



IMPORTANT: The methods in this report are preliminary and updated as of March 10, 2021.

For more information about COVID-19 RESPPONSE, please visit the study website at <https://whri.org/covid-19-respponse-study/>, or contact us by email at [covid19study@cw.bc.ca](mailto:covid19study@cw.bc.ca).

**Report #2: Released March 11, 2021**

**Early Release: COVID-19 Rapid Evidence Study of a Provincial Population-Based Cohort for Gender and Sex (RESPPONSE): Methods**

**Brotto, L. (2021). *Early Release: COVID-19 Rapid Evidence Study of a Provincial Population-Based Cohort for Gender and Sex (RESPPONSE): Methods*. Women's Health Research Institute. [URL]**

Co-Principal Investigators: Dr. Lori Brotto, PhD  
Department of Obstetrics and Gynaecology  
UBC Faculty of Medicine

Dr. Gina Ogilvie, MD, DrPH  
School of Population and Public Health  
UBC Faculty of Medicine

Co-Investigators: Dr. Angela Kaida  
Dr. Liisa Galea  
Dr. Arianne Albert  
Dr. Manish Sadarangani  
Dr. David Goldfarb  
Dr. Melanie Murray  
Dr. H el ene C ot e

Sponsors: BC Women's Health Foundation  
Michael Smith Foundation for Health Research

## **INTRODUCTION**

This report will describe the methods of COVID-19 RESPPONSE (Rapid Evidence Study of a Provincial Population Based Cohort for Gender and Sex) up to March 10, 2021. This is a population-based cross-sectional study, with the possibility for continued longitudinal collection of data.

On March 11, 2020, the World Health Organization declared Coronavirus Disease 19 (COVID-19), the respiratory illness caused by SARS-CoV-2 infection, an official global pandemic.<sup>1</sup> With the support of the British Columbia Women's Health Foundation the COVID-19 RESPPONSE study was launched, as part of the research response to the COVID-19 pandemic.

Pandemics are known to affect men and women differently. Evidence from previous pandemics indicates that women and other marginalized and vulnerable groups experience inequitable short- and long-term health, financial, and psychosocial outcomes.<sup>2,3</sup> However, population-level data are often analyzed without adequate attention to sex and gender, and there is a scarcity of data on how the impact of the COVID-19 pandemic and associated public health measures intersect with sex (male, female) and gender (man, woman, gender-diverse). Understanding the influence of

## COVID-19 RESPPONSE: Rapid Evidence Study of a Provincial Population Based Cohort for Gender and Sex

sex and gender is critical in order to mitigate the impact of pandemic management on existing inequalities in British Columbia (BC) and Canada, and to inform evidence-based policies and the allocation of public health resources post-COVID-19 pandemic.

In addition, when the COVID-19 RESPPONSE study began, knowledge regarding asymptomatic prevalence of COVID-19 was limited, with conflicting estimates from different international geographies and populations. Importantly, at the time there had been no research on the asymptomatic population prevalence of COVID-19 in Canada.

To guide pandemic management, it is vital that Canada and BC have real-time, comprehensive, population-level data on COVID-19, particularly on past and asymptomatic infections anchored in a sex and gender lens. To address these knowledge gaps, the primary objectives of COVID-19 RESPPONSE are:

- 1) To establish the population prevalence of COVID-19 in BC
- 2) To understand how COVID-19 and related public health interventions have affected people in BC through a sex and gender lens.

COVID-19 RESPPONSE is being led by investigators at the Women's Health Research Institute, in partnership with BC Children's Hospital Research Institute, the Vaccine Evaluation Center, the University of British Columbia (UBC), and Simon Fraser University (SFU).

### **METHODS**

#### *Participants and Recruitment*

Participants, aged 25-69, were stratified into nine five-year age strata. Using an estimated SARS-CoV-2 population seroprevalence of 2% ( $\pm 1$ , 95% CI), the target for recruitment was 750 participants in each stratum, for a total of  $n = 6,750$ .

