Update on the Canadian Longitudinal Study on Aging (CLSA)

Dr. David B. Hogan

CLSA National Leads

Parminder Raina
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McGill University

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What is the CLSA?

A research platform – Infrastructure to enable state-of-the-art, interdisciplinary population-based **research** and **evidenced-based** decision-making that will lead to better health and quality of life for Canadians.

Key Points about the CLSA

- Major strategic initiative of CIHR/ discussions began in 2001
- More than 160 researchers and collaborators in 26 institutions/ equivalent number of staff
- Multidisciplinary – biology, genetics, medicine, psychology, sociology, demography, economics, epidemiology, nutrition, health services
- Largest research platform of its kind in Canada for breadth & depth
- Following 50,000+ Canadians aged 45-85 at baseline for 20 years

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CLSA Network of Collaborating Institutions

UNIVERSITY OF CALGARY

SFU SIMON FRASER UNIVERSITY ENGAGING THE WORLD

UNIVERSITY OF MANITOBA EST. 1877

McMaster University

DALHOUSIE UNIVERSITY Inspiring Minds

McGill

Institut de recherche
Centre universitaire de santé McGill

Research Institute
McGill University Health Centre

SOINS CONTINUS
Bruyère CONTINUING CARE

INSTITUT DE RECHERCHE BRUYÈRE RESEARCH INSTITUTE
Affilié à l'Université d'Ottawa
Affiliated with the University of Ottawa

uOttawa

UBC

a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

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University of Victoria

UNIVERSITÉ DE SHERBROOKE

MEMORIAL UNIVERSITY

Participants

- **Tracking Cohort**
  - Target - 20,000 participants from all 10 provinces, followed through **Computer-Assisted Telephone Interviews** (~1 hour at baseline)
  - **21,241 recruited**
- **Comprehensive Cohort**
  - Target - 30,000 participants living within 25 km (or 50 km) of a CLSA Data Collection Site (DCS)
  - Followed through **in-home interviews** (~1 hour) and further assessments (~2-3 hours) at a **DCS**
  - **30,097 recruited**

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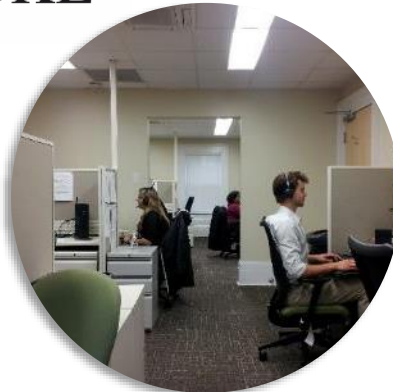Étude longitudinale canadienne sur le vieillissement

CLSA Infrastructure
Computer-Assisted Telephone Interview (CATI) Centres

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DALHOUSIE UNIVERSITY
Inspiring Minds

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CLSA Data Collection
Data Collection Sites

Biospecimen Collection

- Blood
- Urine

Interviews/ Physical Assessments

- Height, Weight, BMI
- Bone Density, Body Composition, Aortic Calcification
- Blood Pressure
- ECG
- Carotid Intima-Media Thickness
- Pulmonary Function
- Vision & Hearing
- Performance testing

Cognitive Assessments

- Memory
- Executive function
- Reaction time

CLSA Research Platform

50,000 participants aged 45 - 85 at baseline

Target: 20,000
Actual: 21,241
Randomly selected within provinces

Target: 30,000
Actual: 30,097
Randomly selected
within 25-50 km of 11 sites

Questionnaire
By telephone (CATI)

Questionnaire
In person (CAPI)

Clinical/physical tests
Blood, urine
@ Data Collection Site

2010 - 2015   **2015**   **2018**   **2021**   **2033**

TIME
20 Years

Participants aged 45 to 85 at baseline (51,338)

Baseline   FUP-1   FUP-2   FUP-3   FUP-4   FUP-5   FUP-6

Active follow-up (FUP) every 3 years

National Scope

Home Interviews & Data Collection Site Visits

Telephone Interviews

St. John's

Victoria
Vancouver
Surrey
Calgary
Winnipeg
Montreal
Ottawa
Sherbrooke
Halifax
Hamilton

