The Canadian Longitudinal Study on Aging:
Protocol Development

CAG Annual Meeting
Toronto, 2003
Overview of the Presentation

- Study aims
- Conceptual framework
- Research questions
- Process
- Design considerations
- Governance
- Timeline
- Future developmental work
Background to CLSA

CANADIAN LIFELONG HEALTH INITIATIVE

• Cross cutting strategic initiative of CIHR

• Two longitudinal studies:
  • Canadian Longitudinal Study on Aging (CLSA)
  • Canadian National Birth Cohort (CNBC)
Background to CLSA

November 4, 2001
- Healthy Aging: From Cell to Society, planning workshop sponsored by the Institute of Aging
- Launch of Requests For Proposal (RFP)

January 15, 2002
- Response to RFP by investigator team

October 1, 2002
- Study commencement
Principal Investigator
Triumvirate

Susan Kirkland - Dalhousie University

Parminder Raina - McMaster University

Christina Wolfson - McGill University
CLSA Research Team

- 3 Principal Investigators
- 20 Co-Investigators
  - 4 Senior Advisors
  - 3 Institutional Advisors
  - 8 Theme leaders
  - 5 Cross cutting Advisors
- 200 collaborators

Representing 26 Universities & 10 Provinces
Institute of Aging

CLSA Steering Committee

Principal Investigators

Theme Groups
Co-Investigators & Collaborators
Rationale for CLSA

- Aging of Canadian population
- Longer life expectancies
- Baby boomers begin turning 65 in 2011
- Different needs, expectations
- Implications for health care system, social programs
- Need for evidence based decision making
- Generation of new knowledge
Development of conceptual model

• Need to characterize aging beyond the absence of disease

• Theoretical discussions in the literature: healthy aging, successful aging, optimal aging, productive aging, active aging

• Know little about the process of aging, except among the aged
Healthy/Successful Aging

Literature dominated by two models:

- **Rowe and Kahn (Gerontologist 1997)**
  - Differentiates successful aging from usual aging
  - based on the assumption that successful agers engage in behaviours that **modify risk factors** to allow them to meet a high degree of physical, mental and social functioning

- **Baltes and Baltes (1990)**
  - Selection, optimization, compensation
  - based on the assumption that decline is an inevitable part of aging, and that successful agers are those who engage in processes that help them to **adapt to change** in order to meet their own goals
Conceptual Framework

- Healthy and successful aging
- Adult development, lifecourse approach
- Determinants of health
- Critical and sensitive periods
- Adaptation
- Complexity: bio-psycho-social aspects of aging, intrinsic and extrinsic level factors, interactions
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 healthy and successful aging.

• To provide infrastructure and build capacity for high quality research on aging in Canada.
Study Objectives

1. To determine how changes over time in
   • Genetic and biochemical factors
   • Exercise, nutrition, other health behaviours
   • Physical, psychological, cognitive abilities
   • Social, economic, and cultural factors
   • Health and community services
   Are inter-related;
   Contribute to healthy and successful aging.
Study Objectives

2. To identify factors that will inform intervention strategies to promote healthy aging

3. To inform evidence based practice, health care delivery, public policy
Overarching Research Questions

• Physical Health and Healthy Aging
• Psychological Health and Healthy Aging
• Social Health and Healthy Aging
• Adaptation
• Perceived Well Being and Successful Aging
Proposed Model of Healthy Aging

Contextual Adaptation

- **Contextual Level Predictors**
  - Example: physician access
  - Example: cont ed opps
  - Example: seniors groups
  - Example: ageism

- **Physical Functioning HA**
  - Indicators: Freedom from Disability

- **Psycho-cognitive Functioning**
  - Indicators: High independent Functioning

- **Social Functioning HA**
  - Indicators: Active Engagement in Life

- **Perceived Well-Being SA**
  - Indicators: High Life Satisfaction

- **Individual Level Predictors**
  - Example: chronic disease
  - Example: fluid intelligence
  - Example: education
  - Example: optimism

Individual Adaptation

Contextual Level Predictors

Individual Level Predictors
Overarching Research Questions
Examples

• What are the determinants of the changes in physical (social, psychological) health over time and across ages?
  • Intra, inter- individual

• How does the interplay between biological, psychological, social, behavioral, health system factors influence changes in physical (social, psychological) health over time and across ages?
Overarching Research Questions
Examples

• What are the adaptive responses to changes in physical (social, psychological) health?
  – What are the individual and societal level adaptive responses to changes in physical (S, P) health?
  – Do adaptive responses vary across age and change over time?
  – Are adaptive responses health state specific?
  – What are the barriers to, or facilitators of, adaptive responses to changes in physical (S, P) health
  – How are adaptive responses related to the heterogeneity in physical (S, P) health and healthy aging?
Overarching Research Questions
Examples

• Describe changes in perceived successful aging over time and across ages
  – Intra, inter-individual changes

• What are the determinants of changes in perceived successful aging over time?
  – Intra, inter-individual changes

• How does the interaction between components of healthy aging and adaptive factors influence changes in successful aging over time and across ages?

