# Deriving National SARS-CoV-2 Seroprevalence and Symptomology Estimates from Self-Collected Biospecimens and Questionnaire Data

**CITF Scientific Meeting – March 9, 2023**

**Jeff Latimer, PhD**
**Director General, Health Statistics Branch**

Delivering insight through data for a better Canada

# Conflict of Interest Declaration

Statistics Canada has no conflict of interest to declare.

The Canadian COVID-19 Antibody and Health Survey was funded by the Public Health Agency of Canada (PHAC). Statistics Canada receives funding from PHAC for COVID-19 and non-COVID-19 initiatives.

Public Health Agency of Canada
Agence de la santé publique du Canada

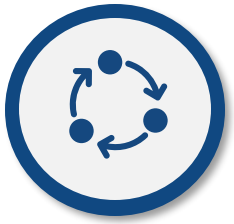
COVID-19 IMMUNITY TASK FORCE
GROUPE DE TRAVAIL SUR L'IMMUNITÉ FACE À LA COVID-19

Statistics Canada
Statistique Canada

# Canada's National Statistical Agency

- Comprehensive and high quality survey frames
- Weighted adjustments and representative findings

- Extensive data collection and methodological infrastructure
- Data linkage platform with numerous health and non-health data



- Advanced analytic cloud-based workspace enables collaboration within a secure environment for study partners

# Canadian COVID-19 Antibody and Health Survey (CCAHS)

Estimate the prevalence of **Post-COVID-19 Condition, contributing factors and impacts** in Canada

Assess the **antibody/immunity profiles** and **acute infection status** of Canadians

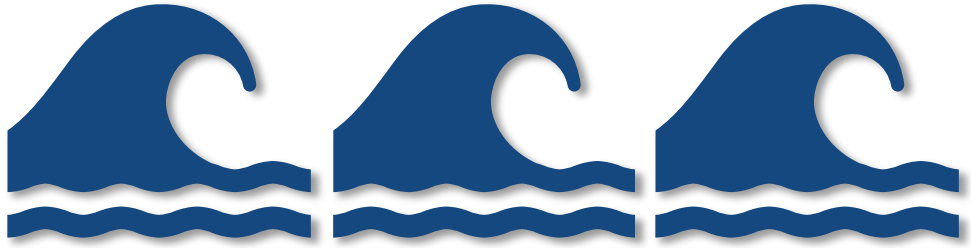
Evaluate how a wide-scale survey-based methodology that includes self-administered biospecimen tests can be used to estimate the national seroprevalence of SARS-CoV 2 infections

