In 2002...
I'll be 5 years old !

Shoring up the Health of Young Children at the Low End of the Social Scale

By Ginette Paquet and Denis Hamel[1]

An ideal future for Dominique...

To illustrate the implications of this study for public health policy, imagine, for each health or developmental problem to be discussed, the ideal family, one with outstanding resilience, for a 4-year-old child who has lived at the low end of the social scale since birth. We shall call this fictitious socioeconomically vulnerable child Dominique.

Dominique runs the same risk of being hospitalized for one night as children from more privileged backgrounds, if breastfed for a minimum of six months and if the family received emotional or instrumental support from grandparents. But in order for these two protective factors to exert their full influence, Dominique would also need to be in a two-parent family and have a very healthy immigrant mother.

To have a similar risk of asthma attacks as more privileged children, Dominique has to live in a home with no second-hand smoke and have a very healthy mother. For these protective factors to exert their optimal influence, Dominique would also have to be a girl. Being in a two-parent family is the only factor that can reduce Dominique's risk of being overweight; however, it would still not be as low as for children from families with a higher social position.

Compared to children from more privileged backgrounds, Dominique would not be at greater risk for developing hyperactive and inattentive behaviours if breastfed for at least 4 months. Still, for this factor to attain its protective potential, Dominique would have to be a girl, live in a neighbourhood that was safe for children and where people looked out for each other, and most important, come from a family in which the parents rarely employed coercive parenting practices. Dominique's mother would be very healthy and the home free of second-hand smoke. Moreover, if living with both biological parents, Dominique would be as likely to have visited a paediatrician as children from more affluent environments. For this to be fully realized, however, Dominique's parents would have to have received instrumental or emotional support from the grandparents and the family would have at least two other children. In addition, Dominique's mother would have to be an immigrant and would not have consumed any alcohol while pregnant.

No social factor seems able to compensate for the higher risk Dominique runs of having dental cavities. Only daycare centre attendance could reduce the likelihood of having them. Moreover, if an only child, Dominique would not have visited the dentist less often than children in higher social positions. These outcomes would be even more likely if Dominique had also gone to kindergarten or, assuming that Dominique's mother had been born in Québec, if Dominique had participated in educational activities.

Québec

Given that children are born into families that do not have equal access to economic, affective, and social resources, and because these disadvantages appear to be inter-related, it is not difficult to see that early childhood plays a role in the production of socially structured health inequalities. Several longitudinal studies from other countries have confirmed that socioeconomic status has an effect not only on children's health, but also on the long-term health of individuals. The case of Québec offers an example. Our previous studies using QLSCD data found that at the end of the 1990s, a Québec toddler about 29 months old who had lived since birth in a family at the lower end of the social scale had an increased risk of poor health.[2] Other studies have shown that despite a considerable reduction in perinatal, neonatal, and infant mortality in Québec over the past 25 years, fetal and infant mortality are still closely related to the mother's educational level.[3] According to Chen and colleagues, if all education groups [of mothers in the study] had experienced the low [fetal and infant mortality] rates attained by the higher education group, the number of fetal and infant deaths would have been reduced by approximately 20%.[4]

The analysis presented in this fascicle is in keeping with current research that addresses influences on health throughout the life course. According to these studies, people's cumulative and differential exposure to environments that harm or support health is the primary determinant of variations in health[5]. Increasing evidence about the long-term health impacts of the prenatal and early childhood environments led us to particularly focus on the importance of the first few years.[6] Consequently, we were especially interested in the socioeconomically disadvantaged conditions that are passed down to children during their early socialization or, in other words, their unequal life opportunities from birth on. Exposure to socially disadvantaged conditions in childhood generally seems to continue throughout adolescence and young adulthood. This social trajectory brings an increased risk of illness in the 40s and 50s. In light of this context, we agree with Willms that public policies to reduce socially structured health inequities must be supported by research that seeks to "identify risk and protective factors that mediate or moderate the socioeconomic gradient, or have effects on social outcomes in addition to the effects associated with SES".[7]

The QLSCD data have given us a remarkable opportunity to work toward this very end. Thus, in examining how the social and health conditions of young Québec children change over time, we primarily wanted to see if the relationship between family social position and various child health and development indicators would hold, after controlling for certain factors and characteristics. In addition, we sought to identify any protective factors that could mitigate the influence of social position on young children's health. Thus the goal of our analysis was to identify factors that could moderate the harmful influences of adversity on children's development. Understanding these factors can help us to develop new ideas for how to improve public health interventions to disadvantaged populations.

Social position and health

Over the years, there has been considerable research on the relationship between health and SES (socioeconomic status). Early research focused on the role of income as a measure of poverty and adverse life conditions in general. Over the past 20 years, however, attention has shifted to other aspects of SES, specifically to social class. For people whose incomes are over the poverty line (i.e., people who are able to purchase essential goods and services), income level cannot explain this relationship. We therefore need to look for an "underlying something" that not only explains the association between SES and health, but also exerts a powerful influence on it. If this "something" proved to be directly linked to people's positions in the social hierarchy, it would exert influence on everyone, not only on disadvantaged minorities.[8] Therefore, to better understand the conditions that support or impair health, we turned to a set of psychosocial factors that are not equally distributed across social groups, such as: feeling able to influence one's destiny, participating fully in community life, and being able to make sense of and have control over one's own life. Accordingly, the social position of individuals in developed societies would no longer be defined by their material capacity to satisfy basic needs (except for small portion of the population at the very low end of the social hierarchy), but rather by their ability to participate fully in community life and have control over their destiny.

