



March 2013

The Physical and Mental Health of Off-Reserve First Nations Children of Teen Mothers

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Recommended Citation

Guèvremont, A., Kohen, D. (2013). The Physical and Mental Health of Off-Reserve First Nations Children of Teen Mothers. *The International Indigenous Policy Journal*, 4(1).

DOI: 10.18584/iiipj.2013.4.1.2

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Abstract

The teen birth rate for First Nations women is higher than the teen birth rate for non-Aboriginal women. While associations between physical and behavioural outcomes have been examined in non-Aboriginal children with teen mothers, fewer studies have focused on First Nations children of teen mothers. This study uses data from the 2006 Aboriginal Children's Survey to compare physical and mental health outcomes of 2- to 5-year-old off-reserve First Nations children of teenage and older mothers. There were few differences in physical health outcomes between off-reserve First Nations children of teen mothers and older mothers with the exception of dental health. However, for all of the mental health outcomes examined, child prosocial behaviours, emotional symptoms, inattention-hyperactivity, and conduct problems, scores were poorer for off-reserve First Nations children of teen mothers. Although the differences in prosocial and emotional problems were attributable to socio-economic factors, differences in child inattention-hyperactivity and conduct problems were not. Future research would help our understanding of the differences in outcomes between off-reserve First Nations children of teen and older mothers.

French Abstract

LA SANTÉ PHYSIQUE ET MENTALE DES ENFANTS DES PREMIÈRES NATIONS VIVANT HORS DES RÉSERVES ET NÉS DE MÈRES ADOLESCENTES

Anne Guèvremont et Dafna Kohen

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Résumé

Le taux de natalité à l'adolescentes femmes des Premières Nations est plus élevé que celui des femmes non autochtones. Bien que les associations entre les résultats physiques et comportementaux aient été examinées chez les enfants non autochtones nés de mères adolescentes, un moins grand nombre d'études ont mis l'accent sur les enfants des Premières Nations nés de mères adolescentes. Cette étude utilise les données recueillies dans le cadre de l'Enquête sur les enfants autochtones de 2006 afin de comparer les résultats en matière de santé physique et mentale des enfants des Premières Nations vivant hors des réserves nés de mères adolescentes et de mères plus âgées, qui sont âgés de deux à cinq ans. Les résultats sur le plan de la santé physique diffèrent peu entre les enfants des Premières Nations vivant hors des réserves nés de mères adolescentes et de mères plus âgées, à l'exception de la santé dentaire. Toutefois, pour ce qui est de tous les résultats en matière de santé mentale examinés – comportements prosociaux chez les enfants, symptômes affectifs, inattention et hyperactivité et problèmes de comportement – ceux obtenus par les enfants des Premières Nations vivant hors des réserves nés de mères adolescentes étaient plus faibles. Les différences en matière de problèmes prosociaux et affectifs étaient attribuables à des facteurs socioéconomiques, ce qui n'était pas le cas des différences sur les plans de l'inattention et de l'hyperactivité ainsi que des problèmes de comportement. Des recherches futures pourraient améliorer notre compréhension des différences touchant les résultats entre les enfants des Premières Nations vivant hors des réserves nés de mères adolescentes et de mères plus âgées.

Remerciements: Cette étude a été financée par Affaires autochtones et Développement du Nord Canada. Les auteurs tiennent à remercier Sacha Sénécal, Eric Guimond, Chris Penney et Marc Fonda pour leurs commentaires utiles concernant les versions provisoires de ce manuscrit.

Spanish Abstract

SALUD FÍSICA Y MENTAL DE LOS HIJOS DE MADRES ADOLESCENTES DE LAS PRIMERAS NACIONES QUE VIVEN FUERA DE LAS RESERVAS

Anne Guèvremont y Dafna Kohen

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Resumen

La tasa de natalidad de las adolescentes de las Primeras Naciones es mayor que la de las adolescentes no indígenas. Aunque se han estudiado las relaciones entre los resultados físicos y los del comportamiento en los hijos no indígenas de adolescentes, pocos estudios se han centrado en los hijos de adolescentes de las Primeras Naciones. En este estudio se emplean datos de la encuesta sobre los niños indígenas de 2006 para comparar los resultados en materia de salud física y mental de hijos de 2 a 5 años de adolescentes de las Primeras Naciones que viven fuera de las reservas y de madres de mayor edad. Existen pocas diferencias en los resultados relativos a la salud física entre los hijos de adolescentes de las Primeras Naciones que viven fuera de las reservas y los de madres de mayor edad, con excepción de la salud dental. Sin embargo, en todos los resultados sobre salud mental examinados —comportamientos prosociales de los niños, síntomas emocionales, inatención-hiperactividad y problemas de conducta—, el puntaje fue peor para los hijos de adolescentes de las Primeras Naciones que viven fuera de las reservas. Aunque las diferencias en los problemas prosociales y emocionales pueden atribuirse a factores socioeconómicos, las diferencias en el ámbito de la inatención-hiperactividad y en los problemas de conducta no se justifican de la misma manera. Las investigaciones futuras nos podrían ayudar a comprender las diferencias de resultados entre los hijos de adolescentes de las Primeras Naciones que viven fuera de las reservas y los de madres de mayor edad.

Agradecimiento: Este estudio fue financiado por el Ministerio de Asuntos Aborígenes y de Desarrollo del Norte de Canadá. Las autoras agradecen a Sacha Sénécal, Eric Guimond, Chris Penney y Marc Fonda sus valiosos comentarios de la versión preliminar de este documento.

Keywords

Aboriginal, child behaviour, child health, maternal age, parenting, socio-economic factors

Acknowledgments

This study was funded by Aboriginal Affairs and Northern Development Canada. The authors thank Sacha Sénécal, Eric Guimond, Chris Penney and Marc Fonda for their helpful comments on earlier drafts of this manuscript.

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The Physical and Mental Health of Off-Reserve First Nations Children of Teen Mothers

Aboriginal children represent a large and growing proportion of the Canadian population. Whereas 31% of the off-reserve First Nations population is under 15 years of age, only 18% of all Canadians are under 15 years (Statistics Canada, 2009). Furthermore, Aboriginal women are more likely to be teen mothers than other Canadian women. The teen birth rate for First Nations women is higher than the teen birth rate for non-Aboriginal women – 1 out of 10 teenage First Nations woman had a child in 2004, compared to 1 in 50 for all Canadian teenage women (Guimond & Robitaille, 2008; Robitaille, Kouaouci, & Guimond, 2004). Higher rates of teen motherhood for First Nations as compared to non-Aboriginal women are supported by the 2006 Aboriginal Children's Survey (Zukewich & O'Donnell, 2008), which demonstrates that 27% of off-reserve First Nations children under the age of 6 had mothers between the ages of 15 and 24, compared to 8% of non-Aboriginal children.

Background

Children of teen mothers face certain challenges, both in terms of physical and mental health. Although a large amount of research has examined the outcomes of non-Aboriginal children of teenage mothers, little research has looked at the outcomes for Aboriginal children of teen mothers. Research conducted with the non-Aboriginal population has shown that children of teen mothers have worse health (including higher rates of low birth weight, small for gestational age, and unintentional injuries) and poorer behaviour compared to the children of older mothers (Wolfe & Perozek, 1997). However, in some studies the differences in outcomes between children of teen and older mothers are explained by differences in socio-economic factors (Pittard, Laditka, & Laditka, 2008). Children of younger mothers often live in more difficult circumstances: they are more likely to live in low-income families, have a lone parent, and have mothers who did not graduate from high school (Dahinten, Shapka, & Willms, 2007). Some research shows that once these differences are accounted for, there are no longer differences in the outcomes between children of teen and older mothers.

