CLSA WEBINAR SERIES

Sociodemographic determinants of mobility decline among community-dwelling older adults: preliminary findings from the CLSA

October 20, 2025 | 1 PM ET

Ogochukwu Onyeso, PhD in Population Studies in Health
University of Lethbridge

University of Lethbridge

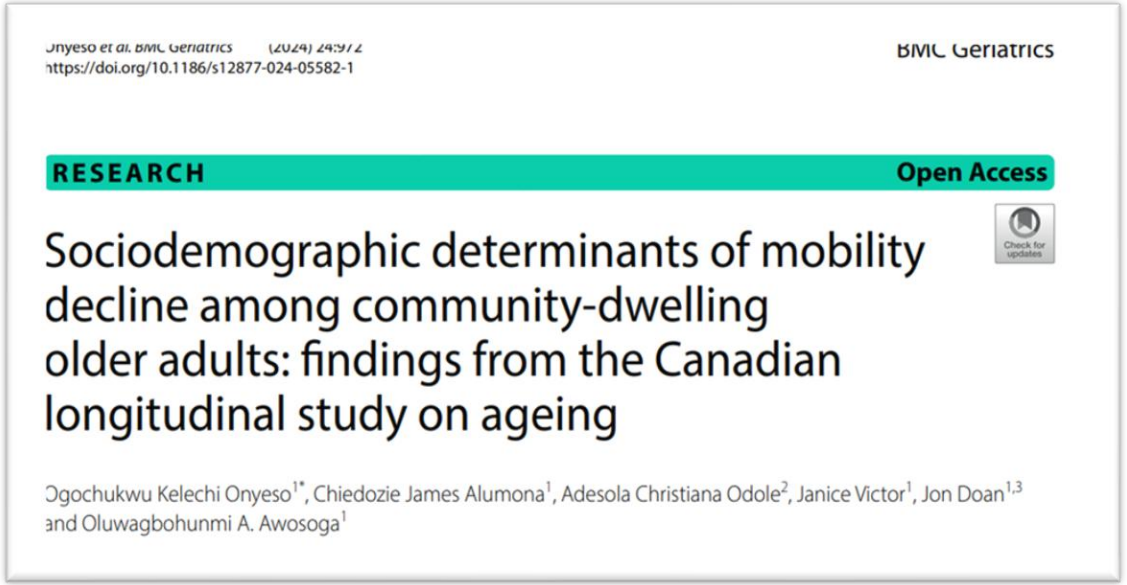
clsa élcv Canadian Longitudinal Study on Aging
Étude longitudinale canadienne sur le vieillissement

Territorial acknowledgment

Oki, and welcome to the University of Lethbridge. Our University's Blackfoot name is Iniskim, meaning Sacred Buffalo Stone.

The University is located in traditional Blackfoot Confederacy territory. We honour the Blackfoot people and their traditional ways of knowing in caring for this land, as well as all Indigenous Peoples who have helped shape and continue to strengthen our University community.

Citation



Onyeso et al. BMC Geriatrics (2024) 24:972
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BMC Geriatrics

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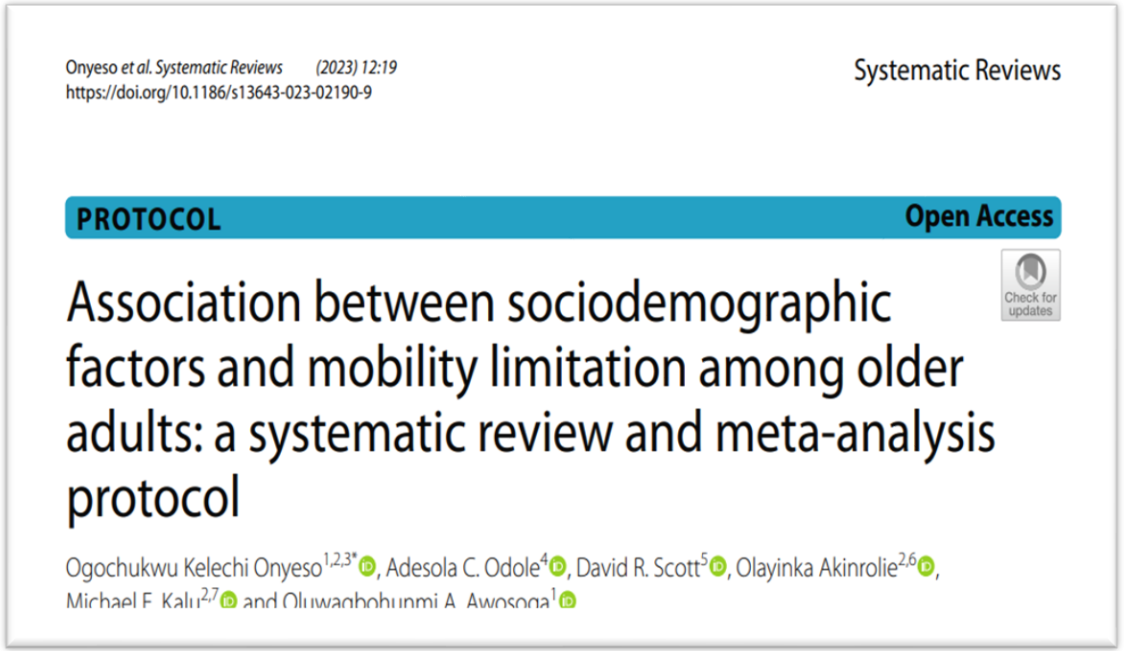
Sociodemographic determinants of mobility decline among community-dwelling older adults: findings from the Canadian longitudinal study on ageing

Ogochukwu Kelechi Onyeso[1*], Chiedozie James Alumona[1], Adesola Christiana Odole[2], Janice Victor[1], Jon Doan[1,3] and Oluwagbohunmi A. Awosoga[1]



