



SASKATCHEWAN POPULATION HEALTH AND EVALUATION RESEARCH UNIT



Saskatchewan *KidsFirst* Program Evaluation: Report of the Quantitative Study



Nazeem Muhajarine, Darren Nickel, Robert Nesdole
and the Evaluation Research Team, Saskatchewan
Population Health and Evaluation Research Unit

2010

Acknowledgements

All of the reports written during this evaluation are the result of the work and input of a number of people. We acknowledge the collaboration and insights of members of the Early Childhood Development Unit (Gail Russell, Gary Shepherd, Rob Gates, Wendy Moellenbeck, and Murray Skulmoski) throughout the evaluation, as well as that of the program managers in the nine *KidsFirst* sites, Lori Albert (Meadow Lake); Krista Bakke (Moose Jaw); Jan Boughen (Nipawin); Kathy Byl (North Battleford); Genevieve Candelora (North); Rebecca Clark Galloway (North); Sylvia Gent (Prince Albert); Heidi Fisher-Phillips (Regina); Pam Woodsworth (Saskatoon); and Lois Okrainec (Yorkton), their staff and management committees, and *KidsFirst* participants who shared their experiences with us. We also appreciate the assistance and guidance of Patty Beck at the Saskatchewan Ministry of Health. While the quantitative data used in this report, in part, were provided by the Ministry of Health, the analyses and interpretation were solely of the authors, and in no way do they represent the views of the Government of Saskatchewan.

The many reports in this evaluation were developed with the guidance, support and contributions of the many members of the *KidsFirst* Evaluation Research Team. This includes *KidsFirst* investigators: Angela Bowen, Jody Glacken, Kathryn Green, Bonnie Jeffery, Thomas McIntosh, David Rosenbluth, and Nazmi Sari, post-doctoral fellow Hongxia Shan, and research staff: Darren Nickel, Fleur Macqueen Smith, Robert Nesdole, Kristjana Loptson, Shainur Premji, Hayley Turnbull, Taban Leggett, Kathleen McMullin and Julia Hardy. We were also assisted by a number of students over the years, including Jillian Lunn, Karen Smith, Vince Terstappen, David Climenhaga, Brayden Sauve and Curtis Mang. Thanks are also due to Janice Michael, research administrator for the SPHERU Saskatoon office, for her financial management during the course of the evaluation, Penny MacKinlay, who edited several of the reports, and Lori Verishagen, graphic designer with Printing Services Document Solutions & Distribution at the University of Saskatchewan, who created our covers. Also, thank you to peer reviewers Mariette Chartier, who reviewed the quantitative report, and Marion Ross, who reviewed the qualitative report. Finally, we extend our thanks to our funders, the Canadian Population Health Initiative - Canadian Institute of Health Information and the Government of Saskatchewan.

The following reports were produced as part of this evaluation:

- Evaluation Framework
- Community Profiles
- Focused Literature Review
- Using Theory to Plan and Evaluate *KidsFirst* (full and summary versions)
- Report of the Qualitative Study
- Report of the Quantitative Study
- Summary of Findings and Recommendations

All of these reports can be downloaded from www.kidskan.ca, the Saskatchewan Knowledge to Action Network for Early Childhood Development. To access information and reports, click on “KidsFirst” on the Projects tab on the front page.

Contents

Highlights of Findings.....1

Executive Summary2

1: Introduction.....5

 1.1 *KidsFirst* background.....5

 1.2 *KidsFirst* Evaluation.....6

2: Family functioning and child development study.....8

 2.1 Background.....8

 2.2 Methods.....9

 2.3 Results.....14

 2.2 Discussion24

3: Child health study.....30

 3.1 Background to study.....30

 3.2 Methods.....30

 3.2 Results.....33

 3.4 Discussion34

4: General Discussion and Conclusion36

 4.1 Findings supporting the effectiveness of *KidsFirst*38

 4.2 Findings suggesting potential areas of improvement for *KidsFirst*.....38

References.....41

Appendix A: Evaluation Objectives.....43

Appendix B: Included In-Depth Assessment/On-Going Assessment items and their cut-off points.....44

Appendix C: Criteria for determining complex needs47

Appendix D: Table 2.4.....48

Appendix E: Table 2.549

Appendix F: Table 2.650

Appendix G: Table 2.7.....53

Appendix H: Table 2.8.....54

Appendix I: Table 2.955

Appendix J: Table 3.3.....56

Appendix K: Table 3.457

Appendix L: Table 3.558

Appendix M: Table 3.6.....59

Appendix N: Table 3.7.....60

Highlights of Findings

- Families experienced reduced risk in all eight family assessment variables considered (availability of social supports; food security; expectations of child(ren); parent motivation; family identity and interactions; living conditions; housing suitability; and housing stability) within six months of enrolling in *KidsFirst*.
- Results for families with complex needs differed from those for families with non-complex needs. While we found significant decreases in risk scores for seven of the eight variables for families with non-complex needs, decreases in risk scores were significant for only two of the eight variables considered (availability of social supports & food security) for families with complex needs.
- 84% of children in the dataset had at least one developmental screen (Ages and Stages Questionnaires; ASQ) in the first year of life. Screening rates ranged from 78% to 90% in the sites.
- *KidsFirst* children achieved age-appropriate development in all outcomes, at most ages. Where children appeared to have difficulties, it was most often in communication, fine motor development, and problem solving.
- Results suggested no relationship between duration of family enrolment and developmental screen (ASQ) scores.
- We had no information on what happened to children whose ASQ scores suggested the need for further assessment. This information is necessary in order to demonstrate support for children's development.
- *KidsFirst* children had fewer routine well-child physician visits than comparison children in the first 13 months of life.
- *KidsFirst* children had fewer physician visits than comparison children for perinatal conditions (e.g., jaundice).
- *KidsFirst* children had more hospital visits than comparison children for respiratory conditions.
- Results were suggestive of *KidsFirst* children having more physician visits than comparison children for infectious diseases.
- There were no differences between *KidsFirst* and comparison children in terms of birth outcomes (at-risk birth weights and gestational ages) as well as rates of physician and hospital visits for a number of conditions.

Executive Summary

KidsFirst was launched in 2002 as a program primarily built around home visiting that provides services and support to vulnerable families with young children in nine targeted sites in Saskatchewan.¹ The overall purpose of the *KidsFirst* program evaluation is to assess its effectiveness in helping to make positive changes within participating families and communities. This document summarizes the Report of the Quantitative Studies. Various other documents have been published as part of the evaluation and provide complementary information to this report.² The quantitative studies aimed to address the following questions derived from the Evaluation Framework:

1. Did social support networks and food security for families improve over time?
2. Did caregiver expectations of their children, caregiver motivation to meet their children's needs, and family interactions improve over time?
3. Did families in *KidsFirst* develop and maintain a safe and secure home environment?
4. What were the rates of developmental screening in the first year of life for *KidsFirst* children? How did these differ by site?
5. In which developmental outcomes did *KidsFirst* children achieve age-appropriate development?
6. To what extent did *KidsFirst* children achieve age-appropriate outcomes?
7. Was higher family exposure to *KidsFirst* (in terms of duration of enrolment) associated with higher subsequent developmental screen (Ages and Stages Questionnaire) scores?
8. Were birth weights better in *KidsFirst* children than in comparison children?
9. Were gestational ages at birth better among *KidsFirst* children than in comparison children?
10. Did *KidsFirst* children have more well-child physician visits in the first 13 months of life than comparison children?
11. Did *KidsFirst* children have fewer physician visits for specific medical conditions than did comparison children?
12. Did *KidsFirst* children have fewer hospital visits for specific medical conditions than did comparison children?

Methods

We used existing data routinely collected by *KidsFirst* to answer the questions concerning family circumstances (questions 1-3 above) and child development (questions 4-7 above) and health care utilization data from Saskatchewan Health to answer the child health questions (8-12 above). A number of analytical procedures were used, ranging from simple frequencies (for questions 4-6) to non-parametric tests (Wilcoxon signed ranks for questions 1-3; Kruskal-Wallis for question 7) to logistic regression (for questions 8-10) and generalized linear regression (for questions 11-12).

¹ Meadow Lake, Moose Jaw, Nipawin, North Battleford, Northern Saskatchewan, Prince Albert (select neighbourhoods), Regina (select neighbourhoods), Saskatoon (select neighbourhoods), Yorkton

² These include the evaluation framework, community profiles, theory document, literature review on the effectiveness of home visiting programs, and report of the qualitative study, all available at www.kidskan.ca. See the Acknowledgements for details.

Findings

Results suggested that many families may have experienced improved functioning within six months of enrolment in *KidsFirst*. While there remain alternative explanations for these results, such as measurement error, the possibility exists that many families experienced improved social supports, food security, parent expectations of their children, parent motivation, family identity and interactions, living conditions, housing suitability, and housing stability soon after enrolling in *KidsFirst*.

Families assessed as having complex needs in any of their first three participation level records appeared to make less progress in most cases. Although we need to be cautious in our interpretation of results as numbers for the complex-needs group were quite small, it is possible that these data support the speculation that some families may respond more slowly or not at all to *KidsFirst* services. If this can be shown to truly be the case, then these results may suggest that policy-makers should consider investigating the efficacy of a six-month stabilization period for families, involving intensive home visit schedules and other services, followed by a consolidation phase involving less intensive services for those who benefit soon after enrolment.

Most children appeared to be developing normally, according to Ages and Stages Questionnaires (ASQ) scores; however, there were still children whose scores suggested potential delays in development. If these children were screened, identified, and referred for further assessment, then we believe that *KidsFirst* has contributed to support children's development. It was not possible for us to determine whether or not this was the case, with the data we received.

Children in families who had been in *KidsFirst* longer, and presumably had more exposure to the *Growing Great Kids* curriculum fared no better than children in families who had been in *KidsFirst* for less time on developmental screens (ASQ). This may suggest that exposure to the curriculum had no meaningful effect on child development. While further studies directed specifically on assessing the effectiveness of the curriculum is needed, the finding from this study might question the usefulness of presenting the curriculum.

After controlling for noted demographic differences between the *KidsFirst* and comparison groups in the child health study, we found no differences between groups in either rates of at-risk birth weights or at-risk gestational ages at birth. In addition, we found no differences in rates of physician or hospital visits for injury/poisoning. Although we controlled for differences in demographic variables, we expect that the groups might have also differed on other risk-related variables (e.g. history of family violence or substance abuse), which were not measured in the health care utilization data and therefore not controlled. As such, we expect that even after controlling for the demographic differences, the *KidsFirst* group was at higher risk for negative child outcomes than was the comparison group. Because of this, the fact that birth weights, gestational ages, and hospital visits for injury/poisoning were not worse in the *KidsFirst* group was interpreted as a positive finding for the program.

On the other hand, results suggested that *KidsFirst* families lagged behind the comparison group in finding and using a physician. *KidsFirst* children had fewer recorded well-child physician visits in their first year of life. Also, *KidsFirst* children had more hospital visits for respiratory reasons. As, ideally, respiratory diseases are controlled through medication and vigilance, one would hope for more physician visits and fewer hospital visits here. This did not appear to be the case with *KidsFirst* children. It is recognized that many *KidsFirst* families reside in areas where access to a physician is challenging. Furthermore, health clinics served by nurses and allied

health personnel may be more accessible for many families. However, if it is deemed an important part of maintaining the health of children, *KidsFirst* might consider increasing effort around this item.

Discussion

From our analysis of the program administrative data we received, it appeared that very few families progressed through the participation levels. Rather, most appeared to remain at their initial participation level and exit the program from there. If many families are truly benefitting from the program as much as the results suggested, it would seem inefficient for them to not progress through the participation levels. If many families remain at their initial intensive participation level, even though they have achieved some stability and improvement, additional work might be done by the program to better communicate the positives (and necessity) of moving on through the levels in order to allow space for more families in the program.

We had concerns about the data we received. It was evident that there were considerable missing data for both the family assessment variables and the child development data, given the much larger numbers in the administrative database. If the data we received in most cases concerned families who were more easily contacted by home visitors, it is possible that the data presented an overly optimistic view of family functioning and child development.

In addition, while we believe that screening the development of children goes a long way to support them, our understanding is that data concerning what happened to those children who screened at-risk on Ages and Stages Questionnaires are not stored in the *KidsFirst* Information Management System (KIMS). We recommend that this be done in order to provide better tracking of that support to children's development. We conclude with the following operational recommendations:

1. *KidsFirst* should examine how to better identify and serve those families slow to respond to *KidsFirst* services.
2. *KidsFirst* should ensure that staff members are communicating to families the positives and necessity of progressing within the program.
3. In order to better serve families and track program effectiveness, we recommend collecting the most valid, reliable, and relevant data on as many families as possible.

1: Introduction

This report details an evaluation of the effectiveness of *KidsFirst* in achieving its goals from its inception in 2002 to 2009. The report is laid out in four chapters. The present chapter is a general introduction to *KidsFirst* and the evaluation research project. Chapters Two and Three contain the family functioning and child development and child health studies, respectively. Both of these follow the same general format with introduction, methods, results, and discussion sections. The final chapter contains a general discussion of the findings of both studies.

1.1 *KidsFirst* background

KidsFirst is a federally-funded and provincially-run program for families with young children that are particularly vulnerable to negative outcomes due to their circumstances. Designed to support parents in doing the best job they can in raising their children, it is targeted at those families believed to most benefit from its services. Additionally, it is run only in select communities and neighbourhoods where the highest concentrations of these families reside.³ Federal funding was announced in 2000, and the program began in 2002.

The vision of *KidsFirst* is that:

Children living in very vulnerable circumstances enjoy a good start in life and are nurtured and supported by caring families and communities. In targeted high-needs communities, supports and services are provided through partnerships between families, communities, service organizations and governments.⁴

In order to realize this vision, a number of goals and objectives have been set.⁵ They are:

1. Children in very vulnerable situations are born and remain healthy.
Objectives:
 - Pregnant women in the program access adequate prenatal care.
 - Primary caregivers address their mental health and addictions issues.
 - Children maintain good physical health status or improved health status over time.
2. Children living in very vulnerable circumstances are supported and nurtured by healthy, well-functioning families.
Objectives:
 - Social support networks, housing, food security, education, employment, and income for families will improve over time.
 - Family interactions will improve over time.
 - Families develop and maintain a safe and secure home environment.
3. Children living in very vulnerable situations are supported to maximize their ability to learn, thrive, and problem solve within their inherent capacity.
Objective:

³ *KidsFirst* sites are: Meadow Lake, Moose Jaw, Nipawin, North Battleford, Prince Albert (select neighbourhoods), Regina (select neighbourhoods), Saskatoon (select neighbourhoods), Yorkton, and the North (select communities). For a description of these communities and *KidsFirst* services in them, see *KidsFirst Community Profiles Report*, <http://kidskan.ca/node/170>

⁴ *2007-2008 Performance Plan: KidsFirst Strategy*. Regina: Saskatchewan Learning, Early Learning and Child Care Branch and Early Childhood Development Unit, 2007.

⁵ *Ibid.*

- Support and nurture children’s ability to learn.
4. Children living in very vulnerable situations are appropriately served by the *KidsFirst* program and support.
- Objectives:
- Establish and maintain shared accountability mechanisms for processes and outcomes.
 - Create and maintain a service system for early childhood development that uses a community development approach; is built on existing services; and is integrated, comprehensive, innovative, flexible, and inclusive.
 - Identify appropriate families in a timely manner and retain them in the program.
 - Families are satisfied with *KidsFirst* services.

These noble and ambitious goals and objectives are addressed via a number of services, of which home visitation is the cornerstone. Paraprofessional home visitors visit families, generally monthly to weekly, depending upon need. During these visits, home visitors deliver the *Growing Great Kids* child development curriculum,⁶ offer support and guidance, and determine other services that might be helpful to families. In this way, home visitation serves as a gateway to other services such as mental health and addictions counselling, and early learning and child care.

1.2 *KidsFirst* Evaluation

1.2.1 Evaluation Framework

An evaluation of the effectiveness of *KidsFirst* was begun in 2007. The initial work produced as part of the *KidsFirst* evaluation was the *KidsFirst Evaluation Framework*.⁷ This document, which was produced by members of the research team in consultation with *KidsFirst* program managers, staff, and representatives of the government ministries involved in *KidsFirst*. It detailed a program logic model, evaluation objectives, and research questions and provided guidance for subsequent evaluation activities to be completed in three phases.

The first phase involved development of the evaluation framework itself. Phase 2 involved the production of a number of reports. First, a profile of each community served by *KidsFirst* was created, including a summary of *KidsFirst* services and key strengths and challenges at each site.⁸ Next, a paper outlining three theories that might help guide the evaluation and potentially shape future program changes was written.⁹ A focused literature review on the effectiveness of home visitation programs similar to *KidsFirst* was completed.¹⁰ Finally, separate quantitative and qualitative studies were conducted. The quantitative studies on understanding *KidsFirst*’s impact on family functioning and early childhood development and health outcomes are detailed in this document. The qualitative study examining how successful outcomes may or may not have been brought about through *KidsFirst* is discussed elsewhere (Muhajarine et al., 2010). These studies constitute the main sources of evidence concerning the effectiveness of *KidsFirst* within the current evaluation. Most of the main questions for both the quantitative and qualitative

⁶ <http://www.greatkidsinc.org/growinggreatkids.htm>

⁷ <http://kidskan.ca/node/174>

⁸ <http://kidskan.ca/node/170>

⁹ This document was not initially planned; however, when it became apparent that a documented theoretical foundation for *KidsFirst* was not available, we decided to produce one. See the full version and two summary versions at <http://kidskan.ca/node/172> , <http://kidskan.ca/node/173> , <http://kidskan.ca/node/171>

¹⁰ <http://kidskan.ca/node/197>

studies were drawn from the evaluation objectives set out in the *Evaluation Framework*. Phase 3 will involve the integration of all sources of information concerning *KidsFirst* collected in the previous phases into a summary report and discussion of the evaluation with stakeholders.

2: Family functioning and child development study

2.1 Background

Home visiting for vulnerable families with young children is a widely-used intervention strategy (Gomby, 2005). Despite its wide application, research findings have been largely equivocal on the effectiveness of home visiting in bringing about positive changes in families, whether those changes are in parent behaviours or child development (Gates, Muhajarine, Nickel, et al., 2010). And where results have supported home visiting, the magnitude of its impact has been quite small (Gomby, Colross, & Behrman, 1999). For example, while reviews have suggested that home visiting programs may influence parents' knowledge of child development and parenting self-efficacy (i.e. believing that one can do what is necessary to bring about specific outcomes related to parenting, such as providing nutritious meals and snacks) (Gomby, 2005; Harding et al., 2007; Gomes et al., 2005; Caldera et al., 2007), the research is equivocal on the effectiveness of home visiting programs in influencing parenting behaviours, such as positive parent-child interactions and supportive parental actions (Gomby, 2005; Love et al., 2005; Wade et al., 1999). Likewise, some research suggests that home visiting programs may effect change in later achievement of children born to young single mothers (Olds, Sadler, & Kitzman, 2007), while other research suggests few benefits in children's cognitive development (Gomby, 2005).

