


Navigating the Tides (of Data): Research and Training Opportunities with the CLSA

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CAG Workshop
Moncton, NB
Oct 26, 2019

DALHOUSIE UNIVERSITY 1818 2018

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Navigating the Tides (of Data): Research and Training Opportunities with the CLSA

Overview of the CLSA

Susan Kirkland, PhD
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Dalhousie University

CAG Symposium
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The Canadian Longitudinal Study on Aging (CLSA)

- Strategic initiative of the Canadian Institutes for Health Research (CIHR); on Canadian research agenda since 2001
- Team of 3 principal investigators, more than 160 co-investigators from 26 institutions
- Aim is to provide infrastructure and build capacity for state-of-the-art, interdisciplinary, population based research and evidenced-based decision making
- Largest study of its kind to date in Canada for breadth and depth

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CLSA Research Platform

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

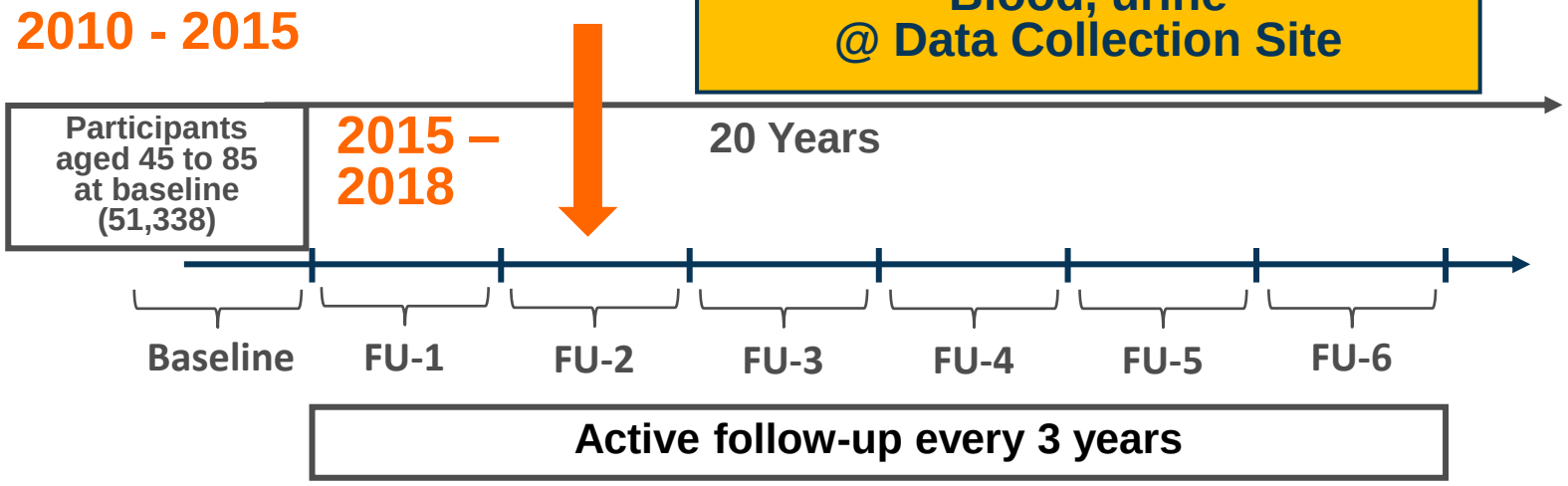
TRACKING
Target: 20,000
Actual: 21,241
Randomly selected within provinces

COMPREHENSIVE
Target: 30,000
Actual: 30,097
Randomly selected within 25-50 km of 11 sites

Questionnaire
- **By telephone (CATI)**

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

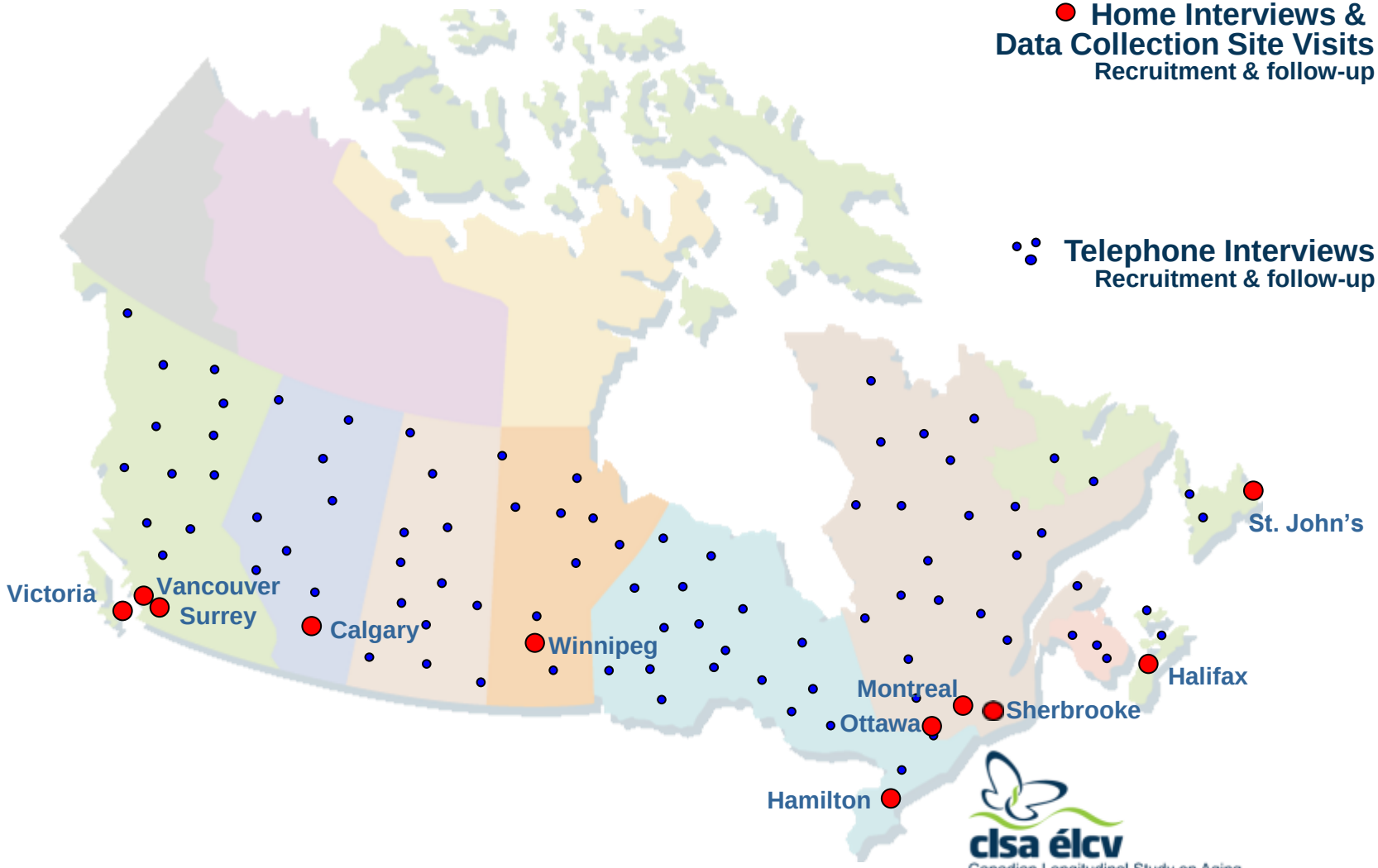
Clinical/physical tests
Blood, urine
@ Data Collection Site



Inclusion Criteria at Recruitment

- Residing in a Canadian province
- Not living on reserve or federal lands
- Not a full time member of the Canadian Armed Forces
- Able to complete interviews in English or French
- Community dwelling
- Cognitively competent

CLSA Participants in every province



Innovative Electronic Data Capture

Pre-recruits Sent Study Information

Participants Consent to Participate in CLSA

Participants Provide Questionnaire Data (n=50,000)

n=20,000 Telephone Interview

n=30,000 Home Interview

DATA COLLECTION SITE VISIT
Physical/Neuropsychological Data

Biological Data Processing
-Blood
- Urine

Stored at Biorepository and Bioanalysis Centre

Stored at Statistical Analysis Centre

Questionnaire data processing

Data dissemination to researchers

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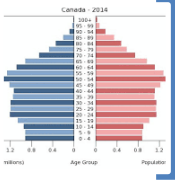
CLSA Questionnaire Modules at Baseline
51,338 participants

Demographic/Lifestyle



- Age
- Gender
- Education
- Marital status
- Sexual orientation
- Language
- Ethnicity
- Wealth/income
- Veteran Identifier
- Smoking, alcohol
- Nutritional risk
- Physical activity
- Health care utilization
- Medication use
- Supplement use

Health

- General health
- Women's health
- Chronic conditions
- Disease symptoms
- Sleep
- Oral health
- Injuries, falls
- Mobility
- Pain, discomfort
- Functional status
- ADL, IADL
- Cognition
- Depression
- PTSD
- Life Satisfaction

