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C.D. Howe Institute COMMENTARY

SOCIAL POLICY

Good Health to All:

Reducing Health Inequalities among Children in High- and Low-Income Canadian Families

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In this issue...

For child-targeted programs to have a substantial impact on health outcomes, income-related policies, such as cash transfers, should receive less emphasis and in-kind transfers, of goods and services directed to children, should receive more.

The Study in Brief

In recent years, the health and well being of Canadian children in low-income families has been identified as a policy priority, but policymakers need to have a clear understanding of the available tools to improve their health outcomes. This *Commentary* examines the relationship between household income and children's health, and finds that the health and education of parents play an even more significant role than household income in determining children's health status. Moreover, since very large transfers of income to relatively poor households would be needed to have a substantial impact on children's health outcomes, such income-related policies should be de-emphasized, in favour of in-kind transfers of goods and services from the provinces.

Specific recommendations include evaluating the implementation of in-kind transfers – healthy breakfasts and lunches, for example – through the school system; implementing policies that improve and promote the health of parents and the awareness of healthy lifestyles; improving the National Child Benefit by broadening the range of services delivered under the program; and providing a more consistent network of health services at the provincial level. Furthermore, the study concludes that children, rather than their parents, should be the direct recipients of in-kind transfers, and governments should charge a graduated system of fees based on household income for universal child-targeted programs.

The Author of This Issue

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Rich people live longer and exhibit lower morbidity and mortality rates than the general population. This relationship between income and health is evident, in fact, across the entire income distribution, as considerable research has shown.

> *"The accident of birth is a major source of inequality."* – James J. Heckman (2008)

For example, in an Ontario survey, 44 percent of women and 46 percent of men from low- to lower-middle-income groups report fair to poor health, compared with 8 percent of women and 7 percent of men from higher-income groups (Statistics Canada 2008). Moreover, this relationship between income and health applies not only to adults, but to children as well.

Social policy advocates believe that health inequalities among children should be addressed early on, since adverse health effects have potentially important consequences that last over a lifetime: poor health in childhood is associated with lower educational attainment and worse health in adulthood, both of which can affect labour force participation and, ultimately, economic growth. According to one study, in the United States, roughly half the inequality in lifetime earnings is due to factors determined by age 18 (Cunha and Heckman 2007). As one of that study's co-authors notes, "investing in disadvantaged young children is a rare public policy initiative that promotes fairness and social justice and at the same time promotes productivity in the economy and in society at large" (Heckman 2006, p.1902).

In designing specific initiatives, however, it is important to have a clear understanding of the factors that affect children's health status and their later life outcomes. Policymakers also need to understand how the available tools for improving the health outcomes of children in low-income families work, including the relative effectiveness of income transfer programs and direct intervention programs. The prime objective of this *Commentary* is thus to discuss the policies that would best address the inequalities in the health of children in families across different income groups. I begin by providing a brief explanation of the effects of household income and of family and child characteristics on children's health. I then review and assess existing policies in Canada and their impact on children's health and well-being.

I conclude that the health inequalities among children in high- and low-income families remain constant as they age, and that parents' health status plays an important and independent role in explaining their children's health status. These findings suggest that improving children's health calls not only for policies that target parents' health, but also for public health initiatives that promote the awareness and adoption of healthy living habits by parents and children alike. Moreover, governments should provide in-kind transfers (that is, goods and services), as opposed to cash transfers (money or tax credits), to improve child health and, when possible, provide them directly to children.

What Does the Evidence Tell Us?

The conceptual framework that I believe best describes the relationship between income and health in childhood makes use of data from Statistics Canada's National Longitudinal Survey of Children and Youth (NLSCY), which follows the development and well-being of Canadian children from birth to early adulthood. Using the NLSCY, I estimate the income-health relationship by age (the "gradient") for Canadian children, which provides insight on the determinants of children's health.[1] In addition, I identify the mechanisms that underlie this relationship. Finally, I examine the costs associated with improving children's health outcomes.

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1 To develop these insights, I replicate and extend the work of Currie and Stabile (2003) through alternative model specifications and by making use of additional years of the NLSCY data that have become available since their analysis. Only children that belong to the original longitudinal cohort are included in these analyses.

Table 1: The Gradient in Canada – Regression Results from the de Oliveira Model

Age Groups	0-3	4-8	9-12	13-15
Log of income coefficient	- 0.042	- 0.091**	- 0.091**	- 0.101**
	(0.031)	(0.023)	(0.030)	(0.051)
Poor health coefficient – mother	0.417**	0.508**	0.543**	0.514**
	(0.036)	(0.025)	(0.032)	(0.054)
Poor health coefficient – father	0.269**	0.297**	0.361**	0.397**
	(0.036)	(0.025)	(0.032)	(0.054)
Number of Observations	7,659	14,264	8,632	2,871

Note: ** Statistically significant at the 5 percent level.
The dependent variable is child health, as measured on a 5-point Likert scale (where 1 corresponds to excellent health and 5 to poor health).
For full model results, see de Oliveira (2008).
Source: Author's calculations, National Longitudinal Survey of Children and Youth (NLSCY).

Determinants of the Health of Canadian Children

In my analysis, I model child health as a function of child and family characteristics[2] and parental socioeconomic status[3] as reported in the NLCSY. In a standard survey question, the person most knowledgeable about the child is asked whether the child is in excellent, very good, good, fair, or poor health – this is the dependent variable. In practice, I estimate the probability that a given child is in any of these health categories, conditional on the explanatory variables.

The statistical models[4] I estimate suggest there is a constant health gap between children from high- and low-income families in Canada. The income coefficients for each age group (from regressing household income, among other variables, on child health) measure the magnitude of the effect of household income on child health. For age groups 4-8, 9-12 and 13-15, the income coefficients do not change, which suggests there is a constant income-health gradient throughout childhood (see Table 1).[5] This result is contrary to existing findings for adulthood and those of previous studies on children for the United States and Canada.

