

Chapter 7

EFFECTS ON CHILDREN

The chapter presents findings about the impacts of Better Beginnings, Better Futures on the development of children. To reflect the holistic view of the child emphasized in the Better Beginnings model, a wide variety of assessment measures were administered (annually in the older cohort sites from Junior Kindergarten through to Grade 3, and every 15 months in the younger cohort sites, beginning at 3 months of age through to 48 months).

The instruments assessed emotional and behavioural problems and social functioning, general child development, cognitive functioning and academic achievement, perinatal health, nutrition, general health and health promotion/prevention (see Appendix B for a complete listing of measures, socio-demographic variables and data collection points).

In this chapter, first the measures within each domain are described followed by the patterns of results. One type of pattern involves outcomes that are similar across younger or older cohort sites. A second type involves outcomes on a series of related measures within a site (termed site-specific findings). Both patterns are important in understanding the short-term effects of Better Beginnings programs on children. Readers are referred to Chapter 1 for a complete summary of these patterns, a description of the criteria applied to identifying overall and site-specific patterns, and a table of effect sizes.

MEASURES OF CHILD EMOTIONAL PROBLEMS, BEHAVIOURAL PROBLEMS, AND SOCIAL FUNCTIONING

Reducing the occurrence of emotional and behavioural problems in young children was the Ontario Government's primary motivating goal for developing and initiating the Better Beginnings, Better Futures Project in the early 1990s. In fact, the first major goal of the project was to "reduce the incidence of serious, long-term emotional and behavioural problems in children" (Ontario Ministry of Community and Social Services, 1989).

An important factor contributing to the interest in these problems was the report of the Province-wide epidemiological survey of children's mental health problems (the Ontario Child Health Study, OCHS: Offord *et al.*, 1987) which suggested that 18% of Ontario children between the ages of four and 16 suffered from a serious behavioural or emotional disorder. Further, it was reported that only one child in six who was experiencing such a disorder had received professional help from a mental health or social service agency in the previous six months. The Better Beginnings demonstration project was initiated to test the effectiveness of early intervention approaches in reducing behavioural and emotional problems in young children. Measures of these mental health problems are very important outcomes for assessing the effectiveness of the Better Beginnings Project.

The development of appropriate prosocial behaviours and social skills (i.e., learning how to relate effectively with adults and other children) is one of the most critical developmental tasks for preschool and primary school children. Developing prosocial behaviour is also an important protective factor in preventing behavioural and emotional problems in early school-aged children (Eisenberg & Fabes, 1998). Consequently, fostering the development of prosocial behaviour in young children was another key objective of Better Beginnings.

Indicators of child emotional and behavioural problems and social functioning examined in the analyses included measures of: (1) emotional problems, (2) behavioural problems, (3) prosocial behaviour, (4) school readiness, (5) temperament, and (6) self-perception.

Emotional Problems

Emotional problems are widely recognized as the most common of all child and adolescent mental health problems (Albano, Chorpita & Barlow, 1996). These emotional problems are expressed in two major forms: anxiety disorders and depression (Craig & Dobson, 1995). Childhood anxiety is associated with severe impairment in functioning expressed in its most disabling form through children's avoidance of important socializing and developmental activities, including child/classroom participation, peer involvement, and autonomous functioning (Albano *et al.*, 1996; Kendall *et al.*, 1992). Childhood depression has received increased research and clinical attention during the past two decades (Birmaher *et al.*, 1996; Cicchetti & Toth, 1998; Hammen & Rudolph, 1996). Results of this research indicate that childhood depression tends to continue into adulthood and is typically associated with poor psychosocial and academic outcomes and increased risk for substance abuse (Birmaher *et al.*, 1996).

Parents' ratings of their children's behaviour often differ substantially from those of teachers (Achenbach, McConaughty & Howell, 1987; Kohen, Brooks-Gunn, McCormick & Graber, 1997; Kolko & Kazdin, 1993; Offord *et al.*, 1987). This may be because children's behaviour is different at school than at home and/or because parents may consider certain behaviours as more or less appropriate than teachers. For these reasons, it is common to collect both parent and teacher ratings on children's behaviour, and this was done in the Better Beginnings research for emotional and behavioural problems, as well as social skills.

Four-year-old children in JK in the younger cohort sites were rated by their parents and teachers on the Preschool Social Behaviour Questionnaire (PSBQ; Tremblay *et al.*, 1987; 1992), which contains subscales for rating emotional problems, behavioural problems, and prosocial behaviours. (Behavioural problems and prosocial behaviour are discussed later.) Examples of emotional problem items on the PSBQ are "Appears miserable, unhappy, tearful or upset", "Is worried. Worries about many things", and "Cries easily". Each behaviour is rated 0 (never or not true), 1 (sometimes or somewhat true), or 2 (often or very true).

For children in Grades 1 to 3 in the older cohort sites, parent and teacher ratings on the overanxious and depression subscales of the Ontario Child Health Study (OCHS) revised checklist (Boyle *et al.*, 1993) were analyzed. Examples of overanxious items from the OCHS subscale are "Self-conscious or easily embarrassed", "Nervous, highstrung or tense", and "Worries about doing better at things". Depression items included "Unhappy, sad or depressed", "Feels too guilty", and "Feels worthless or inferior". Finally, eight items forming a passive victimization subscale from the OCHS rating scale (Boyle *et al.*, in press) were also included for teachers only; several exemplar items for this subscale are "Fails to stand up for self", "Is teased", "Gives in to peers", and "Bullied by others". As in the PSBQ, each item is rated 0 (never or not true), 1 (sometimes or somewhat true) or 2 (often or very true).

Behavioural Problems

Behavioural problems in children include aggressive, oppositional/defiant, and hyperactive behaviours. These behavioural problems impose a substantial burden of suffering on parents and teachers, cause rejection by peers, and are the most frequently occurring basis for childhood referrals for mental health treatment (Campbell, 1995; Hinshaw & Anderson, 1996). Also, the existence of these behavioural

problems in childhood leads in many instances to a lifetime of serious psychological and social difficulties and criminality (Coie, 1996; Hinshaw & Anderson, 1996; Loeber & Farrington, 1998; Offord & Lipman, 1996; Patterson, 1993; Robins & Rutter, 1990). Along with emotional problems, reducing children's behavioural problems is a major goal of the Better Beginnings Project.

The PSBQ measured teacher perceptions of behavioural problems in JK children in the younger cohort sites. Examples of behavioural problem items from the PSBQ scale include: "bullies other children", "disobeys", and "squimpy, fidgety child". The Ontario Child Health Study (OCHS) revised scales, used with parents and teachers of children in Grades 1, 2 and 3, contain two behavioural problem subscales: oppositional/defiant behavioural problems and attention-deficit hyperactivity problems. Examples of behavioural problem items from the OCHS oppositional/defiant scale include "angry and resentful", and "argues a lot with adults". Examples from the attention-deficit hyperactivity scale include: "can't concentrate, can't pay attention for long", "fidgets", and "interrupts or butts in on others".

Prosocial Behaviours

In order to assess a variety of prosocial skills, several measures were employed, involving ratings of social behaviour by parents, teachers and, in Grade 2, by the children themselves. The PSBQ was employed with teachers and parents for JK children in the younger cohort sites. The prosocial scale consists of 10 items (e.g., "shows sympathy for a child who has made a mistake", "invites a shy child to join in a play group", and "tries to stop a quarrel or dispute between friends, brothers or sisters").

For older cohort children, the Social Skills Rating Scale (SSRS) (Gresham & Elliott, 1990) was administered to their teachers and parents when the children were in Grades 1, 2 and 3. The SSRS consists of descriptions of a wide variety of prosocial skills and behaviours (e.g. "the child makes friends easily", "the child controls his or her temper when arguing with other children", and "the child is self-confident in social situations such as parties or group outings"). Each behaviour is rated on a 3-point scale with a score of 0 (never), 1 (sometimes), or 2 (very often). The SSRS yielded three subscale scores: cooperation, assertiveness, and self-control.

A third source of information concerning prosocial behaviour was collected from Grade 2 children themselves using the Social Problem Solving (SPS) measure (Valente, 1995). The SPS measure consists of a structured interview in which children are asked what they would say and do in eight different situations involving interactions with peers. The interviewer shows the child a series of eight drawings that depict two types of social situations and reads a brief description of the situation. Half of the situations require the child to resolve a conflict with a peer and half require the child to initiate social involvement with other children. Children's responses were subsequently coded as socially competent or aggressive according to procedures outlined by Valente (1995). Trained interviewers administered the SPS in French or English, depending on the child's language of instruction in school.

