Canadian Longitudinal Study on Aging as a Platform for Studying Disease and Disability in Aging Population

Parminder Raina, PhD
Canada Research Chair in GeroScience
Raymond and Margaret Labarge Chair in Optimal Aging
Professor, Department of Clinical Epidemiology and Biostatistics, Faculty of Health Sciences,
McMaster University, Hamilton

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The Canadian Longitudinal Study on Aging (CLSA)

A key strategic initiative of CIHR

The Canadian Longitudinal Study on Aging

More than 160 researchers - 26 institutions

Multidisciplinary - biology, genetics, medicine, psychology, sociology, demography, economics, epidemiology, nursing, nutrition, health services, biostatistics, population health
Our Aim

To study aging as a dynamic process and the inter-relationship among intrinsic and extrinsic factors from mid-life to older age.
Overall Aims of the CLSA

- The progression of health from middle-age to early old age to older old age
- The determinants of well-being and quality of life
- Risk Factors (including genetics) of Chronic diseases
- Cognitive functioning and mental health
- Disability and the compression of morbidity
- The examination of socioeconomic and health inequalities in an aging population
- Social participation, social relationships and care giving in an aging population
- Retirement and post retirement labor market activity
## CLSA Sampling

### Canadian Longitudinal Study on Aging

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<th>Sampling Frame: CCHS, provincial health registration databases, and RDD</th>
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<td>CLSA Tracking (n=20,000)</td>
<td>CLSA Comprehensive (n=30,000)</td>
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Participants (50,000)

Enrolled

Questionnaire Data (50,000)

Physical Exam and Biological Specimen (30,000)

Active Follow-up (F) Every 3 years
- Questionnaire
- Physical exam
- Biological samples

Maintaining Contact Interview (MC) mid-wave
- Update contact information
- Short Questionnaire

Passive Follow-up Every 3 years
- Health care utilization
- Disease registries
- Mortality databases

Data and Biological Sample Repositories

Researchers
Depth and Breadth of CLSA

**PHYSICAL & COGNITIVE MEASUREMENTS**
- Height & weight
- Waist and hip measurements
- Blood Pressure
- Grip strength, timed up-and-go, chair raise, 4-m walk
  Standing balance
- Vision (retinal imaging, Tonometer & visual acuity)
- Hearing (audiometer)
- Spirometry
- Body composition (DEXA)
- Bone density (DEXA)
- Aortic calcification (DEXA)
- ECG
- Carotid Plaque sweep (ultrasound)
- Carotid intima-media thickness (ultrasound)
- Depression
- Cognitive assessment (30 min. battery)

**HEALTH INFORMATION**
- Chronic disease symptoms (**disease algorithm**)
- Medication and supplements intake
- Women’s health
- Self-reported health service use
- Oral health
- Preventative health
- Administrative data linkage health services & drugs & other administrative databases

**PSYCHOSOCIAL**
- Social participation
- Social networks and support
- Caregiving and care receiving
- Mood, psychological distress
- PTSD
- Coping, adaptation
- Injuries and consumer products
- Work-to-retirement transitions
- Retirement planning
- Social inequalities
- Mobility-lifespace
- Built environments & Contextual Factors
- Income, Wealth and Assets

**LIFESTYLE & SOCIODEMOGRAPHIC**
- Smoking
- Alcohol consumption
- Physical activity (PASE)
- Nutrition (nutritional risk and food frequency)
- Birth location
- Ethnicity/race/gender
- Marital status
- Education
Chronic Airflow Obstruction (CAO) Algorithm

Self-reported Diagnosis (yes/no)

Spirometry

Normal
- No reported wheezing, coughing, shortness of breath
  - Medication: No
    - Normal (no CAO)
  - Medication: Yes
    - Possible CAO

Abnormal
- Wheezing, coughing, shortness of breath: any 'yes'
  - Medication: No
    - Possible CAO
  - Medication: Yes
    - Definite CAO
- No reported wheezing, coughing, shortness of breath
  - Wheezing with exertion or cough up phlegm: any 'yes'
    - Medication: No
      - Possible CAO
    - Medication: Yes
      - Definite CAO
- Wheezing, coughing, shortness of breath: any 'yes'
  - Medication: No
    - Possible CAO
  - Medication: Yes
    - Definite CAO

*Figure 1c: Chronic Airflow Obstruction Algorithm. CAO = chronic airflow obstruction. If participant coughs without phlegm, then outcome will be possible CAO. †Outcome when self-reported diagnosis = no. ‡Outcome when self-reported diagnosis = yes.
Bio specimens
42 aliquots per participant
Proposed Analysis of baseline biomarkers