# Survey Design

N = 106,000

10 Provinces

18 +



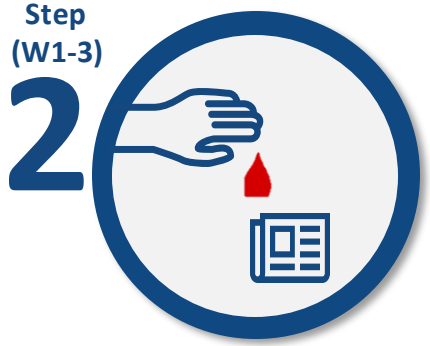
3 Waves of Collection: April, May, June

# Survey Components

## Step 1 — Electronic Questionnaire

- Secure Access Code

## Step (W1-3) 2 — Dried Blood Spot



- Instructional Brochure and Video

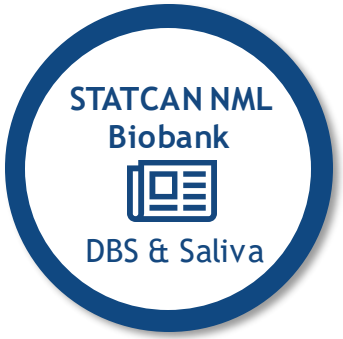
## Step (w2-3) 3 — Saliva Sample

- + Infographic

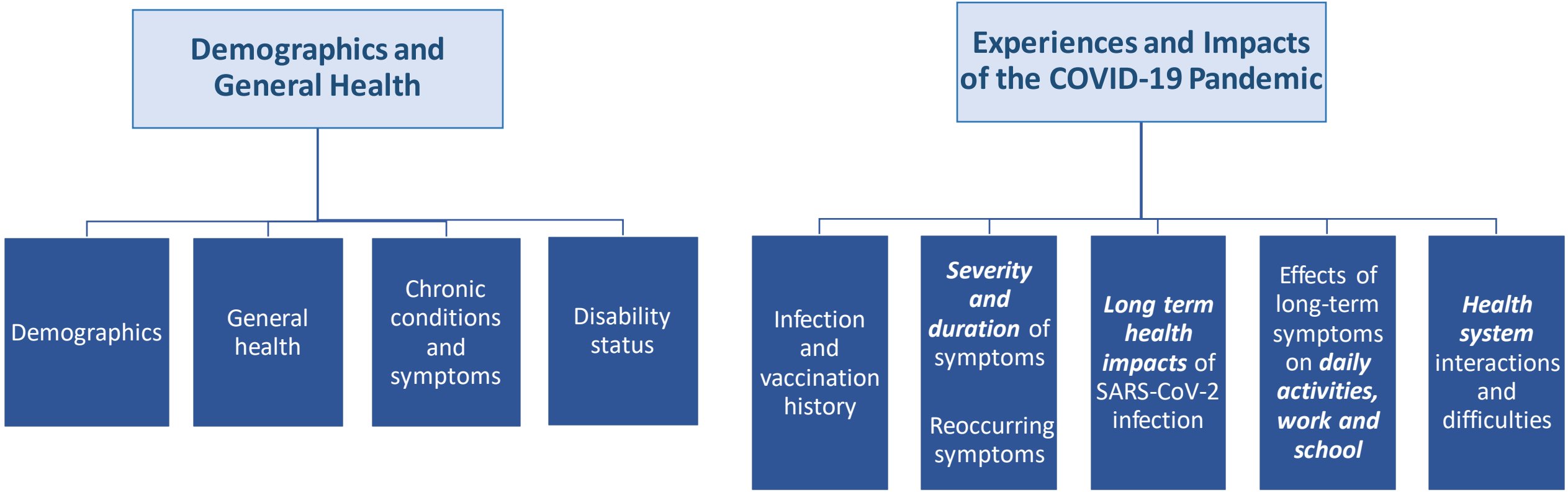
## Step 4 — Laboratory Analysis

- **DBS sample:** Antibodies from infection &/or vaccination
- **Saliva sample:** Current or recent infection, variant, viral sequence

## Step 5 — Reporting & Biobanking



# Electronic Questionnaire Content



# Infections During the Summer of 2022

## Key findings from Saliva testing

On an average day during summer 2022, ***1.8%*** or about ***500,000*** Canadian adults would have tested positive through a PCR test

***35%*** of Canadian adults who had a current or recent infection ***did not know or suspect*** having the virus – they were ***unaware*** of their infection

***14.4%*** of Canadian adults who showed detectable amounts of the virus during the summer reported that they first tested positive for COVID-19 ***more than three months earlier – potential indicator of reinfection***

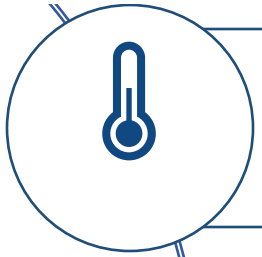
https://www150.statcan.gc.ca/n1/daily-quotidien/221017/dq221017b-eng.htm

**Numbers are based on data released in December 2022 and subject to change with the final dataset*

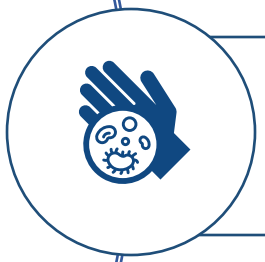
# Post COVID-19 Condition

**Long term COVID-19 Symptoms:** Experienced symptoms 3 or more months after testing positive

## Key findings from survey results

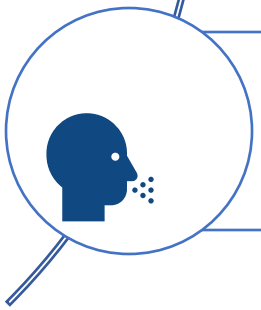


By the end of May 2022, ***28.6% of Canadians had tested positive for COVID-19*** and an additional ***9.0% suspected*** they have had COVID-19.



**12.8%** of Canadian adults who had or thought they had COVID-19 still experienced symptoms three or more months after infection.

