BC Healthy Connections Project

Preparing to Parent in British Columbia

A Profile of Participants in the BC Healthy Connections Project

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We celebrate the First Peoples on whose traditional territories we are all privileged to live and work.

Citing This Report

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We dedicate this report to our participants. We are deeply grateful for the time and effort they have put into this study.

BC Healthy Connections Project

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Executive Summary

This report provides baseline data from the British Columbia Healthy Connections Project (BCHCP) randomized controlled trial (RCT) — describing our 739 participants when they first entered the study in early pregnancy. This RCT is evaluating the effectiveness of the Nurse-Family Partnership (NFP) program compared with BC's existing services (2011–2021). Focusing on families who are coping with socio-economic disadvantage, NFP aims to improve children's mental health and development while also improving mothers' lives. Basic demographics were as follows.

- Nearly half of participants (49%) were age 14–19 years while just over half (51%) were age 20–24 years.
- Participants had a variety of cultural backgrounds, with more than half (57% or 418 of the 739) identifying as "white" and more than a quarter (27% or 200 of the 739) identifying as Indigenous.

Overall, our data show pockets of deep socio-economic disadvantage for this group of BC girls and young women who were pregnant and preparing to parent for the first time.

- Most (83%) were living on less than $20,000 pre-tax annually. More than half (53%) had not completed high school. Almost all (91%) were preparing to parent while single. Nearly half (47%) had experienced homelessness, and a third (34%) had to move three or more times in the past year.
- Most participants (74%) reported coping with long-term health conditions. Nearly half (47%) reported having mental health problems including severe anxiety or depression. Many also reported prenatal substance use including nicotine/cigarettes (27%), cannabis (21%), alcohol (2%) and other street drugs (1%).
- More than half of participants (56%) reported experiencing moderate-to-severe neglect, physical abuse, emotional abuse and/or sexual abuse when they were children, at age 16 years or younger. Half (50%) also reported intimate partner violence within the past year.
- Most participants (77%) had recently received primary health care services for physical health concerns. But few were receiving income assistance (29%) despite almost all living on low income, and few were accessing important BC benefits for people on low income such as PharmaCare (18%) or Medical Services Plan Premium Assistance (35%).
- Overall, 89% of these girls and young women were experiencing three or more forms of disadvantage, with 77% experiencing four or more and 56% experiencing five or more.

The BCHCP RCT continues as we gather data until all the children reach age two years. Final results will be available in 2020–2021. Beyond evaluating NFP's effectiveness, the RCT is highlighting a population that has been underserved. Many participants also tell us, anecdotally, that through this study they feel their voices are being heard, often for the first time. We are pleased to share their stories — through our data.

Our data show pockets of deep socio-economic disadvantage for BC girls and young women who are preparing to parent for the first time.

1. Introduction

1.1 What Is Nurse-Family Partnership and Why Evaluate It in BC?

Nurse-Family Partnership or NFP is a primary prevention program that focuses on young, first-time mothers and their children who are coping with socio-economic disadvantage. NFP aims to improve children's mental health and development and reduce childhood injuries while also improving mothers' lives. An intensive home-visiting program provided by public health nurses, NFP starts early in pregnancy and continues until children reach their second birthday.[1] First developed over 40 years ago in the United States (US), NFP has shown many enduring benefits in the US including reducing prenatal substance use; reducing child maltreatment; improving children's mental health and cognitive development; and helping to lift young mothers out of poverty.[2–5]

Based on outcomes shown in US studies, American cost analyses have suggested that NFP may pay for itself over the long term — even after nursing costs are factored in — based on calculating that NFP families used fewer added services across multiple sectors, including health care, child protection, special education, justice and income assistance.[4,6,7] While there are methodological issues, these US analyses nevertheless suggest there can be "savings" of two to six dollars for every NFP dollar spent over 10 to 15 years.[4,6,7] (Cost estimates can vary by country and by cost analysis methods used.)

Yet beyond a McMaster University pilot study in Hamilton, Ontario, showing that the NFP was feasible and acceptable to providers and families, NFP has never been tested in Canada.[8] So we do not know whether the same benefits for children and mothers will result — particularly given Canada's differing health and social programs and services compared to the US. In 2010, BC therefore decided to evaluate NFP through the BC Healthy Connections Project (BCHCP), led by researchers at the Children's Health Policy Centre at Simon Fraser University (SFU) in collaboration with researchers at McMaster University.[9] Since the BCHCP was launched, new NFP research evidence has also emerged from evaluations in England and the Netherlands.[10,11] These evaluations had differing results — further underscoring the need for a Canadian evaluation of NFP's effectiveness.

> First developed over 40 years ago in the United States, NFP has shown many enduring benefits for children.

1.2 What Is the BC Healthy Connections Project?

The BCHCP involves a randomized controlled trial (RCT) evaluating NFP's effectiveness compared with BC's existing health and social services.[9] The project's main outcome indicators are 1) prenatal substance use; 2) child injuries by age two years; 3) child cognitive development at age two years; 4) child mental health at age two years; and 5) subsequent pregnancies at two years postpartum, as a marker of maternal economic self-sufficiency. The study also measures numerous other indicators of child and maternal well-being. (Appendix 1 outlines all the RCT measures, and Appendix 2 shows participants' pathways through the RCT from early pregnancy until the child's second birthday.) Table 1 shows the main BCHCP RCT outcome indicators.

Table 1. BC Healthy Connections Project Main Outcome Indicators

Domain	Primary Indicator	Secondary Indicators
Pregnancy		Prenatal tobacco and alcohol use ▪ Maternal self-report
Child health	Child injuries by age 2 years ▪ BC Ministry of Health data on community/outpatient, emergency and hospital health care encounters for all injuries	Child cognitive development at age 2 years ▪ Bayley Scales of Infant and Toddler Development III Child behaviour at age 2 years ▪ Child Behavior Checklist
Maternal health		Subsequent pregnancies at 2 years postpartum ▪ Maternal self-report

Participants were recruited through participating regional Health Authorities — Fraser, Interior, Island and Vancouver Coastal Health — who used community, public health and primary health care networks to identify and screen referrals. Potential participants were then referred to the SFU study team, who confirmed eligibility, obtained informed consent, and conducted baseline research interviews prior to randomization (to either existing services or NFP plus existing services). Eligibility criteria for the RCT were specifically designed to identify those most in need. We therefore recruited a sample of girls and young women who were in early pregnancy and preparing to parent for the first time, in keeping with NFP fidelity criteria. We also identified indicators of socio-economic disadvantage associated with childhood injuries, our primary outcome indicator: young maternal age, low income, limited education and single parenting.[12–15] Although there was no minimum age for enrolment, girls age 19 years or younger were considered to automatically meet socio-economic disadvantage criteria. For young women age 20–24 years, we required two of three added indicators: low income, limited education, and/or single parenting. Table 2 outlines the eligibility criteria.

Table 2. BC Healthy Connections Project Eligibility Criteria

Girls and Women Were *Eligible* If They Met *All* Inclusion Criteria at Baseline
1. Age 24 years or younger
2. Preparing to parent for the first time [a]
3. Less than 28 weeks gestation [b]
4. Competent to provide informed consent, including conversational competence in English [c]
5. Experiencing socio-economic disadvantage [d] ▪ Age 19 years or younger ▪ Age 20–24 years and meets 2 of 3 criteria: Low income; less then grade 12; single parenting
Girls and Women Were *Ineligible* If They Met *Any* Exclusion Criteria at Baseline
1. Planning to have the child adopted
2. Planning to leave the catchment area for 3 months or longer during the trial[e]

a. Eligible if a previous pregnancy ended in termination, miscarriage or stillbirth or if previous parenting involved step-parenting only; **b.** Must receive first NFP visit by 28th week of gestation, according to NFP fidelity requirements; **c.** Must be able to participate without an interpreter; **d.** Indicators associated with increased risk of child injuries; **e.** Catchment refers to designated BC Local Health Areas offering the BCHCP, with individual circumstances considered in some cases.

