



# **Advancing the Science of Population Health and Aging through Interdisciplinary Research: The Canadian Longitudinal Study on Aging**

**Lauren Griffith, PhD**

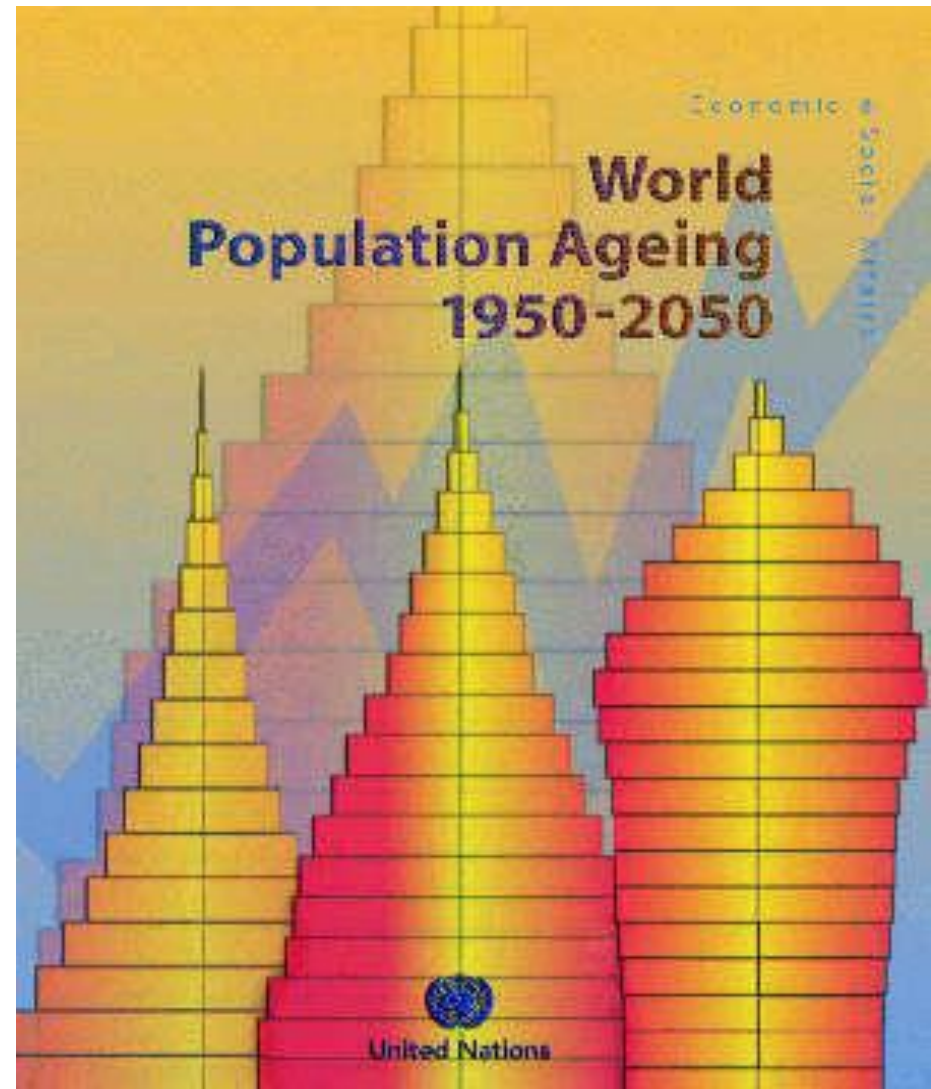
**CLSA Associate Scientific Director and Lead PI of Hamilton DCS  
Department of Clinical Epidemiology and Biostatistics, Faculty of Health Sciences,  
McMaster University, Hamilton**

**Regroupement des organisations de santé publique de la Capitale-Nationale,  
April 27th, 2015**



# Population aging

- Due to declining fertility and increasing longevity (demographic transition)
- Unprecedented, accelerating, shifts will be permanent
- Profound implications for human life, including health





## Population Totals in Canada by Age Group and Year

AGE	MALES	BOTH SEXES	FEMALES
80+	229898	670192	440294
75-79	255599	622194	366595
70-74	364298	833991	469693
65-69	497996	1084588	586592
60-64	578596	1190087	611491
55-59	618096	1238387	620291
50-54	673295	1339986	666691
45-49	844194	1674182	829988
40-44	1076892	2138777	1061885
35-39	1173491	2344675	1171184
30-34	1311991	2597873	1285882
25-29	1282190	2528572	1246382
20-24	1067593	2108978	1041385
15-19	984993	1925780	940787
10-14	980292	1912979	932687
5-9	998293	1953079	954786
0-4	1000393	1953280	952887
1991 TOTALS	13938100	28117600	14179500



## Population Totals in Canada by Age Group and Year

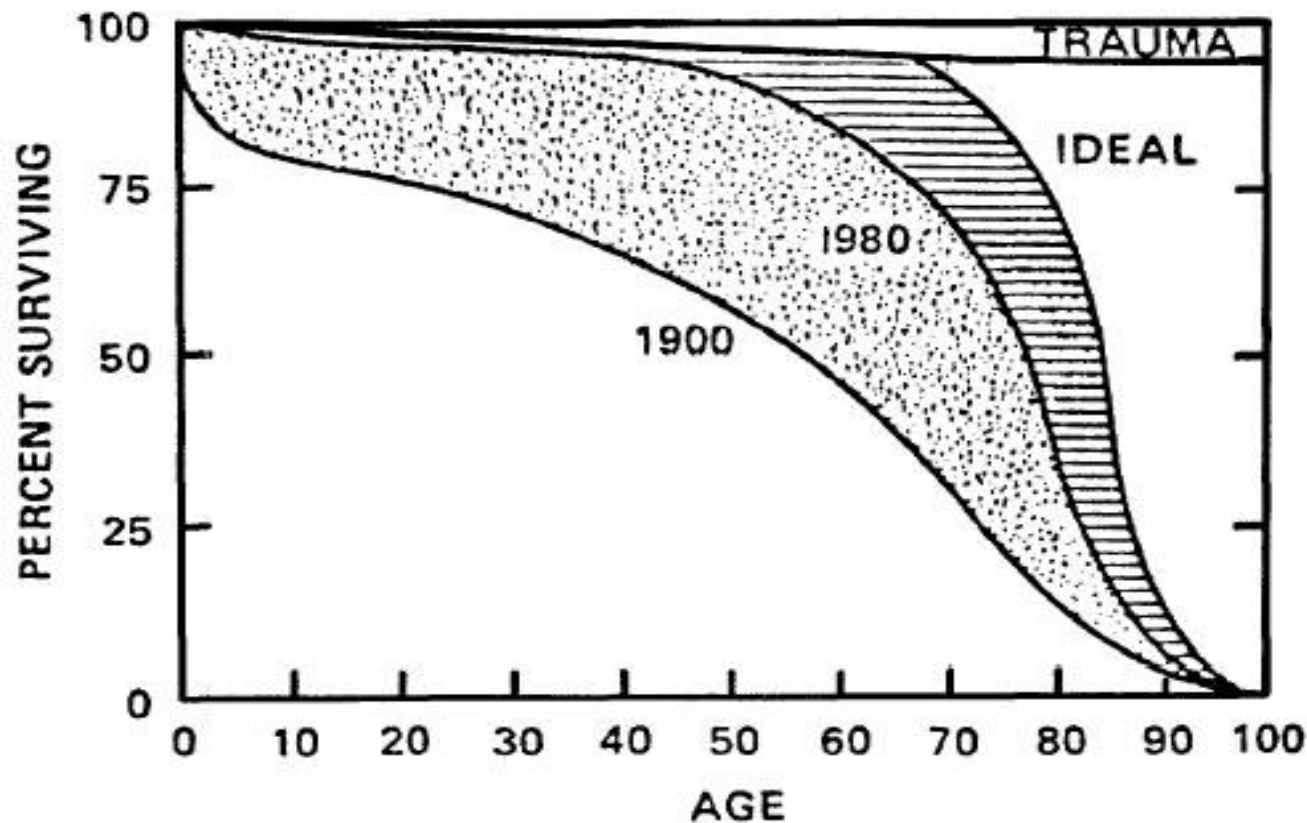
AGE	MALES	BOTH SEXES	FEMALES
80+	229898	670192	440294
75-79	255599	622194	366595
70-74	364298	833991	469693
65-69	497996	1084588	586592
60-64	578596	1190087	611491
55-59	618096	1238387	620291
50-54	673295	1339986	666691
45-49	844194	1674182	829988
40-44	1076892	2138777	1061885
35-39	1173491	2344675	1171184
30-34	1311991	2597873	1285882
25-29	1282190	2528572	1246382
20-24	1067593	2108978	1041385
15-19	984993	1925780	940787
10-14	980292	1912979	932687
5-9	998293	1953079	954786
0-4	1000393	1953280	952887
1991 TOTALS	13938100	28117600	14179500



