# USE AND COST OF LONG-TERM CARE FACILITIES IN QUEBEC, 2010-2050

Pierre-Carl Michaud, ESG UQAM, CIRANO

*Industrielle Alliance* Research Chair on the Economics of Demographic Change

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# Situation in Quebec

- Population aging
  - 34 individuals in the working-age population (18-64 years old) per individual 85 years old and over in 2011
  - 13 individuals in the working-age population per individual 85 years old and over in 2038 (>14 in the ROC)

- Uncertainty with respect to future health status: recent trends
  - ↑ diabetes and hypertension
  - ↓ some type of cancers and cardiovascular diseases
  - ↑ obesity prevalence
  - ↓ % of smokers among younger cohorts

# Situation in Quebec

- Projected increase in the number of individuals 65 years and older in LTC facilities (INSPQ 2010)
  - 2006: 90,724 (8.5% of the 65+ in Quebec)
  - 2041: 244,170 (10.1% of the 65+ in Quebec)
- Large expenditures
- In Quebec, LTC costs represented…
  - In 2000: ~$3.4 billion (7% of the provincial budget)
  - In 2015: ~$6.8 billion (7% of the provincial budget)
- A stay in a LTC facility represents a financial risk for many
  - In 2011: Only 77,000 persons were covered by private LTC insurance
- Long waiting times for access to public facilities (CHSLD)
  - In 2011: 13 months in Quebec City, 7 months in Montreal

# Research objectives

- We use a microsimulation model to project:
    - The probability for an individual to be in an institution
    - The number of institutionalized individuals
    - The number of years that an individual can expect to live in an institution
    - The present value of the cost of institutionalization

- Perform counterfactual scenarios

# Features of COMPAS

- Model covers all of Canada, but was initially developed for Quebec
- Individual-level modeling
- Allows us to account for:
  - The heterogeneity of the life courses of the elderly population
  - Improvements in life expectancy
  - Population aging
  - The impact of technological advances
- Modeling of simultaneous transitions between health statuses as well as survival
- Eases comparisons between scenarios (or assumptions)

# COMPAS (1/2)

- Population age 30+
- Health status defined by…
  - Diseases
    - Diabetes, hypertension, stroke, cancer, dementia, heart disease and lung disease
  - Impairments
    - Cognitive disorder
    - Limitations in Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL)
      - Need help for moving around the house
      - Need help for grocery and shopping, house cleaning and food
      - Need help for dressing, bathing or getting up
  - Risk factors
    - Obesity
    - Smoking

# COMPAS (2/2)

- Use and cost of health care services
  - Institutionalization (long-term care facilities)
  - Home care services
  - Consultations with a physician (generalist, specialist)
  - Short-term hospital stays
  - Prescription drugs (use only)

# Main surveys used

- National Population Health Survey (NPHS)
    - Longitudinal survey
    - Biennial from 1994 to 2011
    - 17,276 respondents in 1994
    - Strictly longitudinal since 2000

- Canadian Community Health Survey (CCHS)
    - Cross-sectional survey
    - We use 2010 as a starting population
    - Around 65,000 respondents (11,000 in Quebec)

- Health variables are similar in both surveys

# Working of COMPAS
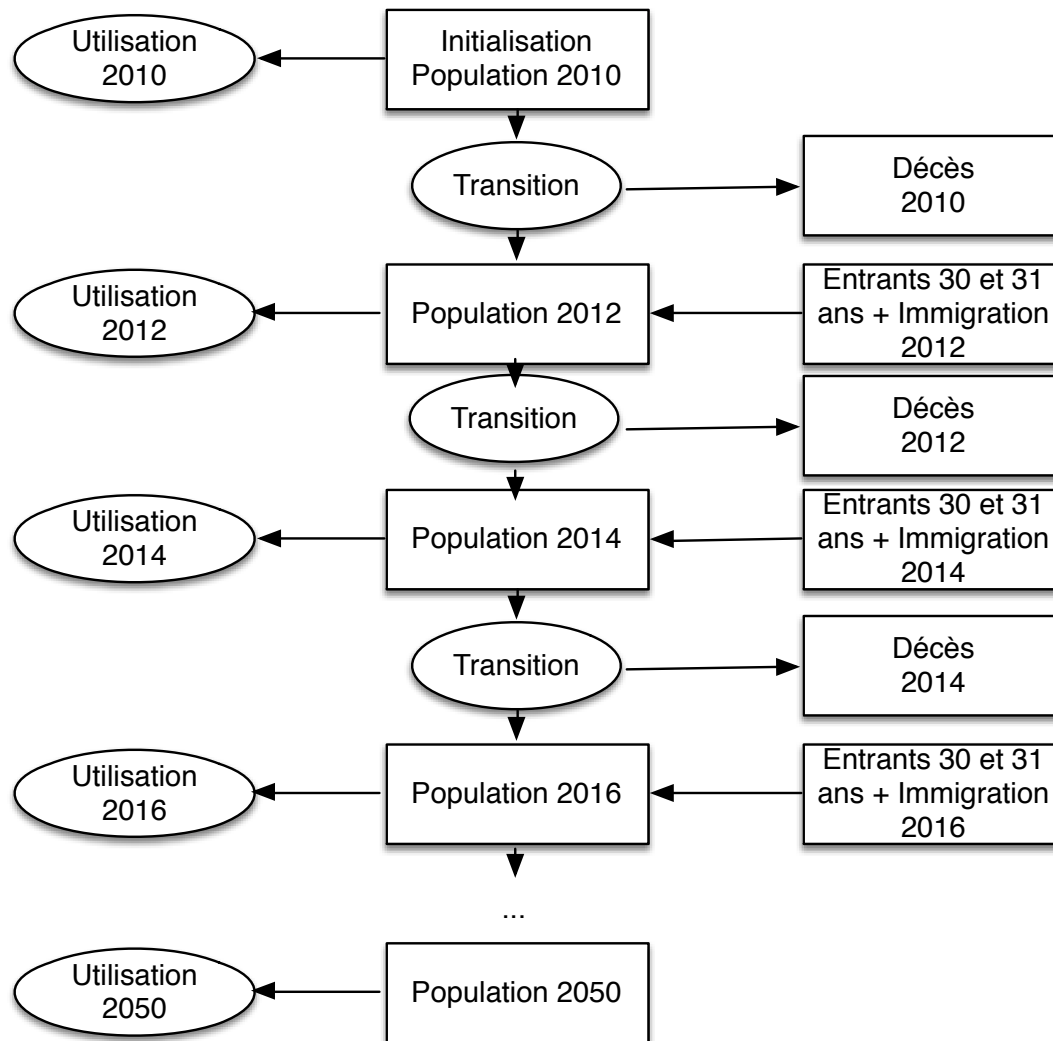
# Base scenario

- Population 30 years old and over

- Evolution of population health under the assumption of no major change in terms of…
  - Public policy
  - Transition probabilities across health states

