Self-rated health and morbidity onset among late midlife US adults. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 68, 107-116. http://dx.doi.org/10.1093/geronb/gbs104

Lawlor, D.A., Shaw, M. (2002). Too much too young? Teenage pregnancy is not a public health problem. *International Epidemiological Association*, 31, 552-554.

Lightman, E., Mitchell, A. & Heard, D. (2010). Cycling off and on welfare in Canada. *Journal of Social Policy, 39*(4), 523-542. doi:10.1017/S0047279410000279

Mace, R. (2007). The evolutionary ecology of human family size. In L. Barrett & R. Dunbar (Eds.) *Oxford Handbook of Evolutionary Psychology.* Oxford University Press.

Makinson, C. (1985). The health consequences of teenage fertility. *Family Planning Perspectives, 17*(3). 132-139.

Makowski, D., Ben-Shachar, M.S., Chen, S.H.A, Lüdecke, D. (2019). Indices of effect existence and significance in the Bayesian framework. *Frontiers in Psychology*, 10. DOI: 10.3389/fpsyg.2019.02767

Maslowsky, J., Hendrick, C.E., Stritzel, H. (2021). Mechanisms linking teenage mothers' educational attainment with self-reported health at age 50. *BMC Women's Health, 20*(15), 1-9. https://doi.org/10.1186/s12905-020-01150-y

Mathews, T.J., Hamilton, B.E. (2019). Total fertility rates by state and race and Hispanic origin: United States, 2017. *National Vital Statistics Reports*, 68(1). Retrieved from https://www.cdc.gov/nchs/data/nvsr/nvsr68/nvsr68_01-508.pdf

McKay, J. (2020). Nunavut to look at guaranteed basic income program. CBC News. September 28, 2020. https://www.cbc.ca/news/canada/north/nunavut-income-assistance-1.5739646

Mittledorf, J. (2009). Female fertility and longevity. *Age*, 32, 79-84. DOI 10.1007/s11357-009-9116-1.

Moffit, R.A. (2015). The deserving poor, the family, and the U.S. welfare system. *Demography, 52*(3), 729-749. https://doi.org/10.1007/s13524-015-0395-0.

Moisan, C., Baril, C., Muckle, G., Belanger, R.E. (2016). Teenage pregnancy in Inuit communities – gaps still needed to be filled. *International Journal of Circumpolar Health, 75*(1), 31790. DOI: 10.3402/ijch.v75.31790

Mollborn, S. (2017). Teenage mothers today: What we know and how it matters. *Child Development Perspectives, 11*(1), 63-69. DOI:10.1111/cdep.12205.

Moscovitch, A. (2015). Welfare state. Canadian Encyclopedia. August 13, 2015. https://www.thecanadianencyclopedia.ca/en/article/welfare-state

Moynihan D.P. (1965). The Negro Family: The Case for National Action. Office of Policy Planning and Research, United States Department of Labor. https://www.dol.gov/general/aboutdol/history/webid-moynihan

Murray C. 1984. Losing Ground: American Social Policy. New York: Basic Books

Neiterman, E. (2012). Constructing and deconstructing teen pregnancy as a social problem. *Qualitative Sociology Review, 8*(3), 24-47.

Newson, L. & Richerson, P.J. (2013). The Evolution of Flexible Parenting. In M.L. Fisher, J.R. Garcia, and R.S. Chang (Eds.) *Evolution's Empress: Darwinian Perspectives on the Nature of Women.* Oxford University Press.

Nunavut Housing Corporation (2021). Public Housing. Nunavut Housing Corporation. Accessed on June 3, 2021. http://www.nunavuthousing.ca/publichousing

Ontario Federation of Indian Friendship Centres, (2002). Tenuous Connections: Urban Aboriginal Youth Sexual Health and Pregnancy.

Oosterveer, T.M. & Young T.K. (2015) Primary health care accessibility challenges in remote indigenous communities in Canada's North, *International Journal of Circumpolar Health, 74*(1), 29576, DOI: 10.3402/ijch.v74.29576

Palacios, J., Chesla, C., Kennedy, H., Strickland, J. (2012). Embodied meanings of early childbearing among American Indian women: A turning point. *Journal of Midwifery & Women's Health, 57*(5), 205-508. doi:10.1111/j.1542-2011.2012.00165.x.

Patel, P.H., Sen, B. (2012). Teen motherhood and long-term health consequences. *Maternal and Child Health Journal.* 16, 1063-1071. DOI 10.1007/s10995-011-0829-2.

