Understanding inequalities and inequities in health among older adults in Canada using the Canadian Longitudinal Study on Aging (CLSA)

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Canadian Context: Demographic Trends

• Canadians are living longer and older people are making up a larger share of the population

• In 2000 1 in 8 Canadians (12%) were 65 or older; by 2036 1 in 4 (25%, 10M) will be over 65

• The first baby boomers turned 65 in 2011

• Fastest growing segment is aged 80+

• Total health and social care expenditures exceed $300 billion

• Healthcare alone is $211 billion, the largest expenditure item in provincial budgets
Canada’s changing population structure

Canada shows its age as seniors outnumber children for first time

ERIC ANDREW-GEE
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The Canadian Longitudinal Study on Aging (CLSA)

• Strategic initiative of CIHR; on Canadian research agenda since 2001

• Team of 3 principal investigators, more than 160 co-investigators from 26 institutions

• Multidisciplinary - biology, genetics, medicine, psychology, sociology, demography, nursing, economics, epidemiology, nutrition, health services

• Largest study of its kind to date in Canada for breadth and depth: following 50,000 Canadians for 20 years
Overall Aims of the CLSA

- To examine aging as a dynamic process
- To investigate the inter-relationship among intrinsic and extrinsic factors from mid life to older age
- To capture the transitions, trajectories and profiles of aging
- To provide infrastructure and build capacity for state-of-the-art, interdisciplinary, population based research and evidenced-based decision making
CLSA Design Overview

50,000 women and men aged 45 – 85 community dwelling at baseline

Tracking (20,000)
Randomly selected
10 provinces

Comprehensive (30,000)
Randomly selected
25-50 km of 11 sites in 7 provinces

Questionnaire
• By telephone (CATI)

Questionnaire
• In person, in home (CAPI)

Physical Assessments
Blood, Urine
• At Data Collection Site

20 year study: Full follow up every 3 years, maintaining contact in between

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

Enrolled

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

Questionnaire data (telephone and in-person interviews) (51,338)
Physical assessments and biological specimens (30,097)

Active follow-up (FU) every 3 years

- Questionnaire
- Physical assessments
- Biological specimens
- Health-care utilization
- Disease registries
- Mortality databases

Data and Biological Sample Repositories

Researchers
National Scope
Representative Sampling Frame

- Winnipeg
- Vancouver
- Victoria
- Surrey
- Calgary
- Hamilton
- Ottawa
- Montreal
- Sherbrooke
- Halifax
- St. John’s

• Telephone Interviews
• Home Interviews & Data Collection Site Visits
Participants Consent to Participate in CLSA

Participants Provide Questionnaire Data (n=50,000)

Pre-recruits Sent Study Information

Biological Data Processing
- Blood
- Urine

DATA COLLECTION SITE VISIT
Physical/Neuropsychological Data

n=30,000
Home Interview

Biorepository and Bioanalysis Centre

n=20,000
Telephone Interview

Statistical Analysis Centre

Stored at Biorepository and Bioanalysis Centre

Data dissemination to researchers

Innovative Electronic Data Capture
**CLSA Data Collection**

**Data Collection Site**

**Physical Assessments:**
- Height, Weight, BMI
- Bone Density, Body Composition, Aortic Calcification
- Blood Pressure, ECG
- Carotid Intimal-Medial Thickness
- Pulmonary Function
- Vision (acuity, ocular pressure, fundus photograph)
- Hearing
- Performance: Timed up and go, chair rise, 4m walk, balance

**Biospecimen Collection:**
- Blood
- Urine

**Cognitive Assessments:**
- Neuropsychological Battery
  - Memory: ReyAVLT
  - Executive function: MAT, PMT, Stroop, FAS, AN
  - Psychomotor speed: Choice Reaction time
Depth and Breadth of CLSA Baseline Questionnaire modules

- **DEMOGRAPHIC**
  - Education
  - Marital status
  - Ethnicity

- **HEALTH BEHAVIOURS**
  - Smoking, alcohol
  - Nutritional risk
  - Food frequency
  - Physical activity
  - Health care utilization
  - Medication use
  - Supplement use