The main difference between my study and previous work on Canadian children, such as that of Currie and Stabile (2003), is the inclusion in my model of parental health as an explanatory variable – see Figure 1.[6] Parental health plays a significant role in explaining children's health, and the effect of that role generally increases with age. Moreover, both the physical and mental health of the mother has a larger

2 These models do not include any controls for whether the child is an immigrant or from an immigrant family, nor whether they are of Aboriginal origin; nonetheless, they control for child ethnicity (white versus nonwhite).

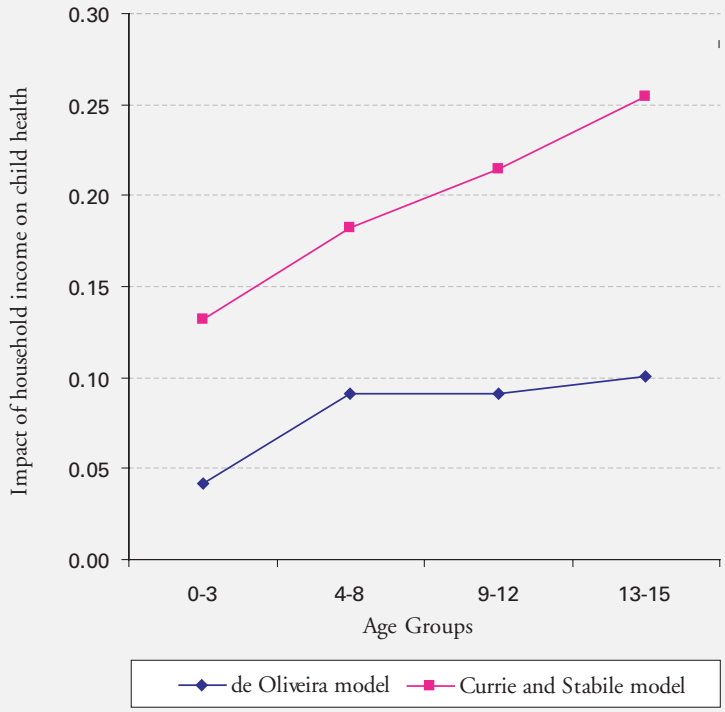
3 Socioeconomic status is made up of an individual's or family's educational attainment, income/earnings, and occupation.

4 These statistical models include parametric and nonparametric models. For the parametric model, I estimate an ordered probit model; for the nonparametric model, I estimate a conditional probability kernel estimator. For more details on these models, see the Appendix as well as de Oliveira (2008).

5 The income coefficients in Table 1 are negative because the health measure provided by the NLSCY varies from 1 to 5, where 1 is excellent health and 5 is poor health. Thus, household income and the measure of child health are negatively correlated.
The income coefficient for the 0-3 age group is not statistically significant. When I test for the equality of income coefficients for adjacent age groups 4-8 to 13-15, I find no significant difference.

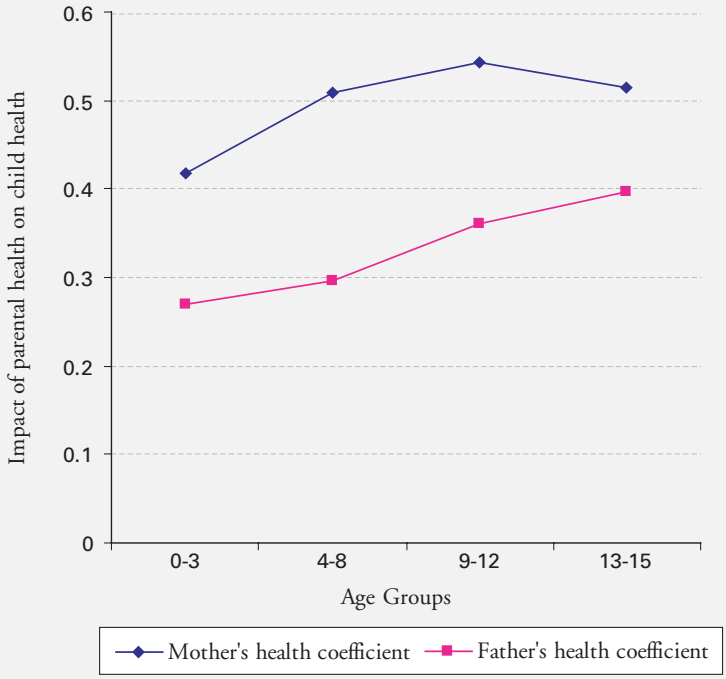
6 In Figure 1, the y-axis has been changed to reflect the fact that household income and child health are positively correlated. (In other words, the y-axis represents the absolute value of the income coefficients from both the Currie and Stabile (2003) and the de Oliveira (2008) models.)

Figure 1: Impact of Household Income on Child Health by Age Groups



The y-axis (value of income coefficient) measures the magnitude of the impact of household income on children's health status, by age groups (x-axis). For the de Oliveira model, we find that this impact is roughly constant with age for children older than 4-year-olds.
Source: Author's calculations, National Longitudinal Survey of Children and Youth (NLSCY).

Figure 2: Impact of Parental Health on Child Health by Age Groups



The y-axis measures the impact of each parents' health status on children's health status, by age groups (x-axis). This figure shows that the impact of parental health increases with children's age and that the effect of maternal health is greater than paternal health on child health.
Source: Author's calculations, National Longitudinal Survey of Children and Youth (NLSCY).

impact on children's health than does that of the father (see Table 1 and Figure 2).
I also find that being the first born in a family increases the probability that the child will be in better health, although this effect decreases as children become older. In addition, the income-health gradient is larger for girls than for boys, although this effect also diminishes as children age, suggesting equalization between boys and girls in adolescence. With regard to the health behaviour of parents, I find no evidence that smoking affects the health of children directly, though it might do so indirectly by deteriorating the health of parents. Finally, I find that the mother's education plays a larger role in explaining children's health than does the father's education.