Pepper, G. V., & Nettle, D. (2014). Perceived extrinsic mortality risk and reported effort in looking after health: Testing a behavioural ecological prediction. *Human Nature, 25*(3), 378–392. http://doi.org/10.1007/s12110-014-9204-5.

Pepper G., Nettle, D. (2017). The behavioural constellation of deprivation: Causes and consequences. *Behavioral and Brain Sciences,* 40. e314. http://dx.doi.org/10.1017/ S0140525X1600234X

Peterson, E.E., Davis, N.L., Goodman, D., et al. (2019). Racial/Ethnic disparities in pregnancy-

related deaths – United States, 2007-2016. *MMWR Morbidity Mortal Weekly Report 2019,* 68, 762-765. DOI: http://dx.doi.org/10.15585/mmwr.mm6835a3.

Porter, K.H., Dupree, A. (2001). Poverty trends for families headed by working single mothers: 1993 to 1999. Washington, D.C. Center on Budget and Policy Priorities.

Prosper Canada. (2015). Financial Literacy and Aboriginal Peoples. Prosper Canada Centre for Financial Literacy. Retrieved from http://prospercanada.org/

Proof. (2014). Household food insecurity in Canada. PROOF. https://proof.utoronto.ca/food-insecurity/

Provencher, C., Milan, A., Hallman, S., and D'Aoust, C. (2018). Fertility: Overview, 2012-2016. Report on the Demographic Situation in Canada. Statistics Canada. Retrieved on February 10, 2019 from https://www150.statcan.gc.ca/n1/pub/91-209-x/2018001/article/54956-eng.htm

Public Health Agency of Canada (2007). Housing conditions that serve as risk factors for tuberculosis infection and disease. Downloaded on May 25, 2021 from: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/07vol33/acs09/index-eng.php

Raatikainen, K., Heiskanen, K., Verkasalo, P.K., Heinonen, S. (2005). Good outcome of teenage pregnancies in high-quality maternal care. *European Journal of Public Health, 16*(2), 157-161. doi:10.1093/eurpub/cki158

Rich-Edwards, J.W., Buka, S.L., Brennan, R.T., Earls, F. (2003). Diverging associations of maternal age with low birthweight for black and white mothers. *International Journal of Epidemiology, 32*(1), 83-90. https://doi-org.ezproxy.uleth.ca/10.1093/ije/dyg008

Rosenman, R., Tennekoon, V., and Hill, L.G. (2011). Measuring bias in self-reported data. *International Journal on Behavioral and Healthcare Research, 2*(4), 320-332. 10.1504/IJBHR.2011.043414

Ruspini, E. (2000). Longitudinal research in the social sciences. Social Research Update. Sociology at Surrey. Issue 20. Accessed via https://sru.soc.surrey.ac.uk/SRU28.html.

Santelli, J.S., Kantor, L.M., Grilo, S.A., Speizer, I.S., Lindberg, L.D., Heitel, J., Schalet, A.T., Lyon, M.E., Mason-Jones, A.J., McGovern, T., Heck, C.J., Rogers, J., Ott, M.A. (2017). Abstinence-only-until-marriage: An updated review of U.S. policies and programs and their impact. *Journal of Adolescent Health, 61*(3), 273-280. doi: 10.1016/ j.jadohealth.2017.05.031.

Santelli, J.S., Lindberg, L.D., Grilo, S.A., Kantor, L.M. (2019). Ideology or evidence? Examining the population-level impact of US government funding to prevent adolescent pregnancy. *American Journal of Public Health, 109*(3), 356-357.

Sear, R. (2020). Do human 'life history strategies' exist? *Evolution and Human Behavior, 41*(6), 513-526. https://doi.org/10.1016/j.evolhumbehav.2020.09.004.

Sheehy, T., Roache, C., Sharma, S. (2013). Eating habits of a population undergoing a rapid dietary transition: portion sizes of traditional and non-traditional foods and beverages consumed by Inuit adults in Nunavut, Canada. *Nutrition Journal, 12*(70). https://doi.org/10.1186/1475-2891-12-70.

Simons, R.L., Lei, M.K., Beach, S.R.H., Philibert, R.A., Cutrona, C.E., Gibbons, F.X., Barr, A. (2016). Economic hardship and biological weathering: The epigenetics of aging in a U.S. sample of black women. *Social Sciences & Medicine, 150,* 192-200. DOI: 10.1016/j.socscimed.2015.12.001

Singh, S., and Darroch, J.E. (2000). Adolescent pregnancy and childbearing: Levels and trends in developed countries. *Family Planning Perspectives, 32*(1), 14-23.