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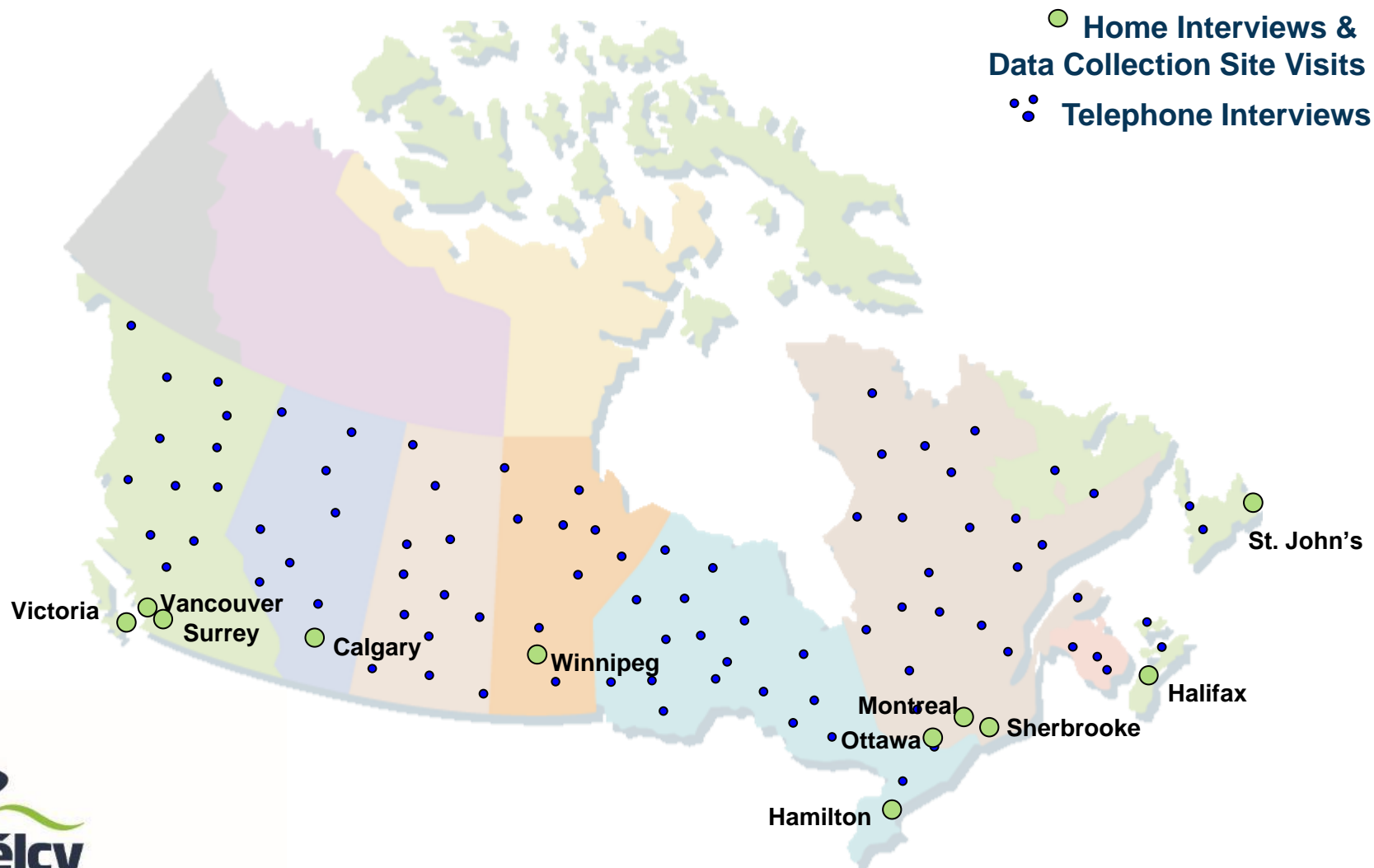
High Retention Rate – 93%

- By the end of the first follow-up, 4.3% of participants had withdrawn from active data collection though most (60.8%) of those withdrawn consented to continue passive data collection through data linkage
  - An additional 2.7% of participants had died since their baseline assessment

- Accommodations made to keep in the study
  - This includes those who move from one area to another or to LTC, modify data collection (e.g., "DCS at home" if can't come), appoint a proxy to answer for them