Social

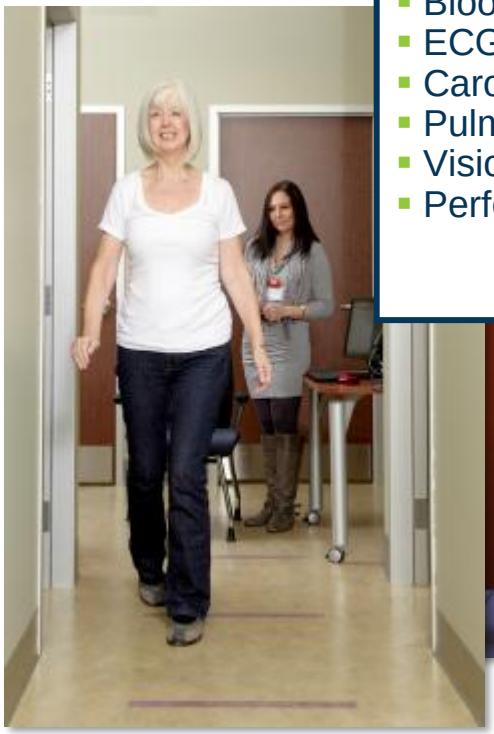
- Social
  - networks
  - support
  - participation
  - inequality
- Online communication
- Care receiving
- Care giving
- Retirement status
- Labour force participation
- Retirement planning
- Transportation
- Mobility, Migration
- Built environments
- Home ownership

CLSA Data Collection

30,000 visit a Data Collection Site

Physical Assessments:

- Height, Weight, BMI
- Bone Density, Body Composition, Aortic Calcification
- Blood Pressure
- ECG
- Carotid Intimal-Medial Thickness
- Pulmonary Function
- Vision & Hearing
- Performance testing



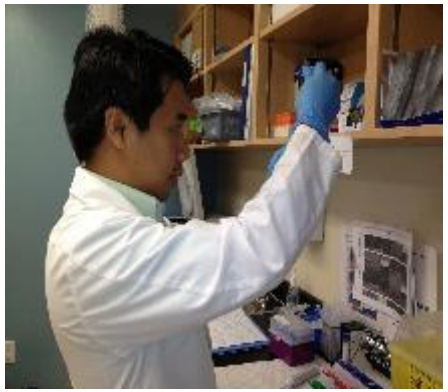
Biospecimen Collection:

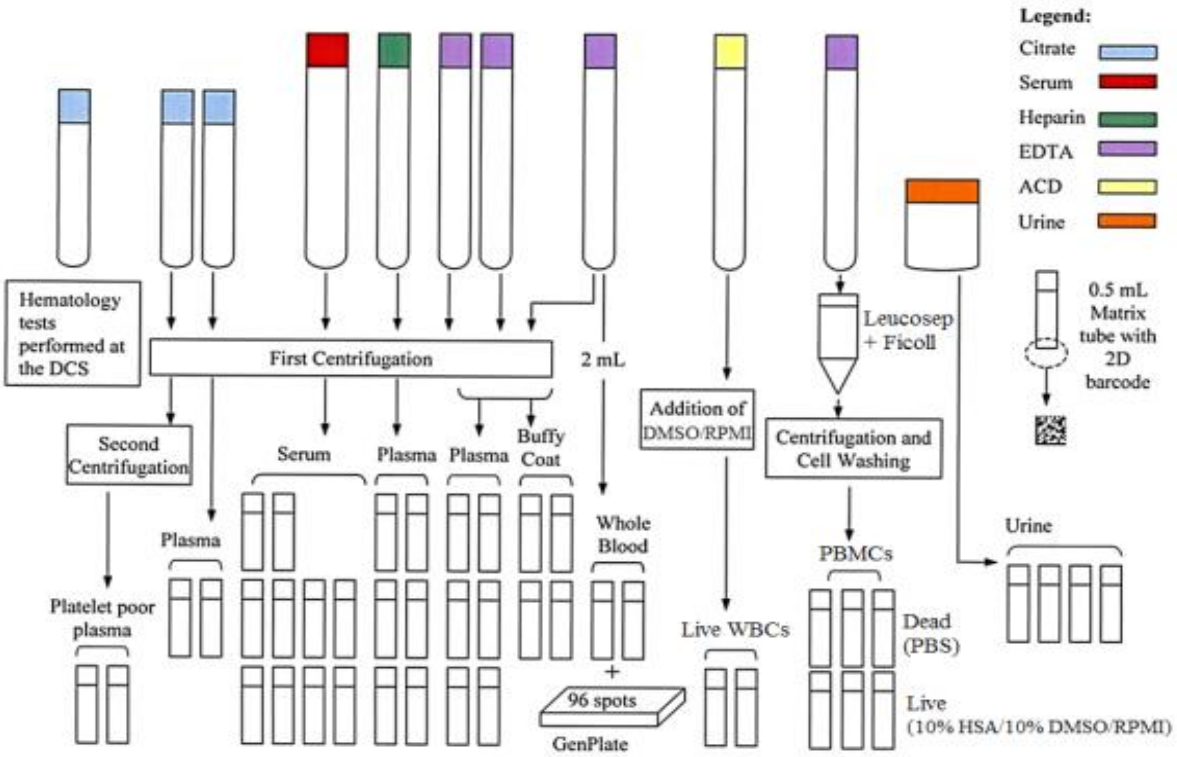
- Blood
- Urine

Cognitive Assessments:

- Neuropsychological Battery
  - Memory
  - Executive function
  - Reaction time

3 Tablespoons of blood = 42 aliquots per participant





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Biorepository and Bioanalysis Centre (BBC), McMaster University

- 31 nitrogen freezers (-190°C)
- Storage for 5 million samples

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Core Biomarkers: Baseline & FUP1

	Category	N*	Biomarkers
Available from Baseline & Follow-up 1	**HEMATOLOGY** Data Collection Sites (DCS)	25,427	• Erythrocytes • Granulocytes • Hematocrit • Hemoglobin • Lymphocytes • Platelets • MCV • MCH • MCHC • MPV • RBC • RDW
	CHEMISTRY Calgary Laboratory Services (CLS) (Analysis repeated every 3 years)	27,012	• Albumin • Alanine aminotransferase (ALT) • C-reactive protein (CRP) • Creatinine • Cholesterol • Ferritin • Free T4 • Hemoglobin A1c (n = 26,961) • HDL • LDL • Non-HDL • Thyroid stimulating hormone (TSH) • Triglycerides • 25-Hydroxyvitamin D • eGFR
Baseline only	**GENETICS** Genetic and Epigenetic Centre (GEC)	26,871	• Genotypes (Affymetrix Axiom array, 794k SNPs) • Imputation (Haplotype Reference Consortium release 1.1, 39.2M SNPs)
	EPIGENETICS Epigenetic Centre (EC)	1,488	• DNA methylation • DNA extracted from PBMCs • 850K Infinium MethylationEPIC BeadChip (Illumina)
	METABOLOMICS Metabolon	10,000	• LC-MS/MS systems • ~1,300 metabolites

*N represents Baseline only. Biomarkers from Follow-up 1 are forthcoming.

Linkage with CANUE and Health Canada datasets

Social & Material Deprivation Indices

Can-ALE Data

Weather & Climate

Air Quality

Nighttime Light

Greenness

CLSA as a Platform for Research: Data and Biospecimen Access

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
- Available to researchers and trainees at public institutions
- Must have approval from the CLSA Data Sample and Access Committee, and an accredited Research Ethics Board

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Navigating the Tides (of Data) Research & Training Opportunities with the CLSA: Data Availability: Data Preview Portal

Istvan Molnar-Szakacs, PhD
CLSA Data Access Officer
McGill University

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Navigating the Tides (of Data) Research & Training Opportunities with the CLSA: Data Access: Magnolia

Lauren Griffith
Dept. of Health Research Methods, Evidence and Impact, McMaster University

on behalf of the CLSA Research Team

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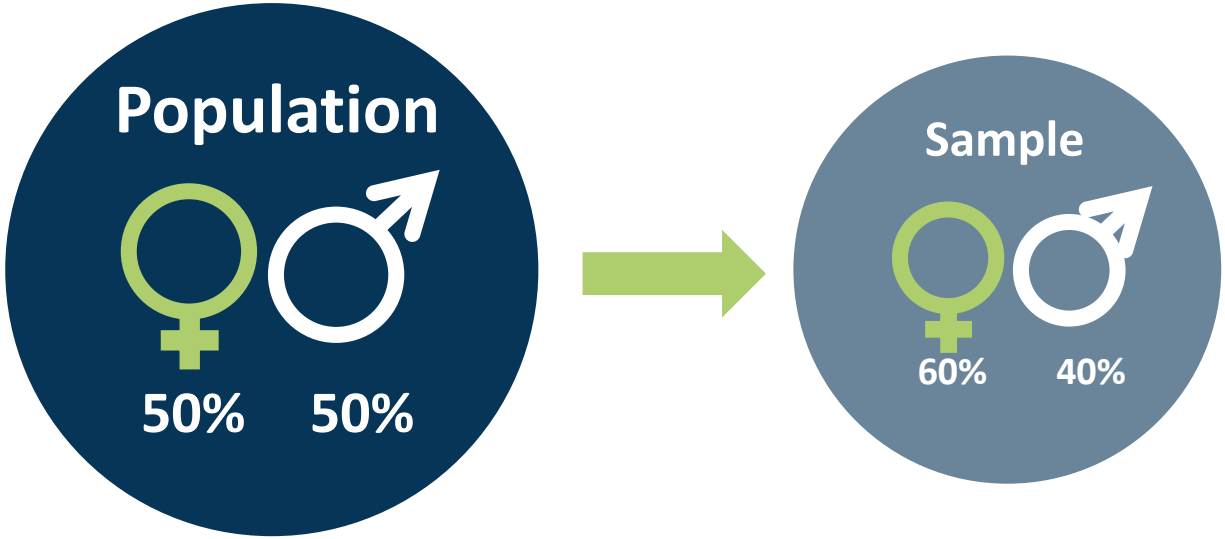
Why do we use sampling weights?