Skinner, R.S., Marino, J.L. (2016). England's teenage pregnancy strategy: A hard-won success. *The Lancet*, 388, 10044. https://doi.org/10.1016/S0140-6736(16)30589-X

Spence, (2008). The long-term consequences of childbearing: Physical and psychological well-being of mothers later in life. *Research on Aging, 30*(6), 722-751. doi:10.1177/ 0164027508322575.

Statistics Canada (2017a, July). Prevalence of daily, occasional and non-smoking, by Inuit region, Inuit population aged 15 or older, Canada, 1991, 2001 and 2021. Accessed on September 28, 2021 at: https://www150.statcan.gc.ca/n1/pub/82-003-x/2017002/article/14773/tbl/tbl01-eng.htm

Statistics Canada (2017b, November). Education Highlight Tables, 2016 Census. Accessed September 28, 2021. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/hlt-fst/edu-sco/Table.cfm?Lang=E&T=11&Geo=00&SP=1&view=2&age=2&sex=3

Statistics Canada (2017c). Nunavut [Territory] and Canada [Country] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recenseofment/2016/dp-pd/prof/index.cfm?Lang=E (accessed October 8, 2021).

Statistics Canada (2021a, April). Canadian Income Survey: Territorial Estimates, 2018. Accessed on May 25, 2021 at: https://www150.statcan.gc.ca/n1/daily-quotidien/210401/ dq210401c-eng.htm

Statistics Canada (2021b, May). Table 13-10-0418-01: Crude birth rate, age-specific fertility rates and total fertility rate (live births). https://doi.org/10.25318/1310041801-eng

Statistics Canada (2021c, May). *Retirement age by class of worker, annual.* https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410006001

Stevens, J.W. (1994). Childbearing among unwed African American adolescents: A critique of theories. *Affilia, 11*(3), 278-302.

Tach, L., Edin, K. (2017). The social safety net after welfare reform: Recent developments and consequences for household dynamics. *Annual Review of Sociology*, 43, 541-561. https://doi.org/10.1146/annurev-soc-060116053300

Tamim, H., Al-Sahab, B., Connolly, J. (2014). Teen Motherhood in Canada. Encyclopedia of Quality of Life and Well-Being Research. A. Michalos (eds.). Springer. DOI: 10.1007/978-94-007-0753-5_4076

Thompson, J. (2016). Meeting the needs of adolescent parents and their children. *Paediatrician Child Health, 21*(5), 273.

Tranter, E. (2021a). COVID-19 cases up in Arviat, Nunavut, but no evidence of "uncontrolled" transmission. *CTV News*. March 4, 2021. https://www.ctvnews.ca/canada/covid-19-cases-up-in-arviat-nunavut-but-no-evidence-of-uncontrolled-transmission-1.5333887

Tranter, E. (2021b). Nunavut community of Arviat declares state of emergency regarding COVID-19 case numbers. *The Globe and Mail*. February 24, 2021. https://www.theglobeandmail.com/canada/article-nunavut-community-of-arviat-declares-state-of-emergency-over-rising/

Tweddle, A., Aldridge, H. (2018). Welfare in Canada, 2017. Maytree and Caledon Institute of Social Policy. November 2018.

U.S. Census Bureau (2019). Decennial Censuses, 1890 to 1940, and Current Population Survey, Annual Social and Economic Supplements, 1947 to 2020. U.S. Department of Commerce, Economics and Statistics Administration.

Vang, Z.M., Chau, S., Kobayashi, K.M., Owen, M.J., McKenzie-Sampson, S., Mayrand-Thibert, J., Brass, G.M. (2021). Pain and functional limitations among midlife and older Canadians: the role of discrimination, race, and sense of belonging. *Journals of Gerontology: Psychological Sciences*. DOI: 10.1093/geronb/gbab137

Vinovskis, M.A. (2003). Historical perspectives on adolescent pregnancy and education in the United States. *History of the Family*, 8, 399-421. doi:10.1016/S1081-602X(03)00044-7.

Vowel, C. (2016). Indigenous Writes: A guide to First Nations, Metis, and Inuit issues in Canada. *Highwater Press.*

Wallace, S. (2014). Inuit health: Selected findings from the 2012 Aboriginal Peoples Survey. Statistics Canada. August, 2014. https://www150.statcan.gc.ca/n1/pub/89-653-x/89-653-x2014003-eng.htm#a2

Warren-Findlow, J. (2006). Weathering: Stress and heart disease in African American women living in Chicago. *Qualitative Health Research, 16*(2), 221-237. doi:10.1177/1049732305278651

Webbink, D., Martin, N., Visscher, P. (2008). Does teenage childbearing increase smoking, drinking and body size? *Journal of Health Economics, 27*(4), 888-903. DOI:10.1016/j.jhealeco.2008.02.005.