Several studies of non-Aboriginal mothers examined the associations between teen motherhood, birth outcomes, and socio-demographic factors. In terms of birth outcomes, children of teen mothers are more likely to be premature, be small for gestational age, and have low birth weight (Fraser, Brockert, & Ward, 1995). These birth outcomes are often associated with later health problems (Hack et al., 2002; Hack, Klein, & Taylor, 1995). In their study of births to women under 25 years of age in the United States, Chen et al. (2007) found that even after adjustment for confounding factors (state of birth, maternal race, marital status, tobacco smoking and alcohol use during pregnancy, and prenatal care status), teenage pregnancy (mothers aged 10 to 19 years) was independently associated with the increased risks of pre-term delivery, low birth weight, being small for gestational age, and neonatal mortality (infant death in the first 28 days of life). Similarly, Amini, Catalano, Dierker, and Mann (1996) found higher rates of pre-term delivery and small size relative to gestational age in infants of mothers aged 12 to 15 years compared to mothers aged 20 or higher. These results controlled for ethnicity, socio-economic status, parity (whether it was the mother's first or later birth), and marital status. In another study based in Utah, United States, Fraser et al. (1995) found that infants of mothers aged 19 and younger were more likely to be premature, have low birth weight, and be small for gestational age compared to infants of mothers aged 20 to 24, even after adjusting for the mother's

education and marital status. Thus, differences in the health of children of teenage mothers emerge early and are sustained even when socio-demographic factors are controlled.

Several studies have examined the health status of preschool and school-aged children of teenage mothers. Wolfe and Perozek (1997) found that 4 to 11-year-old children of teen mothers (17 or under at the birth of the child) were more likely to be rated as being in fair or poor health compared to children of non-teen mothers who were more likely to be rated in good, very good, or excellent health. Although the study controlled for child's age and sex, it did not control for socio-economic status. Shaw, Lawlor, and Najman (2006) found that children of young mothers (less than 18 years at the time of first birth) were no more likely to report being in poor health than children of older mothers (over the age of 18 at first birth). However, children of young mothers were more likely to report a large number of dental fillings at age 14, even when adjusted for family income, maternal education, maternal depression, and family structure. In a study of children born in Sweden from 1987 to 1993, Ekéus, Christensson, and Hjern (2004) found that children of teenage mothers (19 years and younger) had a higher risk of hospital admission for violent as well as unintentional injuries compared to children of mothers at least 32 years of age at the time of the child's birth. When the models were adjusted for socio-economic variables, indicators of parental substance misuse, and psychiatric illness, the risk for children of younger mothers decreased slightly but remained well above that of children with older mothers.

Several studies have also examined the behavioural outcomes of non-Aboriginal children of teenage mothers. Some of these studies have found higher rates of behaviour problems among children born to teen mothers compared to those born to older mothers (Dahinten & Willms, 2002; Moffitt & Study Team, 2002), whereas others did not (Moore, Morrison, & Green, 1997). In a nationally representative study of Canadian children, Dahinten et al. (2002) found that the nearly double the percentage of preschool children in the group with mothers who had their first child at age 18 or 19 had behaviour problems compared to those whose mothers who had delayed childbearing until their twenties. This increased prevalence was reduced, but still significantly higher, when adjusted for family background (family income, parent's education, lone parent status). Moffitt et al. (2002) found that the 5-year-old children of young mothers (aged 15 to 20) in Britain were rated by both parents and teachers as having more emotional and behavioural problems. However, Moffitt et al. (2002) did not adjust for any socio-economic factors. Turley (2003) found that at age 5, children of younger mothers had worse scores on math, reading, and vocabulary tests compared to children of older mothers, but that there were no significant differences in behaviour problems after controlling for the background characteristics of the mothers. Similarly, Terry-Humen, Manlove, and Moore (2005) found that kindergarten children born to mothers aged 17 and younger had higher levels of externalizing and internalizing problem behaviours compared to children of mothers aged 22 to 30, but that the differences were no longer significant when adjusted for family structure, socioeconomic status, and the educational attainment of the child's grandmother. Shaw et al. (2006) found that 14-year-old children of young mothers (less than 18 years at the time of first birth) had higher rates of behaviour problems (defined as any trouble with police or suspension from school) compared to children of mothers who were over 18 years when pregnant, even when adjusting for family income, maternal education, maternal depression, and family structure. Moore et al. (1997) found fewer behaviour problems among 4 to 14-year-old children of mothers aged 19 and younger at age of birth, compared to those with mothers aged 20 to 21 at birth. Findings from these studies are mixed possibly due to

inconsistent controls for socio-economic factors and different methods of defining teen mothers and differences assessing behavior problems.

While associations between physical and behavioural or mental health outcomes have been examined in children of non-Aboriginal teen mothers, less research has been conducted with children of Aboriginal teen mothers. Qualitative research has reported on the circumstances surrounding adolescent pregnancy, as well as the needs of Aboriginal teenage mothers. The Ontario Federation of Indian Friendship Centres (2002) collected data from 340 female and male youth (parents and non-parents), front-line workers, and grandmothers (elders and teachers) with the goal of seeking ways to prevent unwanted pregnancies among Aboriginal youth. They found that, “although pregnancy is something of a social norm, teens who become pregnant can still feel stigmatized and isolated” (Ontario Federation of Indian Friendship Centres, 2002, p. 11). They also found that many of the pregnant and parenting youth are not supported by their families and/or their parenting partner, and are in need of trusting relationships with adults. Murdock (2009) conducted interviews with 28 young Aboriginal mothers living in Winnipeg. The mothers identified many challenges including financial hardship, lack of parenting and life skills, limited access to adequate housing and childcare, and difficulties with transportation. The women expressed a strong desire to further their education, find employment, and have more free time for self-care. Although these studies provide information on the environments in which the children of teen mothers are growing up, to our knowledge associations with health and behavioural outcomes have not been documented for children of Aboriginal teen mothers.

Both Aboriginal and non-Aboriginal teenage mothers experience different socio-economic circumstances compared to older mothers. Numerous studies have found that teenage mothers are more likely to be single parents and have lower levels of income and education (Dahinten et al., 2002; Moffitt et al., 2002; Terry-Humen et al., 2005). In Canada, Dahinten and Willms (2002) found that, for the mothers of 2 to 11-year-olds, 51% of mothers who were 14 to 17-years-old at their first birth were single parents compared to only 12% of first-time mothers who were aged 26 to 30 years. In addition, the mean income of mothers who were 14 to 17-years-old at the time of their first birth was approximately \$25,000 compared to \$53,000 for those who became mothers between the ages of 26 and 30.

Garner, Guimond, and Sénécal (2013, in this issue) found that Aboriginal women who became mothers in their teens had significantly worse socio-economic outcomes when compared to women who postponed motherhood until their 20s. These included lower incomes and a higher likelihood of living in poor housing conditions. While Aboriginal teenage mothers were less likely to graduate high school than older mothers, teenage mothers who had also graduated high school had better socio-economic outcomes (i.e., higher personal and household income, and less likely to be living in overcrowded housing or in housing in need of major repair) than Aboriginal mothers who had children in their 20s. This suggests that education and high school completion, in particular, play an important role in the lives of Aboriginal teen mothers.

In what follows, we use the 2006 Aboriginal Children’s Survey (Statistics Canada, 2008) to examine the physical and mental health of 2 to 5-year-old children of Aboriginal teen mothers. The preschool period is an important time in a child’s development for a number of reasons. During the early years,

the foundations for many skills are laid including emotional regulation, behavioral skills, and the regulation of attention (Duncan et al., 2007; Tremblay et al., 2004). Moreover, children, who during their early years show a disadvantage in behavioral outcomes, may not only be at risk for future behavior problems and poor mental health – particularly if extreme (Côté, Vaillancourt, LeBlanc, Nagin, & Tremblay, 2006; Crick, 1996; Romano, Tremblay, Farhat, & Côté, 2006) – but they may also have poor social skills, poor peer relations, difficulties in school adjustment, and lower academic achievement (Alexander, Farhat, & Dauber, 1993; McClelland, Morrison, & Holmes, 2010; O'Neil, Welsh, Parke, Wang, & Strand, 1997).