Why Are Children in Different Income Groups Not Similarly Healthy?

On average, children in low-income families are in poorer health than those in high-income families, but why, in a wealthy country such as Canada, should this be so? What drives these health differences? To answer these questions, I test two hypotheses proposed by Currie and Stabile (2003). The first hypothesis is that children in low-income families do not deal as effectively with illness as children in high-income families do – perhaps due to a lack of relevant information or constraints on resources, which could affect the treatment of health conditions. The second is that children in low-income families are more likely than those in high-income families to become ill – perhaps due to lifestyle or environmental conditions such as poor housing and poor nutrition.[7]

Generally, I find that, while children in high- and low-income families recuperate from illness at the same rate, those in low-income families are more likely to become ill or be affected by chronic conditions.[8] To formulate recommendations on how to respond, therefore, we need to understand why this might be the case.

Some analysts argue that low-income parents invest less in their children, in terms of both the amount and "quality" of time they spend with them and the material investment they make. Quality of time with children is assumed to increase with parents' education, perhaps because more human capital increases productivity in parenting (Phipps 1999), while household income determines not only what inputs a family can afford to buy, but also what the family does with the inputs it has at hand. For example, parents of lower socioeconomic status might have experiences with the health care system or beliefs about health – such as whether it is normal for a child to cough or wheeze – that differ from those of parents with higher socio-economic status. Lower-income or less-educated parents also might lack access to appropriate health information or be less able to interpret such information so as to help their children, either of which could affect the treatment of a medical condition. They also might be less aware than higher-income or better-educated parents of existing social and health programs or of how to apply for such assistance.

The "Cost" of Improving the Health of Children in Lower-Income Families

If the objective is to improve the health of children in low-income families, why not just give more money to these families? A common exercise in the child health literature is to increase a representative family's income and examine how this cash transfer affects the health status of a representative child. For example, suppose a family's household income were to double from, say, $30,000 to $60,000; what would happen to the probability that a child in that family is in excellent health? The results from my model suggest that such a probability increases by 2.5 percentage points for 4-to-8-year-olds and 2.8 percentage points for 13-to-15-year-olds.[9]

7 The corresponding models that assess these hypotheses are "longitudinal" analyses and can be found in the Appendix.

8 This is in line with Currie and Stabile's (2003) original results.

9 Using the Currie and Stabile (2003) model framework, I find that the probability of a child being in excellent health increases by 5.0 percentage points for 4-to-8-year-olds and 7.0 percentage points for 13-to-15-year-olds, or about twice the size of the effect I find in my model. The difference is mainly due to the inclusion in my model of parental health, which suggests that the effect of income on child health is not as strong as previously thought.

Another interesting exercise is to examine the effect on a child's health of a marginal increase in household income. I find that increasing household income by 1 percent improves a child's health status by 0.67 percent for the 4-8 age group and by 0.78 percent for the 13-15 age group. Put another way, the probability that a child is in poor health decreases by 0.67 percent and 0.78 percent for the 4-8 and 13-15 age groups, respectively, when family household income increases by 1 percent.[10]

Public Policy and Children

As we have seen, additional household income alone is not enough to improve children's health. The health of parents also plays an important role in influencing children's health through, for example, genetics, a less healthy uterine environment, lower-quality care, and health-related behaviour. Some of these channels can be influenced by public policy, but others cannot. Given current technology, policy cannot change a child's being born with poor health due to a genetic disposition, but policy could help to decrease the incidence of low birthweight, for example, or promote healthy behaviour by parents and children. Although some analysts argue that health outcomes are determined largely by the environment in which someone lives, my findings are in line with those who posit, instead, that the choices of individuals and their parents play a significant role in shaping one's health status, and my recommendations reflect this view. Accordingly, what types of policy tools could effectively improve the health of children from low-income backgrounds?

The Cash versus In-Kind Transfers Debate

The main tools policymakers use to increase the welfare of the poor are cash and in-kind transfers of goods or services. Generally, policymakers are interested in understanding whether governments can improve children's health outcomes by increasing cash transfers to low-income families or whether they should focus on the provision of services, such as early childhood education or parenting training.

Cash transfers typically raise the welfare of the poor by increasing their disposable income, while in-kind benefits are used primarily to alter the poor's consumption behaviour towards higher levels of a given good or service. Thus, unlike cash transfers, in-kind transfers constrain the consumption behaviour of recipients, causing economists who perceive cash to be more useful to recipients to be skeptical about their value. The traditional justification for in-kind transfers is thus rooted in paternalism. Paternalistic arguments assume particular importance in situations where the intended recipient of a transfer program is a child but the transfer is given to the parents. However, parents might not take fully into account the interests of their children when making decisions or they might neglect to consider other factors. For example, suboptimal spending on children's education might lead not only to poorer individual prospects but also to slower future economic growth (Currie and Gahvari 2008).

Many economists – among them Currie (1995, 2006); Blau (1999); and Phipps (1999) – suggest that in-kind transfers are a better policy instrument than cash transfers for increasing the well-being of children directly. Currie (2006) compares the relative effectiveness of cash and in-kind transfer programs in the United States – where the pillars of the welfare system are Medicaid, Food Stamps, Head Start, the Supplemental Nutrition Program for Women, Infants, and Children, and public housing (see also Currie 1995) – and their impact on child well-being. She concludes that in-kind programs are more effective than cash at improving the welfare of poor children (Currie 2006). In particular, in-kind transfers can be more effective in encouraging the consumption of specific goods and services that the government wishes individuals to consume.[11]

10 Currie and Stabile (2003), in contrast, find that children's health status improves by 1.39 percent and 2.12 percent for the 4-8 and 13-15 age groups, respectively, when household income increases by 1 percent. Again, the much smaller increases in my model can be explained in large part by the inclusion of parental health status.