Is there a relationship between the health of children approximately 4 years old and family social position?

Not surprisingly, the higher the family social position, the better the health of the young child (for more details about the measure for social position, see Box 1). The results presented in Figure 1 show that hospitalization, asthma, overweight, hyperactivity/inattention, not visiting a paediatrician, dental cavities, and not visiting a dentist were positively associated with low family social position (for a description of the health and development indicators used, see Table A.1 in the Appendix).[9]

Box 1
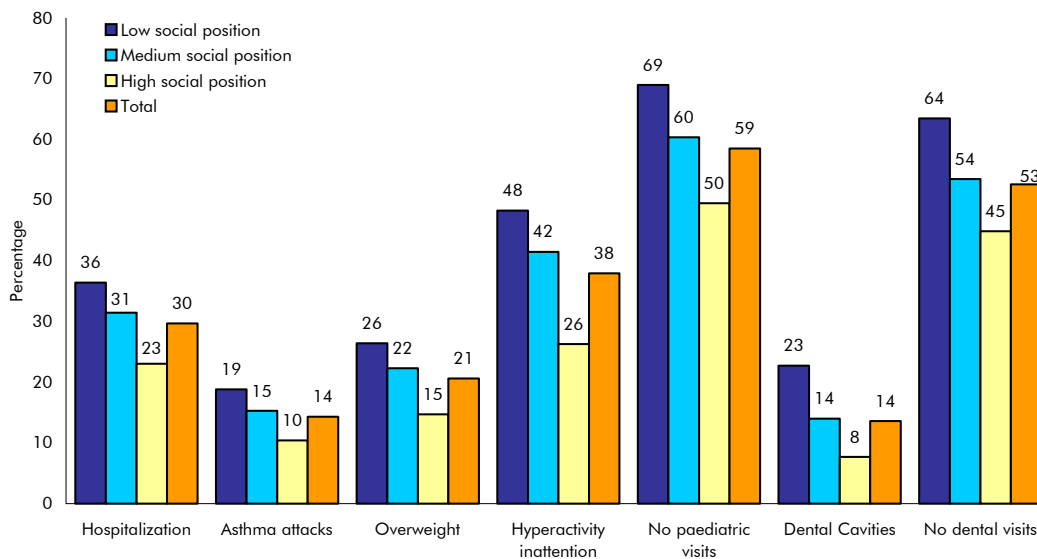### Measure for persistent low social position

In this fascicle, the measure for persistent low social position is based on the family socioeconomic status (SES) index calculated in each of the first four rounds of the survey.[10] This index was used in developing an indicator for families that repeatedly appeared in the lowest socioeconomic group for all the rounds of the study.[11]

This indicator for persistent low social position, which incorporates parents' education, income, and occupation, was defined as the highest social position achieved by a family in any of the rounds of the study. Thus, for a family to fall into the category of persistent low social position, it had to have been in the low socioeconomic group for each of the rounds of the study. For example, if a family was in the middle socioeconomic group (Group 2)[12] in the first round (1998), but in the low position (Group 1) in all the other rounds, it was assigned a middle social position (Group 2) for the analysis.[13] We want to highlight that using such a rigorous indicator means that our results very likely under-estimated the relationship between low family social position and health.

Here is how the Québec families were broken down according to the highest social position attained after the birth of the child:

- 17% of the families were in the low social position category;
- 52% of the families were in the middle social position category;
- 31% of the families were in the high social position category.

Figure 1
Prevalence of certain health and development indicators for children approximately 4 years old by family social position, Québec, 1998-2002

Source : Institut de la statistique du Québec, *QLSCD, 1998-2002*.

What is the net contribution of family social position to the health of young children?

Given that family social position is not the only determinant of children's health, we wanted to examine its relationship with known risk and protective factors and characteristics (details concerning certain explanatory and protective factors are shown in Table A.2 in the Appendix). The results of the bivariate analyses (data not shown) reveal an uneven distribution by social position for all the rounds of the study: The lower the family social position, the higher the prevalence of most risk factors.

Consequently, we asked the following question: If there had been, for example, the same proportion of young children in all social classes who had been breastfed, lived in single-parent families, or whose parents smoked at home, would there still be health differences associated with family social position? Multivariate analyses were carried out in order to control for the effects of these characteristics and factors. We used logistic regression models to identify the net effect of family social position on the health differences still observed in the children, after controlling for certain risk and protective factors and characteristics. Finally, we want to point out that the rigorous nature of the persistent low social position indicator suggests that our results probably under-estimated the relationship between low family social position and children's health.

❖ **Hospitalization**

Once we controlled for the set of selected factors and characteristics, the results showed a weaker link between hospitalization and family social position, although there was a tendency in the expected direction indicating a benefit for better-off children. However, children aged about 4 years who had lived in families at the lower end of the social scale since their birth still had an approximately 41%[14] higher risk of spending at least one night in a hospital than children from a higher social position (Table A.3). Apart from low SES, additional factors increased the probability that these young children would spend at least one night in hospital: living in a single-parent home in at least one of the rounds of the study, not having been breastfed for a minimum of six months, and having a non-immigrant mother who also reported that she was in very good health in at least one of the rounds of the study.