We want to generalize from the sample to the population, but the sample is almost never fully representative. Let's assume:



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Sample Weights

- Sample weights are used to make statistics computed from the data more representative of the population.
- It is a standard practice in surveys to use sampling weights.
- Each participant in the study is assigned a sample weight constructed based on the inclusion probability.
- Sample weights are always positive and non-zero.

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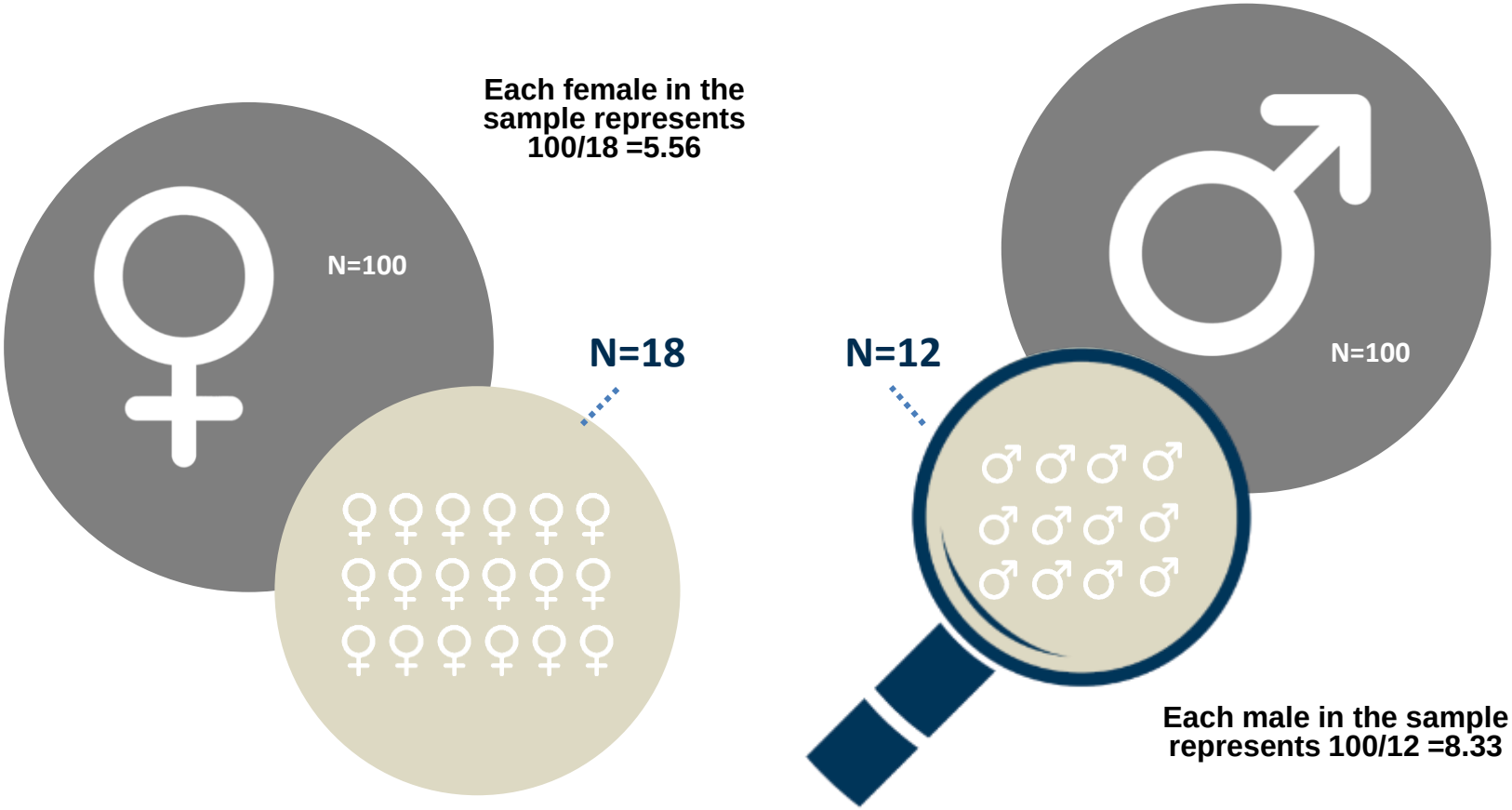
SAMPLE WEIGHTS

- Respondent in under-represented group gets higher weight; respondent in over-represented group gets lower weight.



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CLSA Sample

Sample was obtained via four sources:

- Canadian Community Health Survey-Healthy Aging (CCHS-HA): only for Tracking
- Provincial Health Registries (HR)
  - HR1-initial Health Registry mail-outs
  - HR2-Health Registry mail-outs targeting low-education (LowED) areas

- Telephone Sampling (TS)
  - Random Digit Dialing (RDD)-done by Leger
  - Random Telephone Sampling-conducted by CLSA CATI in targeted LowED areas.

- Quebec Longitudinal Study on Nutrition and Aging (NuAge): only for Comprehensive

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Strata

- 10 provinces
  - 10 provinces in Tracking cohort
  - 7 provinces in Comprehensive cohort
- Age groups
  - 45-54
  - 55-64
  - 65-74
  - 75-85
- Sex
- Geographic areas
  - DCS
  - Non-DCS

Tracking cohort:
136 Strata

Comprehensive cohort:
56 (DCS only) Strata

In QC, ON, and BC, there was more than one DCS, so the DCS area consisted of non-contiguous areas.

In provinces with one or more DCSs there were 16 strata; in NB, PE, SK, there was No DCS and thus there were 8 strata.

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Strata

- Early analyses showed we under-representation of people with lower SES (education, income)
- This under-representation could potentially lead to low statistical power
- Thus, to increase heterogeneity in SES, we chose to over-sample people from dissemination areas with higher a proportion of people with lower levels of education (based on census data)

- This adjustment to the sampling added another stratification variable:
  - Low-Ed
  - Non Low-Ed

Types of Weights: Inflation Weights

- The CLSA Tracking and Comprehensive Cohort inflation weights were constructed
  - to account for
    - sample mispresentation resulting from unequal sampling probabilities,
    - frame coverage error,
    - non-response,
  - to improve the precision of estimates through the use of auxilary information.

- First, basic design weights were computed proportional to the reciprocals of the individual inclusion probabilities; they were then re-calibrated to the sum of the targeted (eligible) Canadian population.

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Types of Weights: Inflation Weights

- Re-calibration requires the use of auxiliary information about the population and may take a number of different variables into account.
- CLSA used the CCHS-HA sample of 20,087. Sampling weights of the 20,087 CCHS-HA participants were grouped by the 136 strata mentioned above. For each sampling frame, the weights were calibrated within stratum (to stratum totals).
- After weights were calibrated for each sample separately, the weights were combined within strata using the general addition rule of probability.
- In some cases the values of weights were extremely large. In a small number of cases, the weights with highest values were trimmed, or set equal to second highest values within their provinces, and calibration was repeated.

Types of Weights: Analytic Weights

- Analytic weights are proportional to the inflation weights but rescaled to sum to the sample size within each province, so that their mean value is 1 within each province.

Available Sample Weights in CLSA Data

Inflation Weights

WGHTS_TRIMMED_TRM

WGHTS_TRIMMED_COM

WGHTS_TRIMMED_CLSAM

Analytic Weights

WGHTS_ANALYTIC_TRM

WGHTS_ANALYTIC_COM

WGHTS_ANALYTIC_CLSAM

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Primary Sampling Unit and Sampling Strata Variables

- The use of complex survey software is recommended for analyses, so that the sampling design can be accounted for.
- This will require specification of the appropriate weights variable and characteristics of the sampling design, namely strata and primary sampling units (PSU).

Primary Sampling Unit and Sampling Strata Variables

- A stratified sampling design involves dividing the population into mutually exclusive strata, and sample is taken from every stratum.
  - Within strata, indviduals may be selected directly (single stage sampling)
  - Alternatively, the sampling may be done in multiple stages within geographic strata
- The samples from the HR and TS fram are effectively single stage, and we take the CCHS-HA design to be single stage.

Primary Sampling Unit and Sampling Strata Variables

- Primary Sampling Unit (PSU) is the first unit that is sampled in the design. In CLSA, PSU is individual, as represented by the unique 'entity_ID'.

- For the strata variable to be specified in complex survey software, we recommend using the geographic strata variables:

  - WGHTS_GEOSTRAT_TRM (10 provinces crossed with DCS/non-DCS with LowED/not LowED) for Tracking Cohort
  - WGHTS_GEOSTRAT_COM (7 provinces within DCS crossed with LowED/not LowED) for Comprehensive Cohort
  - WGHTS_GEOSTRAT_CLSAM (10 provinces crossed with DCS/non-DCS with LowED/not LowED) Pooled Data

When and How to Use the Weights

- Inflation weights: For the estimation of a descriptive parameter of the finite study population, the inflation weights should be used.
- Analytic weights:
  - For analyses that examine relationships between variables at the national or provincial level, analytic weights should be used.
  - For analyses of relationships in smaller sub-groups, the analytic weights are likely to be appropriate.
- The weighting variables (sex, age) should be included as covariates in the analyses.