# Rectangularization of the survival curve

## FURTHER INCREASE IN LIFE EXPECTANCY

Squaring the survival curve





# Compression of morbidity

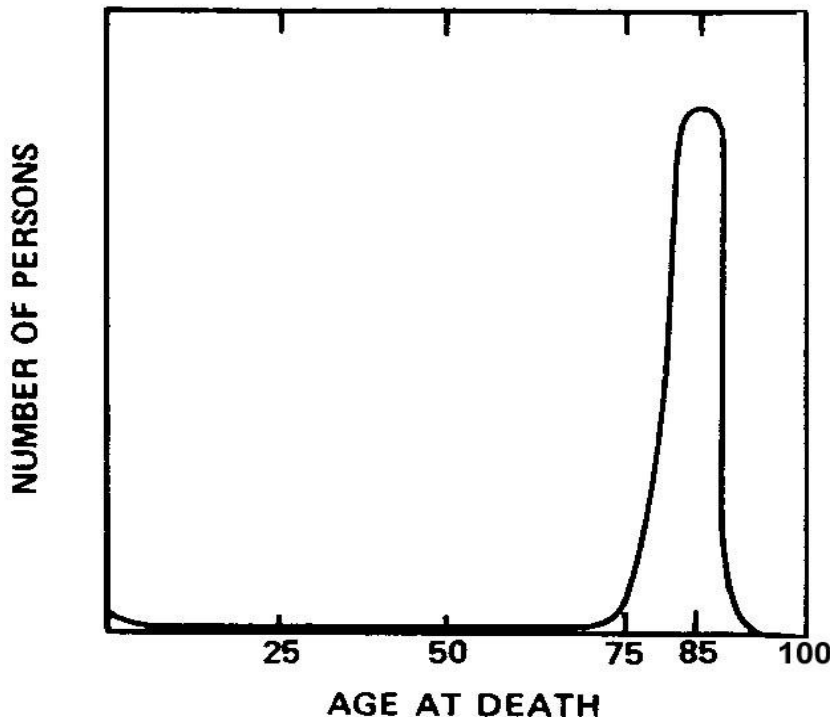


Figure: Mortality According to Age in the Absence of Premature Death

- Morbidity compressed into a short period prior to death
- Represented an important shift in thinking
- Departure from the medical model of aging, which assumed that death always occurred as a result of a disease process, and that older age was a period of inevitable decline



# Compression of morbidity

Fries' paradigm based on the premise that:

- The length of human life is fixed  
AND
- Chronic disease can be postponed
- Predicted that the increase in life expectancy would plateau in the coming decades, particularly life expectancy from age 65 which excludes early life mortality



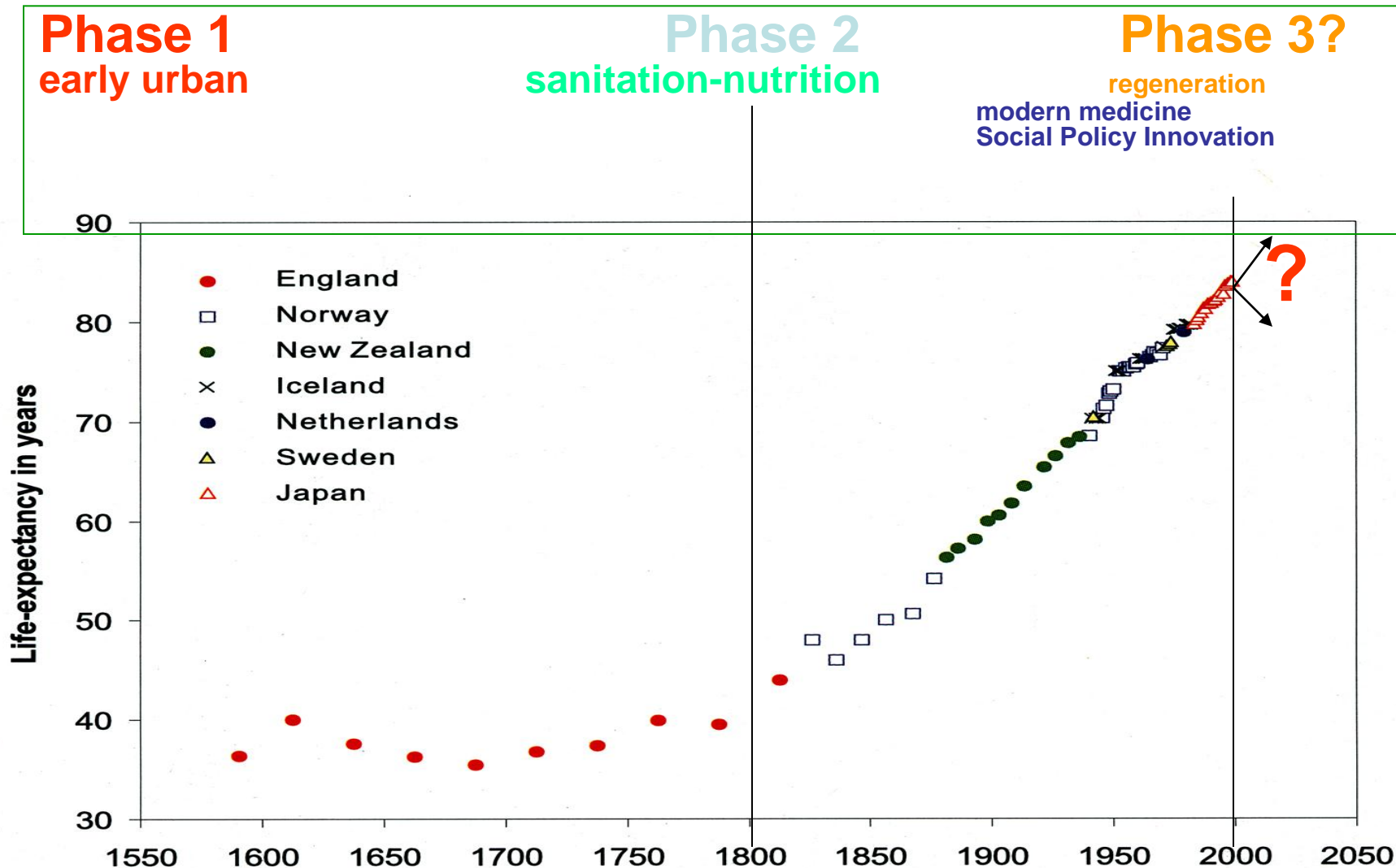
# Evidence suggests otherwise

- Is average life expectancy approaching an upper limit to life expectancy?
  - the evidence that the average life span is 85 years is unconvincing
  - there is no evidence for further rectangularization of survival curves
- Will age at first infirmity increase?
  - there is no evidence for over-all declines in incidence of morbidity: on the contrary
  - evidence for actual “(de)compression” of morbidity is ambiguous



# Historical increases of life expectancy

Oeppen and Vaupel, Science 2002; C Finch adaptation





## Demographic Futures

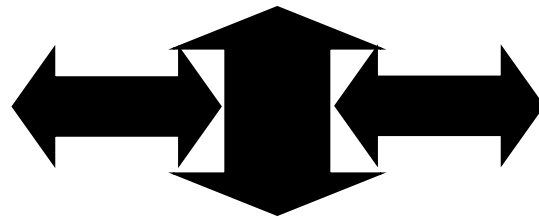
---

- Upward trend in life expectancy continue, cease, or reverse?
  - + Effective interventions against age-related diseases
  - + Improved environment for ageing
  - + Life-cycle deceleration (delayed reproduction)
  
  - Adverse effects of excess nutrition
  - Adverse effects of alcohol and drug abuse
  - Adverse effects of increasingly sedentary lifestyles
  - Life-cycle acceleration (early maturation)



# Why aging occurs

Intrinsic



Extrinsic

# How aging is caused



# Genes Associated With Avoiding Late-Life Disease in Humans

Table 4

GENE	BIOCHEMICAL FUNCTION	COMMENTS	REFERENCES
APOE	Lipoprotein metabolism	E2 variant is frequent in centenarians while E4 variant as a risk factor for Alzheimer's disease is rare in centenarians.	Schachter et al. 1994
ACE	Angiotensin-converting enzyme	Plays a role in regulating blood pressure.	Schachter et al. 1994
PAI1	Plasminogen activator inhibitor 1	Plays a role in blood clotting, thus affecting risk of stroke and heart attack.	Mannucci et al. 1997
HLA-DR	Histocompatibility locus antigen	DR variant is frequent in centenarians; resists infection and inflammation?	Ivanova et al. 1998
WRN	Possesses both DNA helicase and exonuclease activity	Gene responsible for Werner's Syndrome; mutation leads to a variety of aging-related pathologies, e.g., cataracts, cancer, osteoporosis, slow wound healing, etc.	Yu et al. 1996 Huang et al. 1998 Martin and Oshima 2000
B3AR	B-3 adrenergic receptor	Allelic form present affects time of onset of Type 2 diabetes.	Walston et al. 1995
MTHFR	5-, 10-methylenetetrahydrofolate reductase	Deficiency leads to increased levels of homocysteine and DNA hypomethylation; increases risk of cardiovascular disease and cancer.	Heijmans et al. 2000
KLOTHO	Membrane protein with $\beta$ -glucosidase activity?	Homozygous variant form is underrepresented in elderly individuals.	Arking et al. 2002



