



Bridging the knowledge gap

Canadian Reinsurance Conference

March 29, 2017

Agenda

- How do pension actuaries view longevity?
- Bridging the knowledge gap through
 - Modern approaches
 - Up-to-date research

Who we are



- Launched in 2008
- Over 200 plans
- Now tracking 2.5 million pensioners, representing 1 in 4 UK DB retirees

- Launched in 2015
- Initial club of about 40 plans and 500,000 pensioners
- Tracking about 1 in 6 Canadian DB retirees

Club Vita Canada's vision

Drive development and adoption of...

- Advanced longevity analysis and measurement
- Longevity risk management tools and techniques

Move to a consistent approach to longevity

- Help align views of pension plans and insurers
- Be a catalyst for risk-transfer market growth

Be a leader in Canadian longevity

- Collaborate on research initiatives

Pension actuaries' view

Pension actuarial perspective on longevity

Actuarial view

- A valuation assumption for mortality
 - Standard table adjusted by plan experience
- Little focus on improvements
- De-risking work is profitable

CIA guidance

- **Going concern valuation:** Reflect actual experience rather than adjustment to standard table
- **Solvency valuation:** Adjust annuity purchase assumption where insurer would assume shorter or longer than average longevity

Canadian longevity rating factors

Factor	Plans	Insurers	Club Vita
Age & gender	✓	✓	✓
Public / private	✓	Some	✗
Pension size	Few	✓	✓
First vs. second life	✗	Some	✓
Retirement health	✗	Few	✓
Postal code (socio-economics)	✗	Some	✓
Salary at retirement	✗	✗	✓
Marital status	✗	✓	✗


Bridging the knowledge gap



Shift focus from plans to members

Top-down/plan-focused approach (Traditional)

Published or
industry table




Adjustments
based on plan
experience

Plan-specific
mortality tables

Focuses on average experience for
existing pensioners

Bottom-up/member-focused approach (Club Vita)

Plan-specific
mortality tables



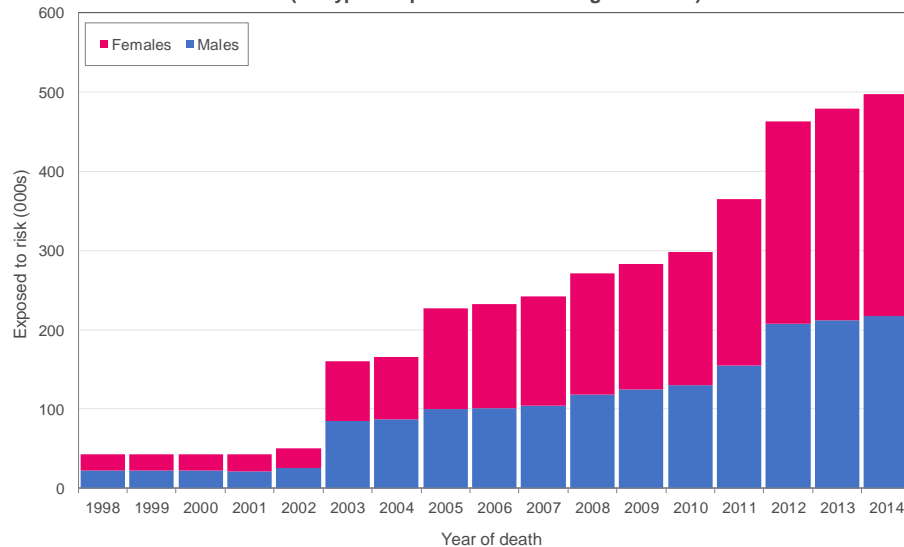
Weight sub-
groups based
on plan's
membership