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Example 1. Prevalence of Cancer in Canada, Comprehensive cohort – SAS code

SAS code: Estimates prevalence of cancer with 95% CI

```
proc surveyfreq data=CLSA_comprehensive;
    tables CCC_CANC_COM/ cl;
    strata WGHTS_GEOSTRAT_COM;
    weight WGHTS_TRIMMED_COM;
run;
```

CCC_CANC_COM

CCC_CANC_COM	Frequency	Weighted Frequency	Std Err of Wgt Freq	Percent	Std Err of Percent	95% Confidence Limits for Percent	
1: Yes	4637	466027	8093	12.4699	0.2195	12.0398	12.9001
2: No	25367	3271190	15365	87.5301	0.2195	87.0999	87.9602
Total	30004	3737217	13368	100			

Frequency Missing = 93

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Example 1. Prevalence of Cancer in Canada, Comprehensive cohort – R code

R code: Estimates prevalence of cancer

```
## Load package
library(survey)
## Define the design: fpc=variable showing the number of participants in each strata
CLSA.dsgn <- svydesign(ids=~1, strata=~WGHTS_GEOSTRAT_COM,
weights=~WGHTS_TRIMMED_COM, data=CLSA_comprehensive, fpc=~strata_total,
nest=TRUE)

## Get the weighted frequencies
svytable(~CCC_CANC_COM,CLSA.dsgn)
```

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Example 2. Odds ratios of having fair/poor health in Canada, Comprehensive cohort – SAS code

SAS code: Adjusted model with 95% CI

```
proc surveylogistic data=CLSA_comprehensive;
class DIA_DIAB_COM (ref=first) CCC_CANC_COM (ref=first) AGE_GRP_COM (ref=first) SEX_ASK_COM (ref=first)/param=ref;
model GEN_HLTH_COM (event='1')=DIA_DIAB_COM CCC_CANC_COM DEP_CESD10_COM
AGE_GRP_COM SEX_ASK_COM/clodds ;
strata WGHTS_GEOSTRAT_COM; weight WGHTS_ANALYTIC_COM; run;
```

Odds Ratio Estimates and t Confidence Intervals

Effect	Unit	Estimate	95% Confidence Limits	
DIA_DIAB_COM Yes vs No	1	0.381	0.301	0.483
CCC_CANC_COM Yes vs No	1	0.598	0.458	0.781
DEP_CESD10_COM	1	0.839	0.826	0.851
AGE_GRP_COM 55-64 vs 45-54	1	0.898	0.68	1.185
AGE_GRP_COM 65-74 vs 45-54	1	0.872	0.645	1.18
AGE_GRP_COM 75+ vs 45-54	1	1.004	0.708	1.424
SEX_ASK_COM M vs F	1	0.771	0.617	0.965

Example 2. Odds ratios of having fair/poor health in Canada, Comprehensive cohort – R code

R code: Adjusted model with 95% CI

```
## Load package
library(survey)
## Define the design: fpc=variable showing the number of participants in each strata
CLSA.dsgn <- svydesign(ids=~1,strata=~WGHTS_GEOSTRAT_COM,
weights=~WGHTS_ANALYTIC_COM, data=CLSA_comprehensive, fpc=~strata_total,
nest=TRUE)

## Get the logistic regression results
svyglm(GEN_HLTH_COM ~
DIA_DIAB_COM+CCC_CANC_COM+DEP_CESD10_COM+AGE_GRP_COM+SEX_ASK_C
OM, design=CLSA.dsgn, family=quasibinomial())
```

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Example 3. Weighted mean value of age, Comprehensive cohort – SAS code

SAS code: mean value of age

```
proc surveymeans data=CLSA_comprehensive ;
var AGE_NMBR_COM;
weight WGHTS_TRIMMED_COM;
strata WGHTS_GEOSTRAT_COM ;
run;
```

Statistics						
Variable	Label	N	Mean	Std Error of Mean	95% CL for Mean	
AGE_NMBR_COM	AGE_NMBR_COM	30097	59.49043	0.069189	59.35481	59.62604

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Example 3. Weighted mean value of age, Comprehensive cohort – R code

R code: mean value of age

```
## Load package
library(survey)

## Define the design: fpc=variable showing the number of participants in each strata
CLSA.dsgn <- svydesign(ids=~1,strata=~WGHTS_GEOSTRAT_COM,
weights=~WGHTS_TRIMMED_COM, data=CLSA_comprehensive, fpc=~strata_total,
nest=TRUE)

## Get the means values of age
svymean(~AGE_NMBR_COM, CLSA.dsgn )
```

Example 3. Weighted mean value of age, Comprehensive cohort – SPSS syntax

SPSS syntax: mean value of age

```
## Prepare for Analyses (if this is the first time with Analyze/Complex Samples tool)
 DATASET ACTIVATE CLSA_Comprehensive.
* Analysis Preparation Wizard.
  CSPLAN ANALYSIS
  /PLAN FILE='/LOCATION ON COMPUTER TO SAVE THE COMPLEX SAMPLE PLAN/ComplexSamplePlan.csaplan'
  /PLANVARS ANALYSISWEIGHT=WGHTS_TRIMMED_COM
  /SRSESTIMATOR TYPE=WOR   /PRINT PLAN
  /DESIGN STRATA=WGHTS_GEOSTRAT_COM
  /ESTIMATOR TYPE=WR.

## Get the descriptive statistics
 * Complex Samples Descriptives.
CSDESCRIPTIVES
  /PLAN FILE='/LOCATION ON COMPUTER TO WHERE THE COMPLEX SAMPLE PLAN IS
SAVED/ComplexSamplePlan.csaplan'
  /SUMMARY VARIABLES=AGE_NMBR_COM   /MEAN   /STATISTICS SE CIN(95)
  /MISSING SCOPE=ANALYSIS CLASSMISSING=EXCLUDE.
```

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What's Next

- Examining other references (census) to calibrate weights to make them more accurate
- Creating longitudinal weights

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Acknowledgement

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- Nazmul Sohel, Urun Erbas Oz, Hon Yiu (Henry) So (CLSA Statisticians)

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Navigating the Tides (of Data) Research & Training Opportunities with the CLSA: Data Access: Magnolia

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Navigating the Tides (of Data) Research & Training Opportunities with the CLSA: Data Access: Magnolia

Timothy Krahn
CLSA Training Co-Ordinator
Dalhousie Dept. of Community Health & Epidemiology

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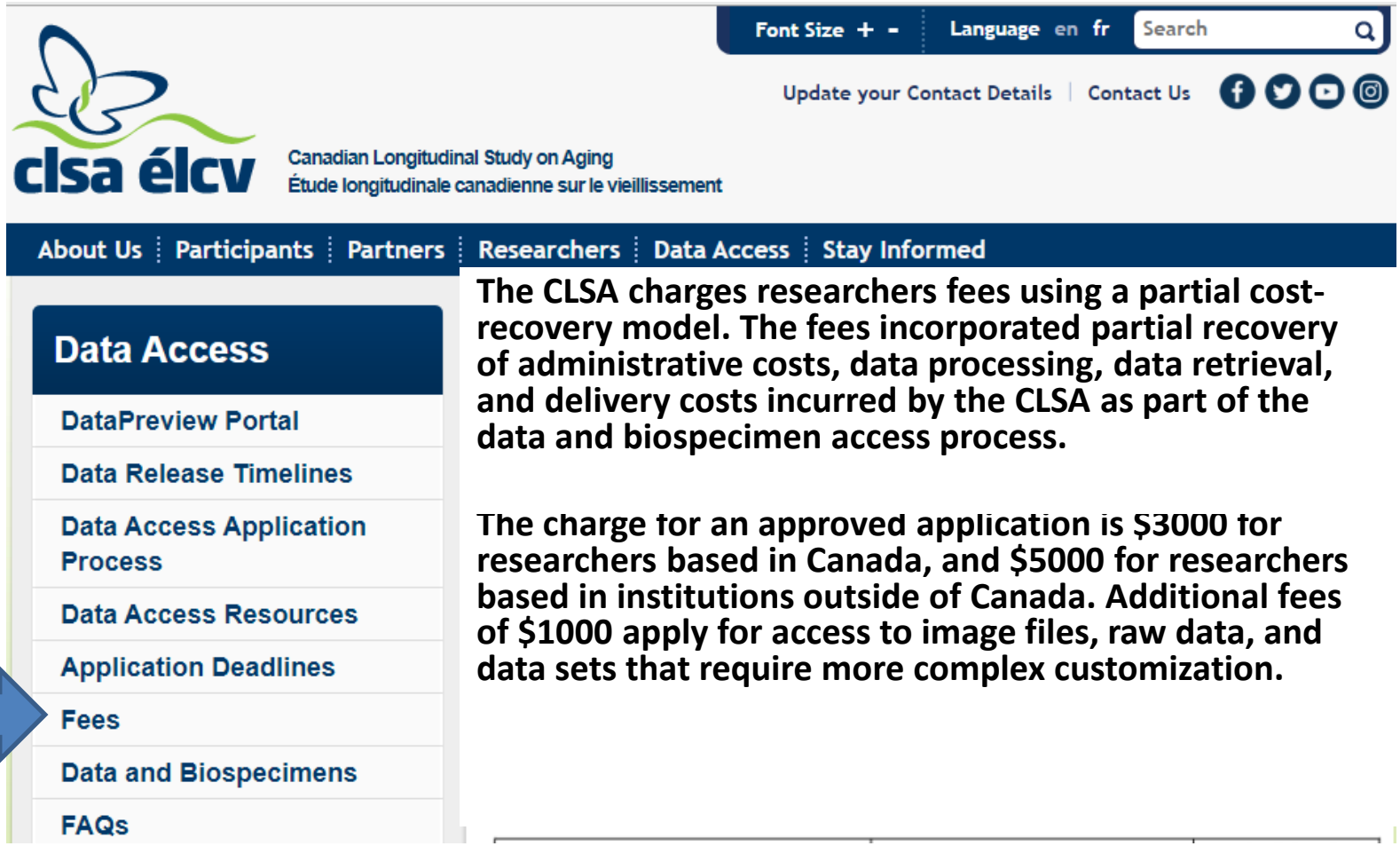
Map

1. Research Support: Data Access – Fee Waiver for Trainees
2. Approved Trainee Projects
3. Research Support – Catalyst and Other Grants to Support Research with CLSA Data (2016-2019)
4. Training Opportunity – Summer Program in Aging (2020)
5. Learning Opportunity – Stay Informed: CLSA Webinars
6. Learning Opportunity – Stay Informed: Further Resources for Training and Research Capacity Building
7. Networking Opportunity: Stay Connected: Social Media & the CLSA
8. Discussion

1.1

Data Access | Fees



The CLSA charges researchers fees using a partial cost-recovery model. The fees incorporated partial recovery of administrative costs, data processing, data retrieval, and delivery costs incurred by the CLSA as part of the data and biospecimen access process.