# Genetic Heritability of Human Lifespan

Cournil & Kirkwood *Trends in Genetics* 2001

## Twin Studies

- |                           |       |
|---------------------------|-------|
| ▪ McGue et al (1993)      | 0.22  |
| ▪ Herskind et al (1996)   | 0.25  |
| ▪ Ljungquist et al (1998) | <0.33 |

## Traditional Family Studies

- |                                 |           |
|---------------------------------|-----------|
| ▪ Philippe (1978)               | 0-0.24    |
| ▪ Bocquet-Appel & Jakobi (1990) | 0.10-0.30 |
| ▪ Mayer (1990)                  | 0.10-0.33 |
| ▪ Gavrilova et al (1998)        | 0.18-0.58 |
| ▪ Cournil et al (2000)          | 0.27      |

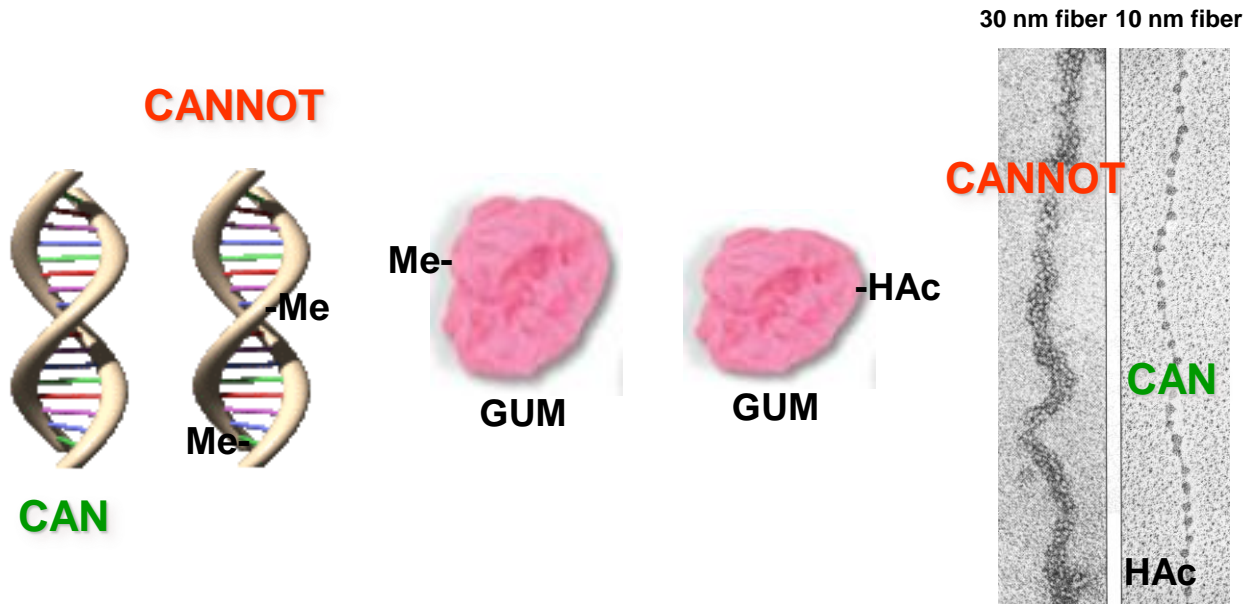
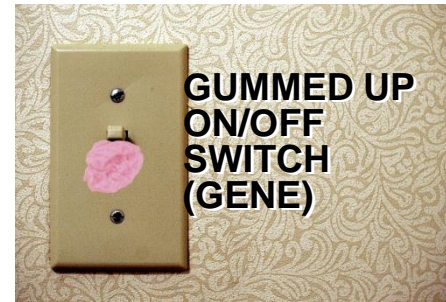
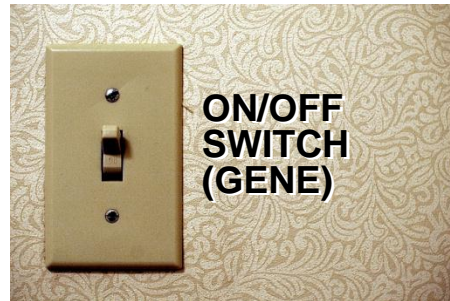
**Genes account for 25% of what determines disease and longevity**



Canadian Longitudinal Study on Aging  
Étude longitudinale canadienne sur le vieillissement



# EPIGENETICS



DNA AND CHROMOSOME LEVELS



# Non-Biological/Medical Determinants of Aging?

---

- Nutrition
- Lifestyle
- Environment
  - Physical
  - Social
  - Economic
  - Work Place
  - Psychological
- Chance



# Intrinsic and Extrinsic Factors

## Environmental influences

(e.g., rural, socio-economic, exercise, nutrition)



## Chronic diseases

(e.g., diabetes, cancer, dementia, arthritis, cardio)

(e.g., telomeres/oxidative stress,  
psychological & cognitive abilities,  
immune functions)

Aging



infections



Health Services Utilization



Genetics

Time (Longitudinal Study)



CLSA élcw  
Canadian Longitudinal Study on Aging  
Étude longitudinale canadienne sur le vieillissement



# Canadian Longitudinal Study on Aging (CLSA)

- 50,000 Participants from across Canada
- Aged 45-85 at baseline
- 20 year study with major data collection every 3 years
- More than 160 researchers in 26 institutions
- biology, genetics, medicine, psychology, sociology, demography, economics, epidemiology, nursing, nutrition, health services, biostatistics, population health





# The CLSA Vision

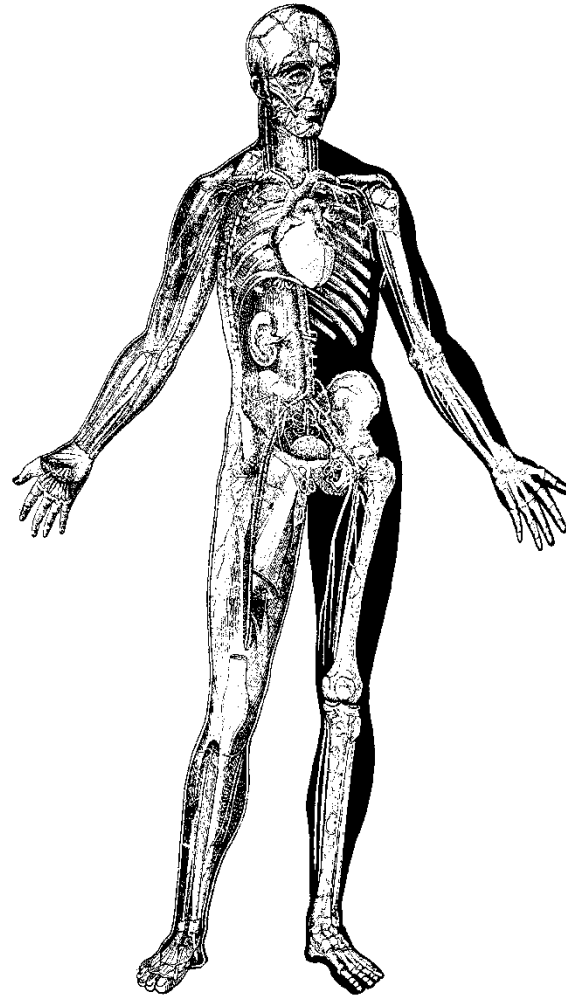
A research platform – infrastructure to enable state-of-the-art, interdisciplinary population-based *research* and *evidenced-based* decision-making that will lead to better health and quality of life for Canadians.







# Innovation - Cell to Society



- ▶ Mid life to old age
- ▶ Quantitative traits
  - ▶ Physical
  - ▶ Social
  - ▶ Psychological
- ▶ Gene-environment interactions
- ▶ Disease, disability, psychosocial consequences
- ▶ Adaptation



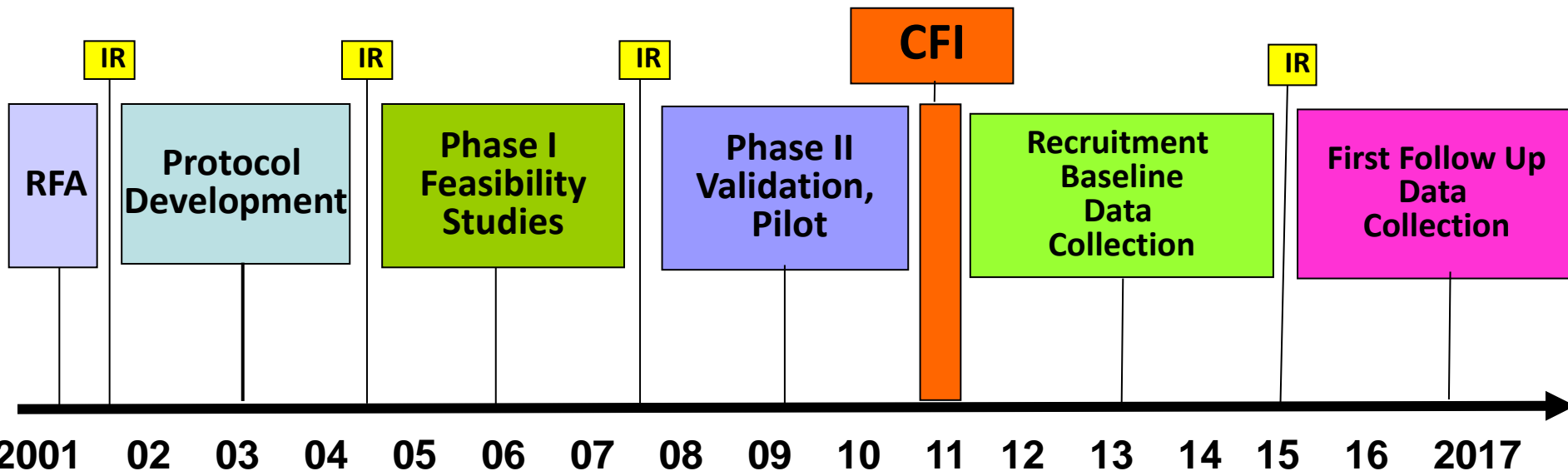
# Timeline and Milestones

Team  
Design  
Objectives  
Content

Acceptability  
Bio-specimens  
Recruitment  
Data Linkage

Pilot recruitment  
Validate measures  
SOPs, TMs  
Pilot protocol

Data Collection



Canadian Longitudinal Study on Aging  
Étude longitudinale canadienne sur le vieillissement



