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Canadian Longitudinal Study on Aging
Étude longitudinale canadienne sur le vieillissement

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

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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

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Lead Scientific Team

Lead PI: Parminder Raina - McMaster University

Co-PI: Christina Wolfson - McGill University

CO-PI: Susan Kirkland - Dalhousie University

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CLSA- The Concept

The Vision

A research platform - - infrastructure to enable state-of-the-art interdisciplinary population based *research* and *evidenced-based* decision making.

The Aim

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

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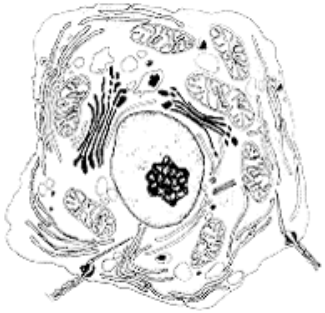
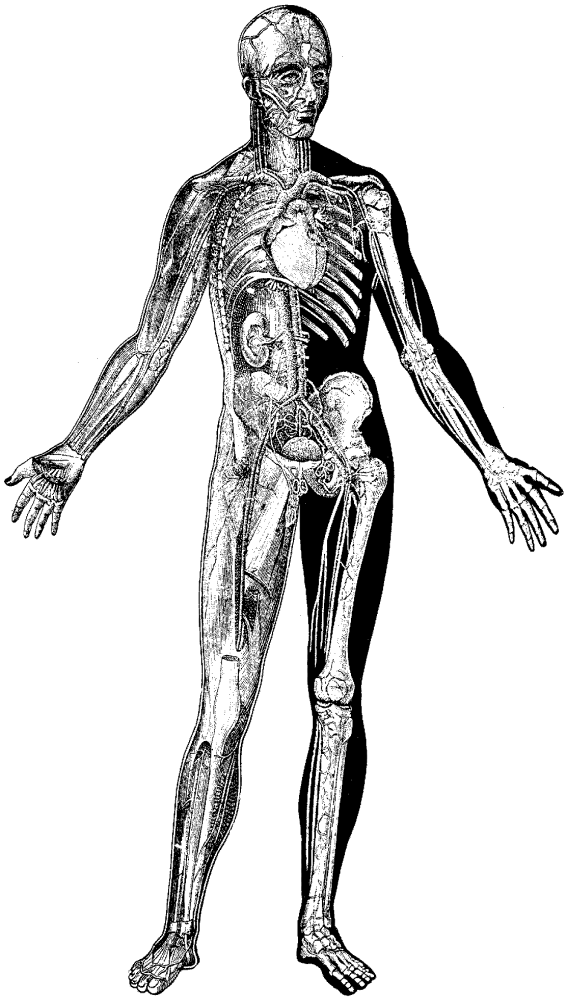


Innovation - Cell to Society



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

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CLSA Program of Research

- Biological Function
  - Genetics/epigenetics
- Physical Function
  - Mobility/Chronic diseases/Injury
- Psychological Function
  - Cognition/Mental Health/Coping
- Social Function
  - Work and retirement/Social Participation/Housing

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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** at older ages
- **Cognitive functioning** and **mental health** at older ages
- **Disability** and the compression of morbidity
- The examination of socioeconomic and health **inequalities** in an ageing population
- **Social participation** and **social relationships** at older ages
- **Retirement** and **post retirement** labor market activity
- **Genetics**, **health behaviours**, **expectations**, **life history**, and determinants of **SES** …

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CLSA Architecture

- Inception Cohort: 50,000 (at 10 sites)
- In-Depth Collection on 30,000
- Questionnaires, Database linkage
- Clinical, Biological, Physical
- Follow-up over 20 years