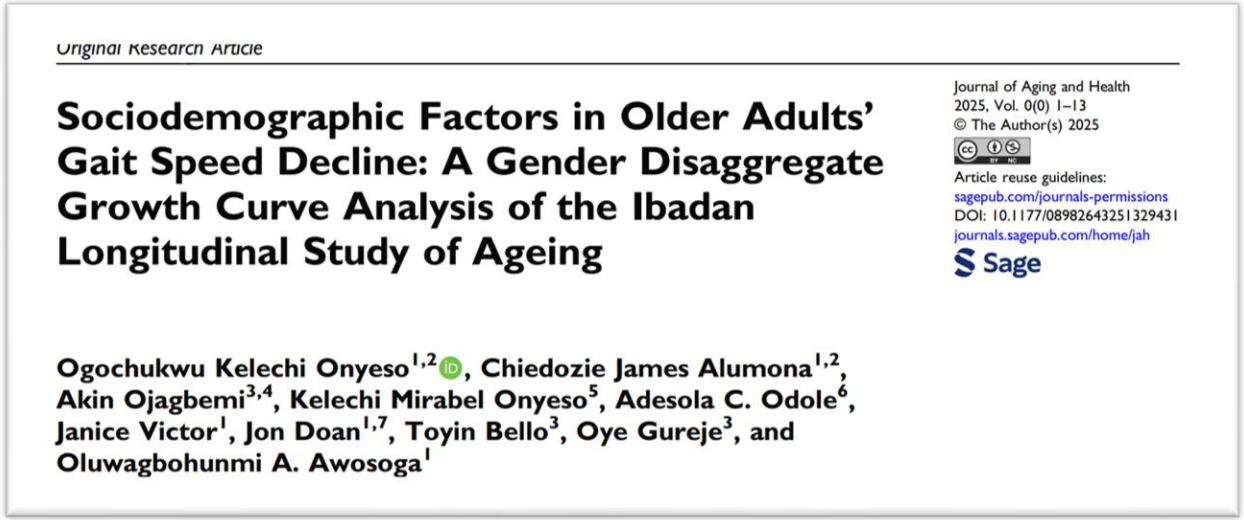
Onyeso et al. Systematic Reviews (2023) 12:19
https://doi.org/10.1186/s13643-023-02190-9

Systematic Reviews

PROTOCOL Open Access

Association between sociodemographic factors and mobility limitation among older adults: a systematic review and meta-analysis protocol

Ogochukwu Kelechi Onyeso[1,2,3*], Adesola C. Odole[4], David R. Scott[5], Olayinka Akinrolie[2,6], Michael E. Kalu[2,7] and Oluwagbohunmi A. Awosoga[1]



Original Research Article

Sociodemographic Factors in Older Adults' Gait Speed Decline: A Gender Disaggregate Growth Curve Analysis of the Ibadan Longitudinal Study of Ageing

Journal of Aging and Health
2025, Vol. 0(0) 1–13
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Ogochukwu Kelechi Onyeso[1,2], Chiedozie James Alumona[1,2], Akin Ojagbemi[3,4], Kelechi Mirabel Onyeso[5], Adesola C. Odole[6], Janice Victor[1], Jon Doan[1,7], Toyin Bello[3], Oye Gureje[3], and Oluwagbohunmi A. Awosoga[1]

Onyeso, OK et al. (2024). Association between sociodemographic factors and mobility among older adults: a systematic review and meta-analysis. *BMC Geriatrics (under review)*.

Onyeso, OK et al. (2024). Life-course sociodemographic determinants of mobility decline: a comparative qualitative study of Canadian and Nigerian older adults' perspectives. *BMC Geriatrics (under review)*.

Outline

- Reflection on mobility
- Study background and rationale
- Overview of the literature
- Overview of methods
- Results and discussion
- Policy implications
- Limitations
- Summary
- Recommendation
- References
- Q&A

Onyeso *et al. BMC Geriatrics* (2024) 24:972
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Sociodemographic determinants of mobility decline among community-dwelling older adults: findings from the Canadian longitudinal study on ageing

Ogochukwu Kelechi Onyeso[1*], Chiedozie James Alumona[1], Adesola Christiana Odole[2], Janic
nd Oluwa[illegible]obunmi A. Awos[illegible]ga[1]

Introduction

Introduction

- The population of older adults 65 years and older is increasing (Bloom et al., 2015).
- Estimate for 60 years and older: 800 million (12%) in 2015 to about (22%) 2.1 billion by 2050 (WHO, 2025).
- Canadian estimate: 19% in 2023 to 25% in 2050.
- Age-related mobility limitation will also increase (Metz, 2000).

Mobility

Active

Walk (Ambulation)

- Unassisted
- Assisted

Motorized

Transport

- Mobility is a person's ability to move around safely and independently, without or with a walking aid (Webber et al., 2010).

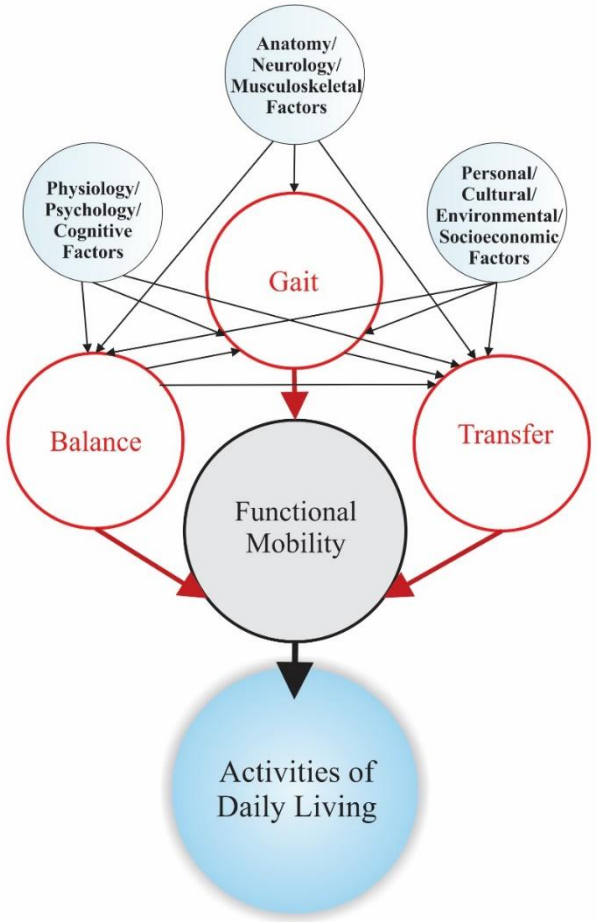
Reflection

"Mobility is not just the ability to move but the essence of autonomy, dignity, and participation. When mobility is limited, the journey of life itself becomes constrained, demanding resilience and adaptation in the face of ageing."