- Use of some Statistics Canada demographic assumptions
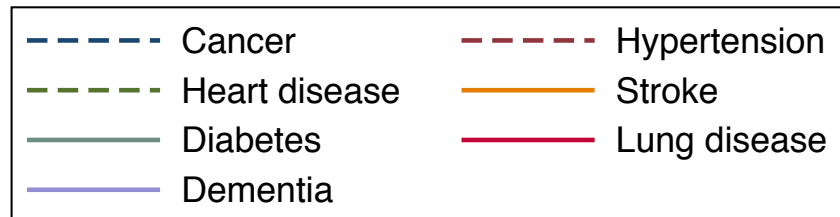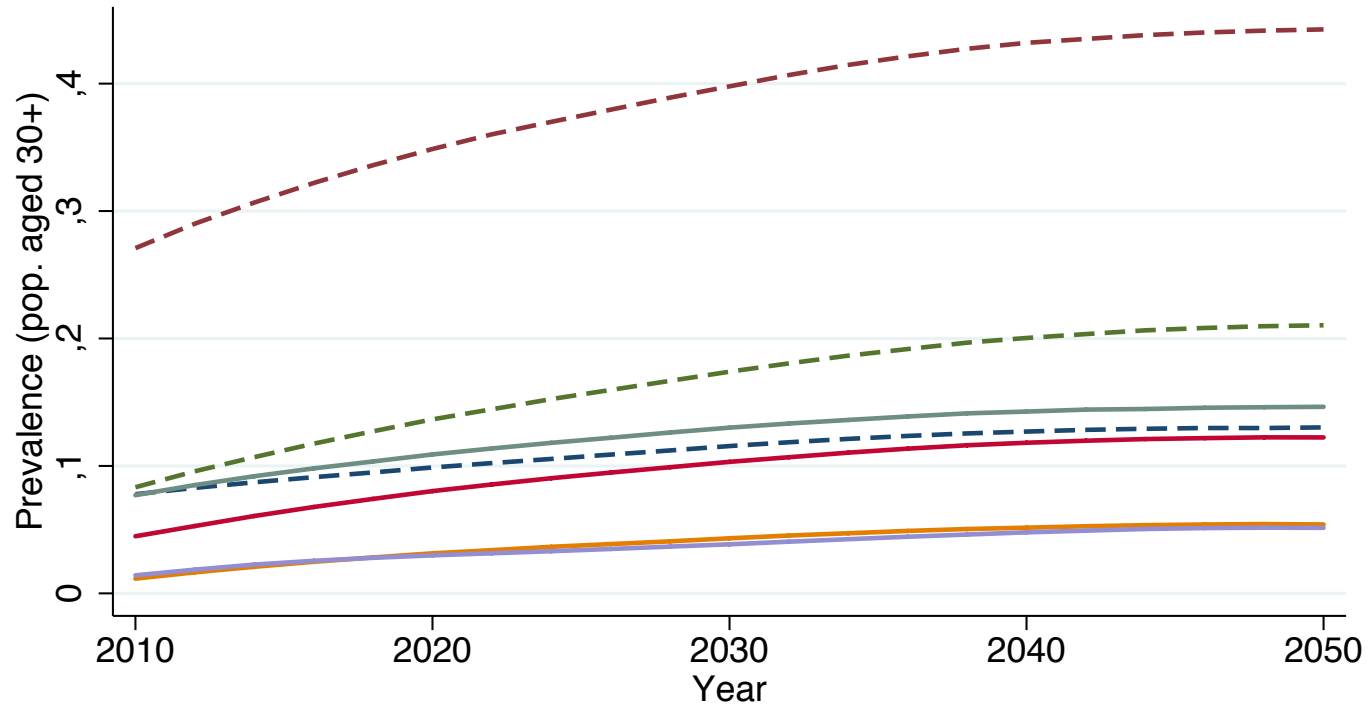  - Exogenous mortality compression
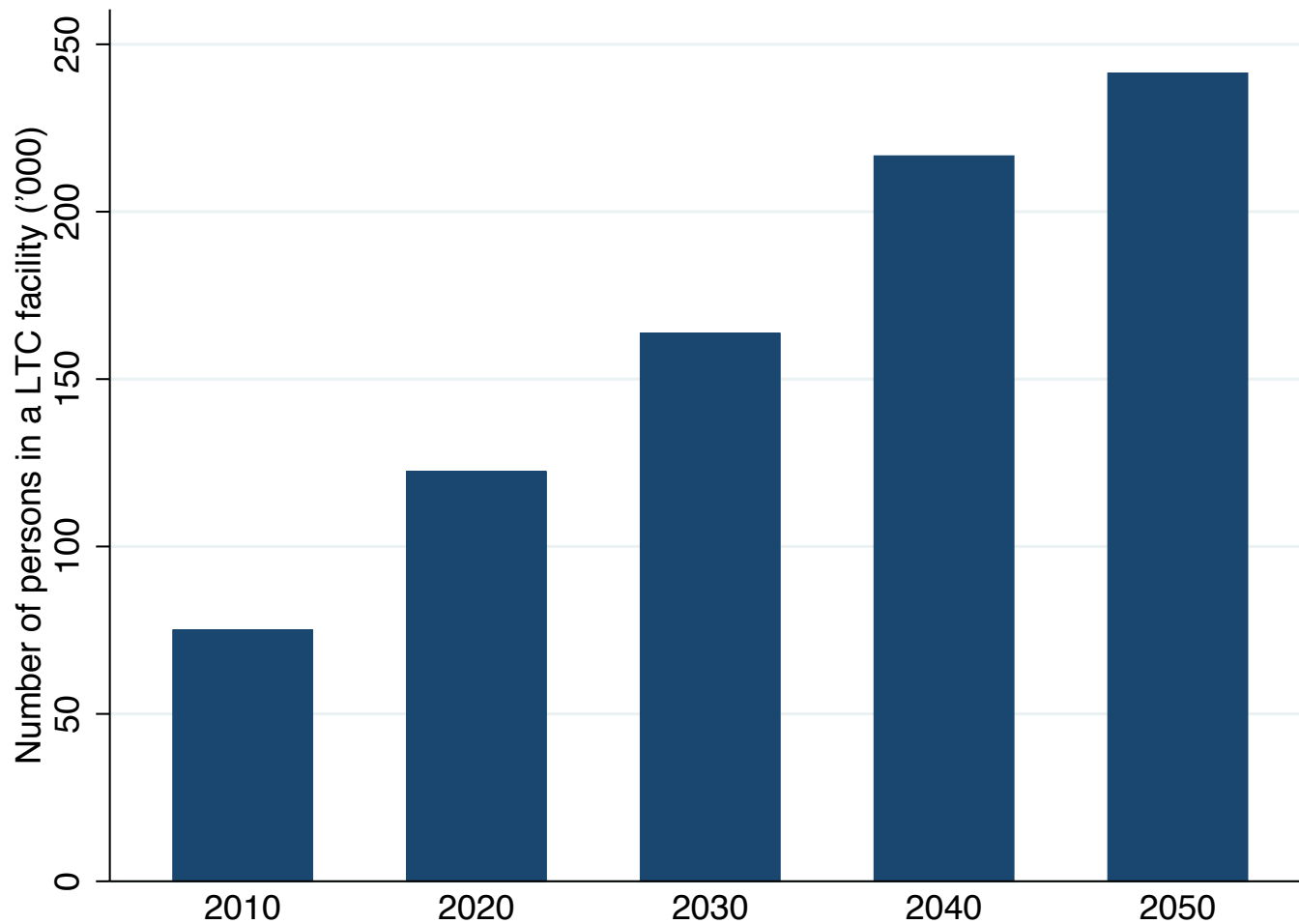  - Net migrations

