



***Transforming Everyday Life  
into Extraordinary Ideas***



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

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# Canadian Longitudinal Study on Aging (CLSA)

- 20 years, 50,000 Canadians
- More than 160 researchers – 26 institutions
- Multidisciplinary – biology, genetics, medicine, psychology, sociology, demography, economics, epidemiology, nursing, nutrition, health services, biostatistics, population health



Canadian Longitudinal Study on Aging  
Étude longitudinale canadienne sur le vieillissement

# Strategic Partners

- Strategic initiative of the Canadian Institutes of Health Research (CIHR)
- Funded by CIHR and the Canada Foundation for Innovation (CFI)
- Provinces and universities across Canada



# Our 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.**



# Our Aim

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

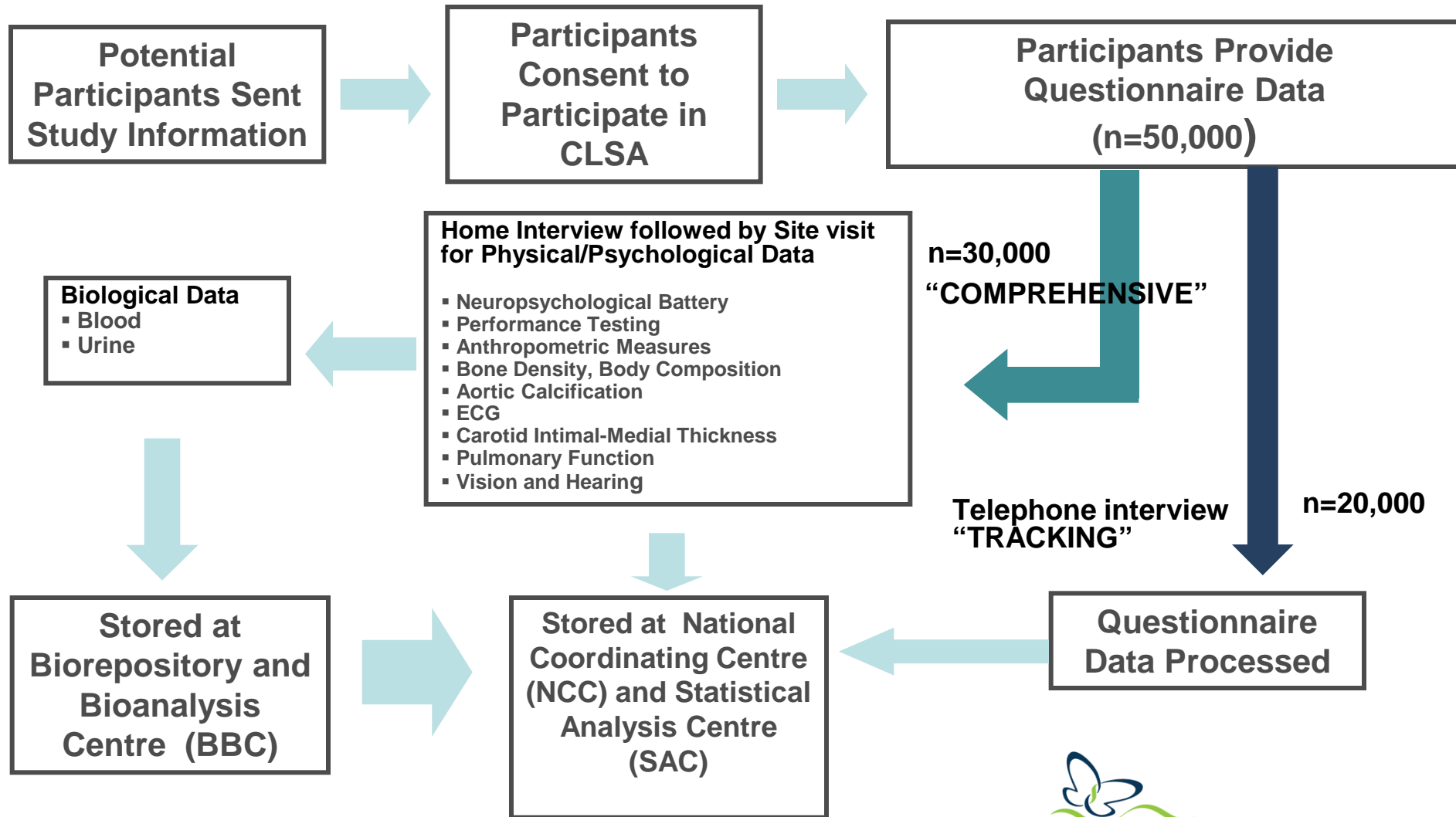


# Overall Goals of the CLSA

- 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**
  - ✓ **Cardiovascular, Cerebrovascular, Neurological, Respiratory, Vision and Hearing, Diabetes, Renal, Metabolic, Cancer, Osteoarthritis, Osteoporosis, Depression, Musculoskeletal**
- **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 caregiving** in an aging population
- **Retirement and post-retirement** labour market activity



# CLSA Data Collection





# Depth and Breadth of CLSA

## PHYSICAL & COGNITIVE MEASUREMENTS

- Height & weight
- Waist and hip measurements
- Bioimpedence
- Arterial pressure
- Mean heart rate
- Grip strength, timed up-and-go, chair raise, 4-m walk
- Standing balance
- Vision
- Hearing
- Spirometry
- Bone density
- Aortic calcification
- ECG
- Carotid intima-media thickness
- Cognitive assessment

## HEALTH INFORMATION

- Chronic disease symptoms (11 chronic conditions)
- Medication intake & compliance
- 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
- Coping, adaptation
- Work-to-retirement transitions
- Job-demand/effort reward
- Retirement planning
- Social inequalities
- Mobility-lifespace
- Built environments
- Wealth

## LIFESTYLE & SOCIODEMOGRAPHIC

- Smoking
- Alcohol consumption
- Physical activity
- Nutrition
- Birth location
- Ethnicity/race/gender
- Marital status
- Education
- Income