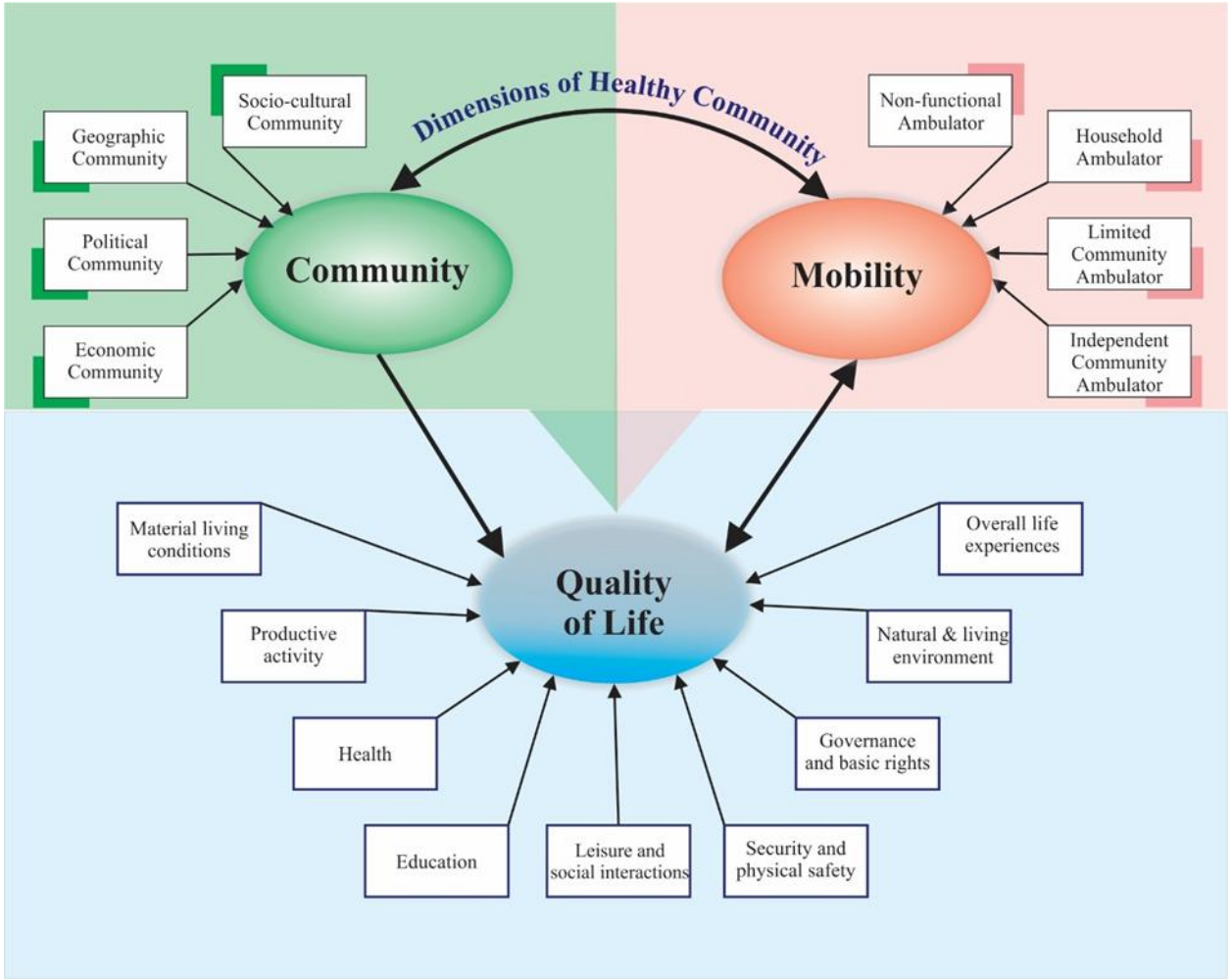
Background

- Studying mobility limitation in older adults is important.
- Mobility impairment leads to:
  - physical disability and institutionalization
  - frequent falls and injuries
  - sedentary behaviour and dependency
  - depression and social isolation
  - reduced quality of life and death
- ~20.6% Canadians aged ≥ 65 years reported mobility limitations as of 2012; the trend increases with age (Bizier et al., 2016).

Background

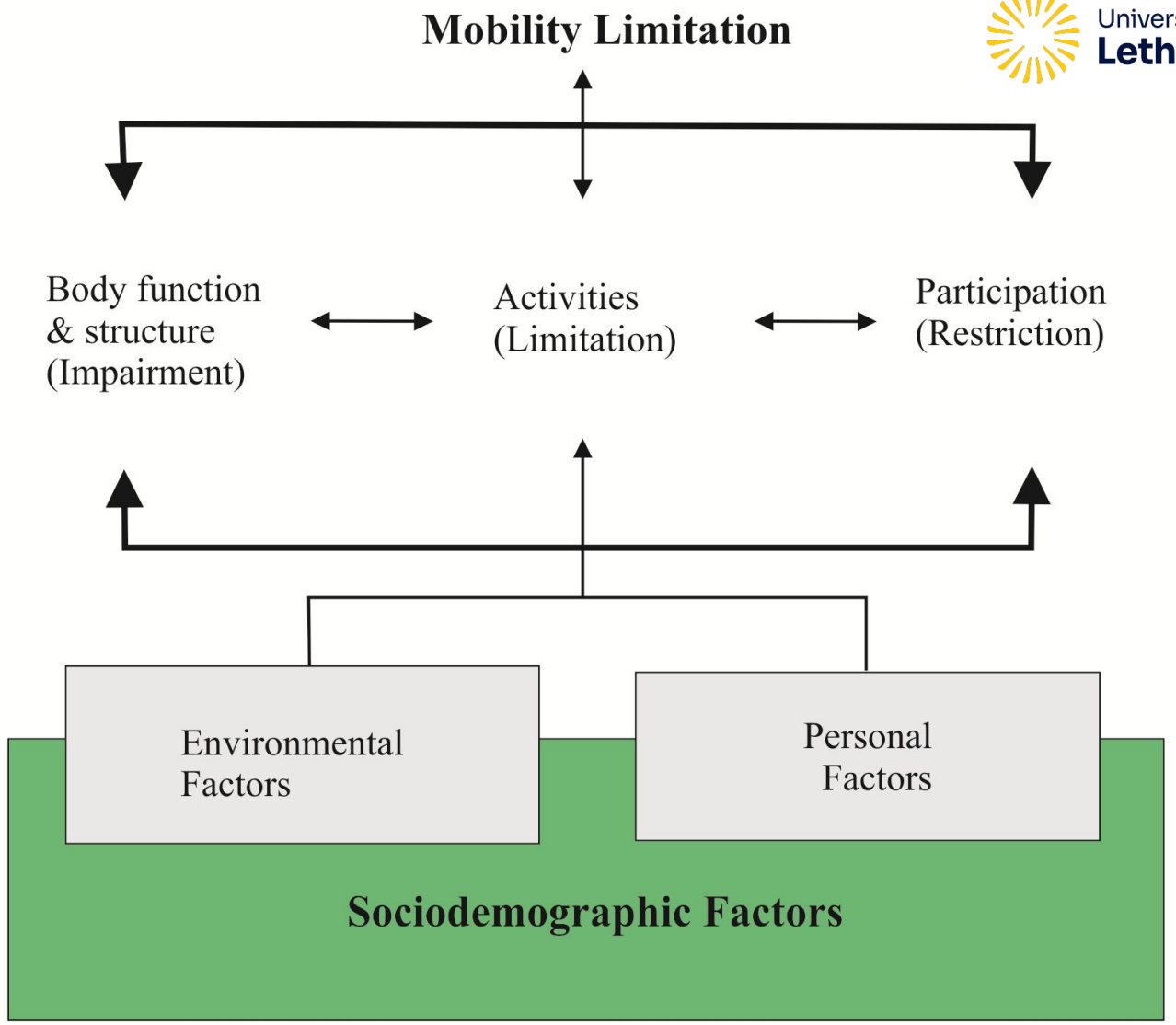


balance, and transfer as components of functional mobility.