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How the collected data are being used

- **Approved projects** – since 2014 a total of 351 (34 new ones so far in 2021)
  - www.clsa-elcv.ca/approved-projects

- **Publications** – since 2009 a total of 140 on PubMed
  - www.clsa-elcv.ca/stay-informed/publications

- Literature
  - "Aging in Three-Year Increments" by Laura Wershler (*You Look Good for Your Age: An Anthology*; edited by Rona Altrows [University of Alberta Press, May 2021])

Number of Projects/ Publications
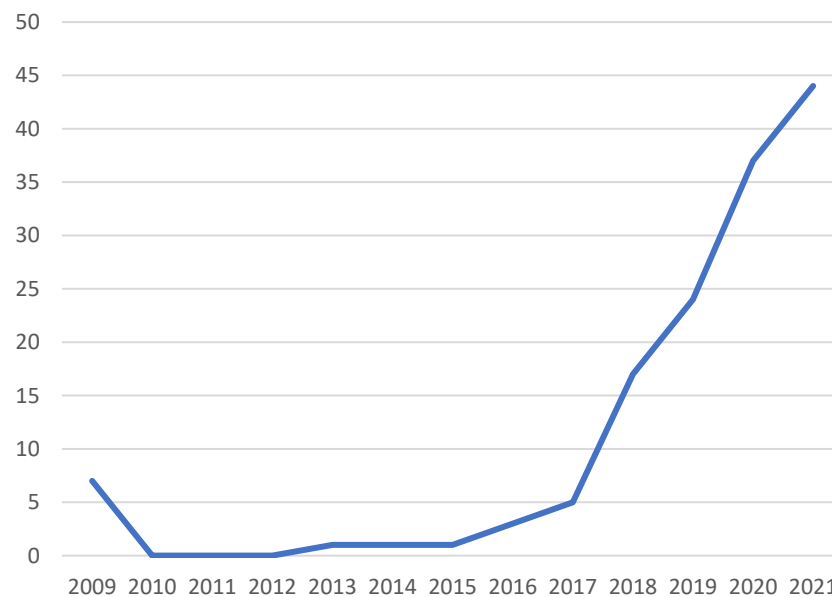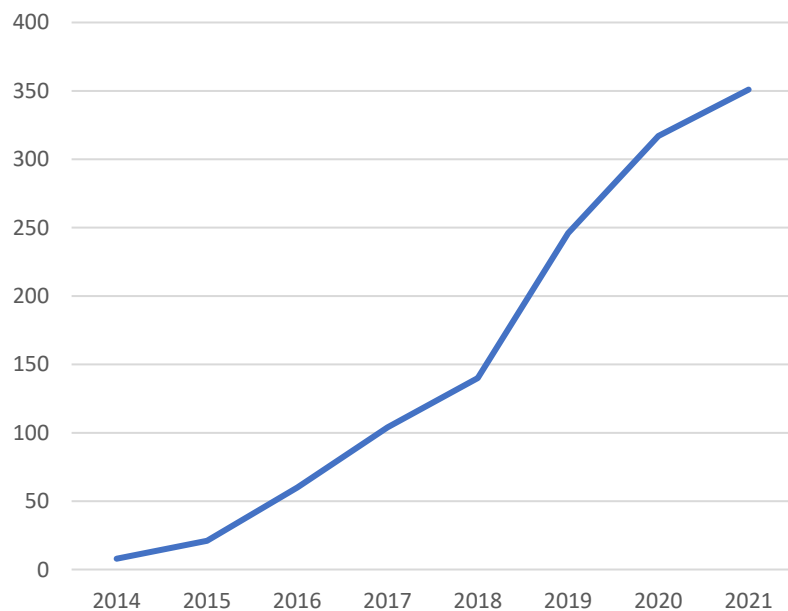
Most "Interesting" Finding

- Over 350 teams and ~1200 researchers have or are using CLSA data to pursue research

- Lag from project → publication → practice & policy (e.g., age-friendly communities, social isolation/ loneliness)
  - Effects of CLSA findings hard to disentangle

- I can only respond from my perspective
  - Incredible engagement of participants
  - Studies where I've taken part

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Studies Where I've Taken Part

- On-going - MCI and dementia algorithm using data being collected in the CLSA

- Did CLSA data show an impact of the 2013 Calgary flood?