School Readiness

School boards across the province have established programs to identify at an early stage the needs of kindergarten children and to assess their school readiness. In order to determine any effects of Better Beginnings programs on school readiness, teachers completed the ABC School Readiness measure (Toronto Board of Education, 1990) when children were in JK in the younger cohort sites, except in Guelph since very few schools in that neighbourhood offer JK. Analyses of the ABC test results indicated a strong correlation with teacher ratings of behavioural problems. Therefore, the school readiness measure is included in this section of the chapter.

Temperament

Child temperament was rated by parents when their children were 3, 18, and 33 months old using a measure based on the Infant Characteristics Questionnaire (ICQ; Bates, Bennett & Lounsbury, 1979). Examples of items from the ICQ are How easily does your child get upset? , How changeable is your child's mood? and How does your child generally respond to being in a new place? Each item is rated on a scale from 1 to 7.

Self-Perception

Self-perception is an important dimension of child development. The way in which the child describes himself or herself is thought to influence his or her behaviour. Since one of the objectives of the Better Beginnings project was to improve the socio-emotional health of children, it was important to assess that dimension. Because of the age of the children, a selection of items from the Self-Description Questionnaire-I was used. It was administered only in Grade 2 (baseline and focal).

Results for Emotional Problems, Behavioural Problems, and Social Functioning

Younger Cohort. Confirmatory factor analyses of the PSBQ ratings for our sample yielded a reliable emotional problems factor for teachers, but not for parents. Therefore, only the teacher ratings were analyzed for emotional problems. Teachers completed the PSBQ on every child in their classroom in May 1993 (Baseline), and this was repeated five years later in the spring of 1999, when the focal cohort of children was completing JK. The teacher ratings of emotional problems at these two points in time are presented for the younger cohort sites in Figure 7.1. There are no ratings for the Guelph site, since very few schools in that neighbourhood offer JK. For the three largest younger cohort Better Beginnings sites, in Kingston, Ottawa, and Toronto, the average teacher ratings of emotional problems show substantial decreases from Baseline (1993) to 1999, after programs have been in place for five years. These decreases are statistically significant for Kingston ($p < .01$, $es = .72$) and for the ratings from all four younger cohort sites combined ($p < .01$, $es = .27$)¹. These results indicate that the JK teachers in Kingston, Ottawa, and Toronto rated their students as showing decreased levels of emotional problems after five years of Better Beginnings programming.

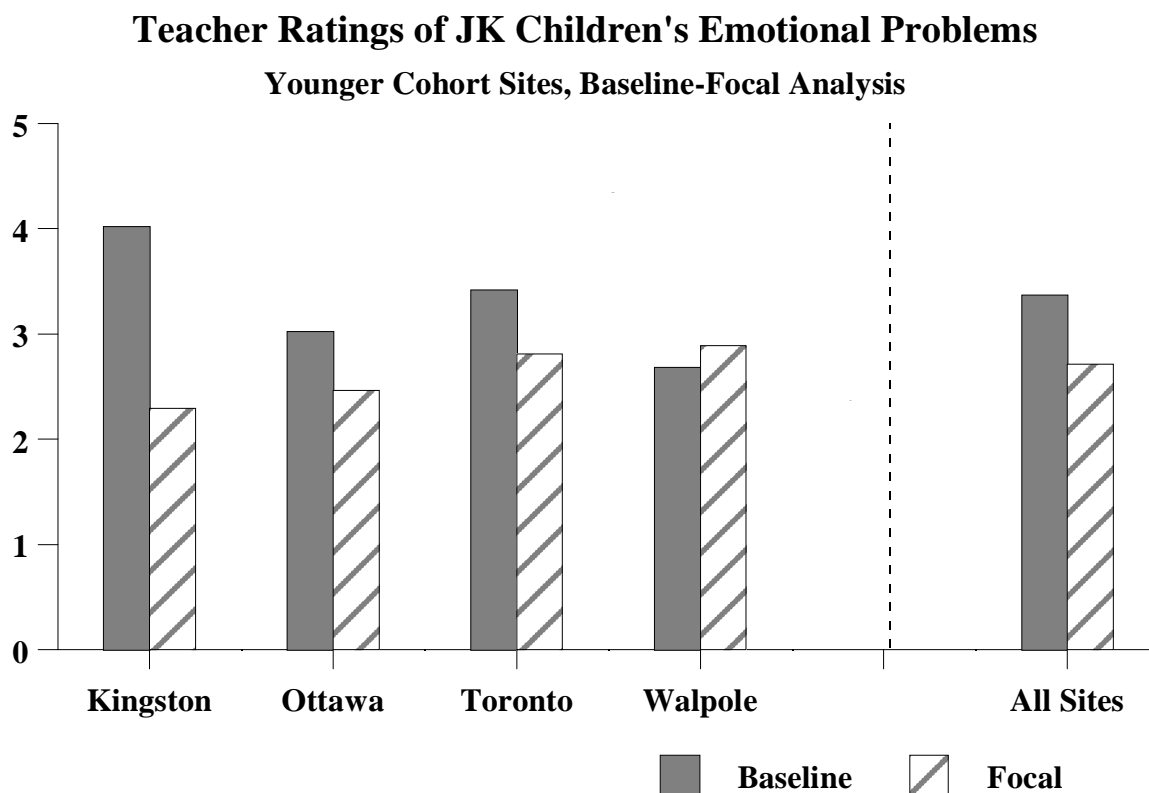
No overall significant differences on the baseline-focal comparisons were found for parent and teacher reports of JK children's behavioural problems or for teacher reports of children's prosocial behaviour. The parent ratings of children's prosocial behaviour were not analyzed as the factor structure was unstable for our sample.

Also, there were no consistent improvements on children's school readiness in the younger cohort sites from baseline in 1993 to five years later. Finally, no significant differences were found between parent ratings of focal cohort children's temperament in the Better Beginnings program sites and the comparison site.

Older Cohort. Of the three subscales of emotional problems of the OCHS (overanxious, depression and passive victimization) measured in children in Grades 1 through 3, results indicated an overall significant reduction in teacher ratings of overanxious behaviours in the three demonstration sites compared to the comparison sites longitudinally ($p < .01$, $es = .47$; see Figure 7.2). This result was primarily due to a decrease in Cornwall, while the comparison sites showed increases in teacher ratings of overanxious

¹ For an explanation of how effect sizes were calculated, see page 6-21.

Figure 7.1



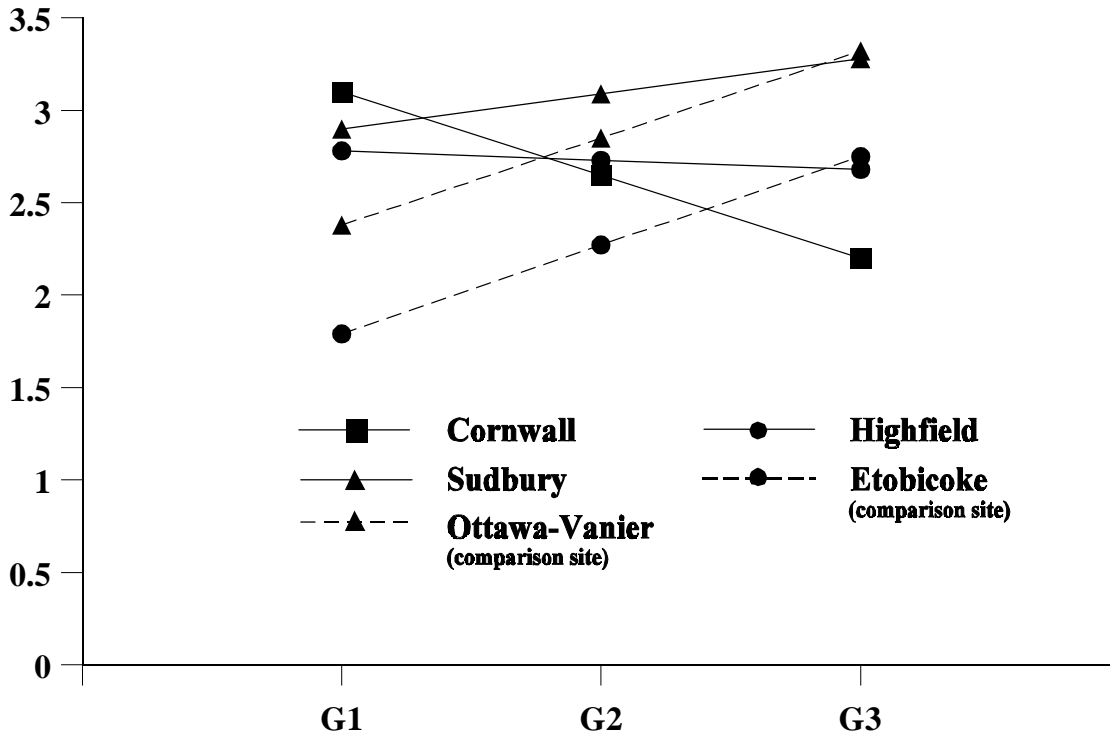
Junior kindergarten teachers rated four-year-old children in the Kingston, Ottawa, and Toronto Better Beginnings neighbourhoods as showing lower scores on emotional problems after five years of project implementation.