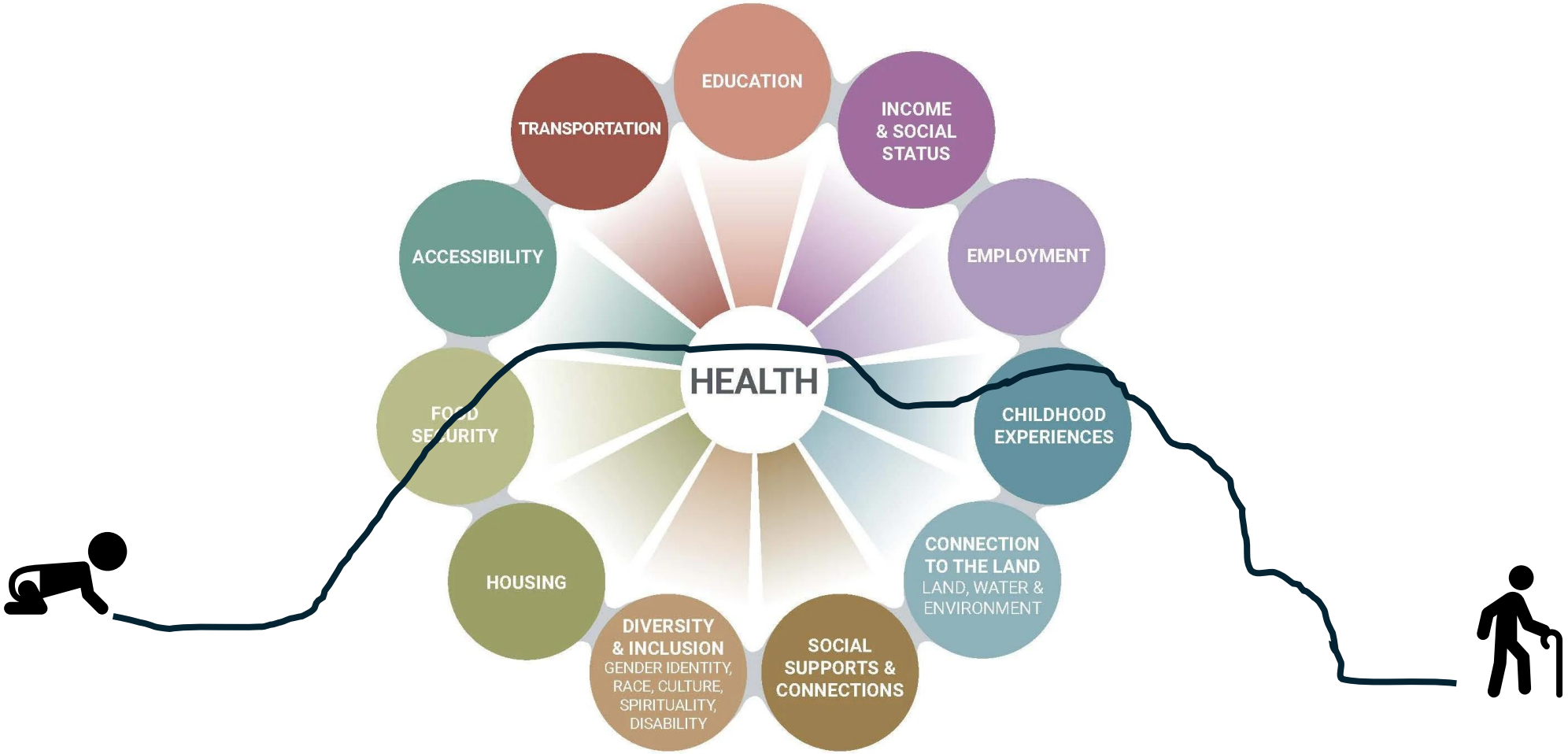
Community, mobility, and quality of life interactions.

Conceptual Framework



International Classification of Functioning, Disability and Health (ICF) model.

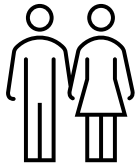
Theoretical Framework



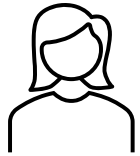
Life course and social determinants of health theories (Marengoni & Calderon-Larrañaga, 2020)

Empirical Literature Review

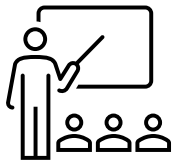
Age
(Dunlap et al., 2022)



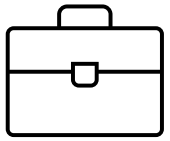
Marital status
(Hossain et al., 2021)



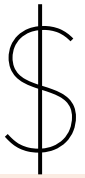
Gender
(Wheaton & Crimmins, 2016)



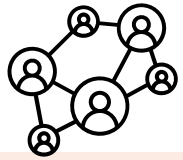
Education
(Kyrönlahti et al., 2021)



Occupation
(Beltrán-Sánchez et al., 2017)

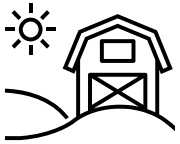


Income
(Marmot et al., 2002)



Social status
(Cattell, 2001)

Race/tribe
(Thorpe et al., 2011)