Mortality curves for a wide
range of sub-groups

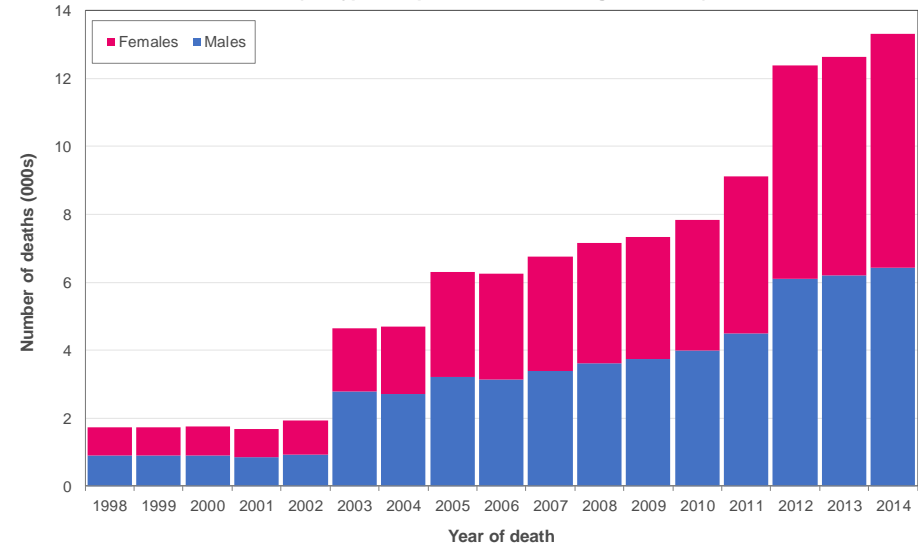
Focuses on membership sub-group
characteristics of entire plan

Our VitaBank

Pensioner-years exposed to risk
(All types of pensioner including survivors)



Number of deaths
(All types of pensioner including survivors)



How VitaBank compares to CPM

- Similar size (~500k exposed lives in final year)
- More current data – VitaBank has complete data to end of 2014
 - CPM study published in 2014, based on data up to 2008
- Much more granular information and more diverse plan populations
- Longer back history