The charge for an approved application is $3000 for researchers based in Canada, and $5000 for researchers based in institutions outside of Canada. Additional fees of $1000 apply for access to image files, raw data, and data sets that require more complex customization.

This is our current fee schedule, which is under revision. Please check the CLSA website for updates. Any changes would also be communicated via our newsletter, *CLSA Update*.

1.1

Data Access | Fee Waiver for trainees

- Graduate students (M.Sc. or Ph.D.)—those enrolled for their degree at Canadian universities and who wish to obtain the CLSA data for the sole purpose of their thesis—as well as postdoctoral fellows may request a fee waiver. There is a limit of 1 waiver per postdoctoral fellow.
- Canadian trainees working outside Canada but funded through a Canadian source are also eligible.
- CIHR Catalyst Grants for the use of CLSA Data are not eligible for Trainee Fee Waivers.

Researchers | Approved Project Summaries

As of September 2019, of the projects approved for use of CLSA data, 78 of 228 (34.2%) were for trainees conducting research.
Here are some examples found under the “Researchers” tab, and “Approved Project Summaries” drop-down menu

2.1

Examples of Approved Trainee Projects

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CLSA Approved Project

Applicant
Dr. Yukiko Asada, Dalhousie University
Trainee: Emily Rosta

E-mail Address
yukiko.asada@dal.ca

Project Title
The association between rurality, social capital, and nutritional risk in community-dwelling older adults in Canada: An analysis of baseline data from the Canadian Longitudinal Study on Aging

Project Summary
Addressing malnutrition in the community setting is key to promoting aging in place and reducing potential burdens on the health care system. Identifying factors which are associated with high nutritional risk is key to developing effective nutrition interventions for community-dwelling older adults. This project will determine how the risk of malnutrition varies between rural and urban areas in Canada. It will also consider whether social capital is a feature of rurality that can help protect against nutritional risk. The proposed study aims to expand the discussion of malnutrition beyond the specialized field of nutrition and into broader discussions of health and aging.

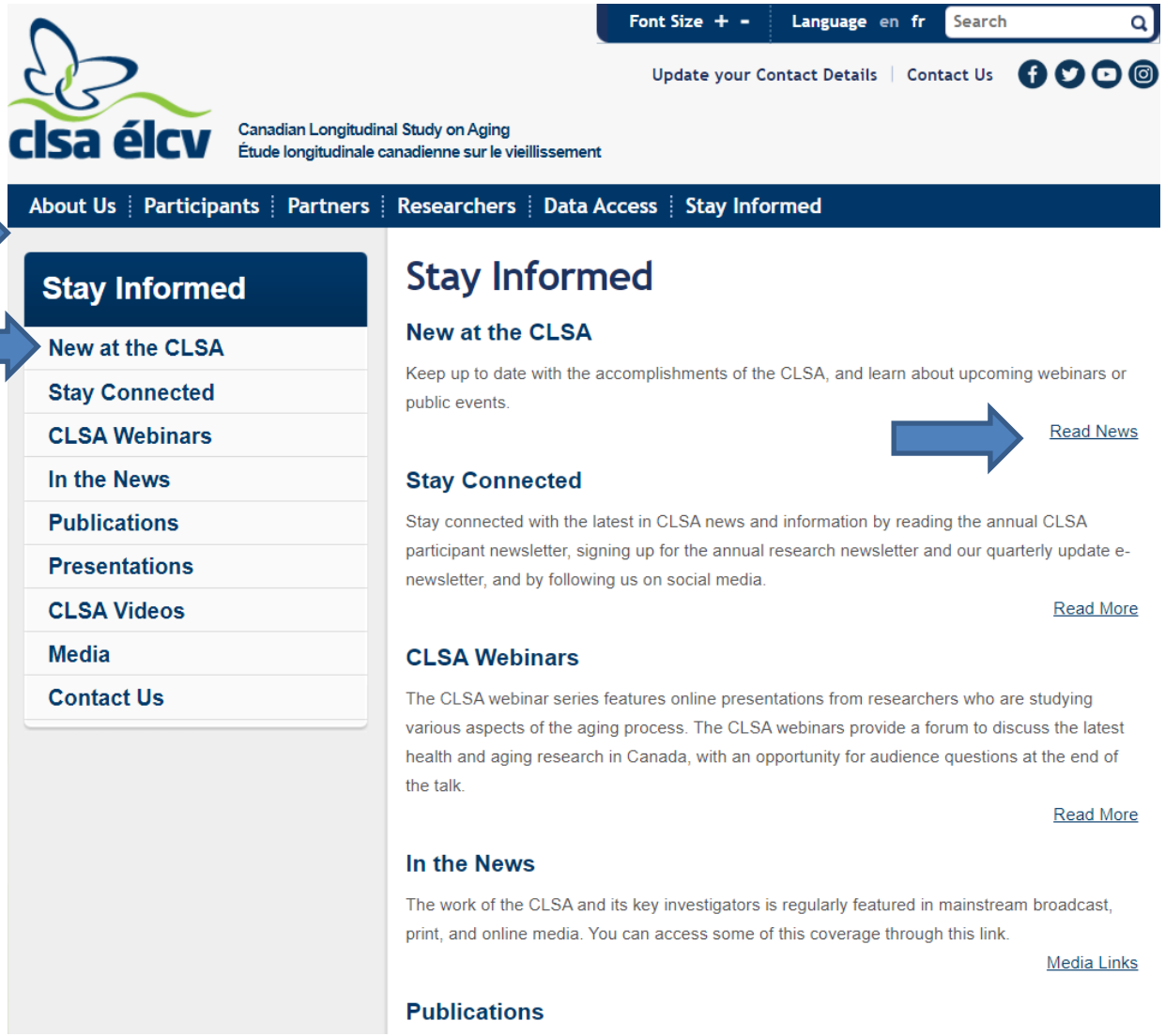
Keywords
Social capital, Nutritional risk, Rural, Urban, Community-dwelling

Grants are another form in which primarily the federal government, but also some partnering provincial governments, have supported researchers whose projects use CLSA data. The Canadian Institutes of Health Research (CIHR) funds an extremely large proportion of Canada's health research overall. The aim of the CIHR *Catalyst Grant program* is to provide seed money to support research activities which represent a step towards the pursuit of more comprehensive applications to funding opportunities (e.g., Operating Grants).

3.0

Stay Informed | Training Opportunities

Let's look at how the Catalyst program has supported research with CLSA data



3.1

Stay Informed | Past Training Opportunities Announcements

Training Opportunities: CIHR Catalyst Grants

42 Projects funded to date

2016 Competition: Government of Canada provided support in the amount of $1.7 million to support 25 projects to be carried out by researchers across the country to use and analyze baseline data from the CLSA.

2018 Competition: Catalyst Grants to support research with CLSA data
Government of Canada provided support in the amount of $1.2 million for 17 projects led by researchers across the country that analyze baseline data from the CLSA to answer important health questions.

2019 Competition: CIHR has committed $715,000 in funding opportunities to support the analysis of Baseline and Follow-up 1 data from the CLSA (to be announced in spring 2020)

Training Opportunities
2019 Grants to support research with cohort data

July 29, 2019: CIHR announced up to $1,975,000 in funding opportunities to support research that uses existing cohort data, administrative datasets and data platforms that link to or allow access to datasets from multiple sources, including the CLSA.

As such, the CIHR Data Analysis Using Existing Databases and Cohorts funding opportunity is providing a one-year operating grant for successful applicants within three streams of research:

- Cancer prevention and control (10 grants up to $100,000 each)
- Healthy cities intervention research (7 grants up to $75,000 each)
- Reproductive, maternal, child and youth health (6 grants up to $75,000)

Researchers applied through ResearchNet. Application deadline was Oct 10, 2019, with funding expected to begin March 2020.