- **HEALTH STATUS**
  - General health
  - Women’s health
  - Chronic conditions, symptoms

- **PHYSICAL**
  - Oral health
  - Injuries, falls
  - Mobility
  - Pain, discomfort
  - Functional status
  - ADL, IADL

- **PSYCHOLOGICAL**
  - Cognition—Executive function, memory, psychomotor speed
  - Depression
  - Mood
  - Psychological distress
  - Veteran identifier
  - Satisfaction with life
  - PTSD

- **SOCIAL**
  - Social networks
  - Social support
  - Social participation
  - Online communication
  - Social inequality
  - Care receiving
  - Care giving
  - Retirement status
  - Labour force participation
  - Retirement planning
  - Transportation
  - Mobility, Migration
  - Built environments
  - Home ownership
Bio specimen processing
42 aliquots per participant

- Basic hematologic tests done on site
- Remainder processed, frozen within 2 hours
- Shipped weekly
- Stored in Nitrogen tanks at BBC McMaster
Wealth of information available in the CLSA

**Psychosocial**
- Social networks/participation
- Caregiving/receiving
- Mood/psychological distress
- Coping/adaptation
- Inequalities

**Social**
- Mobility
- Transportation
- Income/wealth/assets
- Built environment
- Injuries/consumer products

**Medications**
- DIN numbers
- Generics
- Prescriptions

**Health care**
- Home care
- Oral health
- Preventative health
- Women’s health
- Linkage to health care databases
- Supplement use

**Life style**
- Physical activity
- Smoking/Alcohol
- Nutrition

**Biological**
- Serum/plasma/urine/whole blood
- Genetics/epigenetics/metabolomics

**Cognition**
- 30-min battery
- Cognition scores

**Physical**
- Vision/hearing
- Height/weight
- Grip strength
- Balance
- Body composition
- Bone density
- ECG
- Spirometry

**Sociodemographic**
- Ethnicity/race/gender
- Education
- Marital status

**Respiratory**
**Gastro-intestinal**
**High Blood Pressure**
**Arthritis**
**Glaucoma**
**CVD**
**Osteoporosis**
**Cancer**
**Stroke and CVA**
**Mood/Anxiety**
**Urinary incontinence**
**Heart Disease**

Wealth of information available in the CLSA
Successful aging and health inequalities and inequities

• Successful aging
  – Health: an essential component

• Successful aging from a population perspective
  – Good overall level of health
  – Fair distribution of health

• A key indicator of successful aging
  – How health inequalities (differences) and inequities (unfair differences) change over the life course
Aging influence on health inequalities

Chronological age ⊕ aging

Conception of aging

Deterioration
A process of health decline leading to death

Exposure to insults that accumulate overtime

Influence on health inequalities over the life course

Age-as-leveler
Decrease in health inequalities

Age-as-amplifier
Increase in health inequalities
CLSA’s potential for health inequality and inequity studies

• Multiple health outcome measures
  – Allow investigation on inequalities and inequities in different aspects of health and wellbeing
  – Magnitudes of inequality and inequity and their age-related dynamics differ across the Health Utilities Index, the frailty index, grip strength, and cognition

• Rich determinant of health measures
  – Enable investigation of multiple inequity domains at once, using a broad equity framework
  – Different definitions of inequity may have limited impact in empirical results, more important question: Is unexplained inequality fair or unfair?
CLSA’s potential for health inequality and inequity studies, cont.

• Comparability to other health and aging studies
  – Allows international comparison
  – Examples: Survey of Health, Ageing and Retirement in Europe (SHARE), Japanese Study of Aging and Retirement (JSTAR)

• Longitudinal nature
  – Potential to tease out different conceptions of aging and their influence on health inequalities and inequities
### CLSA Research Team

**Principal Investigators, Site Investigators, Working Group Leads, Key Co-investigators**

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