Key rating factors



Gender



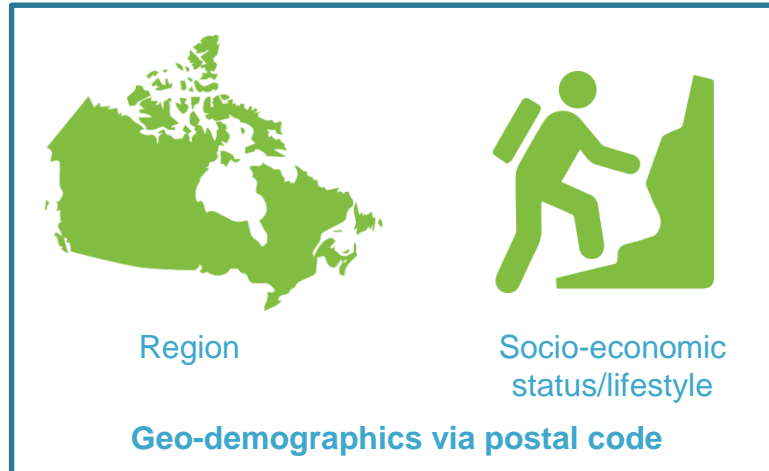
Pensioner Type



Retirement Health



Affluence



Region

Socio-economic
status/lifestyle

Geo-demographics via postal code

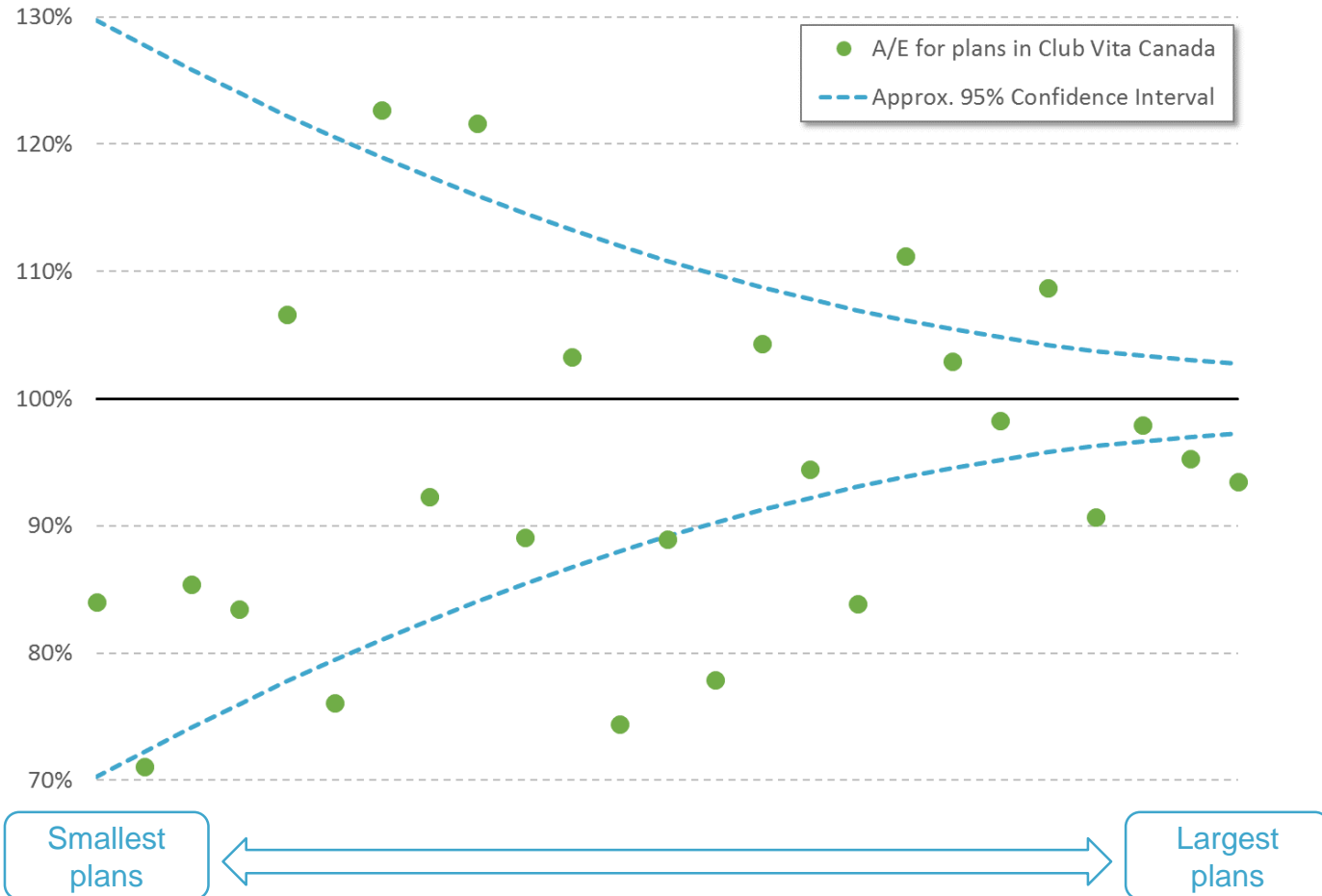


Job Type

Together, these factors explain an 11-year range in period life expectancy for a male age 60