One explanation for the mixed findings is that home visiting is a strategy for intervention and not an intervention in and of itself (Gomby, 2005). Under the rubric of home visiting, programs differ in goals and objectives, services offered, training of home visitors, context, and populations served (Gomby, Colross, & Behrman, 1999). It is not surprising that the research literature is equivocal on the effectiveness of home visiting, given these differences. One way to better understand home visiting programs and their possible effects is to be more particular about program details such as actual service delivery, goals and objectives pursued, and the program model itself, as well as populations and other contextual features in examining outcomes (Braun, 2008). This might lead researchers away from asking whether or not home visiting works and asking instead what aspects of home visiting work, for whom, and under what circumstances (Mann, 2008). With a view to doing that, this study examines the effectiveness of one program in which home visiting is the core service delivery strategy.

As noted in the general introduction, one goal of *KidsFirst* is to have children in very vulnerable circumstances supported and nurtured by healthy, well-functioning families. The objectives under this goal are to have children raised in families with access to social support networks, stable and suitable housing, food security, education, and opportunities for adequate employment and income; interactions within families improve over time; and families develop and maintain a safe and secure home environment. Another goal of *KidsFirst* is to support children living in very vulnerable situations in order to maximize their ability to learn, thrive and problem solve within their inherent capacity. The objective with this goal is to support and nurture children's ability to learn. The purpose of this study is to evaluate the effectiveness of *KidsFirst* in achieving these goals and objectives from program inception (2002) to 2009.

The specific questions to be answered are:

1. Did social support networks and food security for families improve over time?
2. Did caregiver expectations of their child(ren), caregiver motivation to meet their child(ren)'s needs, and family interactions improve over time?
3. Did families in *KidsFirst* develop and maintain a safe and secure home environment?
4. What were the rates of developmental screening (using *Ages and Stages Questionnaires*) in the first year of life for *KidsFirst* children? How did these differ by site?
5. In which developmental outcomes (*Ages & Stages Questionnaires* subscales) did *KidsFirst* children achieve age-appropriate development?
6. To what extent did *KidsFirst* children achieve age-appropriate outcomes?
7. Was higher family exposure to *KidsFirst* associated with higher subsequent developmental screen (ASQ) scores?

These questions address a number of evaluation objectives from the *KidsFirst Evaluation Framework* (Muhajarine, Glacken, Cammer, & Green, 2007),¹¹ mentioned in the general introduction. The first three questions above relate to parenting and family influences and address Evaluation Objectives 5 and 6 (see *Appendix A*). The rest concern child developmental outcomes and address Evaluation Objective 4. The initial plan was to compare outcomes for *KidsFirst* children and families to those of a comparison group from the National Longitudinal Study of Children and Youth (NLSCY). However, levels of risk in families for whom data were collected in the NLSCY were considerably lower than those in *KidsFirst* families. While it would have been possible to develop another comparison group, this would have required the collection of primary data, which would have involved attendant increases in time and expenses. As a result, the research plans and evaluation objectives were amended.

2.2 Methods

2.2.1 Description of population

The program management and demographic dataset received from the Early Childhood Development Unit (Ministry of Education, Government of Saskatchewan: ECDU) included data on 3,779 families, which we believe represents most of the families that have been in *KidsFirst* from 2002 to 2009.¹² Data indicate that 2005 saw a large number of families enrolled, with a quarter of all families who have been in *KidsFirst* to date enrolled that year (see *Table 2.1*). A large majority of primary caregivers were female, and around half were in their twenties when they enrolled in *KidsFirst* (mean age = 24.1 years). Education levels of primary caregivers were generally quite low, with over half the parents not having a Grade 12 diploma.

¹¹ <http://kidskan.ca/node/174>

¹² Note that the datasets used in the analyses were considerably smaller (see section 2.3.2).

Table 2.1	
Demographic characteristics of the <i>KidsFirst</i> Caregivers	
(N=3779)	
	n (% of total)
Admission Dates	
2002	76 (2%)
2003	147 (4%)
2004	476 (13%)
2005	928 (25%)
2006	603 (16%)
2007	545 (14%)
2008	544 (14%)
2009 (to 21 Oct.)	459 (12%)
Admission date out of range	1 (<.1%)
Sex	
Female	3,711 (98%)
Male	66 (2%)
Not recorded	2 (.1%)
Age at Enrolment	
Teens	1,075 (28.4%)
Twenties	2,071 (54.8%)
Thirties	556 (14.7%)
Forties	59 (1.6%)
Fifties	11 (.3%)
Sixties	2 (<.1%)
Data out of range	5 (.1%)
Education	
Less than Grade 9	1,237 (33%)
Grade 9-11 completed	845 (22%)
Grade 12 completed	959 (25%)
Missing information	738 (20%)

2.2.2 Data sources

The *KidsFirst* Information Management System (KIMS) was the source of all data for this study. Program management, demographic, family assessment (In-Depth Assessment, IDA; Ongoing Assessments, OGA), and developmental screen data (Ages and Stages Questionnaires, ASQ) are routinely collected by *KidsFirst* staff and associates,¹³ and are recorded in KIMS. Researchers submitted data requests to a consultant with the Early Childhood Development Unit (ECDU), who worked with Information Technologies staff at Saskatchewan Education in extracting data files for use in this study. These files included all types of data mentioned above.

2.2.3 Measures

The family assessment measure used in *KidsFirst* was adapted from one used in Ontario's *Healthy Babies, Healthy Children* program. In *KidsFirst*, it is used prior to enrolment in most cases to determine areas of particular need (In-Depth Assessment, or IDA) and (since 2007) at regular intervals while in the program (Ongoing Assessments, or OGA, are to be conducted at 6, 12, 24, 36, 48, and 60 months after the family's enrolment). Most items are scored on a 5-point scale from 0 (denoting no concerns or a strength in the area) to 4 (very high risk). For example, in the Availability of Social Supports item, 0 denotes "multiple sources of reliable and useful support" and 4 denotes "effectively isolated." In addition, there is an option to indicate insufficient information to make a rating. *Table 2.2* describes each variable included in this study (see *Appendix B* for the items and responses).

Ages and Stages Questionnaires (ASQ) are developmental screens generally used to quickly assess whether children are meeting developmental milestones or would benefit from further assessment and possible intervention. There are a large number of age-specific questionnaires and they may be completed on children from 4 months to 60 months of age.¹⁴ Each questionnaire has five subscales: communication, gross motor, fine motor, problem-solving, and personal-social.¹⁵ Each subscale has 6 questions, providing a total of 30 items per questionnaire. Cut-off scores were set by the test authors, in most cases, as two standard deviations below the means for the normative sample. Scores falling below the cut-off are indicative of possibly at-risk development and signal the need for additional assessment. Usually, the appropriate questionnaire is given to a parent who takes it home, completes it, and then returns it to the professional or paraprofessional for scoring. Our understanding is that in *KidsFirst*, parents sometimes complete them in collaboration with their home visitors.

¹³ In-Depth Assessments were conducted by public health nurses, home visitors, home visitor supervisors, mental health/addictions workers, social workers, young parent workers, screening and assessment workers, and program managers.

¹⁴ While this was the case for the ASQ – 2nd Edition, which was used in *KidsFirst* during the period of study, the newer version (ASQ-3) has an extended range of applicability.

¹⁵ Communication assesses babbling, vocalizing, listening, and understanding. Gross motor assesses arm, leg, and body movement. Fine motor assesses hand and finger movement. Problem-solving assesses learning and playing with objects. Personal-social assesses solitary social play and play with toys and other children.

Family Assessment Variable	Description
Availability of social supports	- reflects the availability and usefulness of perceived supports (from partner, family, and/or community)
Food security	- reflects the family's access to food on an ongoing basis
Expectations of child(ren)	- reflects parent's knowledge of age-appropriate behaviour and consistency and reasonableness of standards for their child(ren)'s behaviour
Parent motivation	- reflects caregiver's strength of motivation to meet their child(ren)'s needs as well as salience of barriers which could affect progress
Family identity and interactions	- reflects appropriateness of family roles (i.e., parent gives care to child; child receives care from parent; parents provides support to each other) and general warmth and closeness among family members
Living conditions	- reflects absence/presence of conditions in home that could be hazardous to the health of children, which are within the caregiver's control
Housing suitability	- reflects absence/presence of conditions in the home that could affect the safety of children, which are under the landlord's control
Housing stability	- reflects the presence /absence of factors that would affect the likelihood that the family will need to move in the next year

2.2.4 Analytical methods

With the relatively large number of specific questions for this study, a variety of methods and datasets were involved. Questions and specific methods are included in *Table 2.3*. We viewed p-values $<.05$ as the threshold for ruling statistically-significant associations, by convention, and those effects with p-values between .05 and .10 as important to note for this program evaluation study, although the tolerance for ruling an effect as due to chance is somewhat relaxed.

Question	Analytical Approaches
1. Did social support networks and food security for families improve over time?	Compare scores at IDA and OGA (6, 12, 24 months) on availability of social supports and food security items. Wilcoxon signed ranks test ¹⁶
2. Did caregiver expectations and motivation and family interactions improve over time?	Compare scores at IDA and OGA (6, 12, 24 months) on expectations, motivation, and family interactions items. Wilcoxon signed ranks test
3. Did families in <i>KidsFirst</i> develop and maintain a safe and secure home environment?	Compare scores at IDA and OGA (6, 12, 24 months) on living conditions, housing suitability, and housing stability items. Wilcoxon signed ranks test
In order to determine if families with complex needs might experience different changes in these family assessment variables, we re-ran the above analyses separately for those families assessed as having complex needs in any of their first three participation level records and those who were not assessed as having complex needs in any of their first three participation level records. ¹⁷	
4. What were the rates of developmental screening in the first year of life? How did these differ by site?	Number of ASQ scores recorded for the first year of life stratified by site
5. In which developmental outcomes did <i>KidsFirst</i> participants achieve age-appropriate development?	Frequencies: % all normal tests, % with failed domains, % normal scores in each domain of ASQ
6. To what extent did <i>KidsFirst</i> participants achieve age-appropriate outcomes?	Descriptives: medians and modes along with ASQ cut-off scores
7. Was higher family exposure to <i>KidsFirst</i> related to higher subsequent developmental screen scores?	Frequencies and descriptives of ASQ scores by admission group (family enrolled with previous child, prenatal enrolment, enrolment within 1 yr of birth, enrolment with subsequent child) Kruskal-Wallis test ¹⁸ where appropriate

¹⁶ The Wilcoxon signed ranks test is used to examine differences in scores on the same ordinal-type test given on two occasions. While the sign test could also have been used in this study, the Wilcoxon test looks at both the numbers of those participants with lower and higher risk scores as well as the magnitude of the differences in individual family risk scores in comparison to their scores at the first testing, and as such, is a more sensitive test. Wilcoxon Z is the standardized signed-ranks difference: an indication of the magnitude of overall change from test 1 to test 2. A value ≥ 1.96 would be indicative of a significant difference ($p \leq .05$).

¹⁷ Families with complex needs tend to be at higher risk for child maltreatment, due to the presence of risk factors like domestic violence, maternal depression/mental illness, substance abuse, and extreme parenting stress. See *Appendix C* for criteria.

¹⁸ The Kruskal-Wallis test is used to examine differences between groups in ordinal scores.

2.3 Results

2.3.1 Participation levels of families in KidsFirst

KidsFirst has a number of participation levels, which involve different intensities of services. For example, Level 1 involves weekly visits with home visitors, while Level 2 generally involves visits every second week. Visits decrease to monthly and less frequently at Levels 3 and 4. All families enter *KidsFirst* at Level 1, although families at Level 1 may also be prenatal (denoted Level 1-P) or considered to have complex needs (denoted 1-CN). The intention is to have families progress from Level 1 to 2 to 3 to 4 as they become more self-sufficient and healthy. However, the data suggest that many families who entered the program did not progress to higher levels.

Figure 2.1 displays our understanding of the key paths families may take in *KidsFirst*. Note that several of the paths may involve bi-directional movement. The median duration between enrolment and a subsequent participation level record was 4.6 months. Many families enrolled at Level 1-P and later moved to Level 1, indicating progression from prenatal to postnatal but still retaining the same level. However, about 40% of the families appeared to have enrolled, spent time at participation Level 1, and then discontinued service for a variety of reasons (e.g. request, moved, or lost contact).¹⁹ Also, many families may have remained at Level 1 as no further records appeared for them. From these data, it appears that a relatively small proportion of families enrolled and then progressed through Level 1 to Level 2 (see Table 2.4, Appendix D).

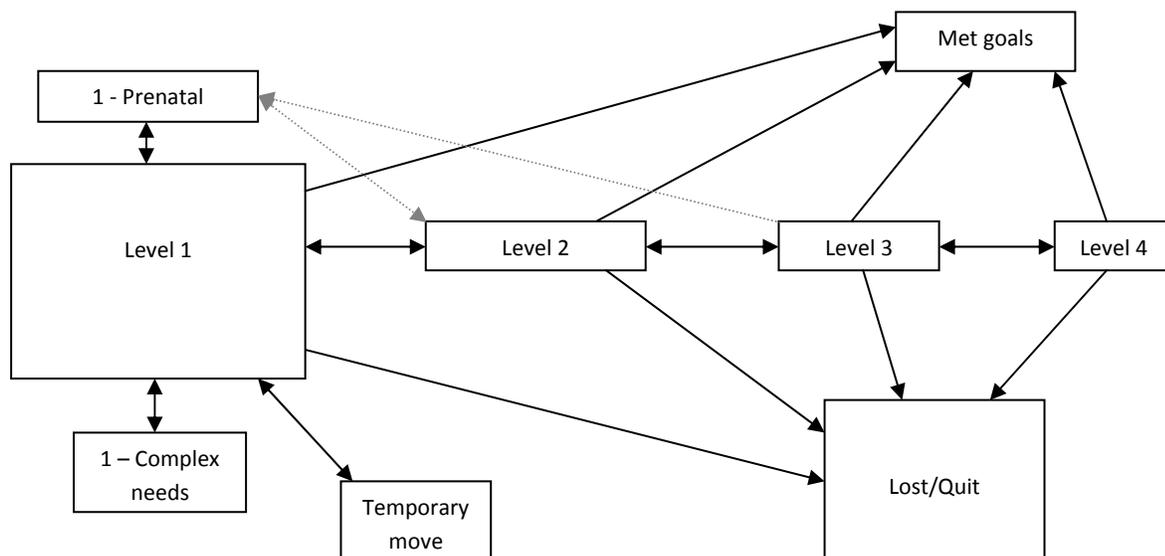


Figure 2.1: Possible paths of progress/engagement for families in *KidsFirst*

2.3.2 Samples

Numbers of families and numbers of children within families included in the data files varied. While all data files had considerable overlap in families and children, no two files included the exact same sample. Possible explanations for this include the fact that families stayed in the program for varying lengths of time. In addition, some families may have been easier to contact than others. While some families may have had ample opportunity to complete the ASQ, for example, others may have had considerably less opportunity. Also, although In-Depth

¹⁹ This includes those whose files were closed ('C') and those who had initially been at level 1 and had subsequently become not reachable and not engaged in the program ('level X'; see Table 2.4, Appendix D)

Assessments have been conducted since the early days of the program, Ongoing Assessments were started in 2007. Because of this, many families did not have any OGA, some had no In-Depth Assessment, some might have had 6- and 12-month OGA, and others might just have had a 24-month OGA. This explains, in part, why there are discrepancies between the numbers of families included in the various IDA/OGA analyses and why all samples are so small relative to the number of families in the program management file. However, it is also particularly important to bear in mind that while there was considerable overlap in the various samples concerning IDA and OGA, these data should not be thought of as truly longitudinal. For example, families included in the IDA/OGA24 sample may not be included in the IDA/OGA6 sample.

2.3.3 *Testing for selection bias*

Using the total IDA dataset we received (N=2650), frequencies were run for all family assessment variables to compare initial risk levels for the total group to initial risk levels for samples included in the analyses (i.e. total possible sample versus subsamples included in various specific analyses) in order to check for potential bias due to sample exclusion (see *Table 2.5, Appendix E*). To do this, we grouped the responses into high, moderate, and low risk categories. In most cases, those with responses of ‘3’ or ‘4’ were categorized as high risk; those with responses of ‘2’ were considered to have moderate risk; and those with responses of ‘0’ or ‘1’ were considered to have low risk on that variable. Responses included in each category for each variable are listed *Table 2.5 (Appendix E)*.

On the whole, initial levels of risk seemed quite low. Only in the social supports variable were there large proportions of the total group initially assessed as high risk (22%). With all other variables, in all samples as well as the total sample, the proportions of families initially assessed as high risk were 11% or less. Chi-square tests were conducted to determine whether or not proportions in each category differed. Significant differences ($p < .05$) were found between the IDA→OGA6 samples and total sample for social supports, food security, parent motivation, family identity and interactions, and housing stability, suggesting significant selection bias. In these cases, levels of risk appeared somewhat lower in the samples used for analyses. As such, it is likely that these samples were not representative of the total group. Although samples were insufficient to test in a number of cases, visual inspection suggested that initial levels of risk in the samples differed trivially from those in the total group in most cases. On the other hand, whereas risk levels seemed somewhat lower in all samples concerning parent motivation, risk levels looked somewhat higher in the IDA→OGA24 and OGA6→OGA24 samples concerning housing stability.

One more note regarding family assessment data: while small proportions of the total group had insufficient information to make a rating at In-Depth Assessment, quite large proportions had insufficient information to make a rating at the Ongoing Assessments. That is, while they had risk scores recorded at In-Depth Assessment, many families had scores of ‘insufficient information to make an assessment’ in Ongoing Assessments.

2.3.4 *Question 1: Did support networks and food security improve over time?*

Figures 2.2 and 2.3 display the proportions of families with increased risk, no change, and decreased risk in social supports and food security. The data suggested improved social supports from In-Depth Assessment (IDA) to a number of Ongoing Assessments (OGA). Excluding those with insufficient data at either IDA or OGA, there was a significant improvement in social support scores from IDA to OGA at 6 months ($Z = -7.0, p < .001$), 12 months ($Z = -5.1, p < .001$), and 24 months ($Z = -3.9, p < .001$; see *Table 2.6, Appendix F*). Likewise, there was a significant

improvement in food security scores from IDA to OGA at 6 months ($Z=-7.9, p<.001$), 12 months ($Z=-3.4, p=.001$), and 24 months ($Z=-3.1, p=.002$; see *Table 2.6, Appendix F*). On the other hand, the results suggested that there was decline in food security scores between OGA6 and OGA12 ($Z=-2.0, p=.041$).