Wenzel, G. (1995). Ningiqtuq: Resource sharing and generalized reciprocity in Clyde River, Nunavut. *Arctic Anthropology, 32*(2), 43-60.

Wilcox A.J., Russell I.T. (1983). Birthweight and perinatal mortality: On weight-specific mortality. *International Journal of Epidemiology, 12*(3):319-25. doi: 10.1093/ije/12.3.319. PMID: 6685112.

Williams, D.R. (2012). Miles to go before we sleep: racial inequities in health. *Journal of Health and Social Behavior, 53*(3), 279-295. doi:10.1177/0022146512455804.

Williams, D.R., Priest, N., & Anderson, N.B. (2016). Understanding associations among race, socioeconomic status, and health: patterns and prospects. *Health Psychology, 35*(4), 407-411. http://dx.doi.org/10.1037/hea0000242.

Williams, B. (1992). Poverty among African Americans in the Urban United States. *Human Organization, 51*(2). http://www.jstor.org/stable/44126723.

Wong, S.P.W., Twynstra, J., Gilliland, J.A., Cook, J.L., Seabrook, J.A. (2020). Risk factors and birth outcomes associated with teenage pregnancy: A Canadian sample. *Journal of Pediatric and Adolescent Gynecology, 33*(2), 153-159. https://doi.org/10.1016/j.jpag.2019.10.006

Zito, R.C. (2016). Children as saviors? A propensity score analysis of the impact of teenage motherhood on personal transformation. *Youth & Society, 50*(8), 1100-1122. DOI: 10.1177/0044118X16653872

APPENDIX A: SURVEY

PART ONE: Demographic information

1. Name:
2. Birthdate:
3. Relationship status:
    a. Married
    b. Single
    c. Common law
    d. Dating
    e. In a serious relationship with one person
    f. Separated
    g. Divorced
    h. Widowed
4. Do you attend church? (yes/no)
    a. How frequently do you attend church?
5. Did you attend school? (yes/no)
    a. To what level of school did you complete?
6. Do you have any other certificates or degrees? (yes/no)
    a. If yes, what?
7. Do you live in your childhood community? (yes/no)
    a. If no, where did you grow up?
8. Are you adopted? (yes/no)
9. Did you mom and dad live together growing up? (yes/no)
    a. If no, which parent did you live with most of the time?
10. Did you have an income in the last year? (yes/no)
    a. If yes, was it:
        i. Self-employed? (yes/no)
        ii. Salaried or wage income? (yes/no)
    b. Monthly income:
11. Did you earn an income that was not from employment? (yes/no)
    a. If yes, what and amount:
12. Do you live with your partner? (yes/no)
13. Did your partner have an income in the last year? (yes/no)
    a. If yes, was it:
        i. Self-employed? (yes/no)
        ii. Salaried or wage income? (yes/no)
    b. Monthly income:
14. Did your partner earn an income that was not from employment? (yes/no)
    a. If yes, what and amount:
15. How many rooms are in your house?

16. Are the following items present in your household? If they are present, how many of them can be found?
    a. Car/truck
    b. ATV/Honda
    c. Snowmobile
    d. Canoe with a motor
    e. Speed or fishing boat
    f. Dirt bike
    g. Bicycle
    h. Sewing machine
    i. TV
    j. Computer/laptop
    k. Cell phone
    l. iPod
    m. iPad
    n. Radio
17. Does your house have internet access? (yes/no)
    a. If yes, how often do you use it?
        i. Never
        ii. Rarely
        iii. Frequently
        iv. Often
        v. Constantly

PART TWO: Household composition

18. How many people live in your house?
    a. For each household occupant, please state:
        i. Their relationship to you
        ii. Their age
        iii. Their sex
        iv. Whether they are attending/have attended school
        v. The level of education they have completed
        vi. The year they moved in
        vii. How long they've lived in Arviat
19. Who is the primary caregiver of your children?
20. Who do you get, most often, to help you care for your children?
21. Do you have someone in the community to help you with your children? (yes/no)
    a. If yes, who?