4.0

Summer Program in Aging: Interactive Training Opportunity

CIHR in partnership with Dr. Parminder Raina,

CLSA Lead PI: Summer Program in Aging

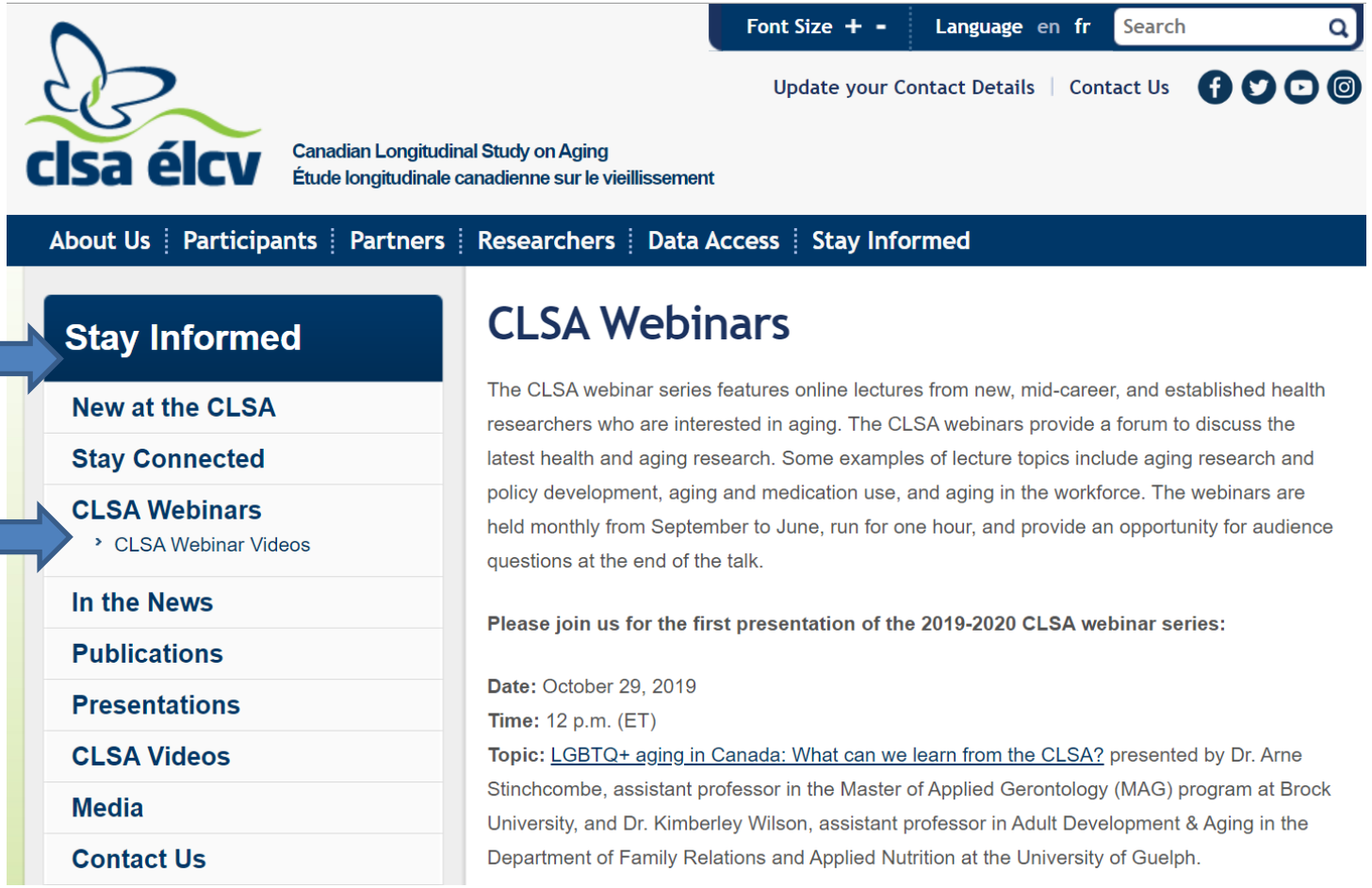
- 5-day program
- Hockley Valley resort in Mono, ON (1hr North of TO)
- 7-12 June 2020
- focussed on longitudinal studies in aging (generally)
- up to 40 spots
- apply to CIHR through Research.net
- application launch: January 2020
  - travel support grants
  - hospitality supports provided

- "*…provid[ing] graduate students and post-doctoral fellows interested in longitudinal studies in aging an advanced training program that crosses disciplines, institutions and geographical boundaries. …Trainees who are conducting, or who have an interest in learning about research in the area of longitudinal studies on aging are encouraged to apply to this program*."

5.0

Learning Opportunity for Trainees

The CLSA webinar series features online lectures from new, mid-career, and established health researchers who are interested in aging.



5.1

Stay Informed | CLSA Webinar Videos – Sign up

All webinars are recorded & posted for viewing.

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CLSA Webinar Videos

Seeing, hearing, and thinking: The cross-sectional relationship between sensory status and cognitive function in CLSA participants

Date: September 12, 2019

Speaker: Dr. Natalie Phillips & Dr. Paul Mick

Presentation slides

CLSA dietary data: Description and example of use in a study on dairy consumption and cognitive performances

Date: June 12, 2019

Speaker: Dr. Nancy Presse & Anne-Julie Tessier

Presentation Slides - French

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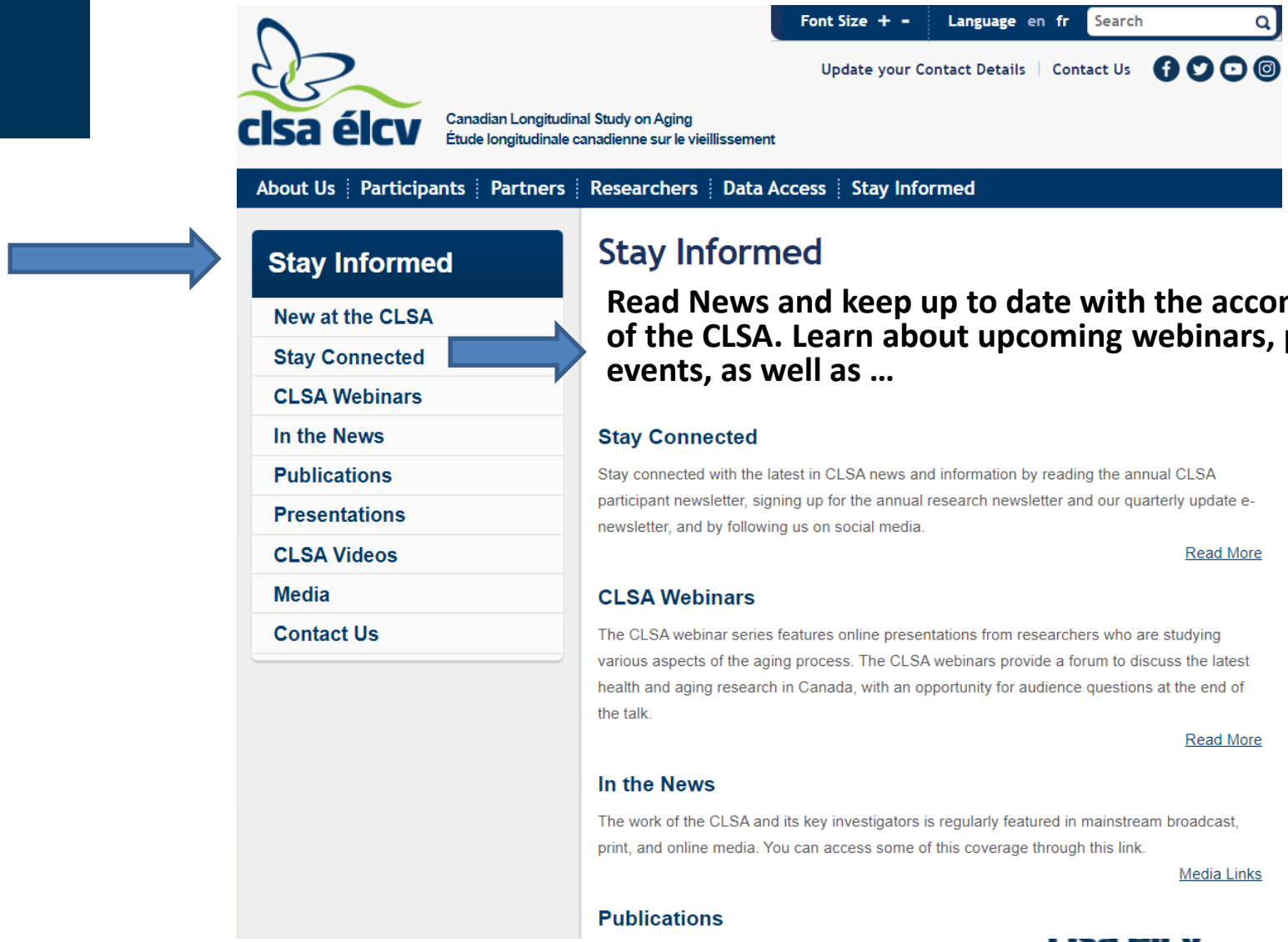
6.0