Embedded within BC's child health and public health systems, the BCHCP involves unique, province-wide research-policy-practice collaborations among:

- The BC Ministries of Health and Children and Family Development;
- Fraser, Interior, Island and Vancouver Coastal Health Authorities; and
- A Scientific Team based at the Children's Health Policy Centre at SFU with collaborators at McMaster University, the University of BC, the University of Victoria and the Public Health Agency of Canada. (Appendix 3 describes the Scientific Team.)

A Steering Committee oversees the BCHCP RCT. This committee includes lead policy-makers from the BC Ministries of Health and Children and Family Development; the BC Ministry of Health Provincial NFP Coordinator; and BC-based Scientific Team members. A Provincial Advisory Committee advises the Steering Committee and includes representatives from the regional and other Health Authorities as well as from community and other policy agencies, including BC's First Nations Health Authority.

The BC Ministry of Health is funding the BCHCP RCT with support from the BC Ministry of Children and Family Development — while Fraser, Interior, Island and Vancouver Coastal Health are covering nursing and associated program costs. Through SFU's Children's Health Policy Centre, the BCHCP RCT has also garnered donor support from the Djavad Mowafaghian and R. and J. Stern Family Foundations.

Two adjunctive studies are being conducted in parallel with the BCHCP RCT: 1) a public health nursing Process Evaluation to document how NFP is being implemented and delivered and how the program may be further adapted for the BC context, funded by the Public Health Agency of Canada and led by Susan Jack;[16] and 2) the Healthy Foundations Study, a biological evaluation of NFP's impact on measures of childhood stress in an RCT subsample, funded by the Canadian Institutes of Health Research and led by Andrea Gonzalez.[17] Reports are being issued separately on these two adjunctive studies.

Embedded within BC's child health and public health systems, the BCHCP involves unique, province-wide research-policy-practice collaborations.

1.3 Progress to Date

The project has made excellent progress to date. In December 2016 we closed RCT recruitment with 739 girls and young women enrolled. Overall, 24% of participants were enrolled early in pregnancy, prior to 16 weeks gestation. We are now continuing study data collection over two-and-a-half years (NFP's duration), until late 2019. Final RCT results will be available in 2020–2021. (Appendix 4 shows the project timelines.) Meanwhile, 744 babies have been born to RCT participants. As well, nearly 300 families have received NFP through an earlier nurse-education pilot project and nearly 150 families have received NFP through the nursing Process Evaluation. Yet on balance, Health Authority recruitment efforts reached fewer than 50% of eligible girls and young women in BC over three years (2013–2016).[18]

Perhaps most importantly, many participants also tell us, anecdotally, that through this study they feel their voices are being heard, often for the first time. This report now provides a province-wide profile of these girls and young women on study entry, in early pregnancy. (Appendix 5 shows data according to each participating regional Health Authority.) We are pleased to share their stories — through these data.

Many participants tell us, anecdotally, that through this study they feel their voices are being heard — often for the first time.

2. Profile of BC Healthy Connections Project Participants

2.1 Overall Demographic Profile

2.1.1 Pregnant and preparing to parent at a young age

All participants were preparing to parent at a young age, by definition according to BCHCP (and general NFP) eligibility criteria. Nearly half (49%) were age 14–19 years and just over half (51%) were age 20–24 years. Yet in comparison, only 2% of BC births typically involve girls age 15–19 years, and only 11% typically involve young women age 20–24 years.[18] These comparisons suggest that BCHCP participants were preparing to parent at young ages at rates that were approximately five times higher than is typical for BC (49–51% for BCHCP versus 2–11% for BC). Young age can be associated with challenges for mothers — and for their children. For example, many young mothers experience interrupted education, lower workforce participation, associated financial and housing instability, and associated health problems.[19,20] Many children of young mothers in turn have been shown to be at increased risk of perinatal complications, injuries, developmental delays and mental health problems such as disruptive behaviour.[21–23] Despite these potential challenges, for some cultural groups and for some communities, young maternal age may nevertheless not be seen as a risk if parents-to-be are well supported.[20]

Young age can be associated with challenges for mothers — and for their children.

2.1.2 Participants' cultural backgrounds

Participants came from a variety of cultural backgrounds, with more than half (57% or 418 of the 739) identifying as "white" and more than a quarter (27% or 200 of the 739) identifying as Indigenous. ("Indigenous" referred to First Nations or Indigenous, including Métis or Inuit — either as a "stand-alone" category [11%] or coupled with identifying with another cultural group as well [16%]. Previous Statistics Canada categories were used.)[24] Others reported a mix of ethnicities.

The BCHCP sample contains a relatively high proportion of Indigenous participants compared with recent BC estimates suggesting that Indigenous people comprised approximately 5% of the population overall.[25] (BCHCP Indigenous participants were all living "off-reserve" at time of enrolment due to the study's research ethics approvals. Findings for these participants are also being reviewed with BC's First Nations Health Authority. The Scientific Team will be preparing a separate report on Indigenous girls and young women in collaboration with the First Nations Health Authority.)

Overall, at time of enrolment, 93% of BCHCP participants reported English as their first language, in keeping with the RCT eligibility criteria requiring conversational competence in English. This language requirement nevertheless likely explains why the population enrolled in the BCHCP may not fully reflect BC's diversity. For example, recent BC surveys have indicated that only 51% of youth reported speaking primarily English at home.[26] But the assistance of language interpreters was not available for the RCT, including for NFP delivery. Table 3 outlines how participants identified themselves.

More than a quarter of BCHCP participants identified as First Nations or Indigenous, including Métis or Inuit.

Table 3. Participants' Cultural Backgrounds*

Self-Identified Ethnicity	%	N = 739
White	57%	418
First Nations or Aboriginal including Métis and Inuit	11%	79
First Nations and White	15%	109
First Nations and Southeast Asian	< 1%	< 5
First Nations and 2+ others specified	1%	10
Chinese	< 1%	< 5
South Asian	1%	< 5
Black	2%	13
Arab/West Asian	1%	5
Filipina	2%	16
Southeast Asian	< 1%	< 5
Latin-American	2%	15
White and Chinese	1%	< 5
White and Latin American	2%	13
Black and Latin American	< 1%	< 5
White and Black	2%	15
Chinese and Latin American	< 1%	< 5
South Asian and Black	< 1%	< 5
White and South Asian	< 1%	< 5
South Asian, Other	< 1%%	< 5
Chinese and Filipina	< 1%	< 5
White and Arab/West Asian	1%	7
White and Southeast Asian	< 1%	< 5
Arab/West Asian and Latin American	< 1%	< 5
White and Filipina	1%	< 5
Mixed heritage (3+ specified)	1%	< 5
Other or preferred not to respond	1%	6

* Statistics Canada categories[24]

2.2 Pregnant and Coping with Socio-economic Disadvantage

2.2.1 Overview

In keeping with the RCT's eligibility criteria, the baseline data confirm that we reached our intended sample of girls and young women who were pregnant and preparing to parent for the first time while coping with socio-economic disadvantage. Table 4 outlines the basic indicators, including living on low income, having limited education and having limited social supports (preparing for single parenting).