This study had two goals. The first was to examine whether or not there are differences in the physical health and/or mental health (as assessed by behavioral outcomes) of First Nations off-reserve children born to mothers who started childbearing in their teens compared to First Nations off-reserve Aboriginal children born to mothers who started childbearing when they were older. The second goal was to examine the role of socio-economic factors in these associations. Since teen mothers (and their children) are more likely to live in disadvantaged socio-economic circumstances (Garner et al., 2013), it is possible that these conditions contribute to poor outcomes for children, rather than teen childbearing, *per se*.¹ This article addresses the following research questions:

1. Are there differences in the physical and behavioural outcomes of off-reserve First Nations children of teenage mothers compared to off-reserve First Nations children of older mothers?
2. Do socio-economic differences explain the differences in physical and behavioural outcomes between off-reserve First Nations children of teen mothers and off-reserve First Nations children of older mothers?

Data Source, Variables, and Methodology

Data Source

As noted above, this study is based on data from the 2006 Aboriginal Children's Survey (Statistics Canada, 2008). The Aboriginal Children's Survey (ACS) provides information on the early development of Aboriginal children and the social and living conditions in which they are growing and learning. The ACS provides an extensive data set about Aboriginal (Métis, Inuit, and off-reserve First

¹“Mediation” occurs when the relationship between two variables is explained by another variable or by a set of variables. To examine whether the relationship between having a teenaged mother and children's outcomes (physical health and behavioural outcomes) was mediated by socio-economic factors, we addressed four questions: (a) Is having a teenaged mother associated with different outcomes than having a non-teen mothers? (b) Do children of teen mothers live in lower socio-economic conditions? (c) Do children living in lower socio-economic conditions have different outcomes? And (d) If we assume that all children live in similar socio-economic conditions (also known as controlling for socio-economic conditions), is having a teenaged mother still associated with poorer outcomes? If there is an association between having a teen mother and child outcomes *prior* to controlling for socio-economic conditions and then no statistically significant association between having a teen mother and child outcomes *after* controlling for socio-economic conditions in the analytic models, it would suggest that the difference in outcomes for children of teenaged mothers are mediated by differences in socio-economic conditions rather than teenaged parenthood *per se*.

Nations) children under 6 years of age in urban, rural, and northern locations across Canada. The study we are reporting on in this chapter focused on First Nations children aged 2 to 5 years living off-reserve. Behavioural outcomes are only available on the ACS for children aged 2 and older, and data is not available on the ACS for First Nations children living on-reserve; thus, limiting the generalizability of the results to First Nations children living off-reserve.

We classified children in our data sample in the following manner: children whose parents identified them as a Treaty or Registered Indian were classified as *Registered Indian*; children whose parents identified them as North American Indian, but not as a Treaty or Registered Indian, were classified as *non-Registered Indian*; and, children who were identified with more than one of the Aboriginal groups (non-Registered Indian, Métis, Inuit) were excluded. Registered Indians or "Status Indians" are people who are entitled to have their names included on the Indian Register, an official list maintained by the federal government. Certain criteria determine who can be registered as a Status Indian. Only Registered Indians are recognized as Indians under the Indian Act (1985), which defines an Indian as "a person who pursuant to this Act is registered as an Indian or is entitled to be registered as an Indian" (Section 2(1) "Indian"). Status Indians are entitled to certain rights and benefits under the law (for example, Registered Indians are eligible to receive services such as vision and dental benefits under the *Non-Insured Health Benefits Program* (Health Canada, 2009), which may lead to different outcomes for Registered and non-Registered Indians).

Variables

Age of mother at first birth. Children were included in the study if the person who responded to the survey was their birth mother. The age of the child's mother at first birth² was determined by looking at the difference between the mother's current age and the age of the oldest sibling living in the household. If the difference between the mother's age on the day of the survey and the age of the oldest child was less than 20 years, she was classified as a teenage mother.³ If the difference was greater than or equal to 25 years, the mother was categorized as an older mother. If the difference was less than 12 years, the child was excluded.

Physical health. Mothers were asked a number of questions about their child's health: *Health status*: "In general, would you say his or her health is ..." Response categories included: excellent, very

²The age of the mother when she started having children (regardless of her age when she had the survey child) was used in this study as opposed to age of mother when the survey child was born. We selected age of mother at first birth based on the assumption that the factors that led the mother to begin childbearing during adolescence

³In our analyses, we categorized teenaged mothers as mothers aged 12 to 19 when they started having children. Some research has examined whether children of mothers who start having children in their late teens (age 18 or 19) differ from children whose mothers started having children in their early teens. This research has generally shown that older teen mothers have certain (socio-economic) advantages and fewer differences compared to older mothers. We examined whether or not socio-economic differences were apparent for older as compared to younger teen mothers by dividing the group into two categories: 12 to 17 and 18 to 19-year-olds. Children of young teen mothers, compared to children of older teen mothers, had mothers with similar levels of education and were as likely to be in low-income or lone parent families. Logistic regression analyses showed similar results for older and younger teen mothers so these two groups are combined in the analyses presented (results are available upon request).

good, good, fair, and poor. These categories were dichotomized with responses of “excellent” and “very good” compared to “good,” “fair,” and “poor.” Previous research has used this dichotomy for self- or parent-rated health (Shields & Shooshtari, 2001; Tremblay, Dahinten, & Kohen, 2003). *Chronic conditions*: “Does [child] have any of the following long term conditions that have lasted or are expected to last 6 months or more?” A child was considered as having a chronic condition if their mother reported they had one of a list of health conditions.⁴ Several specific chronic conditions were also examined separately based on their prevalence and their importance for Aboriginal children (Smylie, 2009). These conditions included: allergies, asthma, two or more ear infections in the last year, and dental problems.

Mental health. Mental health was assessed with the Goodman Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997). The SDQ is a parent-reported instrument designed to provide information on children’s behaviors and relationships. The SDQ consists of 25 items grouped into 5 subscales. In the ACS, mothers answered several questions regarding their child’s behaviour. This questionnaire and its subscales have been validated for use with Aboriginal children, demonstrating that four of the five original subscales are valid for First Nations Children (the peer problems subscale was omitted) (Oliver, Findlay, McIntosh, & Kohen, 2009). All questions included the following possible responses: not true, somewhat true, or certainly true. Exact wording of all items is in Appendix A. We used the four sub-scales suggested by Oliver et al. (2009), which are as follows:

- *Prosocial Behaviour*: this sub-scale is composed of ten items including questions such as “Is he/she ... considerate of other peoples’ feelings?” And “Is he/she ... helpful if someone is hurt, upset, or feeling ill?”
- *Emotional Symptoms*: this subscale is composed of five items including questions such as “Is he/she ... often unhappy, depressed, or tearful?” And “Is he/she nervous or clingy in new situations, easily loses confidence?”
- *Hyperactivity/Inattention*: this subscale is composed of three items including questions such as “Is he/she ... constantly fidgeting or squirming?” And “Is he/she ... restless, overactive, cannot stay still for long?”
- *Conduct Problems*: this final subscale is composed of four items including questions such as, “Is he/she ... often fights with other children or bullies them?” And “Is he/she ... often argumentative with adults?”

