



**Risk and Resilience Factors  
for Early Child Development:  
An analysis of the All Our  
Babies study**

*Prepared for:*

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## In Brief: What This Report Says

In a community based group of women who have participated in a longitudinal cohort study about pregnancy, parenting, and early child development, the majority were married, over the age of 24, had completed college or university, and had incomes over \$80,000 per year. Slightly over 20% were non-Caucasian and/or not born in Canada. These characteristics are similar to other urban families in Canada (Appendix A). The majority of these medically low risk women were trying to get pregnant, began their prenatal care in the first trimester, completed a routine ultrasound, planned to breastfeed, and were happy about being pregnant. Over 84% of women reported high levels of, and satisfaction with, social support.

Depression, anxiety and stress during and after pregnancy affected about 6%, 17%, and 24% of women respectively, with proportions varying slightly over time. Over 30% of women reported having had a past experience with depression and 27% reported a history of abuse.

By one year of age, 17% of infants were identified as delayed on two or more domains of development (communication, gross motor, fine motor, problem solving, personal/social) based on maternal completion of the Ages and Stages Questionnaire. Children most at risk of delay were those who were born preterm, and whose mothers experienced prenatal depression and did not attend a recreation or drop in childcare centre. Other risks for delayed development included not having been engaged in imitation games or read to.

Child development can be adversely influenced by poor maternal mental health, young maternal age, food and housing insecurity, or recent immigration to Canada. Among children with these influences, the risk of delay is significantly reduced if

mothers have high parenting self-efficacy, attend a recreation centre, attend a parent and baby program, have good social support, and if children are engaged in imitation games or read to.

The transition to parenting is a key life event. It is a time when stress, anxiety and depression can emerge, and when social support plays a critical role. This evidence indicates that the following improves outcomes for children and families:

- a) Social support networks
- b) Use of recreation/leisure or fitness for mothers
- c) Parent and child programs
- d) Feeling effective as a parent
- e) Access to 'drop in' or ad hoc childcare
- f) Adult interaction with children through imitation and reading
- g) Addressing mental health concerns of parents early, and with family focused, effective strategies

# Technical Summary

## Background

The All Our Babies (AOB) study is a prospective pregnancy cohort that was designed to examine maternal and infant outcomes during the prenatal and early postpartum period and to identify barriers and facilitators to accessing health care services in Calgary, Alberta. Follow-up studies at 12, 24 and 36 months were initiated to investigate child development outcomes.

The aim of this project is to provide UpStart with a report about the current circumstances under which parents are raising young children in Calgary. Specifically, **this report describes the risk and protective factors for child developmental delay at 12 months. Factors examined in relationship to child development included maternal mental health, social support, socioeconomic status, service utilization, and community engagement.**

## Objectives

1. To describe the demographics, lifestyle, mental health, social support, and service utilization characteristics of the AOB cohort
2. To describe the influence of maternal stress, depression, anxiety, and low social support during pregnancy on child development at 4 months and 12 months postpartum
3. To describe the influence of socioeconomic status, service utilization, and community engagement on child development
4. To describe the factors that reduce the potentially adverse influence of poor maternal mental health and low socioeconomic status on child development

## Methods

Women were recruited from health care offices, communities, and through Calgary Laboratory Services before 25 weeks gestation from May 2008 to December 2010. Participants completed two questionnaires during pregnancy and again at 4 and 12 months postpartum. Data was collected on pregnancy history, demographics, lifestyle, health care utilization, and physical and mental health. Questionnaires at 4 and 12 months postpartum included questions on parenting, social support, lifestyle, mental health, and child development. Participants were also asked to provide permission for the research team to access their obstetrical and birth records.

## Highlighted Results

### *Participant Characteristics*

All Our Babies (AOB) participants represent the medically low risk pregnant and parenting population in Calgary. The majority of AOB study participants were 25 years or older (91%), were living with a partner (94%), had post-secondary education (89%), and had household incomes above \$80,000 (69%). Over 75 percent of participants were born in Canada, described their ethnicity as white or Caucasian and listed English as the primary language spoken in their home. Less than 10 % of participants experienced food security issues during the year prior to pregnancy, during pregnancy, and during the year after they had their baby. Similarly, very few participants ( $\leq 5\%$ ) reported housing security issues during the year prior to pregnancy and the year after they had their baby. Almost two thirds of participants had been pregnant at least once before and the majority of women were trying to get pregnant. Nearly all participants started seeing a health care provider for prenatal care in the first trimester, had at least one ultrasound, and intended to breastfeed. Eight percent of babies were preterm (born at less than 37 weeks gestation) and 6% were low birth weight (less than 2500 grams at birth). One percent of pregnancies resulted in twins and 48% of all babies born were girls.

