

# Birth outcome, the social environment and child health

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## Abstract

### Objectives

This article examines the effects of birth outcome and selected social environmental factors on the health of young children.

### Data source

The data are from the 1994/95 National Longitudinal Survey of Children and Youth. Information provided by the biological mothers of 5,888 children younger than age 3 is analyzed.

### Analytical techniques

The analysis focuses on two measures of child health: the mother's perception of the child's general health and a diagnosis of asthma. Logistic regression was used to estimate the effects of birth outcome and selected social environmental factors on these measures. Birth outcome refers to gestational age and birthweight. Social environmental factors include maternal education, maternal smoking, maternal age at birth of child, family status and household income.

### Main results

Preterm low birthweight was associated with a higher risk of poor health and asthma among children when all the other selected risk factors were controlled. Poor maternal health and maternal smoking were important risk factors for poor child health. Maternal asthma and low maternal education were significantly associated with childhood asthma.

### Key words

preterm, low birthweight, smoking, childhood asthma, maternal education

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Advancements in neonatal care and medical technology have improved the survival of low birthweight infants. Yet this very success has resulted in growing concerns about the subsequent health of these babies.<sup>1-9</sup> Children born too small have higher mortality than babies of normal birthweight and tend to have more developmental and physical health problems.<sup>1-5,7,10,11</sup> Moreover, the effects of low birthweight may persist into adulthood,<sup>6,12-14</sup> and thus, have important long-term public health implications.<sup>15-18</sup>

But low birthweight children are not a homogeneous group. They may be preterm (before 37 weeks' gestation) or full-term but "subnormal in weight because of various abnormal maternal or fetal conditions."<sup>2</sup> Therefore, studies of the subsequent health of low birthweight children "must include consideration of whether the children were born preterm or at term gestation and the conditions associated with the low birthweight."<sup>22</sup>

While the biological outcomes of the fetal environment may exert independent effects on subsequent health, the social environment also has a profound influence. The social

environment consists of socioeconomic and behavioural elements such as maternal education, maternal smoking, the mother's age at the birth of the child, family status, and household income.<sup>19-22</sup> There is increasing concern about the relative importance of birth outcome and social environmental factors to child health.<sup>3,12,23-30</sup>

This article uses data from the 1994/95 National Longitudinal Survey of Children and Youth (NLSCY) to examine the effects of birth outcome

and social environmental factors on the health of children younger than age 3 (see *Methods, Definitions and Limitations*). It focuses on two health outcomes—general health status and asthma—as reported by the child's mother.

### General health

In 1994/95, the overwhelming majority of Canadian children younger than age 3 were judged by their mothers to be healthy; only 2% were considered to

## Methods

### Data sources

The data are from the 1994/95 (first) cycle of the National Longitudinal Survey of Children and Youth (NLSCY). The target population was children from newborn to age 11.<sup>31</sup> In each NLSCY household, up to four children were selected at random, and a question was asked to determine who in the household was the person most knowledgeable (PMK) about them. For 91.3% of the selected children, the PMK was the mother (89.9% biological; 1.4% step, adoptive or foster).

The NLSCY had a responding sample of 13,439 households. In these households, 22,831 children were selected to participate in the survey. Data on these children will be collected every two years as they grow to adulthood. The overall response rate at the household level was 86%. Response rates for the health outcomes of children and the characteristics of the PMK for the sampled children were over 91%. A more detailed description of the survey is available in published reports.<sup>31,32</sup>

Information on birthweight and gestational age was collected only for children younger than age 3. This analysis, therefore, is restricted to a subsample of 5,888 children younger than 3 who were born in Canada and whose biological mothers were interviewed as the PMK (Appendix Table A).