11 They can also lead to the "overprovision" of a publicly provided good when society prefers the recipient to consume more of a given good or service than the individual would do so voluntarily if given a cash transfer of equivalent value.

For example, the WIC and school meals programs have had a measurable effect on children's nutrition, as they resulted in an overprovision of healthy foods relative to what low-income households would have chosen given an equivalent cash transfer (Currie and Gahvari 2008). The cash value of benefits under the WIC and school meals programs alone is so small – roughly $35 per month in the case of WIC packages without infant formula – that it seems unlikely to result in any serious improvement in children's nutritional status (Currie and Gahvari 2008). Much larger cash transfers under the former Aid to Families with Dependent Children program had no effect on infant birth weight (Currie and Cole 1993). Thus, as Blau (1990) argues, substantially large and unrealistic cash transfers to relatively poor households would be required for there to be a significant impact on child development, as my hypothetical exercise of doubling the income of a low-income family confirms. Moreover, many in-kind programs for disadvantaged families with children – such as those that supply primary and secondary education, nutritional supplements, medical care, and child care – are likely to increase productivity and the labour supply in the long run and reduce inequalities (Currie and Gahvari 2008; Heckman 2008).

Who Should Receive Transfers?

Empirical work has shown that spending choices depend on who receives income within a family. Therefore, it is important to understand how parents allocate their resources among household expenditures. If resources are not equally shared in families, children's well-being might depend on whether resources are delivered as a cash transfer to the parents or an in-kind transfer to the child (Phipps 1999).

Parents may use unrestricted cash transfers as they would any other additional income – some might be spent providing for children, but some might be spent on other goods and services that do not necessarily benefit the child. For example, in examining the effect of a lump-sum cash transfer (the child benefit) on household spending patterns of parents in the United Kingdom, Blow, Walker, and Zhu (2006) find that a large proportion of unanticipated increases in the benefit is spent on adult-related goods, rather than on children's needs.

Does it make any difference whether the mother or the father is the recipient of the transfer? To answer this question, some economists have tested what is described in the literature as the "good mother hypothesis," which asserts that the consumption of child-specific goods and children's well-being is superior in households in which mothers have greater control over economic resources. Dooley, Lipman, and Stewart (2005), however, find evidence of only modest effects in such a case. Phipps (1999) assesses whether it makes a difference if resources are directed towards the child via a tax exemption or credit for the father, a family allowance paid to the mother, or a school lunch (or other in-kind program) received directly by the child. She finds that it might be better to issue a cheque in the mother's name – in the form of a baby bonus, for example – than to allow the father to write off some of his taxable income, but it might be better yet to have in-kind transfers delivered directly to the child.

Existing Policy Instruments and Programs

Funding for in-kind transfers for early childhood development and early learning and child care is transferred to the provinces and territories from the federal government through the Canada Social Transfer (CST), and is provided on an equal per capita cash basis to ensure all Canadians have similar support regardless of their place of residence. Including transition protection payments, the CST cash transfer will be roughly $10.6 billion in fiscal year 2008/09, and will grow by a legislated 3 percent escalator in 2009/10. From a policy design perspective, it might be of interest to understand how provinces choose the mix of cash and in-kind benefits for their low-income residents, and how this mix is affected by changes in the level of federal government support (see Marton and Wildasin 2007). The preference for in-kind transfers over cash transfers suggests provincial governments have a greater role to play than the federal government in achieving the best policy outcomes.

The National Child Benefit

Of the existing child benefits, the most important is the National Child Benefit (NCB), which includes the Canada Child Tax Benefit and the National Child Benefit Supplement. While these child benefits do not target the improvement of children's health per se, they have a direct effect on children's well-being generally and, thus, an indirect effect on children's health.

The NCB is a joint initiative of the federal, provincial, and territorial governments (with the exception of Quebec[12]), with a First Nations component. Its aims are to prevent and reduce child poverty, support parents as they move into the labour market, and reduce overlap and duplication among government programs, and it includes both cash and in-kind transfers – see Table 2. Ottawa has taken the lead in financing the program, while the provinces are responsible for the allocation of funds. Under this program, the federal government makes monthly cash payments to low-income families with children, regardless of whether or not the family participates in the workforce or receives social assistance, while the provinces, territories, and First Nations deliver programs and services to low-income families with children. Provinces may reduce the amount they provide in social assistance to these families up to the amount of the federal increase and instead spend the funds on programs aimed at child benefits and earned income supplements, child day care initiatives, services for early childhood and children at risk, supplementary health benefits, and other services.

Before the implementation of NCB in 1968, moving from social assistance into a paying job often led to only a minimal increase in family income for low-income parents. Sometimes it could also mean the loss of other valuable benefits, including health, dental, and prescription drug benefits. As a result, families would find themselves financially worse off in low-paying jobs compared to being on welfare, a situation that has been described in the literature as the "welfare wall." The NCB reduces this welfare wall by providing child benefits outside of social assistance and ensuring that benefits and services continue when parents move from social assistance to paid employment. The unique feature of the NCB relative to policies in other countries is its integration with social assistance (welfare) payments. Milligan and Stabile (2007) find that roughly one-quarter of the drop in social assistance take-up can be attributed to the introduction of the NCB.

The Canada Child Tax Benefit is a tax-free monthly payment made to eligible families to help them with the cost of raising children under age 18. The amount each family is eligible for is based on the number of children in the family, the province or territory of residence, the family's adjusted net income, and whether a given child is eligible for the Child Disability Benefit. The basic annual benefit is roughly $1,307 ($108.91 a month) for each child under age 18,[13] with a supplement of $91 ($7.58 a month) for the third and each additional child. For families whose net income exceeds $37,885, the Canada Revenue Agency taxes back 2 percent of the benefit if there is one child and 4 percent if there are two or more children.