# Projected total population
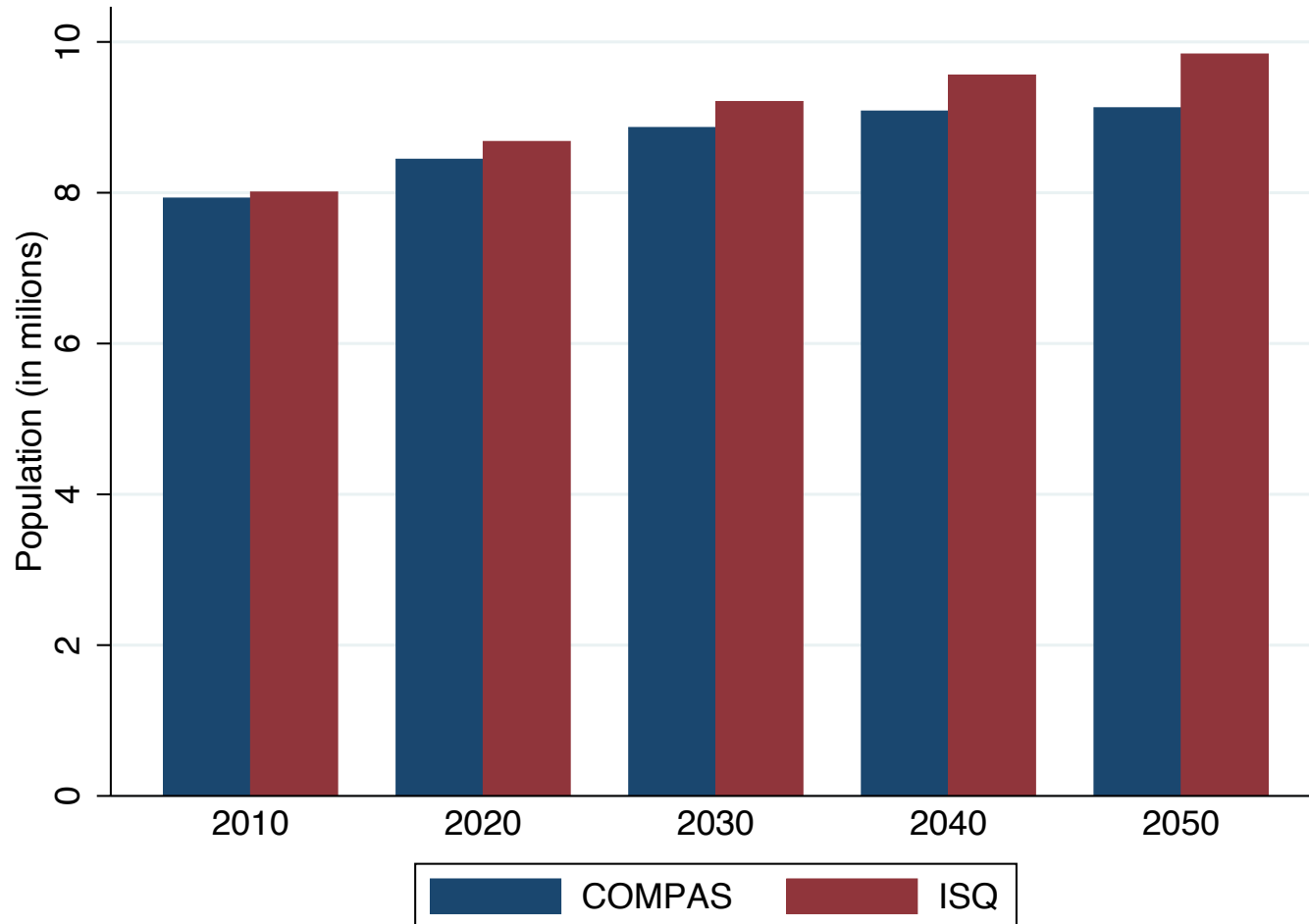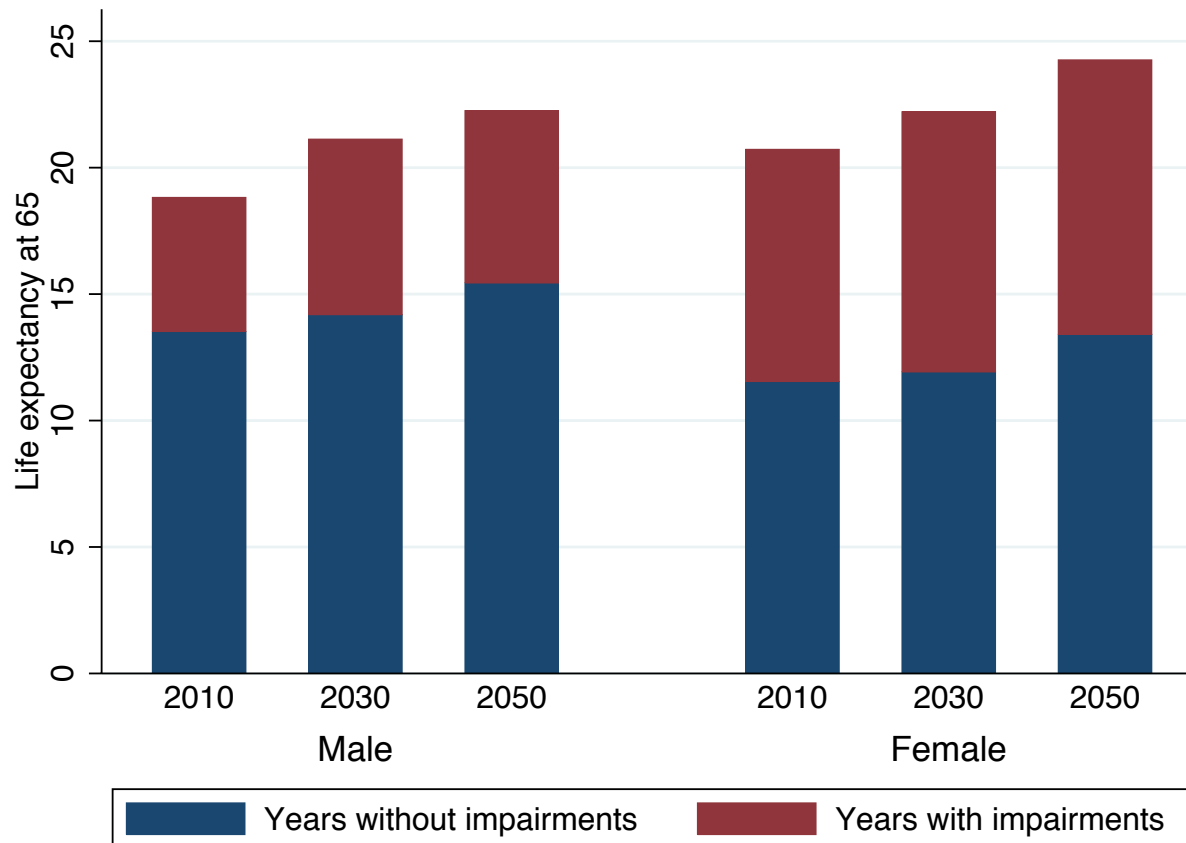
