



# Canadian Longitudinal Study on Aging: A Platform for Interdisciplinary Research

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The Future is Aging  
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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

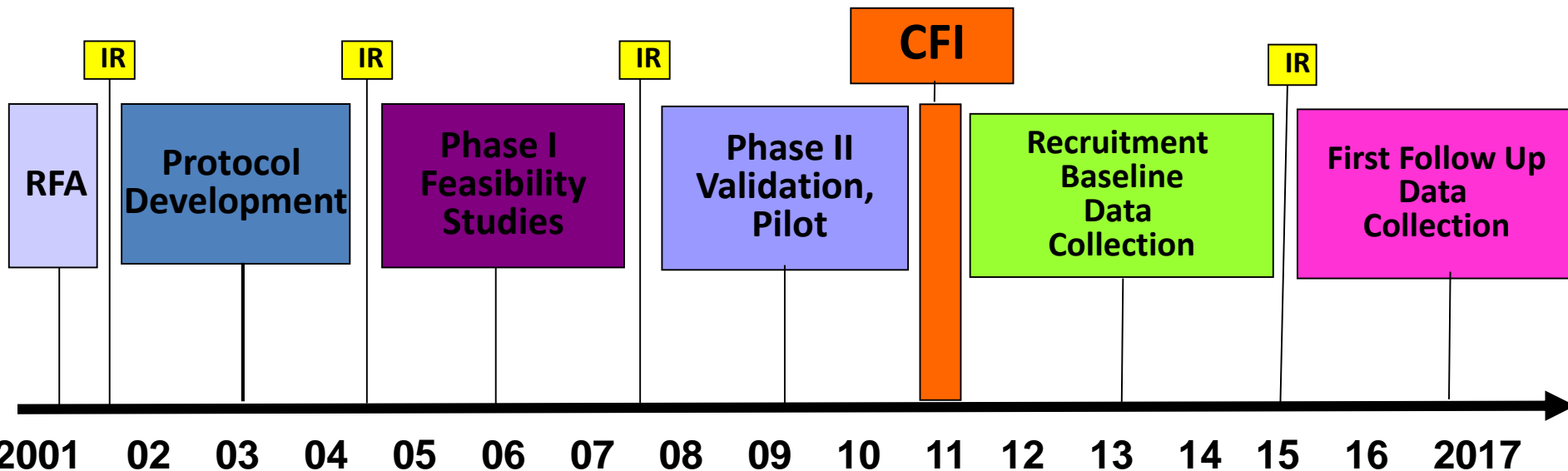
# CLSA Timeline and Milestones

Team  
Design  
Objectives  
Content

Acceptability  
