Health of Canadian Aboriginal children

ORIGINAL ARTICLE

The health of Canada’s Aboriginal children: results from the First Nations and Inuit Regional Health Survey

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ABSTRACT

Objectives. Reports on child health in Canada often refer to the disproportionate burden of poor health experienced by Aboriginal children and youth, yet little national data are available. This paper describes the health of First Nations and Inuit children and youth based on the First Nations and Inuit Regional Health Survey (FNIRHS).

Study design. The FNIRHS combines data from 9 regional surveys conducted in 1996-1997 in Aboriginal reserve communities in all provinces. The target population consisted of all on-reserve communities. All households or a random sample of households or adults (depending on province) were selected based on their population representation.

Methods. One child was randomly selected from each participating household, except in Ontario and Nova Scotia, where children were randomly selected based upon their population representation. Alberta did not include the section on children’s health in their regional survey.

Results. Approximately 84% of adults, who were proxy respondents for their child, rated their children’s health as very good or excellent. The most frequently reported conditions were ear problems (15%), followed by allergies (13%) and asthma (12%). Broken bones or fractures were the most frequently reported injuries (13%). Respondents reported that 17% of children had behavioural or emotional problems. Overall, 76% of children were reported to get along with the family “very well” or “quite well.”
Conclusions. While most respondents rated their child’s health as very good or excellent, injuries, emotional and behavioural problems, respiratory conditions and ear problems were reported among many Aboriginal children. Issues such as substance abuse, exposure to violence and academic performance were not addressed in the 10 core survey questions. Clearly there is a need for more in-depth information about both the physical and emotional health of Aboriginal children and youth.

(Keywords: Aboriginal, Inuit, children, health)

INTRODUCTION

Despite long-standing recognition that the health of Aboriginal children in Canada is poorer than that of other Canadian children (1-4), there are surprisingly few national data available. Yet one of the key elements necessary in addressing the health needs of a population is information about the distribution and determinants of health conditions (5). Much of the Canadian literature describing Aboriginal health in Canada to date has focused on adults (6-9). For example, the Aboriginal People’s Survey, a comprehensive national survey that included questions about health and social issues, concentrated on persons 15 years of age and older (10,11).

This paper reports findings on the health of First Nations and Inuit children and youth in Canada from the First Nations and Inuit Regional Health Survey (FNIRHS) (12). A National Steering Committee composed of health services personnel representing each of the regional First Nations and Inuit populations determined the range of concepts to be measured. Health in the broadest sense was considered; aspects related to physical, emotional, social and cultural well-being were included. Although each region was able to add questions to address concepts of greatest relevance to their population, the National Steering Committee determined that a small section of “core questions” would be included in all regional questionnaires. Children’s health was 1 of 8 topics selected for the development of core questions. (The remaining 7 areas were health services, tobacco, medical conditions, disability, residential schools, wellness and dental health [12].)

MATERIAL AND METHODS

The FNIRHS combines data from 9 regional surveys conducted in 1996-1997 in Aboriginal reserve communities in all provinces (Prince Edward Island was combined with New Brunswick), the details of which are described elsewhere (12). This study was overseen by the National Steering Committee, which undertook the development of a Code of Research Ethics, which established a framework to guide the FNIRHS, and determine principles regarding secondary data analysis. The target population consisted of all on-reserve communities. In 3 provinces
(British Columbia, Manitoba and Ontario) selection was stratified based on geography; for example, based on the remoteness of the community. The Cree, Mohawk and Inuit Nations in Quebec did not participate. Newfoundland was excluded from the Newfoundland and Labrador region. Within these communities, participants were selected as follows: all households (Labrador), a random sample of households (Saskatchewan, Manitoba and New Brunswick) or a random selection of adults, with percentages selected based on the distribution of age and gender in that community.