### Analytical techniques

Prevalence and unadjusted and adjusted odds ratios were estimated to examine the effects of birth outcome and selected social environmental factors on the health of children. This analysis focuses on two measures of health: overall health as assessed by the child's mother and diagnosed asthma. Maternal assessment of overall child health is recognized as being important for primary care clinicians.<sup>33,34</sup> Asthma has been identified as the most common chronic illness and

one of the leading causes of hospitalization among children in industrialized countries.<sup>23,24,35-38</sup>

Logistic regression was used to estimate the odds ratios for health outcomes by the child's birthweight in combination with gestational age, sex and age, by the mother's educational attainment, smoking behaviour and age at the birth of the child, and by family type and household income. The model for the child's general health incorporated the mother's general health status; the model for childhood asthma incorporated the mother's asthma status. Several other health outcomes and measures of health care utilization were also examined in relation to birth outcome (see *Definitions*).

The selection of the variables included in the model was guided by the results of earlier research. Lone parenthood and teenage motherhood are highly associated with poor child health and childhood asthma.<sup>25,39,40</sup> Maternal education and household income have been related to the health of children.<sup>41-43</sup> Maternal health status and maternal asthma were included in the general health and asthma models, respectively, as controls for potential biological links to the child's health.<sup>5,44</sup>

The multiple logistic regression analyses were based on 5,810 children younger than age 3 whose mothers reported information on all the variables included in the models. Records with missing data were excluded. The analysis was based on a weighted sample using survey weights, which were normalized to average 1. Although this procedure produces less biased estimates of the standard errors, the adjustment does not take into account the complex design of the NLSCY and may underestimate the standard errors. Therefore, only tests with p-values of less than 0.01 (instead of 0.05) were considered significant to partially account for the larger variance estimates that would have been obtained if full account had been taken of the survey design. Even so, caution is warranted when interpreting the results.

be in poor health. However, the child's health varied depending on a number of biological and social factors.

Both gestational age and birthweight were associated with subsequent child health (Table 1, Appendix Table B). Six percent of children who had been preterm low birthweight babies were

reported to be in poor health, as were 4% who had been full-term low birthweight babies. The figure was 2% for normal birthweight children regardless of gestational age.

Among the characteristics examined, the only one other than preterm low birthweight that was related to a higher prevalence of poor child health was

## Definitions

The National Longitudinal Survey of Children and Youth asked the person most knowledgeable about the child a series of questions about the child's health and health behaviour. The analysis in this study was confined to the responses of the biological mother.

In this analysis, *birth outcome* was measured in terms of birthweight and gestational age.

For *gestational age*, the mother was asked: "Was ... born before or after the due date?" Those who answered that the child had not been born on the due date were asked the number of days before or after the due date. Gestational age was grouped into two categories: preterm (less than 37 weeks) and full-term (37 or more weeks).

For *birthweight*, the mother was asked: "What was ...'s birthweight in kilograms and grams or pounds and ounces?" Birthweight in grams was divided into two categories: low (less than 2,500) and normal (2,500 or more).

Children were grouped into four categories based on gestational age and birthweight: preterm low birthweight; full-term low birthweight; preterm normal birthweight; and full-term normal birthweight.

To determine the overall health of the child, the mother was asked: "In general, how would you describe ...'s health?" Response options were: excellent, very good, good, fair, poor. For this analysis, if a mother replied "poor" or "fair," the child's health was classified as poor. The asthmatic status of children was based on the question: "Has ... ever had asthma that was diagnosed by a health professional?" The validity of these two measurements of the health of children appears high, since both overall health and asthma status are highly associated with prescription drug use, hospitalization and long-term activity limitation among young children.<sup>45</sup>

Chronic conditions were assessed with the question: "Does ... have any of the following long-term conditions that have been diagnosed by a health professional?" This analysis examines the prevalence of bronchitis.

*Frequent nose or throat infections* was determined by asking whether infections had occurred "almost all the time" or "often."

*Any injury in the past year* refers to injuries that occurred in the past 12 months and were serious enough to require medical attention by a doctor, nurse or dentist.

The presence of long-term *activity limitations* was determined by asking: "Does this condition or health problem prevent or limit ...'s participation in school, at play or any other activity normal for a child ...'s age?"