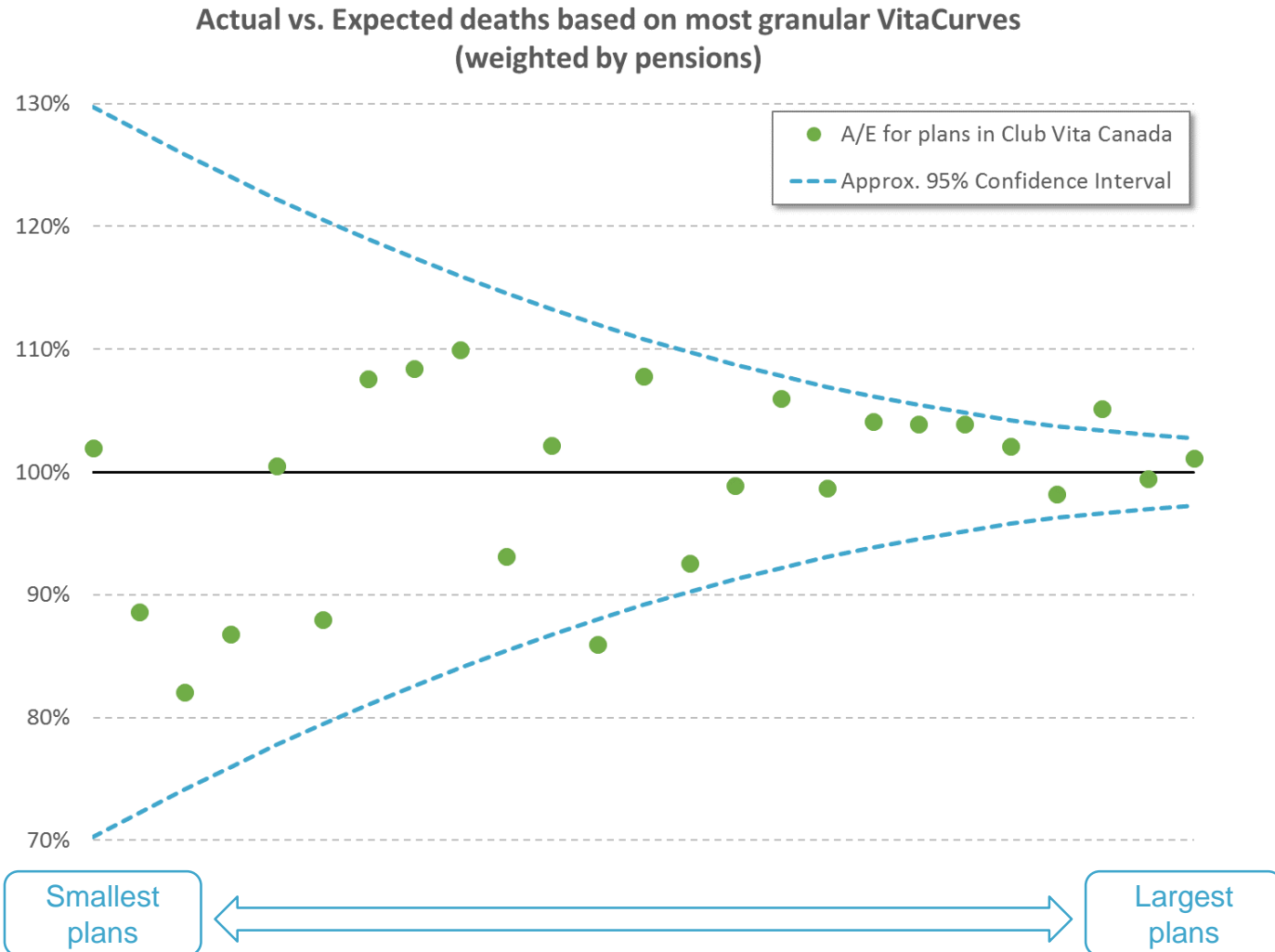
Age and gender model performance

Actual vs. Expected deaths based on age-only VitaCurves
(weighted by pensions)



Actual deaths compared to expected deaths for the period 2012 to 2014, where the expected deaths are calculated by assigning each individual to the VitaCurve based on gender and pensioner type only.

Best model performance



Actual deaths compared to expected deaths for the period 2012 to 2014 where the expected deaths are calculated by assigning each individual to the most granular VitaCurve based on longevity factor availability and quality.