• Why do some individuals perceive they are aging successfully and others do not?
Study Design
Basic Elements

• Longitudinal design
• Canadian women and men aged 40 and over
• 50,000 individuals
• 20 year follow-up
• Repeated measurement
• Embedded sub-studies
• Linkage to existing databases
• Eventual public access data
CLSA Study Design

Canadian Community Health Survey (CCHS): Aging Module Cross-Sectional Survey, 2006

N = 30,000
Age = 40+
Sampling strategy in line with CCHS objectives

N = 30,000
Age = 40+
Sampling strategy in line with Comprehensive CLSA objectives

Tracking Cohort
Random sample (20,000) of the CCHS who agree to be contacted by CLSA

Comprehensive CLSA
30,000 who agree to be contacted by CLSA

- Age 40-59
  - Sex M/F
  - Follow-up period 3 yrs
- Age 60-79
  - Sex M/F
  - Follow-up period 3 yrs
- Age 80+
  - Sex M/F
  - Follow-up period 1 yrs
## Design Considerations
### CLSA Comprehensive Follow up

<table>
<thead>
<tr>
<th>Birth Cohort</th>
<th>Frequency of Major Follow-up</th>
<th>Frequency of Minor Follow-up</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 - 59 yrs</td>
<td>3 years</td>
<td>1 yr</td>
<td>≈ 15,000</td>
</tr>
<tr>
<td>60 - 79 yrs</td>
<td>3 years</td>
<td>1 yr</td>
<td>≈ 10,000</td>
</tr>
<tr>
<td>80+</td>
<td>1 year</td>
<td>6 mo</td>
<td>≈ 5,000</td>
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**Major follow-up includes:**
- Complete survey/questionnaires
- Complete clinical/physical measures
- Bio-samples on all subjects at baseline

**Minor Follow-up includes:**
- Questionnaire to collect frequently occurring changes (self-report) and to maintain contact
Study Design
Tracking Cohort

- Only questionnaire based data to be collected
- Comparable to comprehensive CLSA
- Random sample and representative at provincial level
- Essential for policy directed/relevant research
- Will be used as pool for add-on or specific embedded studies
Study Design
Core, Embedded, Add-on Studies

• Core Sample
  – Defined as all individuals recruited at baseline

• Embedded Studies
  – Two types of embedded studies are foreseen
    • Embedded measures: in-depth investigation of a selected sub sample of the core
    • Core measures collected on special populations who are not adequately represented in the core sample
  – Embedded Studies will be part of the CLSA protocol

• Add-on Studies
  – Not part of the CLSA protocol
  – Separate mechanisms for approval, funding
Study Content Development
Theme-Specific Working Groups

- Research questions generated by theme specific working groups
- Guided by aims and objectives
- Integrated into overarching research questions
- Theme leaders for each WG
- Research Associate assigned to each WG
- Principal Investigators oversee 2-3 WGs
- Work accomplished via email, teleconferencing, listserves, website
Development of scientific content

-Process-

• Working Groups
  • Biology
  • Psychology
  • Social
  • Clinical
  • Health Outcomes
  • Health Services
  • Lifestyles
  • Methodology

Leaders
  Karl Riabowol
  Holly Tuokko
  Margaret Penning
  David Hogan
  Chris Patterson
  Kevin Brazil
  Hélène Payette
  Robert Platt
Development of scientific content

-Process-

- Domains of study generated by Working Groups
- 30 minutes per Working Group as a guide
- Domain development (gaps, overlaps) subject of a face to face meeting with co-investigators
- WG subgroups formed
- Development of background literature, rationale, research questions
- Priority setting at a face to face meeting with co-investigators
- Guiding principles for priority setting: longitudinal, niche, aging
- Development of measures, items and assessment of properties
- Templates catalogue biochemical, physical and questionnaire measures
- Cross cutting groups forming to consider biosample & physical measures, clinical assessment protocol
Social WG

Domains:

- Social networks
- Social support
- Work and retirement
- Structural inequalities
- Income and wealth
- Transportation and migration
- Housing and built environments
Biology WG

Domains:

- Genetics of aging (susceptibility and robustness)
- Cellular aging and immunosenescence
- Caloric intake and oxidative damage
- Metabolic, physiologic biochemical markers of aging
Clinical WG

Domains:

• Frailty
• Sensory losses
• Medication use
• Injuries
• Chronic diseases: Diabetes/metabolic syndrome, osteoporosis, hypertension, stroke, arthritis, congestive heart failure
• Health status: glucose intolerance, blood pressure
• Menopause
• Incontinence
Health Outcomes WG