To measure *physician contact*, the mother was asked: "In the past year, how many times have you seen or talked on the telephone about ...'s physical or mental health with: a general practitioner, family physician or pediatrician?" Frequent contact was defined as at least six times (the average was five).

The regular use of *prescription drugs* was based on the question "Does ... take any of the following prescribed medications on a regular basis." Response options were: Ventolin or other inhalants, Ritalin, tranquilizers or nerve pills, anti-convulsants or anti-epileptic pills, and other.

The child's use of *hospital services* was assessed by asking: "In the past 12 months, was ... ever an overnight patient in a hospital?"

The child's *age* was grouped into three categories: younger than 1, 1, and 2.

*Mother's health status* was defined as poor if she reported herself as being in poor or fair health; otherwise, her health was considered to be good.

*Maternal asthma status* was determined by asking: "Do you have any of the following long-term conditions that have been diagnosed by a health professional?" Asthma was included among the response options.

*Maternal education* was collapsed into three categories: less than high school, high school graduation or some postsecondary, and postsecondary graduation.

*Maternal smoking* was determined by asking: "At the present time do you smoke cigarettes daily, occasionally or not at all?"

*Maternal age at birth of child* was defined as younger than 20, 20 to 24, 25 to 34, and 35 or older.

*Family type* was dichotomized as lone-mother or two-parent family (including stepfather).

Based on household size, *household income* quintiles were derived and further grouped as low (quintiles 1 and 2), middle (quintiles 3 and 4) and high (quintile 5).

maternal health status: 11% of mothers whose health was poor reported that their children, too, experienced poor health. The prevalence of poor health was also somewhat elevated—around 4%—

Table 1  
Prevalence and adjusted odds ratios for poor health among children younger than age 3, by selected characteristics, Canada excluding territories, 1994/95

	Prevalence	Adjusted odds ratio	99% confidence interval
	%		
<b>Characteristics of child</b>			
<b>Birth outcome</b>			
Preterm low birthweight	6.3	3.1**	1.5, 6.6
Full-term low birthweight	4.2	1.8	0.5, 7.0
Preterm normal birthweight	2.1	0.8	0.3, 2.3
Full-term normal birthweight†	1.9	1.0	...
<b>Age</b>			
Younger than 1†	1.4	1.0	...
1	2.1	1.5	0.8, 2.8
2	2.9	1.8	1.0, 3.4
<b>Sex</b>			
Male	2.4	1.3	0.8, 2.2
Female†	1.9	1.0	...
<b>Characteristics of mother</b>			
<b>Health status</b>			
Poor/Fair	11.1	4.8**	2.4, 9.7
Good/Very good/Excellent†	1.9	1.0	...
<b>Educational attainment</b>			
Less than high school	3.5	1.9	0.9, 4.1
High school graduation/Some postsecondary	2.6	1.8	1.0, 3.4
Postsecondary graduation†	1.2	1.0	...
<b>Smoking status</b>			
Daily	4.0	2.0**	1.2, 3.3
Occasional	1.8	1.1	0.3, 3.8
Non-smoker†	1.5	1.0	...
<b>Age at birth of child</b>			
Younger than 20	4.1	0.9	0.3, 2.5
20-24	2.2	0.8	0.4, 1.5
25-34†	2.0	1.0	...
35+	2.2	1.2	0.6, 2.5
<b>Household characteristics</b>			
<b>Family type</b>			
Lone mother	4.5	1.6	0.8, 3.0
Two-parent family†	1.8	1.0	...
<b>Income</b>			
Low	3.8	0.9	0.4, 2.3
Middle	1.7	0.7	0.3, 1.6
High†	1.8	1.0	...

**Data source:** 1994/95 National Longitudinal Survey of Children and Youth  
**Note:** The multivariate analysis is based on 5,810 children younger than age 3 whose mothers reported information on all variables in the model. Tests with *p*-values of less than 0.01 (instead of 0.05) were considered significant to partially account for the larger variance estimates that would have been obtained if full account had been taken of the survey design.