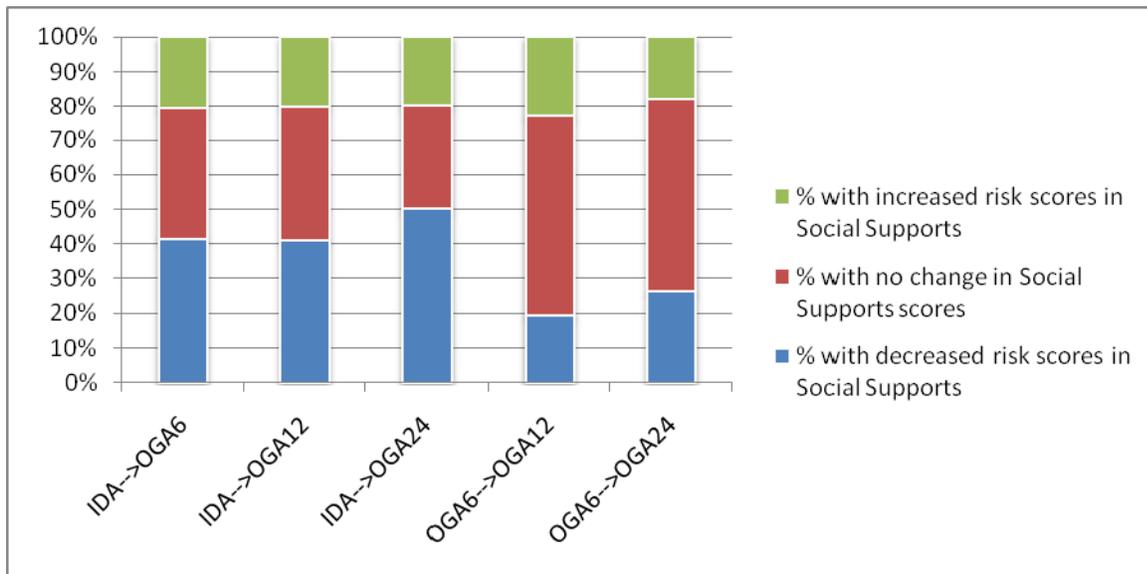


Figure 2.2: Proportions of families with changed social supports scores

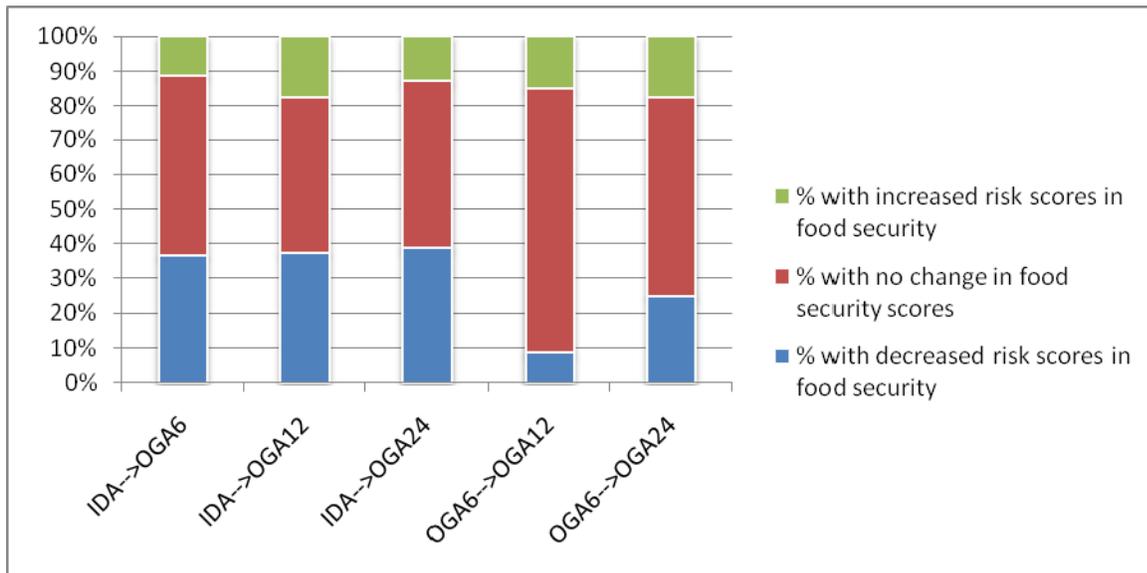


Figure 2.3: Proportions of families with changed food security scores

Social supports results for families with complex needs appeared similar to those without complex needs. However, while there were significant improvements in food security between IDA and OGA6 for both groups, there were significant improvements between IDA and OGA at 12 and 24 months for the non-complex-needs group only. In addition, although both groups showed some increases in risk for food security between OGA6 and OGA12, the increase in risk was statistically significant in the complex-needs group ($Z=-2.2, p=.025$) and not in the non-complex-needs group, even though the sample size was considerably smaller in the former. In the case of food security, the different results suggested differences between the complex-needs and non-complex-needs groups.

2.3.5 Question 2: Did expectations of children, parent motivation, and family interactions improve over time?

Figures 2.4, 2.5, and 2.6 display the proportions of families with increased risk, no change, and decreased risk in expectations of children, parent motivation, and family interactions. Scores on the expectations of children item showed significant improvement from In-Depth Assessment to Ongoing Assessment at 6 months ($Z = -3.9, p < .001$) and 12 months ($Z = -2.4, p = .018$; see Table 2.6, Appendix F). In addition, results were suggestive of an improvement in expectations of children scores between IDA and OGA at 24 months ($Z = -1.9, p = .064$). Scores on the parent motivation item significantly improved between IDA and OGA at 6 months ($Z = -2.2, p = .027$). There were also significant improvements in family interaction scores between IDA and OGA at 6 months ($Z = -5.7, p < .001$), 12 months ($Z = -2.2, p = .030$), and 24 months ($Z = -2.9, p = .004$). On the other hand, there was decline (increased risk) in family interaction scores between OGA at 6 and 12 months ($Z = -2.4, p = .017$).

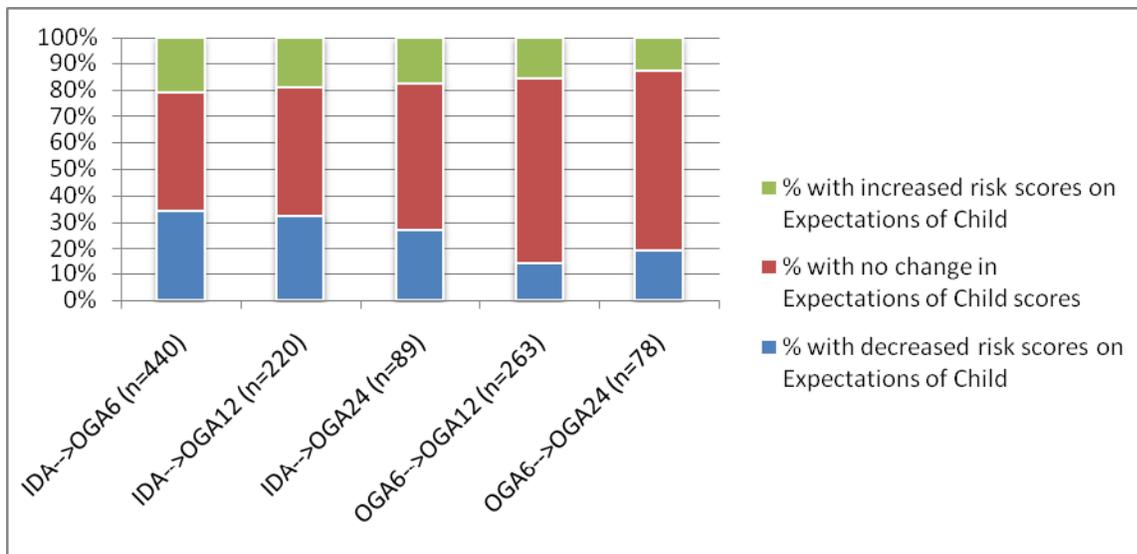


Figure 2.4: Proportions of families with changed scores on expectations of children

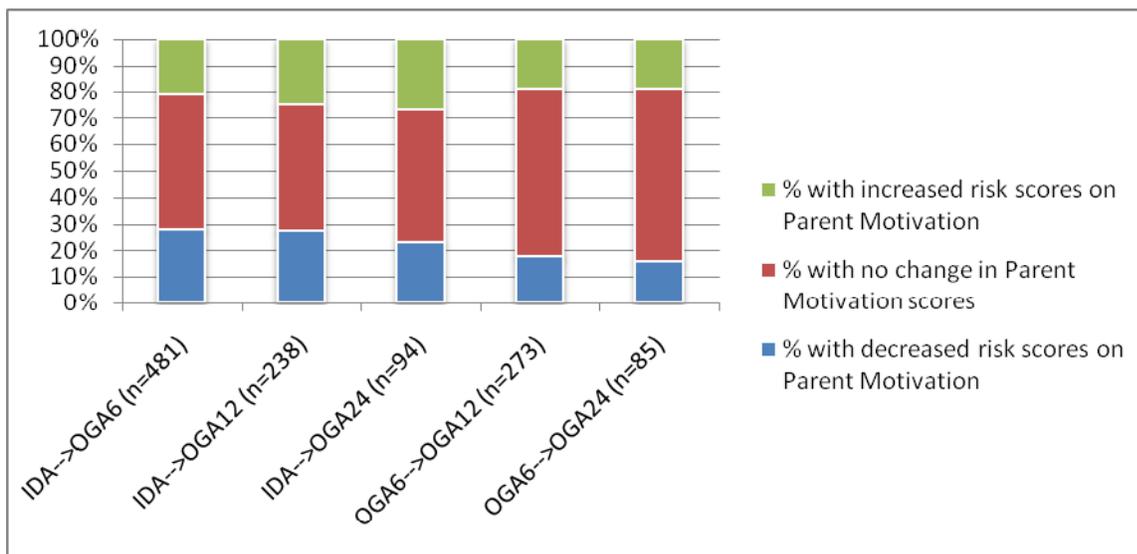


Figure 2.5: Proportions of families with changed scores on parent motivation

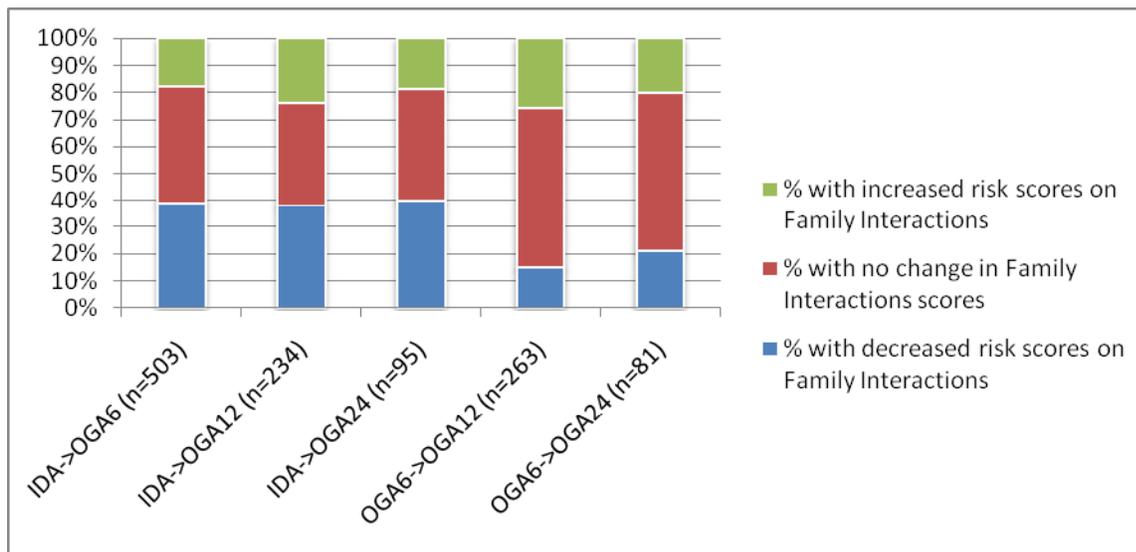


Figure 2.6: Proportions of families with changed family interactions scores

Results suggested that changes in these parent variables differed between complex-needs and non-complex-needs families. There were significant decreases in risk in expectations of child(ren) between IDA and all three OGA in the non-complex-needs group ($Z=-4.2, p<.001$; $Z=-2.4, p=.015$; $Z=-2.1, p=.037$), but not in the complex-needs group. Also, results were suggestive of decreased risk scores in parent motivation between IDA and OGA6 in the non-complex-needs group only ($Z=-1.9, p=.057$). Finally, there were significant decreases in risk concerning family identity and interactions for the non-complex-needs group only ($Z=-5.6, p<.001$; $Z=-2.3, p=.021$; $Z=-3.0, p=.003$). However, significant increases in risk between OGA6 and OGA12 were also only found in the non-complex-needs group ($Z=-2.6, p=.008$). These differences suggested possible differences between the complex-needs and non-complex-needs groups.

2.1.5 Question 3: Did families in KidsFirst develop and maintain a safe and secure home environment?

Figures 2.7, 2.8, and 2.9 display the proportions of families with increased risk, no change, and decreased risk in living conditions, housing suitability, and housing stability. Results suggested significant improvements in living conditions from IDA to OGA6 ($Z=-3.2, p<.001$), in housing suitability from IDA to OGA at 6 months ($Z=-4.3, p<.001$) and 12 months ($Z=-2.9, p=.004$), and in housing stability from IDA to OGA at 6 months ($Z=-7.7, p<.001$), 12 months ($Z=-5.0, p<.001$), and 24 months ($Z=-4.4, p<.001$; see Table 2.6, Appendix F). Once again, there was significant decline in living conditions from OGA6 to OGA12 ($Z=-2.0, p=.041$).

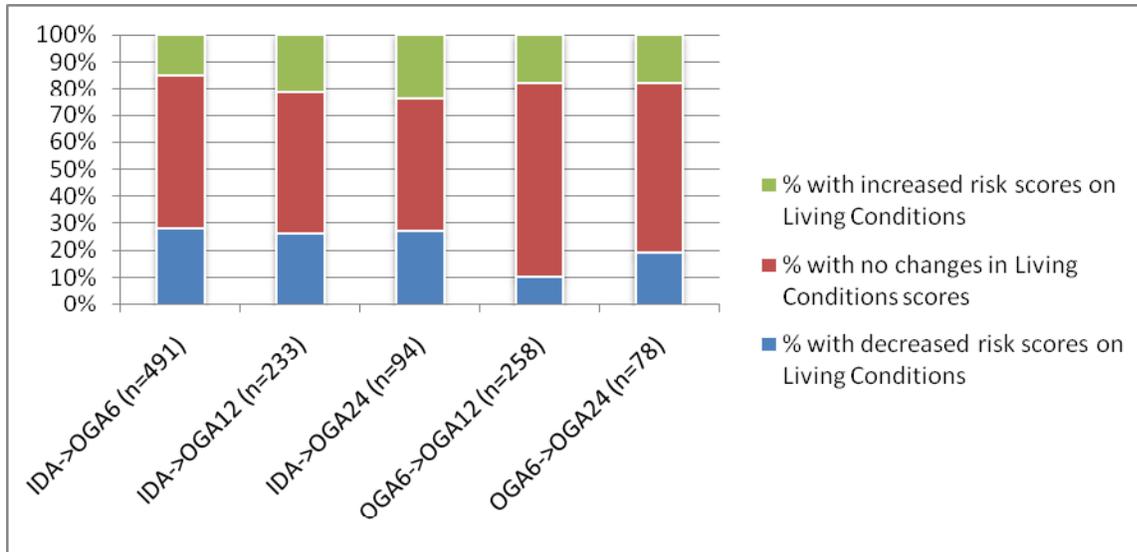


Figure 2.7: Proportions of families with changed living conditions scores

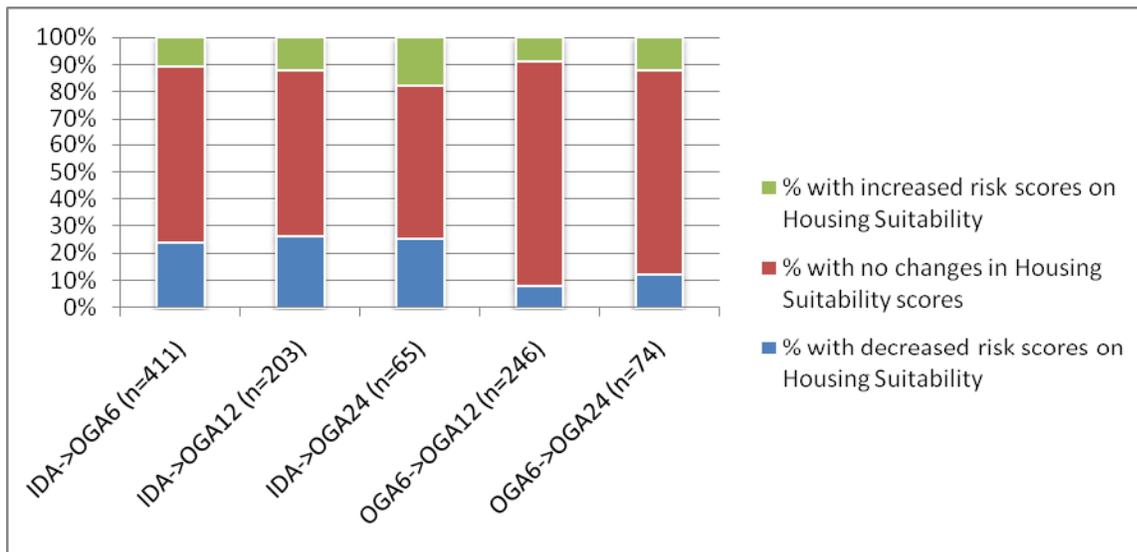


Figure 2.8: Proportions of families with changed housing suitability scores

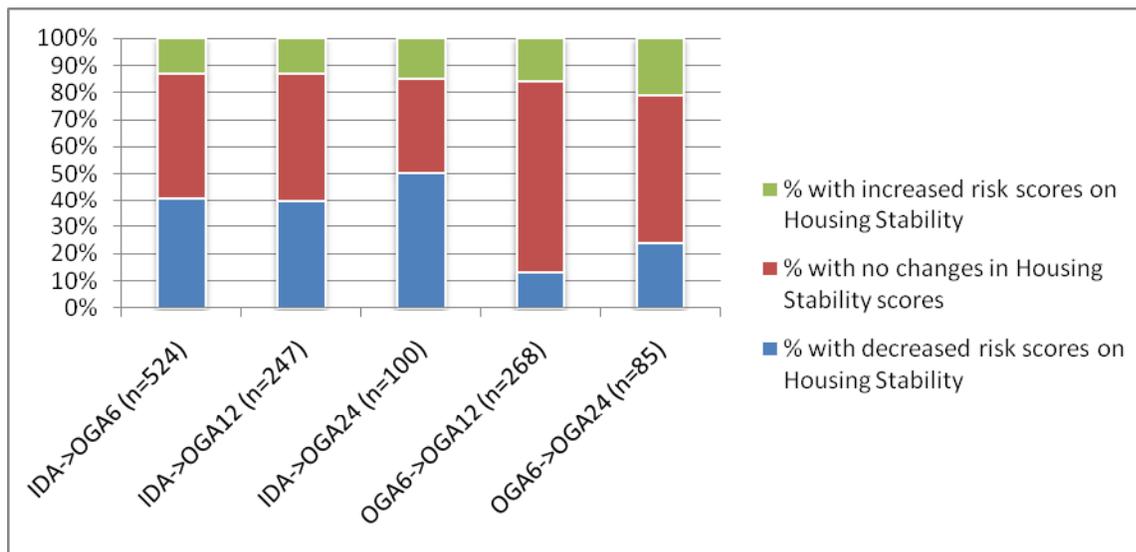


Figure 2.9: Proportions of families with changed housing stability scores

We noted minor differences in results between complex- and non-complex-needs families. Significant improvement was found in living conditions between IDA and OGA6 ($Z=-3.3$, $p=.001$) in the non-complex-needs group only. While both groups had more families with declining than improving scores in living conditions between OGA6 and OGA12, the differences were close to the threshold for statistical significance only in the non-complex-needs group ($Z=-1.7$, $p=.083$). Secondly, results were suggestive of significant improvement in housing suitability between IDA and OGA12 in the complex-needs group ($Z=-1.7$, $p=.083$). On the other hand, significant improvement in housing suitability was noted between IDA and OGA6 ($Z=-4.2$, $p<.001$) and IDA and OGA12 ($Z=-2.5$, $p=.014$) in the non-complex-needs group. Finally, results were suggestive of improved housing stability between IDA and OGA6 ($Z=-1.9$, $p=.063$) in the complex-needs group. Significantly improved scores were found in housing stability between IDA and OGA6 ($Z=-7.7$, $p<.001$), OGA12 ($Z=-5.2$, $p<.001$), and OGA24 ($Z=-4.3$, $p<.001$) in the non-complex-needs group. The differences in results between the complex-needs and non-complex-needs groups seemed in keeping with lower statistical power (due to smaller numbers) in the complex-needs group.