Bio-specimens  
Recruitment  
Data Linkage

Pilot recruitment  
Validate measures  
SOPs, TMs  
Pilot protocol

Data Collection  
Data Cleaning  
Data Release



# 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

# 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

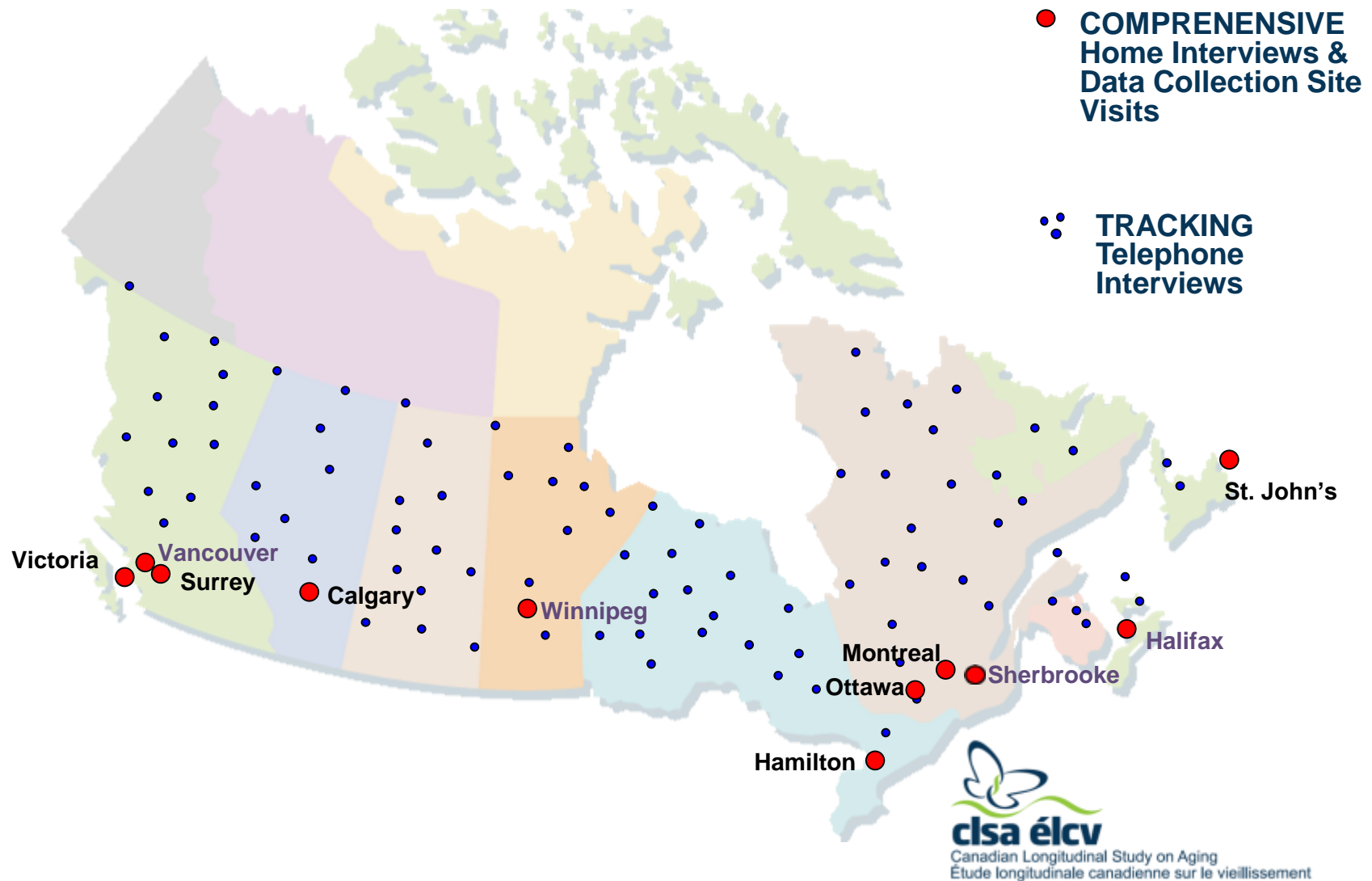
**20 year study: Full follow up every 3 years, maintaining contact in between**