Every 3 years age 45-84

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Core Set of Measurements

Biomedical

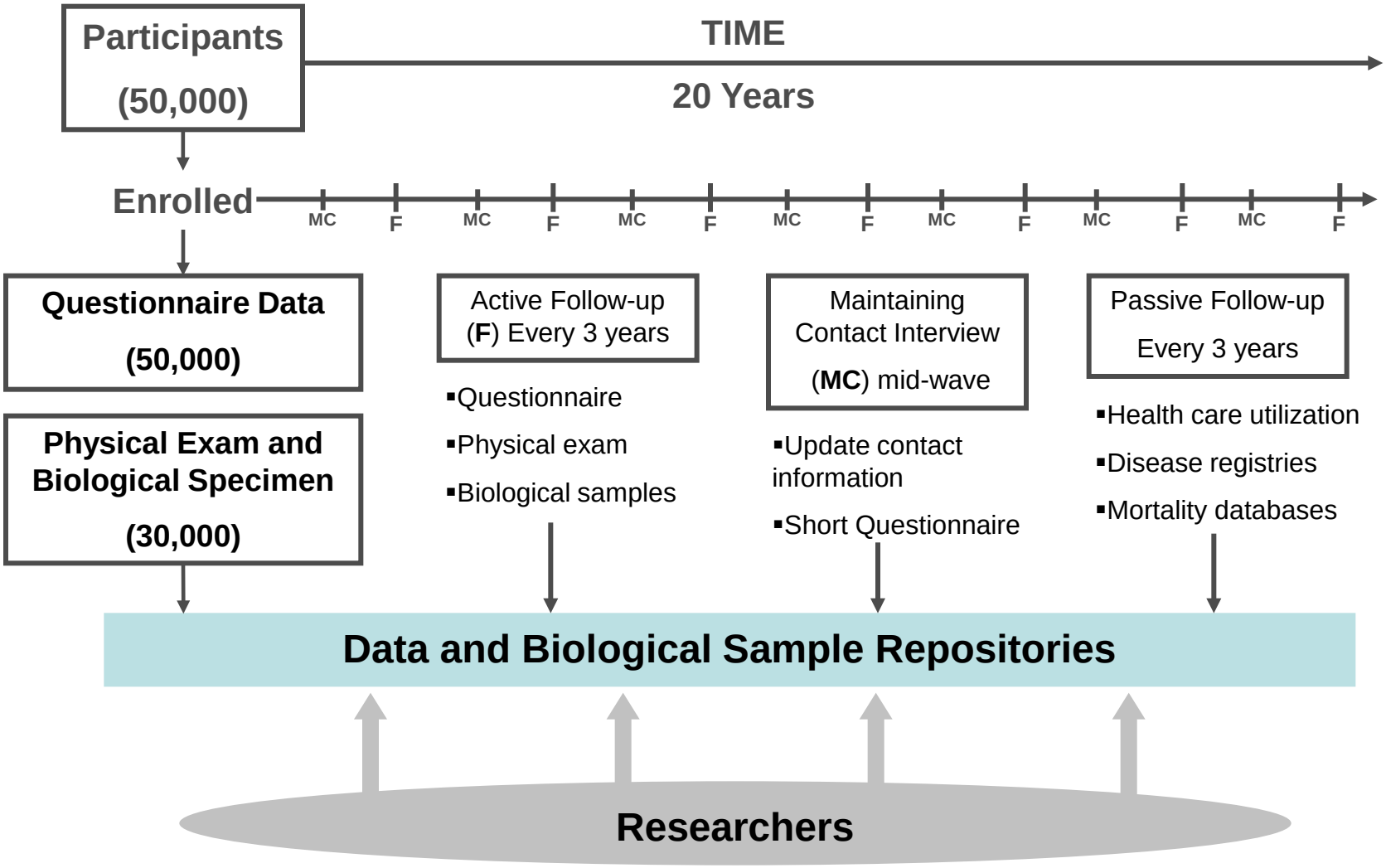
- Health status, Quality of life, healthy aging
- Activities of daily living/disability/injuries
- Frailty/co-morbidities
- Function/Performance
- Physical measures
- Chronic diseases and symptoms
- Injuries
- Cognitive function, Mental Health
- Oral health
- Vision, hearing
- Medications
- Health and Social Services Use
- Institutional care
- Genetics/Biology
  - Disease susceptibility/longevity genes
  - Epigenetics
  - Biomarkers
- Nutrition

Psychosocial

- Social participation
- Lifestyle/behaviours
- Social networks and social support
- Care giving/Care receiving
- Coping, adaptation
- Mood, psychological distress
- Work to retirement transitions
- Workability
- Retirement Planning
- Job-Demand/Effort-Reward
- Social inequalities
- Mobility-Lifespace
- Built environments/physical environment/Housing
- Economics/Wealth
- Demographics
- Linkage to **"secondary"** data bases
  - Health care use, homecare
  - Disease registries e.g. Cancer
  - Environmental (need development)
  - Contextual (need development)
  - Drugs

Biological Samples

- **Blood based Sample Types**
  - Serum
  - Plasma, heparin
  - Plasma, EDTA
  - Plasma, citrate
  - Whole blood, EDTA
  - Buffy coat
  - Buffy Coat with Trizol
  - Whole Blood, Acid Citrate Dextrose + Dimethyl Sulfoxide
  - Peripheral Blood Mononuclear Cells
- Urine (no preservative)