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# Biological Samples

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

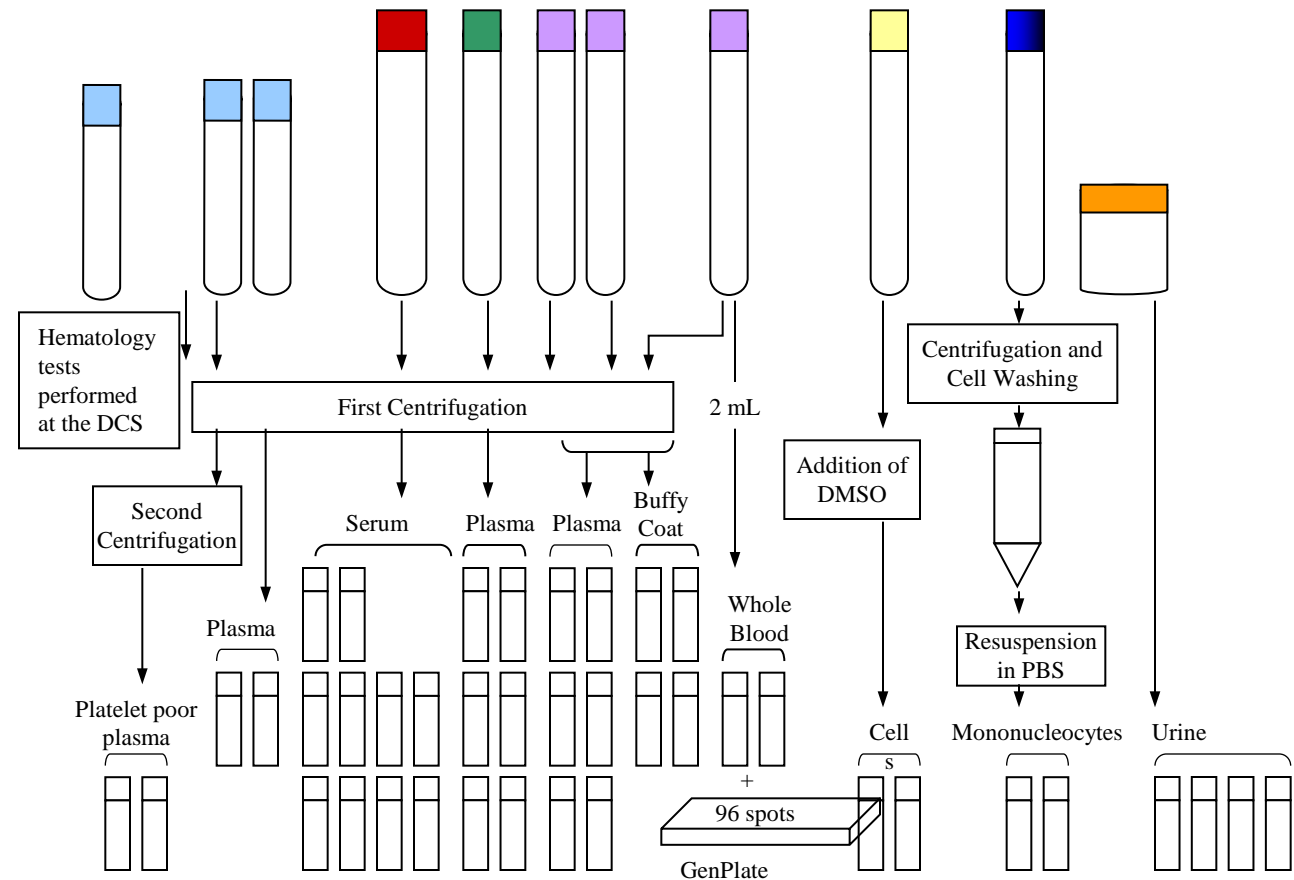
### General Hematology

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