Site	Baseline			Focal			Effect Size
	Mean	s.d.	N	Mean	s.d.	N	
Kingston	4.02	2.57	51	2.29**	2.29	48	.72
Ottawa	3.02	2.34	56	2.46	2.34	24	.23
Toronto	3.42	2.43	48	2.81	1.86	62	.25
Walpole	2.68	1.86	22	2.89	2.92	28	-.09
All Sites	3.37	2.41	177	2.71**	2.20	162	.27

** Difference in means is significant at $p < .01$.

Figure 7.2

**Teacher Ratings of Children's Overanxious Problems
Older Cohort Sites, Grade 1 to Grade 3**



From Grades 1 to 3, children in Cornwall decreased in overanxious problems; Highfield children remained stable, while those in Sudbury and the two comparison sites increased.

Overall, Better Beginnings Program teachers reported significantly greater decreases in child overanxious problems over time compared to non-program site teachers.

Site	Change/ Year	s.d.	N	Effect Size
Cornwall	-0.45**	1.79	50	.74
Sudbury	0.19	1.54	52	.22
Ottawa-Vanier	0.47	1.88	100	na
Highfield	-0.05	1.58	24	.43
Etobicoke	0.48	1.63	62	na
Demonstration-Comparison	-0.59**	1.61	288	.47

** Difference of demonstration from comparison sites is significant at $p < .01$.

behaviours. A similar pattern was seen in the baseline-focal comparisons in that there were small decreases in overanxious behaviours in the 1993 baseline versus 1997 comparisons of Grade 2 teacher ratings (these changes were non-significant).

For the behavioural problems subscale of the OCHS, no overall significant effects were found for parent or teacher ratings, either in the baseline-focal or longitudinal analyses.

For prosocial behaviour, teacher ratings of the SSRS items revealed a consistent pattern of improvement in self-control for children in the Better Beginnings sites. The Better Beginnings program children showed steadily increasing ratings of self-control for Grades 1 to 3, while the children in the comparison sites showed steadily decreasing self-control behaviour ($p < .01$, $es = .46$; Figure 7.3). A similar pattern was found in the baseline-focal comparisons in that there were small increases of self-control in the 1993 baselines versus 1997 comparisons of Grade 2 teacher ratings. (These increases were non-significant.) The other two teacher-rated subscales of the SSRS, cooperation and assertiveness, did not show any overall consistent significant effects.

Parent ratings of the SSRS items revealed significantly higher ratings of children's cooperation in 1997 compared to baseline ratings in 1993 ($p < .01$, $es = .26$; Figure 7.4). This same pattern of improved cooperation was also found in the focal cohort group of children living in the Better Beginnings programs from Grades 1 to 3, although the overall effect was non-significant. The other two parent-rated subscales of the SSRS, self-control and assertiveness, did not show any significant changes either baseline-focal or longitudinally.

Child responses on the Social Problem Solving (SPS) and self-perception measures indicated no significant changes for Grade 2 children from 1993 (baseline) to 1997 in any of the three Better Beginnings sites. This was the only age at which these measures were administered, so no longitudinal analyses were possible.

Site-Specific Findings for Child Emotional Problems, Behavioural Problems, and Social Functioning

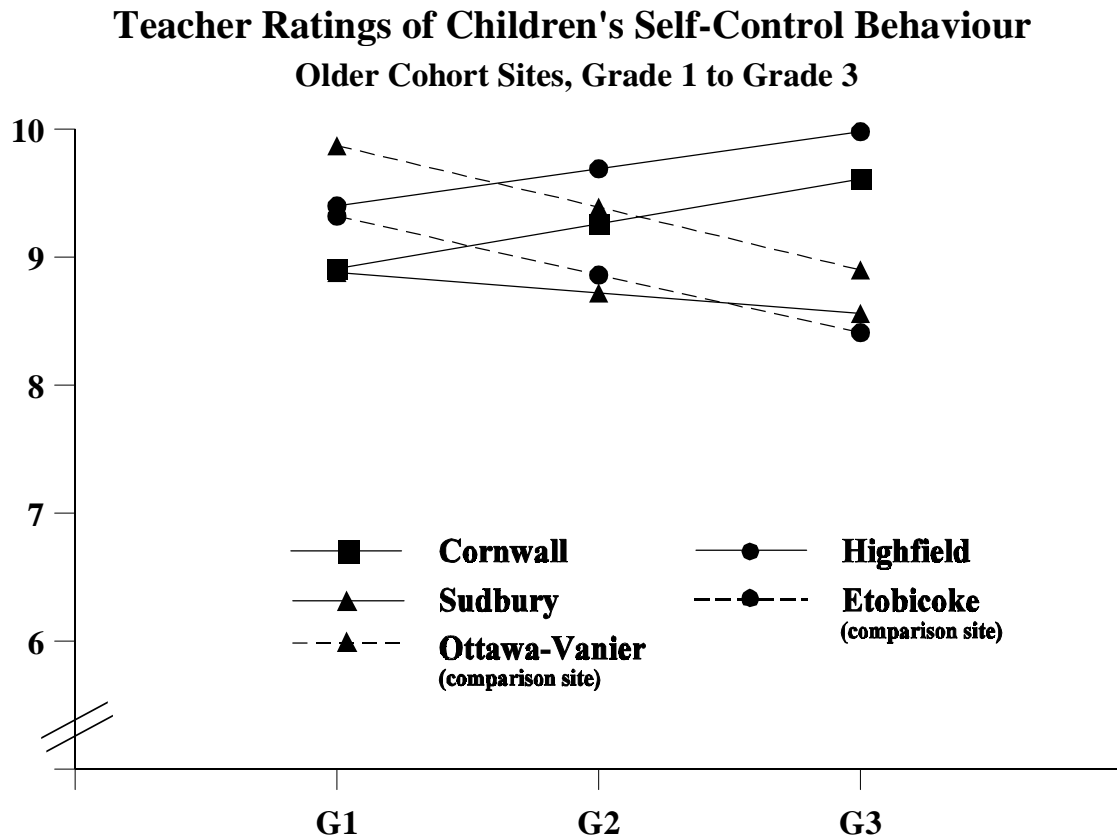
Cornwall: Fewer emotional and behavioural problems were reported by teachers. Based on teacher ratings of the OCHS subscales, children in the Cornwall Better Beginnings site showed significantly less overanxious and passive-victimization behaviour (for each scale, $p < .01$ and $es = .74$). Teacher ratings on the other three subscales, oppositional, attention-deficit, and depression, also showed small but non-significant reductions.

Highfield: Both parents and teachers rated focal cohort children living in the Highfield Better Beginnings site as more socially skilled in both the baseline-focal and longitudinal comparisons. Seven of the 12 statistical tests for parent and teacher ratings of children's social skills were significant at either $p < .05$ or $p < .01$. Parents at the Highfield program site also rated their children as having significantly fewer emotional and behavioural problems; six of the eight statistical tests were significant at $p < .01$.

Kingston: Fewer emotional and behavioural problems were reported by teachers. Emotional problems were significantly reduced ($p < .01$, $es = .27$), and there were also small but non-significant increases in prosocial behaviour and decreases in disruptive behaviour. Also, statistical analyses indicate that focal cohort JK children scored higher on school readiness than JK children at baseline ($p < .01$, $es = .43$).

Sudbury: Parents at the Sudbury Better Beginnings site rated focal cohort children as having more

Figure 7.3



From Grades 1 to 3, children in Cornwall and Highfield showed steadily increasing ratings of self-control. Sudbury children remained stable and the two comparison sites decreased.