2.1.6 Question 4: What were the rates of developmental screening in the first year of life? How did these differ by site?

Developmental screening rates are presented in Table 2.7 (Appendix G). Of those children for whom we had ASQ data, whose families were also in *KidsFirst* in the first year of their life ($N_{\text{children}}=1559$), 84% were screened with ASQ at least once in the first year of life. Screening rates in the various communities ranged from 78% to 90%. Note that these data exclude those whose admission dates were after their first birthday and/or who were missing dates and those with data errors (total $n=868$). In addition, these data do not include an unknown but likely large number of children without developmental data. As such, these screening rates likely overestimate the actual rates.

2.1.7 Question 5: In which developmental outcomes did KidsFirst children achieve age-appropriate development?

Most children in *KidsFirst* for whom we had data appeared to achieve age-appropriate development in all domains (Figure 2.10). In the first year of life, 86-90% of scores in the samples were normal in all domains; at 18 months, 62% of scores were normal, while 32% involved one failed domain, and 6% involved two or more failed domains. Approximately 74% of scores were normal at 24, 36, and 48 months. Only at the 36- and 48-month tests were the proportions of those with two or more failed domains greater than 10%. Communication appeared to be the domain in which most children had problems at 18 and 24 months (Figure 2.11). Fine motor development and problem-solving appeared to present some challenge to some children at 36, 48, and 60 months.

2.1.8 Question 6: To what extent did KidsFirst children achieve age-appropriate outcomes?

Medians and modes were well above cut-offs in almost all cases for ASQ (see Table 2.8, Appendix H). Medians and modes appeared closest to cut-off scores at the 36-month ASQ. Bar charts are presented for these data (Figure 2.12). The dashed vertical lines in Figure 2.12 denote the cut-off scores.

2.1.9 Question 7: Was exposure to KidsFirst related to higher subsequent developmental screen scores?

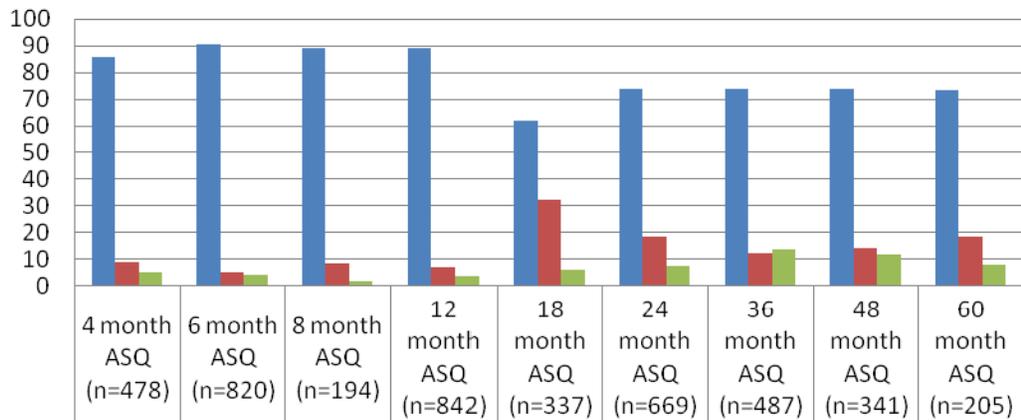
In most cases, median domain scores for groups (family enrolled with previous child, family enrolled during prenatal period, family enrolled within one year of birth, family enrolled with subsequent child) were within 5 points of each other, which is equivalent to the smallest score increment in the Ages and Stages Questionnaires.²⁰ This suggested to us that developmental screen scores were not related to duration of enrolment in *KidsFirst*.

There were a couple of exceptions to this pattern of consistency. With the 12-month ASQ, median problem-solving scores differed by 10 points, which is equivalent to the difference between scores given for an answer of ‘never’ (0) versus ‘always’ (10) on an item. Children of families enrolled either with a previous child or prenatally had median scores of 50, while children of families enrolled within the first year after birth had a median score of 55, and children of families enrolled with a subsequent child had a median score of 60. A Kruskal-Wallis test showed significant differences between groups ($chi-square=11.6$; $p=.009$). Thus, the results suggest that problem-solving scores for children whose families had been in the program longer were significantly lower than scores for children whose families had been in the program less time, contrary to our expectations. At 36 months, median problem-solving scores differed by 7.5 points.²¹ A Kruskal-Wallis test showed a possible difference between groups ($chi-square=7.0$; $p=.07$). Once again, children whose families had been in *KidsFirst* less time tended to score higher than those whose families had been in *KidsFirst* longer. Note that group sizes differed considerably in these cases.

²⁰ In Ages and Stages Questionnaires, scores allocated to response items increase by increments of 5.

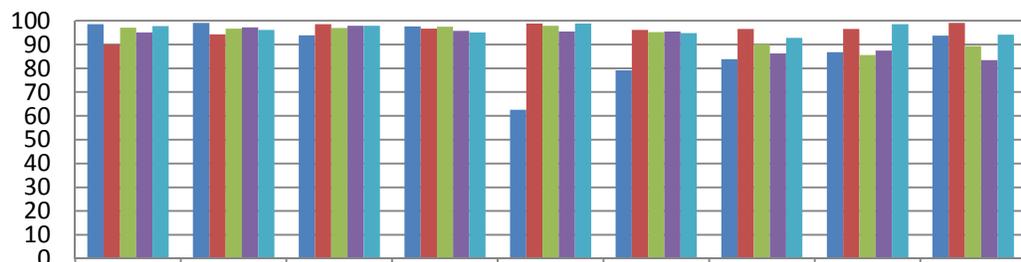
²¹ With an odd number of children in the sample, the median fell between 55 and 60.

Figure 2.10: ASQ results



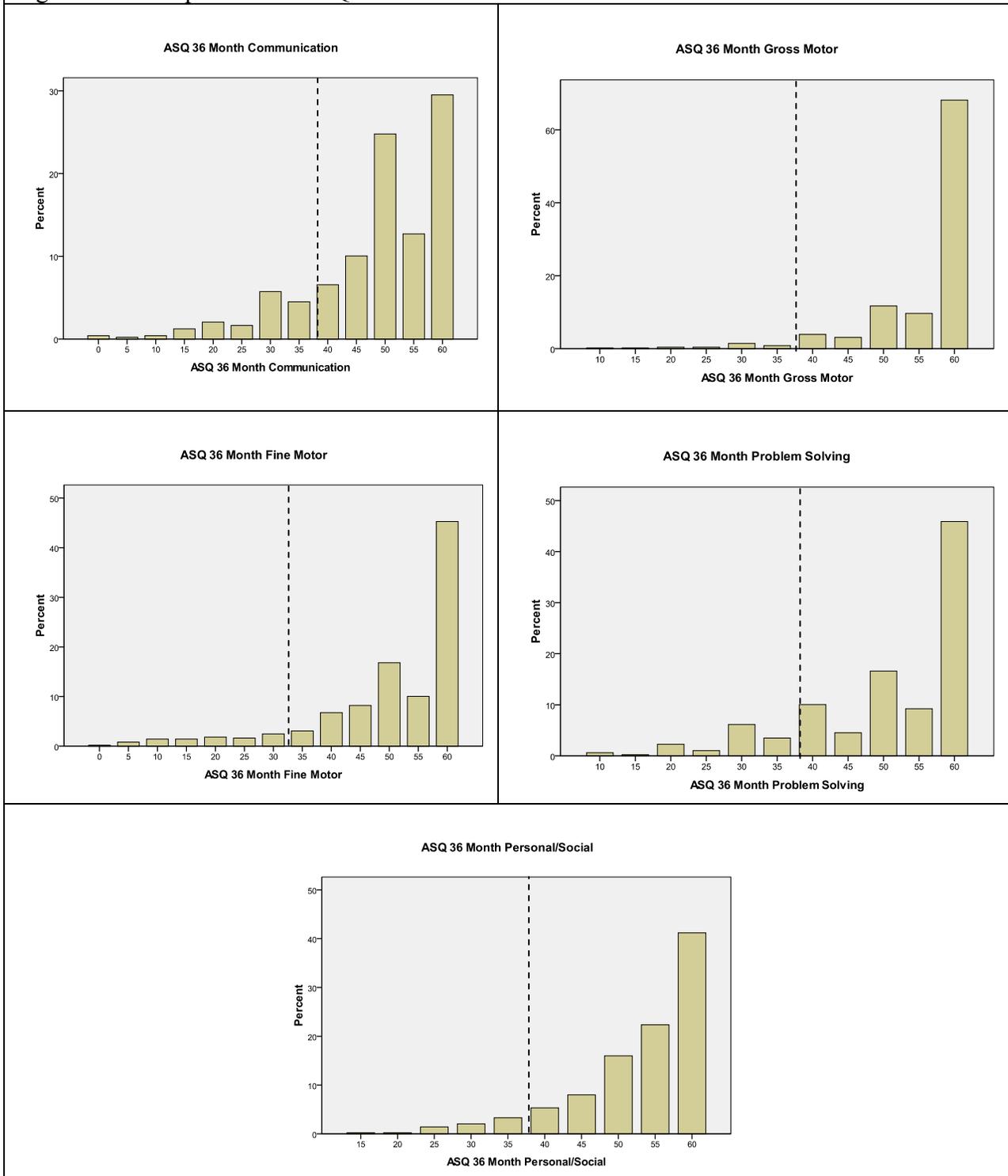
■ % all normal	85.8	90.5	89.2	89.2	61.7	73.7	73.9	73.9	73.2
■ % 1 fail	9	5.2	8.8	7.1	32.3	18.5	12.3	14.4	18.5
■ % 2 or more fails	5.2	4.3	2	3.8	6	7.6	13.8	11.7	8.3

Figure 2.11: % normal scores in ASQ domains



■ communication	98.5	99	93.8	97.6	62.6	79.2	83.8	86.8	93.7
■ gross motor	90	94.3	98.5	96.6	98.8	96.1	96.5	96.5	99
■ fine motor	97.1	96.6	96.9	97.5	97.9	95.2	90.1	85.6	89.3
■ problem-solving	95	97.2	97.9	95.7	95.5	95.5	86.2	87.4	83.4
■ personal-social	97.7	96.1	97.9	95.1	98.8	94.8	92.8	98.5	94.1

Figure 2.12: Frequencies of ASQ36 domain scores.



2.2 Discussion

Results presented in this section support positive answers to the questions regarding family assessment variables. Results suggested that where improvements occurred in family assessment variables, they came quite quickly. For the total group, significant improvements were noted in all eight variables examined, within six months of enrolment. On the other hand, there appeared to be significant declines in some scores in Ongoing Assessments from six months to twelve months. Furthermore, families without complex needs appeared to improve more than those with complex needs on some variables. Developmental screen data suggested that most *KidsFirst* children were developing normally at all ages. However, the proportion of those with at least one domain score at risk on the ASQ appeared to increase substantially at higher ages. In most cases, there were no differences in ASQ scores for children whose families had been in *KidsFirst* longer versus shorter periods of time, suggesting no relationship between the length of time families had been in *KidsFirst* and developmental screen scores. These findings, possible explanations, and suggestions for future study are discussed below.

2.2.1 Family assessment findings

Families may have experienced improvements in availability of social supports and food security soon after enrolment in the program. Significant differences were found for these variables between measurements at IDA and OGA at 6, 12, and 24 months. While improved scores were found among the expectations of children, parent motivation, and family interaction variables, results were not quite as clear-cut as they were with the social supports and food security variables. In order to have more confidence in the changes, we would have liked to have seen significantly improved scores at 6, 12, and 24 months, relative to IDA scores.

This was not the case with expectations, motivation, and interactions. One possible explanation for this is that it could be more difficult to effect change in these variables. Indeed, past research on the effectiveness of similar home visiting programs in influencing parent behaviour and parent-child interactions has been equivocal on the topic (Gates, Muhajarine, Nickel, et al., 2010). Another possible explanation that seems consistent with the results of this study is that some families with complex needs may respond more slowly than those without complex needs on these parent variables.

Finally, significant differences between IDA and OGA at six months were found for all housing variables. As with the parent behaviour variables, the results for these variables did not present a consistent picture of improvement. Nonetheless, it was interesting to find significantly improved scores on these variables, given the expected difficulty in effecting change in the area of housing.

The fact that significant improvements in family assessment scores were found for all eight variables examined in this study within six months of enrolment was surprising. The general belief seems to be that changes in families take considerable time. If these results can be replicated, it may be the case that for many families, positive changes can come about quickly. However, these changes may not come about quickly, or at all, for others. Results for some family assessment variables differed somewhat between complex-needs and non-complex-needs groups. Although numbers in the complex-needs group were small, in many cases results suggested a marked lack of change, particularly in the parent variables (expectations of child, parent motivation, and family identity and interactions).

We need to be cautious in speculating because of the small numbers; however, future researchers might consider looking closely at the families for whom changes came quickly, those for whom

changes came slowly, as well as families for whom changes did not come at all. If changes come about quickly for some families and slowly for others, it would be helpful to be able to detect both types of families at enrolment. If changes do not come at all in the program for some families, it might be preferable to either provide a highly modified program or move them into another program that could better address their needs. This is of particular importance given the high numbers of families who left the program without progressing through the levels of decreasing need.

It was interesting to note significant increases in risk scores in three of the family assessment variables, between Ongoing Assessments at six and twelve months, particularly in light of the significant decreases found between In-Depth Assessment and Ongoing Assessments at six months. On the surface, and to the extent that these data may be construed as longitudinal, this might suggest that while families improved in the first six months after enrolment, some of that improvement was retrenched in the next six months. This might bear testimony to the variability in some families' lives, that is, the speculation that while improvements are possible, they may not be permanent.

On the other hand, there may have been some sampling bias at play in the family functioning analyses. Initial levels of risk in the samples included in the examination of family assessment variables from IDA to OGA6 were lower than those in the total group in five of eight cases. As such, the significant improvements between IDA and OGA6 as well as the significant declines between OGA6 and OGA12 may reflect differences between the samples as well as changes in scores. The significant improvements from IDA to OGA6 may reflect the higher proportion of families who were ready to respond to *KidsFirst* services in this sample, while the significant declines in scores from OGA6 to OGA12 may reflect the higher proportion of families with higher needs.

It is possible that a number of low-needs families enrolled, improved within six months, and then left the program, leaving a relatively higher-needs group in the program, who may in turn have responded more slowly to services. The higher proportions of families determined to have complex needs in the later samples (e.g., IDA→OGA24) as compared to the IDA→OGA6 samples may provide evidence of this, as may the fact that fewer significant improvements were found in the later samples versus the IDA→OGA6 samples. However, the plausibility of this explanation is left to future investigators.

While it is possible that many families experienced improvements within six months after enrolment, and furthermore, that some families experienced deterioration in the next six months, there are other possible explanations for our results. Firstly, as noted earlier, it is our understanding that In-Depth Assessments and Ongoing Assessments may be completed by different people. For example, at the same site, the public health nurses may have completed the IDA, while the OGA may have been completed by home visitors. If this is indeed the case at many sites, it is possible that the differences between IDA and OGA scores may represent the differences between assessors more than real changes in families.

Public health nurses and home visitors may differ in a number of ways, including training in psychology and psychosocial assessment, and experience in assessment. First of all, with such differences, we might expect considerable measurement error, and measurement error masks true effects, whether those include change or not. The fact that significant improvements were found only between In-Depth Assessment and Ongoing Assessments may support this explanation, as we would expect to see some improvement later on as well. Results here suggested no significant improvement from the 6-month OGA onward.

Secondly, experience with a family could be expected to have an impact upon accuracy of assessment. Experience with any family would be expected to change even when the IDA and OGA were completed by the same person, such that even when the family did not change, the assessor's rating of risk might change as they came to better understand the family. Where this was the case, the In-Depth Assessment may have been less accurate than the Ongoing Assessments, and any indication of improvement or deterioration between In-Depth Assessment and Ongoing Assessments would be invalid. The significant deterioration in three family assessment variables between Ongoing Assessments (at six and twelve months) may provide support for this explanation.

Thirdly, while the variables being measured in the IDA and OGA are often complex (e.g., family identity and interactions), assessors must make ratings on single-item scales. Although single-item measures are acceptable with simple constructs, they are not with complex constructs.²² The use of single-item measures with complex variables may also lead to considerable measurement error, as assessors may see the various components of a complex variable as more or less salient over time, thus leading to low reliability.

Even if we set aside the finding of significant improvements in families within six months of enrolment in the program, given that most families were seen to be doing well on most variables at both In-Depth Assessment and Ongoing Assessments, one might suggest that *KidsFirst* children are, for the most part, supported and nurtured by healthy, well-functioning families. However, the results of the present study do not provide clear support for this, as the quality of measures was suspect and there was possible selection bias. In order to obtain better evidence, even if these data are used only for program purposes, it is suggested that *KidsFirst* increase the effort to reliably detect changes that may occur in families.

We recommend that increased efforts be made to ensure that (1) all people completing In-Depth Assessments and Ongoing Assessments understand and apply the rating system in an identical fashion, and (2) assessors complete all items on assessments, minimizing scores of 'insufficient information.' There was a considerable amount of missing data, particularly in the OGA. In many cases, a rating was provided in the IDA but not in the OGA. This may again suggest differences between those who completed IDA versus those who completed OGA. On the other hand, it is also possible that it is evidence for the difficulty home visitors have in actually meeting with some families and getting to know them and their circumstances well enough to provide a rating on some variables. In any case, in order to measure needs and changes in families, it is necessary to record perceptions.