- ***1.3 million Canadians or 4.5% of the adult population***



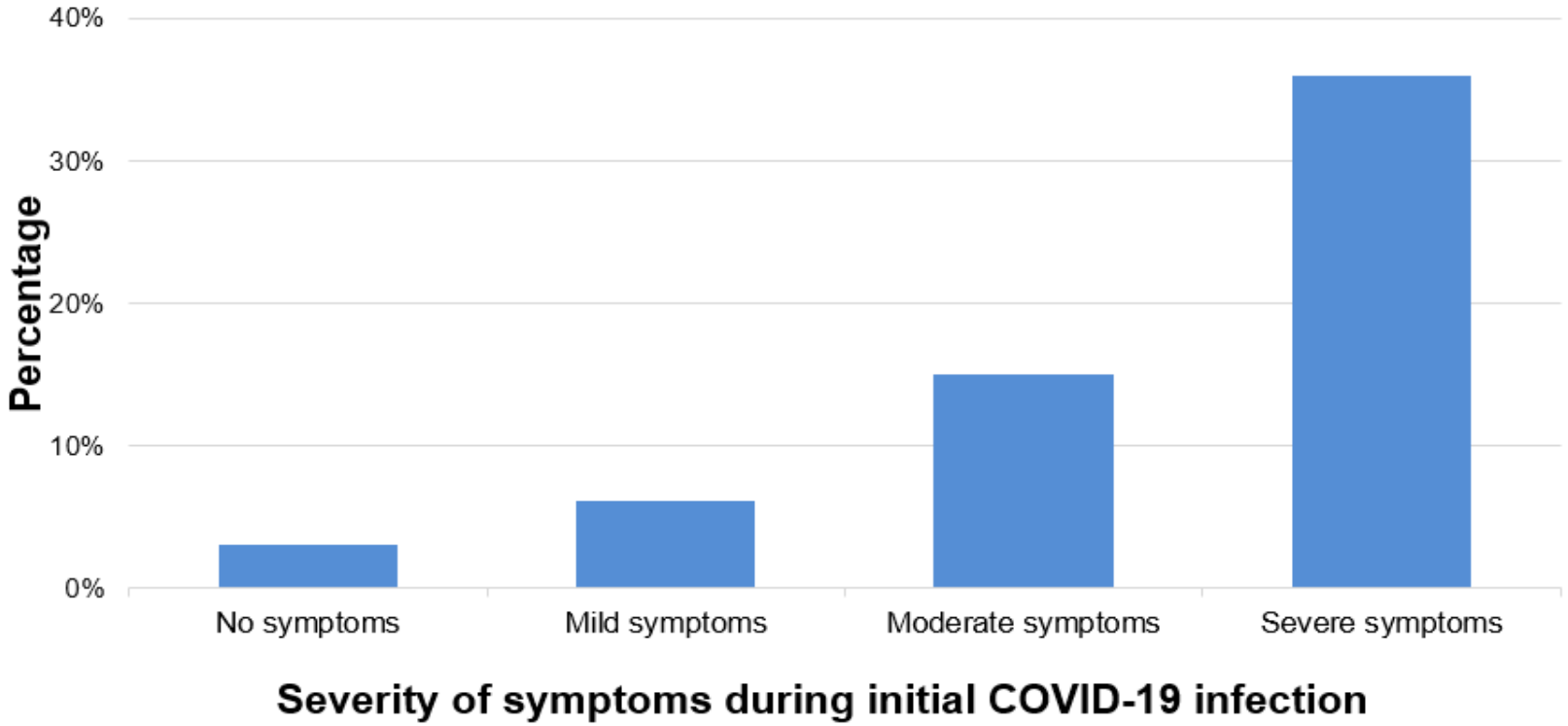
Most common unresolved symptoms: ***fatigue (72%), cough (40%), shortness of breath (39%), and brain fog (33%)***

https://www150.statcan.gc.ca/n1/*daily-quotidien*/221017/dq221017b-eng.htm
https://www150.statcan.gc.ca/n1/daily-quotidien/221208/dq221208a-eng.htm

** Numbers are based on data released in December 2022 and subject to change with the final dataset*

# Severity of Long Term Symptoms

**Increased severity of symptoms at the time of infection is predictive of the likelihood of experiencing long-term (≥3 Months) symptoms**




https://www150.statcan.gc.ca/n1/daily-quotidien/221017/dq221017b-eng.htm

**Numbers are based on data released in December 2022 and subject to change with the final dataset*

# Post-COVID-19 Condition Risk Factors

**20.4% of females** reported longer-term symptoms

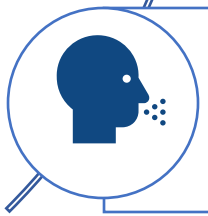
**12.6% of males** reported longer-term symptoms

Percentage of adults reporting longer-term symptoms increased with the **number of chronic conditions pre-infection**:

- **12.3%** of adults with no chronic conditions
- **35.0%** of adults with 4+ chronic conditions

**BMI was a predictor of longer-term symptoms**

- **25.3%** of adults with a BMI between 35- 39.9 kg/$m^2$
- **15.8%** among adults with a BMI less than 24.9kg/$m^2$



Adults infected *before* ***December 2021*** were more likely to report longer-term symptoms