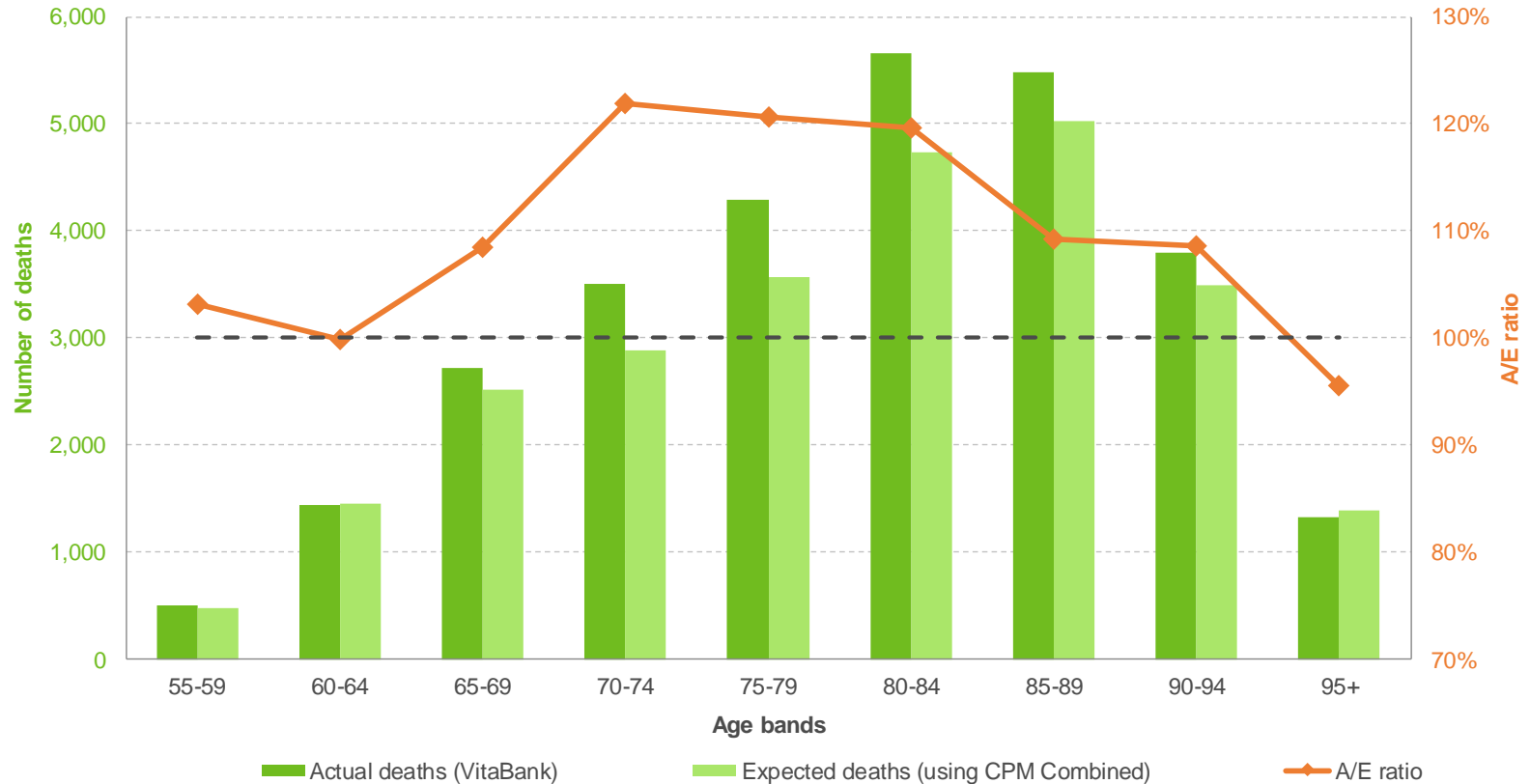
VitaBank actual vs. CPM combined expected



- VitaBank deaths have been consistently been higher than CPM expectations
- Average A/E is 114% over ten years ending 2014
 - 104% based on CPM Private