# Design Overview

**50,000 women and men aged 45 - 85 at baseline**

**n=20,000\***  
**Randomly selected within  
provinces**

**n=30,000**  
**Randomly selected  
within 25-50 km of 11 sites**

**Questionnaire**  
• **By telephone (CATI)**

**Questionnaire**  
• **In person, in home (CAPI)**

**Clinical/physical tests**  
**Blood, urine**  
• **At Data Collection Site**

**Full follow up every 3 years**  
**Maintaining Contact in between waves**

**Data Linkage**



# Recruitment Sampling Frames

Sampling weights are available

1. Partnered with Statistics Canada
  - CCHS 4.2 Healthy Aging Survey
    - 2006 Census as an area frame to select households
  - Agreed to share contact information
2. Partnered with provincial Ministries of Health (MOH)
  - Health Card Registration databases
  - Mailouts, return Consent-to-Contact form
3. Random Digit Dialing
  - Pre-recruitment



Canadian Longitudinal Study on Aging  
Étude longitudinale canadienne sur le vieillissement



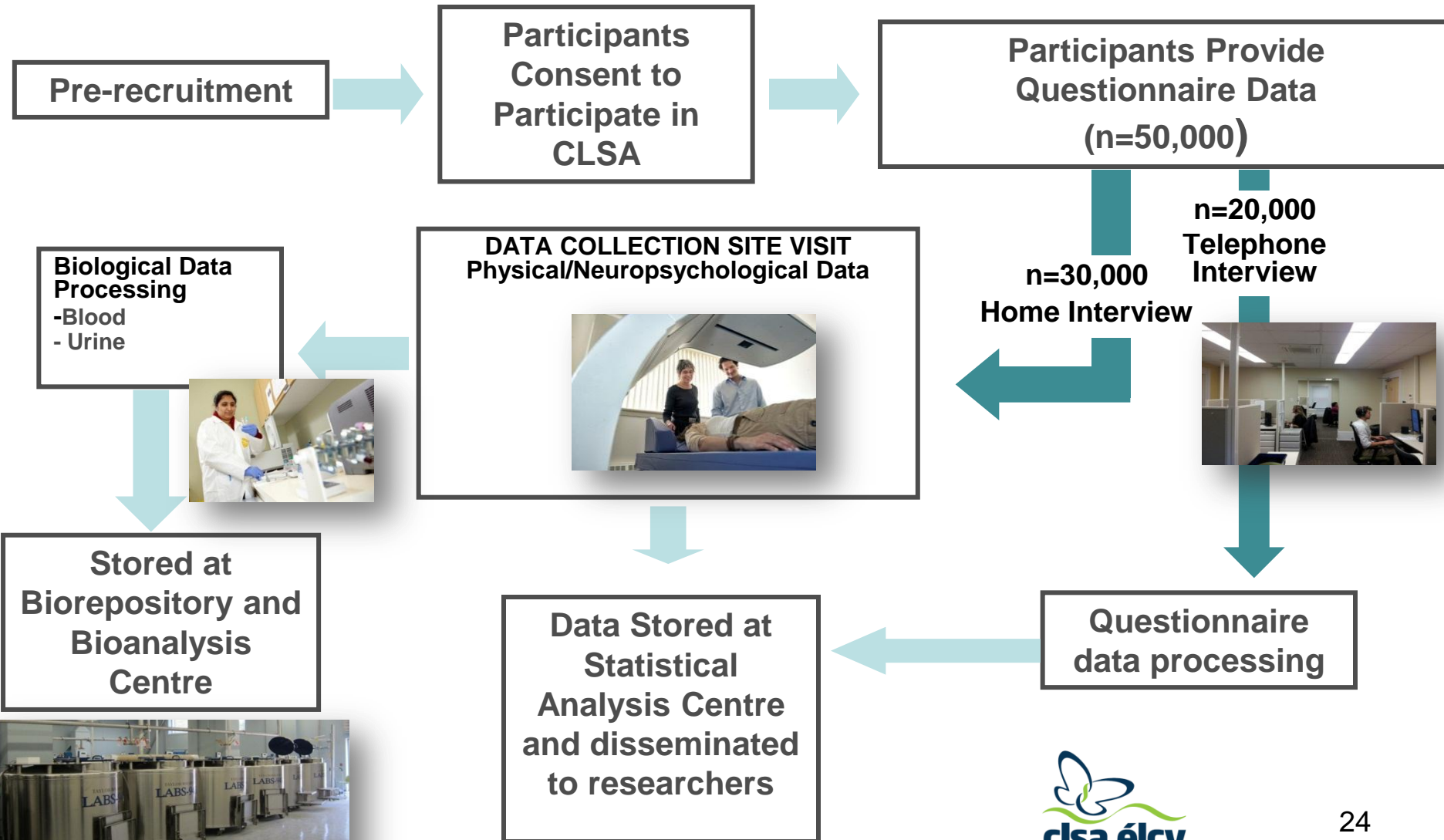
# Exclusion Criteria At Baseline

## CCHS exclusion criteria

- Residents of the 3 territories
  - i.e. Northwest Territories, Nunavut, Yukon
- Living in an institution
- Living on First Nations Reserves
- Full time members of the armed forces
- Temporary visa holders
- Cognitive impairment
- Unable to communicate in French or English



# Standardized Paperless Process





# Content: Tracking Modules

## 60 minute Computer Assisted Telephone Interviews

- Sociodemographics
- Veteran identifier
  - PTSD screen
- Lifestyle
- Health
  - General, women's, vision, hearing, chronic conditions
- Functional Status
- Cognition
  - Rey Auditory Verbal LT
  - Mental Alternation Test
  - Animal Naming
- Depression
- Satisfaction with life
- Social networks/support/participation
- Care-giving/receiving
- Injuries
- Labour Force
- Income



# Content: Comprehensive

## InHome Computer Assisted Personal Interviews

- The Tracking CATI
- plus
- Short diet questionnaire
  - Sleep
  - Medications
  - More extensive disease symptoms questionnaire



# CLSA Data Collection

## At the Data Collection Site

### Physical Data Collected

- Bone Density, Body Composition
- Aortic Calcification
- ECG
- Carotid Intimal-Medial Thickness
- Pulmonary Function
- Vision and Hearing



### Biological Data Collected

- Blood
- Urine



### Psychological Data Collected

- Neuropsychological Battery
- Performance Testing
- Anthropometric Measures



For more  
Information visit  
[www.clsa-elcv.ca](http://www.clsa-elcv.ca)



Canadian Longitudinal Study on Aging  
Étude longitudinale canadienne sur le vieillissement