- Calgary-level representativeness of the CLSA cohort

- Relationship between cognition and balance/gait measures

- Measuring frailty using CLSA data and determining what factors associated with it

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Some Things I Found Interesting

- Sleep apnea ⇧ glaucoma & macular degeneration risk

- 1/6 had a chronic daily cough

- Mild traumatic brain injury ⇧ by 60% risk of cognitive decline at FU-1

- ~60% had adverse childhood experiences

- 44% were caregivers/ 14% care recipients (6% both – "Lean on Me" by Bill Withers)

- COVID-19 mental health impact greatest in the young-old (55-64) + those with low income

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2018 Baseline (2010-2015) Report

- Highlights (Alberta participants – 4,964)
  - 90% rated health as good/very good/ excellent
  - 95% rated mental health as good/very good/excellent – 45-54 had the most concerns
  - 20%+ felt lonely - ↑ women and as they aged
  - 1/20 had suffered a fall in last year
  - 25% physically active as recommended
- Download – www.clsa-elcv.ca/clsareport

Highlights of 2020-2021

- Responding to the COVID-19 pandemic
- Further Canada Foundation for Innovation (CFI) investment in the CLSA
  - Renew infrastructure & add new tools to identify causes & early stages of chronic health conditions (e.g., mobility impairment, disability & cognitive decline)
- Funding for 3rd follow-up cycle of data collection
- Additional funding to address dementia
- Hosted the CIHR-IA 2021 Summer Program on Aging
- Funding provided by CIHR to use CLSA data

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2020-2021 CLSA Calgary Site

Highlights

- Adapting to COVID-19 pandemic
- Successfully supporting the CLSA COVID study
- Successfully supporting the CLSA COVID Antibody study
- Balancing CLSA and local U of C requirements for the conduct of research
- Keeping everyone healthy and well

Calgary Team:
- IH: Pam, Glenn, Amy, Mark
- DCS: Lorlene, Jessica, Kim, Steve
- Lab: Loan
- Coordinator: Berchman
- PIs: Myself, Dr. Jacqueline McMillan

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Contact:
Data inquiries: access@clsa-elcv.ca
General inquiries: info@clsa-elcv.ca

CLSA is funded by the Government of Canada through CIHR and CFI, and provincial governments and universities