Stay Informed | New at the CLSA

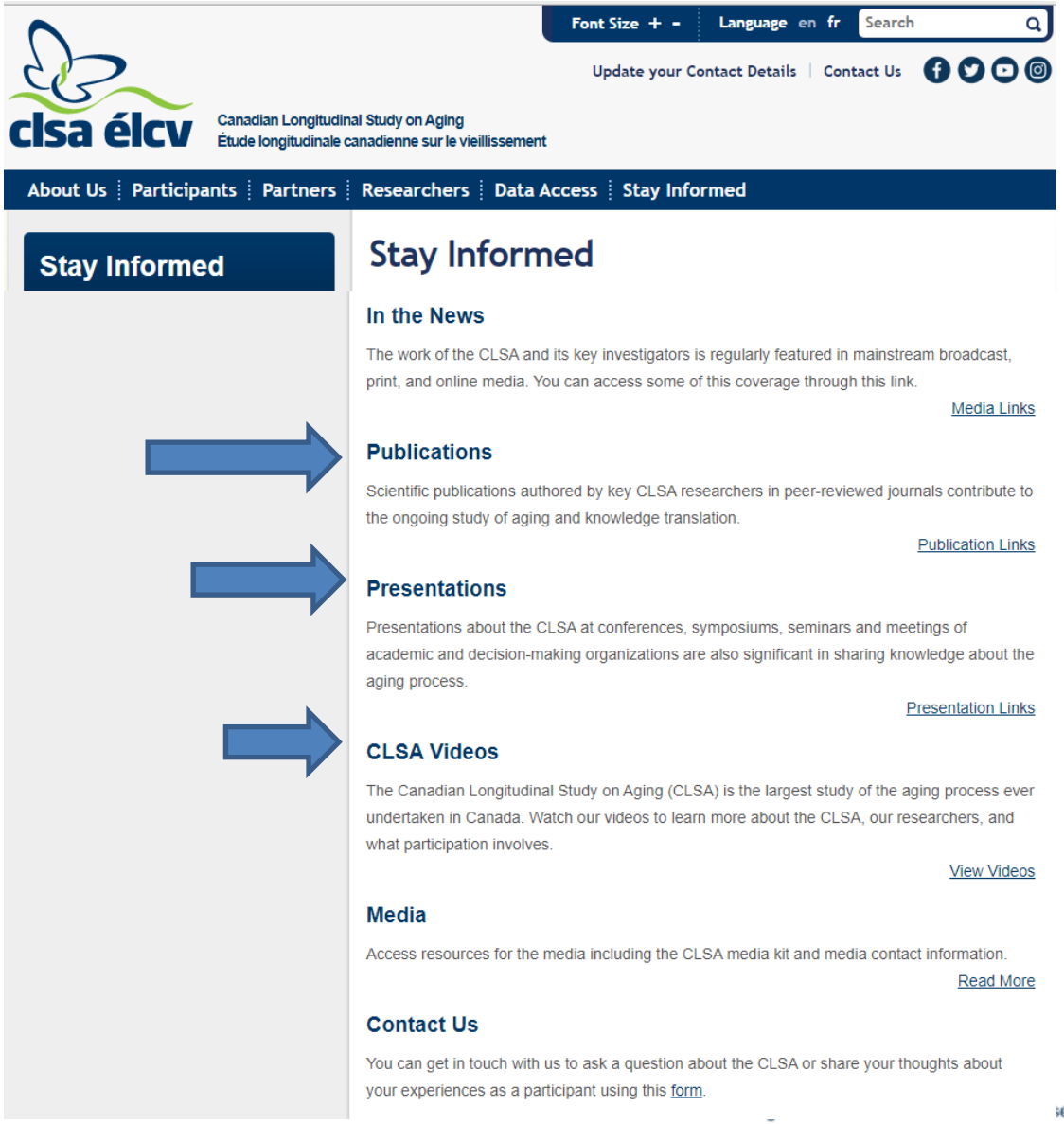


6.1

Stay Informed
Further resources for training and research

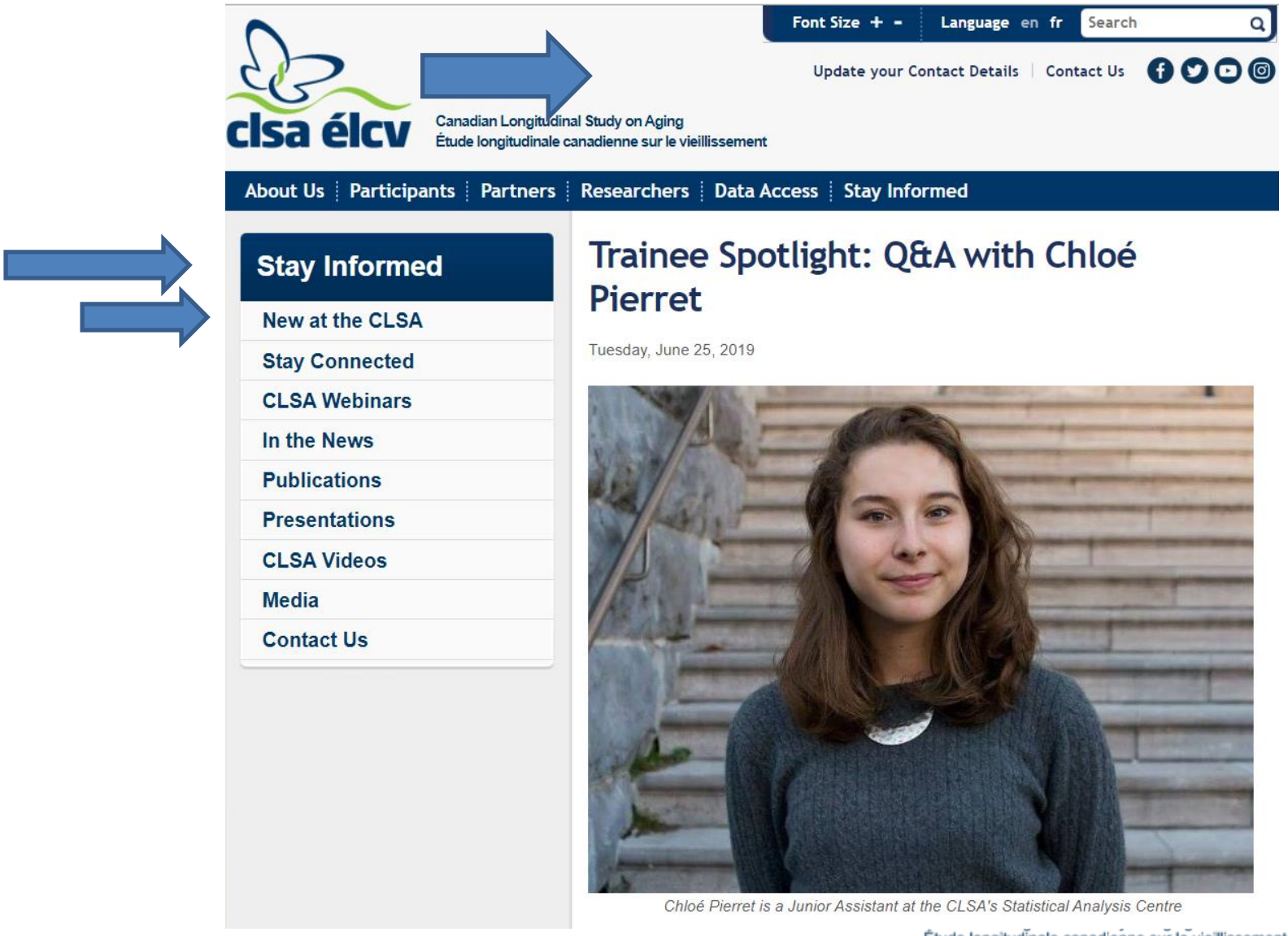
Learn more about the CLSA and the research it's making possible by consulting:

- **Publications**
- **Presentations**
- **Videos**



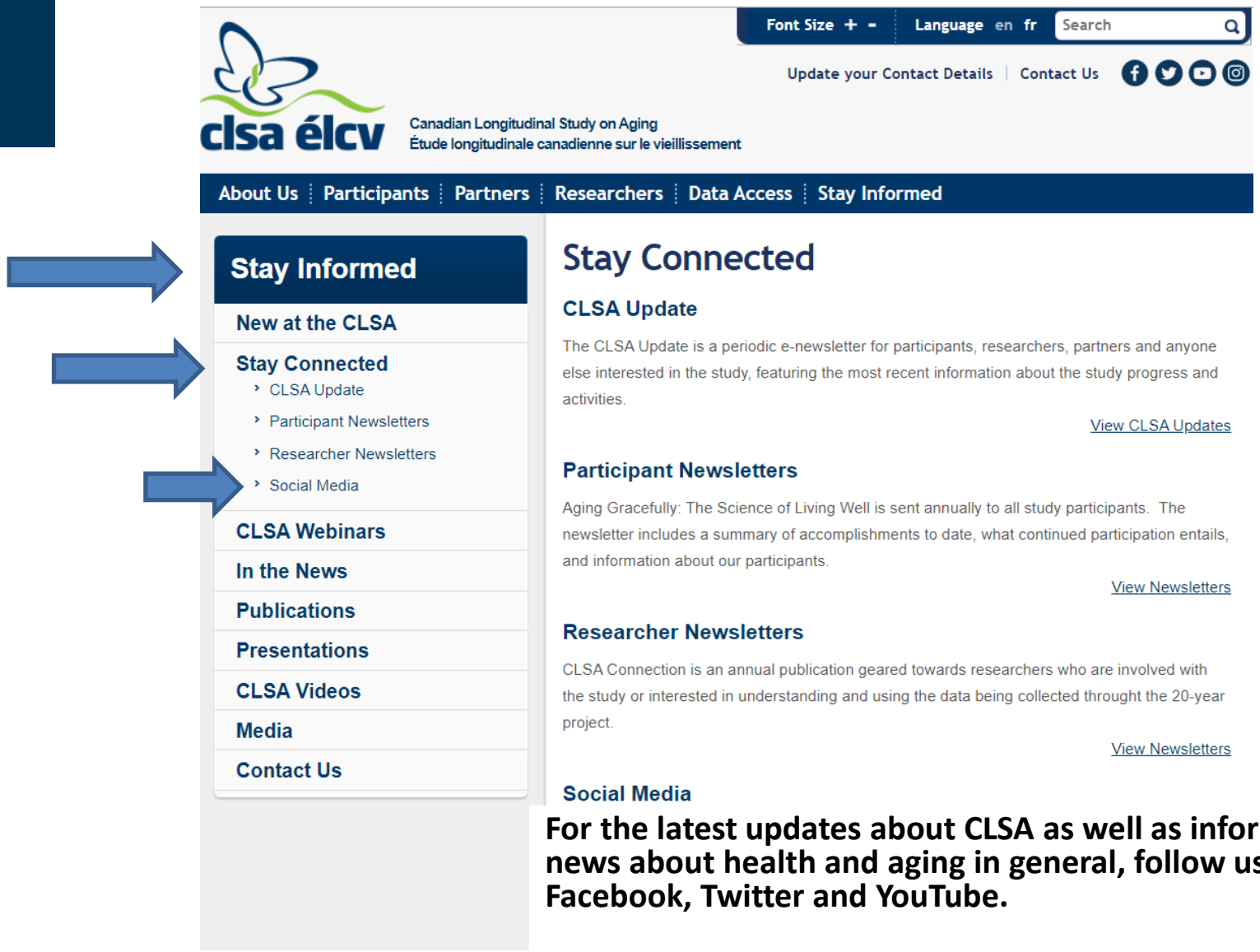
6.2

Stay Informed | Trainee Spotlight story



7.0

Stay Connected | Social Media



For the latest updates about CLSA as well as information and news about health and aging in general, follow us on Facebook, Twitter and YouTube.

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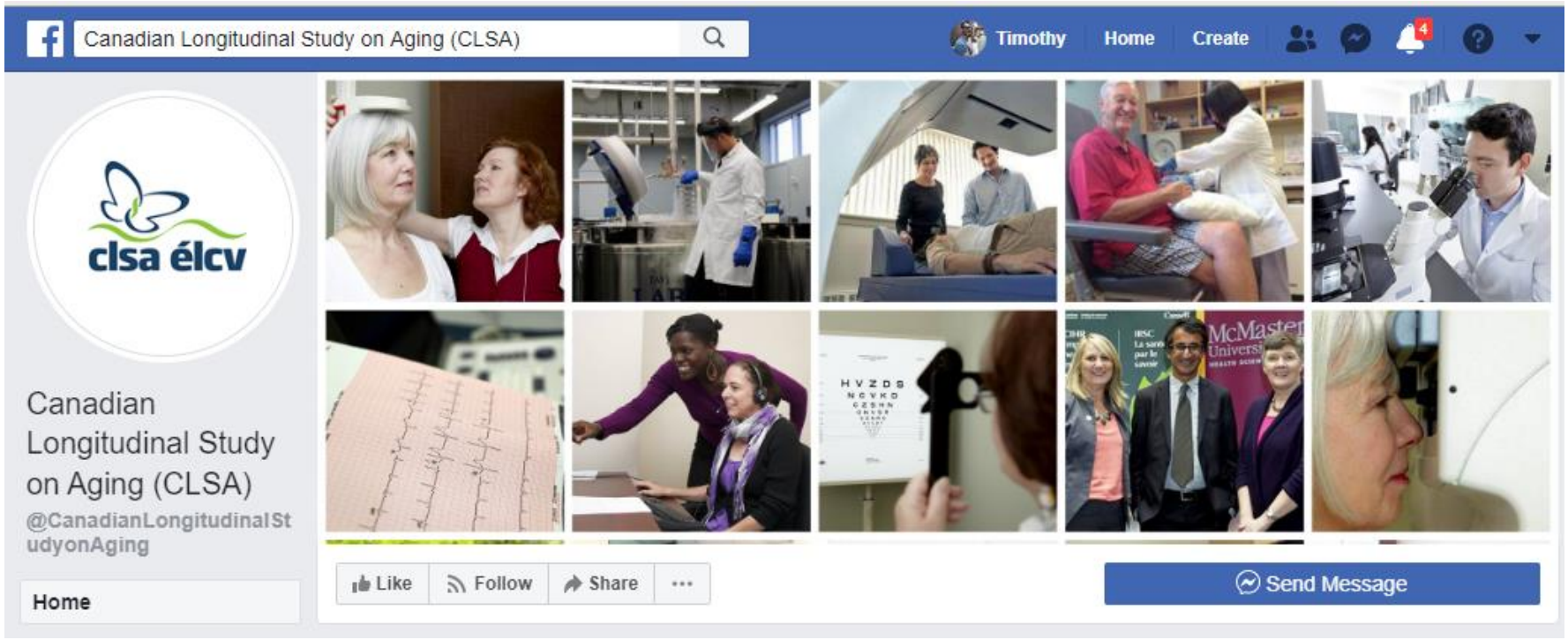
Etude Longitudinale Canadienne Sur Le Vieillissement



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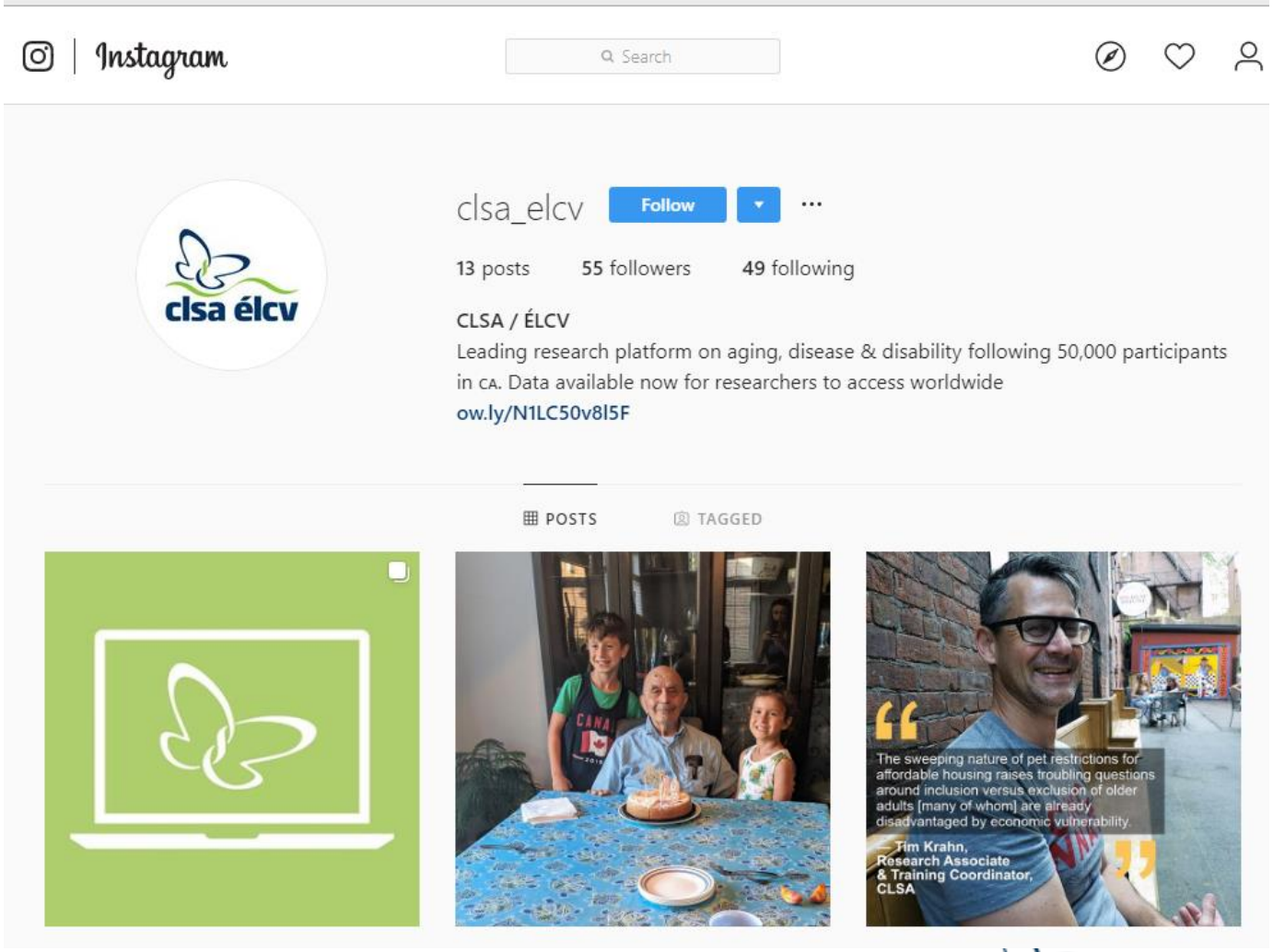

8.0

CIHR IRSC
Canadian Institutes of Health Research
Instituts de recherche en santé du Canada

INNOVATION.CA
FONDATION CANADIENNE POUR L'INNOVATION
CANADA FOUNDATION FOR INNOVATION

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CLSA is funded by the Government of Canada through CIHR and CFI, and provincial governments and universities

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What would you like to see for training opportunities in the CLSA?

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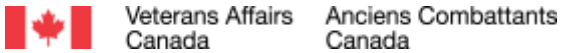
CLSA Research Team

Operations Committee and Scientific Leads

120M+ investment 2009-2020 from CLSA Funders and Partners



Transforming Everyday Life into Extraordinary Ideas

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