PART THREE: Food (in)security

22. How much do you spend on food in a week?
    a. $0-$50
    b. $51-$100
    c. $101-$150
    d. $151-$200
    e. $201-$250
    f. $251-$300
    g. $301-$400
    h. $401-$500
    i. $501-$600
    j. $601-$700
    k. $701-$800
    l. $801-$900
    m. $901-$1000
    n. $1000+
23. How often in the last year did you find the following to be true (often, sometimes, or never)?
    a. Country food did not last
    b. Store food did not last
    c. No food resources in the house
    d. Couldn't afford healthy food

    If you answered "sometimes" or "often" to any of the previous four questions, please answer:

        i. Adults cut the size of meals or skipped meals to make food last
        ii. Adults eat less or skip meals to make food last
        iii. Children skip meals

    e. Winter country food did not last
    f. Winter store food did not last
    g. No food resources in the winter
    h. Could not afford healthy food in the winter

    If you answered "sometimes" or "often" to any of the previous four questions, please answer:

        i. In the winter, adults cut the size of meals or skip meals to make food last
        ii. In the winter, adults eat less or skip meals to make food last
        iii. In the winter, children skip meals

PART FOUR: Reproductive history

24. How many pregnancies have you had?
    a. Age at first pregnancy:
25. How many births have you had?
    a. Age at first birth:
26. How many children have you adopted out?
    a. Of those adopted out, please state:
        i. The adopted child's sex
        ii. Your age when you gave birth to them
27. How many children have you adopted in?
28. For each of your children, please state:
    a. Whether you are their mother (yes/no)
    b. Age at their birth (yes/no)
    c. Whether they were adopted in (yes/no)
    d. Whether they were adopted out (yes/no)
    e. The child's sex
    f. Their age at the time of the survey
29. At what age did you first have your period?
30. Are you currently on birth control? (yes/no)
31. Are you currently trying to get pregnant? (yes/no)
32. Do you plan on getting pregnant? (yes/no)
33. Are you currently pregnant? (yes/no)
    a. If yes, how far along?
34. Are you currently breastfeeding? (yes/no)
    a. If yes, for how long have you been breastfeeding?
35. Do you still experience regular periods? (yes/no)
    a. If no, for how long have you had irregular periods?
36. What do you think about women in Arviat having children so young?

PART FIVE: Health

37. Do you have any health conditions? (yes/no)
    a. If yes, what are they?
38. Do you have high blood pressure? (yes/no)
    a. If yes, for how long have you had it?
39. Do you have diabetes? (yes/no)
    a. If yes, for how long have you had it?
40. How often do you smoke cigarettes?
    a. Daily
    b. Occasionally
    c. Never

41. How many packs of cigarettes do you smoke per month?
    a. 1-2 packs
    b. 2-5 packs
    c. 6-10 packs
    d. More than 10 packs
42. For how many years have you smoked?
43. How would you rate your health?
    a. Poor
    b. Fair
    c. Good
    d. Very good
    e. Excellent

PART SIX: Fertility intentions

44. Do you want more children?
    a. Yes
    b. No
    c. Don't know
45. If yes, how many?
46. How would you plant to have these children?
    a. Give birth to them myself
    b. Adopt them in
47. How likely are you to have more children?
    a. Very unlikely
    b. Somewhat unlikely
    c. Somewhat likely
    d. Very likely
    e. Don't know

PART SEVEN: Mother's reproductive history

48. How many siblings do you have?
49. How many children did your mother adopt in?
50. How many children did your mother adopt out?
51. Do you know how old your mother was when she had her first child? (yes/no)
    a. If yes, how old?
52. What is your mother's current age?
53. For each of your mother's children, please provide:
    a. Whether your mother birthed the child
    b. Whether the child was adopted in
    c. Whether the child was adopted out

d. The sex of the child
e. The child's current age

54. Is your mother currently pregnant?

APPENDIX B: RESULTS FROM ALTERNATIVE ANALYSES WHICH INCLUDED A "TEENAGE PREGNANCY" CATEGORY

Model B.1: Effect of adolescent motherhood on welfare receipt

Adolescent motherhood status had no effect on whether participants received government transfers at the time of the survey, as the estimated standard error of the effects (1.02, 0.98 for the break points between no adolescent pregnancy and pregnancy, and adolescent pregnancy and motherhood respectively) far exceeds the estimated effects (0.00 for each category). Additionally, the credible interval broadly crosses zero for both categories and the probability of direction estimates suggest no certainty in the direction of the effects (PD = 50.25% and 50.32%, respectively, Table B.1). Similarly, I found no effect of fertility, employment, or age on government transfer receipt (PD = 50.75%, PD = 50.32%, and PD = 50.62%, respectively; Table B.1).