# Important increase in nb of oldest old
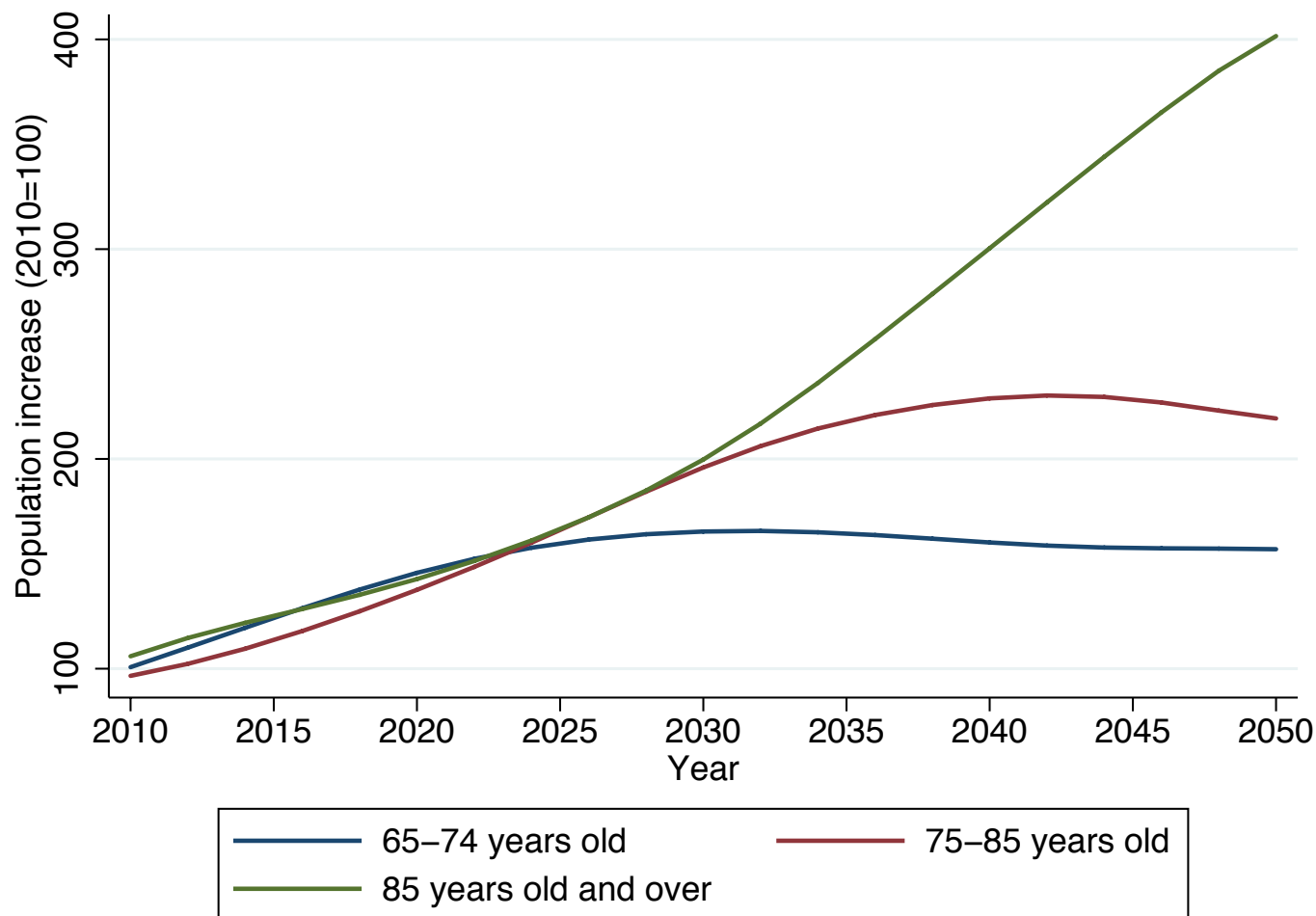
# Disease prevalence, population ≥ 30 y.o.