Let us now turn to the results of the examination of modifying effects, that is, the factors that can modify the association between hospitalization and family social position (see Box 2 for methodological details).
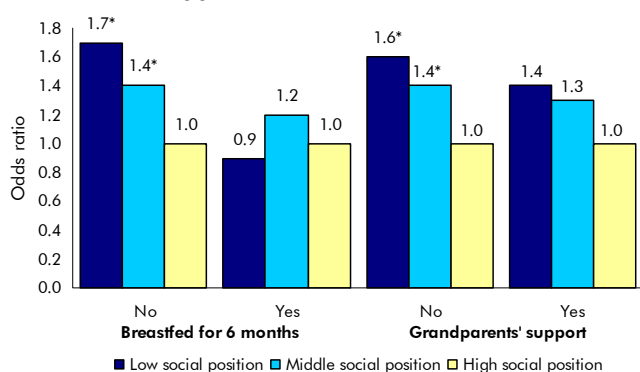

Box 2
Analysis of modifying effects

To detect the modifying effects of certain variables, interactions between social position and potentially modifying variables were introduced into the analysis.[15] These effects were tested by adding the interactions one at a time. For each model, a statistically significant interaction (using a 10% significance level) clearly indicated the presence of a modifying effect. We were particularly interested in the part of the interaction that affected the two social groups at opposite poles. Unless stated otherwise, the p values shown at the bottom of the figures represent the significance levels for that part of the interaction. However, the power of these tests was relatively weak, due to low sample size in certain sub-groups and the rigorous nature of the persistent low social position indicator, so we also constructed and tested certain well-defined contrasts by using the interaction terms. Our goal was to identify new points to consider for intervention. After controlling for other variables, we turned our attention to factors with some sub-groups showing an almost non-existent relationship between social position and the health and development indicator, although this relationship seemed to persist for other sub-groups.

First and foremost, among children who had not been breastfed for a minimum of six months, social position strongly influenced their probability of having at least one overnight hospital stay, although this influence seemed almost to disappear for breastfed children (Figure 2). In other words, SES did not seem to affect children's probability of having an overnight hospital stay since their birth if they were breastfed for six months. The probability of an overnight hospitalization was lower for children in the breastfed group, regardless of social background, than for children who had not been breastfed for at least six months.

Figure 2
Comparison of relationships between family social position and child's hospitalization by feeding method and presence or absence of grandparents' support, Québec, 1998-2002

* Odds ratio statistically significant at the 5% level.
Interactions: Breastfeeding p=0.10; Grandparents' support p=0.20.
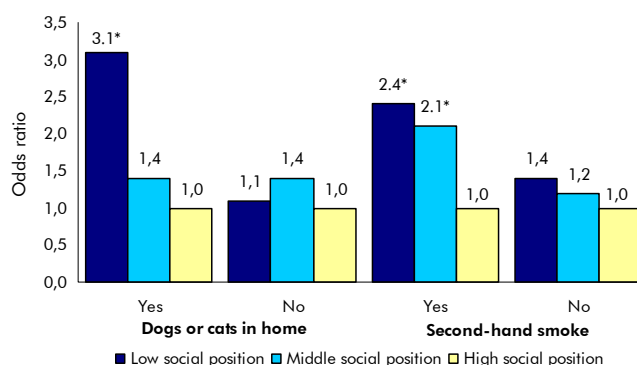Source : Institut de la statistique du Québec, *QLSCD, 1998-2002*.

We examined the contrasts regarding instrumental and emotional support received from grandparents, even though the interaction was not significant at the chosen significance level, because of the small sample size and the rigorous nature of our persistent low social position indicator. Nevertheless, the results were in the expected direction and thus suggested a focus for intervention: instrumental and emotional support received from grandparents. This could attenuate the relationship between a child being hospitalized for at least one night and family social position. In other words, after controlling for the set of selected factors, the impact of low family social position on a child's probability of hospitalization was moderated if the family received support from grandparents. In short, these results suggested two potential protective factors: breastfeeding for a minimum period of six months and possibly support from grandparents.

❖ **Asthma attacks**

After we controlled for certain factors, the association between family social position and the probability of an asthma attack decreased to the point of statistical non-significance, although we did observe a tendency in the expected direction (Table A.3). Children who had lived in families at the low end of the social scale since birth had an approximately 47% greater probability of asthma attacks than their peers from better-off families, after we controlled for the effects of certain risk, protective, and demographic factors.

An examination of the modifying effects showed the following (Figure 3): For children from families in a low social position since their birth, their higher probability of having an asthma attack was equalized when they lived in a home without a dog or cat. In practice, this means that regardless of their social group, all young children whose families do not have a cat or dog run a higher risk of an asthma attack, after controlling for the set of other factors.

Figure 3
Comparison of relationships between family social position and asthma attacks by presence of cats or dogs in home and at-home exposure to second-hand smoke, Québec, 1998-2002

* Odds ratio statistically significant at the 5% level.
Interactions: Dogs or cats p=0.03; Second-hand smoke p=0.18 in the test showing the same difference between low and middle social positions for both exposed and non-exposed children.
Source : Institut de la statistique du Québec, *QLSCD, 1998-2002*.

In a similar manner, while also keeping the findings of other studies in mind, we examined the contrasts regarding "exposure to second-hand smoke at home" and "mother's perceived health status", even though the interaction test results did not reach the defined level of statistical significance. The tendencies we observed suggest that disadvantages linked to family social position may be mitigated for children who are not exposed to

second-hand smoke at home, as well as for those whose mothers (data not shown) report being in good health.