www.clsa-elcv.ca

Responding to COVID-19

- March 2020: In-person data collection suspended

- Migration to telephone interviews

- Pivoted to COVID-19 research

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www.clsa-elcv.ca/coronavirus
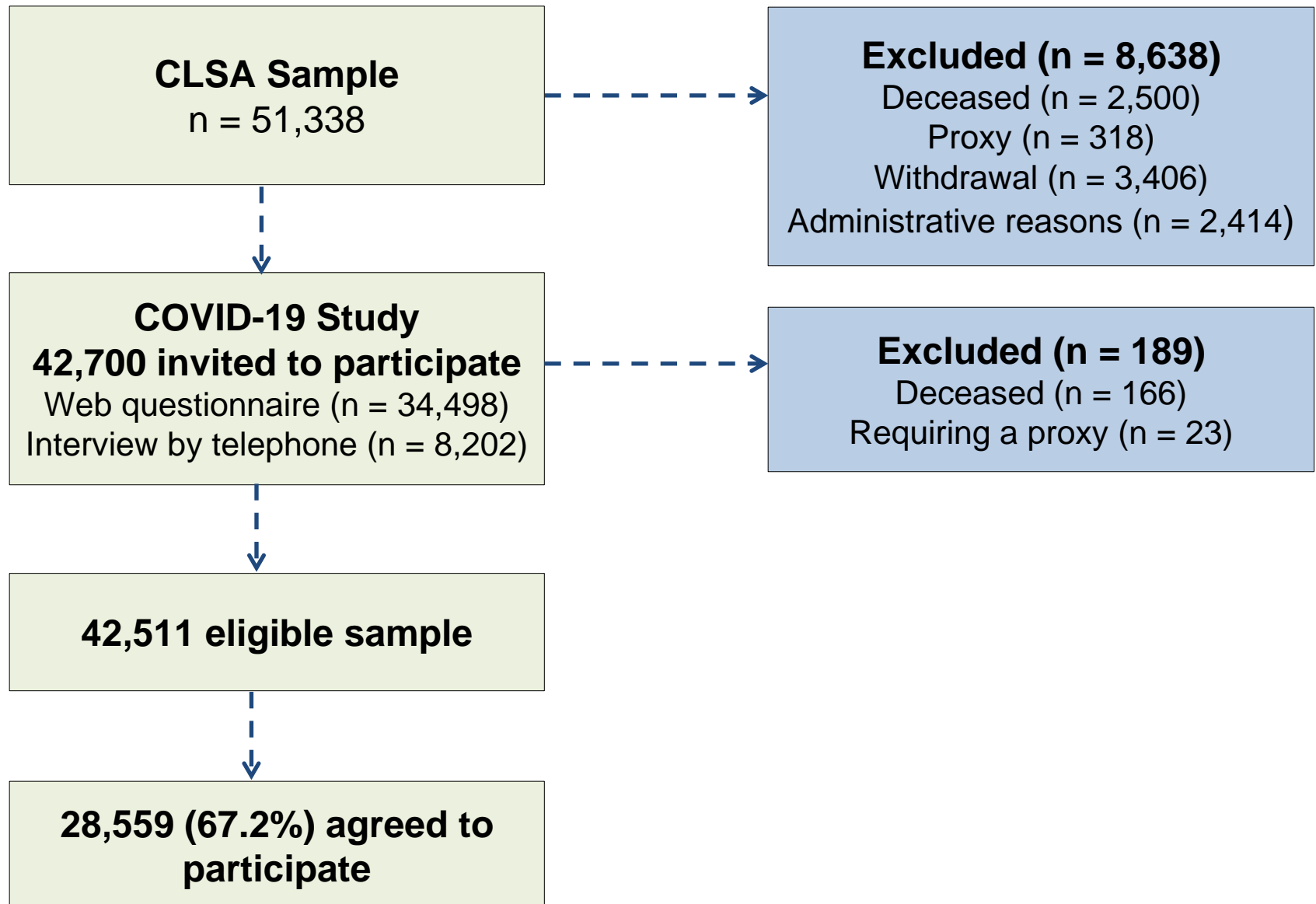
CLSA COVID-19 Questionnaire Study

- Launched April 2020

- Web and telephone questionnaires

- Weekly, biweekly, monthly data collection

- 28,000 baseline participants agreed to participate

- Exit survey fall 2020

- Funded through the McMaster Institute for Research on Aging, McMaster University, Juravinski Research Institute, the Nova Scotia COVID-19 Health Research Coalition and the Public Health Agency of Canada

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CLSA COVID-19 Questionnaire Study

- COVID symptoms
- COVID status
- Risk factors
- Health-care use
- Health behaviours

- Public health measures
- Social factors
- Depression and anxiety
- Economic consequences
- Function and mobility