# Biological Samples

## BIOCHEMICAL & HEMATOLOGICAL ANALYSIS (50 ml Blood; Urine)

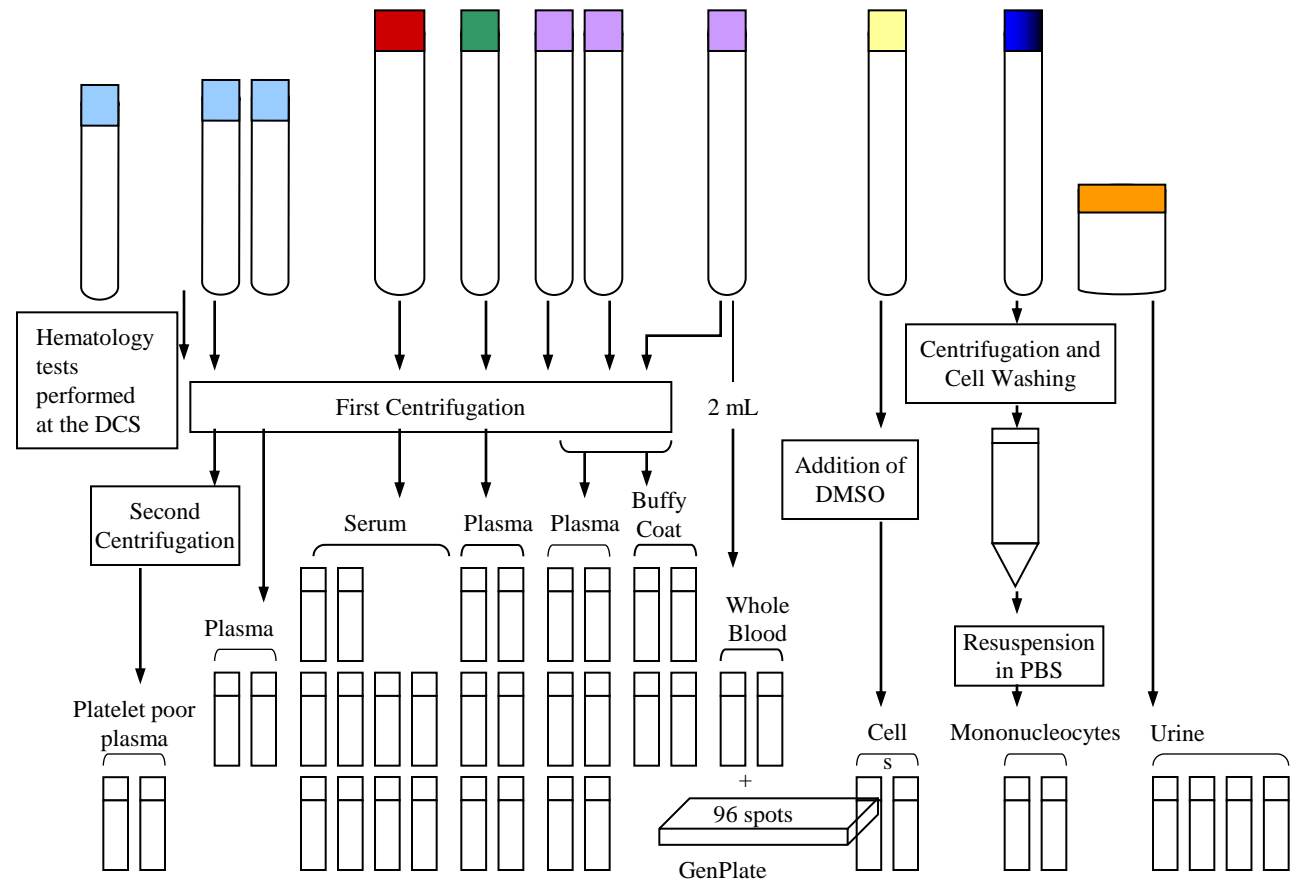
### General Hematology

- Basophils
- Eosinophils
- Neutrophils
- Lymphocytes
- Monocytes
- White blood count
- Red blood cells
- Hemoglobin
- Platelets

### Lipid Profile

- HDL-cholesterol
- LDL-cholesterol
- Tryglycerides
- Glucose
- Fasting blood sugar

### Genetic and Epigenetic Markers





# Content: Maintaining Contact

## 30 minutes CATI

- Falls
- Pain
- Oral Health
- Health Care Utilization
- Dietary Supplement Use
- Nutritional Risk
- Physical Activity
- Social Inequality
- Online social networking
- Transportation, migration, mobility
- Built Environment
- Wealth
- Parkinsonism (T)
- Medication (T)
- Psychological Distress (C)
- Personality Traits (C)



# Status

As of April 24<sup>th</sup>, 2015





# Recruitment & Data Collection Update

## Telephone Interviews

- Recruitment of 20,000\* participants, 60 minute telephone interviews every 3 years:
  - ✓ From....Provincial Health Care Registries
  - ✓ From....Statistics Canada CCHS on Healthy Aging
  - ✓ From....Random Digit Dialing
- Recruitment and baseline data collection are complete!
- Data available for release to researchers‡
  - Maintaining contact interviews initiated 2013 (14,674 completed, ~4% lost)
- First full follow-up begins summer 2015

\*21,241 result of over sampling low SES

‡ cognition data and some open text in second release





# Recruitment & Data Collection Update

## Home Interviews and Data Collection Site Visits

- Recruitment of 30,000 for Home Interviews and Data Collection Site Visits:
  - ✓ From...Provincial Health Care Registries
  - ✓ From...Random Digit Dialing
- Baseline data collection 2012 to 2015:
  - In Home Interviews: 29,063
  - DCS visits: 27,969
  - Data release target: Spring 2016
  - Maintaining Contact 10,792 to date (~4% lost)
- First full follow-up begins summer 2015





# **“Results” Tracking Only**

**N=21,241**

**Acknowledgements to SAC team, Christina Wolfson, Jennifer Uniat,  
Susan Kirkland, Andrew Wister, Verena Menec; CAG presentations, 2014**



# CLSA Tracking Telephone Interviews

	Count	%	Weighted %
<b>Age</b>			
<b>45-54</b>	5826	27.5	38.2
<b>55-64</b>	6554	30.9	31.2
<b>65-74</b>	4525	21.8	18.8
<b>75-85</b>	4203	19.8	11.8
<b>Sex</b>			
<b>Male</b>	10387	49.0	48.3
<b>Female</b>	10821	51.0	51.7
<b>Language</b>			
<b>English</b>	17457	82.3	75.9
<b>French</b>	3751	17.7	24.1
<b>Born in Canada</b>	18486	87.2	84.5



**clsa élc**

Canadian Longitudinal Study on Aging  
Étude longitudinale canadienne sur le vieillissement



# CLSA Tracking Telephone Interviews

<b>Province</b>	<b>Count</b>	<b>%</b>	<b>Weighted %</b>
<b>British Columbia</b>	2619	12.4	13.8
<b>Alberta</b>	2110	10.0	9.3
<b>Saskatchewan</b>	1388	6.5	2.9
<b>Manitoba</b>	1472	6.9	3.3
<b>Ontario</b>	4722	22.3	38.3
<b>Quebec</b>	3603	17.0	24.7
<b>New Brunswick</b>	1350	6.4	2.4
<b>Nova Scotia</b>	1564	7.4	3.1
<b>Prince Edward Island</b>	1132	5.3	0.5
<b>Newfoundland, Lab</b>	1248	5.9	1.7





# CLSA Tracking Telephone Interviews

	Count	%	Weighted %
<b>Chronic Conditions</b>			
Arthritis	8194	38.9	35.1
Asthma	2344	11.1	11.7
COPD	1433	6.8	5.8
Hypertension	8090	38.2	33.4
Diabetes	3542	16.7	15.1
Heart disease	2189	10.3	9.0
Angina	1149	5.4	4.3
Heart attack	1299	6.2	4.9
Stroke	388	1.8	1.5
Dementia	43	0.2	0.2
Parkinson's, Parkinsonism	78	0.4	0.3
Cancer	3262	15.4	13.2
Osteoporosis	2008	9.5	8.7





# CLSA Tracking Telephone Interviews

	Count	%	Weighted %
<b>Marital status</b>			
Single/Never married	1694	8.0	8.4
Married/Common Law	14586	68.8	73.0
Widowed	2355	11.1	7.3
Divorced	1988	9.4	8.5
Separated	579	2.7	2.7
<b>Education</b>			
Less than Secondary	1978	9.3	7.0
Secondary School	2875	13.6	12.8
Some Post-Secondary	1622	7.7	7.6
Post Secondary Degree/ Dipl	14650	69.1	72.2
<b>Annual Household Income</b>			
Less than \$20,000	1341	6.8	5.5
\$20,000 - < \$50,000	5841	29.4	23.9
\$50,000 - < \$100,000	7212	36.3	35.9
\$100,000 - < \$150,000	3212	16.2	19.4
\$150,000+	2237	11.3	15.4



# CLSA Tracking Telephone Interviews

## N=21,208

	Count	%	Weighted %
<b>Self Rated General Health</b>			
Excellent	3972	18.8	20.8
Very Good	8115	38.3	38.3
Good	6249	29.5	28.7
Fair	227	10.5	9.6
Poor	624	2.9	2.7
<b>Self reported Weight Status</b>			
Overweight	11188	53.0	52.1
Underweight	432	2.0	1.9
Just about right	9492	45.0	46.0
<b>Satisfaction with Life</b>			
Dissatisfied	2068	9.8	9.8
Neutral	850	4.0	4.5
Satisfied	18264	86.2	85.6