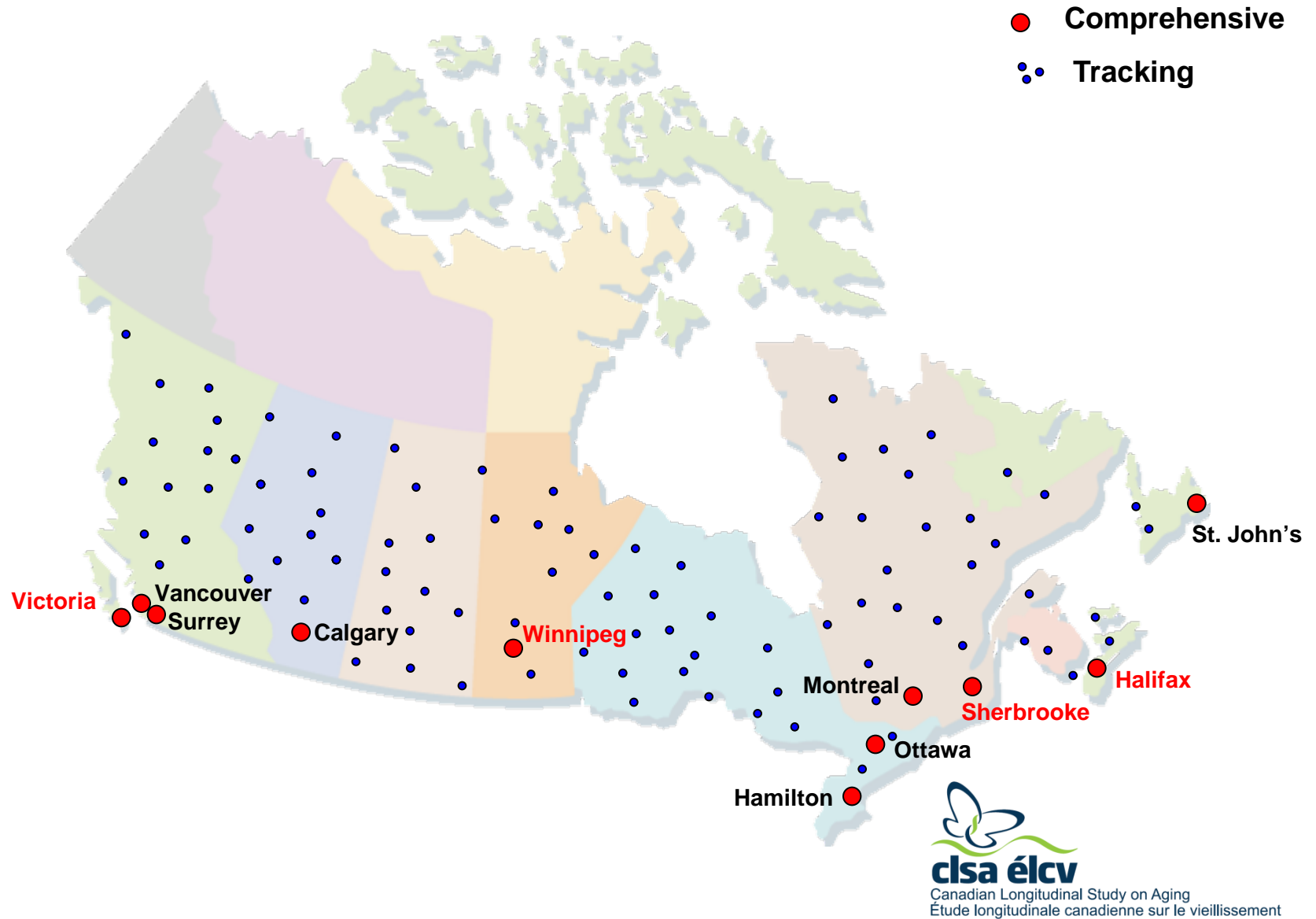
### Lipid Profile

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

### Genetic and Epigenetic Markers



# Participant Recruitment



# CLSA Recruitment

## ***Tracking Cohort Recruitment:***