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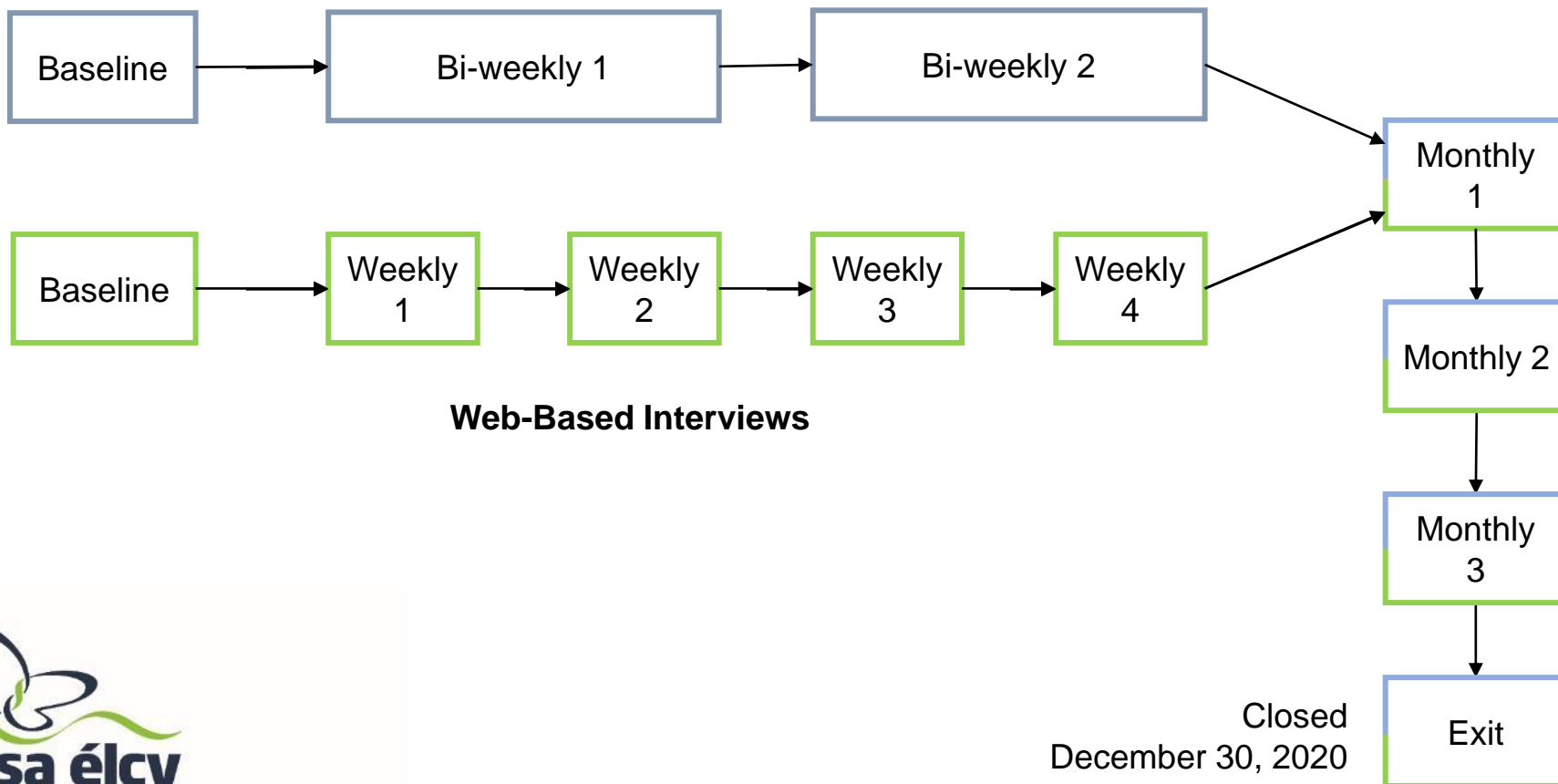