# Projected number of individuals living in a long-term care facility

# Generation life expectancy at age 65, with and without impairments



➢ *"With impairments" means needing help for at least one ADL or IADL or having a cognitive disorder.*

# Alternate scenarios

- We look at other scenarios – one of the main advantages of microsimulation models
  - Supress the exogenous mortality compression brought about by technological advances ("No mortality trend")
    - Mortality risk remains at the 2010 level for the entire projection period → All else equal, death risk increases relative to the base scenario

  - Decrease in dementia incidence ("Dementia decrease")
    - Every year between 2010 and 2050, all individuals have a 50% lower risk of developing dementia

  - Increase in incidence of obesity-related diseases ("Obesity increase")
    - Every year between 2010 and 2050, all individuals have a 50% higher risk of developing diabetes, heart disease, and hypertension

# Number of individuals in a long-term care facility
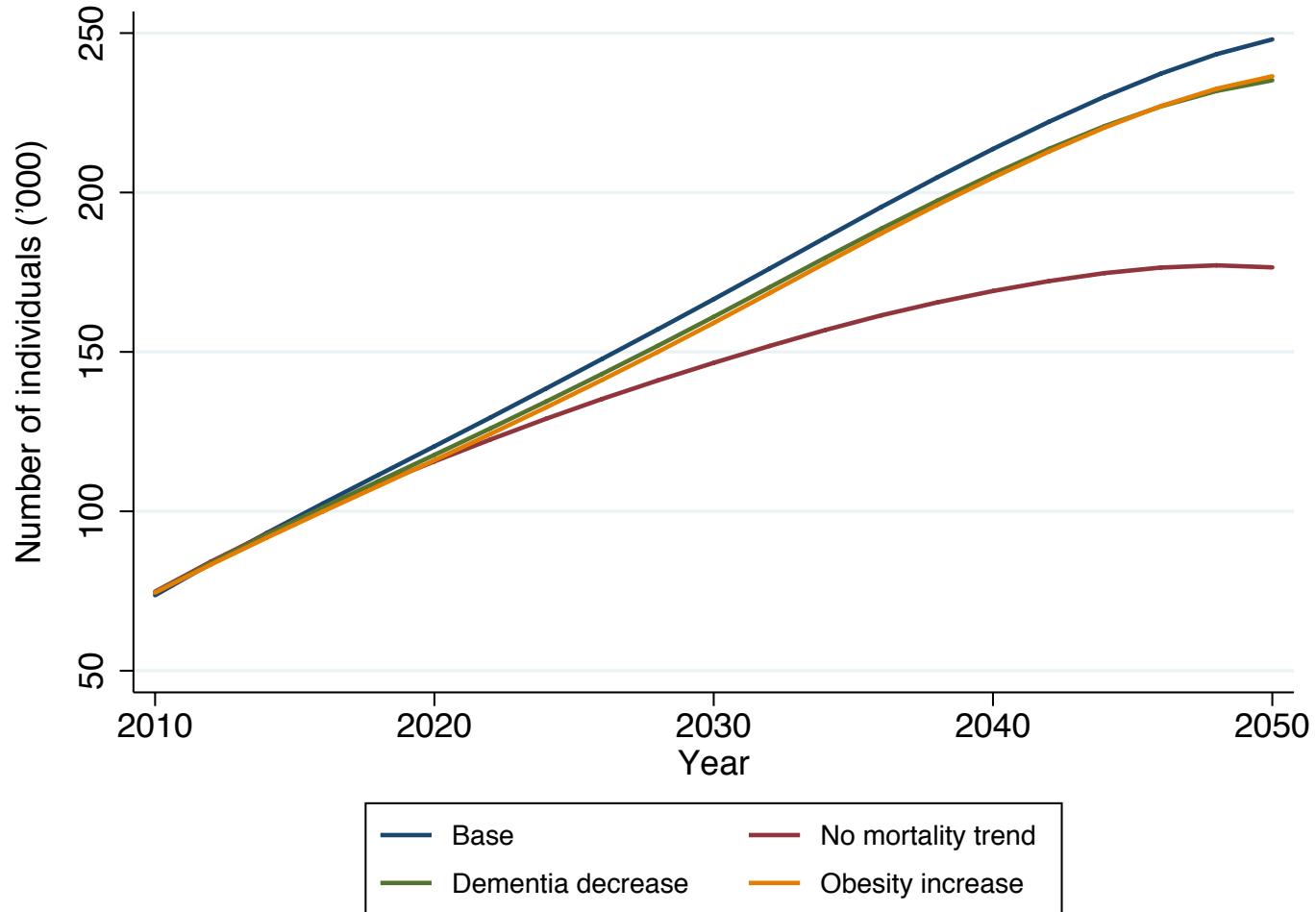
# Cohort analysis

- Individuals aged 51 in 2010 (born in 1959)
- A single cohort that keeps the 2010 characteristics for the entire projection period:
  - Transitions between health statuses remain unchanged
  - Closed population (no migration)
- This approach allows us to study
  - The probability of institutionalisation
  - The expected time spent in a long-term care facility
  - Both measures computed and presented by:
    - Gender
    - Education level
    - Health status
  - Present value of the cost of long-term care

# Cohort life expectancy

- Life expectancy and life expectancy with impairment at 65 y.o. for the cohort aged 51 y.o. in 2010 (born in 1959)