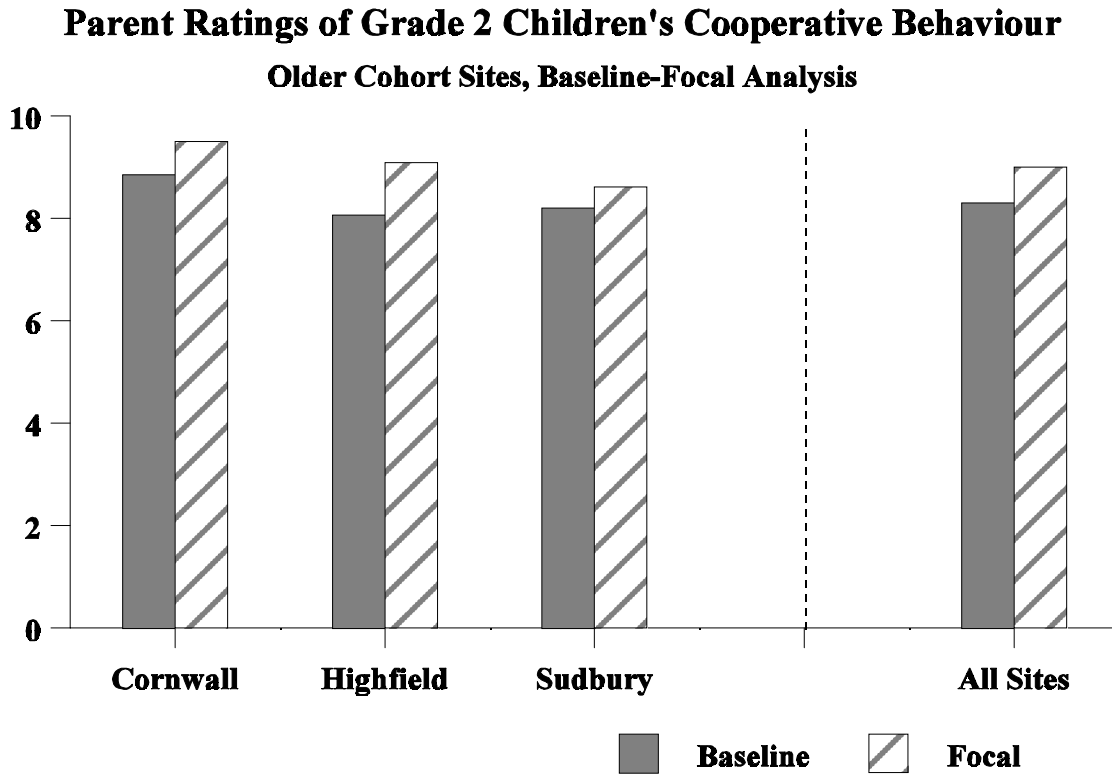
Overall, the teacher ratings of self-control steadily increased for the Better Beginnings Program children and steadily decreased for the comparison site children.

Site	Change/ Year	s.d.	N	Effect Size
Cornwall	0.35**	1.01	51	.63
Sudbury	-0.16	1.24	51	.25
Ottawa-Vanier	-0.22	1.39	99	na
Highfield	0.29*	1.37	24	.55
Etobicoke	-0.45	1.58	62	na
Demonstration-Comparison	0.61**	1.38	287	.46

* Difference of demonstration from comparison sites is significant at $p < .05$.

** Difference from comparison sites is significant at $p < .01$.

Figure 7.4



The small increases in parent ratings of cooperative behaviour in their Grade 2 children over the first four years of program implementation was significant for Highfield and for the combined scores from all three Better Beginnings sites.

Site	Baseline			Focal			Effect Size
	Mean	s.d.	N	Mean	s.d.	N	
Cornwall	8.85	3.03	43	9.50	2.28	65	.24
Highfield	8.07	2.40	43	9.09*	2.75	68	.38
Sudbury	8.20	2.42	117	8.62	2.90	101	.16
All Sites	8.31	2.56	203	9.00**	2.71	234	.26

* Difference in means is significant at $p < .05$.

** Difference in means is significant at $p < .01$.

emotional and behavioural problems. All eight of the statistical tests showed increases in these types of problems, and one was significant at $p < .01$.

GENERAL CHILD DEVELOPMENT

Because children are developing rapidly, the effects of optimal or negative circumstances can be reflected in general development. Two measures of general child development were used with the Better Beginnings research children: in the younger cohort sites, the Diagnostic Inventory for Screening Children (DISC; Amdur, Mainland & Parker, 1990), and in the older cohort sites, the Scales of Independent Behavior (SIB; Bruininks, Woodcock, Weatherman & Hill, 1985).

From 18 months to 48 months, children's developmental skills were described using a research version of the DISC developed for the Better Beginnings, Better Futures research project. Trained interviewers asked the children to do a play interview with them. The children did things like kicking a ball, repeating words, and drawing figures. The subscales describe child development in several areas of function, including gross motor (e.g., running, jumping), fine motor (e.g., drawing), auditory attention and memory (e.g., hearing and following directions), visual attention and memory (e.g., matching colours, reconstructing cube designs), and expressive language (e.g., answering questions, completing sentences).

The Scales of Independent Behaviour were used to assess skills needed to function independently in home, social, and community settings from JK through to Grade 3. The short form of SIB was used. It consists of 32 items and covers gross motor skills, fine motor skills, social interaction, language comprehension, language expression, eating and meal preparation, toileting, dressing, and personal self-care.

Results for General Child Development

For the younger cohort children, auditory attention and memory improved in comparison to Peterborough ($p < .05$, $es = .36$). Children improved in their ability to hear, process, and act on simple instructions or repeat increasingly complex words and numbers in sequence as measured by the DISC. The other five areas of general development using the DISC had mixed results. For the older cohort children, no consistent pattern of effects was found for general child development (SIB).

Site-Specific Findings for General Child Development

Walpole Island: Of the 7 statistical tests for the overall scale and subscales of the DISC, children on Walpole Island showed statistically significant improvements on two of the tests and change in a positive direction on all comparisons.

COGNITIVE FUNCTIONING AND ACADEMIC ACHIEVEMENT

In order to address the Better Beginnings goal of promoting optimal development in children, it was important to include the domain of cognitive development. The research documented the level of children's cognitive functioning in both the younger and older cohort sites. Once the older cohort children reached Grade 1, academic achievement measures for reading and mathematics were also collected.

Cognitive Development

The cognitive development of the children was assessed through their receptive language and non-verbal problem-solving skills.

Receptive Language. The Peabody Picture Vocabulary Test - Revised (PPVT-R; Dunn & Dunn, 1981) was used to assess children's receptive vocabulary, beginning at 4 years of age. The PPVT-R is an individually administered test consisting of 175 vocabulary items of increasing difficulty. When younger cohort children were 4 years old, the PPVT-R was used for the English-speaking children and its new French version of the PPVT-R, the Échelle de vocabulaire en images (Dunn, Thériault-Whalen & Dunn, 1993), was used for French-speaking children.

For the older cohort children, different versions of the PPVT-R were used during the project. The PPVT-R was used for the English-speaking children from JK through to Grade 3; the French version of the PPVT-R, proposed by Dudley-Delage (1980), was used for French-speaking Grade 2 baseline and Grade 2 focal cohorts. The Échelle de vocabulaire en images was used for French-speaking focal cohort children in JK, Senior Kindergarten (SK), Grade 1, and Grade 3.

Non-Verbal Problem-Solving Skills. Because cognitive development implies not only language development, but also problem-solving skills, it was important to assess the children's skills in that domain. For the younger cohort children, non-verbal problem-solving skills of 4 year old children were evaluated using the Block Design subtest of the Wechsler Preschool and Primary Scale of Intelligence for Children (WPPSI) (Wechsler, 1967). For the older cohort children, these skills were evaluated using Block Design subtest of the Wechsler Intelligence Scale for Children-Revised (WISC-R) (Wechsler, 1974) in Grades 2 and 3.

Academic Achievement

Academic achievement was evaluated using measures of reading and mathematics skills obtained directly from children in the older cohort sites in Grades 1 and 2. Children's attitudes towards reading were rated by their teachers.

Reading. The children's reading skills were evaluated using standardized tests. The WRAT-R (Jastak & Wilkinson, 1984) was administered in Grades 1 and 2 (English schools) and the Test de lecture (Commission scolaire des écoles catholiques de Québec, 1990) was administered in Grade 2 (French schools), to baseline and focal groups. Children's attitudes towards reading were evaluated by their teachers in Grades 1, 2 and 3 using the Attitude Towards Reading Scale (Rowell, 1972).

Mathematics. Children's mathematical skills were evaluated using the KeyMath (Connolly, 1991) in Grades 1 and 2. Subtests from the KeyMath include numeration, addition, subtraction, problem-solving, and time and money.