Domains:

• Communication: language, speech
• Oral health
• Functional health and participation
• Psychological/mental health
• Quality of life
• Elder abuse
Lifestyles WG

Domains:

- Smoking
- Drugs
- Alcohol consumption
- Physical activity
- Leisure activities
- Social participation
- Anthropometry
- Food consumption
Psychology WG

Domains:

- Everyday competence
- Adaptive functioning
- Coping
- Cognitive functioning
- Personality
- Emotion, psychopathology
- Spirituality
- Pain
- Sleep
Health Services WG

Domains:

• Formal and informal services
• Community services
• Assistive devices and emerging technology
• Medication use and compliance
• Preventive services
• Continuity of care and perception of services
• End-of-life
• Costs
Methodology WG

Domains:

- Sampling
- Missing data
- Censoring
- Event history analysis
- Change-point models
- Time-dependent covariates
Ongoing Activities

• Collaboration with Statistics Canada
• Consultation with PIs of other longitudinal studies: CSHA, AIM, MFUS, ELSA, LASA, NHANES, HRS
• Linkages with other proposed Canadian longitudinal studies: Birth Cohort, Alberta Tomorrow Study, Statistics Canada Physical and Biomarkers Survey, HRDC Transition to Retirement Study
• Discussions with IHSPR to assess the feasibility of data linkage and development of strategies
• Participation in development of legal, ethical, governance structures: GELS, ELSI
• Promotion of the CLSA at the local, national and international level: Seniors Forum, CSEB, CAG, universities, governmental agencies
# Timeline

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
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<tbody>
<tr>
<td>Draft Protocol submitted to SC</td>
<td>Dec 15, 03</td>
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<tr>
<td>Feedback from SC</td>
<td>Jan 07, 03</td>
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<tr>
<td>Submit final draft for peer review</td>
<td>Jan 21, 04</td>
</tr>
<tr>
<td>Receive peer review comments</td>
<td>Mar 01, 04</td>
</tr>
<tr>
<td>Meeting with peer reviewers</td>
<td>Mar 15, 04</td>
</tr>
<tr>
<td>Submit CLSA protocol</td>
<td>Mar 31, 04</td>
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Future developmental work

- Pilot CCHS aging survey, 2004
- Development of all forms, questionnaire packages
- Develop training guides and modules, procedural manuals
- Recruit data collection directors, sites
- Hire interviewers, nurses, physicians and medical technicians
- Train data collection staff
- Obtain institutional ethics approval
- Field test data collection tools for questionnaires, biological and physical measures
- Fine tune the processing, shipping and storage of biosamples
CIHR Steering Committee

- Réjean Hébert (Chair)
  Scientific Director, CIHR - Institute of Aging

- Anne-Cécile Desfaits
  Assistant Director, CIHR - Institute of Aging

- Linda Mealing
  Assistant Director, Partnerships, CIHR - Institute of Aging

- John Frank
  Scientific Director, CIHR - Institute of Population and Public Health

- Jean-Pierre Grégoire
  Merck Frosst Canada

- Betty Havens
  Member, Institute Advisory Board, CIHR - Institute of Aging

- Barry McPherson
  President, Canadian Association on Gerontology

- Morris Barer
  Scientific Director, CIHR - Institute of Health Services and Policy Research

- Gary Catlin
  Director, Health Statistics Division - Statistics Canada

- Cy Frank
  Scientific Director, CIHR - Institute of Musculoskeletal and Arthritis

- Graydon Meneilly
  Member, Institute Advisory Board, CIHR - Institute of Aging

- John Millar
  Canadian Institute for Health Information

- Linda O’Rourke
  Canadian Association on Gerontology

- Louise Plouffe
  Division of Aging and Seniors, Health Canada
Members of NFPC

Scientific Advisory Committee

Board of Directors

Executive Committee

PI(s) and Scientific & Research Management team

Financial Advisory Committee

Director

Implementation of research protocol
Management and supervision of scientific implementation teams
Re-allocation of research funds to individuals, institutions and projects
Data collection supervision
Research and analysis
Studies and add-on studies
International relationships
Ethical considerations
Knowledge dissemination and translation
Publications

Project administration
Active participation in the definition of the financing strategy and its implementation
Financial management and control
Public communication
Support to research management (logistics, knowledge translation, data collection, etc.) participation and collaboration to IP value-enhancement activities as requested by the CSIP owners.
Working Group Members

Acknowledgements

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(Institute of Aging)

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CLSA Contact Information

- E-mail: CLSA@epid.jgh.mcgill.ca
- Web site: www.fhs.mcmaster.ca/clsa
Healthy and Successful Aging!
Combined age = 256
Discussion Topics

• Feedback about the proposed design

• Feedback about the range of topic areas included in CLSA

• Governance

• Questions?