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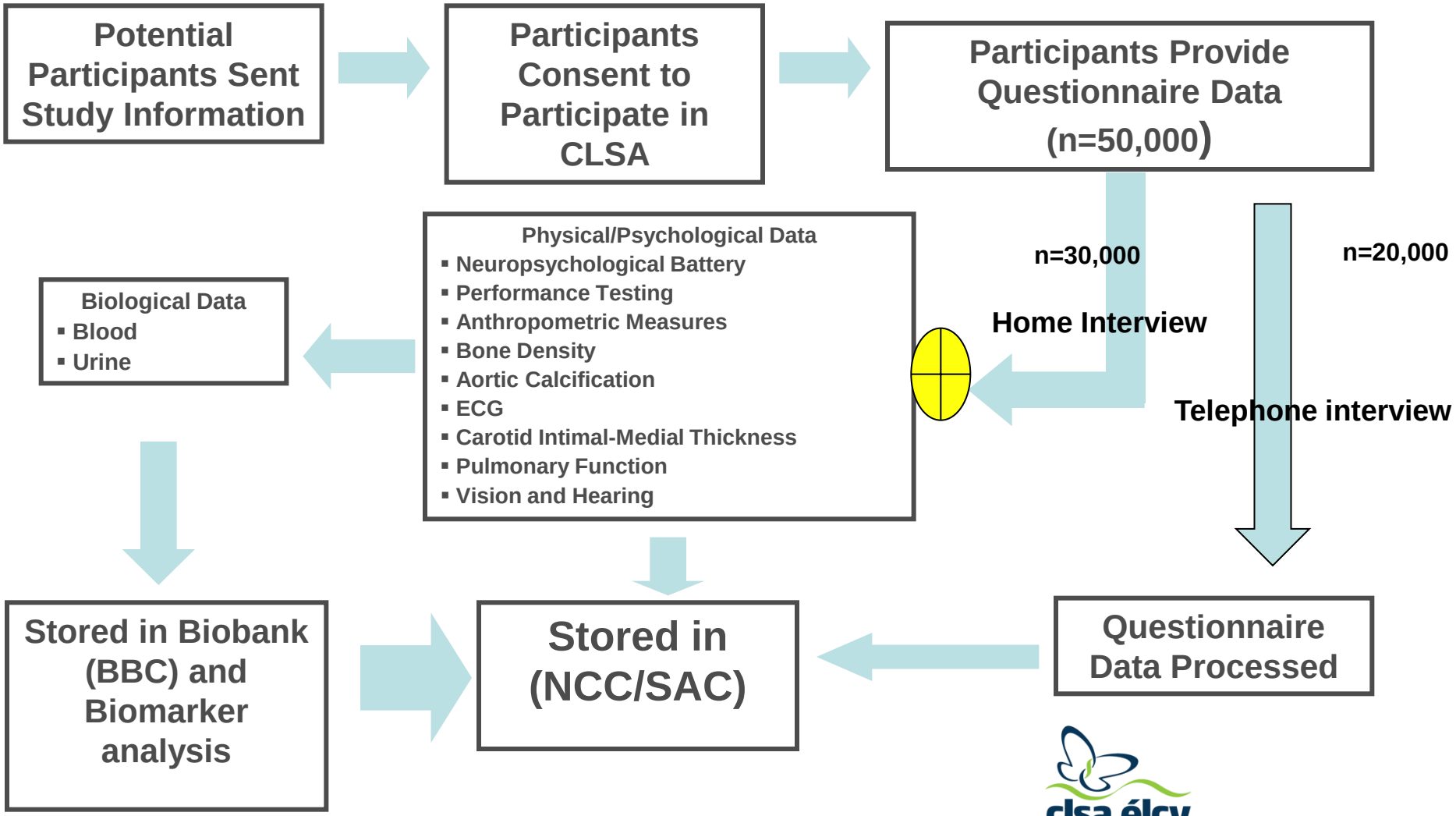
Data Collection Overview



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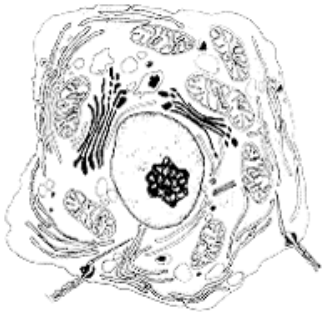