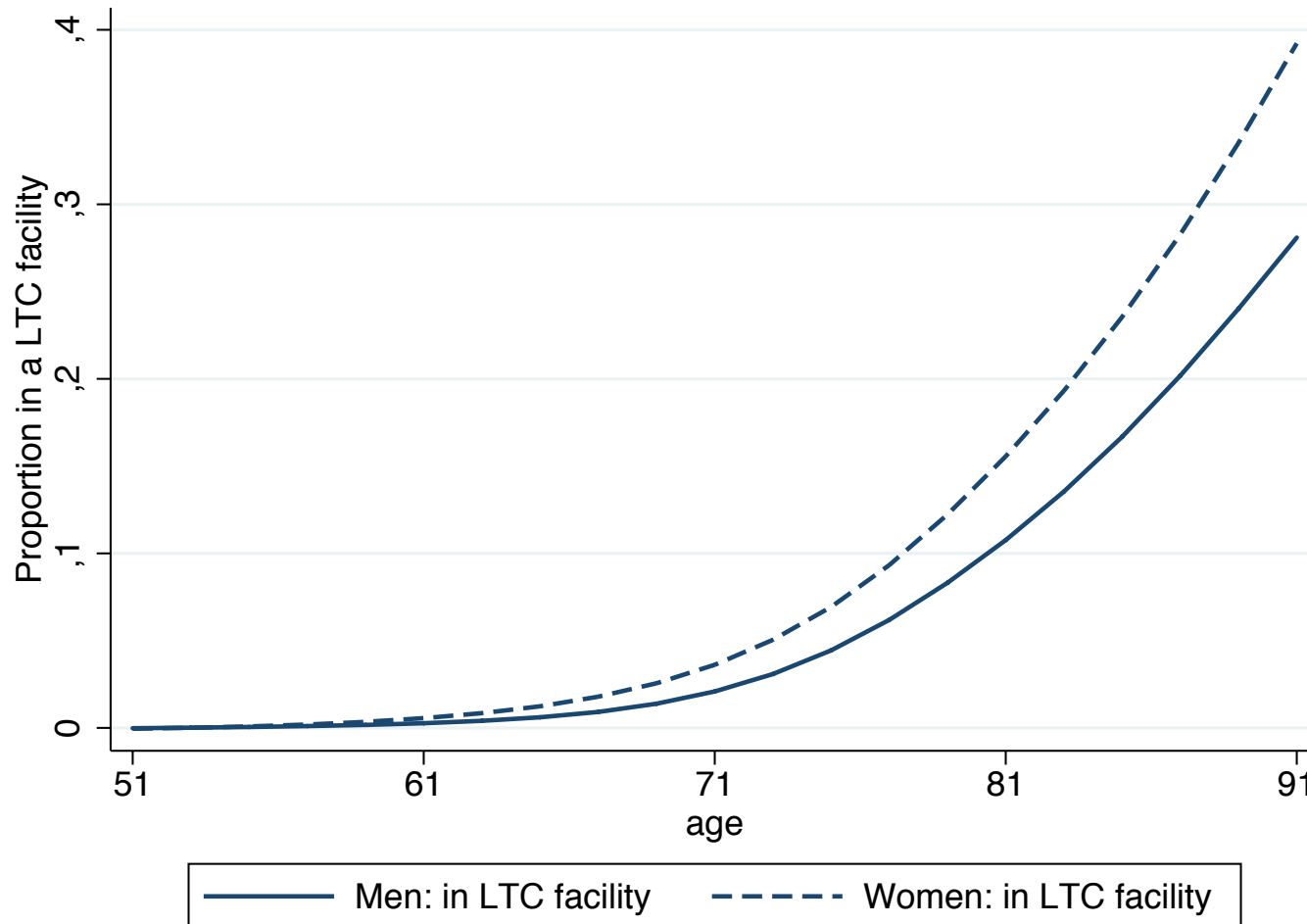|  | Life expectancy | Exp. years with impairment |
|---|---|---|
| No diploma | 18.2 | 8.2 |
| HS diploma | 21.2 | 8.9 |
| CEGEP | 21.7 | 8.6 |
| University degree | 24.6 | 7.6 |
| Never smoked | 23.8 | 8.3 |
| Smoker | 19.8 | 8.9 |
| Men | 21.1 | 6.6 |
| Women | 22.2 | 10.4 |