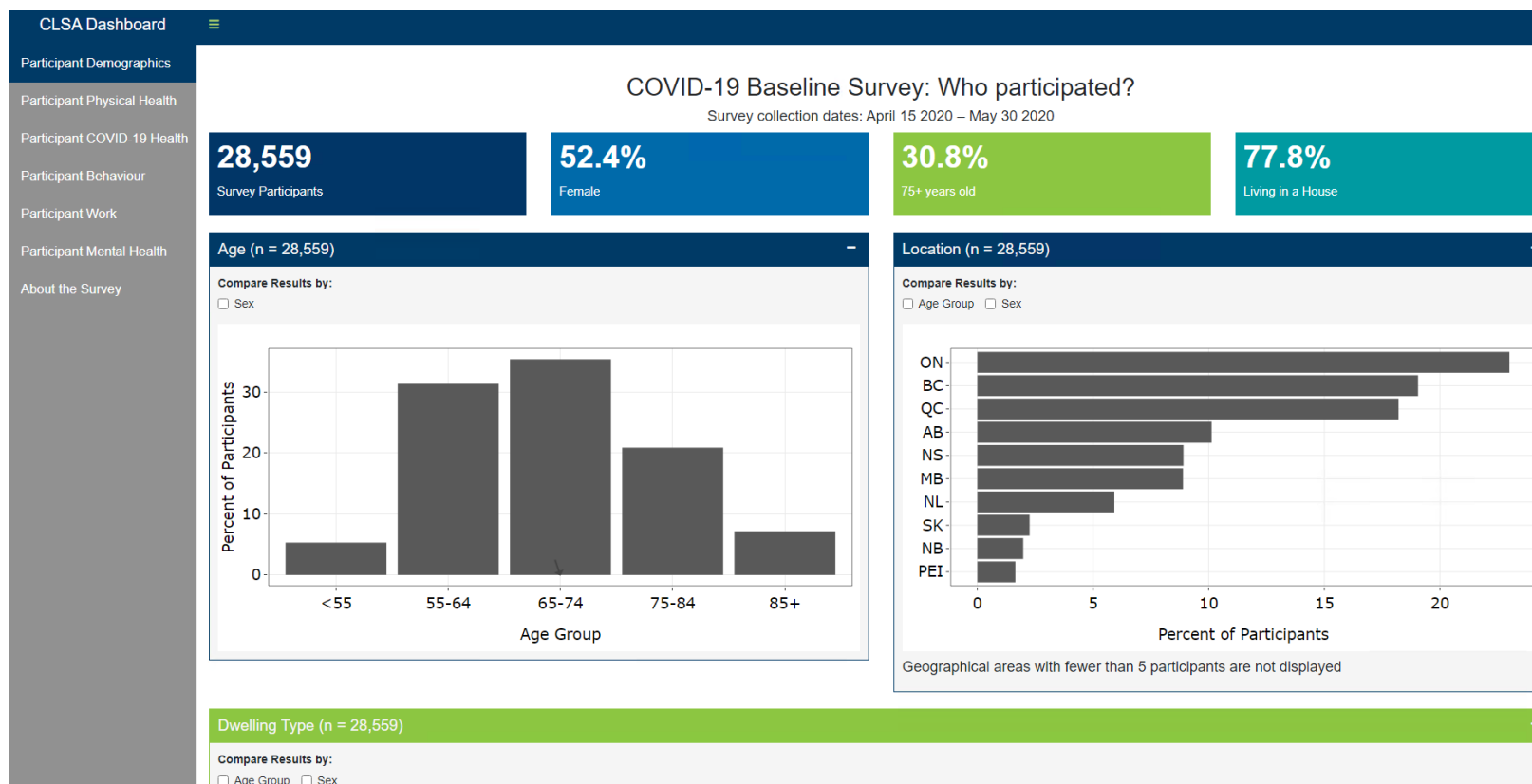Étude longitudinale canadienne sur le vieillissement