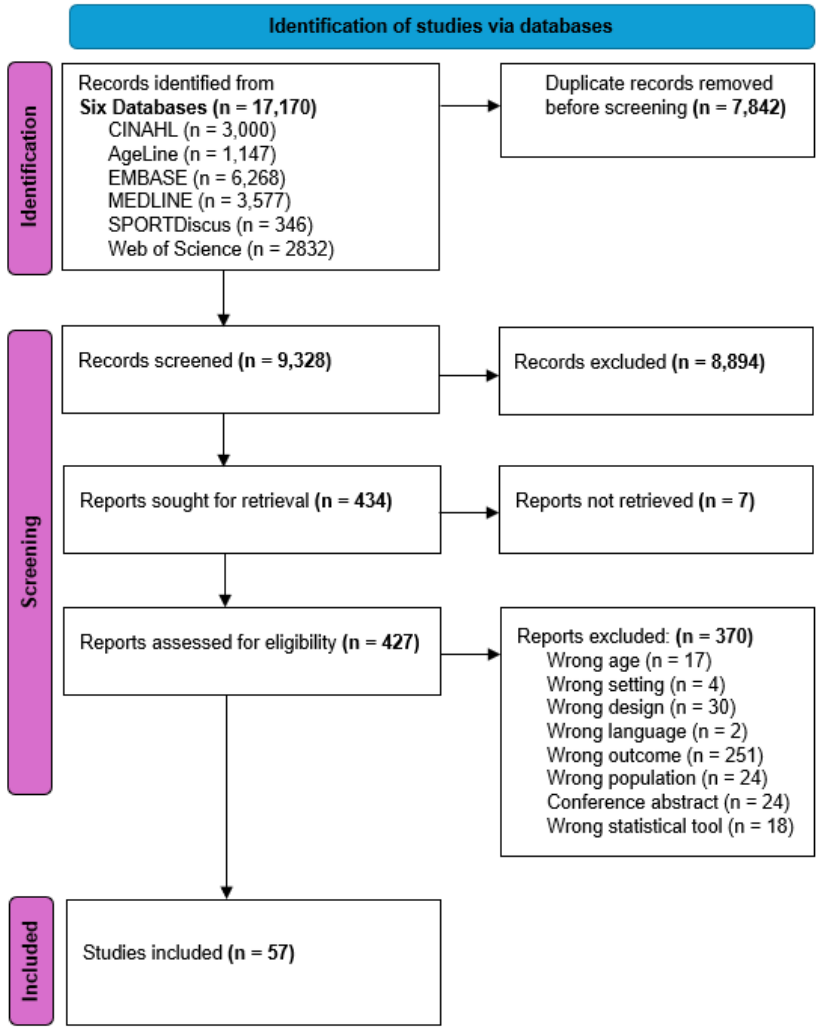


Location
(Lunar et al., 2019)

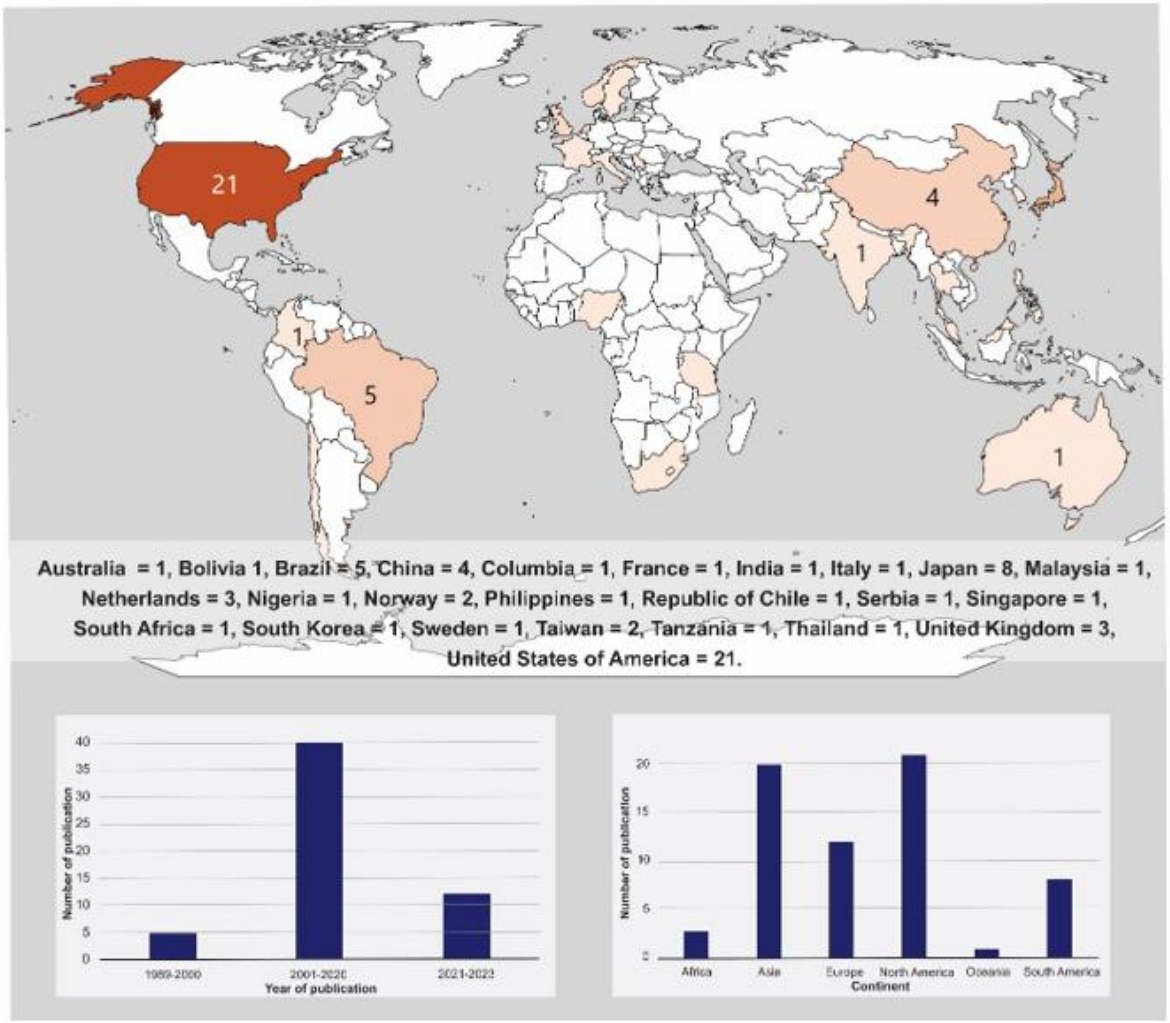
Housing
(Oswald et al., 2007)

Religion
(Hill et al., 2016)