Table B.1
Gaussian generalized linear model examining the effect of teenage motherhood status (i.e., adolescent pregnancy, adolescent motherhood, and neither) on the receipt of government transfers (N = 216). "CI" indicates the ends of the 95% credible intervals, which capture the uncertainty of the parameters.

Effect	Estimate	Std Error	Lower 95 CI	Upper 95 CI	PD
Intercept	0.00	1.14	-2.25	2.23	50.00%
Adolescent pregnancy status					
No adolescent pregnancy | Adolescent pregnancy	0.00	1.02	-2.00	2.02	50.25%
Adolescent pregnancy | Adolescent mother	0.00	0.98	-1.90	1.95	50.32%
Fertility	-0.01	1.00	-1.97	1.94	50.75%
Employment (yes)	0.00	0.96	-1.85	1.89	50.32%
Age	-0.01	1.00	-1.95	1.94	50.62%

Model B.2: Effect of adolescent motherhood on living in an overcrowded household

There was no effect of teenage motherhood status on the household crowding ratio at the time of the survey, as the confidence interval spanned widely across zero and the probability of direction estimates for each category – the break point between no adolescent pregnancy and adolescent pregnancy, as well as the break point between adolescent pregnancy and motherhood) was uncertain (PD = 50.62% and PD = 51.02%, respectively, Table B.2); nor were there any effects of household size or years of education completed on household crowding (PD = 51.28%; PD = 50.38%, Table B.2).

Table B.2
Gaussian generalized linear model examining the effect of teenage motherhood status on household crowding (N = 216). "CI" indicates the ends of the 95% credible intervals, which capture the uncertainty of the parameters.

Effect	Estimate	Std Error	Lower 95 CI	Upper 95 CI	PD
Intercept	-0.01	1.03	-1.97	2.06	50.62%
Adolescent pregnancy status					
No adolescent pregnancy | Adolescent pregnancy	-0.01	0.98	-1.95	1.95	50.62%
Adolescent pregnancy | Adolescent mother	-0.02	1.00	-2.00	1.96	51.02%
Household size	0.01	1.00	-1.97	1.95	51.28%
Years of school completed	0.00	0.98	-1.94	1.93	50.38%

Model B.3: Effect of adolescent motherhood status on perceived health at midlife

The effect of adolescent motherhood status on perceived health at midlife is uncertain: the estimate suggests a positive effect, but the credible interval crosses zero, and the probability of direction for this finding is too low to confirm the existence of an effect for both the break points between no adolescent pregnancy and an adolescent pregnancy (PD = 84.65%, Table B.3) and for the break point between adolescent pregnancy and motherhood (PD = 63.78%, Table B.3).

The effect of fertility, education, and food insecurity scores on perceived health were very similar to each other. For each of these variables, the confidence intervals were similarly narrow, although they still crossed zero. There appears to be a small negative effect of each education, food insecurity, and fertility (Table B.3), but the probability of direction lies below the threshold which would indicate a weak effect (PD = 86.98%, PD = 87.40%, and PD = 83.50% for fertility, education, and food insecurity, respectively, Table B.3). Thus, the effects of these three variables are uncertain, but not non-existent.

Further, the effect of smoking on perceived health at midlife is also uncertain. The confidence intervals for the "Never | Occasionally" and "Occasionally | Daily" categories both cross zero, indicating little certainty in the direction of the effect. However, the PD values are higher relative to the other variables included in the model (PD = 94.10% for the break point between the categories of "Never" and "Occasionally"; and PD = 92.00% for the break point between "Occasionally" and "Daily", Table B.3), suggesting that the effect of smoking on health, too, is not non-existent but remains largely uncertain.

Table B.3

Ordered logit regression for Model B.3 (n = 108). Values refer to the average probability on the logit scale. Perceived health thresholds and smoking frequency categories represent the break points - or intercepts - between categories. E.g., "Poor | Fair" indicates the intercept between the "Poor" and "Fair" health status categories. "CI" indicates the ends of the 95% credible intervals, which capture the uncertainty of the parameters.