In addition, it may be fruitful to consider improving existing measures or adding other measures of parent, family, and home variables of interest, particularly if those variables are changeable, reasonably easy to measure well, and closely connected to intentions and behaviour. *KidsFirst* could improve existing measures of family variables by creating additional items for complex variables and combining these into scales. If done well, this would provide for increased accuracy in assessing levels of risk as well as increased sensitivity to change. If there is openness to additional measures, *KidsFirst* might consider incorporating measures of parenting knowledge, stress, and especially self-efficacy, which has a reasonably good track record concerning changeability, validity and reliability of measures, and a relationship to both intentions and behaviour.

²² For a brief summary of arguments against the use of single-item measures, see Gliem & Gliem (2003). <https://scholarworks.iupui.edu/bitstream/handle/1805/344/Gliem+&+Gliem.pdf?sequence=1>

2.2.2 Developmental screen (ASQ) findings

KidsFirst is effective in screening at least some children for developmental delays. Indeed, this may be a key strength of *KidsFirst*: increased surveillance of children, such that those who need additional psycho-educational assessment and intervention get it sooner. It is quite likely, however, based upon the discrepancy in numbers of families included in the administrative data file versus those included in the developmental screen files, that not all children in *KidsFirst* were screened. The evidence supporting how well *KidsFirst* has done in screening children needs to be strengthened by the inclusion of relevant data concerning all children served by *KidsFirst* in the database.

KidsFirst could go one step further by maintaining records on what happened to those who scored at risk on developmental screens. As the Ages and Stages Questionnaires are merely screens to detect children with possible developmental delay who should then be referred for additional assessment, it would be good to know whether or not children were actually referred for further assessment, what interventions were sought, and what effects these had.

In general, the results show that children in *KidsFirst* did quite well on the developmental screens. In most cases, medians were well above cut-off scores. It is interesting that proportions scoring at risk on at least one domain increased after 18 months. One possible explanation for this is that the Ages and Stages Questionnaires become more sensitive to developmental delays at 18 months. It is also possible that a higher proportion of *KidsFirst* children began exhibiting challenges around 18 months of age. Alternatively, these results may also be suggestive of differences between the normative population and *KidsFirst* children.

Another possible explanation is that a higher proportion of children with developmental challenges were included in the higher age samples (i.e., selective sample). The results for the 18-month ASQ in particular lend credence to this explanation as a considerably higher proportion of children in this sample had scores below the cut-off for at least one domain (in most cases, communication) than in any other sample. In addition, the number of children included in the 18-month sample was lower than those for either the 12- or 24-month ASQ. We speculate that the 18-month ASQ was completed for a higher proportion of children with challenges *because* parents and/or home visitors were already aware of these challenges. A similar story could be the case with the higher age ASQ. Indeed, although we can only speculate based on these results, it is possible that those families with older children and those families who remained in the program longer may have included higher proportions of children with possible developmental challenges, while those families without such concerns may have left the program earlier.

Results did not support the expectation that families with more time in *KidsFirst*, and presumably more understanding and application of the *Growing Great Kids* curriculum, would have children who did better on developmental screens than children from families that had been in *KidsFirst* for less time. This may suggest that longer exposure to *KidsFirst* did not improve the developmental outcomes of children. Alternatively, these results may lend support to the speculation mentioned above: that families who remained in *KidsFirst* longer had children with more developmental concerns. The evidence here would be stronger if it could be determined what the developmental outcomes would have been without *KidsFirst*. Besides employing a control group, the evidence could also be strengthened by the use of more sensitive measures of development, and by more complete data.

In any case, we recognize that *KidsFirst*'s goal is not to directly work on improving developmental deficits, but rather to make sure that children do not lack what they need in order to optimize their learning. Although, as noted above, we may not have had complete data, the fact that *KidsFirst* presented a developmental curriculum (*Growing Great Kids*) to families, screened many children, and presumably referred children who needed additional assessment and intervention leads us to believe that *KidsFirst* has fulfilled this goal for many. However, we would have liked to have been able to better determine whether or not all children who would have benefitted from developmental screening were actually screened.

2.2.3 Comment on results

The positive results seen in the family (IDA & OGA) and developmental (ASQ) outcomes deserve additional comment. Is it really possible that *KidsFirst* families and children have done as well as the results suggested? In short, yes, although one must not conclude that children, parents, and families had no challenges based on these results.

We believe it is feasible that children in *KidsFirst* have achieved what might be considered relatively normal developmental results. A similar intervention in the United States (Healthy Families America) publishes Ages and Stages Questionnaires results for enrolled children on its website.²³ Of the results posted, proportions of those achieving normal development in all domains range from 89% to 95%. These are quite comparable to the results in the current study. Likewise, ASQ data concerning children in a similar program in Manitoba (*Families First*), the control group in Manitoba, the normative sample from the United States, and a small study from Quebec are also strikingly similar (see *Table 2.9, Appendix I*).²⁴ While we would expect results to be similar to those from similar programs (i.e. Healthy Families America and Families First), we were surprised to note just how similar all the results were, regardless of whether the sample was an 'at-risk' sample or a general population sample.

While we have less confidence in the family assessment results, we acknowledge that it is possible that most families had low levels of risk on these family assessment variables and that many families saw improvements in a number of areas shortly after enrolment. However, while there are presumably many possible challenges families face that provide a rationale for involvement in *KidsFirst*, given the rather rosy results concerning challenges analysed in this study, which were chosen for their correspondence to *KidsFirst* goals and objectives, one might question whether or not *KidsFirst* goals and objectives fit the key challenges faced by their families. Otherwise, one must question the validity of the measurements and/or the samples as we have noted above.

2.2.4 Limitations

Like all research, the current study is not without limitations. Firstly, as noted above, in most cases the data we received did not include all possible children and families. Those families who were harder to contact may have had insufficient data to be included in these analyses. However, these families may have had higher levels of risk and/or developmental challenges than those for whom we had data. As such, the results may underestimate levels of family risk and/or developmental challenges of those in *KidsFirst*. Future evaluators of *KidsFirst* might consider examining differences between those for whom data are readily available and those for whom

²³ www.healthyfamiliesamerica.org

²⁴ While the data for *Healthy Families America* were taken from the above website, data for the US normative sample were taken from the ASQ manual. Data for *Families First* and the Manitoba control sample were sent to us by Mariette Chartier and Andrea Friesen, both of whom have worked on evaluations of *Families First*. Data for the study of preschool children in Quebec came from Dionne et al. (2006). Sample sizes ranged from 33 to 1512.

data are scarce. In addition, it would be helpful to better understand which families remained in the program and which left early (without meeting goals). These data would better allow evaluators to understand what has worked and for whom in *KidsFirst*.

Secondly, the measures may have been insufficient for answering the research questions. The family assessment tools and childhood development measures may be better suited to identifying levels of family and developmental challenges in order to determine kinds and levels of services, rather than measuring program effects. It may be beneficial to critically examine the psychometrics of measures used in *KidsFirst* in order to determine whether or not they meet current and potential future data needs.

Thirdly, despite our efforts to be diligent in our treatment of available data and conservative in the analyses chosen given the quality of data, the lack of a comparison group and control over competing explanations lessens our confidence in some of the results in this study.

2.2.5 Summary

While the above limitations must be kept in mind, the data suggest that many families may have experienced improved family and home life quite soon after enrolment. Social support and food security may have improved for families within six months of enrolment. Caregiver expectations, caregiver motivation, and family interactions may likewise have improved soon after enrolment in *KidsFirst*. Given the low frequency of high-risk scores and the significant improvements in housing suitability and housing stability, the results also suggest that many *KidsFirst* families may have cultivated and maintained a safe and secure home environment.

On the other hand, results also suggest that some families did not improve on the parent variables. These results underscore the need for future researchers to continue examining which families appear to respond to *KidsFirst* services and which do not and, for this latter group, what services might be more helpful.

In addition, many children were assessed in order to determine whether or not they were developing normally. The great majority were found to be developing normally, and presumably those who were not were identified as such so that they could be referred for further assessment and/or intervention. Thus in many cases, *KidsFirst* appears to have been meeting its goal of ensuring that children are supported and nurtured by healthy families by improving family situations and interactions. Furthermore, if it is indeed the case that children whose Ages & Stages Questionnaires scores fell below the cut-off were referred for additional assessment, then *KidsFirst* may also have been meeting its goal of supporting children's development.

3: Child health study

3.1 Background to study

Most research suggests that home visiting programs have little influence on health outcomes, such as gestational age, birth weight, child health status, use of preventative health services, and child immunization rates (Gomby, 2005; Love et al., 2005; Brownell et al., 2007; Harding et al., 2007). On the other hand, some research suggests that home visiting programs may influence parents' behaviour concerning the health and safety of their children. For example, researchers have found reduced rates of unintentional injuries amongst home-visited children (Gomby, 2005). Parents in home visiting programs have been found to fix home hazards that are not too complicated or expensive to fix (Gomby, 2005; Harding et al., 2007). There are also anecdotal accounts in *KidsFirst* of behaviour change among mothers in taking their children for immunizations (Gates, Muhajarine, Nickel, et al., 2010). If it is possible to influence parents' health and safety-related behaviour, then it may be possible to detect differences in some health outcomes for home-visited children.

As noted in the general introduction, one goal of *KidsFirst* is to ensure that "Children in very vulnerable situations are born and remain healthy."²⁵ The purpose of this study was to examine the effectiveness of *KidsFirst* in achieving its health-related goal and objectives.²⁶ To do so, we set out to determine whether perinatal and early childhood health outcomes were better among *KidsFirst* participants relative to those among a comparison group. The outcomes of interest in this study are birth weight, gestational age at birth, well-child physician visits, physician visits for specific conditions, and hospitalizations for specific conditions.

3.2 Methods

3.2.1 Questions and specific methods

The general approach involved first examining frequencies and/or descriptives, where applicable, for all variables using tables and charts. After examining frequencies and/or descriptives for *KidsFirst* and comparison children, we looked for group differences using regression (logistic or negative binomial) after controlling for other possible influences (i.e. having received Saskatchewan Assistance [not at all during period of study, sometimes during period of study, always during period of study], Registered Indian Status [yes/no], residence category [large urban, medium urban, other], mother's marital status, and mother's age at birth). See *Table 3.1* for the tests employed to answer each of the research questions.

3.2.2 Data Sources

The Early Childhood Development Unit provided Saskatchewan Health with Health Services Numbers for *KidsFirst* children born between 2002 and 2008 and comparison children born in 2003 or 2006. In order to increase the chance that comparison families would have had comparable levels of risk, only those whose In-Hospital Birth Questionnaire scores were ≥ 9 were eligible for inclusion in this study.²⁷ Saskatchewan Health stripped identifying information and

²⁵ 2007-2008 Performance Plan: *KidsFirst* Strategy. Regina: Saskatchewan Learning, Early Learning and Child Care Branch and Early Childhood Development Unit, 2007.

²⁶ These correspond to Evaluation Objective 3 in the *Evaluation Framework* (see *Appendix A*).

²⁷ In order to find families who might qualify for participation in *KidsFirst*, the In-Hospital Birth Questionnaire (IHBQ) has been completed around the time of birth. Families whose score was ≥ 9 , who also lived in a targeted area, were invited to meet with a worker who would interview them and complete an In-Depth Assessment (IDA). Families have been admitted *KidsFirst* or referred to other services based upon the results of these assessments (IHBQ and/or IDA).

compiled *KidsFirst* and comparison group files to be matched on sex, year and month of birth, and community size (large urban, medium urban, other). The plan was for SPHERU researchers to match two comparison children to each *KidsFirst* child, as it was expected that *KidsFirst* children may have been at higher risk for negative health outcomes than comparison children.

In the end, *KidsFirst* children were only satisfactorily matched on sex. This was unavoidable because comparison children were largely born in 2003 or 2006, while *KidsFirst* children were born from 2002 to 2008, and there was a lack of comparison children from medium urban centres. Once cases were matched, Saskatchewan Health compiled the final data files, which included one file each for mother, child, well-child physician visits, physician visits, and hospitalizations data. These files were examined separately and then merged in order to answer the research questions.

Table 3.1 Questions and analytical approaches	
Question	Analytical approach
Were birth weights better among <i>KidsFirst</i> participants than comparison participants?	Logistic regression to examine the contribution of study group (<i>KidsFirst</i> /comparison) in predicting birth weight (normal/at-risk) while controlling for other possible influences
Were gestational ages at birth better among <i>KidsFirst</i> participants than comparison participants?	Logistic regression to examine the contribution of study group in predicting gestational age (pre-term/term) while controlling for other possible influences
Did <i>KidsFirst</i> participants receive more well-child visits by 13 months of age than comparison participants?	Logistic regression to examine the contribution of study group in predicting receipt of well-child visits (≥ 1 , ≥ 2 , and ≥ 3 in first 13 months of life) while controlling for other possible influences
Did <i>KidsFirst</i> participants have fewer physician visits for specific conditions than comparison participants? <ul style="list-style-type: none"> • Infectious diseases • Perinatal conditions • Respiratory diseases • Injury/poisoning 	Generalized linear models (negative binomial) to examine the contribution of study group in predicting number of physician visits while controlling for other possible influences
Did <i>KidsFirst</i> participants have fewer hospitalizations for specific conditions than comparison participants? <ul style="list-style-type: none"> • Respiratory diseases • Injury/poisoning 	Generalized linear models (negative binomial) to examine the contribution of study group in predicting number of hospitalizations while controlling for other possible influences

3.2.3 Description of samples

The *KidsFirst* group included higher proportions of families from medium urban centres, with younger mothers, single mothers, children with Registered Indian Status, and families who had received Saskatchewan Assistance (3 categories) during the period of study (see *Table 3.2*). The differences between study groups underscored the necessity to statistically control for them in our analyses.

Table 3.2 Description of samples		
	Frequencies (% of group)	
	KF (n=1092)	Comparison (n=2184)
Sex of child		
Male	566 (52%)	1132 (52%)
Female	526 (48%)	1052 (48%)
Child's year of birth		
2002	64 (5.9%)	10 (.5%)
2003	132 (12.1%)	687 (31.5%)
2004	140 (12.8%)	
2005	245 (22.4%)	2 (.1%)
2006	329 (30.1%)	1485 (68.0%)
2007	159 (14.6%)	
2008	23 (2.1%)	
Residence category (as reported on the birth registration record)		
Large urban	498 (45.6%)	1451 (66.4%)
Medium urban	301 (27.6%)	167 (7.6%)
Other	200 (18.3%)	363 (16.6%)
Missing	93 (8.5%)	203 (9.3%)
Mother's age group		
<20	344 (31.5%)	457 (20.9%)
20 -24	379 (34.7%)	565 (25.9%)
25-29	211 (19.3%)	572 (26.2%)
30-34	111 (10.2%)	412 (18.9%)
35+	47 (4.3%)	178 (8.2%)
Mother's marital status (as reported on the birth registration record)		
Single	929 (85.1%)	1203 (55.1%)
Married	91 (8.3%)	845 (38.7%)
Other	22 (2.0%)	53 (2.4%)
Unknown	50 (4.6%)	83 (3.8%)
Registered Indian Status		
No	397 (36.4%)	1539 (70.5%)
Yes	695 (63.6%)	645 (29.5%)
SK Assistance Plan (3 categories)		
Never	740 (67.8%)	1781 (81.5%)
Sometimes	239 (21.9%)	308 (14.1%)
Always	113 (10.3%)	95 (4.3%)

3.2 Results

3.3.1 Question 1: Were birth weights better among KidsFirst participants?

After controlling for other possible influences (i.e. having received Saskatchewan Assistance, Registered Indian Status, residence category, mother's marital status, and mother's age at birth), study group was not significantly associated with birth weights (normal vs. at-risk, $p > .05$). The results suggested no statistically significant difference (at $p < .05$ level) between *KidsFirst* and comparison group children on birth weight (see *Table 3.3, Appendix J*).

3.3.2 Question 2: Were gestational ages better among KidsFirst participants?

After controlling for other possible influences (i.e. having received Saskatchewan Assistance, Registered Indian Status, residence category, mother's marital status, and mother's age at birth), study group was not associated with gestational ages (pre-term vs. term, $p > .05$). The results suggested no significant difference between *KidsFirst* and comparison group children on gestational age at birth (see *Table 3.4, Appendix K*).

3.3.3 Question 3: Did KidsFirst participants receive more well-child physician visits by 13 months of life?

To determine if *KidsFirst* participants were more up-to-date with well-child physician visits, analyses were run using the following three benchmarks: 1) record of at least one well-child visit within the first 13 months of life, 2) record of at least two well-child visits within the first 13 months of life, and 3) record of at least three visits within the first 13 months of life. In all cases, study group was a significant predictor of well-child visits ($p < .05$), after controlling for other possible influences. However, contrary to our prediction, the odds ratios suggested that being in the *KidsFirst* group was associated with decreased likelihood of having a record of these well-child physician visits (OR= 0.8, 0.6, and 0.6 respectively; see *Table 3.5, Appendix L*).

3.3.4 Question 4: Did KidsFirst participants have fewer physician visits for specified outcomes?

The determination of whether or not *KidsFirst* participants had fewer physician visits than comparison group participants was based on the following four outcomes: 1) number of infectious disease physician visits, 2) number of perinatal physician visits, 3) number of respiratory physician visits, and 4) number of injury/poisoning physician visits. After controlling for other possible influences, results were suggestive of an association between study group and number of infectious disease physician visits ($p = .058$). In addition, we found a significant association between study group and number of perinatal physician visits ($p < .001$). The odds ratios suggested that being in the *KidsFirst* group was associated with having more infectious disease visits (OR=1.1) and fewer perinatal visits (OR=0.7; see *Table 3.6, Appendix M*). However, the results for perinatal physician visits should be treated with some caution as the maximum number of iterations was reached before model convergence.

3.3.5 Question 5: Did KidsFirst participants have fewer hospitalizations for specified outcomes?

Whether or not *KidsFirst* participants had fewer hospitalizations was analyzed according to the following two outcomes of interest: 1) number of respiratory hospitalizations, and 2) number of injury/poisoning hospitalizations. After controlling for other possible influences, study group was significantly related to number of respiratory hospitalizations only ($p < .001$). The odds ratio suggested that being in the *KidsFirst* group was associated with having more hospitalizations for respiratory diseases ($OR = 1.8$; see *Table 3.7, Appendix N*). However, models for both hospitalization outcomes should be treated with some caution as the maximum number of iterations was reached before convergence in both cases.

3.4 Discussion

Results suggested no differences in birth outcomes between *KidsFirst* and comparison groups. On the other hand, being in the *KidsFirst* group was associated with having fewer well-child visits in the first 13 months of life. In terms of physician and hospital visits for specific conditions, *KidsFirst* membership was associated with having fewer physician visits for perinatal conditions, more physician visits for infectious diseases, and more hospital visits for respiratory reasons. Study group was not a significant predictor of physician visits for respiratory reasons and either physician or hospital visits for injury or poisoning.