Table 4. Basic Indicators of Socio-economic Disadvantage

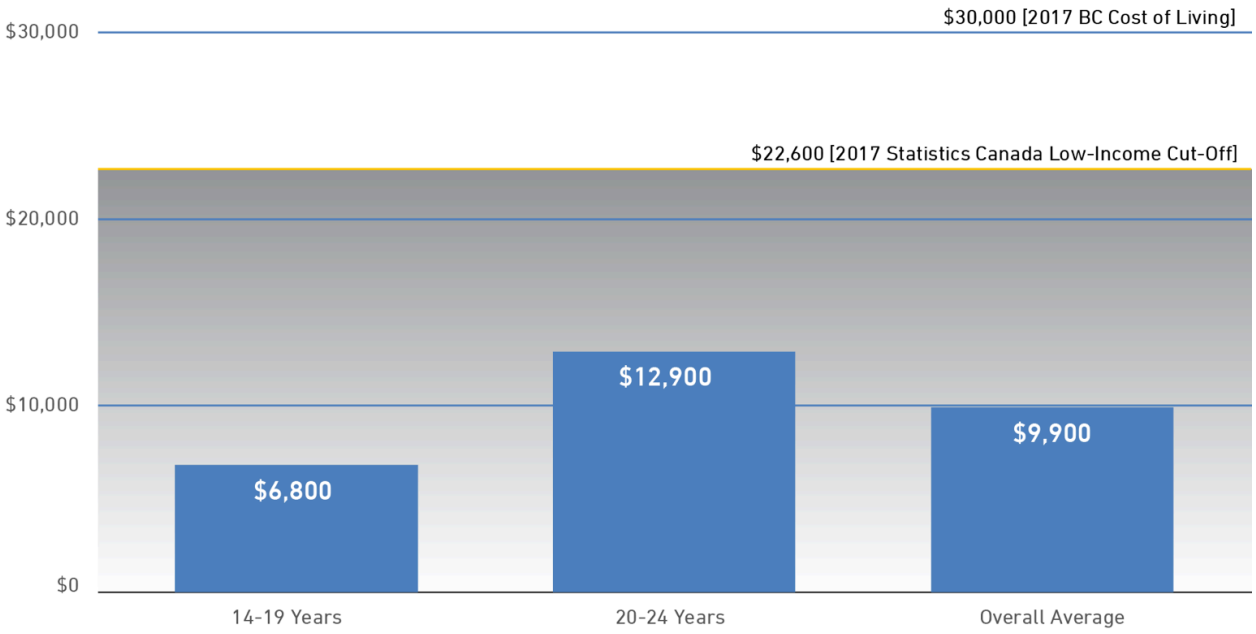
Age (Years)	Low Income (Living on Under $20,000 per Year)	Limited Education (Having Less Than Grade 12)	Limited Social Supports (Preparing for Single Parenting)
14–19	90%	69%	87%
20–24	77%	38%	95%
All Participants	83%	53%	91%

2.2.2 Living on a low income

Participants were invited to report their (pre-tax) individual income from all sources of employment, including unreported or "under-the-table" income. These estimates excluded any money received from family or friends or from income assistance. Most participants (83%) reported living on less than $20,000 annually. The mean annual income for those age 14–19 years was $6,800 (median $3,200) and for those age 20–24 years it was $12,900 (median $11,300). Overall mean annual income for the sample was $9,900 (median $6,800).

According to recent BC estimates, in contrast, annual minimum incomes of $30,000 or higher were required in the participants' communities in 2017 — to live modestly in a small rental apartment using public transit, with no pregnancy or childcare expenses factored in.[27] Statistics Canada has also indicated that approximately $22,600 (pre-tax) annually was the low-income threshold for single people living in larger centres in Canada in 2015.[28] Therefore most participants were living on less than they needed. Figure 1 shows BCHCP participants' mean annual incomes relative to Statistics Canada low-income thresholds and to BC cost-of-living estimates.

Figure 1. Mean Annual Pre-Tax Incomes Relative to Low-Income Thresholds and Cost of Living



Most participants were living on less than they needed.

2.2.3 Having a limited education

More than half of participants (53%) reported having a limited education, meaning they had not completed high school or the equivalent, as shown in Table 4. For those age 14–19 years, 69% had not completed high school; for those age 20–24 years, 38% had not completed this milestone. Approximately 11% of BC girls and young women in the general population under age 25 years typically do not complete high school.[29] While not directly comparable, these figures nevertheless suggest that BCHCP participants may be more likely to have limited education than other BC young people (53% for BCHCP versus 11% for the general BC population under age 25 years). As well, even BCHCP participants who were still enrolled in school (58% of those age 14–19 years and 63% of those age 20–24 years) have had their education interrupted by pregnancy. Beyond concerns about future employment and other opportunities for participants, low maternal education is a risk factor for childhood injuries.[12–15,19]

More than half of participants reported having a limited education.

2.2.4 Having limited social supports

Most participants were also preparing to parent with limited social supports, as shown in Table 4. Specifically, 9% reported being "married" or living "common law" with the father-to-be or with a partner other than the father-to-be, while 91% were preparing to parent alone. ("Common law" was defined as living together consecutively for one year or more.) However, 63% reported being closely involved with a partner. Canadian data from a nationally-representative sample have indicated that 14–19% of new mothers living on low income were "married" and/or living with a partner, meaning that 81–86% were parenting without a partner.[30] As well, BC data have indicated that 85% of all families in general had two parents, meaning that only 15% were parenting alone, albeit across a range of maternal ages and income groups.[24] While not directly comparable, these figures nevertheless suggest that BCHCP participants may be less likely to be preparing to parent with a partner (9% for BCHCP versus 14-19% for other low-income Canadians).

Most participants were also preparing to parent with limited social supports.

2.2.5 Having unstable housing

Nearly half of participants (47%) reported being homeless at some time in their lives, although few (3%) reported being currently homeless. (Homelessness was defined as: living on the streets; staying in emergency or homeless shelters; staying in places not meant as residences, e.g., car or tent; or experiencing "hidden homelessness" such as staying with someone temporarily because of no permanent address or having nowhere else to live, e.g., "couch surfing.") A third of participants (34%) also reported experiencing considerable housing instability, that is, having to move three or more times in the past year. Most participants (94%) reported currently having somewhere to live (e.g., an apartment in a house or other building). But some (approximately 3%) also reported living in group or foster homes, shelters or single-room occupancy hotels.

We could not identify comparable data on homelessness for pregnant girls and young women in BC or Canada. However, national homelessness estimates suggest that only 8% of Canadians age 15–24 years (from all income groups and not pregnant) have had to live temporarily at some time with family or friends, in their car, or in other places because they had nowhere else to live — a rate far lower than the BCHCP rate of 47% reporting lifetime homelessness.[31] A BC survey of adolescents (as well from all income groups and not pregnant) also recently found that only 5% of youth age 12–19 years reported having to move three or more times in the past year — a rate far lower than the BCHCP rate of 34% reporting housing instability.[26] The high reported BCHCP rates of lifetime homelessness and recent housing instability were concerning, given that participants were young and pregnant. Table 5 shows participants' housing situations.

Table 5. Housing

Homelessness	%
At any time in their lives	47%
Currently homeless	3%
Unstable Housing	
Having to move 3 or more times in the past year	34%
Current Housing	
House, apartment or condominium	94%
Group home or shelter or foster home	2%
Single-room occupancy hotel or residence	< 1%

The high reported BCHCP rates of lifetime homelessness and recent housing instability were concerning, given that participants were young and pregnant.

2.3. Coping with Health Challenges

2.3.1 Overall health

Participants were asked if they had been diagnosed by a health professional as having any serious long-term mental or physical health conditions that affected their daily activities. (Participants could describe more than one condition.) Nearly three-quarters (74%) reported having at least one such condition. A recent BC survey indicated that 30% of female adolescents (age 19 years or younger, from all income groups and not pregnant) reported having a serious health condition or disability.[26] While not directly comparable, these figures nevertheless suggest that BCHCP participants may be more likely to be dealing with health challenges compared to other (non-pregnant) BC youth (74% for BCHCP versus 26% for BC).

Nearly three-quarters (74%) reported dealing with physical or mental health challenges that affected their daily lives.

2.3.2 General mental health

Nearly a third of participants (32%) reported experiencing moderate-to-severe levels of psychological distress in the past month based on questions asking about anxiety and depression (for example, about feeling nervous, anxious, hopeless, depressed or worthless). As well, nearly half (47%) indicated that they were regularly experiencing severe anxiety or depressive symptoms. Participants were also asked if they had received a diagnosis from a health professional regarding a serious long-term mental health condition that affected their daily activities. Overall, 22% of participants reported being diagnosed with a mental disorder such as schizophrenia or bipolar disorder or attention problems; 11% reported being diagnosed with developmental conditions such as prenatal alcohol exposure, autism spectrum disorder or learning disorders.