- Complete Blood Count (available)
- Proposed panel of biomarkers: albumin, ALT, creatinine, CRP, ferritin, hemoglobin A1C, lipids (cholesterol, HDL, Triglycerides, LDL), thyroid stimulating hormone, free T4, 25-hydroxyvitamin D
  - N~30,000  (Calgary Laboratory Services)
- Proposed genotyping: Affymetrix UKBiorepository array assay 820,967 SNPs
  - n=10,000  (McGill Genome Centre)
- Proposed epigenetic analysis: targeted age-associated CpG methylation using pyrosequencing and Sequenom EpiTyper
  - n=5,000  (UBC Genetics and Epigenetics Centre)
Baseline Recruitment and Data Collection

• First selection of 20,000 started in late 2011
  • Completed 60 minute questionnaire by telephone on about 21,000 individuals (*Includes Health care number on over 90% of the respondents*)
• In August 2013 our maintaining contact interviews (30 minute telephone interview)
  • Minimize loss to follow-up
  • Collect additional data
Implementation Plan for the Comprehensive Cohort (n=30,000)

- Cohort of 30,000 persons to be recruited within 25 to 50 km radius of 11 data collection sites (DCS)
  - Victoria (3000), Vancouver (1500), Burnaby (1500), Calgary (3000), Winnipeg (3000), Hamilton (3000), Ottawa (3000), Montreal (3000), Sherbrooke (3000), Halifax (3000), St. John’s (3000)
Comprehensive Cohort Rolling Recruitment

- First batch of 10,000 people to be recruited across all sites (Fall-2012 to mid-2013)
  - Maintaining contact by phone (end of 2013-end 2014)
- Second batch of 10,000 (mid-2013 to mid-2014)
  - Maintaining contact: (end of 2014-end of 2015)
- Third batch of 10,000 (mid-2014 to mid 2015)
  - Maintaining contact: (end of 2015-end of 2016)

- Completed almost 24,000 In home (IH) Interviews
- IH + Physical assessment + Health care number (over 95%) + biosamples (96%) over 21,000
CORE ADDITIONAL STUDIES WITHIN CLSA

- Brain CLSA
  - Proposal to CIHR to develop a core brain imaging study (n=800)

- Division of Environment Health: Health Canada (Funded)
  - Air Pollution Data Base (n=50,000)
Data and Sample Access

- **Data and Sample Access is Open**
  - All researchers have access to data
    - No special access to the “creators” of the platform
    - Individual level data versus aggregate data
    - Genetic versus Health (Depression) versus Social data

- **Ethical and Legal Considerations**
  - How the data are used and what purpose?
  - Public sector versus Private sector access to data
Baseline Data Release

• 21,242 Telephone Interviews: Release Spring 2014
• 2\textsuperscript{nd} release late 2014/early 2015 to include cognitive scores (scoring ongoing), occupational classes (planned)
• 30,000 Data Collection Site Visits: anticipate 1\textsuperscript{st} release of data within 10 months of completed recruitment and baseline assessments ~Spring 2016
• Application-to-access process via CLSA DataPreview
• Formal Review through the CLSA Data and Sample Access Committee
• Following approval, release requires data/biospecimen transfer agreements
Aim 1: Recruitment and Baseline Data Collection

Data Release

- DataPreview Portal soft launch May 15, 2014
- Gateway to access for data* and biospecimens
  - Meta data: data dictionaries, data collection tools
  - Documentation and application form
  - Variable search mechanism providing simple descriptive statistics for selected variables

*Currently available for alphanumerical data
DataPreview Portal

Welcome to the DataPreview Portal for the Canadian Longitudinal Study on Aging (CLSA)! The CLSA data and biological samples are available to approved Canadian and international public sector researchers, with no preferential or exclusive access for any individual. As you navigate the site you will find information about the application process and requirements for data and sample access. If you are new to using the portal we recommend you begin by reading the Frequently Asked Questions.

CLSA Overview
Study design and documents

Datasets
Dataset from the baseline interview of 20,000+ Tracking participants

Access
Application procedure, required forms and data access policies
DataPreview Portal

Datasets

A Canadian Longitudinal Study on Aging (CLSA) dataset holds and describes variables collected from participants at each wave of data collection. The variable search tool enables researchers to locate items of interest within all available data collected from CLSA participants.

Currently, data emanating from the over 20,000 Tracking participants who completed the baseline 60-minute telephone interviews are available. Cognitive scoring is ongoing and these data will be available as part of the second CLSA data release in December 2014.

Datasets from future data collection events will be added when they are available.

Variables (June 2014)
 Variables currently available in the first wave of the data release, with filtering and search options.

Variables (December 2014)
 Variables that will be available in the second CLSA data release in December 2014.

Sampling weights
 Description of sampling weights used in the CLSA.

Questionnaire
 Baseline 60-minute Telephone Interview questionnaire (Tracking).

Study design
 Study design of the Canadian Longitudinal Study on Aging (Tracking participants).
CLSA Research Team

Scientific Management Team

Lead Principal Investigator
Parminder Raina (McMaster)

Co-principal Investigator
Christina Wolfson (McGill)

Co-principal Investigator
Susan Kirkland (Dalhousie)
praina@mcmaster.ca

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www.clsa-elcv.ca