Ethical approval for this study was received from Children's and Women's Hospital Research Ethics Board. Starting August 20<sup>th</sup>, 2020, potential study participants were invited from six established health research cohorts from BC Women's Hospital and Women's Health Research Institute to participate in an online survey (Table 1). These individuals represented general and priority populations of BC and had previously consented to be contacted for future research studies.

<b>Research cohort name</b>	<b>Description</b>
HPV FOCAL	Healthy women aged 25-65 from BC
Quadrivalent Vaccine Evaluation Study (QUEST)	Health Canadians aged 20-29
Canadian HIV Women's Sexual and Reproductive Health Cohort Study (CHIWOS)	Canadian women living with HIV/AIDS

COVID-19 RESPPONSE: Rapid Evidence Study of a Provincial Population Based Cohort for Gender and Sex

Complex Chronic Disease Program (CCDP)	Men and women over 18 years old living with chronic complex diseases
Centre for Pelvic Pain and Endometriosis (CPP/Endo)	Women 18 years or older living with pelvic pain and/or endometriosis in BC
Children and Women: AntiRetroviral Therapy and Markers if Aging (CARMA)	Women 19 years or older who are HIV+ enrolled in the CARMA study in Vancouver, BC

Table 1. Health research Cohorts from BC Women’s Hospital and Women’s Health Research Institute leveraged for COVID-19 RESPPONSE.

Individuals aged 25-69 from these cohorts were sent an email invitation to participate (*Index Participants*) via an online survey. To diversify sex and gender representation, respondents were asked to pass on the invitation to a household member who identified as a gender different from the index participant (*Household Participants*). All potential participants received up to three email reminders to participate in the survey.

Inclusion criteria: current resident of British Columbia; aged 25-69; any gender.

Exclusion criterion: unable to complete our survey online.

On October 29<sup>th</sup>, 2020, recruitment expanded to include non-research patients from BC Women’s Hospital CPP/Endo. As well, public enrolment into this study began on November 3<sup>rd</sup>, 2020. Public recruitment was done through the REACH BC platform, social media (i.e., Facebook, Instagram, Twitter), including posts on Women’s Health Research Institute website, and engaging stakeholders to facilitate recruitment including UBC and SFU. All participants in this study were able to enter a draw to receive a \$100 e-gift card for completing the surveys and self-collection kit.

Recruitment continued until pre-determined targets for nine age strata were achieved. The target recruitment numbers were determined based on projected population-level seroprevalence of SARS-CoV-2. On November 18<sup>th</sup>, 2020, public recruitment and enrolment closed for individuals aged 45 years and older, after targets were reached for these ages. On December 15<sup>th</sup>, 2020, public enrolment also closed for individuals aged 40-44 years. All individuals invited from the established health research cohorts were able to enroll despite their age. Recruitment and enrolment closed completely on March 1<sup>st</sup>, 2021.

### *Study Design*

The online survey included six survey modules. Prior to completing the survey, participants were able to consent to be contacted for future research and to participate in potential longitudinal surveys on the impact of COVID-19. The survey was tested for face validity and comprehension, pilot tested, and a final version was implemented using REDCap (Research Electronic Data Capture).

The survey project consisted of six modules that took about 30-45 minutes to complete in total. These modules were:

COVID-19 RESPPONSE: Rapid Evidence Study of a Provincial Population Based Cohort for Gender and Sex

- 1) Core Module: included questions about COVID-19 symptoms and risk factors, sociodemographic factors, chronic diseases, substance use, and vaccine attitudes (using an adapted version of the validated WHO Vaccine Hesitancy Scale);
- 2) Psychosocial Module: included questions about mental health outcomes using validated clinical scales (PHQ-9, GAD-7, Coronavirus Health and Impact Survey; CRISIS), gender-based violence, and coping ability;
- 3) Economics Module: included questions about income, employment, hours dedicated to work and childcare activities, housing security, and food security;
- 4) Vaccine Module: included questions on attitudes, influences, and perceived control regarding the COVID-19 vaccine, grounded in the Theory of Planned Behaviour;
- 5) Reproductive Health Module: for participants who identified with a female birth assignment, this module included questions about access to contraceptives, menstrual cycles, and menopausal symptoms;
- 6) HIV Module: for participants who reported living with HIV, this module included questions about how COVID-19 has impacted their experience of living with HIV.