# CLSA Tracking Data

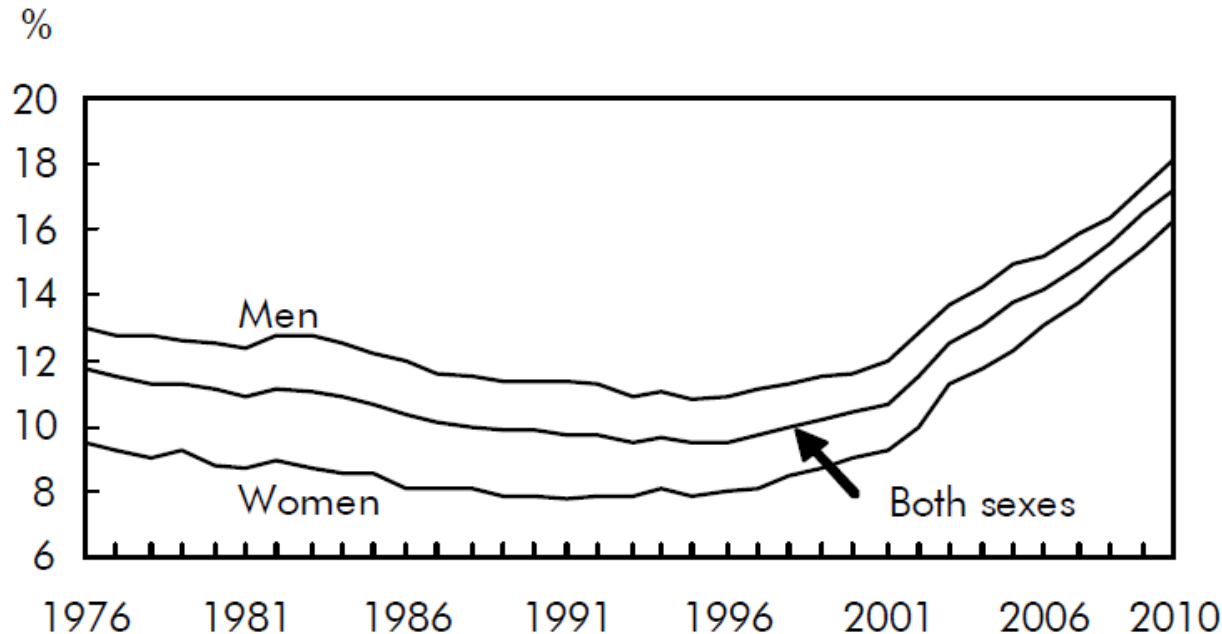
## **Work, Aging, Retirement and Health in the Canadian Longitudinal Study on Aging**



Canadian Longitudinal Study on Aging  
Étude longitudinale canadienne sur le vieillissement



# Canadian Workforce



**Percent of workers 55 years and older is on the rise**

Source: Statistics Canada, Labour Force Survey, 1976 to 2010.



# Canadian Workforce

Financial Post, Jan 28, 2014



“Most older workers who leave career jobs return to work within a decade:  
Statistics Canada”

An extensive study by Statistics Canada shows that of those Canadians who exited a long-term job at age 55 to 59, 60% were re-employed within 10 years. Fotolia



# CLSA Retirement Data

## Tracking - Weighted

Retirement Status	45-64		65-85	
	Male	Female	Male	Female
Completely Retired	17.0%	22.9%	74.6%	84.7%
Partly Retired	8.8%	8.2%	16.0%	8.3%
Not Retired	74.2%	68.8%	9.5%	7.0%

	45-64		65-85	
	Male	Female	Male	Female
Retired and Returned to Work	7.8%	7.2%	26.5%	16.9%



# CLSA Retirement Data

## Tracking

**Of those Retired:**

- **Retirement voluntary**                      **n = 9,683 (78%)**
- **Health/Disability/Stress**                      **n = 2,935 (24%)**  
**contributed to decision to**  
**retire**



# CLSA Retirement Data

Tracking – Weighted

Of Those Not Retired	45-64		65-85	
	Male	Female	Male	Female
Currently Working	92.2%	89.4%	96.7%	72.5%
More than 1 job	15.0%	15.5%	19.5%	11.1%



# Extensive Work and Retirement Modules

- Age at retirement
- Spouse's retirement status
- Reasons for retirement
- Preparation for retirement
- Return to work after retirement
- Reasons for return
- Full-time/Part-time, type of work

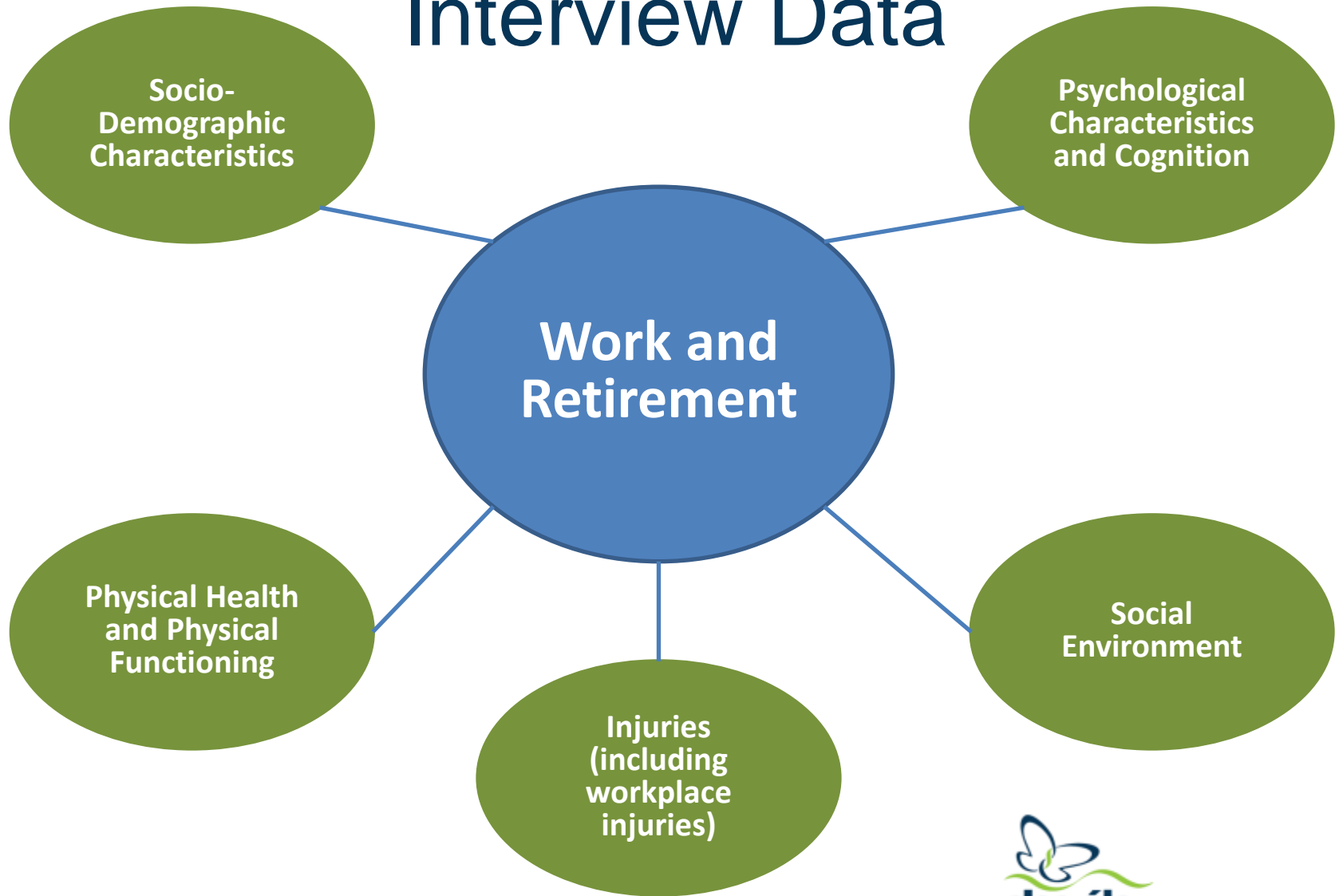


# Retirement Planning Module

- Age plan to retire
- Preparation for retirement
- Contribution to pension
- Adequacy of income/investments to maintain standard of living
- Reasons for planned retirement



# Richness of CLSA Telephone-Interview Data





# Access

Alphanumeric data from 21,241 CLSA participants who completed 60 minute CATIs



# Data and Biospecimen Access

- Data and biospecimens will be available to the research community
- Fundamental tenets:
  - The *rights, privacy* and *consent* of participants must be protected and respected at all times
  - The *confidentiality* and *security* of data and biospecimens must be safeguarded at all times
  - CLSA data and biospecimens are unique resources that must be used optimally to support research to benefit all Canadians.