Although we had hoped to find that *KidsFirst* children had lower incidences of negative health outcomes and higher incidences of preventative health behaviour, with the possible exception of the results for perinatal physician visits, this was not the case. While this might suggest that *KidsFirst* has had no impact upon health outcomes, we are aware that our comparison group likely had lower levels of risk concerning health than did the *KidsFirst* group. We statistically controlled for the influence of a number of variables possibly related to health outcomes and behaviour (i.e. mother's age, residence category, mother's marital status, Registered Indian Status, and receipt of income assistance). However, it is possible that the groups differed on other factors (e.g. history of substance abuse or family violence), for which we did not control. Because of this, we believe that it is possible that the *KidsFirst* group may still have had higher levels of health-related risk than the comparison group, even after controlling for demographic differences. As such, results where the *KidsFirst* group did not fare worse than the comparison group might be interpreted as positive evidence for the program's influence. We need to be cautious with such a speculation though as it cannot be tested with these data.

If we adhere more rigidly to the data we had, results suggested that *KidsFirst* children may have fared better than comparison children on one outcome: perinatal physician visits. While the frequencies of those having these visits was admittedly small, even after controlling for demographic differences between groups, membership in the *KidsFirst* group was associated with having fewer visits. In order to interpret the possible meaning of this difference, we must acknowledge that it depends upon the reason for the perinatal visit. For instance, a perinatal visit might be for a specific health condition. Alternatively, it could be reflective of parents' fears and lack of knowledge regarding what to expect in the perinatal period. In either of these cases, the results could be evidence of *KidsFirst* families lacking a so-called medical home, which (among other things) involves a chosen physician whom the person sees whenever necessary over some length of time. On the other hand, if the visits were primarily for information and support (second reason), we might speculate that the *KidsFirst* group received the support elsewhere and potentially from *KidsFirst* staff. However, it is not likely that many of the perinatal visits were primarily for this reason.

The bulk of the results suggested no health outcomes favouring *KidsFirst* children over comparison children. While this was disappointing, it was not surprising. As noted above, previous research has suggested that it is unlikely that home visiting programs will have much influence upon health outcomes (Gates et al., 2010).

Results suggested that *KidsFirst* children had significantly more hospital visits for respiratory diseases. Ideally, these diseases are managed through medication and physician visits. That was not the case here. Together with the results for well-child visits within the first 13 months of life, where the *KidsFirst* group had fewer visits, and the results for perinatal physician visits, these results may also suggest that *KidsFirst* families often do not have a medical home. If that is the case, it might be beneficial for *KidsFirst* to do additional work to improve the situation.

On the other hand, given the lack of physicians and the existence of medical clinics involving salaried health professionals in many areas served by *KidsFirst*, this may not be the case. It is possible that many *KidsFirst* families use salaried health clinics, and that some of their visits may not have been captured in the data used here. Thus, it is difficult to know how to interpret the well-child visit data, given that they might have been incomplete.

However, if these data are reasonably complete, results would suggest that many *KidsFirst* families may be receiving far from the recommended frequency of preventative health care visits in their children's first year of life. We suggest that *KidsFirst* look at the possibility of increasing efforts to ensure that *KidsFirst* families receive adequate health services, including preventative services.

As with most studies using secondary data, there are limitations to this one. Firstly, the comparison group appeared to have lower levels of variables related to risk. Although we controlled for differences between groups in these variables, we acknowledge that there may have been other influences for which we could not control. As such, it is possible that the groups were not completely comparable, even after controlling for demographic differences.

Secondly, although we tested for differences in birth outcomes between the *KidsFirst* and comparison groups, we could not determine what proportion of the *KidsFirst* group was enrolled prenatally. As such, it is not known the degree to which any ameliorative effect on birth outcomes (i.e. that *KidsFirst* children did not fare worse than comparison children) was due to *KidsFirst* services.

Thirdly, some of the physician visit data may not have been complete. Some visits to physicians in salaried positions likely would not have been captured, particularly in those analyses using fee-for-service codes (i.e. well-child visits). Finally, regarding the well-child visits data, we noted some irregularities in dates and coding. While we tried to ensure that the visits reflected only well-child visits and reflected as many as possible, we are not confident that the data were complete.

Bearing these limitations in mind, the results of this study suggest that membership in *KidsFirst* was not associated with decreases in negative health outcomes or increases in preventative health behaviour relative to the comparison group. These results may provide evidence of a need for *KidsFirst* to increase efforts to ensure that the health of children is supported.

4: General Discussion and Conclusion

KidsFirst has been operating in Saskatchewan since 2002. The present evaluation of its effectiveness was begun in 2007 and concluded in 2010. This quantitative report summarizes the findings of two studies, which examined the effectiveness of *KidsFirst* in achieving its first three goals and several of the associated objectives. Although they are listed in the general introduction, the *KidsFirst* goals and objectives are restated here:

1. Children in very vulnerable situations are born and remain healthy.
Objectives:
 - Pregnant women in the program access adequate prenatal care.
 - Primary caregivers address their mental health and addictions issues.
 - Children maintain good physical health status or improved health status over time.

2. Children living in very vulnerable circumstances are supported and nurtured by healthy, well-functioning families.
Objectives:
 - Social support networks, housing, food security, education, employment, and income for families will improve over time.
 - Family interactions will improve over time.
 - Families develop and maintain a safe and secure home environment.

3. Children living in very vulnerable situations are supported to maximize their ability to learn, thrive, and problem-solve within their inherent capacity.
Objective:
 - Support and nurture children's ability to learn.

4. Children living in very vulnerable situations are appropriately served by the *KidsFirst* program and support.
Objectives:
 - Establish and maintain shared accountability mechanisms for processes and outcomes.
 - Create and maintain a service system for early childhood development that uses a community development approach; is built on existing services; and is integrated, comprehensive, innovative, flexible, and inclusive.
 - Identify appropriate families in a timely manner and retain them in the program.
 - Families are satisfied with *KidsFirst* services.

The family functioning and child development study looked at the second and third goals, while the child health study looked at the first goal. The research questions and basic findings are summarized in Table 4.1. These findings, as well as selected other findings not associated with a specific question are discussed in the following sections.

Table 4.1: Research questions and findings	
Evaluation Question	Finding
1. Did social support networks and food security for families improve over time?	Yes
2. Did caregiver expectations of their children, caregiver motivation to meet their children's needs, and family interactions improve over time?	Yes
3. Did families in <i>KidsFirst</i> develop and maintain a safe and secure home environment?	Yes
4. What were the rates of developmental screening in the first year of life for <i>KidsFirst</i> children? How did these differ by site?	84% of those in the database had at least one screen in the first year of life. Rates ranged from 78% to 90% in the sites.
5. In which developmental outcomes did <i>KidsFirst</i> children achieve age-appropriate development?	<i>KidsFirst</i> children achieved age-appropriate development in all outcomes, at most ages. Where children appeared to have difficulties, it was in communication, fine motor movement, and problem-solving.
6. To what extent did <i>KidsFirst</i> children achieve age-appropriate outcomes?	Median scores were all well above cut-off scores in all cases.
7. Was higher family exposure to <i>KidsFirst</i> (in terms of duration of enrolment) associated with higher subsequent developmental screen (ASQ) scores?	No
8. Were birth weights better among <i>KidsFirst</i> families than comparison families?	No significant difference
9. Were gestational ages at birth better among <i>KidsFirst</i> families than comparison families?	No significant difference
10. Did <i>KidsFirst</i> children have more well-child physician visits in the first 13 months of life than comparison children?	No, <i>KidsFirst</i> children had fewer well-child physician visits in the first 13 months of life.
11. Did <i>KidsFirst</i> children have fewer physician visits for specific conditions? <ul style="list-style-type: none"> • Infectious diseases • Perinatal conditions • Respiratory diseases • Injury/poisoning 	<p>No, results were suggestive of <i>KidsFirst</i> children having more infectious disease visits</p> <p>Yes, <i>KidsFirst</i> children had fewer perinatal visits</p> <p>No significant difference</p> <p>No significant difference</p>
12. Did <i>KidsFirst</i> children have fewer hospital visits for specific conditions? <ul style="list-style-type: none"> • Respiratory diseases • Injury/poisoning 	<p>No, <i>KidsFirst</i> children had more respiratory visits.</p> <p>No significant difference</p>

4.1 Findings supporting the effectiveness of *KidsFirst*

Results suggested that many families may have experienced improved functioning within six months of enrolment in *KidsFirst*. These results surprised us, as we expected to find improvements in family functioning after a longer duration in the program (i.e. more than a year). While there remain alternative explanations for these results, such as measurement error, the possibility exists that many families experienced improved social supports, food security, parent expectations of their children, parent motivation, family identity and interactions, living conditions, housing suitability, and housing stability soon after enrolling in *KidsFirst*.

Most children appeared to be developing normally, according to Ages and Stages Questionnaires scores. Again, these results seemed overly optimistic until we compared the results for *KidsFirst* children to results for children in similar programs. Then the developmental scores seemed quite reasonable. Although most appeared to be developing normally, there were still children whose scores suggested potential delays in development. If these children were screened, caught, and referred for further assessment, then we believe that *KidsFirst* has done much to support children's development.

After controlling for noted demographic differences between the *KidsFirst* and comparison groups in the child health study, we found no differences between groups in either rates of at-risk birth weights or at-risk gestational ages at birth. In addition, we found no differences in rates of physician or hospital visits for injury/poisoning. Although we controlled for differences in demographic variables, we expect that the groups might have also differed on other risk-related variables (e.g. history of family violence or substance abuse), which were not measured and therefore not controlled. As such, we expect that even after controlling for the demographic differences, the *KidsFirst* group was at higher risk for negative child outcomes than was the comparison group. Because of this, the fact that birth weights, gestational ages, and hospital visits for injury/poisoning were not worse in the *KidsFirst* group was interpreted as a positive finding for the program.

4.2 Findings suggesting potential areas of improvement for *KidsFirst*

While, as noted above, many families may have experienced improved family functioning soon after enrolling in the program, results suggested that not all families benefitted equally. Families assessed as having complex needs in any of their first three participation level records appeared to make less progress in most cases. We need to be cautious in our interpretation of results as numbers for the complex-needs group were quite small; however, it is possible that these data support the speculation that some families may respond more slowly or not at all to *KidsFirst* services. If this can be shown to truly be the case, then these results may suggest that policy-makers should consider investigating the efficacy of a six-month stabilization period for families, involving intensive home visit schedules and other services, followed by a consolidation phase involving less intensive services for those who benefit soon after enrolment. At the same time, given the possible lack of progress in some families, it might be useful to also conduct further research aimed at identifying those families that respond more slowly or not at all and understanding what services they need.

From our look at the administrative data we received, it appeared that very few families progressed through the participation levels. Rather, most appeared to remain at level 1 and exit the program from there. If many families are truly benefitting from the program as much as the results suggested, it would seem inefficient for them to remain at level 1. If many families are choosing to remain at level 1, even though they have stabilized, additional work might be done

by home visitors in better communicating the positives (and necessity) of moving on through the levels in order to allow space for more families in the program.

While most children seemed to be developing normally, according to ASQ scores, children in families who had been in *KidsFirst* longer, and presumably had more exposure to the *Growing Great Kids* curriculum fared no better than children in families who had been in *KidsFirst* for less time. This may suggest that exposure to the curriculum had no effect on child development. If this can be shown to be the case, one might question the usefulness of presenting the curriculum.

On the other hand, there are a few other possible explanations worth mentioning here. Firstly, we had no data on how successfully the curriculum was presented to families, nor on how well the parents implemented what they learned in parenting their children. As such, although we assume that the curriculum was presented, received, learned, and implemented, we do not know the extent to which that is the case. Secondly, it is also possible, if curriculum were presented, received, learned, and implemented, that *some* children's development was brought back into normal ranges. However, it was not possible for us to examine this question, given our time constraints and the data we received.

We had concerns about the data. It appeared that there were considerable missing data for both the family assessment variables and the child development data, given the numbers in the administrative database (N=3779). If the data we received in most cases concerned families who were more easily contacted by home visitors, it is possible that the data presented an overly optimistic view of family functioning and child development.

In addition, while we believe that screening the development of children goes a long way to support them, our understanding is that data concerning what happened to those children who screened at-risk on Ages and Stages Questionnaires are not stored in the *KidsFirst* Information Management System (KIMS). We recommend that this be done in order to provide better tracking of that support to children's development. Representative data are of great importance in evaluation and, again, we strongly recommend that those involved in *KidsFirst* do everything possible to collect the best data possible on as many families as possible in order to serve those families and track the effectiveness of the program.

Although the picture was not altogether consistent, and the data, particularly concerning well-child visits, may have been incomplete, results suggested that *KidsFirst* families lagged behind the comparison group in finding and using a physician. *KidsFirst* children had fewer recorded well-child physician visits in their first year of life. Also, *KidsFirst* children had more hospital visits for respiratory reasons. As, ideally, respiratory diseases are controlled through medication and vigilance, one would hope for more physician visits and fewer hospital visits here. This did not appear to be the case with *KidsFirst* children. It is recognized that many *KidsFirst* families reside in areas where access to a physician is challenging. Furthermore, health clinics served by nurses and allied health personnel may be more accessible for many families. However, if it is deemed an important part of maintaining the health of children, *KidsFirst* might consider increasing effort around this item.

4.3 Summary

Results from the quantitative studies provided evidence supporting the effectiveness of *KidsFirst* in achieving outcomes related to each of its first three goals. *KidsFirst* children differed only trivially from comparison children on selected birth outcomes and medical visits for injury/poisoning. Families' risk scores decreased within six months of enrolment on all eight

family assessment variables investigated. Also, most children appeared to be developing normally.

On the other hand, some findings and results suggested potential areas of improvement. *KidsFirst* may consider further examining how to better identify and serve those families slow to respond to *KidsFirst* services. As few families appear to have progressed through the participation levels, additional work may need to be done in order to communicate the positives and necessity of progressing within the program. It appeared that the data were not complete and may not have been representative of the total *KidsFirst* group. In order to better serve families and track program effectiveness, we recommend collecting the most valid, reliable, and relevant data on as many families as possible.

References

- Braun, S. (2008). Creating optimal learning conditions for children: Home visiting programs reach out to at-risk families. *Early Childhood Learning Knowledge Centre Bulletin*. Canadian Council on Learning, 3, 2-4.
- Brownell, M., Santos, R., Kozyrskyj, A., Roos, N., Au, W., Dik, N., Chartier, M., Girard, D., Ekuma, O., Sirski, M., Tonn, N., Schultz, J. (2007). Next steps in the provincial evaluation of the *BabyFirst* program: Measuring early impacts on outcomes associated with child maltreatment. Winnipeg, MB: Manitoba Centre for Health Policy.
- Caldera, D., Burrell, L., Rodriguez, K., Crowne, S.S., Rohde, C., & Duggan, A. (2007). Impact of a statewide home visiting program on parenting and on child health and development. *Child Abuse & Neglect*, 31, 829-852.
- Dionne, C., Squires, J., Leclerc, D., Peloquin, J., & McKinnon, S. (2006). Cross-cultural comparison of a French Canadian and U.S. developmental screening test. *Developmental Disabilities Bulletin*, 34, 43-56.
- Gates, R., Muhajarine, N., & Nickel, D., et al. (2009). The effectiveness of home visitation interventions similar to *KidsFirst*, Saskatchewan: A focused literature review.
- Gomby, D.M. (2005). Home visitation in 2005: Outcomes for children and parents. Invest in Kids Working Paper No. 7. Committee for Economic Development. Invest in Kids Working Group.
- Gomby, D., Colross, P., & Behrman, R. (1999). Home visiting: recent program evaluations — analysis and recommendations. *The Future of Children*, 9, 27-43.
- Gomes, J., Hornick, J., Wagner, H.A., Boyes, M.C. & Billings, A. (2005). *Evaluation of capital region home visitation network: Outcome evaluation report* (area around Edmonton, AB). Canadian Research Institute for Law and the Family.
- Harding, K., Galano, J., Martin, J., Huntington, L., & Schellenbach, C.J. (2007). Health Families America effectiveness: A comprehensive review of outcomes. *Journal of Prevention & Intervention in the Community*, 34, 149-179.
- Love, J.M., Kisker, E.E., Raikes, H., Constantine, J., Boller, K., Brooks-Gunn, J., Chazan-Cohen, R., Tarullo, L.B., Brady-Smith, C., Fuligni, A.S., Schochet, P.Z., Paulsell, D., & Vogel, C. (2005). The effectiveness of early head start for 3-year-old children and their parents: Lessons for policy and programs. *Developmental Psychology*, 41, 885-901.
- Mann, B. (2008). *What Works for Whom?: Promising Practices in Parenting Education*. Canadian Association for Family Resource Programs. www.frp.ca/www.parentsmatter.ca.
- Muhajarine, N., Loptson, K., Shan H., Turnbull, H., Premji, S., Leggett, T., McMullin, K., et al. (2010). Saskatchewan *KidsFirst* program evaluation: Report of the qualitative study. Saskatoon, SK: Saskatchewan Population Health and Evaluation Research Unit.

Olds, D.L., Sadler, L., & Kitzman, H. (2007). Programs for parents of infants and toddlers: Recent evidence from randomized trials. *Journal of Child Psychology and Psychiatry*, 48, 355-391.

Wade, K., Cava, M., Douglas, C., Feldman, L., Irving, H., O'Brien, M.A., Sims-Jones, N., & Thomas, H. (1999). A systematic review of the effectiveness of peer/paraprofessional 1:1 interventions targeted towards mothers (parents) of 0-6 year-old children in promoting positive maternal (paternal) and/or child/health/ developmental outcomes. *Prepared by the Effective Public Health Practice Project for the Public Health Branch, Ontario Ministry of Health.*

Appendix A: Evaluation Objectives

1. To create a community profile of each *KidsFirst* site

(supplementary) To create a document outlining connections between KF and three theories: self-efficacy theory, attachment theory, and human ecology theory

(supplementary) Building upon the findings of Gomby (2005), examine and summarize the findings of applicable literature

2. To describe the implementation operation of *KidsFirst* at each site (i.e., process)

3. To compare perinatal and early childhood health outcomes of KF participants over time, and where possible with those of comparison groups

4. To determine whether and to what extent *KidsFirst* participants achieve age-appropriate developmental outcomes

5. To determine the extent to which confidence, knowledge, and self-efficacy improve with participation in KF

6. To determine whether and, if so, the extent to which the quality of parent-child interaction improved among *KidsFirst* parents

7. To identify the site-specific processes, practices, and policies that contributed most to positive short-term/intermediate outcomes related to families and child health and development

8. To assess the overall effectiveness of the *KidsFirst* program

9. To evaluate whether and, if so, the extent to which the overall goals/objectives of the program were met

10. To determine the cost-benefit of the *KidsFirst* program

11. To provide feedback to key program stakeholders to facilitate the ongoing/future implementation of the *KidsFirst* program

12. To provide feedback to key program stakeholders to facilitate the ongoing/future implementation of the *KidsFirst* program

Appendix B: Included In-Depth Assessment/On-Going Assessment items and their cut-off points.

**1. Availability of Social Supports
Caregiver**

- 0. Multiple sources of reliable and useful support.
- 1. Some reliable and useful support.
- 2. Some reliable support, but limited usefulness.
- 3. Some support but unreliable.
- 4. Effectively isolated.
- 9. Insufficient information to make a rating.