***25.6%*** of adults infected before December 2021

***10.3%*** of adults infected after November 2021

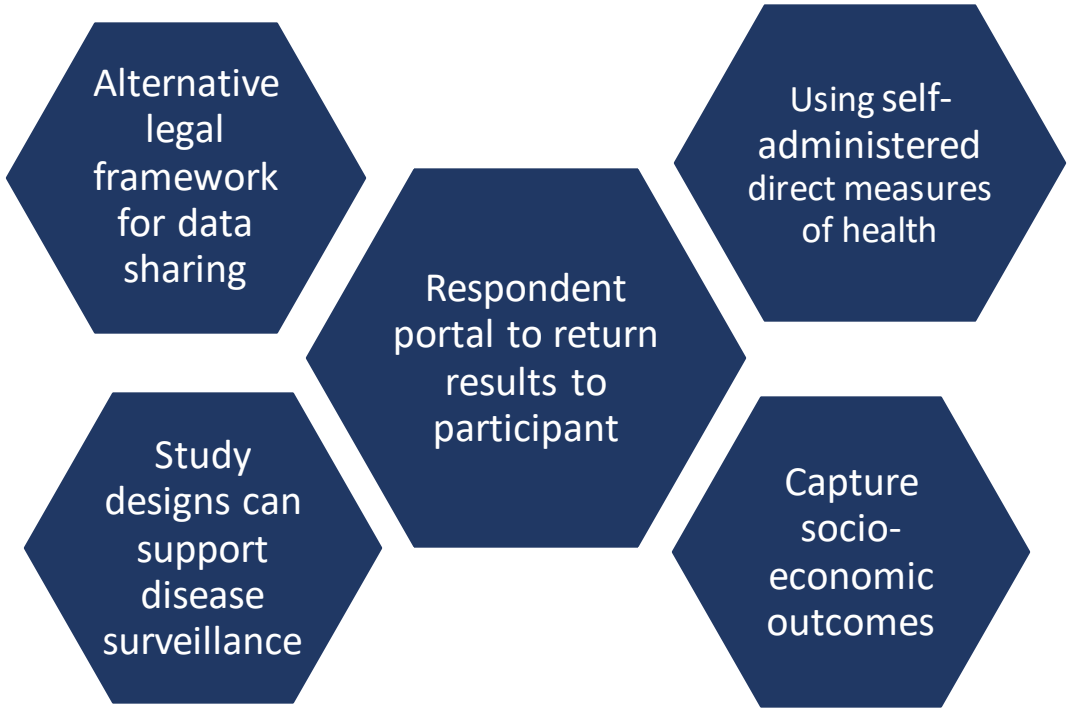
** Numbers are based on data released in December 2022 and subject to change with the final dataset*

# Challenges and Solutions for Official Statistics

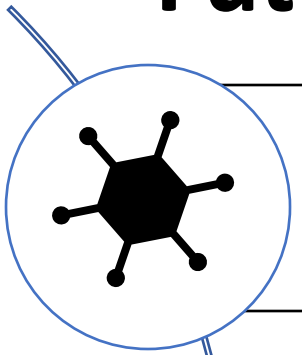
## Challenges

- Timely release of data to partners
- Reporting to respondents in a timely manner
- Turn-around-time for lab results and dissemination.

## Options for consideration in future studies

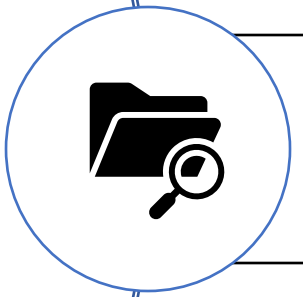


# Future Analytical Products



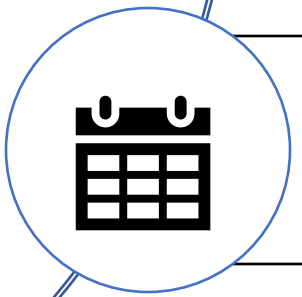
**March 2023**

- Official release of seroprevalence results
- Survey data becomes available for research (RDCs)



**April-May 2023**

- Release of CCAHS-2 public use microdata files



**May 2023**

- Release of results on healthcare access and experiences
- Neighborhood analysis of the impact of the pandemic

# Acknowledgements


Statistics Canada
Statistique Canada

uOttawa
Marc-Andre Langlois, PhD

Sinai Health | Lunenfeld-Tanenbaum Research Institute
Anne-Claude Gringas, PhD

National Microbiology Laboratory

Public Health Agency of Canada
Agence de la santé publique du Canada

COVID-19 IMMUNITY TASK FORCE
GROUPE DE TRAVAIL SUR L'IMMUNITÉ FACE À LA COVID-19