† Reference category, for which odds ratio is 1.0

\*\* *p* < 0.01

... Not applicable

among children whose mother was not a high school graduate, smoked daily, had been a teenager when she gave birth, was a lone parent, or had low household income. Many of these characteristics co-exist, however. For instance, low birthweight is associated with poor maternal health, low educational attainment and smoking. Teenage motherhood often results in lone parenthood and low income.

After birth outcome, child age and sex, maternal education, smoking and age at the birth of the child, and family type and household income were controlled, maternal health emerged as being independently associated with poor child health. Children whose mother was in poor health had almost five times the odds of being in poor health themselves, compared with children of mothers in good, very good or excellent health.

After adjustment for the other factors including maternal health, preterm low birthweight remained significantly associated with poor child health. The odds that such children would experience poor health were three times the odds for full-term normal birthweight children. Full-term low birthweight children had moderately higher odds of poor health, but the difference was not statistically significant and is partly attributable to small sample size.

It also appears that daily maternal smoking had a detrimental effect on child health, after birth outcome and other social environmental conditions were controlled. The adjusted odds of poor health among children whose mothers smoked daily were twice as high as among children whose mothers did not smoke.

The odds of poor health among children of mothers with low education were relatively high, but the difference was not statistically significant. Likewise, the association of poor child health with teenage births, family type and household income disappeared when the other factors were introduced into the analytical model.

### Early childhood asthma

In 1994/95, according to the NLSCY, 6% of Canadian children younger than age 3 had been

diagnosed with asthma. The prevalence of asthma tended to be associated with the biological and social characteristics of the children and their mothers.

Asthma was especially common among children whose mother also had asthma (15%) (Table 2, Appendix Table C). The prevalence of asthma was also high among children who had been preterm low birthweight babies or whose mother had been a teenager when she gave birth (11% and 10%, respectively). The age of children was related to asthma: 8% of 2-year-olds had been diagnosed, compared with 2% of children younger than age 1. Asthma affected a higher percentage of boys than girls: 7% versus 4%. As well, low maternal education, maternal smoking, lone parenthood, and low household income tended to be related to high rates of asthma.

As was true for general health status, many of these social environmental factors are associated with each other. Yet even after adjusting for such potentially confounding effects, the odds of asthma among children of mothers with asthma were still three times the odds for children whose mother did not have asthma.

The relationship between asthma and preterm low birthweight also persisted, with such children's odds of having asthma two times the odds for full-term normal birthweight children. Children who had been full-term low birthweight babies or preterm normal birthweight babies did not have significantly high odds of having been diagnosed with asthma.

The mother's education was significantly associated with her child being diagnosed with asthma. After controlling for the other factors, the odds of asthma among children of mothers with less than high school graduation were 1.7 times the odds for children whose mother was a postsecondary graduate.

As has been shown in earlier research,<sup>45-47</sup> asthma is related to the child's sex. Even after the effects of the other variables were controlled, boys' odds of having asthma were 1.8 times those of girls.

While the odds of asthma among children of mothers who smoked were high relative to those of children of non-smoking mothers, the difference

was not statistically significant after controlling for other factors. Similarly, the associations of family type and household income with childhood asthma were not significant after adjusting for the other factors.

**Table 2**  
**Prevalence and adjusted odds ratios for asthma among children younger than age 3, by selected characteristics, Canada excluding territories, 1994/95**