Results for Cognitive Development and Academic Achievement

For children's receptive language and problem-solving skills, the analyses revealed no significant differences between children assessed before the implementation of the Better Beginnings Project compared to those children who were in the Better Beginnings Project four years later in both the younger and older cohort sites; there were also no significant differences on the longitudinal analyses in the older cohort sites.

There were no consistent patterns of overall significant effects across the baseline-focal or longitudinal designs on any of the measures of academic achievement in the older cohort sites.

PERINATAL HEALTH

Given that almost all of the younger cohort sites had prenatal classes for pregnant women, programs were expected to affect pregnancy and births. Newborn health indicators and delivery indicators were examined using Canadian Institute of Health Information (CIHI) data. All the urban younger cohort Better Beginnings program sites were compared to the rest of their surrounding areas before (1990 - 1992) and after (1994 - 1997) programs were well established; 1993 was omitted, as immediate program effects on hospitalizations were not expected. Also, parents were asked questions about their newborn and breastfeeding experiences.

Delivery Outcomes

Two indicators of delivery outcomes examined from the CIHI data were percentage of deliveries that were Cesarean sections and percentage of normal deliveries that used general anaesthesia. These two delivery events have some degree of parent control, although both can be unarguably necessary at times. Unnecessary Cesarean sections and general anesthesia with normal deliveries can increase the risks to mothers and newborns.

Birth Weight

When infants were 3 months of age, parents were asked to recall their child's weight at birth. CIHI data were also examined. Low birth weights are associated with poor perinatal outcomes and long-term health and learning problems.

Breastfeeding

When infants were 3 months of age, mothers were asked how they fed their baby at birth, and if they breastfed, for how many weeks/months. When children were 18 months of age, mothers were again asked how long they breastfed their children.

Breastfeeding is the optimal method of infant feeding; however, it does increase nutrient requirements for the mother. The nutrient adequacy of maternal diet was seen as an important issue, especially among low income women. Therefore, as part of the perinatal interviews, 24 hour dietary recalls were completed with women who were breastfeeding.

Results for Perinatal Health

The percentage of Cesarean sections dropped more in the Better Beginnings sites over time, compared to surrounding areas; however, this drop was not statistically significant. General anaesthesia for normal deliveries also decreased more in the Better Beginnings sites compared to the surrounding areas, but again this decrease was non-significant. Also, no significant difference was found between program and comparison sites in parent-reported or hospital-reported birth weights.

Women in the Peterborough sample were significantly more likely to initiate breastfeeding compared to women in the Better Beginnings demonstration sites ($p < .01$, $es = -.42$). The initiation rate in the

demonstration communities was 70.5%; Peterborough had a higher rate (91.4%). The rate of initiation of breastfeeding in the Better Beginning sites is close to national figures; initiation rates range from a low of 43% in Newfoundland (Matthews *et al.*, 1995) to 83% in Vancouver (Williams & Innis, 1996). In the Ontario Health Survey, the rate was 69% across all income groups (Nolan & Goel, 1995).

Among women who initiated breastfeeding, there was no significant difference between the demonstration sites (61.6%) and the comparison site (57.2%) in the proportion who continued for at least 3 months. The proportion of women who continued breastfeeding for at least 3 months was slightly higher than the rate shown in other Canadian data. In Quebec, for example, 52% of women continued breastfeeding for 3 months (Carceller *et al.*, 1995).

The 24-hour dietary recalls of breastfeeding women in the demonstration and comparison sites were used to compare nutrition intakes in the Canadian Recommended Nutrient Intakes (RNIs) (Health and Welfare Canada, 1990) for women aged 25 to 49 years during lactation. None of the women in any site met the RNI for zinc. Only women in Toronto and Peterborough met the RNI for folate. And, only women in Guelph met the RNI for calcium. Those in Toronto did not meet the RNI for iron. Thus, nutrient inadequacies were common among women who were breastfeeding.

MEASURES OF CHILD NUTRITIONAL HEALTH

Better Beginnings, Better Futures provides the first population-based information on the dietary intake and anthropometric status of Canadian children since the Nutrition Canada Survey (1973). The nutritional health of children was assessed using anthropometric measurements and a 24-hour dietary recall (for children aged 4 and over).

Anthropometric Measurements

The protocols for measuring height (or length) and weight follow the recommendations of Lohman *et al.* (1988). Each measurement was taken at least twice, as follows:

- " length at 3 and 18 months to the nearest 0.1 cm using an infant length board (Pediatric Length Board, Ellard Instrumentation Ltd, Seattle, WA);
- " weight at 3 and 18 months to the nearest 0.05 kg using the portable Health-o-Meter Infant Weigh Scale (Health-o-Meter Inc., Bridgeview, IL);
- " height from 33 months to Grade 3 to the nearest 0.1 cm using a modified tape measure (Microtoise, CMS Weighing Equipment, London, UK);
- " weight from 33 months to Grade 3 to the nearest 0.5 pound with a strain-gauge digital scale (Wonderscale", Health-o-meter, Inc., Bridgeview, IL).

Percentile values for height-for-age (HAP) and weight-for-height (WHP) were compared to the distribution of age- and sex-specific National Center for Health Statistics (NCHS) reference data (Frisancho, 1990) to determine the proportion of children at or below the 10th percentile and at or above 90th percentile. A value for WHP at or above the 90th percentile reference data is considered overweight, and at or below the 10th percentile is defined as underweight. HAP values at or below the 10th percentile reference data may indicate stunting. If the proportion exceeds 10% in these extreme categories in any population of children, this indicates a nutritional concern.

Results for Anthropometric Measurements

Younger cohort. There were no overall significant differences between the baseline and focal cohorts or longitudinally for HAP or WHP. The proportion below the 10th percentile HAP was consistent with the reference data (12.1% at baseline and 10.4% in the focal cohort). Only 3.5% at baseline and 4.4% in the focal cohort were underweight (below the 10th percentile WHP). However, approximately one child in five (23.7% of baseline, and 21.7% of focal) was overweight (Figure 7.5). The proportion of children at or above the 90th percentile for WHP is well above 10% at each measurement point. For younger children, it is inappropriate to regard a high value for WHP as a cause for concern because they are in a period of rapid growth. It must be stressed that the only implication of these findings is that physical activity should be encouraged for 48-month-old children. To summarize, few children were underweight; overweight is a concern among children aged 48 months, and there was no change in the prevalence of overweight over time.

Older cohort. There were no differences between the baseline and focal cohort, or in the longitudinal analysis for either HAP or WHP. There were few children below the 10th percentile for HAP (2.8% at baseline and 7.8% in the focal cohort). This suggests that long-term undernutrition has not occurred. There was little evidence of underweight, with only 8.5% below the 10th percentile WHP at baseline and 8.3% in the focal cohort. As with the younger cohort, approximately 22% of both cohorts were above the 90th percentile for WHP (Figure 7.5). To summarize, underweight is not a problem, but at least one child in five was overweight and this did not change significantly over time.