# Data Access Steps

## Tracking Data Only

Application process via CLSA **DataPreview** portal

1. Administrative Review
2. Data and Sample Access Committee Review
3. Recommendation to Scientific Management Team
4. Notification of applicant
  - Steps 1 to 4 take 3-4 weeks
5. CLSA Access Agreement preparation and signatures
  - Institutional review/signature timing is unpredictable
6. Raw data provided to approved investigator
  - Step 6 takes 5 working days following completion of step 5

[acces@clsa-elcv.ca](mailto:acces@clsa-elcv.ca)



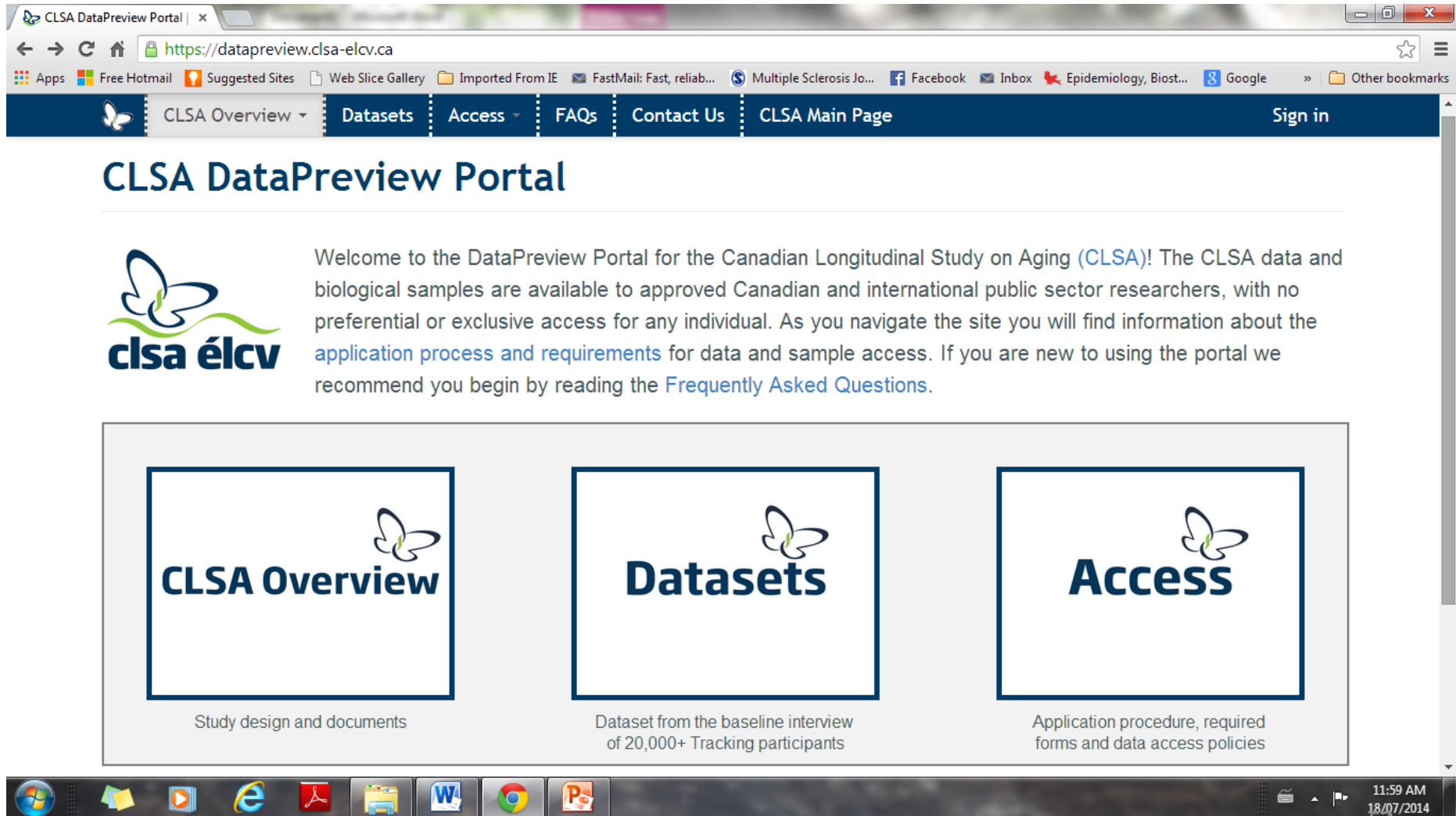
# Data Access Continued

- Costing
- Cost Recovery
  - a. \$1,000 for a straightforward dataset
  - b. No cost for data for graduate student theses
- DSAC Meetings 2015
  - February, April, June, September, December
- Application deadlines
  - March 23<sup>rd</sup>, May 15<sup>th</sup>, August 14<sup>th</sup>, November 16<sup>th</sup>



# DataPreview Portal

<https://datapreview.clsa-elcv.ca/>



The screenshot shows a web browser window displaying the CLSA DataPreview Portal. The browser's address bar shows the URL <https://datapreview.clsa-elcv.ca/>. The page features a dark blue navigation bar with links: CLSA Overview, Datasets, Access, FAQs, Contact Us, and CLSA Main Page. A 'Sign in' link is also present. Below the navigation bar, the page title 'CLSA DataPreview Portal' is displayed. The main content area includes the CLSA elcv logo, a welcome message, and three large buttons: 'CLSA Overview', 'Datasets', and 'Access'. Each button has a description below it. The Windows taskbar at the bottom shows the time as 11:59 AM on 18/07/2014.


CLSA DataPreview Portal | x

← → ↻ 🏠 <https://datapreview.clsa-elcv.ca/> ☆ ☰


Apps Free Hotmail Suggested Sites Web Slice Gallery Imported From IE FastMail: Fast, reliab... Multiple Sclerosis Jo... Facebook Inbox Epidemiology, Biost... Google » Other bookmarks

CLSA Overview ▾ Datasets Access ▾ FAQs Contact Us CLSA Main Page Sign in

## CLSA 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



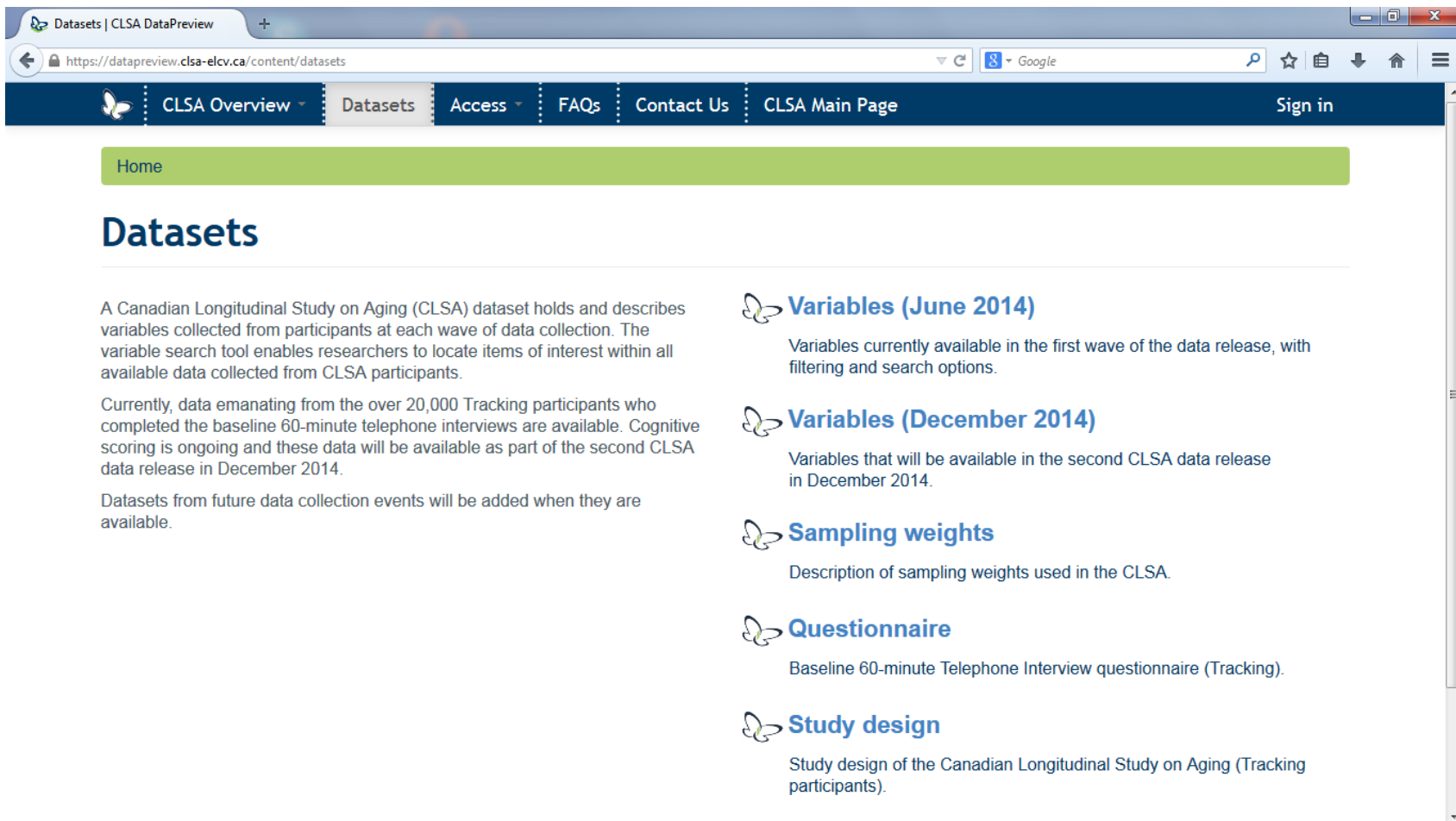
Access

Application procedure, required forms and data access policies

Windows taskbar: 11:59 AM 18/07/2014



# DataPreview Portal








The screenshot shows a web browser window with the URL <https://datapreview.clsa-elcv.ca/content/datasets>. The page has a dark blue navigation bar with links: CLSA Overview, Datasets (active), Access, FAQs, Contact Us, and CLSA Main Page. A 'Sign in' link is on the right. Below the navigation bar is a green 'Home' button. The main heading is 'Datasets'. The content area is divided into two columns. The left column contains three paragraphs: a general description of the CLSA dataset, information about the current data release (June 2014), and a note about future data collection events. The right column contains five links, each preceded by a butterfly icon: 'Variables (June 2014)', 'Variables (December 2014)', 'Sampling weights', 'Questionnaire', and 'Study design'. Each link has a brief description of its content.