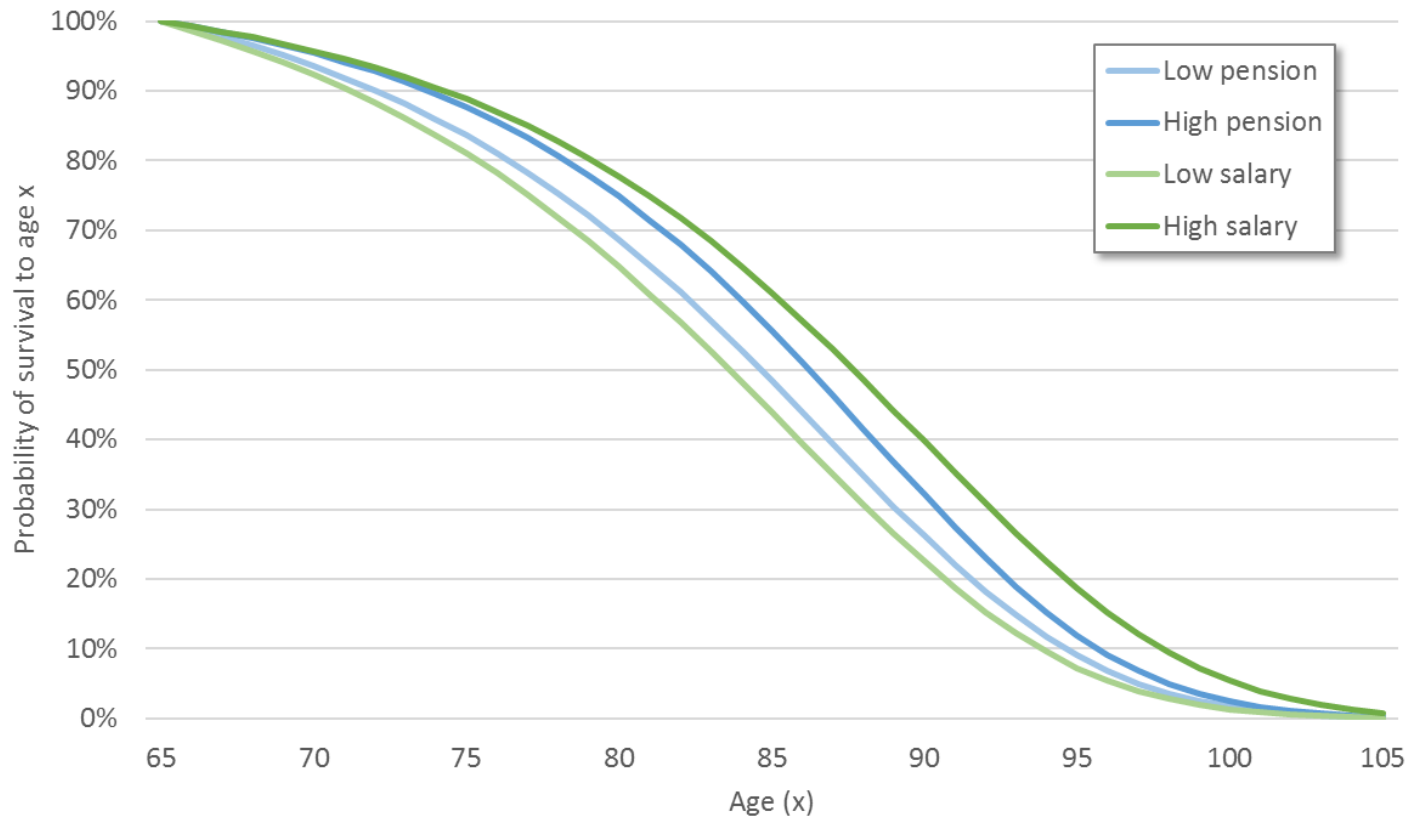
Different age-slope than CPM

Actual and expected 2012 to 2014 pensioner deaths by age band (excluding survivors)



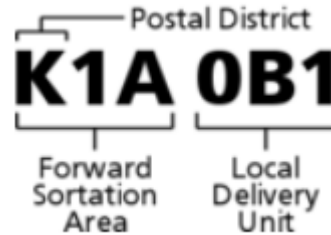
Affluence – Salaries better than pension

Male Survival Curves from Age 65



Pensions account for just under a 2-year range in male life expectancy at age 60, whereas salaries explain just over 4 years

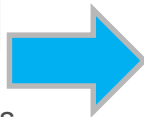
Creating lifestyle/longevity groups



Census/Survey Data



Statistics Canada

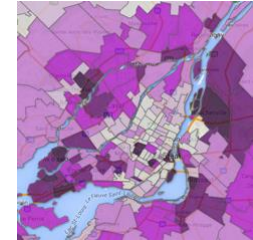


- Data by geographic areas (e.g., household income, level of education, etc.)