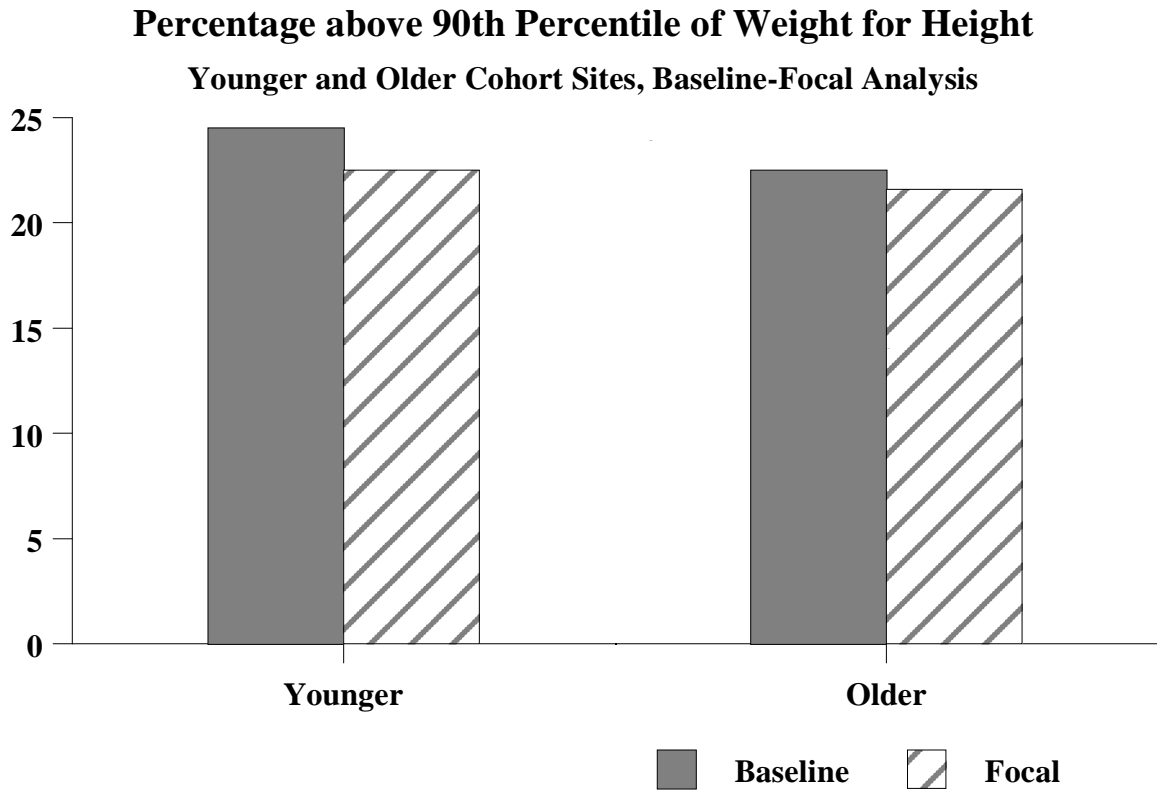
24-Hour Dietary Recall

Information on the intake of energy and selected nutrients was obtained with a 24-hour dietary recall. For JK and SK children, the interviewer asked the parent to recall what the child ate during the previous day. To ensure that the information was complete, the parent's permission was obtained to contact caregivers if the child had been away from home for any part of the day. This interview was conducted according to a standardized protocol, asking additional questions (snacks, type of milk, cereal, use of butter or margarine, etc.) to obtain as complete a description as possible. Food models (similar to those used in the Nutrition Canada Survey; Nutrition Canada, 1973) and calibrated utensils were used to assist the parent with recall of portion sizes. The interviews took place randomly throughout the month, usually within two weeks of the child's fourth birthday.

For children in Grade 2, the interviewer asked each child to recall what s/he had eaten during the previous day. The interviews took place, usually in school, randomly throughout the month, Monday to Friday. To ensure that the information was complete, whenever possible the parent was also asked to recall what the child ate.

The 24-hour dietary recall data were analyzed using the Candat Nutrient Calculation System (Godin London Inc., 1993). In addition to determining whether there have been positive program effects on the energy and nutrient intake of children, it is also necessary to evaluate the nutritional adequacy at baseline and at the focal interview. Mean intakes are compared to the Canadian Recommended Nutrient Intakes (RNIs) (Health and Welfare Canada, 1990).

Figure 7.5



The prevalence of overweight children is well above expected levels for both the baseline and focal cohorts in all sites. Approximately one child in four or five is overweight.

Cohort	Baseline		Focal	
	%	N	%	N
Younger	24.5	273	22.5	316
Older	22.5	160	21.6	157

Results for 24-Hour Dietary Recall

Younger cohort baseline-focal. There were significant overall increases from the baseline to the focal cohorts for intakes of carbohydrate ($p < .05$, $es = -.65$), niacin ($p < .01$, $es = .73$) and folate ($p < .05$, $es = .54$). There was no evidence of dietary inadequacies despite a mean energy intake below the RNI for both the baseline and focal cohorts because intakes of all nutrients were at or above the RNIs.

Younger cohort longitudinal analysis. The Dietary Recall was conducted only at 48 months, so no longitudinal comparisons were possible. Within the longitudinal cohort at 48 months, mean intakes of all nutrients were at or above the RNIs for the demonstration sites and Peterborough; therefore, no further analyses were conducted. Energy was below recommended levels, but this is not a concern because of the tendency to overweight and the fact that diets were nutritionally adequate.

Older cohort baseline-focal. There were significant increases, all at $.01$, for energy ($es = .63$), protein ($es = .55$), carbohydrate ($es = .51$), fat ($es = .69$), niacin ($es = .59$), riboflavin ($es = .67$), thiamine ($es = .40$), folate ($es = .27$), calcium ($es = .34$), iron ($es = .39$), and zinc ($es = .69$). At baseline, the mean intakes of energy and zinc were below the RNIs for boys. In addition to these inadequacies, the vitamin A and calcium intakes of girls did not meet recommended values. Although major improvements in dietary intake were observed in the focal cohort, energy still did not meet the RNIs for either boys or girls, and zinc was still marginal for girls. There is growing evidence that energy intake tends to be under-reported, largely because fat consumption is underestimated (Champagne *et al.*, 1998). Thus, energy intake below the RNI is not a concern, especially since the intakes of most nutrients appear to be adequate.

Older cohort longitudinal. The longitudinal analysis indicated no improvements in energy and nutrient intakes from SK to Grade 2. This is in contrast to the increases in the intakes of energy and almost all nutrients found in the baseline-focal analysis. Once the results from the baseline data collection were reported back to the sites, a number of food and nutrition programs were developed to address the dietary inadequacies, and this is reflected in the higher intakes in the focal cohort. By SK, the programs were in place, and these were ongoing at the time of the Grade 2 data collection. Among children in SK, energy was below the RNI overall, but the intake of all nutrients met the RNIs.

Site-Specific Findings for Child Nutritional Health

Toronto: Child nutrition clearly improved. From baseline in 1993 to 1998, there were significant increases in children's consumption of calories, carbohydrates, protein and significant increases on 8 of 9 nutrients.

CHILD HEALTH

Parents are a good source of information on the health of their children. However, each parent's concept of what constitutes being healthy, injured, or sick is different. In addition, there is variation among parents in their ability to assess the health of each of their children. A parent's view of the child thus depends on how well they read the child's degree of pain, inconvenience or fatigue. What is ignored or seems acceptable to one parent for one child could seem very distressing or limiting for another child. For these reasons, health researchers ask questions about a child from several perspectives: in the Better Beginnings study, child health was assessed by parents' overall perceptions of their children's health, the degree to which children's health problems interfere with daily activities, presence of medical conditions, injuries and poisonings, and rates of hospitalizations.

Provincial data on the study indicators are presented wherever possible to provide a context within which to interpret the effects of Better Beginnings on child health. The primary sources of these comparison figures were the National Longitudinal Survey of Children and Youth (NLSCY, 1997) and the Canadian Institute for Health Information (CIHI).

Parent Ratings of Child Health

Each parent in the comparison and program sites was asked, "In general, compared to other children the same age, would you say your child's health is excellent, very good, good, fair or poor?" The question was repeated from 3 months to 48 months in the younger cohort sites, and from JK through Grade 3 in the older cohort sites.

Results for Parent Ratings of Child Health

Younger Cohort. No consistent significant improvements were found in parents' ratings of their children's health in the Better Beginnings program sites compared to the comparison site. When the Better Beginnings parent ratings were compared to those of Ontario parents (based on data from the NLSCY, 1997), children's health was generally poorer.

Older Cohort. There is evidence for Better Beginnings having a positive effect on the parent ratings of their children's health over time (Figure 7.6). A significant improvement in program site parents' health ratings was found in relation to the ratings of parents in the comparison sites ($p < .05$, $es = .37$). Highfield parents' ratings showed the greatest improvement versus their comparison site ($p < .01$, $es = 1.02$).

When comparing Better Beginnings parent ratings to those of Ontario parents, from JK through Grade 2, the children at both the Better Beginnings program communities and comparison communities were less apt to be rated by their parents as having excellent health compared to Ontario children in general between the ages of 5 and 9 years (NLSCY, 1997): across the four years, 42% of the parents in the Better Beginnings program and comparison sites rated their children as having excellent health compared to 61% of Ontario parents with children aged 5 to 9 years. However, by Grade 3, Better Beginnings parent ratings of child health were similar to Ontario parent ratings (NLSCY, 1997).

Health Problems

Parents were asked if their children had a condition or health problem which prevented or limited participation in school, at play, or in other activities. Parents were also asked if their children had a chronic health condition. These questions were asked in the younger cohort sites when the children were 33 months and 48 months of age, and in the older cohort sites when the children were in JK through Grade 3.