Effect	Estimate	Std Error	Lower 95 CI	Upper 95 CI	PD
Perceived health thresholds:					
Poor | Fair	-3.48	0.48	-4.45	-2.59	100%
Fair | Good	-1.70	0.35	-2.39	-1.02	100%
Good | Very good	0.96	0.34	0.30	1.61	99.72%
Very good | Excellent	2.76	0.49	1.84	3.76	100%
Adolescent mother status					
No adolescent pregnancy | Adolescent pregnancy	0.28	0.28	-0.24	0.82	84.65%
Adolescent pregnancy | Adolescent mother	0.15	0.41	-0.66	0.96	63.78%
Fertility	-0.22	0.19	-0.59	0.15	86.98%
Education (years completed)	-0.22	0.19	-0.58	0.14	87.40%
Food (in)security score	-0.18	0.19	-0.56	0.18	83.50%
Smoking frequency					
Never | Occasionally	-0.53	0.35	-1.21	0.15	94.10%
Occasionally | Daily	-0.86	0.60	-2.01	0.32	92.00%

Model B.4: Effect of adolescent motherhood on perceived health at midlife (where AFB < 18 years or AFB > 22 years)

The effect of adolescent motherhood status on perceived health at midlife among the outer quartiles of first birth timing is uncertain. Though the estimate indicates a positive effect, the estimated effect size is quite small (0.34 and 0.06 for the break points between no adolescent pregnancy and adolescent pregnancy, and adolescent pregnancy and motherhood, respectively), and the estimated standard errors (0.47 and 0.53, respectively) are larger than the effect sizes (Table B.4). Further, the credible interval of the effects cross zero, and the probability of direction for these findings illustrates that any positive effects are uncertain (PD = 77.33 % for

the break points between no adolescent pregnancy and adolescent pregnancy, and PD = 53.90 % for the break points between adolescent pregnancy and motherhood, Table B.4).

Here, the effect of fertility was less certain than Model B.3, where there appears to be a negative effect of fertility on perceived health, yet there remains uncertainty as the probability of direction estimate does not surpass the threshold to be considered a weak effect (PD = 68.38%, Table B.4). Like Model B.3, the effect of food insecurity scores and education on perceived health were similar to each other yet are uncertain (Table B.4). Although there is some suggestion of a negative effect of both education and food insecurity, the confidence intervals for each variable cross zero and are uncertain (PD = 85.32%, and PD = 82.08% for education and food insecurity, respectively, Table B.4).

Within the present subset of data, there was only one participant who reported smoking "occasionally," and this datapoint was thus considered an outlier and removed from this analysis. This left only "Daily" and "Never" as smoking frequency categories. The effect of smoking on perceived health at midlife among this subset is negative, though uncertain, as its confidence intervals reach across zero and the PD is 89.35% (Table B.4).

Comparatively, there were limited differences between Model B.3 and Model B.4 regarding the effects of adolescent motherhood status on perceived health at midlife.

Table B.4

Ordered logit regression examining Model B.4 (n =42). Values refer to the average probability on the logit scale. Perceived health thresholds and smoking frequency categories represent the break points - or intercepts - between categories. E.g., "Poor | Fair" indicates the intercept between the "Poor" and "Fair" health status categories. "CI" indicates the ends of the 95% credible intervals, which capture the uncertainty of the parameters.

Effect	Estimate	Std Error	Lower 95 CI	Upper 95 CI	PD
Perceived health thresholds:					
Poor | Fair	-3.07	0.58	-4.26	-1.99	100%
Fair | Good	-1.30	0.42	-2.14	-0.51	99.92%
Good | Very good	1.19	0.41	0.43	2.01	99.90%
Very good | Excellent	2.24	0.53	1.27	3.34	100%
Adolescent mother status					
No adolescent pregnancy | Adolescent pregnancy	0.34	0.47	-0.57	1.28	77.33%
Adolescent pregnancy | Adolescent motherhood	0.06	0.53	-1.00	1.10	53.90%
Fertility	-0.19	0.38	-0.93	0.55	68.38%
Education (years completed)	-0.36	0.34	-1.01	0.30	85.32%
Food (in)security score	-0.29	0.31	-0.90	0.31	82.08%
Smoking frequency					
Never | Daily	-0.62	0.48	-1.54	0.33	89.35%

Model B.5: Effect of adolescent motherhood on smoking frequency at midlife

Results of Model B.5 indicate that adolescent motherhood status has an uncertain effect on smoking frequency at midlife, as the standard error of the effects (0.31 and -0.54 for the break points between no adolescent pregnancy and adolescent pregnancy, and adolescent pregnancy and motherhood, respectively) is larger than the estimated effect itself (0.34 and 0.61, respectively). In addition, the credible intervals are wide, cross zero, and the probability of direction is 81.25% and 81.83% for the break points between no adolescent pregnancy and adolescent pregnancy, and adolescent pregnancy and motherhood, respectively (Table B.5), indicating uncertainty in both the direction of the effects and their magnitude. As such, there is no discernable effect of adolescent motherhood status on frequency of smoking at midlife.