Other variables. We examined several socio-economic variables to determine their role in explaining differences in outcomes between children of Aboriginal teen mothers and older mothers. These included: mother’s education (currently in school, not in school and not a high school graduate, not in school and a high school graduate), family structure (lone parent or two parent family), low-

⁴ Conditions included asthma, chronic bronchitis, tuberculosis, diabetes, hypoglycemia, heart disease, kidney disease, epilepsy, cerebral palsy, Down’s syndrome, spina bifida, attention deficit hyperactivity disorder, anxiety or depression, fetal alcohol spectrum disorder, autism, hearing impairment, visual impairment, speech or language difficulties, iron deficiency anaemia, or any other long term condition or disease.

income family (family income below low income cut-off [LICO]),⁵ and number of people living in the household.

Methodology

Descriptive analyses (percentages and means) were used to describe the socio-economic characteristics and physical and mental health of off-reserve First Nations children according to the age of their mother when she began childbearing. Differences between the characteristics of off-reserve First Nations children of teenage and older mothers were assessed with t-tests. Multiple regression was used to examine the association between the age of the mother when she first gave birth and each mental health outcome, while controlling for socio-economic characteristics. Analyses were based on survey data weighted to be representative of the 2006 Census counts of children younger than age 6 in Canada according to different age groups (Statistics Canada, 2008). The bootstrap method was used to account for the complex sampling design used by the survey (Rao, Wu, & Yue, 1992; Rust & Rao, 1996).

Research Findings

The remainder of this article is a discussion of the findings of our research. In general, there were few differences in the physical health outcomes for Aboriginal children born to teen mothers compared to Aboriginal children born to older mothers. Differences in behavioural outcomes were demonstrated, although some of these differences were found to be attributed to socio-economic factors, rather than differences in childbearing age; other outcomes were not explained by differences in socio-economic factors between teen and older mothers.

One-third of Registered Indian children and one-fifth of non-Registered Indian children living off-reserve had mothers who started having children as teens.

About one-third (33%) of Registered Indian children and one-fifth (23%) of non-Registered Indian children had mothers who had their first child as a teen (Figure 1). Another 38% of Registered Indian children and 34% of non-Registered Indian children had mothers who started having children when aged 20 to 24. The remaining 29% of Registered Indian children and 44% of non-Registered Indian children had mothers who starting having children when aged 25 or older.⁶

⁵ The low-income cut-off (LICO) is a statistical measure of the income thresholds below which families likely devote a larger-than-average share of their income to the necessities of food, shelter, and clothing (Statistics Canada, 2009).

⁶ Although a high percentage of First Nations children had mothers who started having children in their teen years, the mothers' current age at the time of the survey was over age 25 for half of children whose mothers started having children as teens and four out of five children whose mother started having children when aged 20 to 24.

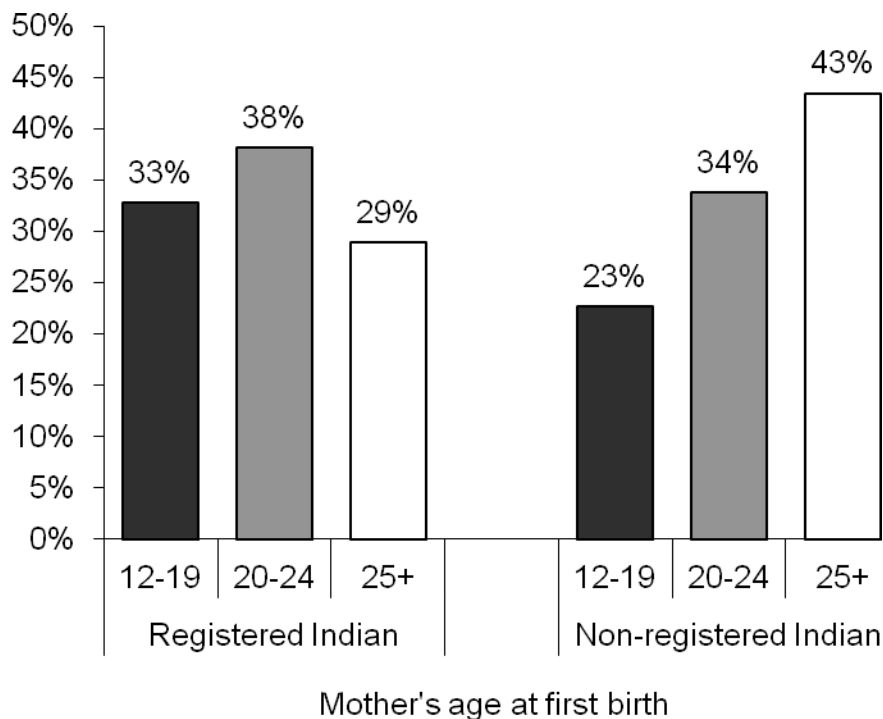


Figure 1: Percentage of off-reserve First Nations children aged 2 to 5 with mothers who first gave birth at age 12 - 19, 20 - 24, and 25+.

Source: Aboriginal Children’s Survey, 2006

These numbers demonstrate that a relatively high percentage of Aboriginal children, registered or not, have mothers that began giving birth as teenagers. Moreover, 71% of Registered Indian children have mothers who gave birth before they turned 24-years-old and this is also true for 57% of their non-Registered counterparts.

Off-reserve First Nations children of teen mothers lived in more disadvantaged socio-economic circumstances.

Off-reserve First Nations children whose mothers started childbearing during adolescence were more likely to have mothers who were still in school or had not completed high school (Table 1). About 28% of Registered Indian children with teen mothers had mothers who were still in school compared to 13% of Registered Indian children with mothers who had their first birth when aged 25 or more. About 2 out of 5 (38%) Registered Indian children with teen mothers had mothers who had not completed high school compared to 15% of Registered Indian children with mothers who started having children when aged 25 or more. Fewer Registered Indian children with teen mothers (17%) had mothers with more than a high school education compared to children with older mothers (55%).

Table 1: Descriptive Characteristics of First Nations Children Aged 2 to 5 Years by Age of Mother at First Birth (%)

	Registered Indian			Non-Registered Indian		
	12-19 (n = 848)	20-24 (n = 988)	25+ (n = 724)	12-19 (n = 305)	20-24 (n = 446)	25+ (n = 528)
Maternal education						
Currently in school	28 *	19 *	13	20 *	14 * ^E	6 ^E
Less than high school	38 *	28 *	15	40 *	18 *	9 ^E
High school	17	22	18	20 ^E	29	23
More than high school	17 *	31 *	55	20 *	39 *	61
Family structure						
Married	13 *	21 *	39	21 *	34 *	56
Common-law	27	25	22	20 ^E	23	17
Lone parent	60 *	55 *	38	59 *	43 *	28
Low income family						
Not low income	26 *	45 *	66	37 *	41 *	79
Low income	74 *	56 *	34	63 *	39 *	21

* Numbers with stars mean that the number is significantly different from the number for children of mothers aged 25+ at their first birth ($p < 0.05$).

^E Use with caution – number may be unreliable.

Source: Statistics Canada, 2006 Aboriginal Children's Survey

Trends in education by age of mother at first birth were similar for non-Registered Indian children. In addition, children with teen mothers were more likely to be in lone parent families (60% vs. 38% for Registered Indian children; 59% vs. 28% for non-Registered Indian children), less likely to have married mothers (13% vs. 39% for Registered Indian children; 21% vs. 56% for non-Registered Indian children), and also more likely to be in low-income families (74% vs. 34% for Registered Indian children; 63% vs. 21% for non-Registered Indian children) compared to children with older mothers.

These findings were similar to those of Garner, Guimond, and Senecal (2013), although the sources of data were different: they used data from the Canadian Census to examine the socio-economic characteristics of teenage mothers and we used data from the Aboriginal Children's Survey. Both studies found that mothers who were teens at their first birth were less likely to have completed high school, more likely to be single parents, and more likely to have lower personal and household incomes than mothers who were older at their first birth.