	Prevalence	Adjusted odds ratio	99% confidence interval
	%		
<b>Characteristics of child</b>			
Birth outcome			
Preterm low birthweight	11.3	2.1**	1.2, 3.6
Full-term low birthweight	3.6	0.6	0.2, 2.6
Preterm normal birthweight	4.9	0.8	0.4, 1.5
Full-term normal birthweight†	5.5	1.0	...
Age			
Younger than 1†	2.1	1.0	...
1	6.3	3.1**	1.9, 5.0
2	8.4	4.4**	2.8, 7.0
Sex			
Male†	7.1	1.8**	1.3, 2.5
Female	4.1	1.0	...
<b>Characteristics of mother</b>			
Has asthma			
Yes	14.8	3.2**	2.0, 5.0
No†	5.2	1.0	...
Educational attainment			
Less than high school	7.9	1.7**	1.0, 2.8
High school graduation/Some postsecondary	6.2	1.4	0.9, 1.9
Postsecondary graduation†	4.2	1.0	...
Smoking status			
Daily	7.7	1.3	0.9, 1.8
Occasional	3.5	0.7	0.3, 1.7
Non-smoker†	5.1	1.0	...
Age at birth of child			
Younger than 20	9.9	1.1	0.6, 2.3
20-24	5.4	0.8	0.5, 1.2
25-34†	5.9	1.0	...
35+	3.5	0.7	0.4, 1.1
<b>Household characteristics</b>			
Family type			
Lone mother	8.2	1.1	0.7, 1.7
Two-parent family†	5.3	1.0	...
Income			
Low	7.4	1.0	0.5, 1.8
Middle	5.3	1.0	0.6, 1.6
High†	4.7	1.0	...

**Data source:** 1994/95 National Longitudinal Survey of Children and Youth  
**Note:** The multivariate analysis is based on 5,810 children younger than age 3 whose mothers reported information on all variables in the model. Tests with p-values of less than 0.01 (instead of 0.05) were considered significant to partially account for the larger variance estimates that would have been obtained if full account had been taken of the survey design. Because of rounding, some confidence intervals with 1.0 as the lower limit were significant.  
 † Reference category, for which odds ratio is 1.0  
 \*\* p < 0.01  
 ... Not applicable

### Other health outcomes

Aside from the mother's health, the factor that emerges most consistently as being related to both the child's general health and asthma status is preterm low birthweight. And according to the 1994/95 NLSCY, preterm low birthweight had a persistent and independent effect on other aspects of child health as well (Table 3).

For example, preterm low birthweight children had about seven times the odds of having an activity limitation, compared with full-term normal birthweight children, even after controlling for the effects of child age and sex, maternal health status, education, smoking and age at the time of the birth, and family type and household income. The odds that preterm low birthweight children would have bronchitis or frequent nose or throat infections were also significantly elevated. In addition, children who had been preterm but of normal birthweight had high odds of frequent nose or throat infections. And full-term low birthweight children had significantly high odds of having suffered an injury in the past year.

Given the prevalence of health problems among preterm low birthweight children, it is hardly surprising that their odds of having frequent physician contacts, regularly using prescription drugs, or having been hospitalized exceeded those of children who had been full-term normal birthweight babies. However, low birthweight children who had been full-term and preterm children of normal birthweight did not have significantly high odds of health care utilization.

### Implications

Clearly, the risk of poor health tends to be greater for preterm low birthweight children than for full-term normal birthweight children. According to the 1994/95 National Longitudinal Survey of Children and Youth, a substantial number of children younger than age 3—an estimated 41,000—had been preterm low birthweight babies. Moreover, rates of low birthweight and preterm births, especially the latter, have shown little decline in recent years.<sup>48-50</sup>

Table 3  
Prevalence and adjusted odds ratios for selected health outcomes and health care utilization among children younger than age 3, by gestational age and birthweight, Canada excluding territories, 1994/95