Insights from Systematic Review

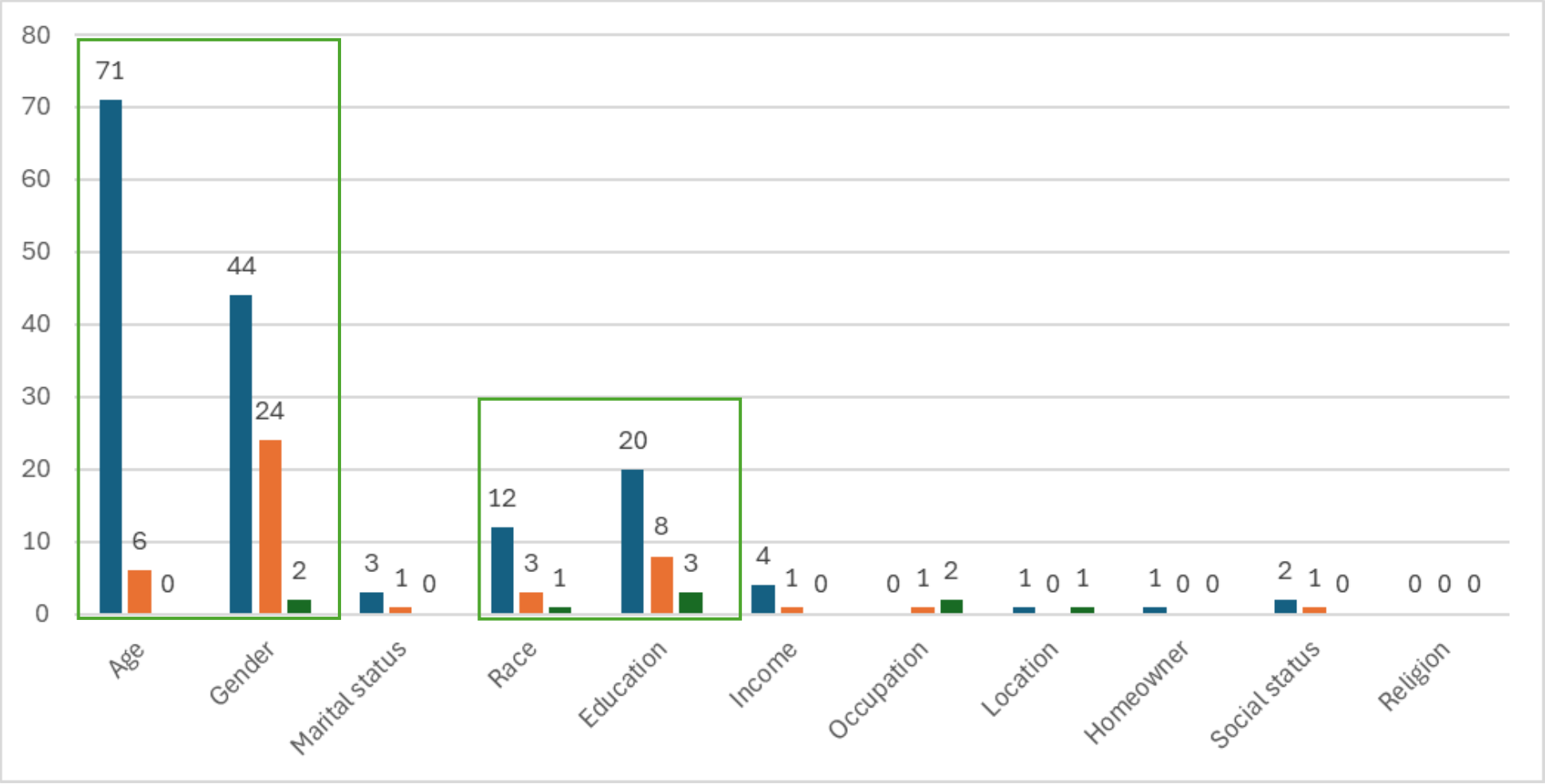


PRISMA Flowchart



Study location and era

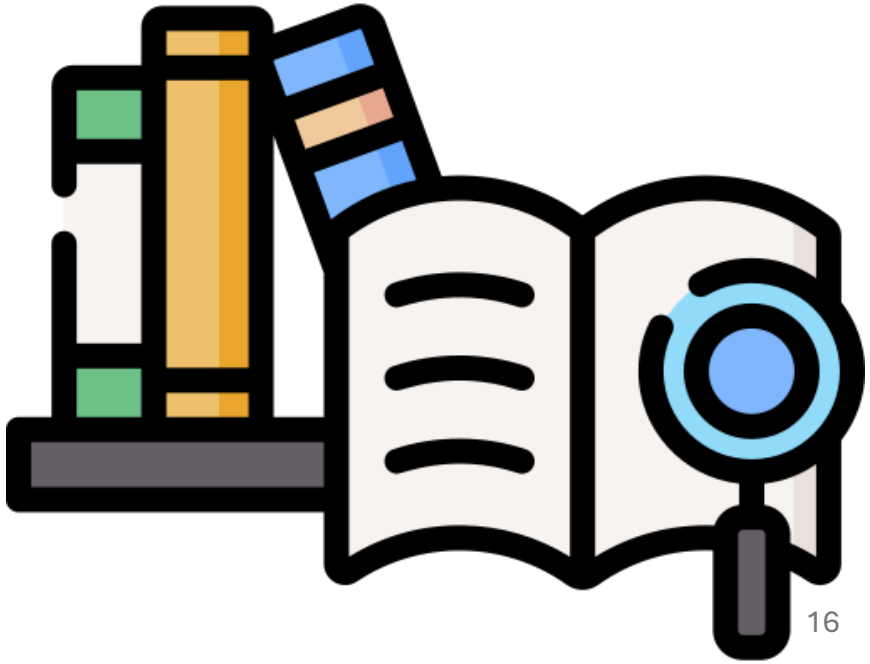
Insights from Systematic Review



Narrative synthesis in chart

Summary of gaps in Literature

- Determinants of mobility in older adults.
  - Biophysical and psychocognitive.
  - Sociodemographic.
- Descriptive and without inferential analysis of SDF.
- Few longitudinal studies.
- Scarcity of disaggregated analysis.
- Paucity of a systematic review.



Objectives

Study objectives were to:

Assess Mobility Changes

- Examine mobility changes over six years to track decline.

Explore Sociodemographic Factors

- Study investigates how age, gender, economic and social factors affect mobility decline.

Validate Mobility Tests

- 4MWT vs. TUG tests.

Identify Influencing Factors

- Classify factors as modifiable and non-modifiable.

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[illegible]

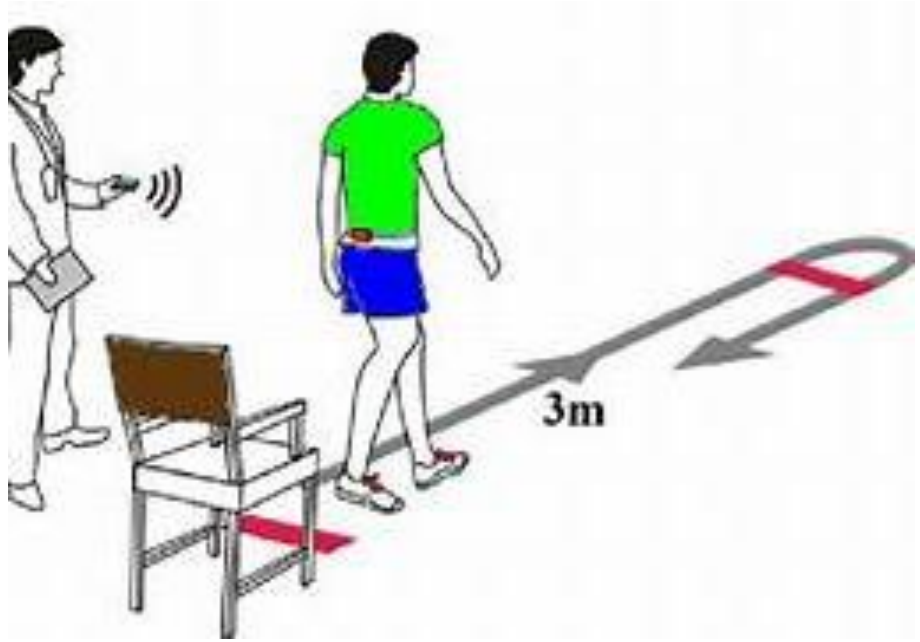
Methods

Data Source & Study Design

- Secondary analysis of CLSA's comprehensive cohort: Baseline, FU1, FU2
- CLSA: National bilingual longitudinal study (2011–ongoing), 30,097 participants aged 45–85
- Data collected in-person: sociodemographics, biospecimens, physical measures (TUG, 4MWT)
- Follow-up every 3 years for ≥20 years
- Sample: 3,882 participants aged ≥65 at baseline, completed all 3 cycles, never lived in long-term care
- Ethics: Approved by 13 university boards and the University of Alberta (Pro00129371)