- Canadian Community Health Survey (CCHS)
- Ministry of Health Registries and/or Random Digit Dialing

## ***Comprehensive Cohort Recruitment:***

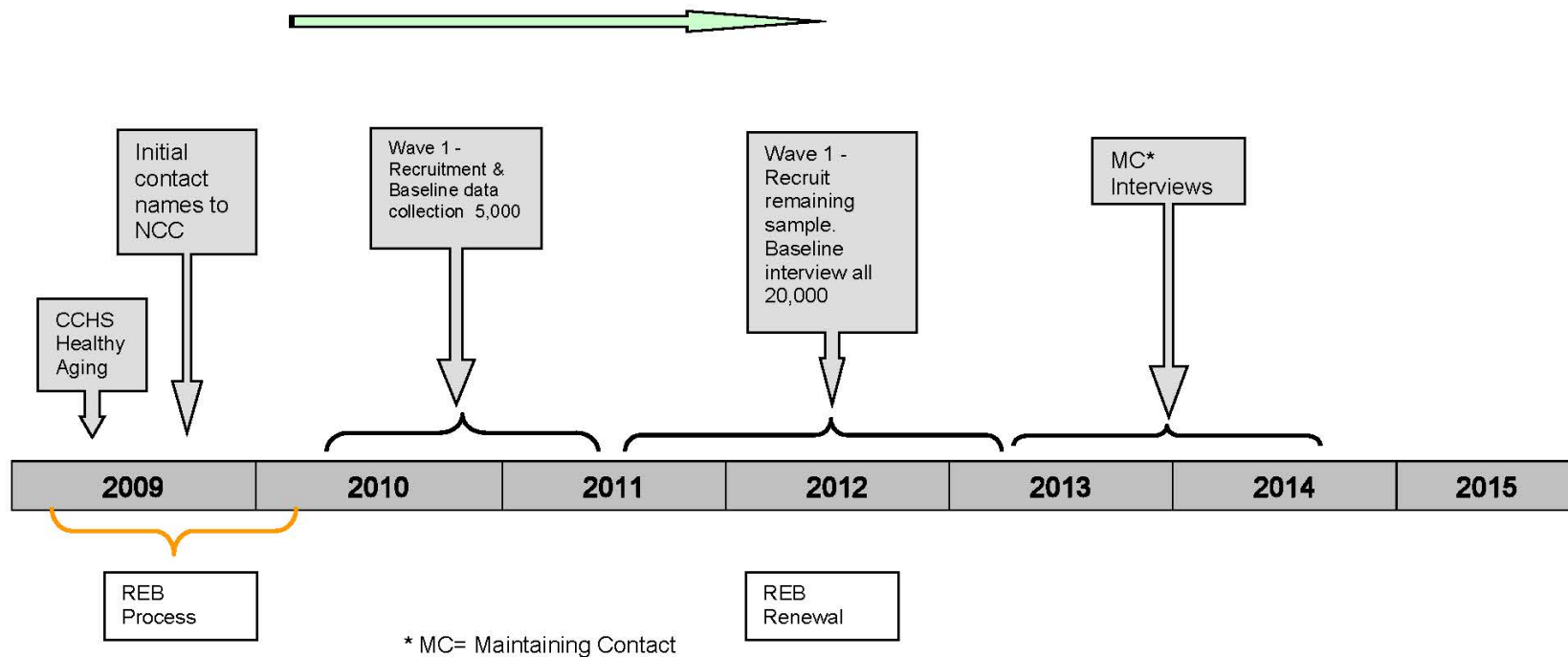
- Ministry of Health Registries and/or Random Digit Dialing