One child between the ages of newborn and 18 years was randomly selected from each participating household. Exceptions occurred as follows: in Ontario and Nova Scotia, children and youth were randomly selected based on the distribution of the age and gender of children in that community; Alberta did not include the section on children’s health in their regional survey, and thus the following findings exclude representation from Alberta.

The individual identified as being the most knowledgeable about the child completed the child’s health section. Information about children was given 81% of the time by female informants. Of 9,870 adults participating, 6,045 indicated children in the household; of these, 4,149 gave at least 1 proxy response for the child, for a response rate of 68.6%. Child records with no weights calculated because of missing data about age and/or sex were excluded (n=220), as were those which were 18 (n=124) and 19 years old (n=14). The final sample consisted of 3,791 (unweighted) child records.

The core section on child health was limited to 10 questions. These items were derived or adapted from other population surveys where possible; however, the National Steering Committee sometimes made wording changes to ensure that the questions were culturally appropriate.

Wherever applicable, comparisons have been made between this survey and the National Longitudinal Survey of Children and Youth (NLSCY). The NLSCY is a long-term research program which began in 1994 to monitor the influences on developmental outcomes for a nationally representative sample of Canadian children. The sample excluded children living on Aboriginal reserves. Methods of the NLSCY are documented elsewhere (13). Comparisons were not tested statistically because the large samples would produce statistically significant differences that were not clinically meaningful. The authors decided that a difference of 10% was important.

**Statistical analyses**

All analyses were run in SPSS v.10, which accommodates weighting. Data from both the FNIRHS and the NLSCY were weighted so that each child in the sample represents a group of children in the population. All tables and figures were based on weighted data. If unweighted sample sizes were fewer than 30 cases, figures were not reported. Readers are cautioned about the reliability of those estimates noted as “qualified” due to high sampling variability. Chi-square tests were used for categorical data. Because of the number of tests done, a Bonferroni correction was applied, resulting in an alpha set at 0.0008.
RESULTS

Age, gender and family size
The mean age of children was 8.7 years (SD=5.0, median=8.0). Overall, 51% of the sample was male. The number of children living at the respondent’s home ranged from 1 to 18, with a mean of 2.6 (SD=1.5). About half (52%) of the children lived in families with fewer than 3 children living at home.

In the NLSCY, information was collected solely about children newborn to 11 years of age. The mean age in the NLSCY was 5.5 years (SD=3.4, median=5). Fifty-one percent of the sample was male. Two-thirds (67%) of children lived in families with fewer than 3 children under the age of 18 in the household.

Birth weight
Birth weight was asked for children of all ages in the FNIRHS. Low birth weight was defined as a weight of less than 2,500 grams and high birth weight as greater than 4,000 grams. Significantly higher proportions of males (21.7%) than females (14.0%) had high birth weights (see Fig. 1).

In the NLSCY, birth weight was asked only for children between the ages of newborn and 3 years. Far more children aged newborn to 3 years in the FNIRHS had high birth weights compared to those in the NLSCY (17.9% vs. 12.0%; see Fig. 1). The proportion of males in this age group was similar in the 2 surveys, so this difference in the prevalence of high birth weights was not due to unequal representation of males in the samples.

Breastfeeding
Half (50%) of the respondents reported that the child had been breastfed. Of the children who were breastfed, more than half (55%) were breastfed for more than 7 months. No differences in the average number of months of being breastfed were seen by age group or gender.

In the NLSCY, questions about breastfeeding were asked only for those children up to 2 years of age. Published figures show that 75% were breastfed (14). This figure is much higher than for those up to 2 years of age in the FNIRHS (54%). About one-quarter (24%) of those less than 2 years of age in the NLSCY were breastfed for more than 6 months, much lower than the percentage for those in the FNIRHS (39%).