**Data Linkage**

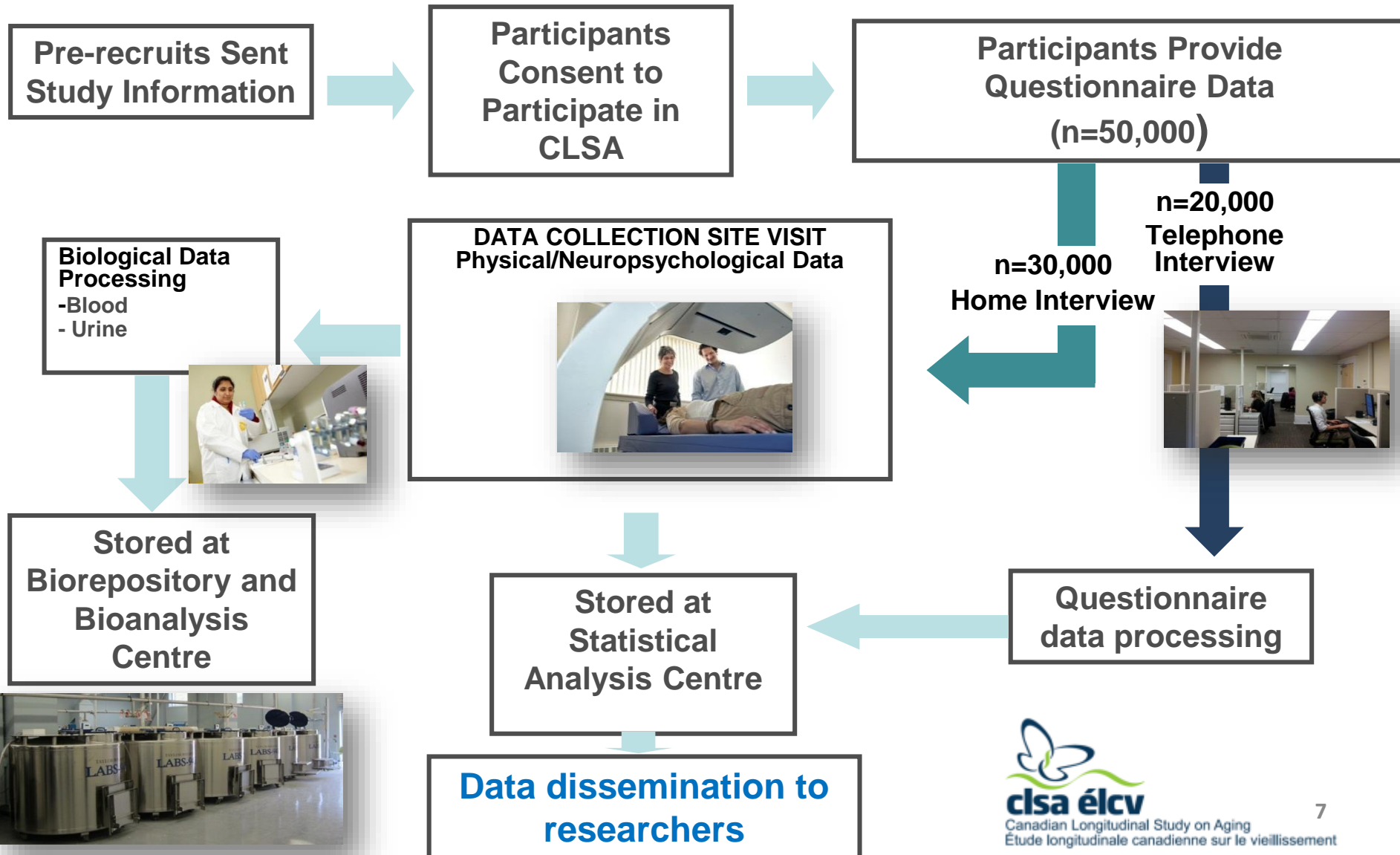


Canadian Longitudinal Study on Aging  
Étude longitudinale canadienne sur le vieillissement

# National Scope Representative Sample Frame



# Innovative Standardized, Electronic Data Capture



# Depth and Breadth of CLSA

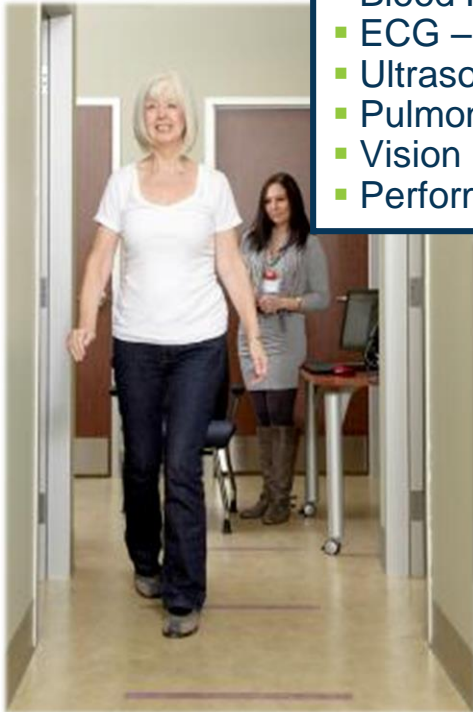
## Baseline Questionnaire modules

- **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
- Oral health
- **PHYSICAL**
  - 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