There were few differences in the physical health of First Nations children of teen mothers compared to First Nations children of older mothers.

Our research found that Registered Indian children of teen mothers were as likely to be in very good or excellent health as compared to Registered Indian children of older mothers. However, non-Registered Indian children of teen mothers were less likely to be in very good or excellent health compared to non-Registered children of mothers aged 25 and older at their first birth (see Table 2).

First Nations children of teen mothers (both Registered and non-Registered) did not differ from First Nations children of older mothers in the presence of a chronic health condition or in the number of chronic conditions. For specific health conditions, First Nations children of teen mothers (both Registered and non-Registered) did not differ from First Nations children of older mothers in reports of asthma or the occurrence of two or more ear infections in the last year. However, children of Registered Indian teen mothers were less likely to have allergies compared to children of older mothers. They were also more likely to have dental problems compared to children of older mothers. There were no differences in dental problems for non-Registered Indian children (see Table 2).

Differences in the behaviours of off-reserve First Nations children of teen mothers compared to older mothers were explained by socio-economic circumstances for some outcomes but not others.

Our research showed that First Nations children of teen mothers (both Registered and non-Registered Indians) had lower prosocial behaviour scores (how readily the child shares with other children, whether the child is kind to younger children), higher scores on emotional symptoms (includes having many worries and fears and being depressed or tearful), higher inattention-hyperactivity scores (being easily distracted and unable to stay still for long), and higher scores for conduct problems (such as child having fights with other children and often losing his or her temper) as reported by their mothers. These results are shown in Figure 2 (model results are shown in Model 1 in Tables 3 and 4).

Table 2: Physical Health Outcomes by Age of Mother at First Birth (%)

		Registered Indian			Non-Registered Indian		
		12-19 (<i>n</i> = 848)	20-24 (<i>n</i> = 988)	25+ (<i>n</i> = 724)	12-19 (<i>n</i> = 305)	20-24 (<i>n</i> = 446)	25+ (<i>n</i> = 528)
In very good or excellent health (vs. good, fair, or poor)		81	83	84	82 *	89	90
Presence of chronic condition		33	34	31	38	31	31.1
Number of chronic conditions	None	67	66	69	63	69	68.9
	One	24	24	24	30	21	22.7
	Two or more	10	10	8 ^E	8 ^E	9 ^E	8.4 ^E
Presence of specific condition	Asthma	11	13	14	13 ^E	10 ^E	10.2 ^E
	2+ ear infections in last 12 months	11	14	13	16 ^E	14 ^E	13.3
	Allergy	8 *	11	12	10 ^E	8 ^{*E}	14.4
	Dental problem	35 *	29	26	18	18	18.8

* Numbers with stars mean that the number is significantly different from the number for children of mothers aged 25+ at their first birth ($p < 0.05$).

^E Use with caution – number may be unreliable.

Source: Statistics Canada, 2006 Aboriginal Children's Survey

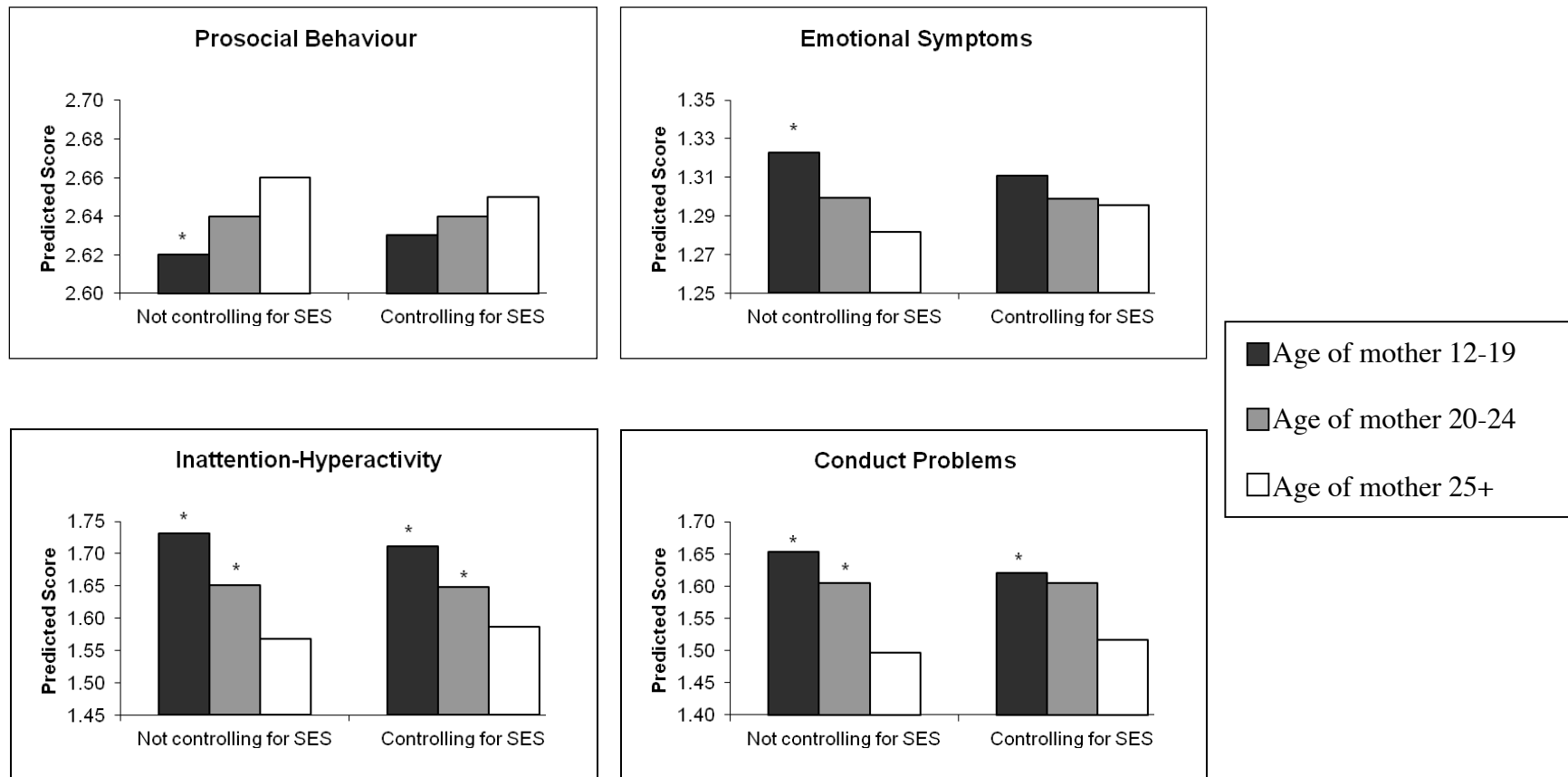


Figure 2: Predicted scores of behavioural outcomes with and without controlling for socio-economic characteristics (SES).

* Numbers with stars mean that the number is significantly different from the number for children of mothers aged 25+ at their first birth ($p < 0.05$).

Models that controlled for SES included mother’s highest level of education, household size, and whether the child lived in a lone parent family or a low income family.