Current health
Respondents were asked to rate the child’s health as “excellent, very good, fair or poor.” About 84% of respondents rated their child’s health as “excellent” or “very good.” The prevalence of “very good” and “poor” health ratings were similar across age groups and by gender.
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In the NLSCY, responses offered were “excellent, very good, good, fair or poor.” About 88% rated the child’s health as “excellent” or “very good.” The proportion of children with poor/fair health was much higher in the FNIRHS than the NLSCY (16% vs. 2%). However, this may be due to the different categories offered to respondents in the 2 surveys.

Specified health problems
Table I shows the prevalence of specified health problems by age group. No significant differences by gender were found in any of the specified health problems or in the “other health problem” item. A significantly larger proportion of younger children were reported with bronchitis, asthma and ear problems. Significantly, a greater number of older children were reported as having overweight problems.

The NLSCY prompted for 10 long-term conditions and any “other” condition. The NLSCY had information on “ear infections or otitis” as compared with the FNIRHS “ear problems.” In the NLSCY, a condition must have been diagnosed by a health professional; this was not the case in the FNIRHS, so figures may not be comparable. Published percentages for comparable conditions in the NLSCY were ear infection (53% of children aged newborn to 3 years), allergies (14%), asthma (11%) and bronchitis (3%) in those aged newborn to 11 years. Heart and kidney conditions, as well as epilepsy were rare (less than 1%). Psychological difficulties were reported in 2% of those aged 6 to 11 years.

Injuries
Table II shows the lifetime prevalence of specified injuries by age group. No significant gender differences were found in the prevalence of any injury. Fractures showed a significant pattern with increasing age, as did near drowning.

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Table I. Prevalence of specified medical conditions by age group in the FNIRHS.

| Condition                       | Age group |
|--------------------------------|-----------|
|                                | 0-5       | 6-11      | 12+       | Total     |
|                                | %         | %         | %         | %         |
| Allergies                      | 13.0%     | 13.2%     | 13.5%     | 13.2%     |
| Bronchitis                     | 8.8%      | 5.2%      | 5.6%      | 6.5%      |
| Asthma                         | 14.9%     | 11.3%     | 8.8%      | 11.6%     |
| TB                              | unreportable |         |           |           |
| Heart problems                 |           |           |           |           |
| Kidney problems                |           |           |           |           |
| Epilepsy                       |           |           |           |           |
| Diabetes                       |           |           |           |           |
| Overweight                     | 3.4%      | 5.9%      | 10.1%     | 6.5%      |
| Psychological or nervous difficulties | 21.0% | | 3.7% | 2.7% |
| Ear problems                   | 20.3%     | 16.7%     | 10.5%     | 15.8%     |
| Other health problems          | 4.7%      | 5.5%      | 5.2%      | 5.1%      |

FNIRHS - First Nations and Inuit Regional Health Survey

\(\chi^2=15.97, df=2, p=.00034\)

\(\chi^2=22.57, df=2, p=.00001\)

\(\chi^2=45.11, df=2, p<.00001\)

\(\chi^2=45.04, df=2, p<.00001\)
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Behavioural and emotional problems
In the FNIRHS, 17% of children were reported as experiencing “more emotional or behavioural problems than other boys/girls” of the same age in the past 6 months. Proportions for females and males were similar. However, problems increased significantly with age, with 9% reported in the youngest group, 18% in the 6 to 11 year-old age group and 23% in the 12+ age group ($\chi^2=83.9$, df=2, p<0.00001). For those aged 4 to 11, 77% got along very or quite well with the family.

In the NLSCY, this information was collected only for those 4 to 11 years of age, in the 2-part question, How has the child gotten along with (1) his/her parents (88% got along well), and (2) his/her brothers or sisters (60% got along well)?

Knowledge of Native culture
When respondents were asked to rate their satisfaction with the child’s knowledge of Native culture, 69% were “very satisfied or satisfied.” No significant differences by age group or gender of the child were found. However, those who spoke an Aboriginal language were significantly more satisfied with their child’s knowledge of Native culture than those who spoke English, French or another non-Aboriginal language ($\chi^2=121.2$, df=2, p<0.00001).