Thus, two additional factors are likely to make children aged approximately 4 years a little more socially equal in health status: non-exposure to second-hand smoke and a mother in very good or excellent health. Moreover, the absence of dogs or cats in the home may cost more privileged children their advantage of a lower risk of asthma attacks. In more affluent families, having a cat or dog seems to benefit the development of young children's immune systems. This effect has also been noted in other longitudinal studies[16].

❖ **Overweight**

After controlling for certain factors, children aged 3 and 4 had a higher probability of being overweight if they lived in a family with a persistent low or middle social position (see Table A.3). Young children in low-SES families were almost 42% more likely to be overweight than children growing up in better-off areas. In addition to the effect of low or middle SES, young children in single-parent families were more likely to have excess body weight. After examining the modifying effects, the association between social position and overweight persisted, regardless of family type (data not shown). For example, we checked the effects of children's birth weights, their television viewing time, and computer time, as well as some pertinent dietary indicators. Results showed that none of the many factors studied seemed to provide any protection against an increased risk of being overweight for young children at the low end of the social scale.
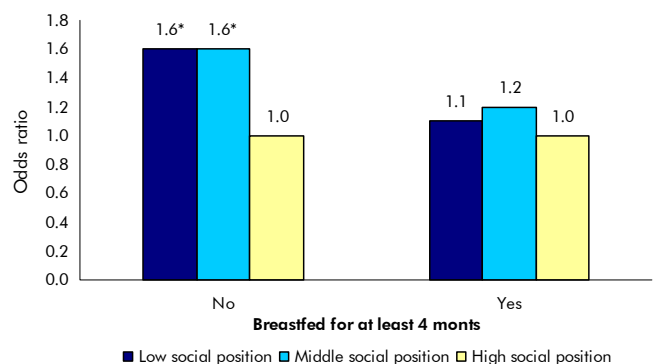
❖ **Hyperactivity and inattention**

Table A.3 shows that the relationship between family social position and children's hyperactivity/inattention was considerably weakened after we controlled for other factors, although children from a higher social position still tended to have an advantage. Apart from SES, the following factors increased the likelihood that mothers would perceive their children's behaviours as hyperactive-inattentive: being a boy, living in a family with coercive parenting practices in addition to being exposed to second-hand smoke, having a mother who reported not being in very good or excellent health, not having been breastfed for a minimum of four months, and living in a neighbourhood considered dangerous for children and where neighbours do not help one another other.

The stratified analyses showed the expected results: The link between mothers' reports of hyperactive and inattentive child behaviours and family social position

weakened for children who had not been breastfed for a minimum of four months (Figure 4). Although the interaction was not statistically significant, we were able to identify certain points to consider for public health interventions. For children who had been breastfed for a minimum of four months, SES did not seem to influence their probability of exhibiting hyperactive and inattentive behaviours. This means that, regardless of their social position, the likelihood that these children would be hyperactive was lower than that of children who had not been breastfed for at least four months. These results can be added to the findings of other studies that have tended to confirm the protective potential of breastfeeding for a minimum of four months, for all young children living at the low of the social scale since their birth.

Figure 4
Comparison of relationships between family social position and hyperactivity-inattention by feeding method, Québec, 1998-2002

* Odds ratio statistically significant at the 5% level.
Interaction: p=0.22 in the test showing the same difference between low and middle social positions for both breastfed and non-breastfed children.
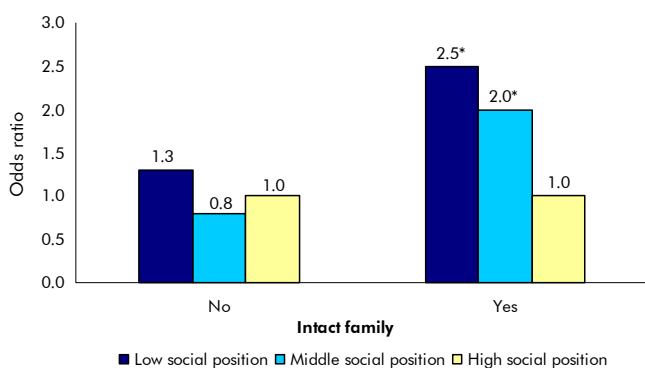Source : Institut de la statistique du Québec, *QLSCD, 1998-2002.*

❖ **Paediatrician visits**

A low social position remained linked to a higher probability of not having visited a paediatrician between birth and about 3½ years old. Table A.3 shows the persistence of the link between not consulting a paediatrician across the four first rounds of the survey and family social position since the birth of the child, even after controlling for the effects of a number of factors and characteristics. In fact, compared to their peers from more privileged areas, children of low social position have approximately a 34% higher risk of never having visited a paediatrician. This is a bit surprising, because we have seen throughout the study that poor health tends to be characteristic of young children of low social position. In addition to low SES, other factors increased the

probability that young children were not seen by a paediatrician in the 12 months preceding each round of the survey: no support from grandparents, living in a family of three or more children, and having a non-immigrant mother who consumed alcohol while pregnant.

We also found factors that somewhat modified this relationship. The stratified analyses showed that among children whose parents were separated, there was a weaker relationship between no paediatrician visits and family social position (Figure 5). This means that children whose biological parents stopped living together in the period between their birth and about age 3½ were equally likely to not have visited a paediatrician, regardless of their family's SES. Having separated biological parents seemed to cause young children to lose the advantages of more frequent paediatrician visits that are associated with living in families of a higher social position.