Source: Statistics Canada, 2006 Aboriginal Children’s Survey

Table 3: Regression Coefficients and Standard Errors Predicting Prosocial Behaviour and Emotional Symptoms

		Prosocial Behaviour		Emotional Symptoms	
		Model 1	Model 2	Model 1	Model 2
Age of mother at first birth	12 – 19	- 0.04 (0.02)*	- 0.02 (0.02)	0.04 (0.02)*	0.02 (0.02)
	20 – 24	- 0.01 (0.02)	- 0.01 (0.02)	0.02 (0.02)	0.00 (0.02)
	25+	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
Age of child in years		0.06 (0.01)***	0.06 (0.01)***	0.01 (0.01)*	0.01 (0.01)*
Male child		- 0.08 (0.01)***	- 0.08 (0.01)***	- 0.02 (0.01)	- 0.02 (0.01)
Identity	Registered Indian	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
	Non-Registered Indian	0.04 (0.01)**	0.03 (0.01)*	- 0.03 (0.01)*	- 0.03 (0.02)*
Mother's education	Currently in school		0.02 (0.02)		0.00 (0.02)
	Less than high school		- 0.03 (0.02)		0.03 (0.02)
	High school graduate		<i>Ref.</i>		<i>Ref.</i>
Lone parent			0.01 (0.02)		0.00 (0.02)
Low income family (income below LICO)			- 0.03 (0.02)*		0.04 (0.02)*
Number of people in the household			0.00 (0.00)		- 0.01 (0.01)
Age by registered interaction			<i>ns</i>		<i>ns</i>
Age by education interaction			<i>ns</i>		<i>ns</i>
<i>N</i>		2,541	2,216	2,545	2,217
<i>R</i> ²		0.07	0.08	0.01	0.02

p* < 0.05*p* < 0.01****p* < 0.001

Source: Statistics Canada, 2006 Aboriginal Children's Survey

Table 4: Regression Coefficients and Standard Errors Predicting Inattention Hyperactivity and Conduct Problems

		Inattention-Hyperactivity		Conduct Problems	
		Model 1	Model 2	Model 1	Model 2
Age of mother at first birth	12 - 19	0.16 (0.03)***	0.13 (0.04)***	0.16 (0.02)***	0.10 (0.03)***
	20 - 24	0.08 (0.03)**	0.06 (0.03)	0.11 (0.02)***	0.09 (0.02)***
	25+	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
Age of child in years		-0.03 (0.01)*	-0.02 (0.01)*	-0.05 (0.01)***	-0.05 (0.01)***
Male child		0.13 (0.02)***	0.14 (0.03)***	0.02 (0.02)	0.02 (0.02)
Identity	Registered Indian	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
	Non-Registered Indian	0.02 (0.03)	0.04 (0.03)	-0.03 (0.02)	-0.02 (0.02)
Mother's education	Currently in school		0.01 (0.04)		0.00 (0.03)
	Less than high school		0.12 (0.04)***		0.11 (0.03)***
	High school graduate		<i>Ref.</i>		<i>Ref.</i>
Lone parent			-0.01 (0.03)		0.00 (0.03)
Low income family (income below LICO)			0.07 (0.03)*		0.05 (0.03)
Number of people in the household			-0.02 (0.01)		0.00 (0.01)
Age by registered interaction			<i>ns</i>		<i>ns</i>
Age by education interaction			<i>ns</i>		<i>ns</i>
<i>N</i>		2,517	2,195	2,508	2,189
<i>R</i> ²		0.03	0.04	0.04	0.05

**p* < 0.05

***p* < 0.01

****p* < 0.001

Source: Statistics Canada, 2006 Aboriginal Children's Survey

As stated previously, because socio-economic disadvantage is associated with both teen parenthood and poor behavioural outcomes, analyses were conducted to examine if socio-economic factors contribute to (mediate) the association between having a mother who started childbearing as a teen and preschool-aged children's behaviour scores.

While differences in all behavioral outcomes examined were found for children of teen mothers compared to children of older mothers, after accounting for differences in socio-economic characteristics, including maternal education, income, lone parent family, and household size, children of teen mothers did not differ from children of older mothers on scores of prosocial behaviours and emotional symptoms. However, even after considering socio-economic factors, children of teen mothers still had higher scores of inattention-hyperactivity and higher scores of conduct problems compared to children of older mothers (results shown in Figure 2 and Model 2 of Tables 3 and 4.)

Children of mothers currently in school had the same behaviour scores as children of mothers who had a high school level of education; children of mothers with less than a high school level of education had poorer scores on reported inattention-hyperactivity and conduct problems than children of mothers with a high school education.

Children of mothers currently in school had similar scores on all four mental health measures (prosocial behaviour, emotional symptoms, inattention-hyperactivity, and conduct problems) as compared to children of mothers who were high school graduates. Children of mothers with less than a high school level of education had worse scores on two of the outcomes – higher scores on both inattention-hyperactivity and conduct problems. Schooling had the same association with child behavior outcomes regardless of whether the child had a teen mother or not – children of both teen and non-teen mothers had fewer behaviour problems if their mother was currently in school or had graduated high school.⁷

Discussion

To our knowledge, this study is the first to use population-based data to report on the outcomes of off-reserve First Nations children born to teen mothers compared to off-reserve First Nations children born to older mothers. Findings from the 2006 Aboriginal Children's Survey (based on maternal reporting) suggest that there are few differences in physical health outcomes between the children of teen mothers and older mothers with the exception of dental health. However, the picture is different for maternal-reported behavioural problems and mental health. All the mental health outcomes examined – child prosocial behaviors, emotional symptoms, inattention-hyperactivity, and conduct problems – were worse for children of teen mothers.

⁷ There was no interaction between having a teenage mother and mother's education for any of the behavioural outcomes. The relationship between age of mother at first birth and mental health outcomes was the same for children of mothers still in school, high school graduates, and non-graduates.

There are several reasons why children of teen mothers may be at risk of negative outcomes. One reason may be that living in lower socio-economic conditions can impact living conditions, daily stress levels, as well as interactions between mother and child (McLoyd, 1998). In this study, similar to others, we found that off-reserve First Nations children of teenage mothers lived in more difficult socio-economic circumstances compared to off-reserve First Nations children of older mothers. Moreover, the lower scores of prosocial behaviours and higher scores of emotional problems for children of teen mothers, as compared to older mothers, were found to be attributed to socio-economic factors rather than differences in age of childbearing. Of the socio-economic factors considered, household income and maternal education were shown to be important. Yet, differences in child inattention-hyperactivity and conduct problems persisted and were not explained by differences in socio-economic factors between teen and older mothers.

Several studies of non-Aboriginal children show that children growing up in disadvantaged socio-economic circumstances demonstrate worse school, behavioural, and health outcomes compared to children growing up in better socio-economic circumstances (Willms, 2002). Socioeconomic differences can have an influence in many ways. These have included living in neighborhoods that are less safe, poorer housing conditions, and more limited access to resources in terms of health, education, recreation, and employment opportunities (Kohen, Brooks-Gunn, Leventhal, & Hertzman, 2002; Sampson, Morenoff, & Gannon-Rowley, 2002), family stress and poor mental health (Hill & Herman-Stahl, 2002; Kohen, Leventhal, Dahinten, & McIntosh, 2008; McLoyd, 1998; Xue, Leventhal, Brooks-Gunn, & Earls, 2005), as well as differences in parenting styles, behaviours, and the types of activities in and outside of the home (Edwards & Bromfield, 2009; Hill & Herman-Stahl, 2002; McLoyd, 1998; Vaden-Kiernan et al., 2010). Lower levels of education, in particular, may be associated with different parenting behaviors, including less language use and fewer literacy activities (reading books, teaching, counting, storytelling) (Burgess, 2005). This suggests that living in conditions of socio-economic disadvantage may have far-reaching consequences for mothers and their children.

The present study demonstrated differences in the socio-economic circumstances of preschool children of both Registered and non-Registered First Nations teen mothers living off-reserve. In terms of child outcomes, there were few differences in the physical health of off-reserve First Nations children of teen mothers compared to off-reserve First Nations children of older mothers, other than a higher rate of dental problems for Registered Indian children of teen mothers. These findings are similar to those of others. For example, based on samples of non-Aboriginal children of young mothers in Australia, Shaw et al. (2006) found that young maternal age was not associated with self-rated health or with maternal reports of asthma, number of hospital admissions, or emergency visits. Similar to our study, Shaw et al., (2006) found that the younger age of mothers was associated with worse dental health of children.