	Preterm low birthweight			Full-term low birthweight				Preterm normal birthweight				Full-term normal birthweight <sup>†</sup>		
	%	Adjusted odds ratio	99% confidence interval	%	Adjusted odds ratio	99% confidence interval	%	Adjusted odds ratio	99% confidence interval	%	Adjusted odds ratio	99% confidence interval		
Bronchitis	5.3	2.3**	1.0, 5.0	2.9	1.1	0.2, 5.6	2.2	0.8	0.3, 2.1	2.3	1.0	...		
Frequent nose or throat infections	10.1	2.4**	1.3, 4.3	1.0	0.2	0.0, 2.9	8.6	1.9**	1.1, 3.3	4.4	1.0	...		
Any injury	8.0	1.2	0.6, 2.3	17.6	3.1**	1.5, 6.5	9.8	1.3	0.8, 2.1	6.9	1.0	...		
Any long-term activity limitation	12.4	6.8**	3.8, 12.3	3.6	1.9	0.5, 8.1	2.0	1.1	0.4, 3.2	1.9	1.0	...		
Frequent contact with physician or pediatrician	41.5	1.6**	1.1, 2.3	30.3	1.0	0.5, 1.7	37.7	1.3	0.9, 1.8	31.6	1.0	...		
Regular use of prescription drugs	16.4	2.7**	1.7, 4.4	3.6	0.5	0.1, 2.1	9.0	1.3	0.8, 2.2	6.7	1.0	...		
Overnight hospitalization in past year	19.7	2.4**	1.5, 3.8	6.7	0.7	0.2, 2.0	12.7	1.4	0.9, 2.1	9.1	1.0	...		

**Data source:** 1994/95 National Longitudinal Survey of Children and Youth

**Note:** Odds ratios adjusted for child age and sex, maternal health status, maternal education, maternal smoking, maternal age at birth of child, family type and household income. The multivariate analyses are based on 5,810 children younger than age 3 whose mothers reported information on all variables in the model. Tests with *p*-values of less than 0.01 (instead of 0.05) were considered significant to partially account for the larger variance estimates that would have been obtained if full account had been taken of the survey design. Because of rounding, some confidence intervals with 1.0 as the lower limit were significant.

<sup>†</sup> Reference category, for which odds ratio is 1.0

\*\* *p* < 0.01

\*\*\* Not applicable

It has been suggested that the fetal environment may permanently change or “program” the structure and function of the body and have a profound

### Limitations

The National Longitudinal Survey of Children and Youth collected information about gestational age and birthweight only for children younger than age 3. Both, but especially the former, may be subject to recall error or errors due to lack of accuracy in the assessment.<sup>2,51</sup> Restriction of the analysis to information provided by biological mothers may help minimize such errors. However, children who were low birthweight babies tend to have a higher risk of institutionalization.<sup>5</sup> Therefore, because this study was based on data from a household population, the effects of preterm low birthweight on subsequent child health could be underestimated.

Studies of the health of low birthweight babies have tended to focus on very low birthweight (less than 1,500 g) and preterm small-for-gestational age births.<sup>3,4,52</sup> Preterm and small-for-gestational age, two components of low birthweight, may have different effects on child health.<sup>10,53</sup> However, the NLSCY sample sizes were too small for reliable estimates, so no further breakdown of low birthweight below 2,500 g was used in this analysis. While the data reveal disproportionately high odds of health problems associated with an interaction between preterm births and small-for-gestational-age births, the results are not shown because of small sample size.

All information about the child’s health was provided by his or her mother; there was no independent clinical verification of the presence or absence of health problems. Nor were data collected on the severity of asthma or of other reported health conditions. As well, the need to restrict the analysis to children younger than age 3 may have limited the examination of asthma rates because of the greater chance of misdiagnosis. In this age group, other respiratory problems such as bronchiolitis are sometimes confounded with asthma.

Some mothers may have been unwilling to report harmful behaviour, notably smoking. This may explain the weaker-than-expected association between maternal smoking and childhood asthma.

The NLSCY contained questions about other health outcomes such as epilepsy, cerebral palsy, kidney conditions and mental disabilities. However, the sample size for each of these outcomes among children younger than age 3 was too small to examine these conditions individually.

influence on susceptibility to illness in childhood and later life.<sup>14,54</sup> The heightened vulnerability of preterm low birthweight children has been attributed to possible structural abnormalities or impairments (such as pulmonary growth retardation), birth defects, birth asphyxia or neonatal complications of prematurity.<sup>4,6,7,15,55</sup>