**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.

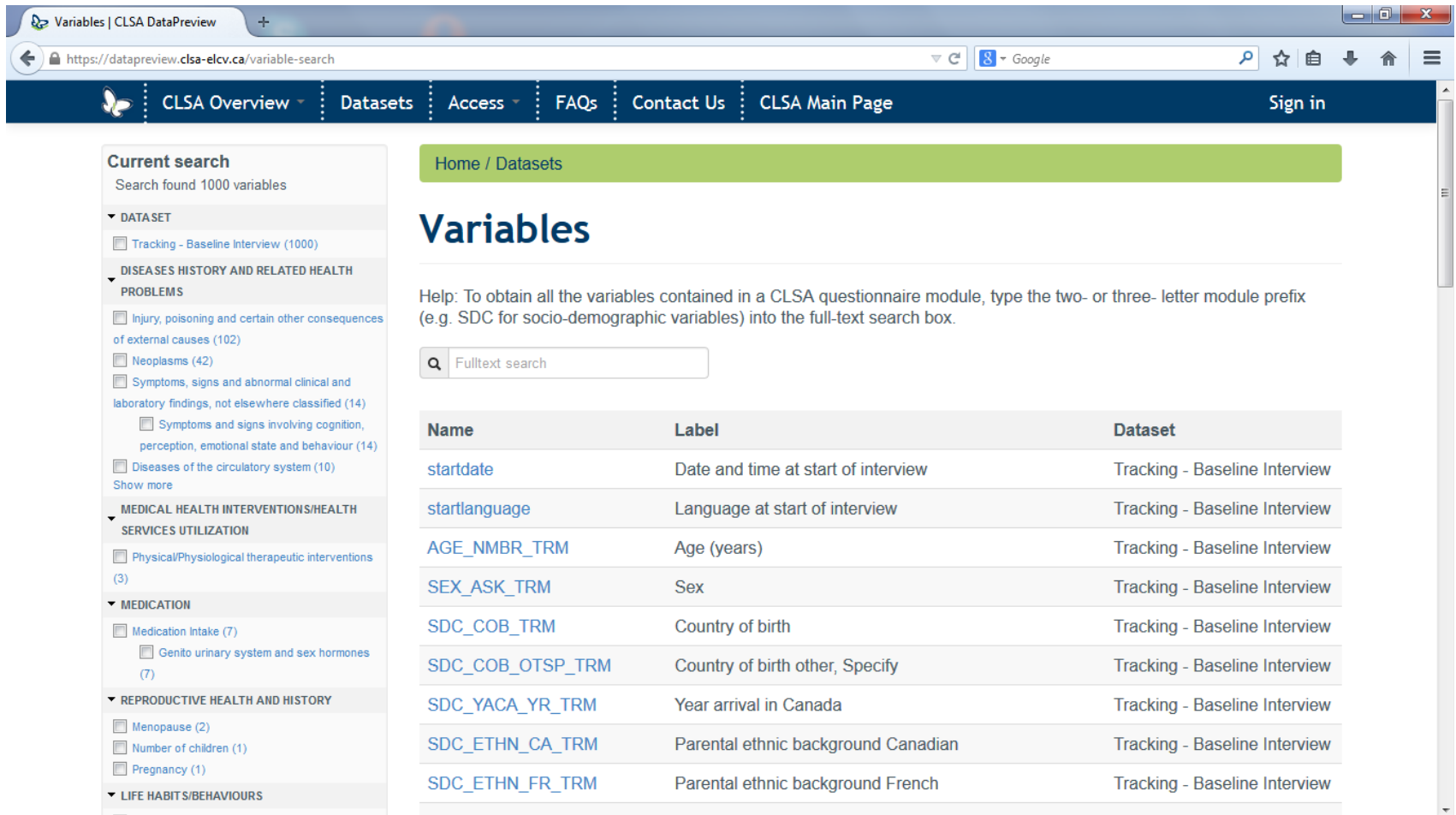
Currently, data emanating from the over 20,000 Tracking participants who completed the baseline 60-minute telephone interviews are available. Cognitive scoring is ongoing and these data will be available as part of the second CLSA data release in December 2014.

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).



# DataPreview Portal



Variables | CLSA DataPreview

https://datapreview.clsa-élc.ca/variable-search

CLSA Overview Datasets Access FAQs Contact Us CLSA Main Page Sign in

**Current search**  
Search found 1000 variables

**DATASET**

- ☐ Tracking - Baseline Interview (1000)

**DISEASES HISTORY AND RELATED HEALTH PROBLEMS**

- ☐ Injury, poisoning and certain other consequences of external causes (102)
- ☐ Neoplasms (42)
- ☐ Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (14)
  - ☐ Symptoms and signs involving cognition, perception, emotional state and behaviour (14)
- ☐ Diseases of the circulatory system (10)  
[Show more](#)

**MEDICAL HEALTH INTERVENTIONS/HEALTH SERVICES UTILIZATION**

- ☐ Physical/Physiological therapeutic interventions (3)

**MEDICATION**

- ☐ Medication Intake (7)
  - ☐ Genito urinary system and sex hormones (7)

**REPRODUCTIVE HEALTH AND HISTORY**

- ☐ Menopause (2)
- ☐ Number of children (1)
- ☐ Pregnancy (1)

**LIFE HABITS/BEHAVIOURS**

Home / Datasets

## Variables

Help: To obtain all the variables contained in a CLSA questionnaire module, type the two- or three- letter module prefix (e.g. SDC for socio-demographic variables) into the full-text search box.

Fulltext search

Name	Label	Dataset
<a href="#">startdate</a>	Date and time at start of interview	Tracking - Baseline Interview
<a href="#">startlanguage</a>	Language at start of interview	Tracking - Baseline Interview
<a href="#">AGE_NMBR_TRM</a>	Age (years)	Tracking - Baseline Interview
<a href="#">SEX_ASK_TRM</a>	Sex	Tracking - Baseline Interview
<a href="#">SDC_COB_TRM</a>	Country of birth	Tracking - Baseline Interview
<a href="#">SDC_COB_OTSP_TRM</a>	Country of birth other, Specify	Tracking - Baseline Interview
<a href="#">SDC_YACA_YR_TRM</a>	Year arrival in Canada	Tracking - Baseline Interview
<a href="#">SDC_ETHN_CA_TRM</a>	Parental ethnic background Canadian	Tracking - Baseline Interview
<a href="#">SDC_ETHN_FR_TRM</a>	Parental ethnic background French	Tracking - Baseline Interview



# Approved Applications

Applicant Title	Location
Consumer Product related senior falls and injury risk assessment	Ontario
CLSA Neurological conditions initiative (CLSA-NCI)	Quebec
The association between hearing loss and social function in older Canadians	British Columbia
The Veterans' Health Initiative within the CLSA (CLSA-VHI)	Quebec
Labour force participation: Retirement Transitions, Expectations and Planning	Ontario Student application
Who is at risk of social isolation and loneliness?	Manitoba
Companion animals and the aging population: Exploring relationships, contexts, and opportunities to contribute to health equity	Alberta Student application
Factorial invariance of the CES-D	Saskatchewan
The development of normative data and comparison standards for the cognition measures employed in the CLSA	British Columbia



# Linking CLSA Data

- Linkage is key to CLSA research strategy
  - Enormous potential for collection of information that is difficult to get from participants due to time, accuracy limitations; unknown to participants
- Types of databases
  - Individual level administrative provincial health databases (priority)
  - Disease registries
  - Population level databases of community characteristics, climate, **pollution**
  - Individual level economic characteristics





# First Follow Up (2015-2018)

- 1<sup>st</sup> follow up Tracking (September 2015)
  - Re-contacting 21,242 participants for their follow up telephone interviews
- 1<sup>st</sup> follow up Comprehensive (July 2015)
  - Re-contacting 30,000 participants for their follow up in-home interviews and DCS visits



# First Follow Up

## New Content

- Child maltreatment
- Elder Abuse
- Epilepsy
- Hearing handicap
- Arterial stiffness
- Workability
- Subjective cognitive decline
- Transportation
- Health care use
- Preventive health behaviours



# Analysis of baseline biomarkers

## Biomarker and epigenetic analyses repeated over time

- Panel of biomarkers: albumin, ALT, creatinine, CRP, ferritin, hemoglobin A1C, lipids (cholesterol, HDL, Triglycerides, LDL), thyroid stimulating hormone, free T4, 25-hydroxyvitamin D
  - n=28,000 (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)
- Proposals submitted to do miRNA and metabolomics
- Requires isolation of DNA from PBMCs



# CLSA



Study on Aging



Canadian Longitudinal Study on Aging  
Étude longitudinale canadienne sur le vieillissement



Funded by the Government of Canada through the CIHR and CFI, and by Provincial Governments



## *Transforming Everyday Life into Extraordinary Ideas*

[griffith@mcmaster.ca](mailto:griffith@mcmaster.ca)  
[www.clsa-elcv.ca](http://www.clsa-elcv.ca)





# Questions? Comments?