Additionally, there was no effect of either education or fertility on smoking frequency. Both variables have small estimated effects (0.13 and 0.04, respectively, Table B.5) which are smaller than the standard errors (0.23 and 0.24 for each education and fertility, Table B.5). Illustrated in Figure 15, the credible intervals for each variable cross zero, and probabilities of direction remain low, at 72.52% and 50.95% for education and fertility (Table B.5).

Table B.5
Ordered logit regression for Model B.5 (n = 108). Values refer to the average probability on the logit scale. Health status thresholds represent the break points - or intercepts - between two adolescent mother status and health status categories. E.g, "Poor | Fair" indicates the intercept between the "Poor" and "Fair" health status categories. "CI" indicates the ends of the 95% credible intervals, which capture the uncertainty of the parameters.

Effect	Estimate	Std Error	Lower 95 CI	Upper 95 CI	PD
Smoking frequency:					
Never | Occasionally	-1.64	0.32	-2.51	-1.26	100%
Occasionally | Daily	-1.56	0.30	-2.18	-1.01	100%
Adolescent mother status					
No adolescent pregnancy | Adolescent pregnancy	0.31	0.34	-0.35	0.99	81.25%
Adolescent pregnancy | Adolescent motherhood	-0.54	0.61	-1.79	0.56	81.83%
Education (years completed)	0.13	0.23	-0.33	0.61	72.52%
Fertility	0.04	0.24	-0.45	0.48	50.95%

Model B.6: Effect of adolescent motherhood on smoking quantity at midlife

Table B.6 presents descriptive statistics regarding the average number of cigarette packs smoked by participants per month (where a pack, on average, includes twenty cigarettes). Results indicate that adolescent motherhood status appears to have a positive effect on smoking quantity, as the estimate increases across the categories of no adolescent pregnancy and adolescent pregnancy (-0.48) and adolescent pregnancy and motherhood (0.18). However, the effects appear uncertain, as the confidence intervals broadly span zero and the probabilities of direction sits are

below the significant thresholds (at 92.35% and 63.32% for the break points between no adolescent pregnancy and adolescent pregnancy, and adolescent pregnancy and motherhood, respectively) (Table B.7).

Additionally, there seems to be a positive effect of education, though the probability of direction does not surpass the threshold to be considered a weak effect (PD = 93.83%, Table B.7). Fertility continues to have an uncertain – though not non-existent – effect on smoking quantity (PD = 83.78%, Table B.7).

Table B.6

Descriptive statistics for the subset of the sample population, including only those aged 40 years and above and who responded to the question regarding smoking quantity, with differentiation for those who were adolescent mothers, those who only had adolescent pregnancies, and those who had neither (i.e., "no adolescent pregnancy" in the table below) (N_{all} = 64; $N_{adolescent\ mothers}$ =25; $N_{adolescent\ pregnancy}$ =7; $N_{no\ adolescent\ pregnancy}$ = 32).

	Adolescent mothers		***Adolescent pregnancy***		***No adolescent pregnancy***	
	Count	***%***	***Count***	***%***	***Count***	***%***
Smoking quantity (monthly)						
1-2 packs	5	20	0	0	3	9.38
3-5 packs	12	48	6	85.71	11	34.38
6-10 packs	4	16	0	0	14	43.74
More than 10 packs	4	16	1	14.29	4	12.50

Table B.7

Ordered logit regression examining Model B.6 (N = 64). Values refer to the average probability on the logit scale. Health status thresholds represent the break points - or intercepts - between two health status categories. E.g, "1-2 packs | 3-5 packs" indicates the intercept between the "1-2 packs" and "3-5 packs" categories. "CI" indicates the ends of the 95% credible intervals, which capture the uncertainty of the parameters.

Effect	**Estimate**	**Std Error**	**Lower 95 CI**	**Upper 95 CI**	**PD**
Smoking quantity (monthly):					
1-2 packs | 3-5 packs	-1.85	0.37	-2.59	-1.18	100%
3-5 packs | 6-10 packs	0.39	0.29	-0.16	0.96	90.83%
6-10 packs | more than 10 packs	1.90	0.36	1.23	2.65	100%
Adolescent mother status					
No adolescent pregnancy | Adolescent pregnancy	-0.48	0.43	-1.15	0.18	92.35%
Adolescent pregnancy | Adolescent motherhood	0.18	0.52	-0.87	1.21	63.32%
Education (years completed)	0.34	0.23	-0.09	0.78	93.83%
Fertility	0.22	0.23	-0.22	0.66	83.78%