# Depth and Breadth of Physical Assessment Modules

## Physical Assessments:

- Height, Weight, BMI
- Bone Density, Body Composition, Aortic Calcification
- Blood Pressure
- ECG – heart rate, rhythm
- Ultrasound - Carotid Intimal-Medial Thickness
- Pulmonary Function
- Vision (acuity, blood flow, pressure) & Hearing
- Performance testing – grip strength, balance, walk



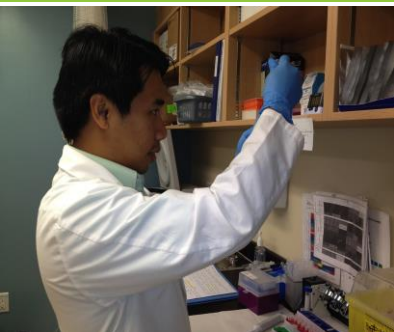
## Biospecimen Collection:

- Blood
- Urine

## Cognitive Assessments:

- Neuropsychological Battery
  - Memory
  - Executive function
  - Reaction time

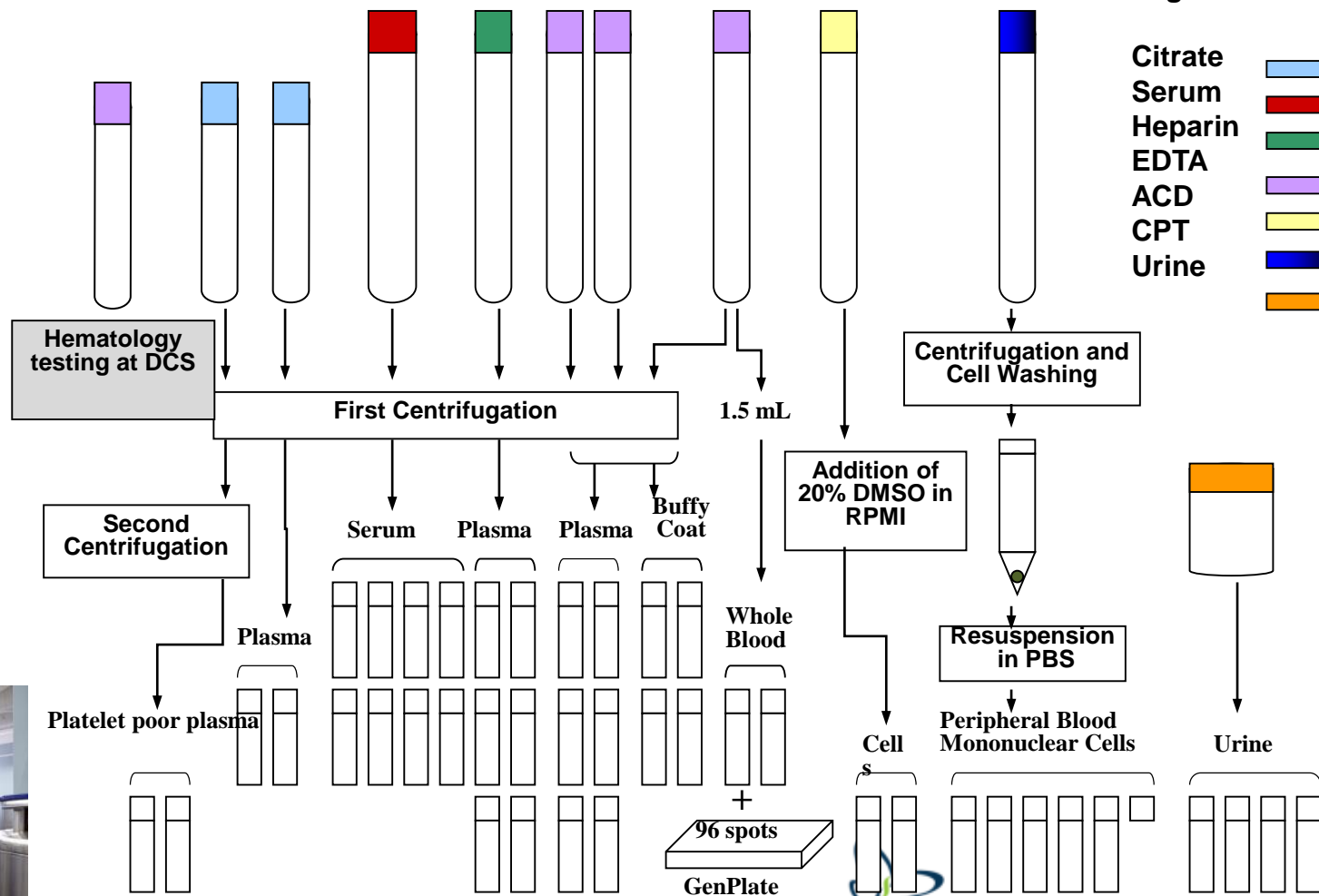




# Bio specimen processing 42 aliquots per participant

Legend:

Citrate  
Serum  
Heparin  
EDTA  
ACD  
CPT  
Urine



- Basic hematologic tests done on site
- Remainder processed, frozen within 2 hours