We could not identify comparable data on mental health for low-income pregnant girls and young women in BC or Canada. However, a recent BC survey indicated that only 13% of female youth (age 15–18 years, from all income groups and not pregnant) were experiencing severe levels of despair such that they could not function.[26] Recent prevalence surveys have also indicated that rates of mental disorders such as anxiety and depression in young people were only approximately 4% and 2%, respectively, with rates for disorders such as schizophrenia or bipolar disorder being even lower, at under 1% (also from all income groups and not pregnant).[32] Although not directly comparable, these figures nevertheless suggest that BCHCP participants may be much more likely to be dealing with severe mental health challenges compared with other young people (47% for BCHCP versus 13% for BC). Table 6, below, outlines the general mental health problems reported by BCHCP participants.

Table 6. General Mental Health*

Psychological Distress	%
Moderate/severe psychological distress (past month)	32%
Mental Health Conditions	
Severe anxiety or depressive symptoms on a regular basis	47%
Diagnosed mental disorder (e.g., schizophrenia or bipolar disorder or attention problems)	22%
Diagnosed related developmental condition (e.g., prenatal alcohol exposure, autism spectrum or learning disorders)	11%

* Participants could give more than one answer

Nearly half of the participants were coping with severe ongoing mental health challenges.

2.3.3 Prenatal substance use

Nearly a quarter of participants (23%) reported prenatal substance use in the past month, including cannabis or hash (21%); alcohol (2%); and other street drugs such as LSD, mushrooms, ecstasy, cocaine, speed, heroin and methamphetamines (1%). (Note that questions on substance use were completed confidentially such that interviewers were not aware of the responses — to encourage participants to be candid.) Over a quarter (27%) also reported using nicotine/cigarettes within the past 48 hours. Many (40%) reported second-hand smoke exposure as well.

We could not identify comparable data on prenatal substance use for low-income pregnant girls and young women in BC or Canada. However, BC survey data have indicated that 15% of BC youth in general (age 19 years or younger, from all income groups and not pregnant) had recently used cannabis,[26] while 5% of pregnant girls and young women in Canada in general (of all ages and from all income groups) have reported (unspecified) prenatal street drug use.[33] As well, 9% of Canadian pregnant girls and young women (of all ages and across all income groups) have reported prenatal alcohol use,[34] and 9% of BC pregnant girls and young women (of all ages and across all income groups) have reported using prenatal nicotine/cigarettes.[35] Previous BC survey data have also shown that 21% of youth (age 19 years or younger, from all income groups and not pregnant) reported some second-hand smoke exposure.[26]

Although not directly comparable, these figures nevertheless suggest that BCHCP participants may be more likely to use cannabis, less likely to use alcohol, and more likely to use nicotine/cigarettes and to have second-hand smoke exposure than others in BC and Canada. Yet the BCHCP rates were still concerning, given that all participants were young and pregnant. Table 7, below, summarizes substance use reported by BCHCP participants.

Table 7. Prenatal Substance Use*

Prenatal Substance Use	%
Any cannabis, alcohol or other street drug use (past month)	23%
Cannabis use (past month)	21%
Alcohol use (past month)	2%
Other street drug use (past month)	1%
Nicotine/cigarette use (past 48 hours)	27%
Second-hand smoke exposure (≥ 1–4 days in past week)	40%

* Participants could give more than one answer

Rates of substance use were concerning given that participants were young and pregnant.

2.3.4 Physical health

Participants were asked whether they had ever received a diagnosis from a health professional regarding a serious long-term physical health condition that affected their daily activities. They reported experiencing a number of such problems: iron-deficiency anemia (20%); asthma or allergies (19%); migraines (15%); injuries that left a disability (8%); and other conditions including thyroid and cardiovascular disease as well as epilepsy, autoimmune, and chronic infectious illnesses such as hepatitis C and HIV.

BC surveys have found that 87% of female youth (age 19 years or younger, from all income groups and not pregnant) reported having "good or excellent" physical health.[26] Although not directly comparable, these figures nevertheless suggest that BCHCP participants may be more likely to experience high rates of serious long-term physical health problems. Table 8, below, summarizes these problems.

Table 8. Physical Health Problems*

Serious Long-term Physical Health Conditions	%
Iron-deficiency anemia	20%
Asthma or allergies requiring puffers on a regular basis	19%
Migraines (weekly or more)	15%
Serious injury that left a disability (head or leg injury)	8%
Thyroid disease	3%
Cardiovascular disease (including high blood pressure)	2%
Epilepsy or seizures (weekly or more)	2%
Autoimmune disorders (requiring medication on a regular basis)	1%
Chronic infectious illness (e.g., hepatitis C or HIV)	1%
Fibromyalgia	1%
Diabetes (requiring insulin or pills on a regular basis)	1%
Other (e.g., arthritis, irritable bowel syndrome)	15%

* Participants could give more than one answer

Physical health problems posed added challenges for project participants.

2.4. Experiencing Maltreatment

2.4.1 Past child maltreatment

On measures asking about their personal history of experiencing maltreatment when they were children, more than half of participants (56%) reported experiencing moderate-to-severe neglect, physical abuse, emotional abuse and/or sexual abuse when they were age 16 years or younger. (Note that questions on childhood experiences of maltreatment were completed confidentially such that interviewers were not aware of the responses — to encourage participants to be candid.)

We could not identify comparable data on childhood experiences of maltreatment for low-income pregnant girls and young women in BC or Canada. However, in recent BC surveys only 15% of female youth (age 19 years or younger, from all income groups and not pregnant) reported experiencing physical abuse, while 10% reported experiencing sexual abuse.[26] As well, Canadian data have shown that 21% of females reported experiencing physical abuse before age 16 years, while 14% reported experiencing sexual abuse and 9% reported exposure to intimate partner violence — with 30% experiencing any of these forms of maltreatment overall.[36]

Although not directly comparable, these figures nevertheless suggest that BCHCP participants may be more likely to have experienced maltreatment during childhood than others (56% for BCHCP versus 15% for BC versus 30% for Canada). Table 9 shows the findings on maternal childhood maltreatment experiences.

Table 9. Maternal Childhood Maltreatment Experiences*

Child Maltreatment at Age 16 Years or Younger	%
Moderate-to-severe neglect, physical abuse, emotional abuse and/or sexual abuse	56%

* Participants could give more than one answer

More than half of participants reported experiencing maltreatment when they were children.

2.4.2 Recent intimate partner violence

Half of participants (50%) reported experiencing intimate partner violence within the past year. These problems included physical abuse (e.g., being pushed or slapped) and emotional abuse (e.g., being called derogatory names or being harassed or threatened or followed). (Note that questions on intimate partner violence were completed confidentially such that interviewers were not aware of the responses — to encourage participants to be candid.)

We could not identify comparable data on intimate partner violence for low-income girls and young women in BC or Canada. However, a national Canadian survey indicated that 40% of girls (age 15–19 years) and 22% of young women (age 20–24 years) — from all income groups — reported experiencing physical or sexual abuse in the two years preceding a postpartum interview.[37] Although not directly comparable, these figures nevertheless suggest that BCHCP participants may be more likely to have experienced intimate partner violence (50% for BCHCP versus 22–40% for all Canadian girls and women). Table 10 shows the findings on intimate partner violence.

Table 10. Intimate Partner Violence*

Intimate Partner Violence in the Past Year	%
Any physical or emotional abuse	50%

* Participants could give more than one answer

Half of participants reported experiencing intimate partner violence within the past year.

2.5 Receiving Health and Social Services, or Not?

2.5.1 Health services

Participants were asked about health services they had received regarding physical health concerns in the past month. Most (77%) reported visiting primary health care providers regarding physical health concerns in this time period — including family doctors, nurse practitioners and midwives in settings including emergency rooms and walk-in clinics. This finding may be in keeping with primary health care providers being one of the recruitment sources for the RCT. Yet 23% also reported not receiving any primary health care in the past month, a concerning finding given that these girls and young women were pregnant. As well, few (28%) reported receiving other health supports such as prenatal classes — from any source, including community and governmental organizations. Table 11 summarizes participants' reports on receiving health services.

Twenty-three percent reported not receiving any primary health care in the past month, a concerning finding given that these girls and young women were pregnant.