A list of mental health and support resources was provided to participants who endorsed answers of concern (e.g. experiencing gender-based violence).

For some survey questions, participants were asked to retrospectively reflect on different phases of the pandemic, which for the purpose of the survey were delineated by the pandemic control measures in place in BC. Participants who completed the surveyed before November 30<sup>th</sup>, 2020 were asked to respond based on three phases of the pandemic: **pre-COVID** (before mid-March 2020), **Phase 1** (mid-March 2020 to May 20, 2020), and **Phase 2-3** (May 21, 2020 to November 30, 2020). On November 30<sup>th</sup>, 2020, phase dates were amended and additional phases were added in response to changing public health orders in the province: **pre-COVID** (before mid-March 2020), **Phase 1** (mid-March 2020 to May 20, 2020), **Phase 2-3** (May 21, 2020 to August 31, 2020), **Phase 4** (September 1, 2020 to October 31, 2020), and **Phase 5** (November 1, 2020 to March 1, 2021) (Table 1).

COVID-19 Phases in BC	COVID-19 Control Measures in BC <sup>4,5</sup>
Phase 1 (mid-Mar. 2020 to mid-May 2020)	Only essential services (i.e., essential health services, law enforcement, first responders, food and agriculture service providers, vulnerable population service providers, transportation, manufacturing, sanitation, financial institutions, communications and information technology, critical infrastructure, non-health essential service providers).

## COVID-19 RESPPONSE: Rapid Evidence Study of a Provincial Population Based Cohort for Gender and Sex

Phase 2 (mid-May 2020 to June 2020)	Re-opening of select services under enhanced protocols (i.e., restoration of health services such as re-scheduling elective surgery and medically related services such as dentistry, retail sector, personal service establishments such as hair salons, in-person counselling, restaurants, museums, office-based worksites, recreation/sports, parks and outdoor spaces, childcare).
Phase 3 (June 2020 to Aug. 31, 2020)	Continued re-opening of select services under enhanced protocols (i.e., hotels and resorts, parks including overnight camping, domestic film industry, select entertainment such as movie theaters, post-secondary education with mix of online and in-person learning, K-12 education).
Phase 4 (Sept. 1, 2020 to Oct. 31, 2020)	Restrictions implemented on gatherings and for select services (i.e., prohibited events in banquet halls, maximum 50-person gatherings, liquor service to stop at 10:00pm).
Phase 5 (Nov. 1, 2020 to the date of this report)	Increased restrictions on gatherings and services (i.e., prohibited gatherings at private residences for those who are not occupants of that residence, restrictions on gatherings outside of a private residence, restrictions on sport and indoor fitness facilities, restrictions on buses and vehicles, requirements to wear face coverings).

*Table 2. COVID-19 phases and associated control measures in BC. Note: details included in this table are not exhaustive. This table is only intended to provide a general understanding of COVID-19 control measures in BC.*

After completing the survey modules, participants were given the opportunity to consent to receive an at-home SARS-CoV-2 research antibody test, tested via dried blood spots (DBS). Participants were asked to provide their mailing address and could indicate their willingness to participate in additional self-collection activities in the future.

Self-collection packages were mailed to the participants. Participants received up to two reminders to complete their self-collection and were provided with the link to an instructional video to assist them with the self-collection process. Self-collection packages included an instruction manual, a pre-paid return envelope addressed to the Vaccine Evaluation Centre (VEC) in Vancouver, BC, and all necessary materials for collecting a DBS sample. Once completed, participants were asked to write the date and time of their self-collection on their DBS collection card and return their sample to the VEC for storage and processing.