Figure 5
Comparison of relationships between family social position and not visiting a paediatrician, by presence of both biological parents, Québec, 1998-2002

*   Odds ratio statistically significant at the 5% level.
Interaction: p=0.08.
Source : Institut de la statistique du Québec, *QLSCD, 1998-2002*.

❖ **Dental cavities (treated or untreated)**

After controlling for a number of risk and protective factors and characteristics, a persistent low social position remained significantly associated with a considerably higher risk of children having cavities (treated or untreated) during early childhood (Table A.3). The risk of cavities for young children at the low end of the social scale since their birth was about 112% higher than that of their better-off peers. Apart from low SES, another factor increased the likelihood that young children would have cavities: not going to daycare. We will now turn to the findings about factors that can modify this relationship. None of the many factors analyzed seem to protect 4-year-old children who have lived since birth in families
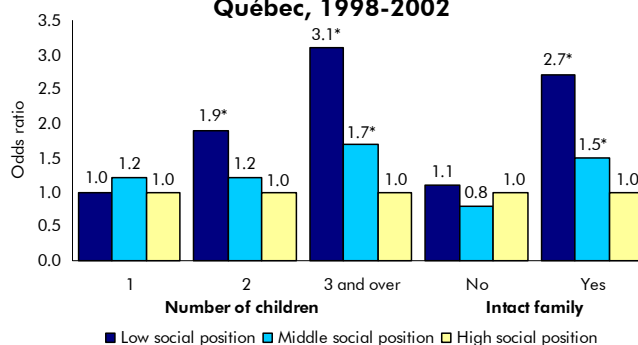
with a low social position against a higher probability of having cavities (data not shown).

❖ **No Dentist Visits**

In Québec, most dental services are free for children under age 10, because they are paid by our publicly-funded health insurance program. However, our analysis indicated that a child of low social position had a higher likelihood of not seeing a dentist before about age 4. Table A.3 shows the persistence of this relationship between no dentist visits and family social position since the birth of the child, even after controlling for the effects of potentially confounding factors. Between the ages of about 2½ and 4 years, socially disadvantaged children have an almost 48% greater risk of not having gone to a dentist than better-off children. In addition to low SES, certain factors increased the probability of young children not visiting a dentist: being an only child, not having attended daycare or participated in educational activities, and having an immigrant mother.

We observed two factors that somewhat modified these relationships: being an only child and living in a family where the biological parents are separated. On the one hand, our results showed that children without siblings all ran higher risks of not having gone to the dentist, regardless of their family SES (Figure 6). Even if these children were in a family of three or more children, the lower the family social position, the higher the child's risk of not having seen a dentist. So being an only child seems to cause better-off children to lose their advantage related to early dental care.

Figure 6
Comparison of relationships between family social position and not visiting a dentist by presence of two biological parents and number of children, Québec, 1998-2002

*   Odds ratio statistically significant at the 5% level.
Interactions: Intact family p=0.01; Number of children p=0.05.
Source : Institut de la statistique du Québec, *QLSCD, 1998-2002*.

On the other hand, for children with separated biological parents, their social position had no effect on their probability of not getting dental care before about age 4 (Figure 6). Children with separated biological parents thus have equivalent risks, with parental SES making little difference. The picture was different for children from intact families. Their probability of not visiting a dentist during their early childhood was closely related to their family's social position, since the lower the family social position, the higher their probability of not having seen a dentist. Better-off children with separated parents thus seem to lose the advantages of their higher family social position.

❖ **Avenues for intervention with socioeconomically vulnerable populations**

Before going on, it is important to remember some of the limitations of our study: a small sample size, the low prevalence of health and developmental problems among young children in comparison to a cohort of older adults, and a very rigorous indicator of persistent low social position that did not always allow us to achieve a flawless level of statistical significance. Nevertheless, we are convinced that the QLSCD, drawing on the results of other longitudinal studies, has given us an extraordinary opportunity to identify factors that could diminish socially structured health inequalities among young children. We can now describe changes in the lives of young Québec children and their families between birth and starting school.

Overall, our results showed that there are higher risks to the health and development of most young children about 4 years old living since birth in families at the low end of the social scale (as measured by household income, parent's education, and occupational prestige). For example, after controlling for other factors related to excess body weight, these children have an almost 42% higher risk of being overweight during their early years than better-off children. Compared to their more privileged peers, they also have about a 112% greater risk of cavities. Moreover, 4 year old children from disadvantaged backgrounds were taken less frequently to the paediatrician or dentist than better-off children: an approximately 34% higher risk of no paediatrician visits and a close to 48% higher risk of no dentist visits.

Clearly, in order to reduce socially structured health inequalities, we need to address the more general issue of socioeconomic inequality in Québec. Nevertheless, as a starting point, this study suggests some possibilities for public health interventions targeting vulnerable populations. We have highlighted certain factors and

characteristics that can explain the links between a disadvantaged social position and child health and development problems, even though other factors could potentially overcome the effects of adversity. In the light of these results, we will suggest some approaches to be considered for intervening with socioeconomically vulnerable populations.