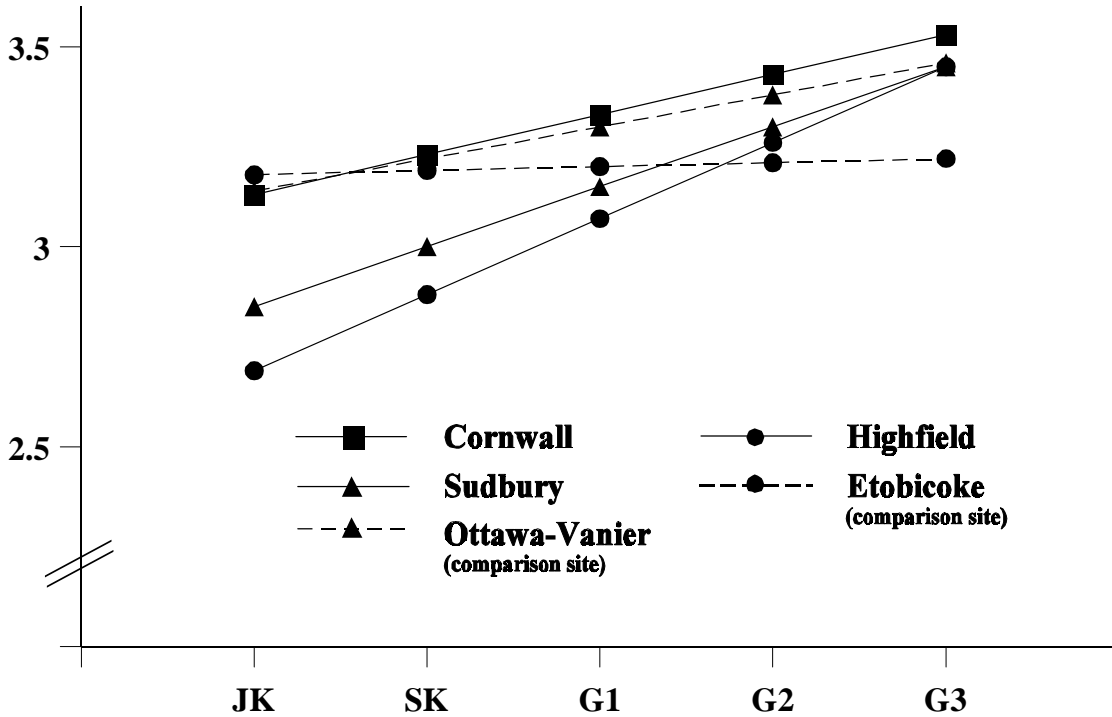
Results for Health Problems

Younger Cohort. Parents in the demonstration sites rated their children as having slightly more health limitations than children in the comparison site ($p < .01$). Also, children in the program sites had more health-related limitations in their daily activities than Ontario children in general. While only 3% of parents province-wide report that their 0 to 4 year old children have health-related limitations, the rates in the Better Beginnings sites range from 4% to 18%.

Figure 7.6

Parent Ratings of Children's Health, JK to Grade 3

Older Cohort Sites



Parents rated their children's health on a 4 point scale: 1 = fair or poor, 2 = good, 3 = very good, 4 = excellent child health.

Better Beginnings Program parents reported slightly greater gains in child health over time compared to non-program site parents.

Site	Change/ Year	s.d.	N	Effect Size
Cornwall	0.10	0.22	35	.28
Sudbury	0.15	0.26	51	.14
Ottawa-Vanier	0.08	0.20	92	na
Highfield	0.19**	0.24	29	1.02
Etobicoke	0.01	0.23	38	na
Demonstration-Comparison	0.09*	0.24	245	.37

* Difference of demonstration from comparison sites is significant at $p < .05$.

** Difference from comparison sites is significant at $p < .01$.

Older Cohort. There were no significant differences between program or comparison sites' parent reports of child limitations on activities of daily living. However, it is important to note that children in both the program and comparison sites have more health-related limitations on their daily activities than do Ontario children in general (based on NLSCY data). Province-wide, only 4% of parents report their 5 to 9 year olds have limitations. In the Better Beginnings program sites, the rates of parent-reported health-related limitations are about double that of Ontario as a whole, ranging from 7% to 11%.

Asthma

The most common health problem among children at all ages in the older and younger cohort sites was asthma. There was no evidence that rates of asthma were affected by Better Beginnings programs or that there was a reduction in hospitalization for asthma (based on CIHI data). However, the rates are so high that some detail and discussion is provided. Across the eight Better Beginnings project sites, parents report that between 9% and 33% of children have been diagnosed with asthma by a doctor. These rates are very high. While asthma is the most common chronic illness among children, in the general population it affects only 7% to 10% of children (Dekker, Dales, Bartlett, Brunekreff, & Zwanenburg, 1991; Betz, Hunsberger, & Wright, 1994). These rates are of serious concern because asthma accounts for more missed school days than any other childhood illness (Winkelstein, Tarizian, & Wood, 1997). It was expected that the rates would be somewhat higher, because low-income families are known to be more apt to have children who have asthma, and their children are more apt to have more severe asthma (Taylor & Newacheck, 1992; Winkelstein *et al.*, 1997). Although death is uncommon, the rates are rising, especially among children from low-income families (Winkelstein *et al.*, 1997).

Injuries and Poisoning/Hospitalizations

Parents in the younger cohort sites were asked if their child had been injured or poisoned in the past twelve months; these questions were asked for children at 33 months and 48 months. Parents in the older cohort sites were asked about their children's injuries for all data collection points except when children were in Grade 1.

Using the CIHI database, child hospitalizations for the following conditions were examined for children 0 to 4 years of age: asthma; all surgeries; all medical admissions; and pneumonia. Because hospitalizations were too infrequent among 0 to 4 year olds, no site-specific analyses were possible. Also, the frequency was too low to examine for children aged 5 to 9.

Hospitalization rates in the younger cohort urban Better Beginnings sites were compared to the rest of their surrounding areas before programs (1990-92) and after programs were well established (1994-97).

Results for Injuries and Poisoning/Hospitalizations

Poisonings and injuries were reported very rarely, so analyses of a possible effect in the younger cohort sites were not possible. In the older cohort sites, there were no significant results.

In the younger cohort sites, hospitalizations for asthma were slightly lower in the years after Better Beginnings in comparison to their surrounding areas and the comparison site. The drop was from 2.8% to 2.3% and this result was non-significant. Also, surgeries, medical admissions and pneumonia hospitalizations did not show an effect.

HEALTH PROMOTION/PREVENTION OF INJURY AND ILLNESS

Promotion of Child Health

This aspect of child health was examined in parent reports of: child's immunization status at 18 and 33 months, at SK, and at Grade 1; and number of hours children were exposed to tobacco smoke per week when children were 33 and 48 months of age. Also, parents were asked six questions adapted from Tinsley and Holtgrave (1989) that measured their perceived ability to positively influence their child's health; for example, I can do lots of things to keep my child from getting sick. Parents could rate whether they strongly agreed (1) to strongly disagreed (6) with each of the six statements. This measure was used when children were 3, 33, and 48 months old in the younger cohort sites, and from Grades 1 to 3 in the older cohort sites.

Child Injury Prevention

This was explored in three ways: use of car seats, use of bicycle helmets, and traffic safety. Each of these could prevent child injuries and is under some degree of parental control. Each could have changed as a result of broader Better Beginnings health promotion efforts. When children were 18 months of age, parents were asked whether they used a car seat for their children in a vehicle. When the children were 48 months of age in the younger cohort sites and in SK in the older cohort sites, parents were asked, When your child rides a bicycle, how often do you try to see that he/she wears a helmet? Finally, when the children were in Grade 3 in the older cohort sites, parents were asked how consistently they thought their child looked both ways before crossing a street.

Results for Child Health Promotion/Injury Prevention

Younger Cohort. As shown in Table 7.1, at 18-months, children in the program sites were more likely to be up to date with immunizations than children in the comparison site ($p < .05$, $es = .18$); Guelph, Ottawa, and Toronto were significant at $p < .01$ compared to Peterborough, with respective effect sizes of .50, .47 and .38.

Almost all parents in the projects sites and comparison site reported appropriate use of car seats; therefore, no statistical analyses were done. For bicycle helmet use, there were significantly lower rates of parental encouragement at the program sites versus the comparison site ($p < .05$, $es = -.74$). However, program sites were not focusing on bicycle safety at this early age.

Neither children's exposure to second-hand smoke nor parents' perceived ability to positively influence their children's health showed any significant effect compared to Peterborough.

Older Cohort. There were no overall consistent significant differences between the program and comparison sites on measures of children's immunization, parents' perceived ability to positively influence their child's health, children's use of bicycle helmets, or children's traffic safety.