Geo-demographic segments



Geography/Proximity



Cluster segments based on life expectancy



A B C D E

Longevity groups

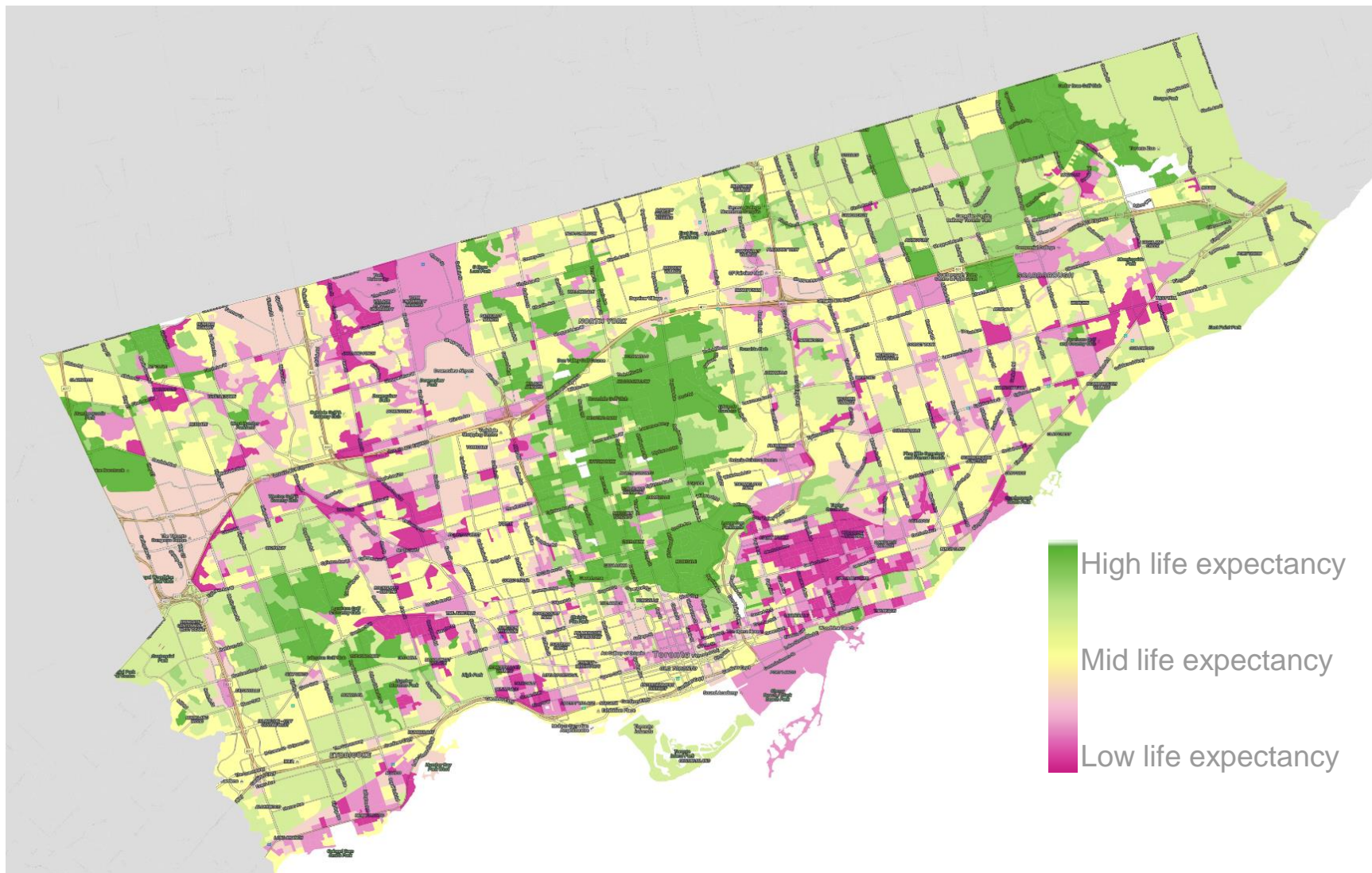
Postal code visualization

Golden Horseshoe – males



Postal code visualization

Toronto – males



Bridging the knowledge gap with plans