Like the Canada Child Tax Benefit, the size of the National Child Benefit Supplement (NCBS) – the federal government's contribution to the NCB – is determined by the family's net income and the number of children in the family. A one-child family receives $2,025 a year ($168.75 a month), an amount reduced by 12.2 percent of the amount by which family net income exceeds the threshold of $21,287. A two-child family receives $1,792 a year ($149.33 a month), reduced by 23 percent of the amount by which family net income exceeds the threshold, while a family with three or more children receives $1,704 a year ($142 a month), with the amount reduced by 33.3 percent of the amount of family net income that is more than the threshold. Thus, families receive the maximum only if their net income is less than $21,287.

12 Although it agrees with the basic principles and has adopted a similar approach to the NCB, Quebec does not participate in the program, preferring to assume control over income support for children in the province. The federal government, through the Canada Revenue Agency, administers the child benefit programs of all other provinces and territories except those of Manitoba, Ontario, and Prince Edward Island.

13 In Alberta, eligible families receive a basic benefit of $1,196 ($99.66 a month) for children under age 7, $1,277 ($106.41 a month) for children ages 7 to 11, $1,429 ($119.08 a month) for children ages 12 to 15, and $1,514 ($126.16 a month) for children ages 16 and 17.

Table 2: Existing Canadian Policies/Programs that Target Children and their Well-Being

				Evaluation	
Objective/Brief Description	**Program/Policy Components**	**Target Population**	**Type of Transfer**	**Effectiveness**	**Cost-effectiveness**
		The National Child Benefit			
To prevent and reduce the depth of child poverty, support parents as they move into the labour market, and reduce overlap and duplication between government programs.	This policy consists of monthly payments and benefits/services to low-income families with children.	All children in Canada (with the exception of Quebec).	Cash and In-kind.	NA	NA
		The Aboriginal Head Start Program			
To provide opportunities for Aboriginal preschool children to develop a positive sense of themselves, a desire for learning and develop fully as successful young people.	This program typically provides half-day preschool education that prepares young Aboriginal children for their school years.	First Nations, Inuit and Métis children and their families in Urban and Northern Communities.	In-kind.	NA	NA
		The Community Action Program for Children			
To invest in the well-being of vulnerable children.	This program provides long term funding to communities to deliver programs that address the health and development of at-risk children ages 0 to 6.	All children in Canada (specifically, 0-to-6-year-old, at-risk children).	In-kind.	Michael Boyle and Doug Willms (2002) found that CAPC participants experienced only modest gains on the health indicators examined, namely motor and social development and emotional-behavioural problems.	NA
		The Canada Prenatal Nutrition Program			
To reduce the incidence of unhealthy birth-weights, improve the health of both infant and mother and encourage breastfeeding.	This program provides long-term funding to community groups to develop or enhance programs for vulnerable pregnant women.	At-risk pregnant women and infants.	In-kind.	NA	NA

NA – Information not available.
Source: Public Health Agency of Canada.

Other Programs for Child Well-Being and Healthy Development

In addition to the federal and provincial child benefit programs, a number of community-based programs are in place whose primary goal is to improve the well-being and healthy development of vulnerable children and youth – and, in some instances, mothers – including Aboriginal children and families, such as the federal government's First Nations-Inuit Child Care Initiative and the Aboriginal Head Start Program.

There are also numerous prevention and early intervention programs, generally directed to "at risk" families, that are funded both federally and provincially. Federal programs include the Child Development Initiative, the Canada Prenatal Nutrition Program, and the Community Action Program for Children. The numerous provincial initiatives include New Brunswick's Early Childhood Initiatives, Ontario's Better Beginnings, Better Futures, and a range of programs under larger program banners such as Alberta's Child and Family Services Authorities, Saskatchewan's Action Plan for Children, and Quebec's Centres locaux de services communautaires (local community resource centres). In the following section, I briefly describe some of these programs and, where possible, compare them to US programs.

ABORIGINAL HEAD START: Aboriginal Head Start (AHS) is an early childhood development program for First Nations, Inuit, and Métis children and their families in urban and northern communities, and is funded by Health Canada. The AHS program typically provides half-day preschool education that prepares young Aboriginal children for their school years.

Projects are locally designed and controlled, and administered by non-profit Aboriginal organizations. Health Canada regional offices administer contribution agreements and work directly with projects to ensure program quality. The AHS national office in Ottawa provides national coordination, leadership, resources, and training, and coordinates a national evaluation of the program.

Unfortunately, there have not been any studies that have conducted an appropriate cost-effectiveness analysis of the AHS. Therefore, to understand the merits of such program, I examine its American counterpart, the Head Start program, which targets disadvantaged children, with the objective of placing these children on an equal footing with their more advantaged peers. Cost-benefit analyses suggest that Head Start could be cost-effective, and thus pay for itself in terms of cost savings, if the long-term benefits produced are a quarter as large as those of model programs, such as the Perry Preschool Program (Currie 2001). The available evidence indicates that the short- and medium-term benefits could easily offset 40 to 60 percent of the costs of Head Start. Two similar programs in the US, the Perry Preschool Program and the Abecedarian Program, have also shown substantial positive effects of early environmental enrichment on a series of cognitive and non-cognitive skills, schooling achievement, job performance, and social behaviours, well after the programs ended. An evaluation by Heckman et al. (2008) found that the Perry Preschool Program is cost effective, with a reasonably large rate of return. However, contrary to Head Start, the Perry Preschool and Abecedarian Programs were small-scale programs targeted at disadvantaged children in specific local communities. There is no available evidence on how these programs would fare on a larger scale.