Mobility Outcomes

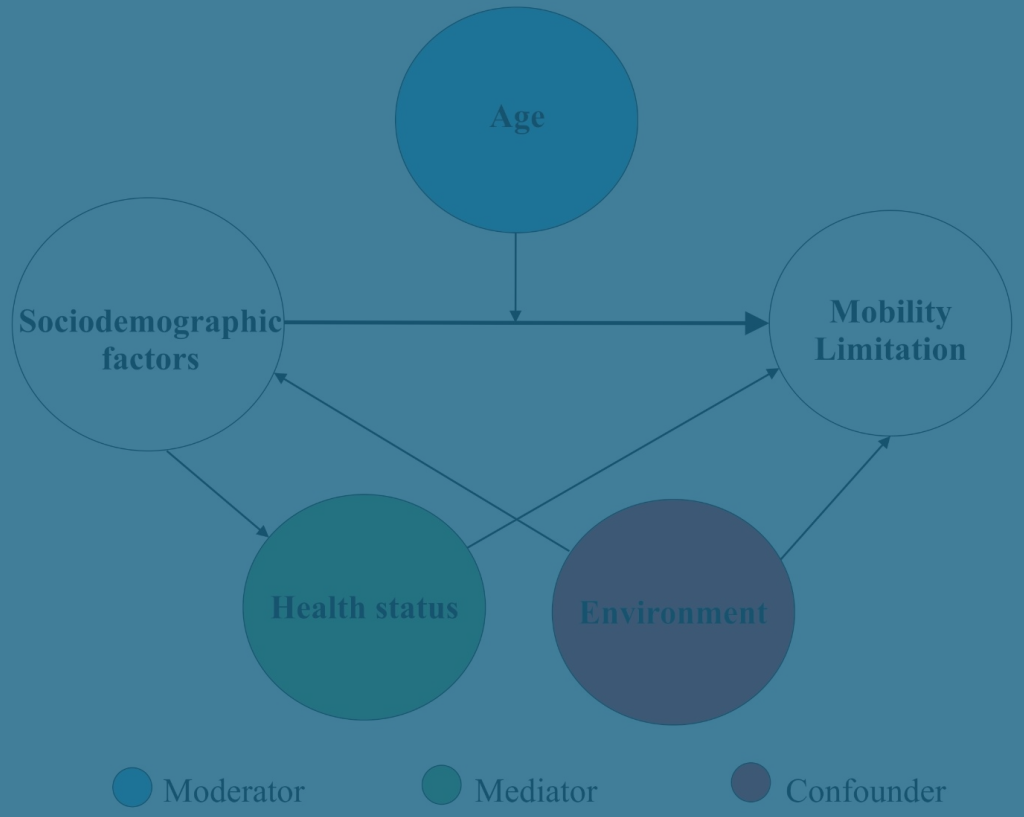
- Primary measures: Time to complete TUG and 4MWT
- TUG: Assesses gait, balance, transfer; high reliability (r = 0.99), strong validity (r = 0.75)
- 4MWT: Measures gait speed; reliability (r = 0.96–0.98), validity (r = 0.93)
- Tools: Stopwatch and meter rule used for measurement

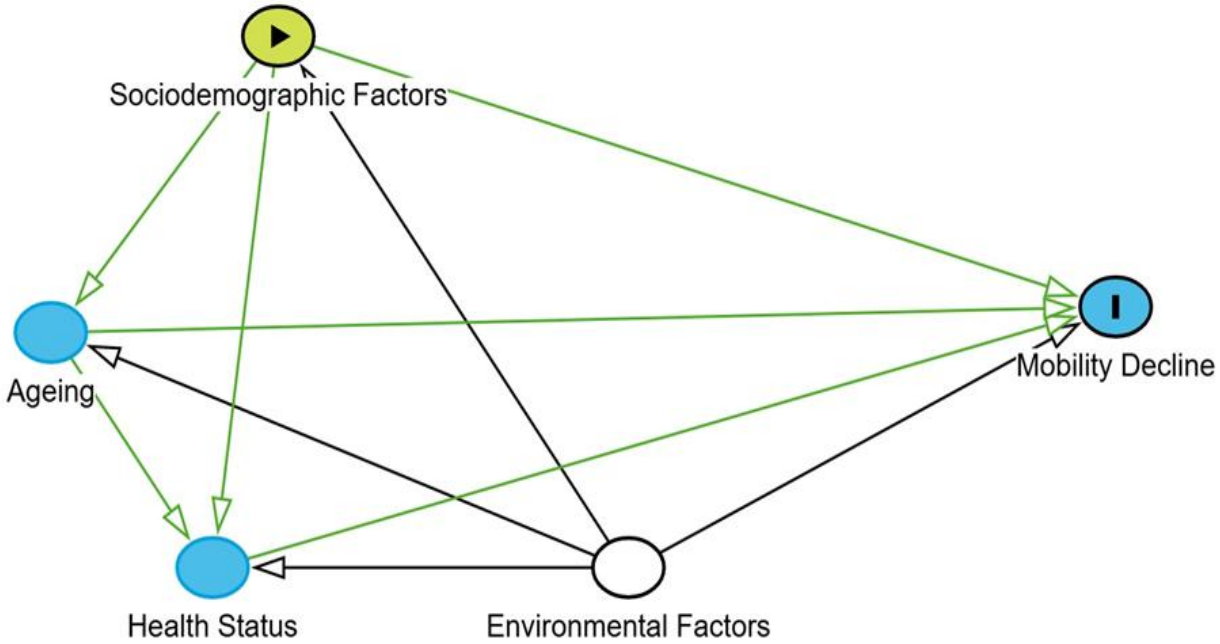


Explanatory Variables & Covariates

- Sociodemographic variables:
  - Age, sex, marital status, country of birth, ethnicity, cultural identity
  - Province, residence area, education, occupation, income, wealth
  - Homeownership, home type, religion, retirement status, social status
- Social status: MacArthur Scale (1–10 ladder)
- Covariates:
  - Smoking, alcohol use, chronic disease status, general health

Analytic Lenses





Directed Acyclic Graph (DAG)