2.5.2 Social services

Participants were also asked about social services they had received in the past month. Just under a third (29%) reported receiving income assistance, including through provincial or federal programs such as BC Income and Disability Assistance; Canada Disability Benefits and Employment Insurance; and BC Youth Agreement benefits (supports for young people living on their own, including those leaving foster care). About one-sixth (16%) also reported attempting to receive income assistance; this included being approved and waiting for benefits or applying for benefits and being denied. But more than half (55%) indicated that they had neither received nor tried to receive income assistance.

Furthermore, most reported not receiving important benefits for BC people living on low income. Specifically, nearly two-thirds (65%) reported not receiving BC Medical Services Plan Premium Assistance and 82% reported not being enrolled in BC PharmaCare. (These plans assist with costs of health care premiums and prescription drugs for people on low income.) The limited reach of these social services is notable given that 83% of participants reported living on less than $20,000 annually (see above) — such that most should have been eligible to receive these benefits. This limited reach is also notable given that most participants (74%) reported having long-term health conditions that could preclude them from working for pay (as also outlined above). Table 11 summarizes participants' reports on receiving social services.

Table 11. Provision of Health and Social Services

Health Services Received in the Past Month	%
Primary health care in the past month*	77%
Prenatal classes	28%
Social Services Received in the Past Month	**%**
Income assistance**	29%
Assistance with BC Medical Services Plan Premium	35%
Enrolled in BC PharmaCare	18%

* Primary health care included family doctors, nurse practitioners and midwives, including at walk-in clinics or emergency rooms

** Income assistance included BC Income and Disability Assistance; Canada Disability Benefits and Employment Insurance; and BC Youth Agreement benefits

Despite most being on low income, most participants were not receiving social services such as income assistance.

2.6. When Disadvantage Accumulates

To identify cumulative socio-economic disadvantage, nine markers were selected based on RCT eligibility criteria and on relevance to current BC prenatal public health screening criteria. Markers included: young age; living on low income; having limited education; preparing for single parenting; experiencing housing instability; having mental health challenges with anxiety or depression; having mental health challenges with substance use; having a history of being maltreated as a child; and experiencing intimate partner violence. Overall, almost all participants (89%) were experiencing three or more of these forms of disadvantage, while three-quarters (77%) were experiencing four or more, and more than half (56%) were experiencing five or more.

These findings show concentrated disadvantage in this population. Notably, however, many of these forms of disadvantage are preventable, pointing to the need for more concerted early primary preventive initiatives, in addition to NFP.[38,39] Table 12 shows the multiple disadvantages BCHCP participants were coping with.

Table 12. Coping with Multiple Disadvantages

Participants Affected	Indicators of Disadvantage
100%	1
98%	2
89%	3
77%	4
56%	5
37%	6
19%	7
7%	8
2%	9

Almost all participants reported experiencing multiple forms of adversity, suggesting concentrated disadvantage.

3. Implications and Next Steps

This profile of BCHCP participants on study entry confirms that these 739 pregnant BC girls and young women were preparing to parent for the first time while coping with considerable adversity. Socio-economic disadvantages included low income, limited education, limited social supports, and housing instability. Amplifying these issues, many participants were also coping with mental health challenges including anxiety, depression and substance use; physical health challenges; past history of maltreatment as children; recent exposure to intimate partner violence; and the limited reach of public services. Perhaps most telling, 89% of these girls and young women reported experiencing three or more different forms of adversity, while 77% reported four or more and 56% reported five or more. Although this sample is not representative of the general population, on balance the data nevertheless depict pockets of deep socio-economic disadvantage for this group of BC girls and young women who were pregnant and preparing to parent for the first time.

> Our data depict pockets of deep socio-economic disadvantage for this group of BC girls and young women who were pregnant and preparing to parent for the first time.

Our baseline data also confirm that through the RCT, participating BC regional Health Authorities and BC public health nurses have reached the population that NFP was designed to support — those experiencing concentrated socio-economic disadvantage. This confirmation suggests that NFP may benefit these BC girls and young women. Even more so, NFP may benefit their children, given the program's concerted focus on addressing socio-economic disadvantage and its sequelae very early in life, starting before children are born. The BCHCP RCT continues as the study team completes data collection at subsequent assessments until each child's second birthday. These data will provide valuable insights on the intervention levels and intensity that are required to better address the adversities that BCHCP families — and families facing similar challenges — are coping with. BC's participating regional Health Authorities have signalled their commitment to reaching these populations by continuing to offer NFP to eligible girls and young women and their children as an enhanced child and maternal health program embedded within their overall suites of public health services — while awaiting RCT findings. This means that many more families can now access the NFP program.

It is noteworthy, however, that fewer than 50% of eligible BC girls and young women were reached through the RCT over the three years of recruitment (2013–2016).[18] Recruitment through participating regional Health Authorities was challenging, initially, due to having to establish new systems for identifying and reaching eligible girls and young women early in pregnancy. In many cases, this population was historically not being reached, despite their high needs. Recruitment improved as the trial proceeded. But by being embedded within BC's child health and public health systems, the RCT has also perhaps contributed to raising awareness and encouraging Health Authorities in their endeavours to better serve these girls and young women and their children on an ongoing basis — by confirming the high levels of need and by confirming that this population can indeed be reached prenatally.

Yet our baseline data suggest that much more is needed. Most importantly, considerable research evidence has now accumulated showing the profound influence of social determinants such as socio-economic inequalities and cumulative adversities on the health of individuals and of populations.[40] We see stark evidence of these social determinants at play in the BCHCP baseline data. British Columbians and Canadians take pride in the health and

social "safety nets" that we have collectively constructed.[41] But our data show that unacceptable pockets of deep socio-economic disadvantage remain. Beyond the NFP program, therefore, our data support renewed collective efforts and new public initiatives to better address social inequalities and cumulative adversities — starting when children are young. Greater public investments are needed to create the conditions for *all* children to develop in environments that are as free as possible from preventable adversities starting very early in life — in essence bringing about a "proportionate universalism" that allows all British Columbians and all Canadians to flourish on an equal footing.[40,42]

Our data also suggest that public policy remedies must go beyond public health and health care — extending also to social services, including ensuring adequate income and housing supports. It is unacceptable that pregnant girls and young women in BC are living on incomes as low as $5,000 annually and are experiencing housing instability. In other words, our findings have implications for public services writ large — challenging policy-makers and British Columbians to ensure that we are both identifying and reaching those most in need with a comprehensive array of effective social supports and interventions, in addition to public health and health care programs.

Our data suggest, furthermore, that existing social programs may not be reaching the people they are most intended to help. The limited reach of programs providing assistance with BC health care premiums, for example, suggests the need to examine how these programs are delivered and how their reach is evaluated. The BCHCP early recruitment issues may also be instructive, in that regional Health Authority commitment and tenacity were required to improve the reach to many more young people in need. Reaching many more eligible participants will also be important for ongoing NFP implementation, so the program sustains high uptake with those who need it most. Meanwhile, our baseline data show high levels of mental health problems, including prenatal substance use, and concerning maternal reports of childhood maltreatment and of intimate partner violence. These data suggest that beyond awareness of the multiple adversities that some young people are living with, it is urgent that BC improve the funding and reach of public programs designed to prevent and treat these problems early in life. Prevention in particular holds great promise. Many interventions have been shown to effectively prevent mental health problems, starting in early childhood.[40] Interventions with young people have also been shown to prevent child maltreatment.[41]

This baseline data analysis has limitations. We cannot yet draw conclusions about NFP program effects in BC and Canada, although future reports will address this issue. We also cannot draw conclusions about the eligible girls and young women we did not reach through the BCHCP. It is possible that their needs are even higher than those discussed here. The lack of comparison data for many of our BCHCP measures was also problematic, suggesting a need for more administrative and research data collection on populations in need — data that could and should inform policy-making. The issue of Indigenous participants and their potentially differing needs is important as well and will be addressed in future BCHCP reports, to be prepared in collaboration with First Nations partners.
In addition, we are not yet able to address many nuanced questions of considerable policy salience. For example, NFP may have greater effects for younger participants with fewer social and other resources — suggesting the need to tailor public policy responses and suggesting the need for a thoughtful continuum of programs and services. These issues, too, will be addressed in future reports.