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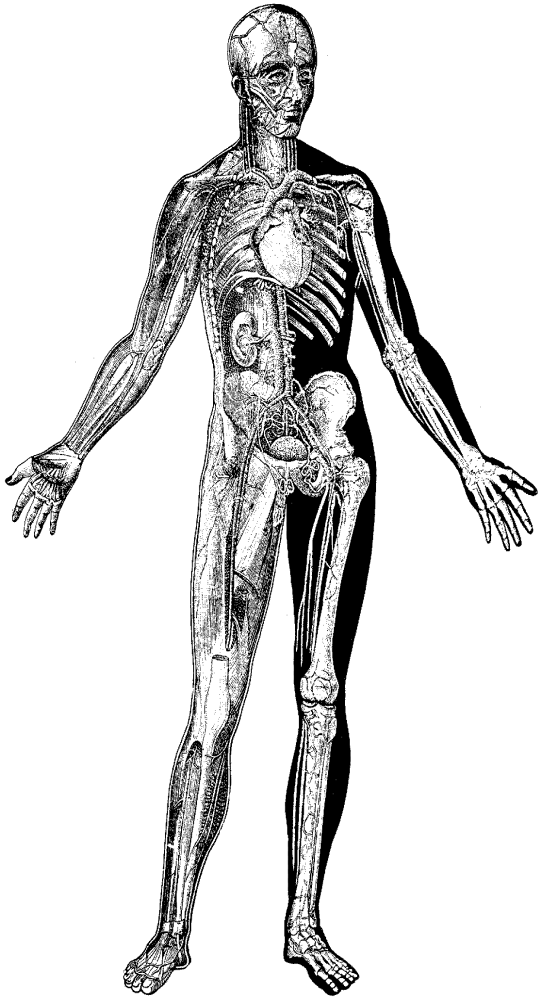

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Example

Physical Function

Mobility

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Mobility

«activity & participation» *

Examples of precursors

Individual (or intrinsic)

Chronic diseases (eg osteoarthritis)
Neuropsychological conditions
Cognition/Perceived health
Medication use/Pain/ Dizziness
Poor vision
Fear of falling/
Obesity/Nutrition/weight loss/appetite
Physical activity/fitness/strength
Functional performance (measured & reported)
Alcohol use
Biomarkers (inflammation, hormonal, metabolism, genetics, epigenetics)
Personality

Contextual (or extrinsic or environmental)

Social partcipation
Transportation resources
Community/neighbourhood characteristics
Social network/support

Examples of consequences

Diseases

Osteoporosis, sarcopenia

Physical Health

Injuries/Frailty/Disability
Poor nutrition status

Psychological Health

Psychological distress
Quality of life
Loneliness
Unmet needs

Social Health

Social participation/engagement/capital
Work Transitions
Unmet needs
Institutionalization

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Mobility

Mobility as a precursor:

Is mobility in mid- and later life associated with physical, psychological and social functioning? Specifically:

- How do changes in mobility impact upon indicators of psychological health including, depression, psychological distress, satisfaction with life, adjusting for other factors?

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Mobility

Mobility as a mediator:

How does mobility in mid- and later life mediate relationships between determinants of health and health outcomes? Specifically:

– How does compromised mobility mediate the relationship between income and health?

Mobility

Mobility as an outcome:

How do physical, psychological, and social functioning in mid- and later life relate to changes in mobility? Specifically:

- What is the relationship between inflammatory biomarkers (e.g., IL-6, C reactive protein, albumin), hormonal biomarkers (e.g., IGF-1, T3, T4), metabolic (e.g., fasting glucose, cholesterol) or immunological markers (TNFα), oxidative stress (e.g. vitamin E and C), vitamin D, and (Epi) genetic markers (e.g., IGF-I and Apo-E) and changes in mobility and how is this relationship modified by SES?

- What is the relationship between neighbourhood deprivation and incident mobility disability in aging population?

Equipment and Infrastructure Supporting Research on Aging

Computer-Assisted Telephone Interview Centres

Collect health and psychosocial data (located in Halifax and Sherbrooke).

Data Collection Centres

collection of nutrition, physical, clinical data, & biological specimens.

National Coordinating Centre

Oversight, project management, data management, communication for overall initiative

(located in Hamilton)

Biological Processing Centre

Bio-banking, biomarker discovery & analysis (located in Hamilton).

Genetics and Epigenetics Centre

Genotyping, epigenetic analysis, and bioinformatics, (located in Vancouver)

Statistical Analysis Centre

assimilation, distribution and analysis of of all CLSA data (located in Montreal).