Despite the low risk socio-demographic profile, some lifestyle habits and mental health profiles are of concern:

Nearly half of participants (49%) reported drinking some alcohol during their pregnancy which included before they knew they were pregnant. Ten percent reported at least one binge drinking (consumed five or more drinks on one occasion) episode after conception and prior to pregnancy recognition.

Participants reported lifetime proportions of abuse (27%), depression (32%), other mental health disorders (8%), and suicidal thoughts or attempts (13%).

Postpartum depression can occur anytime in the first 12 months after delivery. Antepartum depression is often a good predictor of risk for postpartum depression. Using a standardized measure (Edinburgh Postnatal Depression Scale, EPDS), the proportion of women with symptoms of depression was 8% during pregnancy, and 5% at 4 months postpartum. By 12 months of age, 10% of women reported experiencing postpartum depression and seeking treatment during their child's first year.

Proportions of anxiety (Speilberger Anxiety Inventory, SAI) ranged from 15-21% during the period from pregnancy to the first postpartum year. The highest proportion of women with symptoms of anxiety (SAI) was during the third trimester prior to giving birth.

The proportion of women with high stress scores (Perceived Stress Scale, PSS) was 22-23% during pregnancy and 24% at 4 and 12 months postpartum.

Approximately 85% of women rated their social support as high during pregnancy and in the first postpartum year (The Medical Outcomes Study Social Support Scale, MOS). Almost 90% of women were satisfied with the social support they received from family, friends, their health care provider, and their partner (if applicable) across pregnancy and first year postpartum.

During pregnancy and up to the first postpartum year, nearly all women (94%) had a partner, and 83% of women reported their partner provided them with practical support most or all of the time during pregnancy, with 79% of women reporting this at 4 months postpartum and 66% at 12 months postpartum.

The majority of participants used a recreation, fitness or leisure centre (70%) and their local library (54%) during the first postpartum year. Fewer participants accessed other community resources such as parenting resources (ParentLink centers, parenting classes) (28%), learning resources (Calgary Learning Centre, family literacy program) (4%), and drop-in childcare centers (9%). During the first postpartum year, participants accessed or used informal community resources in the following proportions: parenting books (67%), Mom and Tot's groups (54%), parenting magazines (41%), spiritual institutions (26%), parenting television shows (23%) and internet parenting groups (17%).

Nearly all families are accessing health services for their children as at 12 months. Ninety-three percent of children's immunizations were up to date, and 90% had been to a doctor or public health clinic for at least one well baby visit.

For the majority of families, at least one parent took a parental leave (82%), while 63% of mothers returned to work by one year and 75% of families indicated childcare was provided by someone other than themselves. The majority of parents read to their child daily (73%) and played imitation games such as clapping or playing patty cake on a daily basis (88%). Thirty percent of children were exposed to a language other than English on a regular basis.

### *Primary Outcomes*

#### *Child Development*

Five domains of child development (communication, gross motor, fine motor, problem solving, and personal social) were examined using the Ages and Stages Questionnaire 3rd Edition (ASQ-3) as part of the 12 month follow-up questionnaire. The ASQ-3 is a 30-item parent-report questionnaire that has five developmental subscales. The ASQ was normed on 15,138 children (including children with

disabilities) in the United States. Each subscale has a total score and cutoff scores that generate three developmental categories: (i) above referral cut-off; (ii) monitoring zone (scores between one and two standard deviations (SD) below the mean); and (iii) referral zone (scores 2 SD below the mean). A child is considered to demonstrate a risk for developmental delay if the child's ASQ score falls below the one SD cutoff for his/her corrected age (i.e., categories ii and iii above) and was used to operationalize delay in the All Our Babies study. A composite risk of developmental delay was used in the present study, operationalized as scoring below the one SD cutoff on at least two of the five developmental domains. Based on this definition, 17% (n=225/1271) of children were categorized as delayed.

Note: It is known that children born preterm or low birth weight are at elevated risk for developmental delay, and indeed, AOB data suggests that at 12 months postpartum about 30% of these children were delayed in at least two domains of the ASQ (Table 9).

Based on maternal report of child development on the ASQ:

- 6% of children had a communication delay,
- 23% of children had a gross motor delay,
- 10% of children had a fine motor delay,
- 17% of children had a problem solving delay, and
- 13% of children had a personal social delay.