All health professionals should promote and support breastfeeding among disadvantaged populations, because breastfeeding can protect the health of children of low social position. Of course, this must be done in a non-judgmental and respectful manner. The results concerning hospitalization and, to a less statistically significant degree, those concerning hyperactivity-inattention support this policy. Single-parent families should also receive special attention, as well as those with Québec-born parents, considering the net effect of these two factors on children's propensity for hospitalization. It would also be beneficial to support initiatives that encourage the strengthening of intergenerational bonds, because the instrumental and emotional assistance that grandparents provide appears to protect the health of their disadvantaged grandchildren. We should also remember that public health programs aimed at improving the health of mothers living in disadvantaged circumstances can accomplish a second objective at the same time, protecting the health of their children.

Non-judgmental interventions to eliminate second-hand smoke from homes would further benefit disadvantaged young children by protecting them against asthma. Smoking is also associated with a higher risk of hyperactive and inattentive behaviours, with boys being more vulnerable than girls, relative to their risk of both asthma attacks and hyperactivity-inattention. Another important finding was that the highest prevalence of hyperactive and inattentive behaviours among children of low SES was linked to coercive parental practices, living in a neighbourhood considered dangerous for children where there was little mutual support, and having a mother who reported not being in very good health in at least one of the rounds of the study.

Furthermore, special attention should be paid to families with low SES when developing public health programs to prevent overweight or dental cavities, since it seemed more difficult to counter the influence of adversity for these problems. We also need to focus on the problem of overweight for young children in single-parent families. In addition, families whose children do not attend daycare should have a targeted follow-up to reduce their prevalence of cavities and we must noticeably increase our efforts to encourage parents of lower social position

to take their children to the dentist at an earlier age. To promote dental visits for children in disadvantaged areas, particular attention should be paid to families with three or more children, families with immigrant mothers and children who do not attend daycare or other structured educational activities.

Finally, certain factors can cause children in better-off families to lose the health advantages characteristic of their social position. These are children whose parents are separated (paediatric and dental care), families who do not have dogs or cats (asthma), and families with only one child (dental care).

In conclusion, we believe it is critical to invest early in the lives of disadvantaged children. We agree with James J. Heckmar, Nobel laureate in economics, who encouraged Québec to make its highest per capita investment in its citizens in early childhood.[17] Such a reversal would give preferential service to young children from disadvantaged families. In a context where financial resources are scarce, it is essential to implement public health programs whose primary focus is on those who will benefit the most. Let us hope that future public health programs in Québec will give priority to the protective factors identified by our research, in order to shore up the health of young children at the low end of the social scale. If we are able to counter some of their expected social and health outcomes, then we should be able to greatly reduce socially structured health inequalities in the adult population.

Appendix

Table A.1
Description of selected child health and development indicators

Health and Development Indicator	Round	Description of indicator
Hospitalization	1998 to 2002	Admission to hospital for at least one night since the child's birth
Asthma	1999 to 2002	Asthma attacks reported in at least one of the rounds of the study
Overweight	2001 or 2002*	Body Mass Index (BMI), calculated from the child's weight and height, taking age and gender into account**
Hyperactivity/inattention	2000 to 2002	Scores higher than 5 on the standardized hyperactivity/inattention scale scores in at least one of the rounds
No paediatrician visits	1998 to 2001	No consultation with a paediatrician in at least one of the rounds versus having visited a paediatrician in all the rounds
Dental cavities	2002	Dental cavities, whether treated or not
No dentist visits	2000, 2001 and 2002	No visit to a dentist in any of the rounds versus having visited a dentist in at least one of the rounds

* In cases where data from the 2002 round was unavailable we used data from the 2001 round.

** BMI was calculated using the values proposed by Cole and colleagues : T. J. COLE, M. C. BELLIZZI, K. M. FLEGAL, and W. H. DIETZ (2000). "Establishing a standard definition for child overweight and obesity worldwide: international survey", *British Medical Journal* , 320 (7244), 1240-1243.

Source : Institut de la statistique du Québec, *QLSCD, 1998-2002*.

Table A.2
Details of certain explanatory and protective factors retained for the multivariate analyses

Explanatory factor	Round	Description of factor
Breastfeeding	1998 and 1999	Two dichotonmous variables • Not breastfed for less than 4 months and breastfed 4 months and longer • Not breastfed for less than 6 months and breastfed 6 months and longer
Primary form of childcare	1999 to 2002	Two variables • 2 categories: attended daycare in all 4 rounds and other forms of childcare • 3 categories: attended daycare in all 4 rounds; at home with a parent in 4 rounds; other forms of childcare
Mother's perceived health	1998 to 2002	Mother's perceived health less than "very good" (good, average, adequate, or poor in at least one of the 5 rounds)
Single-parent family	1998 to 2002	Child lived in a single-parent family for at least one round, in which SES was also the highest
Intact family	1998 to 2002	Child lived in a family with both biological parents in the 5 rounds of the study
Coercive parental practices	2000 to 2002	Scores higher than 4 on the standardized scale (from 0 to 10) that measured coercive parenting practices in reaction to problem behaviours of the child in at least one of the rounds
Pets	1998	Presence of dogs or cats in the house
Support from grandparents	2000	Scores of 5 and higher on the standardized scale (from 0 to 10) measuring instrumental and emotional support from maternal and paternal grandparents
Neighbourhood perceived as dangerous/ people don't help each other	1998, 2000 and 2002	Scores higher than 2.5 on the scale (from 1 to 4) measuring perceptions of a dangerous neighbourhood/ people not helping each other, in at least one of the rounds
Social support	1999 to 2002	Scores higher than 7 on the standardized scale (from 0 to 10) measuring social support, in at least one of the rounds

Source : Institut de la statistique du Québec, *QLSCD, 1998-2002*.