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Collaboration with Statistics Canada

- CCHS 4.2: Healthy Aging and CLSA
  - CLSA expertise for content development
  - Recruitment for CLSA
    - Release of names with written consent
    - Sharing of Data with written consent

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Implementation Plans for Tracking Cohort of the CLSA

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Launch of the CLSA

- First selection of 20,000 started in late 2008 in collaboration with Statistics Canada CCHS Healthy Aging module (Tracking Cohort)
    - Approximately 12 500 have agreed to release their names to CLSA

- Remaining 30,000 will be recruited in late 2010 (Comprehensive Cohort)

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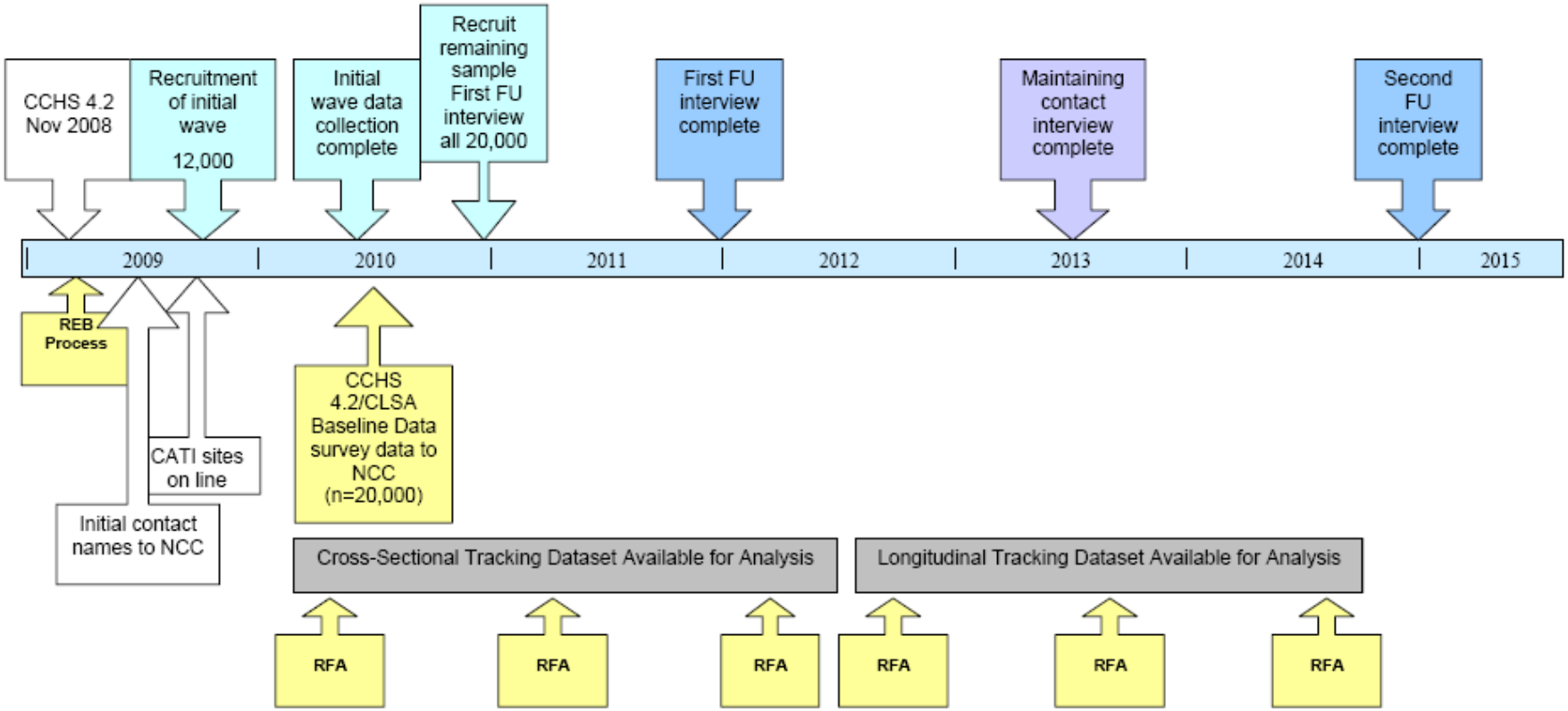
Tracking Cohort Timeline (2009-2015)



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Implementation Plans for Comprehensive Cohort of the CLSA

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Implementation Plan for the Comprehensive Cohort (n=30,000)