In terms of mental health, we found that off-reserve First Nations children of teenage mothers had lower prosocial behaviour scores, more emotional symptoms, higher inattention-hyperactivity scores, and more conduct problems compared to children born to older mothers. Although some of these differences (i.e. for emotional symptoms and prosocial behaviours) were explained by socio-economic differences, others remained (e.g. inattention-hyperactivity and conduct problems) even after accounting for the differences in income, education, marital status, and household size between teen

and older mothers. While these findings are consistent with research on non-Aboriginal children in Canada (Dahinten et al., 2002), they are noteworthy for Aboriginal children.

Inattention-hyperactivity and conduct problems are likely to be associated with poorer school readiness and problems with academic achievement. It was beyond the scope of the present study to explore other factors that may have contributed to differences in hyperactivity-inattention and conduct problems of children of teen mothers compared to older mothers. For example, parenting behaviours, learning activities, and the availability of social and other supports, including father involvement, can all be important for children's behavioural outcomes during the preschool period (Howard, Burke Lefever, Borkowski, & Whitman, 2006; Rhule, McMahon, Spieker, & Munson, 2006).

Moreover, the implications of educational attainment for the behavioural outcomes of children of teen mothers suggest that factors enabling teen mothers to attend school and/or complete high school may be particularly important as benefits accrue to both mother and child. The area of educational attainment of teen mothers warrants further investigation because the completion of high school education has been associated with direct effects to the mother, such as socio-economic benefits (see Garner et al., 2013, in this issue), as well as indirect benefits to children.

Strengths and Limitations of this Study

To our knowledge, this is the first large-scale empirical study examining the physical and mental health of off-reserve First Nations children of teenage mothers. Strengths of this study include a population-based sample that was nationally representative of First Nations children living off-reserve in Canada, the examination of both physical and mental health outcomes, and information on mother's age when she started having children, as well as a variety of socio-economic characteristics. Despite these strengths, this study has several limitations. Our measure of maternal age at first birth is based on the age of the oldest sibling in the household. It is possible that this sibling was a step, foster, or adoptive sibling, and not a birth sibling, which could lead to inaccuracy in determining the mother's age at first birth. In addition, the physical and mental health outcomes examined in this study were based on parent-reporting. Mothers' responses could be influenced by the way they think they should respond, their experiences, or subjective views of their own child. However, the cultural relevance of standardized measures is often uncertain (Greenfield, 1997), which points to the importance of parent-reported measures for this population. In addition, both groups of teen and older mothers reported on the same measure. These limitations highlight the need for further qualitative and quantitative research to replicate these findings. Future research could use a direct measure of age at first childbirth and could also examine physical and mental health outcomes from other reporters (such as teachers or child care providers) or ones based on observational measures. Finally, this study focused on socio-economic factors to explain differences in the association of being a teen mother with preschoolers' outcomes; however, other factors are likely involved and warrant future study.

Conclusions

Findings from our research using the 2006 Aboriginal Children's Survey show that there are few differences in the physical health of off-reserve First Nations children of teen mothers compared to off-reserve First Nations children of older mothers. In terms of mental health, differences were apparent in

all outcomes with children of teen mothers faring worse compared to children of older mothers. Although some differences in mental health are explained by socio-economic factors, such as household income and maternal education (for prosocial behaviour and emotional symptoms), other differences (inattention-hyperactivity and conduct problems) were not; differences between children of teen and older mothers persisted even when socio-economic differences were considered. These findings suggest that differences in the mental health outcomes of off-reserve First Nations children of teen mothers start as early as the preschool period. Further qualitative and quantitative research would help our understanding of the differences in outcomes between the children of teenage and older mothers.

References

- Alexander, K. L., Farhat, A., & Dauber, S. L. (1993). First-grade classroom behavior: Its short- and long-term consequences for school performance. *Child Development, 64*, 801-814.
- Amini, S. B., Catalano, P. M., Dierker, L. J., & Mann, L. I. (1996). Births to teenagers. Trends and obstetric outcomes. *Obstetrics and Gynecology, 87*, 668-674.
- Burgess, S. (2005). The preschool home literacy environment provided by teenage mothers. *Early Child Development and Care, 175*, 249-258.
- Chen, X. K., Wen, S. W., Fleming, N., Demissie, K., Rhoads, G. G., & Walker, M. (2007). Teenage pregnancy and adverse birth outcomes: a large population based retrospective cohort study. *International Journal of Epidemiology, 36*, 368-373.
- Côté, S., Vaillancourt, T., LeBlanc, J. C., Nagin, D. S., & Tremblay, R. E. (2006). The development of physical aggression from toddlerhood to pre-adolescence: A nationwide longitudinal study of Canadian children. *Journal of Abnormal Child Psychology, 34*, 68-82.
- Crick, N. R. (1996). The role of overt aggression, relational aggression, and prosocial behavior in the prediction of children's future social adjustment. *Child Development, 67*, 2317-2327.
- Dahinten, V. S., Shapka, J., & Willms, J. D. (2007). Adolescent children of adolescent mothers: The impact of family functioning on trajectories of development. *Journal of Youth and Adolescence, 36*, 195-212.
- Dahinten, V. S. & Willms, J. D. (2002). The effects of adolescent childbearing on children's outcome. In J.D. Willms (Ed.), *Vulnerable children: Findings from Canada's National Longitudinal Survey of Children and Youth* (pp. 243-258). Edmonton, AB: University of Alberta Press.
- Duncan, G. J., Dowsett, C. J., Claessens, A., Magnuson, K., Huston, A. C., Klebanov, P. et al. (2007). School readiness and later achievement. *Developmental Psychology, 43*, 1428-1446.
- Edwards, B. & Bromfield, L. M. (2009). Neighborhood influences on young children's conduct problems and pro-social behavior: Evidence from an Australian national sample. *Children and Youth Services Review, 31*, 317-324.
- Ekéus, C., Christensson, K., & Hjern, A. (2004). Unintentional and violent injuries among pre-school children of teenage mothers in Sweden: A national cohort study. *Journal of Epidemiology Community Health, 58*, 680-685.

- Fraser, A. M., Brockert, J. E., & Ward, R. H. (1995). Association of young maternal age with adverse reproductive outcomes. *New England Journal of Medicine*, 332, 113-117.
- Garner, R., Guimond, E., & Senécal, S. (2013). The socio-economic characteristics of First Nation teen mothers. *International Indigenous Policy Journal*, 4(1). Available from <http://ir.lib.uwo.ca/iipj/vol4/iss1/>
- Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *Journal of Child Psychology and Psychiatry*, 38, 581-586.
- Greenfield, P. M. (1997). You can't take it with you: Why ability assessments don't cross cultures. *American Psychologist Association*, 52, 1115-1124.
- Guimond, E. & Robitaille, N. (2008). When teenage girls have children: Trends and consequences. *Horizons*, 10, 49-51.
- Hack, M., Flannery, D. J., Schluchter, M., Cartar, L., Borawksi, E., & Klein, N. (2002). Outcomes in young adulthood for very low birth weight infants. *The New England Journal of Medicine*, 346, 149-157.
- Hack, M., Klein, N. K., & Taylor, H. G. (1995). Long-term developmental outcomes of low birth weight infants. *The Future of Children*, 5, 176-196.
- Health Canada (2009). *Non-Insured Health Benefits for First Nations and Inuit*. Retrieved from <http://www.hc-sc.gc.ca/fniah-spnia/nihb-ssna/index-eng.php>
- Hill, N. E. & Herman-Stahl, M. A. (2002). Neighborhood safety and social involvement: Associations with parenting behaviors and depressive symptoms among African American and Euro-American mothers. *Journal of Family Psychology*, 16, 209-219.
- Howard, K., Burke Lefever, J., Borkowski, J., & Whitman, T. (2006). Father's influence in the lives of children with adolescent mothers. *Journal of Family Psychology*, 20, 468-476.
- Indian Act. (1985). (R.S.C., 1985, c. I-5).
- Kohen, D. E., Brooks-Gunn, J., Leventhal, T., & Hertzman, C. (2002). Neighborhood income and physical and social disorder in Canada: Associations with young children's competencies. *Child Development*, 73, 1844-1860.
- Kohen, D. E., Leventhal, T., Dahinten, V. S., & McIntosh, C. (2008). Neighborhood disadvantage: pathways of effects for young children. *Child Development*, 79, 156-169.
- McClelland, M. M., Morrison, F. J., & Holmes, D. L. (2010). Children at risk for early academic problems: the role of learning-related social skills. *Early Childhood Research Quarterly*, 15, 307-329.
- McLoyd, V. (1998). Socioeconomic disadvantage and child development. *American Psychologist*, 53, 185-204.