Table A.3

Explanatory factors[1] relating family social position to various health and development indicators for children approximately 4 years old, Québec, 1998-2002

Explanatory factors[2]	Hospitalization	Asthma	Overweight	Hyperactivity/ inattention	Paedia-trician	Dental cavities	Dentist
	Models before adjusment						
Social position (high)							
• Low	**1.63**	**1.72**	**1.86**	**2.38**	**2.05**	**3.27**	**2.13**
• Average	**1.47**	**1.51**	**1.69**	**1.97**	**1.57**	**1.93**	**1.43**
Single-parent family (two-parent)	**1.52** *	1.40	**1.55**	1.18		1.05	
Family not intact (Intact)					**1.31**		1.05
	Adjusted models						
Social position (high)							
• Low	1.45	1.60	**1.53**	1.39	**2.22**	**2.40**	**1.88**
	41% [3]	47% [3]	**42%** [3]	23% [3]	**34%** [3]	**112%** [3]	**48%** [3]
• Average	**1.35**	1.39	**1.52**	**1.36**	**1.65**	**1.67**	**1.31**
Single-parent family (two-parent)	**1.45** *	1.37	**1.52**	1.05		1.06	
Family not intact (Intact)					1.26		0.99
Boy (girl)	1.24	**1.68**		**1.61**	1.13		1.04
Number of siblings (none)							
• 1 sibling					1.04		0.76
• 2 siblings					**1.46**		**0.71**
Breastfeeding							
• Less than 6 months (6 mths and longer)	**1.30** *						
• Less than 4 months (4 mths and longer)				**1.37** *			
Primary form of childcare (daycare)							
• Not attending daycare (dichotomous)						**2.44** *	
• One of two parents looks after the child			1.24 *				
• Relative or acquaintance looks after the child			1.29				
No regular attendance at kindergarten or other educational activities (yes)							**1.44**
Mother's perceived health less than "very good" (very good or excellent)	**1.25** *	1.28 *	1.29	**1.38** *			1.21 *
Mother smoked during pregnancy (no)	1.12 *				1.18 *		
Mother consumed alcohol during pregnancy (no)					**1.41** *		
Non-immigrant mother (yes)	**1.67** *				**1.76**		**0.50**
Coercive parenting practices (no)				**2.58** *			
Exposure to second-hand smoke (no)		0.88 *	1.19 *	**1.33** *			
No dog or cat (yes)		**1.41**					
No support from grandparents (yes)					**1.59**		
Neighbourhood perceived as dangerous (no)		1.28		**1.47** *			
No social support (yes)						1.30 *	

1. Unless otherwise stated, this table presents the odds ratio from the logistic regression analysis. Odds ratio shown in bold were statistically significant at the 5% level.
2. The reference category for each factor is shown in parentheses.
3. Elevated risk for the low social position category compared to that of higher categories (relative risk).
* Variables playing a confounding role between social position and the health indicator. Note that certain variables were not statistically significant and did not play any confounding role in the relationship between SES and the corresponding indicator. They were nevertheless present, because they were subsequently retained (p-values slightly higher at 5% with the adjusted model) or because other studies demonstrated that these were important factors.

Source : Institut de la statistique du Québec, *QLSCD, 1998-2002*.

Notes

1. Ginette Paquet (Ph.D.) and Denis Hamel (M.Sc) are, respectively, a researcher and a statistician at the Institut national de santé publique du Québec (INSPQ). This fascicle can be downloaded either from the ISQ Web site (www.stat.gouv.qc.ca) or the INSPQ Web site (www.inspq.qc.ca).

2. In particular, our results showed that the probability of a child spending a night in hospital during the first 29 months is approximately 77% higher for children of low social position. Compared to their better-off peers, they also had close to a 31% higher risk of a respiratory tract infection, an approximately 69% greater probability that their mother reported not being in good health, and an approximately 96% higher probability of consulting a primary care physician. See: G. PAQUET and D. HAMEL (2003). "Socioeconomic conditions and health. Part II Social and health inequalities in young children: In search of protective factors", in : *Québec Longitudinal Study of Child Development (QLSCD 1998-2002) – From birth to 29 months,* Québec, Institut de la statistique du Québec, *2* (3).

3. J. CHEN, J. M. FAIR, R. WILKINS, M. CYR and the FETAL AND INFANT MORTALITY STUDY GROUP OF THE CANADIAN PERINATAL SURVEILLANCE SYSTEM. "Maternal education and fetal and infant mortality in Quebec." *Health Reports* Statistics Canada (no. 82-003) 1998;10(2):53-64.

4. *Ibid*, p. 57.

5. M. G. MARMOT, and J. SIEGRIST (2004). "Health inequalities and the psychosocial environment. Preface", *Social Science and Medicine*, vol. 58, no 8, avril, p. 1461-1574.

6. See: D.J. BARKER (1995). "Foetal origins of coronary heart diseases." *British Medical Journal, 311* (6998), 171-174; C. POWER and C. HERTZMAN (1997). "Social and biological pathways linking early life and adult disease," *British Medical Bulletin*, *53* (1), 210-221; M. WADSWORTH (1999). "Early life," in: M. MARMOT and R. WILKINSON (Eds), *Social Determinants of Health,* Oxford, Oxford University Press, pp. 44-63.

7. J. D. WILLMS (2003). "Ten hypotheses about socioeconomic gradients and community differences in children's developmental outcomes," *Final Report*, Gatineau, Applied Research Branch, Human Resources Development Canada, Strategic Policy, 40 pp.