# Disease prevalence, by education level
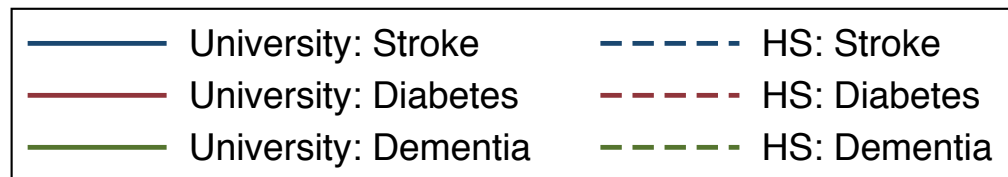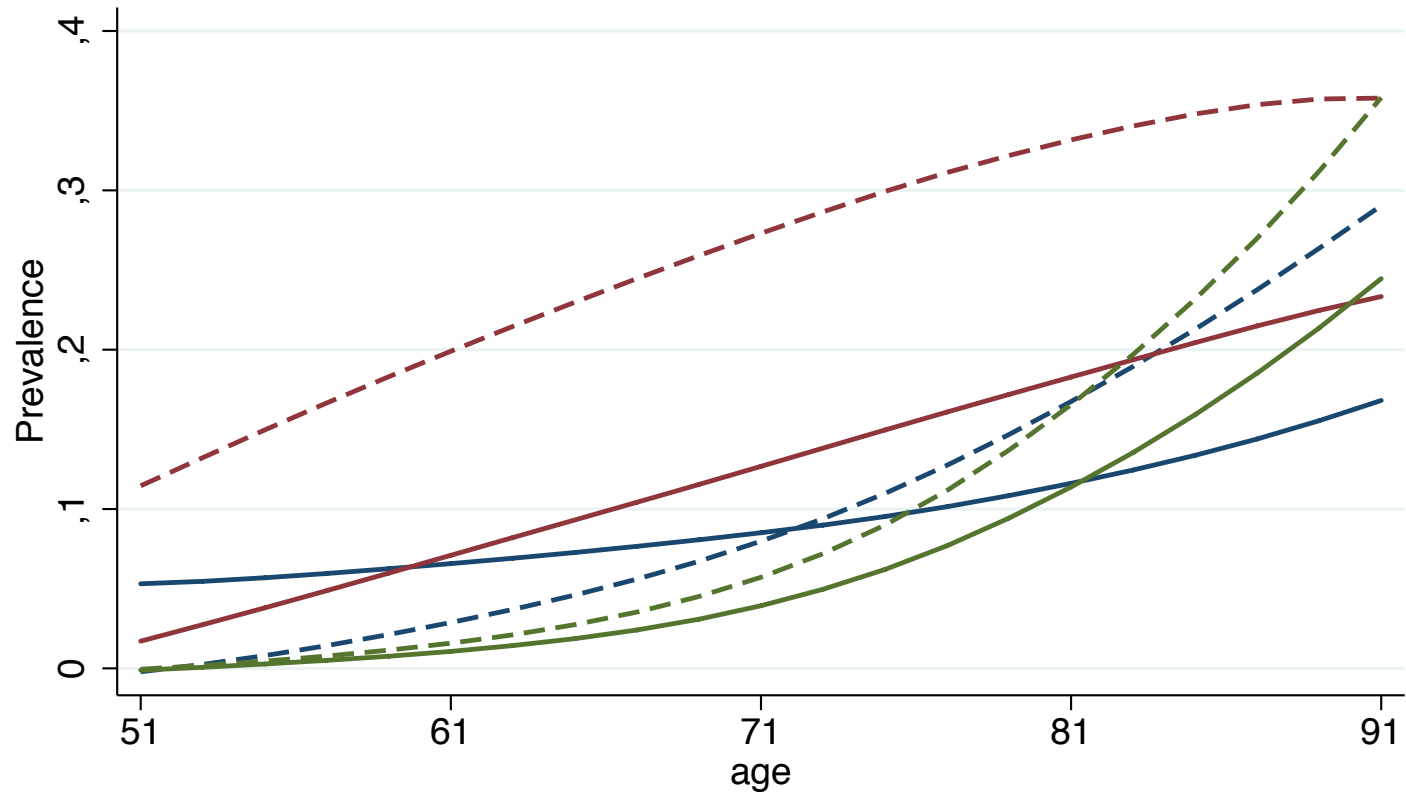
# Disease prevalence, by smoker status
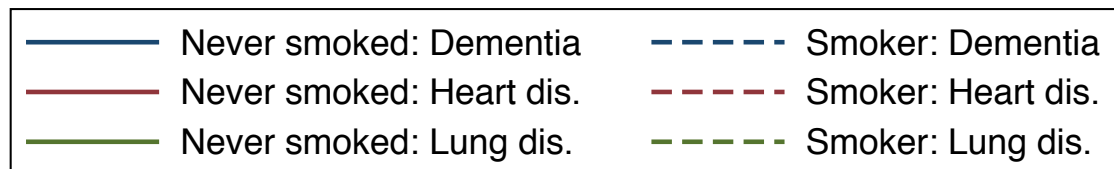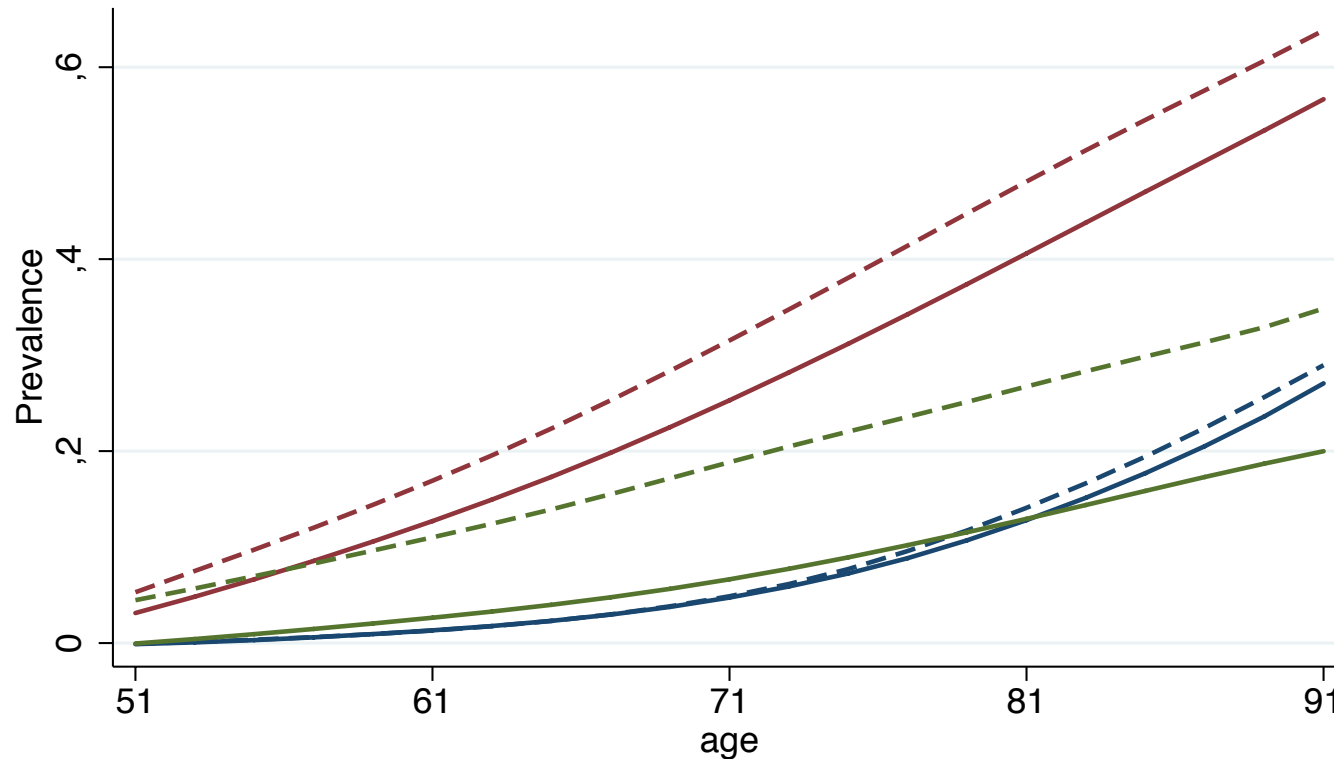
# Proportion of individuals in a LTC facility, by age and sex

# Long-term care risk at 50 y.o., by characteristic (in 2010)

|  | Probability of ever entering a LTC facility | Average number of years spent in a LTC facility (for total population) | Average number of years spent in a LTC facility (for individuals who ever enter a LTC facility) |
|---|---|---|---|
| No diploma | 0.30 | 1.79 | 5.50 |
| HS diploma | 0.32 | 1.80 | 5.53 |
| CEGEP | 0.34 | 2.10 | 5.99 |
| University degree | 0.16 | 0.80 | 4.97 |
| Men | 0.25 | 1.28 | 5.06 |
| Women | 0.36 | 2.19 | 6.00 |
| Total population | 0.31 | 1.74 | 5.67 |