### Table II. Lifetime incidence of specified injuries by age group in the FNIRHS

|                     | 0-5 | 6-11 | 12+ | Total |
|---------------------|-----|------|-----|-------|
| A serious head injury | 2.6%| 4.3% | 4.6%| 3.8%  |
| A serious burn       | 2.7%| 3.2% | 4.2%| 3.4%  |
| Broken bone or fracture | 4.4%| 13.7%| 20.4%| 12.9% |
| Almost drowned, rescued\(^a\) | Age 0-11 | 4.9% | 3.5% |
| Frostbite, hypothermia | 2.8% | cells unreportable | 2.0% |
| Loss of limb(s), vision, hearing | cells unreportable | unreportable |

\(^a\) FNIRHS - First Nations and Inuit Regional Health Survey

\(^b\) $\chi^2=15.97$, df=2, p=.00034

\(^c\) $\chi^2=22.57$, df=2, p<.00001
DISCUSSION

The FNIRHS included 2 important correlates of infant health: birth weight and breastfeeding. The prevalence of high birth weight infants was greater in the FNIRHS as compared to the NLSCY; this is consistent with previous findings from regional studies of birth weight distribution among the Canadian First Nations population (15,16). Risk factors for high birth weight include obesity and diabetes, both of which are common among First Nations women (16). Just over 5% of children had low birth weight; it is well-documented that this is associated with increased risk of health problems later in life, such as glucose intolerance, high blood pressure, dyslipidemia and cardiovascular disease (17). Although the validity of parental report of birth weight has been questioned, a British study representing all social classes showed that parental recall of birth weight was good (18). Three-quarters of recalled birth weights were within 50 grams of hospital-recorded weights. The authors concluded that “recalled birth weights are sufficiently accurate for use in epidemiological investigations.” Data about birth weight and patterns of growth within the First Nations and Inuit people should be collected systematically so that more relevant standards may be developed.

In the FNIRHS, approximately half of the caregivers indicated that their child had been breastfed, less than the proportion in the NLSCY, which stood at 75%. However, data from the FNIRHS showed that a higher proportion of First Nations and Inuit women are breastfeeding their infants for longer than 6 months, compared with respondents to the NLSCY. Since breastfeeding is associated with important health benefits for infants, assistance should be provided to First Nations and Inuit people to develop strategies to improve the proportions of breastfeeding mothers among Aboriginal women.

Almost half the children in the FNIRHS lived in families with 3 or more children. According to Census data, registered Indian families were larger than those of the other Aboriginal population which were slightly larger, in turn, than those of other Canadians (19). Families with larger numbers of children and inadequate housing typically experience crowding, a factor that may be important in the spread of infectious diseases. According to the APS, Aboriginal people report poor housing as a major problem (11).

Although it may be surprising that the number of children and youth reported to have diabetes was too small even to report accurately, in fact, the type of diabetes commonly occurring among the Native population is type 2 diabetes, which mainly affects people over the age of 18. Nevertheless, there is evidence from other Canadian studies that type 2 diabetes is increasingly observed in First Nations children and youth (20-22). Given that obesity is a major risk factor for non-insulin-dependent diabetes mellitus (23), it is of note that 5% of boys and 7% of girls were reported as having “overweight problems” and that the prevalence of weight problems rose with increasing age. The FNIRHS data are based on caregiver reports of children and youth having overweight problems. It was not possible to obtain direct measurements of body mass index (BMI) through height and weight measurements. Anthropometric studies of Mohawk children, however, report higher average adiposity than overweight children from a reference population (24-26). A recent study comparing measured and self-reported...
weight and height among adolescents showed high correlations (for example, 0.87 to 0.94 for body mass). However, compared to males, females were more likely to under-report body mass (27). Since the FNIRHS question about “overweight problems” was directed to the adult respondent, data about the validity of self-reporting are not necessarily applicable.