It is also noteworthy that maternal education had an important effect on childhood asthma after adjusting for birth outcome, maternal asthma status and smoking behaviour, family type, household income, and teenage motherhood. The link between low maternal education and the poor health of young children could be partially attributed to a “lack of knowledge and unhealthy parental attitudes and behaviour patterns.”<sup>56</sup>

This analysis demonstrates that the association between household income and child health may be explained by other factors. The observations in an earlier study are relevant: “Certain parental characteristics, such as age, marital status, physical health, education ... may predispose to poverty and ill health in children. This assumes that lack of parental skills, time, dedication or knowledge can adversely affect the health of children. For example, chronically ill parents who are poor may have less time and energy to provide proper care and supervision for their children. Single parents may not be able to earn a living and care for children adequately. Adolescent parents are usually poor and may lack maturity. Parents who have a limited educational background ... may not know how to care for their child adequately or understand the health care system.”<sup>243</sup>

Even after birth outcome and other social environmental factors were taken into account, children whose mothers smoked daily were at higher risk of poor health than were the children of non-smoking mothers. Protecting children from passive smoking within their homes is acknowledged to be a major public health issue.<sup>57-59</sup> In Canada, recognition of the importance of smoke-free homes for children increased between 1992 and 1996, although in 1996, most children with parents who smoked (80%) still did not live in smoke-free homes.<sup>59</sup>

The data from the NLSCY suggest that attempts to improve child health cannot be compartmentalized. While birth outcome is important to health in early childhood, the health of the child's mother is also influential. Consequently, one implication of this analysis is that efforts to improve the health of children must take a broad approach. Child health cannot be viewed in isolation. Rather, it should be considered in the context of the health of other family members.<sup>48</sup>

The results of this analysis underscore the importance of both birth outcome and social environmental factors to the health of young children.<sup>11</sup> The provision of a healthy environment for children before they are born and in the early years of life is a challenge that requires the combined efforts of parents, community organizations, the educational system and health care workers. ●

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## Appendix

Table A

**Distribution of selected characteristics among children younger than age 3, Canada excluding territories, 1994/95**

	Sample size	Estimated population '000	% of total†
<b>Total</b>	<b>5,888</b>	<b>1,006</b>	<b>100</b>
<b>Characteristics of child</b>			
<b>Birth outcome</b>			
Preterm low birthweight	232	41	4
Full-term low birthweight	104	17	2
Preterm normal birthweight	340	58	6
Full-term normal birthweight	5,164	880	87
Missing	48	11	1
<b>Age</b>			
Younger than 1	1,992	329	33
1	2,175	330	33
2	1,721	348	35
<b>Sex</b>			
Male	2,976	512	51
Female	2,912	494	49
<b>Characteristics of mother</b>			
<b>Health status</b>			
Poor/Fair	207	31	3
Good/Very good/Excellent	5,655	972	97
Missing	26	4	--
<b>Has asthma</b>			
Yes	369	54	5
No	5,506	952	95
Missing	13	1	--
<b>Educational attainment</b>			
Less than high school	967	158	16
High school graduation/Some postsecondary	2,693	440	44
Postsecondary graduation	2,214	407	40
Missing	14	1	--
<b>Smoking status</b>			
Daily	1,672	264	26
Occasional	319	47	5
Non-smoker	3,868	692	69
Missing	29	4	--
<b>Age at birth of child</b>			
Younger than 20	238	36	4
20-24	1,123	165	16
25-34	3,889	671	67
35+	638	135	13
<b>Household characteristics</b>			
<b>Family type</b>			
Lone mother	770	143	14
Two-parent family	5,116	863	86
Missing	2	--	--
<b>Income</b>			
Low	1,289	202	20
Middle	3,981	663	66
High	618	141	14

**Data source:** 1994/95 National Longitudinal Survey of Children and Youth

† Percentage may not add to 100 because of rounding.

-- Amount too small to be expressed.