# Costs of institutionalization

- Computation of the average cost of a year in a LTC facility
    1. Sum of total government expenditures and user contributions (CIHI data)
    2. Division of this sum by the number of individuals declaring in the Census that they live in an institution (StatsCan's 2011 Census)
- Cost of one year in a LTC facility: $42,784 (2011)

- To compute the present value of institutionalization:
    - Real discount rate of 3%

# Individual cost of institutionalization

- Total cost of institutionalization and present value for the cohort aged 51 y.o. in 2010 (born in 1959)

|  | Present value of total cost ($) |
|---|---|
| No diploma | 47,098 |
| HS diploma | 58,778 |
| CEGEP | 54,854 |
| University degree | 28,637 |
| Never smoked | 50,795 |
| Smoker | 47,272 |
| Men | 32,830 |
| Women | 64,685 |

# Aggregate cost of institutionalization
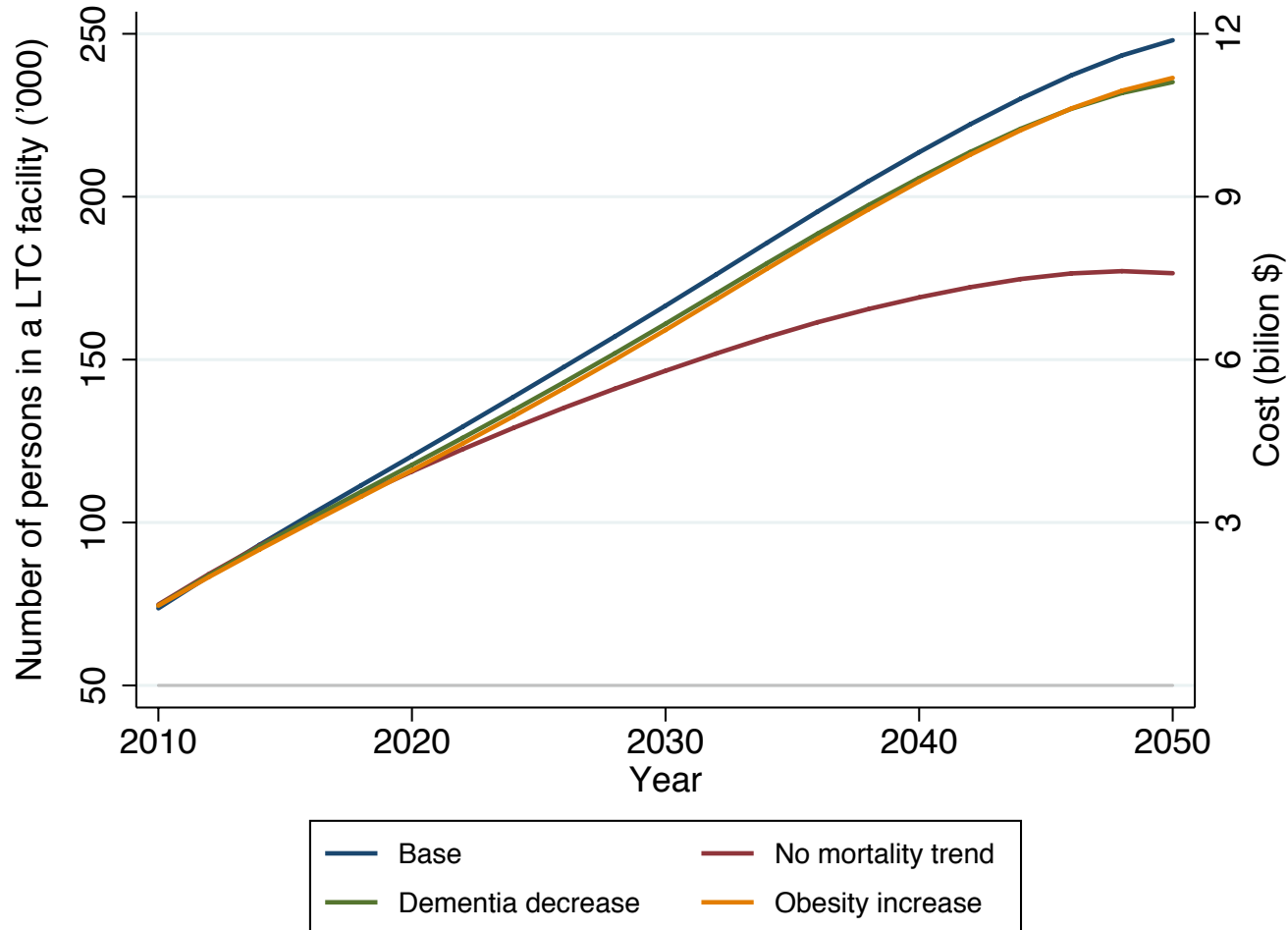
# User contribution in CHSLD (2016)

- In a CHSLD, the maximum user contribution for a single room is $1,811/month, or $21,732/year

- For a senior whose only income is OAS and GIS (~$1,350/month), the contribution is $13,660/year

- The share that is "insured" by governments therefore varies between 50% and 70% approx.

# Conclusions

- In coming years, important needs in terms of insurance and financing of health expenditures

- Need to be able to properly assess risk, for various population sub-groups

- Will allow to quantify the value of different insurance products for the insured…

- … and the cost of such products for insurers and governments

# Data limitations (1/2)

- No uniform or consistent definition of facility type between sources (e.g. StatsCan vs. CIHI)
  →need to use imperfectly compatible sources

- Impossible to distinguish type of facility residents are in
  - Intermediate vs. Nursing homes
  - CIHI: For physically impaired vs. For addiction issues

- Impossible to distinguish whether residents are in a private or a public facility

- Limited cost data available, especially for private facilities

# Data limitations (2/2)

- Our data and model do not allow us to account for presence / effects of:
  - Spouse
  - Children
  - Other caregivers

- No trend towards home care modelled

# COMPAS Team

- David Boisclair (ESG UQAM)
- Aurélie Côté-Sergent (CIRANO)
- Yann Décarie (ESG UQAM)
- Guy Lacroix (U Laval)
- François Laliberté-Auger (ESG UQAM)
- Steeve Marchand (U Laval)