- Moffitt, T. & E-Risk Study Team (2002). Teen-aged mothers in contemporary Britain. *Journal of Child Psychology and Psychiatry*, 43, 727-742.
- Moore, K., Morrison, D., & Green, A. (1997). The effects on the children born to adolescent mothers. In R. Maynard (Ed.), *Kids having kids* (pp. 145-180). Washington, DC: The Urban Institute Press.
- Murdock, L. (2009). *Young Aboriginal mothers in Winnipeg*. Winnipeg, MB: The Prairie Women's Health Centre of Excellence.
- O'Neil, R., Welsh, M., Parke, R. D., Wang, S., & Strand, C. (1997). A longitudinal assessment of the academic correlates of early peer acceptance and rejection. *Journal of Clinical and Child Psychology*, 26, 290-303.
- Oliver, L., Findlay, L., McIntosh, C., & Kohen, D. (2009). *Evaluation of the Strengths and Difficulties Questionnaire*. Ottawa, ON: Minister of Industry.
- Ontario Federation of Indian Friendship Centres (2002). *Tenuous connections: Urban Aboriginal youth sexual health & pregnancy*. Toronto, ON: The Ontario Federation of Indian Friendship Centres.
- Pittard, W., Laditka, J., & Laditka, S. (2008). Associations between maternal age and infant health outcomes: Among medicaid-insured infants in South Carolina: Mediating effects of socioeconomic factors. *Pediatrics*, 122, e100-e106.
- Pogarsky, G., Thornberry, T., & Lizotte, A. (2006). Developmental outcomes for children of young mothers. *Journal of Family Psychology*, 68, 332-344.
- Rao, J. N. K., Wu, C. F. J., & Yue, K. (1992). Some recent work on resampling methods for complex surveys. *Survey Methodology*, 18(2), 209-217.
- Rhule, D., McMahon, R., Spieker, S., & Munson, J. (2006). Positive adjustment and associated protective factors in children of adolescent mothers. *Journal of Child and Family Studies*, 15, 231-251.
- Robitaille, N., Kouaouci, A., & Guimond, E. (2004). La fécondité des Indiennes à 15-19 ans, de 1986 à 1997. In J.P. White, P. Maxim, & D. Beavon (Eds.), *Aboriginal policy research - Setting the agenda for change*. Toronto, ON: Thompson Educational Publishing Inc.
- Romano, E., Tremblay, R. E., Farhat, A., & Côté, S. (2006). Development and prediction of hyperactive symptoms from 2 to 7 years in a population-based sample. *Pediatrics*, 117, 2101-2110.
- Rust, K. F., & Rao, J. N. K. (1996). Variance estimation for complex surveys using replication techniques. *Statistical Methods in Medical Research*, 5, 281-310.

- Sampson, R. J., Morenoff, J. D., & Gannon-Rowley, T. (2002). Assessing "neighborhood effects": Social processes and new directions in research. *Annual Review of Sociology*, 28, 443-478.
- Shaw, M., Lawlor, D., & Najman, J. (2006). Teenage children of teenage mothers: Psychological, behavioural and health outcomes from an Australian prospective longitudinal study. *Social Science & Medicine*, 62, 2526-2539.
- Shields, M. & Shooshtari, S. (2001). Determinants of self-perceived health. *Health Reports*, 13, 35-52.
- Smylie, J. (2009). *Indigenous children's health report: Health assessment in action*. Toronto, ON: Keenan Research Centre.
- Statistics Canada (2008). *Aboriginal peoples survey 2006: Concepts and methods guide*. Ottawa, ON: Minister of Industry.
- Statistics Canada (2009). *Low income cut-offs for 2008 and low income measures for 2007*. Ottawa, ON: Minister of Industry.
- Terry-Humen, E., Manlove, J., & Moore, K. (2005). *Playing catch-up: How children born to teen mothers fare*. Washington, DC: National Campaign to Prevent Teen Pregnancy.
- Tremblay, R. E., Nagin, D. S., Seguin, J. R., Zoccolillo, M., Zelazo, P. D., Boivin, M. et al. (2004). Physical aggression during early childhood: Trajectories and predictors. *Pediatrics*, 114, 43-50.
- Tremblay, S., Dahinten, V. S., & Kohen, D. (2003). Factors related to adolescents' self-perceived health. *Health Reports*, 14, 7-16.
- Turley, R. N. L. (2003). Are children of young mothers disadvantaged because of their mother's age or family background? *Child Development*, 74, 465-474.
- Vaden-Kiernan, M., D'Elio, M., O'Brien, R., Tarullo, L. B., Zill, N., & Hubbel-McKey, R. (2010). Neighborhoods as a developmental context: A multilevel analysis of neighborhood effects on Head Start families and children. *American Journal of Community Psychology*, 45, 49-67.
- Willms, J. D. (Ed.). (2002). *Vulnerable children: Findings from Canada's National Longitudinal Survey of Children and Youth*. Edmonton: University of Alberta Press.
- Wolfe, B. & Perozek, M. (1997). Teen children's health and health care use. In R. Maynard (Ed.), *Kids having kids* (pp. 181-203). Washington, DC: The Urban Institute Press.
- Xue, Y., Leventhal, T., Brooks-Gunn, J., & Earls, F. J. (2005). Neighborhood residence and mental health problems of 5- to 11-year-olds. *Archives of General Psychiatry*, 62, 563.

Zukewich, N. & O'Donnell, V. (2008). *Aboriginal Children's Survey, 2006: Family, community and child care*. Ottawa, ON: Minister of Industry.

Appendix A: Wording of Mental Health Items

Prosocial Behaviour

Considerate of other peoples' feelings

Shares readily with other children, for example, toys, treats, pencils

Helpful if someone is hurt, upset, or feeling ill

Kind to younger children

Often offers to help others including parents, teachers, other children

Generally well-behaved, usually does what adults request

Has at least one good friend

Generally liked by other children

Can stop and think things out before acting

Good attention span, sees work through to the end

Hyperactivity-Inattention

Restless, overactive, cannot stay still for long

Constantly fidgeting or squirming

Easily distracted, concentration wanders

Emotional symptoms

Often complains of headaches, stomach-aches, or sickness

Many worries or often seems worried

Often unhappy, depressed, or tearful

Nervous or clingy in new situations, easily loses confidence

Many fears, easily scared

Conduct problems

Often loses temper

Often fights with other children or bullies them

Often argumentative with adults

Can be spiteful to others