#### *Risk Factors for Delayed Child Development*

Maternal risk factors for having a child with delayed development (delayed in at least two of the five domains on the ASQ) at 12 months included:

- primarily speaking a language other than English at home,
- multiparous (giving birth at least once before),
- depression during pregnancy,
- stress during pregnancy ,
- low social support at 4 months postpartum,
- not attending a recreation, fitness or leisure centre for themselves during the first postpartum year,
- not attending a recreation, fitness or leisure centre for a mother and baby class or program during the first postpartum year, and



- not using a drop in childcare centre during the first postpartum year.

Family risk factors for having a child with delayed development (delayed in at least two of the five domains on the ASQ) at 12 months included:

- a parent not reading to the child on a daily basis at 12 months, and
- a parent not playing imitation games such as patty cake or clapping on a daily basis at 12 months.

Child risk factors for being delayed in at least two of the five domains on the ASQ) at 12 months included:

- being born preterm (less than 37 weeks), and
- being low birth weight (less than 2500 grams).

Results of the multivariable logistic regression modeling found the **key risk factors** that increased the likelihood that a child would be delayed were:

- being born preterm,
- having a mother who was depressed during pregnancy,
- having a mother that did not attend a recreation or fitness centre for a mother and baby class or program in the first postpartum year ,
- having a mother that did not use drop-in childcare in the first postpartum year,
- not having a parent read to them daily at one year of age, and
- not having a parent play imitation games daily at one year of age.

#### *Protective Factors in the Presence of Risk*

To determine which protective factors are most relevant to child development in the midst of known risk, three groups of participants were examined, including:

- 1) mothers with a history of poor mental health,
- 2) mothers with socio-demographic risk, and
- 3) children with health risk.

Among each group, an analysis was completed to identify factors that protect against delayed child development.

1. Among mothers with a history of poor mental health, factors that were protective against delayed development included:
  - higher parenting self-efficacy when their child was 12 months old,
  - feeling happy in their relationship with their partner after the first postpartum year,
  - attending a recreation or fitness center for a mother and baby class or program during the first postpartum year,
  - playing, or having another adult in their household play imitation games such as clapping or patty cake with their child on a daily basis during the first postpartum year.
2. Among mothers with socio-demographic risk, factors that were protective against delayed development included:
  - higher social support during pregnancy,
  - higher parenting self-efficacy at 12 months,
  - attending a fitness or recreation centre for themselves during the first postpartum year,
  - attending a fitness or recreation centre for a mother and baby class or program during the first postpartum year,
  - attending a drop-in childcare centre during the first postpartum year,
  - reading or having another adult in the their household read to child on a daily basis at 12 months,
  - playing or having another adult in their household play imitation games such as clapping or patty cake with their child on a daily basis at 12 months.
3. Among children with a health risk (any of preterm, low birth weight, diagnosed with a long term health condition by 12 months), factors that were protective against delayed child development included:
  - playing or another adult in their household played imitation games such as clapping or patty cake with their child on a daily basis at 12 months.

Note: The medical sequelae of preterm birth and low birth weight delivery increases the risk of chronic respiratory conditions and delay, and these risks increase with decreasing gestational age. Of note, the majority of preterm infants in the AOB cohort were delivered after 34 weeks gestational age when the risk of developmental delay is less well established.

## Conclusions

The key risk factors for delayed child development at 12 months included being born preterm, maternal depression during pregnancy, having a mother who did not attend a recreation or fitness centre for a mother and baby program during the first postpartum year, having a mother who did not utilize a drop-in childcare centre during the first postpartum year, not having a parent read to them daily, and not having a parent play imitation games with them daily.

Among those mothers with a history of poor mental health or with socio-demographic risk, factors that in general distinguished families of children at low risk of delayed development from those with high risk of delayed development included: playing with their children daily, having higher parenting self-efficacy at one year postpartum, and attending a recreation or fitness centre during their child's first year.

Child health risks included being born preterm, low birth weight, or diagnosed with a long term health condition by 12 months. The majority of children that composed this group were born preterm or low birth weight (61%), with the remaining 39% in this group manifesting a chronic condition not attributable to a poor birth outcome. Of note, approximately 30% of children born preterm or low birth weight were delayed in at least two domains of the ASQ at 12 months. The only factor that reduced the risk of delayed development among children with at least one child health risk factor was having parents who played imitation games with them on a daily basis at 12 months. Given that preterm birth and low birth weight are known risk factors for developmental delay, protective factors of a different nature than those examined in this analysis may be important, especially since over 60% of children in this group had a poor birth outcome. For example, although daily interaction in the form of reading or playing imitation games appears to buffer the potential adverse influences of socio-demographic and maternal mental health risk factors for delayed development, more intensive buffering practices and strategies may be required for the subgroup of children with a poor birth outcome or chronic health condition, such as special developmental programs or remedial interventions.