When a DBS sample arrived at the lab, a follow-up survey was automatically sent to the participant. This 1-5 question survey asked the participant about their vaccination status at the time that they completed their self-collection. At the date of this report, data collection of DBS samples was still ongoing.

### **Knowledge Translation**

In February 2021 we received funding from the Michael Smith Foundation for Health Research to facilitate knowledge translation. A series of reports was prioritized, and briefing notes were prepared as requested by public health and health authority stakeholders. As of March 1<sup>st</sup>, 2021, we have prioritized our data analytic plan as well as completion of all DBS analyses.

COVID-19 RESPPONSE: Rapid Evidence Study of a Provincial Population Based Cohort for Gender and Sex

Co-Investigators and Collaborators

**Co-Principal Investigators:**

Lori Brotto, PhD, R Psych  
Professor, Department of Obstetrics and Gynaecology, University of British Columbia

Gina Ogilvie MD, MSc, FCFP, DrPH  
Professor, School of Population and Public Health, University of British Columbia

**Co-Investigators:**

Angela Kaida PhD, MSc  
Associate Professor, Department of Health Sciences, Simon Fraser University

Liisa Galea, PhD  
Professor, Department of Psychology, University of British Columbia

Arianne Albert, PhD  
Adjunct Professor, Department of Obstetrics and Gynaecology, University of British Columbia  
Senior Biostatistician, Women's Health Research Institute

Manish Sadarangani, BM, BCh, DPhil  
Associate Professor, Department of Pediatrics, University of British Columbia

David Goldfarb, MD  
Clinical Associate Professor, Department of Pathology and Laboratory Medicine, University of British Columbia

Helene Cote  
Professor, Department of Pathology and Laboratory Medicine, University of British Columbia

Melanie C. Murray  
Clinical Associate Professor, Department of Infectious Diseases, University of British Columbia

Sarai Racey  
Post-Doctoral Fellow, School of Population and Public Health, University of British Columbia

Anna Gottschlich  
Post-Doctoral Fellow, School of Population and Public Health, University of British Columbia

**Research Staff:**

Laurie Smith  
Research Program Manager, BC Cancer Agency/Women's Health Research Institute

COVID-19 RESPPONSE: Rapid Evidence Study of a Provincial Population Based Cohort for Gender and Sex

Shanlea Gordon

Research Coordinator, BC Children's Hospital Research Institute/Women's Health Research Institute

Amy Booth

Research Coordinator, School of Population and Public Health, University of British Columbia/Women's Health Research Institute

Falla Jin

Research Assistant, BC Children's Hospital Research Institute/Women's Health Research Institute

Alexandra Baaske

Research Assistant, BC Children's Hospital Research Institute/Women's Health Research Institute



REFERENCES

1. World Health Organization. Rolling updates on coronavirus disease (COVID-19) [Internet]. 2020 Mar 11 [cited 2021 Feb 5]. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen>.
2. Wenham C, Smith J, Morgan R. COVID-19: the gendered impacts of the outbreak. The Lancet [Internet]. 2020 Mar 6;(395):846-848. Available from: [https://doi.org/10.1016/S0140-6736\(20\)30526-2](https://doi.org/10.1016/S0140-6736(20)30526-2).
3. United Nations Population Fund. COVID-19: A gender lens [Internet]. 2020 Mar 1 [cited 2021 Feb 8]. Available from: <https://www.unfpa.org/resources/covid-19-gender-lens>.
4. Government of British Columbia. BC's restart plan: next steps to move BC through the pandemic [Internet]. 2020 [cited 2021 Feb 8]. Available from: [https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/gdx/bcs\\_restart\\_plan\\_web.pdf](https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/gdx/bcs_restart_plan_web.pdf).
5. Government of British Columbia. COVID-19 (novel coronavirus) [Internet]. 2021 Feb 10 [cited 2021 Feb 12]. Available from: <https://www2.gov.bc.ca/gov/content/health/about-bc-s-health-care-system/office-of-the-provincial-health-officer/current-health-topics/covid-19-novel-coronavirus>.