8. M. MARMOT and J. SIEGRIST (2004), *op. cit*.

9. In addition to hospitalization and asthma, we also examined perceived health, respiratory infections, and consultation with a primary care physician in a manner that allowed us to see if the relationships in our previous analysis were maintained over time as the children grew up (see G. Paquet and D. Hamel, op. cit.). Note that the results indicated the persistence of these relationships. This will be the subject of a future publication.

10. This index was constructed by Direction Santé Québec according to Willms and Shields' method in the National Longitudinal Survey of Children and Youth (see: J. D. WILLMS and M. SHIELDS (1996). *A measure of socio-economic status for the National Longitudinal Survey of Children and Youth*, Working documented prepared for the users of microdata from the first round of the National Longitudinal Survey of Children and Youth, Atlantic Center for Policy Research in Education (University of New Brunswick and Statistics Canada), Ottawa, 7 pp. It combines five indicators: gross household income for the 12 months preceding the survey, education of the person most knowledgeable about the child (PMK) and that person's spouse, if applicable, as well as the prestige of the primary occupation of the PKM and his/her spouse, should the need arise. This indicator of household socioeconomic situation was successfully used in several studies, notably that of Tremblay and his colleagues on the aggressivity of youth (see: R. E. TREMBLAY, B. BOULERICE, P. W. HARDEN, P. MCDUFF, D. PÉRUSSE, R. O. PIHL and M. ZOCCOLILLO (1996). "Do children in Canada become more aggressive as they approach adolescence?" in: Statistics Canada and Human Resources Development Canada, *Growing Up in Canada*, Ottawa, Ministry of Industry, Catalogue No. 89-550-mpf) and Willms' report on child development (see: J. D. Willms, *op. cit*.).

11. This conforms to the literature on child health showing the determining influence of a disadvantaged situation lasting several years. Our previous analyses have shown (G. Paquet and D. Hamel, op. cit.) that numerous Québec families had a transitory low SES during the early years of the child's life. We have thus distinguished between temporary and more permanent situations, relative to their health effects, with an indicator describing the family social position since the birth of the child.

12. The indicator for family social position was allocated in the following manner: The first group includes children for whom the standardized SES indicator is lowest in the 25th percentile (low). The second group consists of the middle percentiles (from 25 to 75), thus approximately 50% of the population. The third group is composed of the 25 upper percentile of the standardized SES scale (high).

13. This is clearly a very rigorous requirement, but it allowed us to avoid including families that lived in temporarily reduced circumstances during the child's early years, frequently attributable to a loss of income due to taking parental leave. Finally, it is important to stress that using such an rigorous indicator means that our results very likely under-estimated the relationship between the low family social position and health.

14. Since the odds ratio is not interpreted as relative risks, we obtained this by modifying the logistic regression models and by using the "log" rather than the "logit".

15. See: G. Paquet and D. Hamel, *op. cit.;* J. D. Willms, *op. cit.;* P. M. BERNARD and C. LAPOINTE (1991). *Mesures statistiques en épidémiologie*, Québec, Presses de l'Université du Québec, 314 pp.

16. See: D. R. OWNBY, C. C. JOHNSON and E. L. PETERSON (2002). "Exposure to dogs and cats in the first year of life and risk of allergic sensitization at 6 to 7 years of age," *Journal of American Medical Association, 288* (8): 963-972; J. C. CELEDON, A. A. LITONJUA, L. RYAN, T. PLATTS-MILLS, S. T. WEISS, and D. R. GOLD (2002). "Exposure to cat allergen, maternal history of asthma, and wheezing in first 5 years of life." *Lancet, 360* (9335): 781-782.

17. J. J. Heckman (2004). "Investir pour les jeunes enfants." Public lecture by the Nobel laureate in economics delivered at Université de Montréal, 2000, Montréal, May 27.

About QLSCD

The results presented in this fascicle are based on data collected on a representative sample of 2,120 children born to mothers residing in Québec in 1997-1998. Within the first phase of QLSCD 1998-2002 those children have been followed annually until they reached approximately 4 years old.

The target population of the survey is made of babies (singleton births only)[1] who were 59 or 60 weeks of gestational[2] age at the beginning of each period of data gathering. It should be noted that babies born to mothers for whom we did not have the duration of pregnancy or were living in the Health and Social Services Ministry's administrative regions 10 (Northern Québec), 17 and 18 (Cree and Inuit territories) or in Indian reserves were excluded from the initial sample. Due to variations in the duration of pregnancy and the allotted time for each collection wave (four to five weeks), babies were not exactly all the same chronological age at survey. Thus, for the first round (1998), children were about 5 months old.

QLSCD rely on many instruments of data collection to gather information on the most knowledgeable person about the child (PMK), her/his spouse/partner, the target child and the non residential biological parents if it applies. All data presented in this publication have been weighted and adjusted to reduce potential biases.

To obtain more details about the survey methodology and the data presented in this fascicle, see numbers 1 and 12 of volume 1 of QLSCD 1998-2002 Collection (QLSCD 1998-2002).

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1. Twins and other multiple births were not targeted by the survey. Moreover, among singleton births, a very small proportion of babies born before 24 weeks or after 42 weeks of gestation have been excluded from the initial sample (approximately 0.1% of all births).

2. Gestational age is defined as the sum of the duration of gestation (pregnancy) and the chronological age of the baby.

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