**2. Food Security
Family**

- 0. Secure access to food – no problems with access to food for self or child in the past or foreseeable future.
- 1. Fairly secure access to food – has occasionally run out of food in past, but has secure source of food for self and child now, and for foreseeable future.
- 2. Insecure access to food – sometimes runs out of food at the end of the month; unable to feed self or child at least once in the last six months.
- 3. Very insecure access to food – relies on multiple sources, but is frequently unable to feed self or child.
- 4. Extremely insecure access to food – relies totally on food banks, friends or panhandling.
- 9. Insufficient information to make a rating.

Appendix B cont'd.

<p>3. Expectations of Child Caregiver</p> <ul style="list-style-type: none"><input type="checkbox"/> 0. Realistic expectations with strong support.<input type="checkbox"/> 1. Realistic expectations with minimal support.<input type="checkbox"/> 2. Inconsistent expectations leading to confusion.<input type="checkbox"/> 3. Unrealistic expectations with angry conflicts.<input type="checkbox"/> 4. Unrealistic expectations with violent punishment.<input type="checkbox"/> 9. Insufficient information to make a rating.
<p>4. Motivation/Responsibility Caregiver</p> <ul style="list-style-type: none"><input type="checkbox"/> 0. Motivated to meet child's needs, and caregiver has no impediments to solving problems.<input type="checkbox"/> 1. Motivated to meet child's needs, but caregiver has some impediments to solving problems.<input type="checkbox"/> 2. Motivated to meet child's needs, but caregiver has multiple impediments to solving problems.<input type="checkbox"/> 3. Very little motivation to meet child's needs.<input type="checkbox"/> 4. No motivation to meet child's needs.<input type="checkbox"/> 9. Insufficient information to make a rating.
<p>5. Family Identity and Interactions Family</p> <ul style="list-style-type: none"><input type="checkbox"/> 0. Family interactions typically supportive.<input type="checkbox"/> 1. Family interactions usually positive.<input type="checkbox"/> 2. Inconsistent family interactions.<input type="checkbox"/> 3. Family interactions generally indifferent.<input type="checkbox"/> 4. Negative family interactions.<input type="checkbox"/> 9. Insufficient information to make a rating.

6. Living Conditions – Safety within Caregiver’s Control Family

- 0. Safe; no hazardous conditions apparent.
- 1. Fairly safe; one possibly hazardous condition that may harm children. Caregiver is able and willing to modify condition as soon as it is pointed out.
- 2. Unsafe; one hazardous condition that is dangerous to children. Caregiver is unable or unwilling to modify condition.
- 3. Very unsafe; multiple hazardous conditions that are dangerous to children.
- 4. Extremely unsafe; multiple hazardous conditions that are dangerous to children and have caused physical injury or illness.
- 9. Insufficient information to make a rating.

7. Housing Suitability – Safety within Landlord’s Control Family

- 0. Safe; only regular maintenance is needed (painting, furnace cleaning, etc.)
- 1. Minor repairs needed (missing or loose floor tiles/bricks/shingles, defective steps/railing or siding, etc.).
- 2. Unsafe; major repairs are needed (defective plumbing or electrical wiring, structural repairs to walls, floors or ceilings, etc.).
- 9. Insufficient information to make a rating.

8. Housing Stability Family

- 0. Stable housing – no reasons to leave current housing in the foreseeable future.
- 1. Fairly stable housing – housing will be stable for at least six months in the future.
- 2. Unstable housing – fixed address, but may leave for reasons other than overcrowding, safety or affordability.
- 3. Very unstable housing – no fixed address; rotates among municipal or charitable shelters, or friends.
- 4. Extremely unstable housing – no fixed address, no regular shelter.
- 9. Insufficient information to make a rating.

Appendix C: Criteria for determining complex needs²⁸

Complex needs are defined by a family whose circumstances are represented in seven of the following ten characteristics:

1. *Individuals who:*
 - a. *have mental health issues, developmental challenges and/or physical health conditions that are chronic or long term in nature;*
 - b. *have conditions are complicated by problems that are socio-economic;*
 - c. *lack sufficient family or community support to supplement existing publicly funded services;*
 - d. *may have formal obligations to the justice system or ongoing contact with the justice system.*
2. *“Case” planning and service supports involving multiple sectors.*
3. *“Case” is consuming significant time, energy and public resources.*
4. *No current service option is adequately addressing the needs of the individual from the view of the courts, service providers, or advocacy groups.*
5. *Level of risk of harm to the individual or others is high.*
6. *There are two or more service agencies involved in a significant way with the individual.*
7. *The individual is deemed to have a high level of dysfunction by the primary service provider’s front line staff and requires a long-term service plan.*
8. *There have been failed or unsatisfactory case interventions in the individual’s case history.*
9. *Level of risk to the community-at-large is serious if the individual is in the community unsupervised.*
10. *Individuals may have a history of compliance problems with past treatment/support services.*

²⁸ This is excerpted from a document from ECDU: ‘Draft caseload weighting definitions and revised weight’

Appendix D: Table 2.4

Table 2.4 Cross-tabulation of first and second participation records Exclude: data errors (n=238)														
			Second participation record											Total
			missing	1	1-CN	1-P	2	3	4	C	X	X-OS	X-TM	
First participation record	1	Count	220	115	127	44	380	30	3	670	424	92	158	2263
		% within row	9.7%	5.1%	5.6%	1.9%	16.8%	1.3%	.1%	29.6%	18.7%	4.1%	7.0%	100%
	1-CN	Count	7	57	20	1	3	0	0	59	14	15	13	189
		% within row	3.7%	30.2%	10.6%	.5%	1.6%	.0%	.0%	31.2%	7.4%	7.9%	6.9%	100%
	1-P	Count	80	581	37	44	6	0	0	195	79	16	51	1089
		% within row	7.3%	53.4%	3.4%	4.0%	.6%	.0%	.0%	17.9%	7.3%	1.5%	4.7%	100%
Total	Count	307	753	184	89	389	30	3	924	517	123	222	3541	
	% within row	8.7%	21.3%	5.2%	2.5%	11.0%	.8%	.1%	26.1%	14.6%	3.5%	6.3%	100%	

1: level 1 involves weekly visits
 1-CN: level 1-complex needs
 1-P: level 1-prenatal
 2: level 2 involves visits every second week
 3: level 3 involves monthly visits
 4: level 4 involves quarterly visits
 C: closed file
 X: lost
 X-OS: participating in services in *KidsFirst* other than home visiting
 X-TM: temporarily moved out of target area

Appendix E: Table 2.5

Table 2.5 Proportions of those included in Family Assessment Variable analyses who were assessed at high, moderate, and low risk on Family Assessment Variables at In-Depth Assessment (Excluded those with 'insufficient data' at either IDA or OGAs)						
Variable	Total sample	IDA→ OGA6	IDA→ OGA12	IDA→ OGA24	OGA6→ OGA12	OGA6→ OGA24
Social supports (n)	2641	540	249	106	224 ^a	75 ^a
% at high risk ('3' or '4')	22.4	17.4 ^b	20.5	22.6	21.4	26.7
% at moderate risk ('2')	19.3	16.1	17.3	21.7	16.5	17.3
% at low risk ('0' or '1')	58.3	66.5	62.2	55.7	62.1	56.0
<i>Chi-square</i> (sig.)		15.1 (.001)	1.6 (.448)	0.4 (.800)	1.5 (.464)	0.8 (.661)
Food security (n)	2579	526	247	101	222 ^a	70 ^a
% at high risk ('3' or '4')	3.0	1.3 ^b	1.2	1.0	1.4	1.4
% at moderate risk ('2')	20.6	17.1	17.8	25.7	18.9	25.7
% at low risk ('0' or '1')	76.4	81.6	81.0	73.3	79.7	72.9
<i>Chi-square</i> (sig.)		9.8 (.007)	4.2 (.121)	^c	2.6 (.267)	^c
Expectations of child (n)	2269	440	220	89	194 ^a	59 ^a
% at high risk ('3' or '4')	1.7	.9 ^b	.9	1.1	1.0	1.7
% at moderate risk ('2')	16.5	15.5	15.5	18.0	16.5	22.0
% at low risk ('0' or '1')	81.8	83.6	83.6	80.9	82.5	76.3
<i>Chi-square</i> (sig.)		2.1 (.351)	^c	^c	^c	^c
Parent motivation (n)	2466	481	238	94	216 ^a	67 ^a
% at high risk ('3' or '4')	1.2	.4 ^b	.8	0	.9	0
% at moderate risk ('2')	15.6	11.6	10.5	9.6	11.1	10.4
% at low risk ('0' or '1')	83.3	87.9	88.7	90.4	88.0	89.6
<i>Chi-square</i> (sig.)		8.5 (.014)	^c	^c	^c	^c
Family interactions (n)	2525	503	234	95	215 ^a	71 ^a
% at high risk ('4')	6.9	5.2 ^b	4.3	10.5	3.7	11.3
% at moderate risk ('2' or '3')	27.8	22.9	28.6	25.3	27.0	22.5
% at low risk ('0' or '1')	65.3	72.0	67.1	64.2	69.3	66.2
<i>Chi-square</i> (sig.)		10.0 (.007)	2.5 (.285)	2.0 (.359)	3.7 (.155)	^c
Living conditions (n)	2471	491	233	94	212 ^a	67 ^a
% at high risk ('2', '3', or '4')	9.1	6.5	7.7	8.5	8.5	10.4
% at moderate risk ('1')	32.3	35.4	37.3	35.1	38.2	35.8
% at low risk ('0')	58.6	58.0	54.9	56.4	53.3	53.7
<i>Chi-square</i> (sig.)		5.1 (.077)	2.8 (.241)	0.3 (.842)	3.4 (.183)	0.7 (.718)
Housing suitability (n)	1542	411	203	65	180 ^a	47 ^a
% at high risk ('2')	6.4	5.1	5.9	1.5	6.1	2.1
% at moderate risk ('1')	25.8	28.2	30.5	30.8	31.1	31.9
% at low risk ('0')	67.8	66.7	63.5	67.7	62.8	66.0
<i>Chi-square</i> (sig.)		2.1 (.353)	2.4 (.303)	^c	2.7 (.264)	^c
Housing stability (n)	2591	524	247	100	228 ^a	75 ^a
% at high risk ('3' or '4')	3.6	3.4 ^b	3.2	4.0	3.5	5.3
% at moderate risk ('2')	25.2	20.6	21.5	30.0	20.6	30.7
% at low risk ('0' or '1')	71.2	76.0	75.3	66.0	75.9	64.0
<i>Chi-square</i> (sig.)		6.1 (.048)	2.0 (.359)	^c	2.6 (.271)	^c

NOTES:
a.) Numbers included in the OGA6→OGA12 and OGA6→OGA24 columns differ from those for the analyses, as many families did not have IDA data for these items.
b.) Cells shaded pink included proportions initially assessed at low, moderate, and high risk that differed from proportions in the total sample ($p < .05$).
c.) In cases where at least one cell had an expected frequency less than 5, the results for the chi-square test are not presented, as the test results may not be valid.

Appendix F: Table 2.6

Table 2.6 Results of Wilcoxon Signed Ranks Tests for Family Assessment Variables among complex-needs families, non-complex-needs families, and the total group (Excluded those with 'insufficient data' at either IDA or OGA)					
Variable	IDA→OGA6	IDA→OGA12	IDA→OGA24	OGA6→OGA12	OGA6→OGA24
Social supports – CN (n)	55	30	19	33	14
Neg. ranks (mean rank)	25 (21.5)	13 (12.9)	9 (8.2)	6 (7.3)	2 (3.0)
Pos. Ranks (mean rank)	13 (15.7)	8 (8.0)	4 (4.3)	8 (7.7)	3 (3.0)
Ties	17	9	6	19	9
Z (sig.)	-2.5 (p=.014)	-1.8 (p=.068)	-2.0 (p=.044)	-.6 (p=.550)	-.4 (p=.655)
Social supports-no CN (n)	484	219	87	230	70
Neg. ranks (mean rank)	198 (158.9)	89 (71.4)	44 (32.2)	45 (47.7)	20 (15.8)
Pos. Ranks (mean rank)	99 (129.2)	42 (54.5)	17 (28.0)	52 (50.1)	12 (17.7)
Ties	187	88	26	133	38
Z (sig.)	-6.5 (p<.001)	-4.8 (p<.001)	-3.5 (p<.001)	-.9 (p=.365)	-1.0 (p=.305)
Social supports-total (n)	540	249	106	263	84
Neg. ranks (mean rank)	224 (180.1)	102 (83.6)	53 (39.6)	51 (54.4)	22 (18.5)
Pos. Ranks (mean rank)	112 (145.4)	50 (62.1)	21 (32.2)	60 (57.4)	15 (19.8)
Ties	204	97	32	152	47
Z (sig.)	-7.0(p<.001)	-5.1(p<.001)	-3.9(p<.001)	-1.1(p=.282)	-.9(p=.382)
Food security – CN (n)	54	31	18	34	13
Neg. ranks (mean rank)	24 (18.4)	12 (10.0)	5 (4.9)	3 (6.5)	4 (4.4)
Pos. Ranks (mean rank)	11 (17.1)	9 (12.3)	4 (5.1)	11 (7.8)	3 (3.5)
Ties	19	10	9	20	6
Z (sig.)	-2.2 (p=.031)	-.2 (p=.871)	-.3 (p=.803)	-2.2 (p=.025)	-.6 (p=.527)
Food security – no CN (n)	471	216	83	230	67
Neg. ranks (mean rank)	167 (109.6)	80 (56.2)	34 (21.5)	20 (25.9)	16 (14.1)
Pos. Ranks (mean rank)	49 (104.8)	34 (60.7)	9 (24.1)	29 (24.4)	11 (13.8)
Ties	255	102	40	181	40
Z (sig.)	-7.6 (p<.001)	-3.7 (p<.001)	-3.2 (p=.001)	-1.1 (p=.293)	-1.0 (p=.330)
Food security – total (n)	526	247	101	264	80
Neg. ranks (mean rank)	192 (127.8)	92 (65.5)	39 (26.0)	23 (32.2)	20 (18.0)
Pos. Ranks (mean rank)	60 (122.5)	43 (73.3)	13 (28.0)	40 (31.9)	14 (16.8)
Ties	274	112	49	201	46
Z (sig.)	-7.9(p<.001)	-3.4(p=.001)	-3.1(p=.002)	-2.0(p=.041)	-1.2(p=.246)
NOTES:					
1. CN: complex-needs designation assessed in any of first three participation level records					
2. No CN: no complex-needs designation assessed in any of first three participation level records					
3. Cells displaying significantly improved scores are green (p<.05)					
4. Cells displaying significantly declined scores are pink (p<.05)					
5. Negative ranks denote improvement while positive ranks denote deterioration.					
6. Mean rank is a measure of the average magnitude of change in risk scores. Thus for example, when the mean rank for those with negative ranks is larger than that for those with positive ranks in food security, we would know that the average decrease in risk score was greater than the average increase in risk score for food security.					

Table 2.6 cont'd: Results of Wilcoxon Signed Ranks Tests for Family Assessment Variables

Variable	IDA→OGA6	IDA→OGA12	IDA→OGA24	OGA6→OGA12	OGA6→OGA24
Expectations – CN (n)	43	24	16	33	15
Neg. ranks (mean rank)	16 (15.3)	8 (8.4)	3 (6.7)	6 (6.3)	2 (2.5)
Pos. Ranks (mean rank)	14 (15.7)	7 (7.5)	5 (3.2)	9 (9.2)	3 (3.3)
Ties	13	9	8	18	10
Z (sig.)	-.3 (<i>p</i> =.781)	-.4 (<i>p</i> =.659)	-.3 (<i>p</i> =.776)	-1.3 (<i>p</i> =.187)	-.7 (<i>p</i> =.496)
Expectations – no CN (n)	396	196	73	230	63
Neg. ranks (mean rank)	134 (109.3)	63 (48.6)	21 (17.6)	31 (33.1)	13 (10.5)
Pos. Ranks (mean rank)	77 (100.3)	35 (51.2)	11 (14.5)	32 (31.0)	7 (10.4)
Ties	185	98	41	167	43
Z (sig.)	-4.2 (<i>p</i> <.001)	-2.4 (<i>p</i> =.015)	-2.1 (<i>p</i> =.037)	-.1 (<i>p</i> =.899)	-1.3 (<i>p</i> =.197)
Expectations of child – total (n)	440	220	89	263	78
Neg. ranks (mean rank)	150 (124.4)	71 (56.2)	24 (22.5)	37 (38.7)	15 (12.4)
Pos. Ranks (mean rank)	92 (116.8)	42 (58.4)	16 (17.4)	41 (40.2)	10 (13.9)
Ties	198	107	49	185	53
Z (sig.)	-3.9(<i>p</i> <.001)	-2.4(<i>p</i> =.018)	-1.9(<i>p</i> =.064)	-.6(<i>p</i> =.557)	-.7(<i>p</i> =.504)
Parent motivation – CN (n)	47	29	17	35	15
Neg. ranks (mean rank)	16 (17.7)	7 (12.2)	3 (5.0)	9 (9.6)	2 (4.3)
Pos. Ranks (mean rank)	14 (13.0)	13 (9.6)	7 (5.7)	11 (11.2)	4 (3.1)
Ties	17	9	7	15	9
Z (sig.)	-1.1 (<i>p</i> =.271)	-.8 (<i>p</i> =.443)	-1.4 (<i>p</i> =.166)	-.7 (<i>p</i> =.462)	-.4 (<i>p</i> =.666)
Parent motivation – no CN (n)	433	209	77	238	70
Neg. ranks (mean rank)	118 (101.0)	58 (51.6)	19 (17.5)	40 (38.5)	12 (13.0)
Pos. Ranks (mean rank)	86 (104.5)	47 (54.7)	18 (20.6)	40 (42.5)	12 (12.0)
Ties	229	104	40	158	46
Z (sig.)	-1.9 (<i>p</i> =.057)	-.7 (<i>p</i> =.467)	-.3 (<i>p</i> =.749)	-.4 (<i>p</i> =.672)	-.2 (<i>p</i> =.847)
Parent motivation – total(n)	481	238	94	273	85
Neg. ranks (mean rank)	135 (118.4)	65 (62.4)	22 (22.1)	49 (47.6)	14 (16.2)
Pos. Ranks (mean rank)	100 (117.4)	60 (63.6)	25 (25.7)	51 (53.3)	16 (14.9)
Ties	246	113	47	173	55
Z (sig.)	-2.2(<i>p</i> =.027)	-.3(<i>p</i> =.752)	-.9(<i>p</i> =.364)	-.7(<i>p</i> =.463)	-.1(<i>p</i> =.892)
Family identity and interactions – CN (n)	48	29	19	34	15
Neg. ranks (mean rank)	23 (17.6)	10 (11.1)	6 (6.8)	7 (10.8)	4 (2.5)
Pos. Ranks (mean rank)	13 (20.1)	10 (9.9)	5 (5.1)	10 (7.8)	2 (5.5)
Ties	12	9	8	17	9
Z (sig.)	-1.2 (<i>p</i> =.247)	-.2 (<i>p</i> =.819)	-.7 (<i>p</i> =.500)	-.05 (<i>p</i> =.961)	-.1 (<i>p</i> =.914)
Family identity and interactions – no CN (n)	454	205	76	229	66
Neg. ranks (mean rank)	171 (128.7)	79 (60.3)	32 (24.1)	32 (45.0)	13 (13.0)
Pos. Ranks (mean rank)	80 (120.2)	45 (66.4)	13 (20.4)	58 (45.8)	14 (14.9)
Ties	203	81	31	139	39
Z (sig.)	-5.6 (<i>p</i> <.001)	-2.3 (<i>p</i> =.021)	-3.0 (<i>p</i> =.003)	-2.6 (<i>p</i> =.008)	-.5 (<i>p</i> =.612)
Family identity and interactions – total (n)	503	234	95	263	81
Neg. ranks (mean rank)	195 (146.3)	89 (70.4)	38 (30.0)	39 (55.7)	17 (15.0)
Pos. Ranks (mean rank)	93 (140.7)	55 (75.8)	18 (25.4)	68 (53.0)	16 (19.2)
Ties	215	90	39	156	48
Z (sig.)	-5.7(<i>p</i> <.001)	-2.2(<i>p</i> =.030)	-2.9(<i>p</i> =.004)	-2.4(<i>p</i> =.017)	-.5(<i>p</i> =.618)

NOTES:

1. CN: complex-needs designation assessed in any of first three participation level records
2. No CN: no complex-needs designation assessed in any of first three participation level records
3. Cells displaying significantly improved scores are green (*p*<.05)
4. Cells displaying significantly declined scores are pink (*p*<.05)
5. Negative ranks denote improvement while positive ranks denote deterioration.
6. Mean rank is a measure of the average magnitude of change in risk scores.