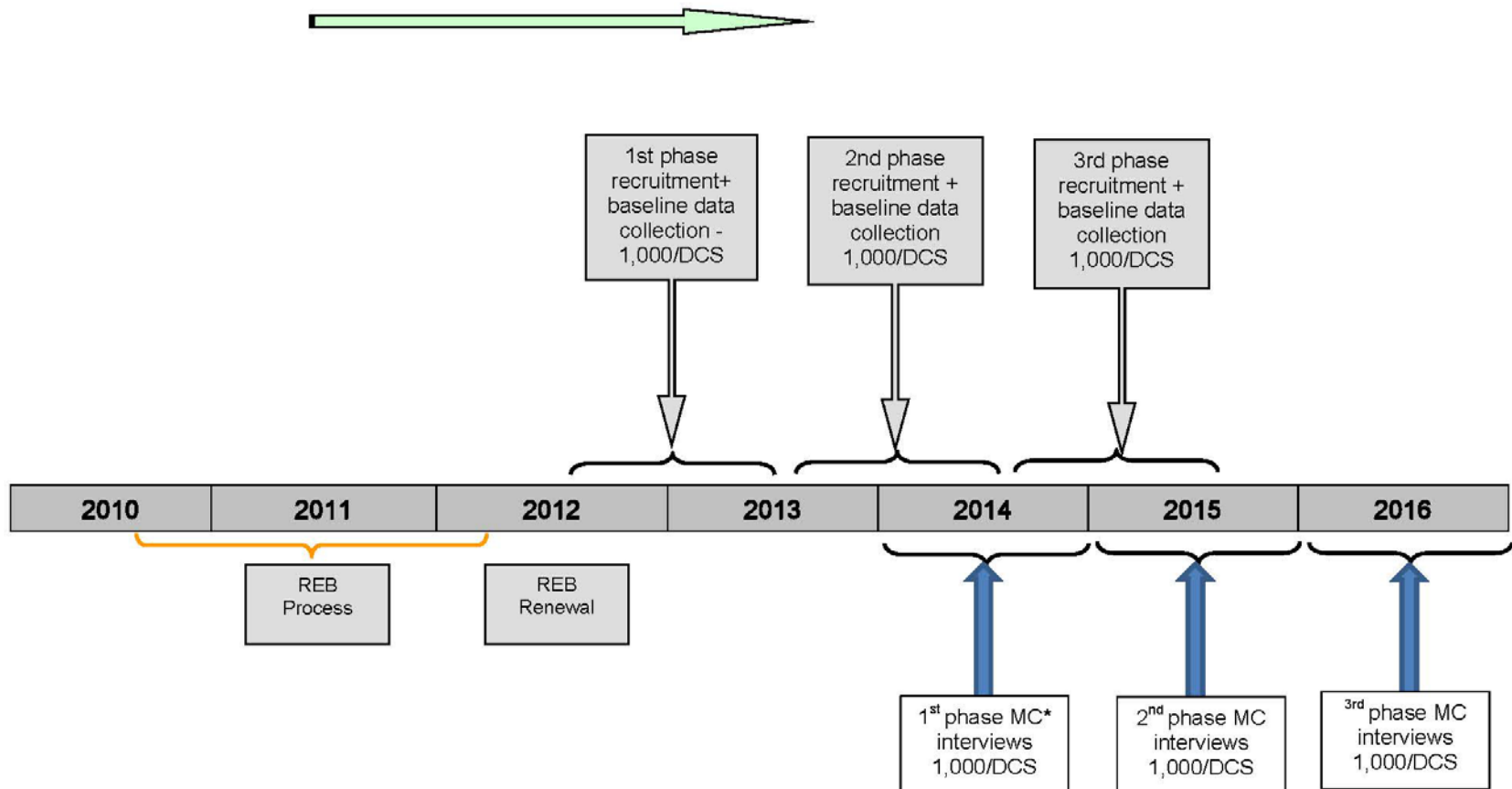
# Time lines

- 50,000 participants
- 20 years to complete the study
- Baseline Wave 1, to be completed 2013 – 2015
- Six additional Waves every three years