Psychological or nervous conditions lasting longer than 6 months were reported among 3% of individuals below the age of 18 years. Although this may seem incongruous with the higher reported prevalence of emotional and behavioural problems, inquiry about the latter referred to the last 6 months, while the question about psychological or nervous difficulties asked about long-term problems.

The proportion of children with injuries was very high, with 13% of children and youth described as having experienced broken bones or fractures. Serious head injury, serious burns, near drowning and frostbite or hypothermia were all experienced by more than 1% of children and youths. Unfortunately, information about injuries experienced by Canada’s young people generally focuses on hospitalization due to injury (3). Since children and youth who experience injuries are not necessarily hospitalized, this precludes a useful comparison.

Most Native and Inuit children were reported as having no “emotional or behavioural problems.” Children over the age of 12 had the highest prevalence of these problems. Data from large-scale community surveys measuring emotional and behavioural problems in non-Aboriginal children and youth suggest that the prevalence of psychiatric disorders varies between 17% and 22% (28). Since such surveys use a detailed approach to gather information about specific mental health conditions rather than asking generally about the presence of any emotional or behavioural problem, no direct comparison with FNIRHS data is possible.

It is important to highlight the positive finding from the FNIRHS that over three-quarters of the children were described as getting along with the family “very well” or “quite well.” The proportion of children who did not get along well with the family was highest in the oldest age group.

In terms of the overall health of children and youth, it is of note that more than 80% of respondents rated their child’s health as “very good” or “excellent.” Unfortunately, a response category of “good” was not included in the FNIRHS, so it is difficult to determine if this perception of children’s health differs substantially from that of respondents in the NLSCY. Another key issue is ascertaining in detail what respondents mean when they report their child’s health as very good or excellent.

Since only 10 core questions could be included on child health, issues such as academic performance, mental health conditions, substance abuse and child maltreatment could not be covered adequately, and some issues were not covered at all. Including a larger and more detailed section on child health in future First Nations and Inuit surveys, particularly if longitudinal in design, would provide a more comprehensive picture of the well-being of Aboriginal children. Nevertheless, this cross-sectional survey provides important information not previously available about the health of First Nations and Inuit children. Furthermore, the FNIRHS demonstrates that it is possible to
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conduct a large-scale survey of the health of First Nations and Inuit children and youth with collaboration between community representatives and research teams, including academic members.

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No authors have any financial or personal relationships with other people or organizations that could potentially influence the results or interpretation of the work being submitted for consideration.