CLSA COVID-19 Study Recruitment

CLSA Sample
n = 51,338

Excluded (n = 8,638)
Deceased (n = 2,500)
Proxy (n = 318)
Withdrawal (n = 3,406)
Administrative reasons (n = 2,414)

COVID-19 Study
42,700 invited to participate
Web questionnaire (n = 34,498)
Interview by telephone (n = 8,202)

Excluded (n = 189)
Deceased (n = 166)
Requiring a proxy (n = 23)

42,511 eligible sample

28,559 (67.2%) agreed to participate

CLSA COVID-19 Questionnaire Study

Launched
April 15, 2020

Phone-Based Interviews

Baseline → Bi-weekly 1 → Bi-weekly 2 → Monthly 1

Baseline → Weekly 1 → Weekly 2 → Weekly 3 → Weekly 4 → Monthly 1

Web-Based Interviews

Monthly 1 → Monthly 2 → Monthly 3 → Exit

Closed
December 30, 2020

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COVID-19 Study Data Dashboard

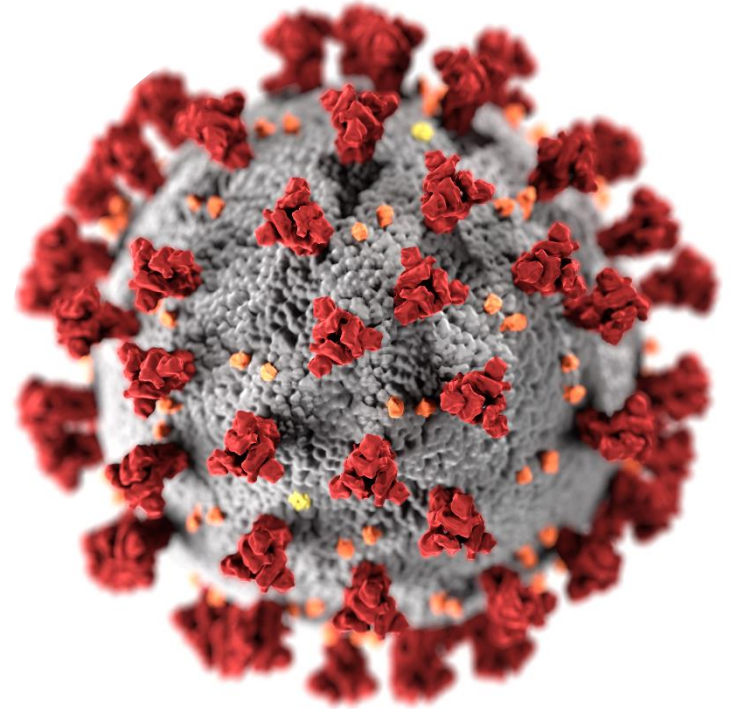https://dashboard.clsa-elcv.ca/baseline/clsa-dashboard-en/

COVID-19 Questionnaire Study

- Learnings to date:
    - Vaccination willingness
    - Mental health impact
    - Mobility and function impact
    - Long-haul COVID-19

COVID-19 Antibody Study

- To understand prevalence and impact of SARS-CoV-2 infection among middle-aged and older adults in Canada

COVID-19 Antibody Study

- Launched November 2020

- 19,000 CLSA participants

- Blood sample to determine if a person has been previously infected with SARS-CoV-2 or vaccinated against SARS-CoV-2

- 3 waves of data collection

- $4M investment from the Government of Canada's COVID-19 Immunity Task Force (CITF)

COVID-19 Antibody Study
Venous Blood Collection

- Venous blood collection at CLSA Data Collection Sites

- Enhanced health and safety measures + COVID-19 screening

- 50 mL of blood (about 3 tbsp)

- Telephone questionnaire

- Partners: Alberta Precision Laboratories (APL), FedEx, CITF

COVID-19 Antibody Study
Dried Blood Spot

- Self-collection at home

- 4-5 drops of blood from fingertip using blood collection kit

- Telephone or online questionnaire

- Partners: Boston Microfluidics, APL, FedEx, CITF

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COVID-19 Antibody Study

- Seroprevalence = the level of pathogen in a population, as measured in blood serum

  - Pathogen- SARS-CoV-2

  - Population- a subset of CLSA participants

  - Serum- component of blood

COVID-19 Antibody Study

- Pathogen- SARS-CoV-2 (cause of COVID-19)
  - Tests detect antibodies to SARS-CoV-2
  - Antibodies are protective proteins produced by the immune system
  - Antibodies indicate an immune response to a foreign body
  - We tested for 2 common antibodies to SARS-CoV-2

COVID-19 Antibody Study

- Participants will receive a letter with their results
- The letter will indicate the results of each test
  - Nucleocapsid +/-
  - Spike protein +/-
- Antibodies can be produced to both after infection
- Current vaccines in Canada use spike protein (only the spike protein antibodies would be positive)
- An interpretation of the results will be provided

COVID-19 Antibody Study

- Seroprevalence (presence of antibodies) = the level of pathogen in a population, as measured in blood serum
  - Pathogen - SARS-CoV-2
  - Population - a subset of CLSA participants
- Should not change individual-level behavior based on results of a population-level study - continue to adhere to public health measures to prevent infection and transmission

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COVID-19 Antibody Study

- Negative results can occur:

  - In blood collected too soon after infection or vaccination

  - In persons who are immunosuppressed

  - In persons with mild or asymptomatic infection

  - If concentrations are below the detection limit of the test

  Results should not be used to diagnose recent infection

Additional information about serology tests and results

- www.canada.ca/en/health-canada/services/drugs-health-products/covid19-industry/medical-devices/testing/serological/information-for-patients.html

- www.cdc.gov/coronavirus/2019-ncov/lab/resources/antibody-tests-guidelines.html

- www.fda.gov/medical-devices/safety-communications/antibody-testing-not-currently-recommended-assess-immunity-after-covid-19-vaccination-fda-safety

Thank you!