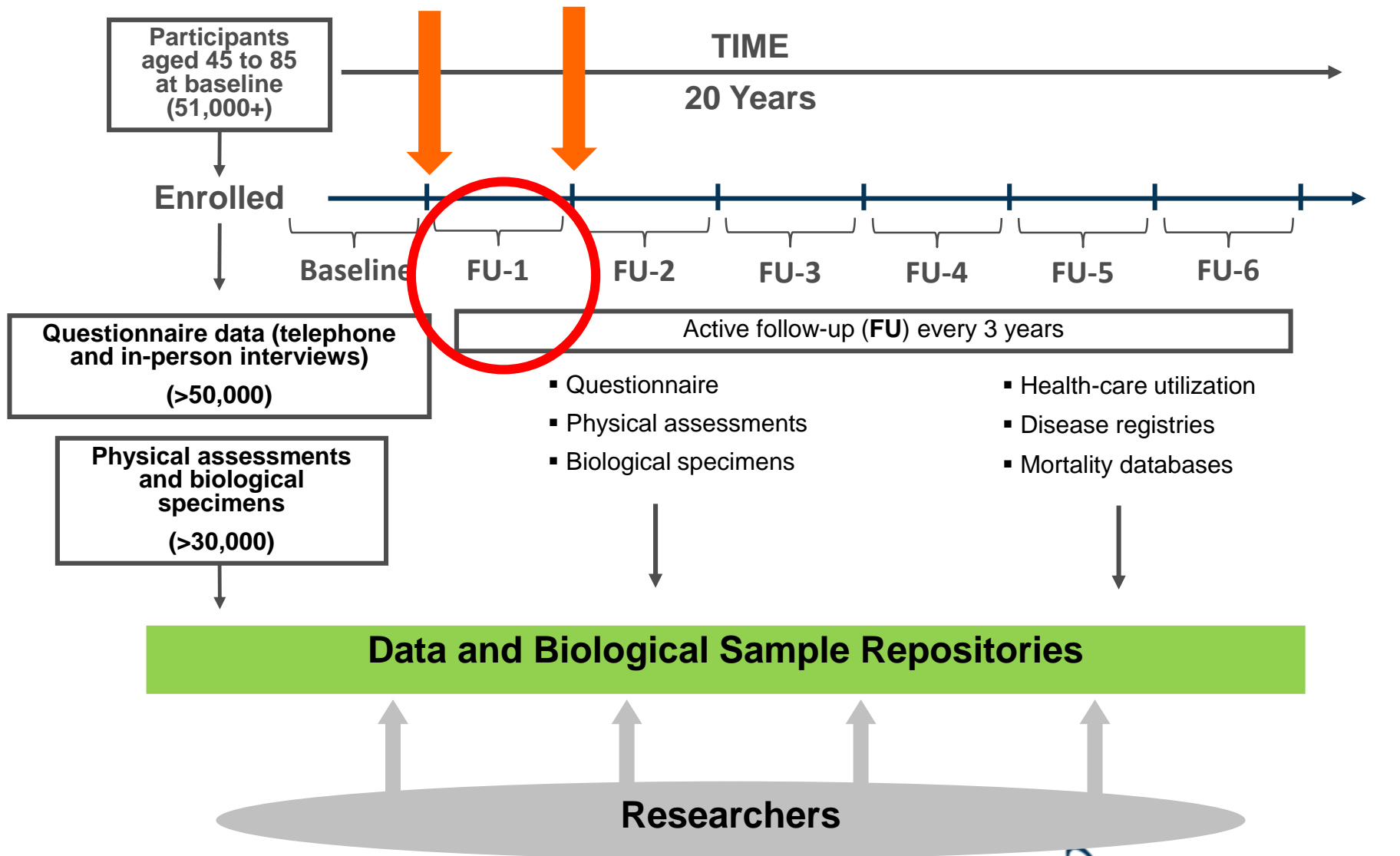


2010 - 2015

2015

2018

# CLSA Overview



# First Follow-Up: New Content

- Child maltreatment
- Elder abuse
- Unmet health-care needs
- Workability
- Preventive health behaviours
- Subjective cognitive decline
- Loneliness
- Sexual orientation and gender identity
- Transition to institutions
- Decedent information



# First Follow-Up: Accommodation Strategies

- **Changing circumstances**

- Migration out of area
- Mobility, travel challenges
- Cognitive impairment
- Physical impairment
- Sensory impairment
- Institutionalization



- Accommodation strategies to maintain long-term participation
- Allows for flexible participation
- Baseline exclusion criteria no longer apply



# A Snapshot of CLSA Participants



# Socio-demographic Characteristics

	Tracking N=21,171	Comprehensive N=30,094	Total N=51,265
<b>Age</b>			
<b>45-64</b>	12389 (58.5)	17459 (58.0)	29848 (58.2)
<b>65-85</b>	8782 (41.5)	12635 (42.0)	21417 (41.8)
<b>Sex</b>			
<b>Male</b>	10375 (49.0)	14784 (49.1)	25159 (49.1)
<b>Female</b>	10796 (51.0)	15310 (50.9)	26106 (50.9)
<b>Language</b>			
<b>English</b>	17423 (82.3)	24291 (80.7)	41714 (81.4)
<b>French</b>	3748 (17.7)	5803 (19.3)	9551 (18.6)
<b>Born in Canada</b>	18455 (87.2)	24644 (81.9)	43099 (84.1)