Table B

**Unadjusted odds ratios for poor health among children younger than age 3, by selected characteristics, Canada excluding territories, 1994/95**

	Unadjusted odds ratio	99% confidence interval
<b>Characteristics of child</b>		
<b>Birth outcome</b>		
Preterm low birthweight	3.4**	1.7, 7.1
Full-term low birthweight	2.2	0.6, 8.3
Preterm normal birthweight	1.1	0.4, 3.0
Full-term normal birthweight†	1.0	...
<b>Age</b>		
Younger than 1†	1.0	...
1	1.5	0.8, 2.9
2	2.1**	1.2, 3.9
<b>Sex</b>		
Male	1.3	0.8, 2.1
Female†	1.0	...
<b>Characteristics of mother</b>		
<b>Health status</b>		
Poor/Fair	6.5**	3.4, 12.5
Good/Very good/Excellent†	1.0	...
<b>Educational attainment</b>		
Less than high school	2.9**	1.5, 5.7
High school graduation/Some postsecondary	2.1**	1.2, 3.8
Postsecondary graduation†	1.0	...
<b>Smoking status</b>		
Daily	2.8**	1.7, 4.5
Occasional	1.2	0.4, 4.2
Non-smoker†	1.0	...
<b>Age at birth of child</b>		
Younger than 20	2.1	0.8, 5.3
20-24	1.1	0.6, 2.1
25-34†	1.0	...
35+	1.1	0.6, 2.2
<b>Household characteristics</b>		
<b>Family type</b>		
Lone mother	2.6**	1.5, 4.3
Two-parent family†	1.0	...
<b>Income</b>		
Low	2.2	1.0, 4.7
Middle	1.0	0.5, 2.1
High†	1.0	...

**Data source:** 1994/95 National Longitudinal Survey of Children and Youth

**Note:** The sample sizes for the analyses ranged from 5,840 to 5,888 children younger than age 3. Tests with p-values of less than 0.01 (instead of 0.05) were considered significant to partially account for the larger variance estimates that would have been obtained if full account had been taken of the survey design.

† Reference category, for which odds ratio is 1.0

\*\* p < 0.01

... Not applicable

Table C  
**Unadjusted odds ratios for asthma among children younger than age 3, by selected characteristics, Canada excluding territories, 1994/95**

	Unadjusted odds ratio	99% confidence interval
<b>Characteristics of child</b>		
Birth outcome		
Preterm low birthweight	2.2**	1.3, 3.8
Full-term low birthweight	0.6	0.2, 2.6
Preterm normal birthweight	0.9	0.5, 1.7
Full-term normal birthweight†	1.0	...
Age		
Younger than 1†	1.0	...
1	3.1**	1.9, 4.9
2	4.2**	2.7, 6.6
Sex		
Male	1.8**	1.3, 2.4
Female†	1.0	...
<b>Characteristics of mother</b>		
Has asthma		
Yes	3.2**	2.1, 4.9
No†	1.0	...
Educational attainment		
Less than high school	2.0**	1.3, 2.9
High school graduation/Some postsecondary	1.5**	1.1, 2.1
Postsecondary graduation†	1.0	...
Smoking status		
Daily	1.6**	1.1, 2.1
Occasional	0.7	0.3, 1.6
Non-smoker†	1.0	...
Age at birth of child		
Younger than 20	1.7	0.9, 3.2
20-24	0.9	0.6, 1.4
25-34†	1.0	...
35+	0.6**	0.3, 1.0
<b>Household characteristics</b>		
Family type		
Lone mother	1.6**	1.1, 2.3
Two-parent family†	1.0	...
Income		
Low	1.6	1.0, 2.7
Middle	1.1	0.7, 1.8
High†	1.0	...

**Data source:** 1994/95 National Longitudinal Survey of Children and Youth  
**Note:** The sample sizes for the analyses ranged from 5,840 to 5,888 children younger than age 3. Tests with p-values of less than 0.01 (instead of 0.05) were considered significant to partially account for the larger variance estimates that would have been obtained if full account had been taken of the survey design. Because of rounding, some confidence intervals with 1.0 as the upper limit were significant.

† Reference category, for which odds ratio is 1.0

\*\*  $p < 0.01$

... Not applicable