THE COMMUNITY ACTION PROGRAM FOR CHILDREN: In 1990, the federal government implemented a Child Development Initiative with the objective of enhancing the well-being of vulnerable children. The Community Action Program for Children (CAPC), the largest program of this initiative, provides long-term funding to communities to deliver programs that address the health and development of children ages 0 to 6 who are living in conditions of risk. Programs include family resources centres, parenting classes, parent/child groups, and home visiting, as well as street-level programs for substance-abusing mothers.

Each province and territory receives a fixed annual base amount to allow for at least one major project of significant intervention. The remaining funding is allocated on the basis of the number of children ages 0 to 6 in each province and territory. The CAPC is managed by the federal, provincial,

and territorial governments through provincially based Joint Management Committees that determine how best to address provincial and territorial priorities and allocate CAPC funds. As a result, there are significant differences among the provinces and territories with respect to project size, sponsorship, and the geographic distribution of projects.

An evaluation of the CAPC by Boyle and Willms (2002) found that the health benefits to families participating in the initiative during the first two years after the program's implementation were not any better than those of children whose families did not participate. Moreover, CAPC participants experienced only modest gains in terms of the health indicators of motor and social development and emotional-behavioural problems. These results might be due to the fact that the program had only a short-run follow-up; long-run effects might be different. The fundamental problem with the program, however, is that it is not really a funding stream, and program funds support a multitude of different components, only some of which are likely effective. Thus, while there is no definitive evidence on the effectiveness of the CAPC program as a whole, randomized trials based on the Olds model[14] suggest that nurse home-visiting programs can be effective in improving children's health and other long-term outcomes, such as fewer convictions and increased labour force participation (see Goodman 2006). Given these findings, policymakers might want to revisit this program in the future.

THE CANADA PRENATAL NUTRITION PROGRAM: The Canada Prenatal Nutrition Program (CPNP) provides long-term funding to community groups to develop or enhance programs for vulnerable pregnant women. The main objectives of the CPNP are to reduce the incidence of unhealthy birthweights, improve the health of both infants and mothers, and encourage breastfeeding. The services provided by this program include food supplementation, nutritional counselling, support, education, and referral, and counselling on health and lifestyle issues.

The CPNP is jointly managed by the federal and provincial/territorial governments. Administrative protocols, established for the CAPC, set out the terms and conditions of how the program is managed in each jurisdiction. Each province and territory receives a fixed annual base amount, and the remaining funds are allocated in accordance with the birth rate of the province or territory. These government investments are further enhanced by financial and in-kind contributions from other partners.

This program is similar to the US Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). WIC was established to improve the nutritional status of at-risk mothers and their children, and provides participants healthy food, generally in the form of vouchers, and nutritional counselling. A series of influential studies by Barbara Devaney and her colleagues[15] found that, for mothers on Medicaid, each dollar spent on WIC saved the state anywhere from $1.77 to $3.13 in healthcare costs – evidence of the program's cost effectiveness that is confirmed by Bitler and Currie (2005). In the Canadian setting, however, given the existence of universal health insurance, governments already spend a substantial portion of resources on the in-kind provision of healthcare services for children. Thus, there might not be a reasonable basis of comparison for a program such as WIC, which offers not only food and education but also assistance in accessing medical care.

Overall, I conclude that, to improve children's health outcomes, policymakers should favour in-kind transfers over cash transfers, and that children should be the direct recipients of these transfers. Where this approach is not possible, the second-best policy option would be to deliver cash transfers to mothers.

As for specific programs, the CAPC needs to be revisited, as target children have experienced only modest gains in terms of motor and social development and emotional-behavioural problems. The

14 In 1977, David Olds began developing a nurse home-visitation model designed to help young women take better care of themselves and their babies. Nearly 30 years later, the "Olds model" has evolved into the Nurse-Family Partnership, a non-profit organization serving more than 20,000 mothers in 20 states across the United States.

15 See Bitler and Currie (2005) for more details on these studies.

Aboriginal Head Start program and the Canada Prenatal Nutrition Program still require a thorough evaluation, and until that is done, policymakers will not have a proper understanding of their effects on child health or be able to evaluate their usefulness as policy instruments. However, similar programs in the United States have been shown to be both beneficial to children's health and cost effective.

What Should We Do to Improve Children's Health?

> "The optimal policy is to invest relatively more in the early years. But early investment must be followed up to be effective." – *James J. Heckman (2008)*

How can social policy improve the health and well-being of children from lower-income families, and thus reduce health inequalities in childhood? Typically, when choosing among policies, policymakers are confronted with tradeoffs due to the scarcity of resources in the economy. A common tradeoff is the one between economic efficiency and equity. Economic efficiency generally describes how well a system performs in generating the maximum desired output given the available inputs and technology. Equity relates to ethical judgments of fairness in the distribution of, for example, income, health, and health services. In some cases, increasing economic efficiency can lead to situations of decreased equity and vice-versa. For early childhood policies, this tradeoff is not a concern, since early interventions both promote economic efficiency and reduce lifetime inequality. For the gains from effective early interventions to be sustained, however, they need to be followed by continued, high-quality learning experiences.[16]

In this section, then, I offer recommendations in the form of answers to a set of appropriate questions.

What policy levers should be used?