# Chronic Conditions

<b>Chronic Condition</b>	<b>Tracking 21,171</b>		<b>Comprehensive 30,094</b>		<b>Total 51,265</b>
<b>Osteoarthritis</b>					
<b>Knee</b>	3406	(16.1)	4499	(15.2)	7905 (15.4)
<b>Hand</b>	2966	(14.1)	3852	(13.0)	6818 (13.3)
<b>Hip</b>	2075	(9.8)	2500	(8.4)	4575 (9.0)
<b>Asthma</b>	2340	(11.1)	3983	(13.3)	6323 (12.3)
<b>COPD</b>	1430	(6.8)	1725	(5.8)	3155 (6.2)
<b>Hypertension</b>	8065	(38.2)	11099	(37.1)	19164 (37.4)
<b>Diabetes</b>	3536	(16.7)	5311	(17.7)	8847 (17.3)
<b>Heart disease</b>	2170	(10.3)	3499	(11.7)	5669 (11.1)
<b>Angina</b>	1136	(5.4)	1323	(4.4)	2459 (4.8)
<b>Heart attack</b>	1303	(6.2)	1461	(4.9)	2764 (5.4)
<b>Stroke</b>	388	(1.8)	521	(1.7)	909 (1.8)
<b>Cataracts</b>	5236	(24.8)	8607	(29.2)	13843 (27.0)
<b>Mood disorder</b>	3100	(14.7)	5140	(17.1)	8240 (16.1)
<b>Cancers</b>	3250	(15.4)	4680	(15.6)	7930 (15.5)
<b>Osteoporosis</b>	1998	(9.5)	2688	(9.0)	4686 (9.1)

# Self Rated Health

	Tracking 21,271	Comprehensive 30,094	Total 51,265
<b>Self Rated General Health</b>			
Excellent	3969 (18.8)	5991 (19.9)	9960 (19.5)
Very Good	8103 (38.3)	12423 (41.3)	20526 (40.1)
Good	6237 (29.5)	8872 (29.5)	15109 (29.5)
Fair	2218 (10.5)	2318 (7.7)	4536 (8.9)
Poor	623 (3.0)	467 (1.6)	1090 (2.1)
<b>Satisfaction with Life</b>			
Dissatisfied	2068 (9.8)	2971 (9.9)	5039 (9.8)
Neutral	849 (4.0)	1338 (4.5)	2187 (4.3)
Satisfied	18229 (86.2)	25752 (85.7)	43981 (85.9)

# Interdisciplinary Collaborations

## Partnerships with End Users

- Canadian Consortium on Neurodegeneration and Aging (CCNA)
- Health Canada: Ambient air pollution, socioeconomic and lifestyle characteristics and health
- MINDMAP: Urbanization and Mental Health (EU - Horizon2020)
- WELFUTURE: Forecasting impact and sustainability of future welfare for older people with health, social and long-term care needs -Italy, Austria, Finland, Canada (JPND MYBL)
- AGE-WELL: Use of assistive devices for mobility, sensory loss and unmet needs

# Linking research to practice and policy

- Public Health Agency of Canada (PHAC)
  - Neurological Conditions Initiative
  - Injuries and consumer products
  - Elder Abuse
  - Child Maltreatment
- Veterans Affairs
  - Veterans Health Initiative
- Provincial, regional, municipal governments
- Health authorities

# Data and Sample Access

- Data and biospecimens available to the research community
- Fundamental tenets:
  - The *rights, privacy* and *consent* of participants protected and respected at all times
  - The *confidentiality* and *security* of data and biospecimens safeguarded at all times
  - CLSA data and biospecimens are unique resources that must be used optimally to benefit all Canadians
  - No preferential or exclusive access
- Data and Sample Access Policy and Guiding Principles [www.clsa-elcv.ca](http://www.clsa-elcv.ca)
- DataPreview portal to see data
- Data and/or Sample Request Application
- Queries to [access@clsa-elcv.ca](mailto:access@clsa-elcv.ca)
- Applications reviewed by Data and Sample Access Committee at least 3 times per year – dates on website
- Cost recovery of \$3,000 for baseline alphanumeric data on over 51,000 (fee waived for graduate students, PDF)

# CLSA Research Team

## Operations Committee and Scientific Leads



# CLSA Funders and Partners



Veterans Affairs  
Canada



Anciens Combattants  
Canada

Health PEI





## *Transforming Everyday Life into Extraordinary Ideas*



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