On balance, the stories of these girls and young women — as told through our data — are also stories suggesting strength and hope in the face of adversity. In choosing to participate in this study, with no guarantee of personal gain and despite the challenges in their lives, BCHCP participants have expressed a willingness to contribute to the greater good. Collectively, we must respond to these expressions of strength and hope by better meeting their needs — and the needs of all those who are coping with similar challenges.

In choosing to participate in this study, BCHCP participants have expressed a willingness to contribute to the greater good. Collectively, we must respond by better meeting their needs.

Acknowledgements

We are grateful to the girls and young women who are participating in the BC Healthy Connections Project — for the time and effort they have put into the study, and for their willingness to share their time and the details of their lives. We also appreciate the public health nurses who have committed their knowledge, skills and passion to the BCHCP. The contributions of the SFU study team, the many BC Health Authority and BC government staff, and the Children's Health Policy Centre team have all been essential. The BC Ministry of Health funds the BCHCP RCT with support from the BC Ministry of Children and Family Development — and from the Fraser, Interior, Island and Vancouver Coastal Health Authorities. The Canada Research Chairs program, the Djavad Mowafaghian Foundation and the R. and J. Stern Family Foundation have provided generous additional supports. We thank the BCHCP RCT Steering Committee members (past and present) for their insightful comments on early drafts of this report. Bigstock was the source for the cover photo.

Research Ethics Approvals

The BCHCP has ongoing Research Ethics Board approvals from 10 participating institutions: Simon Fraser University; the University of British Columbia; the University of Victoria; McMaster University; Fraser, Interior, Island, Northern and Vancouver Coastal Health Authorities; and the Public Health Agency of Canada. In addition, an independent data and safety monitoring committee oversees the trial. The BCHCP RCT was registered on July 18, 2013 with ClinicalTrials.gov (identifier NCT01672060).

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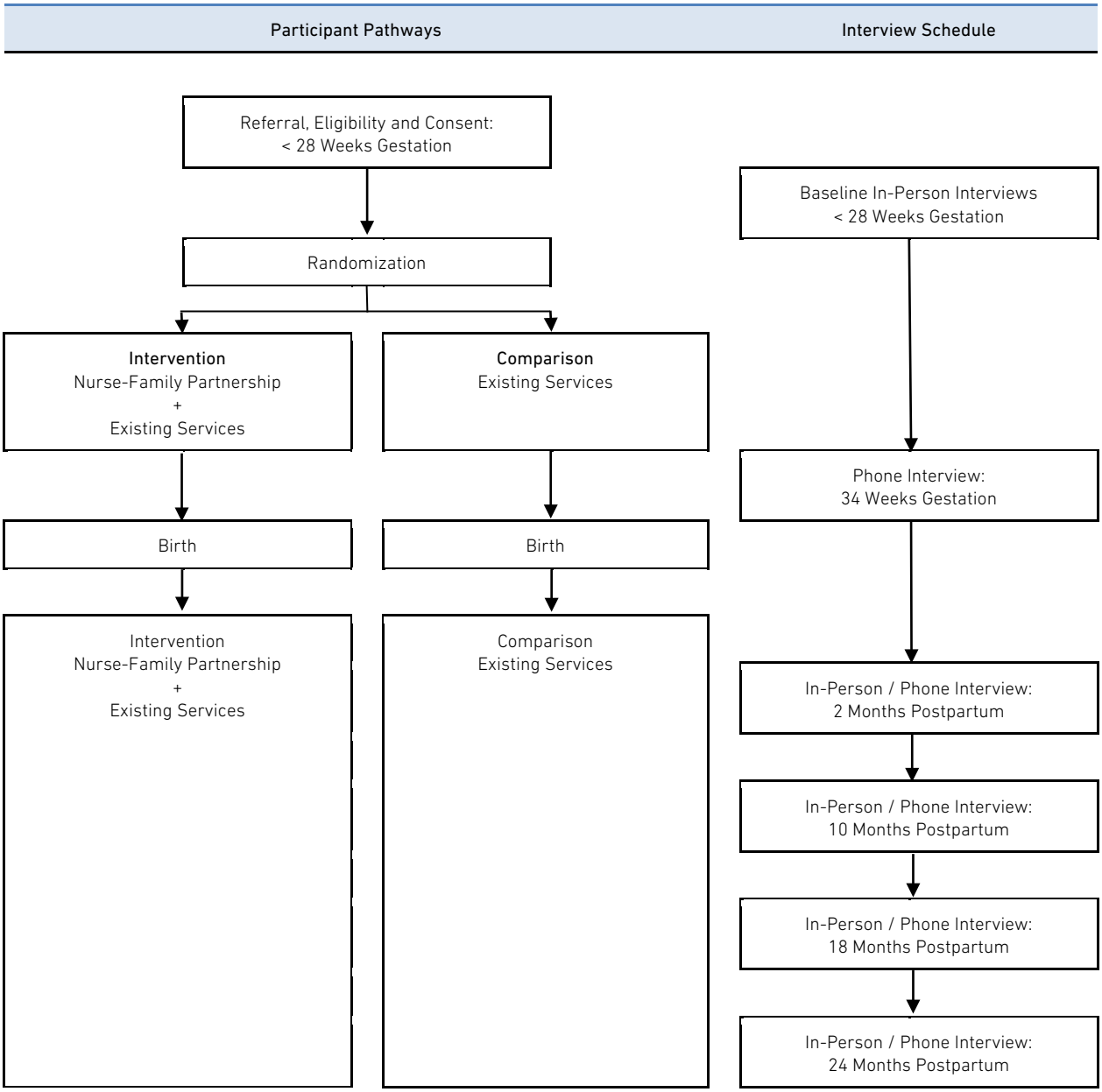
Appendix 1:
BC Healthy Connections Project Randomized Controlled Trial (RCT) Measures*

	Assessment Points						
	Prenatal		Birth through 24 Months Postpartum				
Measures	Baseline	34–36 Weeks	Birth	2 Months	10 Months	18 Months	24 Months
Maternal Demographics and Socio-economic Status							
Age, racial/cultural group, language	✓						
Education + employment	✓	✓		✓	✓	✓	✓
Income + financial supports	✓	✓		✓	✓	✓	✓
Housing/residential stability	✓	✓		✓	✓	✓	✓
Relationship status + demographics	✓	✓		✓	✓	✓	✓
Maternal Health and Functioning							
Obstetric history	✓	✓	✓				
History of abuse or neglect	✓						
General health + long-term illness	✓						✓
Self-efficacy + mastery	✓	✓		✓	✓	✓	✓
Anxiety + depression	✓	✓		✓	✓	✓	✓
Prenatal nicotine + alcohol use**	✓	✓					
Prenatal illicit drug use	✓	✓					
Intimate partner violence (IPV)	✓	✓		✓	✓	✓	✓
Executive functioning	✓						
Cognitive ability	✓						
Substance misuse				✓	✓	✓	✓
Antisocial behaviour				✓	✓	✓	✓
Contraceptive use				✓	✓	✓	✓
Subsequent pregnancies**				✓	✓	✓	✓
Neonatal Health							
Gestation at delivery			✓				
Birth weight			✓				
Apgar scores (1 + 5 minutes)			✓				
Intensive care admission(s)			✓				
Parenting Behaviours and Beliefs							
Breastfeeding initiation + duration				✓	✓		
Provision of safe + nurturing home				✓	✓	✓	✓
Child exposure to second-hand smoke				✓	✓	✓	✓
Parenting attitudes/beliefs						✓	
Child Health and Development							
General health + long-term illness							✓
Immunizations				✓	✓	✓	✓
Language + cognition**							✓
Mental health (behaviour)**							✓
Physician encounters for injuries**				✓	✓	✓	✓
Substantiated abuse or neglect				✓	✓	✓	✓
Maternal and Child Service Access + Use							
Prenatal programs	✓	✓					
Primary + secondary health care	✓	✓		✓	✓	✓	✓
Financial/educational assistance	✓	✓		✓	✓	✓	✓
Other services (e.g., housing)	✓	✓		✓	✓	✓	✓
Parenting + early childhood programs	✓	✓		✓	✓	✓	✓
Other services	✓	✓		✓	✓	✓	✓

* All data are being gathered on both NFP and control children and mothers
** Main outcome indicators

Appendix 2:
BC Healthy Connections Project Participant Randomized Controlled Trial Pathways*



* Adapted from Catherine, N., Gonzalez, A., Boyle M., et al. (2016). Improving children's health and development in British Columbia through nurse home visiting: A randomized controlled trial protocol. *BioMedCentral Health Services Research*, 16, 349–362.