The results of my modelling and the available empirical evidence indicate that cash transfers would have to be substantially large to have a significant impact on children's physical health. Thus, provincial and local governments should implement more in-kind transfers, which have been found to be more effective in improving children's health outcomes. In particular, I suggest the following:

- Evaluate the implementation of in-kind transfers – healthy breakfasts and lunches, for example – through the school system. Rather than food stamps, which are quite common in the United States and can be used to purchase even junk food, school meals should follow government-approved meal plans and provide a source of good nutrition for children from low-income families who might otherwise not receive it. At present, however, there is a lack of rigorous evaluation of the effectiveness of school feeding programs in the Canadian context – most of such evaluation is based on anecdotal evidence that nevertheless suggests these programs have a positive effect on the health and well-being of participants.[17]
- Implement policies that improve and promote the health of parents and the awareness of healthy lifestyles. My results indicate that parental health has a strong impact on children's health status, which increases as children become older. Given evidence that health in utero can influence adult outcomes, one way to improve children's health – and help break the intergenerational cycle of poverty – is to improve the health and well-being of young women who will bear the next generation (Currie forthcoming).
- Improve the National Child Benefit by broadening the range of services delivered under the program, including pre-natal screening, parenting skills, and information on mothers' and children's nutrition; this will require the allocation of additional financial resources to the program.
- Provide a more consistent network of services at the provincial level so that all children have

16 Remedial interventions directed at disadvantaged adolescents, however, might not be as beneficial as those targeted at disadvantaged younger children, since they generally provide low rates of return (Heckman 2008).

17 Bhattacharya, Currie, and Haider (2006) find that the School Breakfast Program in the United States has been effective at improving the nutritional outcomes of children, but research is needed in the Canadian context.

equal access to health and developmental intervention programs that have been found to have a significant and positive effect on children's health outcomes. This could involve expanding the scope of existing services and setting up new community centres.

The impact and cost effectiveness of these initiatives would have to be thoroughly researched, however, before policymakers are able to assess their appropriateness.

Who should receive these transfers?

The evidence indicates that in-kind transfers to children are more effective than cash transfers in improving children's health. If a cash transfer is the only feasible type of transfer, however, it might not be reasonable for the child to be the direct recipient. Yet, when parents are the recipients of cash transfers, there is the possibility of their spending the additional income on adult-related, rather than child-related, goods. Since evidence shows that the mother's income is more likely than the father's to be spent in ways that positively affect the child, it is the mother – typically the primary caregiver – who should be the direct recipient of cash transfers. This is, in fact, already legally the case in Canada, so the current benefits system should remain as it is in this regard.

Who should pay for early childhood programs?

The question of whether the responsibility for the provision of in-kind transfers targeted at children should fall on government, parents, or both might be answered by appealing to the concept of equity: those who start off with unequal endowments end up with unequal allocations, even if there is an efficient outcome. Here, the case can be made for government intervention, and a government concerned with equity should compensate for differences in final outcomes by adjusting for unequal endowments. Provincial governments handle the provision and partial funding of the child-targeted programs discussed in this paper, while Ottawa provides the remaining funding. For programs aimed specifically at low-income families, this model should remain as it is.

The provision of children's health services should depend largely on the target population of the program in mind. In other words, policymakers need to define whether a given program should be targeted at a specific group, such as disadvantaged children, or be universal. The highest economic returns are from interventions that target children from low-income families with limited ability to pay for such programs (see Barnett 2008; Heckman 2008). Given the financial constraints these families face, they might be tempted to invest in cheaper, less effective child-targeted services or, alternatively, underinvest in the consumption of such services. This choice can generate serious negative implications for the economy as a whole – such as a workforce that is less educated, healthy, and productive than it otherwise might be – which could lead to slower economic growth.

If the program or service is aimed at the entire population of children, governments should charge a sliding fee schedule according to family income (see Currie 2006; Heckman 2008). With sliding fees, the value of benefits would decline gradually with income level, as opposed to an "all-or-nothing" system. While sliding fees do not entirely eliminate work disincentives (since those who work more still receive fewer benefits), families no longer would face large, abrupt decreases in their income with small increases in work effort. A similar solution has been proposed for reducing marginal effective tax rates for Canadians of modest income (Poschmann 2008).

Conclusion

The positive relationship between income and health is one of the most robust and well-documented findings in the economics literature. Previous research in the field has shown that this relationship can be traced back to childhood. My empirical work suggests that, in Canada, there is a health gap between children from high- and low-income families in childhood that is constant with age.

From a policy perspective, it is important to understand whether there are any effective policies to mitigate the impact of low income on children's health. Traditionally, policymakers have suggested cash transfers as a means to increase household

income and, consequently, to improve children's health outcomes. I find, however, little support for the proposal that cash transfers and/or income-conditioned services alone are an efficient way to improve children's health. Rather, my findings are consistent with those of other authors who have sounded a cautionary note about using cash transfers. In fact, the characteristics of parents, such as their health and education, have a larger effect on children's health than income. Improving children's health also calls for a broader set of policies that target parents' health, as well as public health initiatives that promote the awareness and adoption of healthy living habits by parents and children alike. Moreover, programs directed toward disadvantaged populations might be a better use of public funds.

Appendix 1

Data

The data used in this paper are from Statistics Canada's National Longitudinal Survey of Children and Youth (NLSCY). The NLSCY is conducted by Statistics Canada, in partnership with Human Resources and Social Development Canada (formerly Social Development Canada). The objective is to provide a better understanding of how various risk and protective factors affect Canadian children's development and overall well-being over time. The NLSCY is a probability-based sample survey[18] whose target population comprises the noninstitutional civilian population (ages 0 to 11 at the time of their selection) in the ten provinces. The survey excludes children living on Indian reserves or Crown lands, residents of institutions, full-time members of the Canadian Armed Forces, and residents of some remote regions. The survey collects detailed information on children's health, as well as information about their families. While some questions are asked of older children (and even their teachers), most are asked of the person most knowledgeable about the child (commonly known as the PMK), usually the mother.

The first survey was conducted in 1994, and those in the initial survey constitute the first wave. The same households are surveyed at two-year intervals, so that by the fifth wave in 2002 the 0-to-11-year-olds in the original sample were ages 8 to 19. The oldest children are expected to remain in the survey until age 25, in 2008. Additionally, children ages 0 and 1 have been added with each wave and retained until they reach ages 4 and 5, to provide a wider cross-sectional snapshot of the child population. These children are known as the Early Childhood Development (ECD) cohorts and are introduced every three cycles.