# Baseline - Tracking Cohort Timeline (2009-2015)

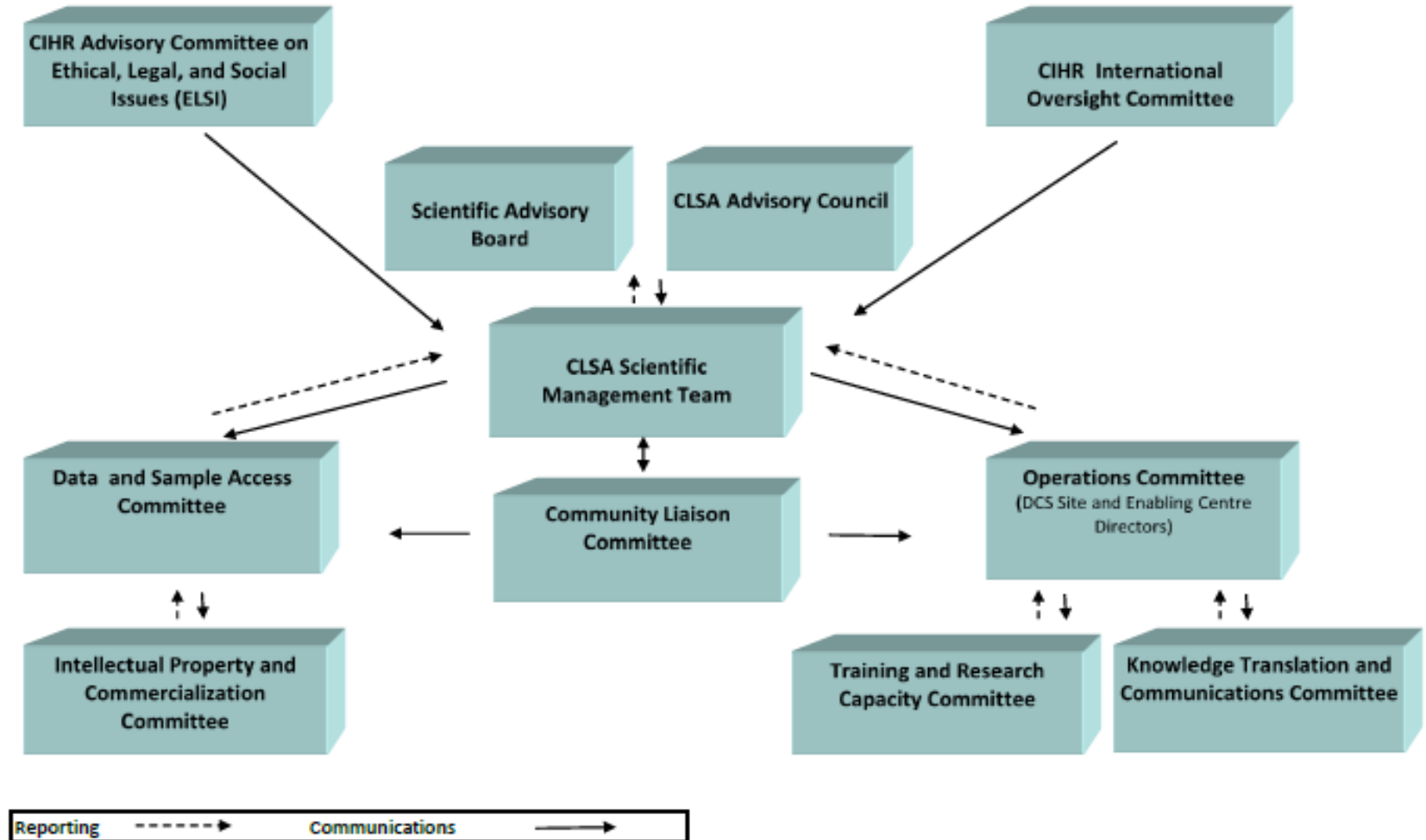


# Baseline - Comprehensive Cohort Timeline (2009-2015)



\*MC = Maintaining Contact

# CLSA Governance Structure





# Canadian Investment

## **\$50M Canadian investment in national platform**

- \$23.5M CIHR for 5 Years
- \$10M CFI for 5 Years (infrastructure)
- \$10M Provinces for 5 Years (infrastructure)
- \$6.5 M Universities and other partners

# CLSA Partners

- Public Health Agency of Canada
- Veterans Affairs
- Statistics Canada
- Ontario Ministry of Health and Long-Term Care
- Provinces
- Universities
- CLSA Infrastructure vendors and suppliers
- Private companies

# CLSA by the numbers

- 50,000 participants
- 20 years to complete the study
- 57,487 Lines of code making up Sabretooth, Beartooth and Mastodon (software)
- Up to 140,000 Telephone interviews
- Up to 210,000 Home interviews
- Up to 210,000 Visits to data collection sites
  - Up to 8,820,000 biospecimen aliquots
- Up to 300,000 Follow-up calls
- Up to 129 million Questions asked during telephone interviews
- Up to 219 million Data points collected during CLSA home interviews and visits to data collection sites
- Up to 348 million Anticipated number of data points that will form the CLSA research platform



# COLLABORATE AND INNOVATE

## INFRASTRUCTURE

- State-of-the-art facilities: bio-repository and bio-analysis laboratories, fully equipped data collection facilities and call centres across Canada, statistical analysis centre, genetics and epigenetics centre
- Novel open-source software for conducting multicentre research
- Novel hardware design and architecture
- Secure data management systems to preserve participant confidentiality