Appendix 3:
BC Healthy Connections Project Scientific Team

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Healthy Foundations Study Principal Investigator	
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* Hui Xie, MS, PhD, Professor, FHS, SFU, Burnaby, BC, has also recently joined the project as a consultant

Appendix 4:
BC Healthy Connections Project Timelines

2008	▪ Canadian Nurse-Family Partnership (NFP) curriculum and materials developed ▪ McMaster pilot project demonstrated NFP's feasibility and acceptability in Canada
2010	▪ BC Ministry of Health (MoH) invited SFU's Children's Health Policy Centre to explore BC NFP evaluation options ▪ Scientific, policy and practice collaborations were established
2011	▪ MoH announced funding for trial with support from BC Ministry of Children and Family Development (MCFD) ▪ Fraser, Interior, Island, Northern and Vancouver Coastal Health Authorities initiated support for the trial ▪ Scientific, policy and practice collaborations were further developed
2012	▪ Project was launched, trial was named BC Healthy Connections Project (BCHCP) ▪ BCHCP trial protocol was developed, ethics applications were submitted, scientific peer review was obtained ▪ NFP public health nurses' and supervisors' education was initiated, including taking on 100 "guiding clients" ▪ Adjunctive Process Evaluation funding obtained from Public Health Agency of Canada
2013	▪ BCHCP trial protocol finalized, approvals finalized from 10 research ethics boards ▪ Trial was launched in Fraser, Vancouver Coastal, Island and Interior Health (Northern Health did not join the trial) ▪ Process Evaluation was launched in Fraser, Interior, Island, Northern and Vancouver Coastal Health ▪ Adjunctive Healthy Foundations Study funding obtained from Canadian Institutes of Health Research
2014	▪ BCHCP trial recruitment continued ▪ Process Evaluation continued, first reports developed ▪ Healthy Foundations Study was launched in Fraser and Vancouver Coastal Health
2015	▪ BCHCP trial recruitment continued ▪ Process Evaluation continued, ongoing reports shared ▪ Healthy Foundations Study continued
2016	▪ BCHCP trial enrolment closed; data collection and associated NFP delivery continued ▪ Process Evaluation continued, ongoing reports shared ▪ Healthy Foundations Study continued
2017	▪ BCHCP trial continued; data collection and associated NFP delivery continued ▪ RCT descriptive reports and talks prepared on participants' characteristics on study entry in early pregnancy ▪ Process Evaluation continued, ongoing reports shared ▪ Healthy Foundations Study enrolment closed; data collection continued ▪ Health Authorities began offering NFP via enhanced public health programming for eligible girls and young women
2018	▪ BCHCP trial continues; data collection and associated NFP delivery continue ▪ Process Evaluation continues, interim qualitative reports shared ▪ Healthy Foundations Study data collection continues
2019	▪ BCHCP trial interviews and data collection conclude (by December) for all mothers and children ▪ Process Evaluation concludes and final reports shared ▪ Healthy Foundations Study concludes
2020	▪ BCHCP trial reports prepared and findings shared on NFP's impact on secondary and other outcome indicators ▪ Provincial data received and reports prepared on NFP's impact on primary outcome indicator (child injuries)
2021	▪ All BCHCP trial reports finalized and shared ▪ Plans finalized and funding applications submitted for long-term follow-up of the children ▪ BCHCP concludes

Appendix 5:
BC Healthy Connections Project Health Authority Data Tables

Table A. Participants in Each Health Authority

	Fraser Health	Interior Health	Island Health	Vancouver Coastal Health	Total Sample
Enrolled	406	122	127	84	739
Percentage of Total	55%	17%	17%	11%	100%

Table B. Basic Indicators of Socio-economic Disadvantage

	Age		Low Annual Income (Under $20,000 per Year)		Limited Education (Less Than Grade 12)*		Limited Social Supports (Single Parenting)**	
	%	N	%	N	%	N	%	N
All Participants			**83%**	**606/726**	**53%**	**391/738**	**91%**	**670/736**
14–19 years	49%	361/739	90%	319/354	69%	248/360	87%	312/360
20–24 years	51%	378/739	77%	287/372	38%	143/378	95%	358/376
Fraser Health			**84%**	**334/398**	**48%**	**193/406**	**92%**	**369/403**
14–19 years	48%	194/406	89%	168/189	64%	125/194	86%	166/193
20–24 years	52%	212/406	79%	166/209	32%	68/212	97%	203/210
Interior Health			**83%**	**100/121**	**58%**	**70/121**	**92%**	**112/122**
14–19 years	52%	63/122	92%	57/62	69%	43/62	87%	55/63
20–24 years	48%	59/122	73%	43/59	46%	27/59	97%	57/59
Island Health			**80%**	**101/127**	**59%**	**75/127**	**92%**	**117/127**
14–19 years	54%	68/127	88%	60/68	76%	52/68	90%	61/68
20–24 years	46%	59/127	69%	41/59	39%	23/59	95%	56/59
Vancouver Coastal			**89%**	**71/80**	**63%**	**53/84**	**86%**	**72/84**
14–19 years	43%	36/84	97%	34/35	78%	28/36	83%	30/36
20–24 years	57%	48/84	82%	37/45	52%	25/48	88%	42/48

* Less than grade 12 or the equivalent

** Defined as not legally married or living with a partner consecutively for one year

Table C. Average Annual (Pre-Tax) Incomes*

Annual Income	All Girls and Young Women		Fraser Health		Interior Health		Island Health		Vancouver Coastal Health	
	%	N = 725	%	N = 398	%	N = 121	%	N = 126	%	N = 80
Under $5,000	42%	308	41%	165	40%	49	45%	57	46%	37
$5,000–9,999	16%	118	14%	56	20%	24	14%	18	25%	20
$10,000–19,999	25%	180	28%	113	22%	27	21%	26	18%	14
$20,000–29,999	10%	75	11%	42	10%	12	12%	15	8%	6
$30,000 or more	6%	44	6%	22	7%	9	8%	10	< 5%	<5

* Participants could choose not to respond to any survey item

Table D. Housing

	All Girls and Young Women		Fraser Health		Interior Health		Island Health		Vancouver Coastal Health	
	%	N	%	N	%	N	%	N	%	N
Homelessness										
Homeless at any time in their lives	47%	333/716	41%	158/389	53%	65/122	55%	70/127	51%	40/78
Currently homeless	3%	22/721	2%	9/393	< 5%	< 5/122	< 5%	< 5/127	13%	10/79
Housing Instability										
Had to move 3 or more times in past year	34%	244/721	33%	130/400	38%	43/113	41%	52/127	23%	19/81
Current Housing										
House, apartment or condominium	94%	681/725	94%	379/403	94%	113/120	96%	122/127	89%	67/75
Group home or shelter or foster home	2%	18/725	2%	10/403	< 5%	< 5/120	0	0/127	7%	5/75
Single-room occupancy hotel/residence	< 1%	< 5/725	< 1%	< 5/403	0%	0/120	0	0/127	< 1%	< 5/75