Site-Specific Findings for Health Promotion/Injury Prevention

Cornwall: Three of the four health promotion/injury prevention measures were significant at $p < .01$ (increased sense of parent control over child's health, more timely immunizations and increased parental encouragement to wear a bicycle helmet, with respective effect sizes of .49, .55 and .24). The parents living in the Better Beginnings Cornwall site also reported children more likely to look both ways before

crossing the street, although this change was not statistically significant.

Sudbury: Of the four health promotion/injury prevention measures, two were statistically significant at $p < .01$ (parents' control over child's health ($es = .48$) and parental encouragement to use a bicycle helmet ($es = .24$)). Children having more timely immunizations showed a slight non-significant improvement as well.

**Table 7.1 Rate of Children's 18-Month Immunizations
Younger Cohort Sites**

Site	% of Children Immunized on Time at 18 Months
Guelph	66.7 **
Kingston	30.0
Ottawa	62.5 **
Toronto	60.0 **
Walpole Island	50.6
ALL DEMONSTRATION SITES	49.9 *
Peterborough Comparison	35.0

* Difference is significant at $p < .05$.

** Difference is significant at $p < .01$.

USE OF HEALTH CARE SERVICES FOR CHILDREN

Improved health promotion often requires access to professionals, for example, to obtain immunizations. If Better Beginnings can affect child health and parents' perceptions about how best to keep their children well, then some changes in the use of health care services might also be expected. It might also be reasonable to expect changes in how satisfied parents were with the care they could get for their child. However, opposing factors can affect service use. For example, the positive factor of health promotion should increase use. On the other hand, the negative factor of illness should also increase use. Finally, local availability will affect usage rates.

To assess health care use, parents were asked if their child had used various types of services or professionals over the last six months. The questions were whether or not the parent used the service for the child. Parents in the longitudinal sample were asked about services at several points in time. For example, parents of JK, SK and Grade 2 children were asked how often they had visited an emergency room for their child in the last six months. In the younger cohort sites, parents of 33 and 48 month olds were asked similar questions.

To assess general access to health care services, parents were asked if there was ever a time during the last 12 months when you wanted to see a professional for your child but didn't? Parents were also asked Did you ever feel you were not getting as good service as other people?

Results for Access to Professionals for the Child

The professionals most often not seen were psychologists, followed by physicians and dentists. The most frequently mentioned reason for not seeing a professional for the child was the cost. This was followed by not being able to get an appointment in time, not knowing who to see, where to go or who to call and the parent being too busy with other things. The frequencies of each type of professional and each type of reason were too low to allow statistical analysis.

Younger Cohort. Overall, parents at Better Beginnings program sites felt they had improved access to professionals after programs began compared to before programs ($p < .05$, $es = .17$); all sites were in the same direction and two of the five were significantly improved. Before programs, 21% reported they had not seen a professional when they thought they needed it for their child. This dropped to only 10% after programs were in place. In comparison to Peterborough, the same significant overall trend ($p < .05$, $es = .24$) repeated; all sites were in the same direction and two of these were statistically significant. At the comparison site, 36% of the parents reported not being able to see a professional when they thought they needed it for the child. The lower rates of access problems for the Better Beginnings sites ranged from 15 to 32%.

Older Cohort. There is no consistent patterned effect of Better Beginnings on access to professionals for children in the older cohort sites.

Results for Quality of Service Obtained

Younger Cohort. Better Beginnings parents in the baseline-focal comparison tended to think that they were receiving better service than before programs began ($p < .05$). All sites were in the same direction, but taken individually, none showed significant change.

Older Cohort. There is no consistent patterned effect of Better Beginnings on quality of service obtained.

Results for Health Care Visits

Younger Cohort. No overall changes in visits to a doctor, emergency room, optometrist or dentist for the child were found in the younger cohort sites.

Older Cohort. For visits to an optometrist or dentist, there were no changes in parent reports of child visits. There were significantly more emergency room visits among children at the older cohort program sites versus their comparison sites ($p < .05$). Across all sites, 61% of the children had visited an emergency room. Of these, 37% had visited only once, 29% twice and 34% had visited three or more times in the time sampled. Comwall and Sudbury had significantly increased usage ($p < .01$). There was no consistent pattern effect of Better Beginnings on visits to a doctor.

SUMMARY OF SIGNIFICANT CHILD FINDINGS

CHILD EMOTIONAL PROBLEMS, BEHAVIOURAL PROBLEMS, AND SOCIAL FUNCTIONING

General Findings

- " In both the younger and older cohort Better Beginnings sites, there were significant decreases in teacher reports of children's overanxious emotional problems.
- " In the older cohort Better Beginnings sites, children show significantly improved self-control as reported by their teachers and significantly improved cooperation as rated by their parents.

Site-Specific Findings

Cornwall: Fewer emotional and behavioural problems were reported by teachers. Based on teacher ratings of the OCHS subscales, children in the Cornwall Better Beginnings site showed significantly less overanxious and passive-victimization behaviour ($p < .01$). Teacher reports on the other 3 subscales, oppositional, attention-deficit, and depression, showed small but non-significant reductions.

Highfield: Both parents and teachers rated children living in the Highfield Better Beginnings site as more socially skilled in both the baseline-focal and longitudinal comparisons; seven of the 12 statistical tests were significant at either $p < .05$ or $p < .01$. Parents living in the Highfield program site also rated their children as having significantly fewer emotional and behavioural problems; six of the eight statistical tests were significant at $p < .01$.

Kingston: Fewer behavioural-social-emotional problems were reported by teachers. Of the three subscales of the PSBQ, a reduction in emotional problems was significant at $p < .01$, and there were also small non-significant increases in prosocial behaviour and small decreases in disruptive behaviour. Also, children were rated by their teachers as improving in school readiness ($p < .01$).

Sudbury: Parents living in the Sudbury Better Beginnings site rated their focal cohort children as having more emotional and behavioural problems. All eight of the statistical tests showed increases in these types of problems, and one was significant at $p < .01$.

GENERAL CHILD DEVELOPMENT

General Findings

- " Auditory attention and memory significantly improved among the younger cohort in comparison to Peterborough ($p < .05$).

Site-Specific Findings

Walpole Island: Improved general development was clear. Of the 7 statistical comparisons for the DISC, children on Walpole Island showed statistically significant improvements on two of the tests and change in a positive direction on all of the comparisons.

PERINATAL HEALTH

General Findings

- " Women at the Better Beginnings sites had lower initiation rates for breastfeeding compared to Peterborough ($p < .01$). The initiation rates for breastfeeding at the demonstration sites are close to national figures.

CHILD NUTRITIONAL HEALTH

General Findings

- " In the younger cohort sites, very few children were underweight. There was a tendency to overweight among 4 year olds.
- " In the older cohort Better Beginnings sites, there were significant improvements on 10 of the 12 indices of children s nutrition from baseline 1993 to 1997.
- " In the older cohort sites, more than one child in five was overweight. This reflects a North American trend to pediatric obesity (Freedman *et al.*, 1997; Yip *et al.*, 1993). This is an issue for all sites; there was no decrease in the prevalence of overweight in either the baseline-focal or the longitudinal analyses.

Site-Specific Findings

Toronto: Improvement in child nutrition was clear. From baseline in 1993 to 1998, there were significant increases in children s consumption of calories, carbohydrates, and protein and significant increases on eight of nine nutrients.

CHILD HEALTH AND HEALTH PROMOTION/PREVENTION OF INJURY AND ILLNESS

General Findings

- " For the older cohort Better Beginnings sites, there was a significant improvement in parents overall ratings of their children s health, and by Grade 3 the ratings were similar to those for other children living in Ontario.
- " In the younger cohort Better Beginnings sites, program children were more likely to be up to date with immunizations. Program parents were less likely to encourage their children to wear bicycle helmets than comparison site parents.

Site-Specific Findings

Cornwall: Increased health promotion/injury prevention was shown. Three of the four measures were significant at $p < .01$ (increased sense of parent control over child s health, more timely immunizations, and increased parental encouragement to wear a bicycle helmet).

Sudbury: Increased health promotion/injury prevention was apparent. Of the four measures, two were statistically significant at $p < .01$ (parent s control over child s health and parental encouragement to use a bicycle helmet).

USE OF HEALTH SERVICES FOR CHILDREN

General Findings

- " Parents at the younger cohort Better Beginnings program sites report having improved access to professionals after programs began compared to before programs ($p < .05$) and compared to Peterborough ($p < .05$).