REFERENCES
1. Postl BD. Building tomorrows for Aboriginal children: more work is needed. Paediatr Child Health 1999;4:241-242.
2. Pekeles G, the 1986/87 Indian and Inuit Health Committee of the Canadian Paediatric Society. The health of Indian and Inuit children in Canada in the 1980s and 1990s. Can Fam Physician 1988;34:1567-1572
3. Canadian Institute of Child Health. Aboriginal children. In: The health of Canada's children: a CIHI profile. 2nd ed. The Institute; 1994. p. 31-48.
4. Department of National Health and Welfare. Health status of Canadian Indians and Inuit - 1990. Ottawa: Department of National Health and Welfare; 1991. Cat no H34-48/1991E. 58 p.
5. Fletcher RH, Fletcher SW, Wagner EH. Clinical epidemiology: the essentials. 3rd ed. Baltimore: Williams and Wilkins; 1996. 223 p.
6. CMA’s submission to the Royal Commission on Aboriginal Peoples. In: Bridging the gap: promoting health and healing for aboriginal peoples in Canada. Ottawa: The Canadian Medical Association; 1994. p. 9-17.
7. Postl B, Irvine J, MacDonald S, Moffat M. Background paper on the health of Aboriginal peoples in Canada. In: Canadian Medical Association. Bridging the gap: promoting health and healing for Aboriginal peoples in Canada. Ottawa: The Canadian Medical Association; 1994. p. 19-56.
8. Waldram JB, Herring DA, Young TK. Aboriginal health in Canada: historical, cultural, and epidemiological perspectives. Toronto: University of Toronto Press; 1995. 334 p.
9. MacMillan HL, MacMillan AB, Offord DR, Dingle JL. Aboriginal health. CMAJ 1996;155(11):1569-1578.
10. Statistics Canada. 1991 Aboriginal Peoples Survey; Schooling, work and related activities, income, expenses and mobility. Ottawa: Statistics Canada; 1993. Catalogue No. 89-534. 329 p.
11. Statistics Canada. 1991 Aboriginal Peoples Survey; Language, tradition, health, lifestyle and social issues. Ottawa: Statistics Canada; 1993. Catalogue No. 89-533. 247 p.
12. MacMillan HL, Walsh C, Jamieson E, Crawford A, Boyle M. Children’s health. In: First Nations and Inuit Regional Health Survey. National report. First Nations and Inuit Regional Health Survey National Steering Committee; 1999. p. 1-26.
13. Human Resources Development Canada. Growing up in Canada: National Longitudinal Survey of Children and Youth. Ottawa: Statistics Canada; 1996. 270 p.
14. McIntyre L. Starting out. In: Human Resources Development Canada. Growing Up in Canada: National Longitudinal Survey of Children and Youth. Ottawa: Statistics Canada; 1996. p. 47-56.
15. Thomson M. Heavy birthweight in Native Indians of British Columbia. Can J Public Health 1990;81(6):443-446.
16. Armstrong IE, Robinson EJ, Gray-Donald K. Prevalence of low and high birthweight among the James Bay Cree of northern Quebec. Can J Public Health 1998;89(6):419-420.

17. Phillips DI, Jones A, Goulden PA. Birth weight, stress, and the metabolic syndrome in adult life. Ann N Y Acad Sci 2006;1083:28-36.

18. O’Sullivan JJ, Pearce MS, Parker L. Parental recall of birth weight: how accurate is it? Arch Dis Child 2000;82(3):202-203.

19. Hull J. Aboriginal single mothers in Canada, 1996: a statistical profile. Ottawa: Ministry of Northern Affairs and Northern Development; 2001. 149 p.

20. Young TK, Reading J, Elias B, O’Neil JD. Type 2 diabetes mellitus in Canada’s First Nations: status of an epidemic in progress. CMAJ 2000;163(5):561-566.

21. Harris SB, Perkins BA, Whalen-Brough E. Non-insulin-dependent diabetes mellitus among First Nations children. New entity among First Nations people of north western Ontario. Can Fam Physician 1996;42:869-876.

22. Dean HJ, Young TK, Flett B, Wood-Steiman P. Screening for type-2 diabetes in Aboriginal children in northern Canada. Lancet 1998;352(9139):1523-1524.

23. Everhart JE, Pettitt DJ, Bennett PH, Knowler WC. Duration of obesity increases the incidence of NIDDM. Diabetes 1992;41(2):235-240.

24. Horn OK, Paradis G, Potvin L, Macaulay AC, Desrosiers S. Correlates and predictors of adiposity among Mohawk children. Prev Med 2001;33(4):274-281.

25. Potvin L, Desrosiers S, Trifonopoulos M, et al. Anthropometric characteristics of Mohawk children aged 6 to 11 years: a population perspective. J Am Diet Assoc 1999;99(8):955-961.

26. Goran MI, Kaskoun M, Johnson R, Martinez C, Kelly B, Hood V. Energy expenditure and body fat distribution in Mohawk children. Pediatrics 1995;95(1):89-95.

27. Strauss RS. Comparison of measured and self-reported weight and height in a cross-sectional sample of young adolescents. Int J Obes Relat Metab Disord 1999;23(8):904-908.

28. Offord DR, Fleming JE. Epidemiology. In: Lewis M, editor. Child and adolescent psychiatry: a comprehensive textbook. 2nd ed. Baltimore: Williams and Wilkins; 1996. p. 1166-1178.

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