Table E. Cultural Backgrounds*

	All Girls and Young Women		Fraser Health		Interior Health		Island Health		Vancouver Coastal Health	
	%	N = 739	%	N = 406	%	N = 122	%	N = 127	%	N = 84
"White"	57%	418	58%	234	61%	75	68%	86	27%	23
First Nations or Aboriginal including Métis and Inuit	11%	79	8%	32	10%	12	11%	14	25%	21
First Nations and White	15%	109	15%	60	20%	24	13%	16	11%	9
First Nations and South-East Asian	< 1%	< 5	< 1%	< 5	0	0	0	0	< 5%	< 5
First Nations and 2+ others specified	1%	10	1%	6	< 5%	< 5	< 5%	< 5	< 5%	< 5
Chinese	< 1%	< 5	0	0	0	0	0	0	< 5%	< 5
South Asian	< 1%	< 5	1%	< 5	0	0	0	0	< 5%	< 5
Black	2%	13	2%	10	0	0	< 5%	< 5	< 5%	< 5
Arab/West Asian	< 1%	< 5	1%	< 5	< 5%	< 5	0	0	0	0
Filipino	2%	16	1%	6	< 5%	< 5	< 5%	< 5	10%	8
South-East Asian	< 1%	< 5	< 1%	< 5	< 5%	< 5	0	0	0	0
Latin-American	2%	15	3%	12	0	0	< 5%	< 5	< 5%	< 5
White and Chinese	< 1%	< 5	< 1%	< 5	0	0	0	0	< 5%	< 5
White and Latin American	2%	13	2%	10	0	0	< 5%	< 5	< 5%	< 5
Black and Latin American	< 1%	< 5	< 1%	<5	0	0	0	0	0	0
White and Black	2%	15	2%	7	< 5%	< 5	< 5%	< 5	< 5%	< 5
Chinese and Latin American	< 1%	< 5	0	0	0	0	0	0	< 5%	< 5
South Asian and Black	< 1%	< 5	0	0	0	0	< 5%	< 5	0	0
White and South Asian	< 1%	< 5	< 1%	< 5	0	0	0	0	0	0
South Asian, Other	< 1%	< 5	0	0	0	0	0	0	< 5%	< 5
Chinese and Filipino	< 1%	< 5	0	0	0	0	< 5%	< 5	0	0
White and Arab/West Asian	1%	7	< 1%	< 5	< 5%	< 5	< 5%	< 5	< 5%	< 5
White and South-East Asian	< 1%	< 5	0	0	0	0	0	0	< 5%	< 5
Arab/West Asian and Latin American	< 1%	< 5	< 1%	< 5	0	0	< 5%	< 5	0	0
White and Filipino	< 1%	< 5	< 1%	< 5	0	0	0	0	< 5%	< 5
Mixed heritage (3+ specified)	< 1%	< 5	< 1%	< 5	0	0	0	0	0	0
Other or prefer not to respond	1%	6	< 1%	< 5	0	0	0	0	< 5%	< 5

* Self-identified ethnicity according to Statistics Canada categories [24]

Table F. General Mental Health*

	All Girls and Young Women		Fraser Health		Interior Health		Island Health		Vancouver Coastal Health	
	%	N	%	N	%	N	%	N	%	N
Psychological Distress										
Moderate/severe psychological distress (past month)	32%	234/734	28%	113/403	37%	45/121	36%	46/127	36%	30/83
Mental Health Conditions										
Severe anxiety or depression on a regular basis	47%	346/739	45%	183/406	54%	66/122	50%	63/127	40%	34/84
Diagnosed mental disorder (e.g., schizophrenia or bipolar disorder or attention problems)	22%	160/739	12%	47/406	20%	25/122	11%	14/127	12%	10/84
Diagnosed developmental condition (e.g., autism or fetal alcohol exposure or learning disorders)	11%	83/739	10%	39/406	16%	20/122	15%	19/127	6%	5/84

* Participants could give more than one answer

Table G. Substance Use*

	All Girls and Young Women		Fraser Health		Interior Health		Island Health		Vancouver Coastal Health	
Use	%	N	%	N	%	N	%	N	%	N
Any cannabis, alcohol or other street drug (past month)	23%	172/732	21%	83/402	20%	24/121	33%	41/126	29%	24/83
Cannabis (past month)	21%	155/738	19%	77/405	18%	22/122	28%	35/127	25%	21/84
Alcohol (past month)	2%	17/ 736	< 1%	< 5/405	< 5%	< 5/122	< 5%	5/126	< 5%	< 5/83
Other street drug (past month)	1%	11/736	< 1%	< 5/404	< 5%	< 5/121	< 5%	< 5/127	< 5%	< 5/84
Nicotine/cigarettes (past 48 hours)	27%	196/736	27%	107/403	28%	34/122	27%	34/127	25%	21/84
Second-hand smoke exposure (≥ 1–4 days in past week)	40%	292/736	40%	160/403	42%	51/122	43%	54/127	32%	27/84

* Participants could give more than one answer

Table H. Physical Health Problems*

	All Girls and Young Women		Fraser Health		Interior Health		Island Health		Vancouver Coastal Health	
	%	N = 739	%	N = 406	%	N = 122	%	N = 127	%	N = 84
Iron-deficiency anemia	20%	151	21%	84	28%	34	14%	18	18%	15
Asthma or allergies requiring puffers on a regular basis	19%	139	18%	74	16%	19	24%	31	18%	15
Migraines (weekly or more)	15%	108	15%	59	16%	19	16%	20	12%	10
Serious injury that left a disability (head or leg injury)	8%	57	8%	32	7%	8	8%	10	8%	7
Thyroid disease	3%	21	3%	12	< 5%	< 5	< 5%	< 5	< 5%	< 5
Cardiovascular disease (including high blood pressure)	2%	13	< 5%	6	< 5%	< 5	< 5%	< 5	0	0
Epilepsy or seizures (weekly or more)	2%	13	< 1%	< 5	< 5%	< 5	< 5%	< 5	< 5%	< 5
Autoimmune disorders (requiring medication on a regular basis)	1%	6	< 1%	< 5	< 5%	< 5	0	0	0	0
Chronic infectious illness (e.g., hepatitis C or HIV)	1%	10	< 1%	< 5	< 5%	< 5	< 5%	< 5	< 5%	< 5
Fibromyalgia	1%	6	< 1%	< 5	< 5%	< 5	0	0	0	0
Diabetes (requiring insulin or pills on a regular basis)	1%	5	< 1%	< 5	< 5%	< 5	< 5%	< 5	0	0
Other (e.g., arthritis, irritable bowel syndrome)	15%	109	15%	60	20%	25	15%	19	< 5%	< 5

* Participants could give more than one answer; all were serious long-term conditions

Table I. History of Maltreatment as a Child*

	All Girls and Young Women		Fraser Health		Interior Health		Island Health		Vancouver Coastal Health	
	%	N	%	N	%	N	%	N	%	N
Moderate/severe neglect, physical abuse, emotional abuse and/or sexual abuse when age 16 years or younger	56%	410/728	55%	221/401	55%	66/119	60%	75/125	58%	48/83

* Participants could give more than one answer

Table J. Recent Exposure to Intimate Partner Violence*

	All Girls and Young Women		Fraser Health		Interior Health		Island Health		Vancouver Coastal Health	
	%	N	%	N	%	N	%	N	%	N
Any intimate-partner violence in the past year	50%	364/735	46%	184/396	55%	65/118	56%	68/122	49%	40/82

* Participants could give more than one answer

Table K. Health and Social Services

	All Girls and Young Women		Fraser Health		Interior Health		Island Health		Vancouver Coastal Health	
	%	N = 739	%	N = 406	%	N = 122	%	N = 127	%	N = 84
Health Services Received in the Past Month										
Primary health care in the past month*	77%	567	75%	303	68%	83	94%	119	74%	62
Prenatal classes**	28%	210	20%	81	26%	32	41%	52	54%	45
Social Services Received in the Past Month										
Income assistance**	29%	212	29%	117	26%	32	29%	37	31%	26
Assistance with health care premiums (BC MSP Premium Assistance)	35%	260	37%	149	28%	34	35%	44	39%	33
Enrolled in program to assist with prescription drug costs (BC PharmaCare)	18%	132	18%	74	8%	10	20%	25	27%	23

* Primary health care included family doctors, nurse practitioners and midwives, including at walk-in clinics or emergency rooms

** Income assistance included BC Income and Disability Assistance; Canada Disability Benefits and Employment Insurance; and BC Youth Agreement benefits