Table 2.6 cont'd: Results of Wilcoxon Signed Ranks Tests for Family Assessment Variables
(Excluded those with 'insufficient data' at either IDA or OGAs)

Variable	IDA→OGA6	IDA→OGA12	IDA→OGA24	OGA6→OGA12	OGA6→OGA24
Living conditions – CN (n)	49	30	16	33	12
Neg. ranks (mean rank)	17 (13.5)	10 (8.8)	6 (5.9)	4 (6.4)	5 (3.7)
Pos. Ranks (mean rank)	12 (17.1)	7 (9.3)	5 (6.1)	8 (6.6)	2 (4.8)
Ties	20	13	5	21	5
Z (sig.)	-3 (p=.777)	-6 (p=.565)	-2 (p=.813)	-1.1 (p=.266)	-8 (p=.429)
Living conditions – no CN (n)	441	203	78	225	66
Neg. ranks (mean rank)	118 (89.4)	51 (48.5)	19 (20.5)	21 (32.3)	10 (12.3)
Pos. Ranks (mean rank)	64 (95.5)	42 (45.1)	18 (17.4)	38 (28.8)	12 (10.9)
Ties	259	110	41	166	44
Z (sig.)	-3.3 (p=.001)	-1.2 (p=.232)	-6 (p=.545)	-1.7 (p=.080)	-1 (p=.888)
Living conditions – total(n)	491	233	94	258	78
Neg. ranks (mean rank)	136 (102.8)	61 (56.8)	25 (25.9)	25 (38.2)	15 (15.5)
Pos. Ranks (mean rank)	76 (113.1)	49 (53.9)	23 (23.0)	46 (34.8)	14 (14.5)
Ties	279	123	46	187	49
Z (sig.)	-3.2(p=.001)	-1.3(p=.186)	-6(p=.516)	-2.0(p=.041)	-3(p=.736)
Housing suitability – CN (n)	32	23	12	27	11
Neg. ranks (mean rank)	11 (7.2)	7 (5.1)	3 (2.7)	3 (3.0)	1 (1.5)
Pos. Ranks (mean rank)	4 (10.3)	2 (4.5)	1 (2.0)	4 (4.8)	1 (1.5)
Ties	17	14	8	20	9
Z (sig.)	-1.1 (p=.251)	-1.7 (p=.083)	-1.1 (p=.257)	-9 (p=.380)	.0 (p=1.000)
Housing suitability – no CN (n)	378	180	53	219	63
Neg. ranks (mean rank)	88 (65.2)	46 (33.5)	13 (12.0)	16 (17.6)	8 (9.0)
Pos. Ranks (mean rank)	40 (62.9)	22 (36.7)	11 (13.1)	18 (17.4)	8 (8.0)
Ties	250	112	29	185	47
Z (sig.)	-4.2 (p<.001)	-2.5 (p=.014)	-2 (p=.847)	-3 (p=.772)	-2 (p=.825)
Housing suitability – total (n)	411	203	65	246	74
Neg. ranks (mean rank)	99 (71.9)	53 (38.1)	16 (14.4)	19 (20.2)	9 (10.0)
Pos. Ranks (mean rank)	44 (72.3)	24 (40.9)	12 (14.7)	22 (21.7)	9 (9.0)
Ties	268	126	37	205	56
Z (sig.)	-4.3(p<.001)	-2.9(p=.004)	-7(p=.495)	-7(p=.504)	-2 (p=.833)
Housing stability – CN (n)	53	32	17	34	13
Neg. ranks (mean rank)	26 (19.0)	11 (8.8)	8 (6.8)	6 (7.7)	3 (3.5)
Pos. Ranks (mean rank)	12 (20.5)	7 (10.6)	4 (6.0)	9 (8.2)	4 (4.4)
Ties	15	14	5	19	6
Z (sig.)	-1.9 (p=.063)	-.5 (p=.603)	-1.2 (p=.222)	-8 (p=.410)	-6 (p=.546)
Housing stability – no CN (n)	470	215	83	234	72
Neg. ranks (mean rank)	186 (123.1)	88 (57.3)	42 (28.2)	28 (30.8)	17 (16.2)
Pos. Ranks (mean rank)	57 (118.3)	26 (58.1)	11 (22.5)	35 (32.9)	14 (15.8)
Ties	227	101	30	171	41
Z (sig.)	-7.7 (p<.001)	-5.2 (p<.001)	-4.3 (p<.001)	-1.0 (p=.298)	-6 (p=.575)
Housing stability – total(n)	524	247	100	268	85
Neg. ranks (mean rank)	212 (142.3)	99 (65.7)	50 (34.5)	34 (38.0)	20 (19.1)
Pos. Ranks (mean rank)	70 (139.2)	33 (68.9)	15 (28.1)	44 (40.7)	18 (19.9)
Ties	242	115	35	190	47
Z (sig.)	-7.7(p<.001)	-5.0(p<.001)	-4.4(p<.001)	-1.3(p=.192)	-2(p=.859)

NOTES:

1. CN: complex-needs designation assessed in any of first three participation level records
2. No CN: no complex-needs designation assessed in any of first three participation level records
3. Cells displaying significantly improved scores are green (p<.05)
4. Cells displaying significantly declined scores are pink (p<.05)
5. Negative ranks denote improvement while positive ranks denote deterioration.
6. Mean rank is a measure of the average magnitude of change in risk scores.

Appendix G: Table 2.7

Table 2.7 Rates of Developmental Screening in the first year of life					
	# of ASQ tests recorded				
	4	3	2	1	0
Meadow Lake (n=108)	1	22	37	33	15
% of group	0.9	20.4	34.3	30.6	13.9
Moose Jaw (n=86)			32	35	19
% of group			37.2	40.7	22.1
Nipawin (n=62)		2	17	37	6
% of group		3.2	27.4	59.7	9.7
North Battleford (n=146)			30	95	21
% of group			20.5	65.1	14.4
Prince Albert (n=191)	1	13	42	102	33
% of group	0.5	6.8	22.0	53.4	17.3
Regina (n=338)	10	26	75	169	58
% of group	3.0	7.7	22.2	50.0	17.2
Saskatoon (n=175)		10	46	93	26
% of group		5.7	26.3	53.1	14.9
Yorkton (n=232)	1	56	72	70	33
% of group	0.4	24.1	31.0	30.2	14.2
North (n=209)	2	30	52	95	30
% of group	1.0	14.4	24.9	45.5	14.4
Missing community (n=12)		1	4	3	4
% of group		8.3	33.3	25.0	33.3
TOTAL	15	160	407	732	245
%	1.0	10.3	26.1	47.0	15.7

Appendix H: Table 2.8

	Communication	Gross motor	Fine motor	Problem-solving	Personal-social
4 mos.	N=479	N=479	N=479	N=478	N=478
Median	55	60	60	60	57.5
Mode	60	60	60	60	60
Cut-off	33.3	40.1	27.5	35	33
6 mos.	N=820	N=822	N=822	N=822	N=822
Median	55	50	60	60	55
Mode	60	60	60	60	60
Cut-off	25	25	25	25	25
8 mos.	N=194	N=194	N=195	N=195	N=195
Median	55	60	60	60	55
Mode	60	60	60	60	60
Cut-off	36.7	24.3	36.8	32.3	30.5
12 mos.	N=844	N=844	N=844	N=843	N=843
Median	50	60	55	50	50
Mode	60	60	60	60	60
Cut-off	15.8	18	28.4	25.2	20.1
18 mos.	N=337	N=338	N=338	N=338	N=338
Median	45	60	60	50	55
Mode	60	60	60	50	60
Cut-off	35	25	25	25	25
24 mos.	N=671	N=671	N=671	N=670	N=671
Median	55	60	55	50	55
Mode	60	60	60	60	60
Cut-off	36.5	36	36.4	32.9	35.6
36 mos.	N=488	N=487	N=488	N=488	N=488
Median	50	60	55	55	55
Mode	60	60	60	60	60
Cut-off	38.7	35.7	30.7	38.6	38.7
48 mos.	N=345	N=342	N=345	N=344	N=344
Median	55	60	50	55	55
Mode	60	60	60	60	60
Cut-off	39.1	32.9	30	35	23.4
60 mos.	N=205	N=205	N=205	N=205	N=205
Median	55	60	55	50	60
Mode	60	60	60	60	60
Cut-off	31.7	32.7	30.5	30.1	39.5

Appendix I: Table 2.9

Age (months)	Sample*	N	Communication <i>M(SD)</i>	Gross Motor <i>M(SD)</i>	Fine Motor <i>M(SD)</i>	Problem-solving <i>M(SD)</i>	Personal-social <i>M(SD)</i>
4	KF	478	54.7 (6.8)	54.6 (8.4)	52.9 (9.9)	55.2 (7.8)	54.2 (8.0)
	USA	1380	50.7 (9.0)	55.3 (7.4)	49.2 (11.1)	53.3 (9.2)	51.2 (9.3)
	MB (FF)	1512	53.8 (7.2)	55.7 (7.0)	53.6 (9.4)	56.2 (7.3)	53.6 (7.8)
	MBcontrol	237	53.3 (8.7)	54.9 (7.6)	52.8 (10.1)	55.6 (8.3)	54.0 (8.1)
8	KF	194	53.6 (8.6)	52.8 (10.1)	55.8 (7.4)	55.2 (7.4)	53.3 (8.3)
	USA	1285	53.5 (8.6)	50.4 (13.3)	54.4 (9.0)	51.7 (10.0)	51.2 (10.7)
12	KF	842	47.7 (12.3)	51.4 (13.4)	52.6 (9.6)	50.1 (11.3)	48.2 (12.5)
	USA	1091	42.1 (13.3)	48.6 (15.3)	49.3 (10.3)	48.5 (11.7)	45.4 (12.9)
	MB (FF)	1101	48.6 (11.3)	52.3 (12.4)	53.9 (8.3)	50.6 (10.5)	49.2 (11.1)
	MBcontrol	172	46.3 (12.1)	51.7 (11.5)	53.0 (8.1)	49.3 (10.3)	48.9 (10.5)
24	KF	669	48.2 (14.5)	55.7 (8.3)	52.8 (8.3)	50.7 (9.8)	52.3 (8.8)
	USA	820	49.5 (11.4)	54.3 (9.4)	52.8 (8.3)	51.4 (9.5)	52.3 (8.4)
	MB (FF)	600	49.0 (13.9)	55.1 (8.7)	52.1 (8.3)	50.4 (9.9)	51.5 (9.3)
	MBcontrol	117	49.6 (15.0)	56.1 (6.7)	51.7 (6.2)	51.2 (9.5)	51.6 (9.2)
36	KF	487	48.7 (11.8)	56.0 (7.7)	50.5 (12.8)	50.8 (11.4)	52.9 (8.7)
	USA	512	54.3 (7.8)	54.7 (9.5)	52.1 (11.1)	54.9 (8.2)	53.4 (7.4)
	MB (FF)	344	50.6 (10.8)	55.6 (8.0)	51.1 (11.9)	50.8 (11.2)	52.4 (8.9)
	MBcontrol	75	53.9 (8.2)	56.9 (6.6)	49.7 (11.1)	53.0 (9.7)	55.9 (7.0)
48	KF	341	51.3 (12.5)	55.0 (8.7)	47.7 (13.3)	50.2 (12.5)	52.6 (9.6)
	USA	336	55.9 (8.5)	51.9 (9.6)	43.5 (14.3)	56.7 (8.1)	48.6 (12.6)
	MB (FF)	96	51.8 (11.7)	55.0 (7.5)	47.1 (12.9)	52.3 (10.5)	53.0 (8.2)
	Quebec	126	51.2 (13.1)	54.5 (9.4)	50.0 (11.8)	50.95 (11.6)	53.6 (6.5)
60	KF	205	51.6 (10.7)	55.2 (6.8)	49.1 (13.0)	46.4 (13.1)	54.7 (7.4)
	USA	125	49.9 (9.1)	52.2 (9.8)	51.1 (10.3)	51.4 (10.6)	54.0 (7.3)
	MB (FF)	33	50.8 (9.7)	52.1 (9.2)	50.5 (10.1)	48.3 (9.2)	55.0 (6.3)
	Quebec	82	49.6 (10.3)	51.4 (8.7)	47.2 (12.6)	47.6 (11.1)	55.2 (5.4)

NOTES:

- KF=*KidsFirst* sample
- USA=American norming sample
- MB (FF)=Families First sample
- MBcontrol=Families First control sample
- Quebec=Quebec sample (Dionne et al., 2006)

Appendix J: Table 3.3

Table 3.3: <i>KidsFirst</i> vs. comparison group on Birth Weight (Normal vs. At-Risk) (n = 3276)							
	Frequencies			Logistic Regression*			
	Study group				95% CI		
Birth weight (Normal vs. At-Risk)	<i>KidsFirst</i> (n = 1092)	Comparison (n = 2184)		<i>p</i>	<i>Odds ratio</i>	Lower	Upper
Normal	75.5%	76.4%		.829	1.0	0.8	1.2
At-Risk	24.5%	23.6%					
* controlled for other possible influences: Mother's Age at Birth, Residence Category, Mother's Marital Status, Registered Indian Status, SK Assistance Plan (3 categories)							

Appendix K: Table 3.4

Table 3.4: <i>KidsFirst</i> vs. Comparison group on Gestational Age (Pre-Term vs. Term) (n = 3276)							
	Frequencies			Logistic Regression*			
	Study groups					95% CI	
Gestational Age (Pre-Term vs. Term)	<i>KidsFirst</i> (n = 1092)	Comparison (n = 2184)		<i>p</i>	<i>Odds ratio</i>	Lower	Upper
Pre-Term	16.1%	17.1%		.758	1.0	0.8	1.3
Term	83.9%	82.9%					
* controlled for other possible influences: Mother's Age at Birth, Residence Category, Mother's Marital Status, Registered Indian Status, SK Assistance Plan (3 categories)							

Appendix L: Table 3.5

Table 3.5: <i>KidsFirst</i> vs. comparison group on Well-Child visits (n = 3276)							
Well- Child physician visits	Frequencies			Logistic Regression*			
	Study group			<i>p</i>	<i>Odds ratio</i>	95% CI	
	<i>KidsFirst</i> (n = 1092)	Comparison (n = 2184)				Lower	Upper
At least 1 within 13 months							
No	27.9%	14.9%		.009	0.8	0.6	0.9
Yes	72.1%	85.1%					
At least 2 within 13 months							
No	51.8%	28.4%		.000	0.6	0.5	0.8
Yes	48.2%	71.6%					
At least 3 within 13 months							
No	70%	42.3%		.000	0.6	0.5	0.7
Yes	30%	57.7%					
* controlled for other possible influences: Mother's Age at Birth, Residence Category, Mother's Marital Status, Registered Indian Status, SK Assistance Plan (3 categories)							

Appendix M: Table 3.6

Table 3.6: <i>KidsFirst</i> vs. comparison group on number of physician visits for specified outcomes (n = 3276)						
	Descriptives		Negative binomial distribution*			
# of physician visits for specified outcomes	Median		<i>p</i>	<i>Odds ratio</i>	95% CI	
					Lower	Upper
# of infectious disease physician visits						
• <i>KidsFirst</i> (n = 1092)	2		.058	1.1	1.0	1.2
• Comparison (n = 2184)	1					
# of perinatal physician visits†						
• <i>KidsFirst</i> (n = 1092)	0		.000	0.7	0.6	0.8
• Comparison (n = 2184)	0					
# of respiratory physician visits						
• <i>KidsFirst</i> (n = 1092)	7		.117	1.1	1.0	1.2
• Comparison (n = 2184)	5					
# of injury/poisoning physician visits						
• <i>KidsFirst</i> (n = 1092)	0		.691	1.0	0.8	1.1
• Comparison (n = 2184)	0					
* controlled for possible influences: Mother's Age at Birth, Residence Category, Mother's Marital Status, Registered Indian Status, SK Assistance Plan (3 categories); Yrs of SK Health Coverage (offset)						
† The maximum number of iterations was reached before model convergence						

Appendix N: Table 3.7

Table 3.7: <i>KidsFirst</i> vs. comparison group on the number of hospitalizations for specified outcomes (n = 3276)					
	Descriptives		Negative binomial distribution*		
Hospitalizations for specified outcomes	Median	<i>p</i>	<i>Odds ratio</i>	95% CI	
				Lower	Upper
# of respiratory hospitalizations†					
• <i>KidsFirst</i> (n = 1092)	0	.000	1.8	1.5	2.2
• Comparison (n = 2184)	0				
# of injury/poisoning hospitalizations†					
• <i>KidsFirst</i> (n = 1092)	0	.540	0.8	0.5	1.4
• Comparison (n = 2184)	0				
* controlled for possible influences: Mother's Age at Birth, Residence Category, Mother's Marital Status, Registered Indian Status, SK Assistance Plan (3 categories); Yrs of SK Health Coverage (offset)					
† The maximum number of iterations was reached before model convergence					



For general information regarding SPHERU's research
please contact us at a centre nearest you:

SPHERU Saskatoon

E-mail spheru@usask.ca
Phone (306) 966-2250
Fax (306) 966-6487

SPHERU Regina

E-mail spheru@uregina.ca
Phone (306) 585-5674
Fax (306) 585-5694

SPHERU Prince Albert

E-mail spherupa@uregina.ca
Phone (306) 953-5535
Fax (306) 953-5305

SPHERU is a bi-university, interdisciplinary research unit committed to critical population health research. The SPHERU team consists of researchers from University of Saskatchewan and University of Regina who conduct research in three main areas - northern and aboriginal health, rural health, and healthy children.



www.spheru.ca