- Collaboration and harmonization with other national and international cohorts

## RESEARCH

- Progression and management of disease and disability
- Risk factor identification
- Co-morbidity
- Psychosocial aspects of health
- Genetic and epigenetic aspects of disease and disability
- Biospecimen and preservation research
- Biomarker discovery for early detection and management of disease
- Research platform for auxiliary studies
- Trajectories of healthy aging
- Quality of life

## OUTPUTS

- Healthcare utilization patterns
- Evidence to inform health and public policy
- Personalized medicine to improve outcomes
- Development of interventions and programs
- Development of services and products
- Research capacity
- Advanced science of aging
- Improved health of Canadians





# CLSA CORE TEAM

<b>Lead PI</b>	Parminder Raina ( <b>McMaster</b> )
<b>CO-PI</b>	Christina Wolfson ( <b>McGill</b> ) and Susan Kirkland ( <b>Dalhousie</b> )
<b>Key Senior Co-Investigators</b>	Gerry Mugford ( <b>Memorial</b> ), Helene Payette ( <b>Sherbrooke</b> ), Ron Postuma ( <b>McGill</b> ), Larry Chambers and Vanessa Taler ( <b>Ottawa</b> ), Harry Shannon, Cynthia Balion, Christopher Patterson, Lauren Griffith and Mark Oremus ( <b>McMaster</b> ), Mary Thompson and Chang Bo ( <b>Waterloo</b> ), Margaret Penning, Holly Tuokko, ( <b>Victoria</b> ), Verena Menec ( <b>Manitoba</b> ), David Hogan ( <b>Calgary</b> ) , Max Cynader, Michael Hayden and Michael Kobor ( <b>UBC</b> ) and Andrew Wister ( <b>SFU</b> )
<b>Scientific Working Group</b>	<b>See our website – <a href="http://www.clsa-elcv.ca">www.clsa-elcv.ca</a></b>



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**[www.clsa-elcv.ca](http://www.clsa-elcv.ca)**





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