All available cycles of the NLSCY have been used in this analysis.[19] All analyses are based on a sample of children present in all cycles (i.e., longitudinal sample).

Methods

A. Parametric Models

1. The Ordered Probit – Pooled Cross-sectional OLS Model

The purpose of the pooled cross-sectional OLS model is to assess how the income-health relationship changes with age, while controlling for child and family characteristics. Although I do not make use of the panel nature of the data for this model, I adjust the standard errors to account for repeated observations for the same child. I specify a Huber/White estimator (see Huber 1967; White 1980), where observations are allowed to be independent between units of analysis, but not within them, resulting in robust standard errors. The starting point is the replication of Currie and Stabile's (2003) model,

$$\text{health}_{it} = \alpha + \beta \ln(\text{inc})_{it} + \gamma \,\text{mom edu}_{it} + \lambda X_{it} + \varepsilon_{it}, \quad (1)$$

where health is child health status; ln (inc) is the natural log of household income;[20] and mom edu is a dummy variable indicating whether the mother has education beyond high school. X includes a set of control variables: the log of family size, the mother's age at the birth of the child, year effects (year dummies), dummy variables for single years of age (cohort dummies),[21] and dummy variables indicating the sex of the child, if the child belongs to a one-parent household, if the PMK is female, if the child's mother is not the biological mother,[22] and a variable to indicate if income was imputed.

18 For a detailed account of the NLSCY methodology, see Statistics Canada (2005) Microdata User Guide, National Longitudinal Survey of Children and Youth, Cycle 5, September 2002 to July 2003.

19 At the time of writing, only five cycles were available; a sixth and a seventh cycles have since been released.

20 Household income is reported by the PMK in dollars, and adjusted for price inflation using the consumer price index. (When income is not reported, Statistics Canada imputes a value.)

21 The age and cohort dummies are intended to capture both age-related changes in child behaviour and cohort effects, such as availability of treatment, that might affect different cohorts.

22 Although Currie and Stabile (2003) report including a dummy variable for whether or not the PMK is the child's biological mother, their code shows this is not the case. In practice, the authors code this dummy variable to reflect whether or not the child's mother (rather than the PMK) is the biological mother.

The subscript *i* denotes the individual child, while the subscript *t* represents the cycle in which the child is observed. This equation is estimated separately for each of four age groups (0-3, 4-8, 9-12, and 13-15), as in the model by Case, Lubotsky, and Paxson (2002). All observations are clustered by children in line with the work of Currie and Stabile (2003).

Additionally, I estimate two extensions of this model, one of which is the de Oliveira model.[23] The main explanatory variables for this model are household income, mother's education, and father's education. Each parent's educational attainment is classified into one of four categories: 1 (less than secondary school); 2 (secondary school graduation); 3 (beyond high school); or 4 (college or university degree, including trade, where the first is the omitted case). I also control for a series of child, parental, and household characteristics: dummies to indicate child ethnicity (white or nonwhite), if the child is first born, if the mother and father smoke, and if housing conditions in which the child lives are poor. Finally, and of particular importance, I include variables measuring the health status of each parent.

2. The Ordered Probit – "Longitudinal" OLS Model

For the "longitudinal" analyses, I make use of the panel nature of the data. The basic idea of this model is to assess the different effects of current and past health shocks on current health status by income. By distinguishing between past shocks and more recent ones, Currie and Stabile (2003) investigate whether any different effects of health shocks persist or whether, with time, children from high- and low-income families respond similarly. Thus, I estimate the following model:

$$\text{health98}_{it} = \alpha + \delta\ \text{shock94}_{it} + \chi\ \text{shock98}_{it} + \beta\ \ln(\text{inc})_{it} + \phi\ \ln(\text{inc})_{it} * \text{shock94/98}_{it} + \gamma\ \text{mom edu}_{it} + \lambda X_{it} + \varepsilon_{it}, \quad (2)$$

where health98 is a binary variable indicating good or poor child health in 1998; shock denotes a bad health shock in the indicated year;[24] ln (inc) is the natural log of the average of permanent household income; and the other variables are as defined above for equation (1). All observations are clustered by family, and STATA 9 was used for all parametric model estimations.[25]

B. Nonparametric Model

For the nonparametric model, I estimate the same cross-sectional model as discussed above, using nonparametric regression techniques:

$$\text{health}_{it} = f(\ln(\text{inc})_{it}, X_{it}) + \varepsilon_{it}, \quad (3)$$

where health_{it} is regressed on the log of household income, a series of child, parental, and household covariates X_{it}, and an error term, ε_{it}; and where the functional form of the regression is unknown. The subscript *i* denotes the individual child, while the subscript *t* represents the cycle in which the child is observed.

The nonparametric estimator I use in this analysis is a conditional probability kernel estimator. I use a second-order Gaussian kernel for the continuous variables, a Wang-van Ryzin kernel for the ordered discrete variables, and a Li-Racine kernel for the unordered discrete variables.[26] To select the bandwidths, I use the least squares cross-validation method proposed by Hall, Li, and Racine (2004). Finally, I use the R Development Core Team (2006) package "np" to generate the nonparametric results.

23 The other extension is the Currie and Stabile (2003) model with the inclusion of parental health status, which I do not include in this *Commentary.*

24 Currie and Stabile (2003) exclude the shock98 variable but include it in their 2002 paper. I estimate both models to check the robustness to different model specifications.

25 For more detailed descriptions of these models, see Currie and Stabile (2002, 2003).

26 For more details, see Hayfield and Racine (2007a, 2007b); Li and Racine (2007); and Wang and van Ryzin (1981).

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