- Cohort of 30,000 persons to be recruited within 25km radius of 10 data collection sites (DCS)
  - Victoria, Vancouver, Calgary
  - Winnipeg, Hamilton, Ottawa
  - Montreal, Sherbrooke
  - Halifax, St. John's

Comprehensive Cohort Rolling Recruitment

- First batch of 1000 people to be recruited/site (mid-2011 to mid-2012)
  - Maintaining contact by phone (end of 2012- end 2013)
- Second batch of 1000 people to be recruited/site (mid-2012 to mid-2013)
  - Maintaining contact: (end of 2013-end of 2014)
- Third batch of 1000 people to be recruited/site (mid-2013 to mid 2014)
  - Maintaining contact: (end of 2014-end of 2015)

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Components Comprehensive of Data Collection

- Mail information package and consent forms
- Telephone contact to recruit and set up a home visit
- Home Visit
  - Consent Process
  - Data collection using Computer Assisted Personal Interview
- Set up appointments for a visit to Data Collection Site

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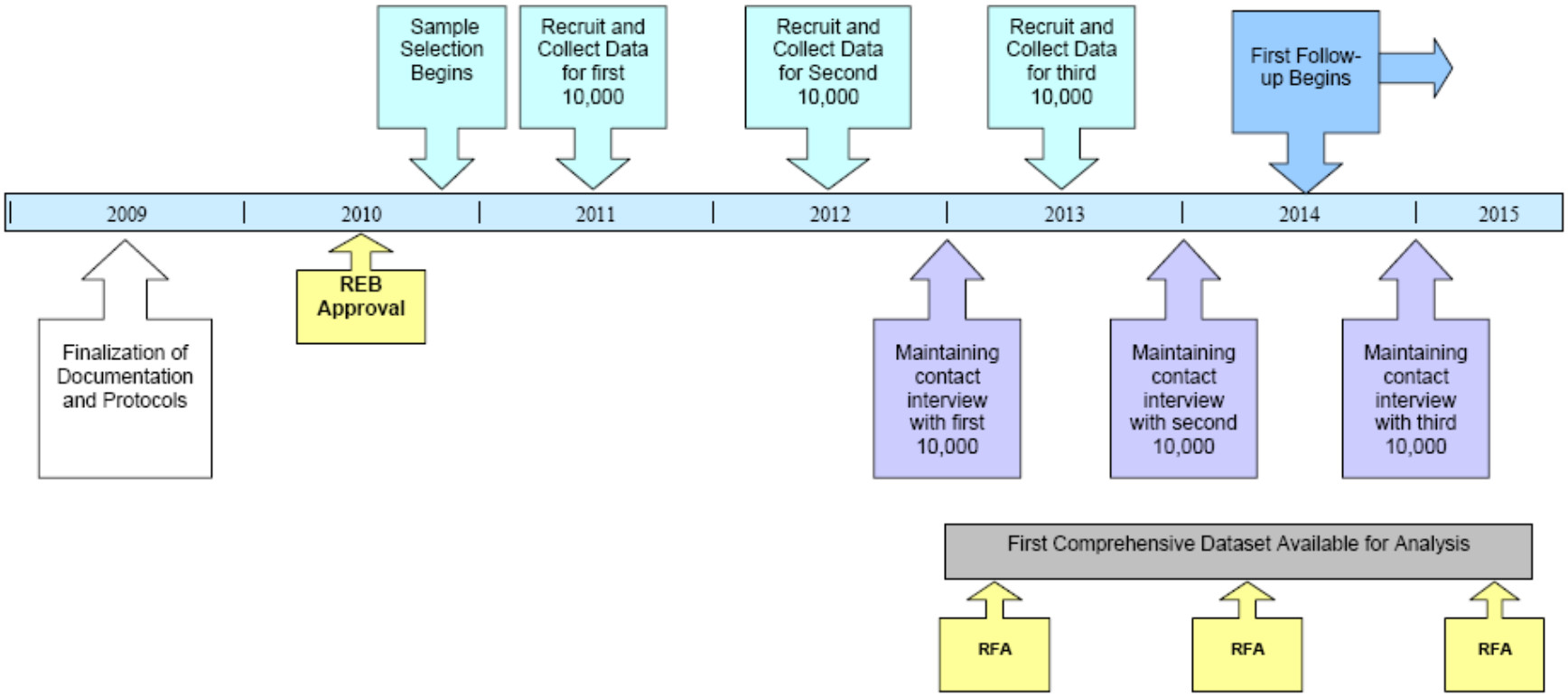
Comprehensive Cohort Timeline (2009-2015)



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