Data Analysis

- Software: SPSS v28 and R Studio v4.4.1, weighted dataset
- Descriptive stats: Frequency, %, mean, SD, bar chat
- Assumption checks:
  - Outliers: Z-score > ±3.29, Mahalanobis distance
  - Normality: Q-Q plot
  - Sphericity: Mauchly's test
  - Homogeneity: Levene's test
  - Linearity & multicollinearity (VIF < 4)
- Transformations: Log-transformed TUG and 4MWT
- Inferential tests:
  - χ^2 (Hypothesis I), Repeated Measures ANOVA (II), Bivariate Regression (III), Multivariate Regression (IV), Pearson's r (V), Alpha level: 0.05

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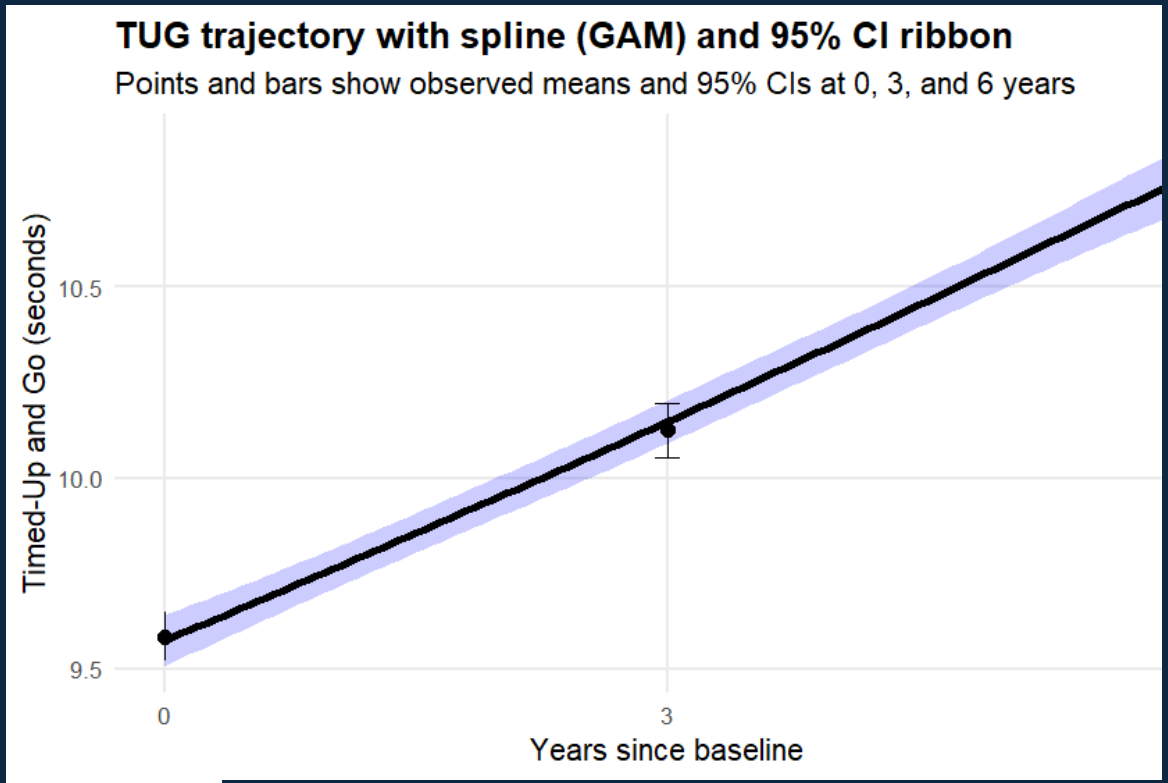
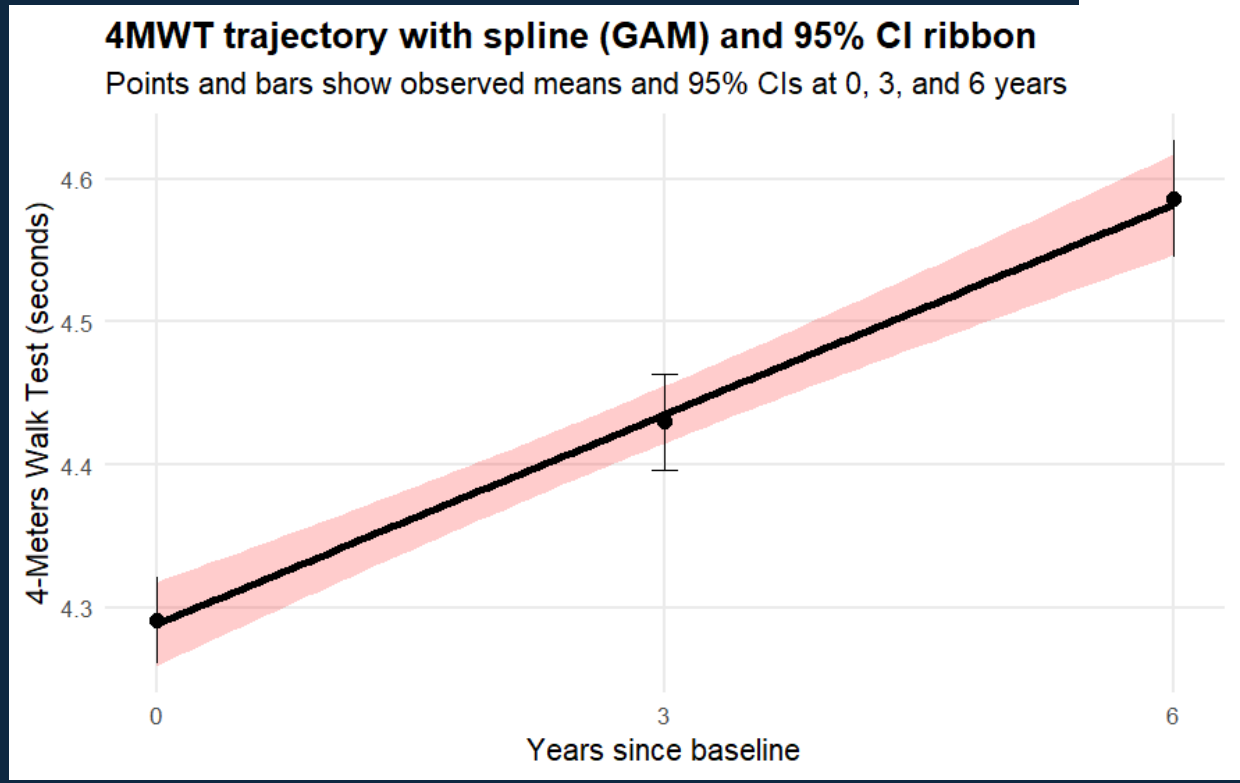
Results and Discussion

Results Summary

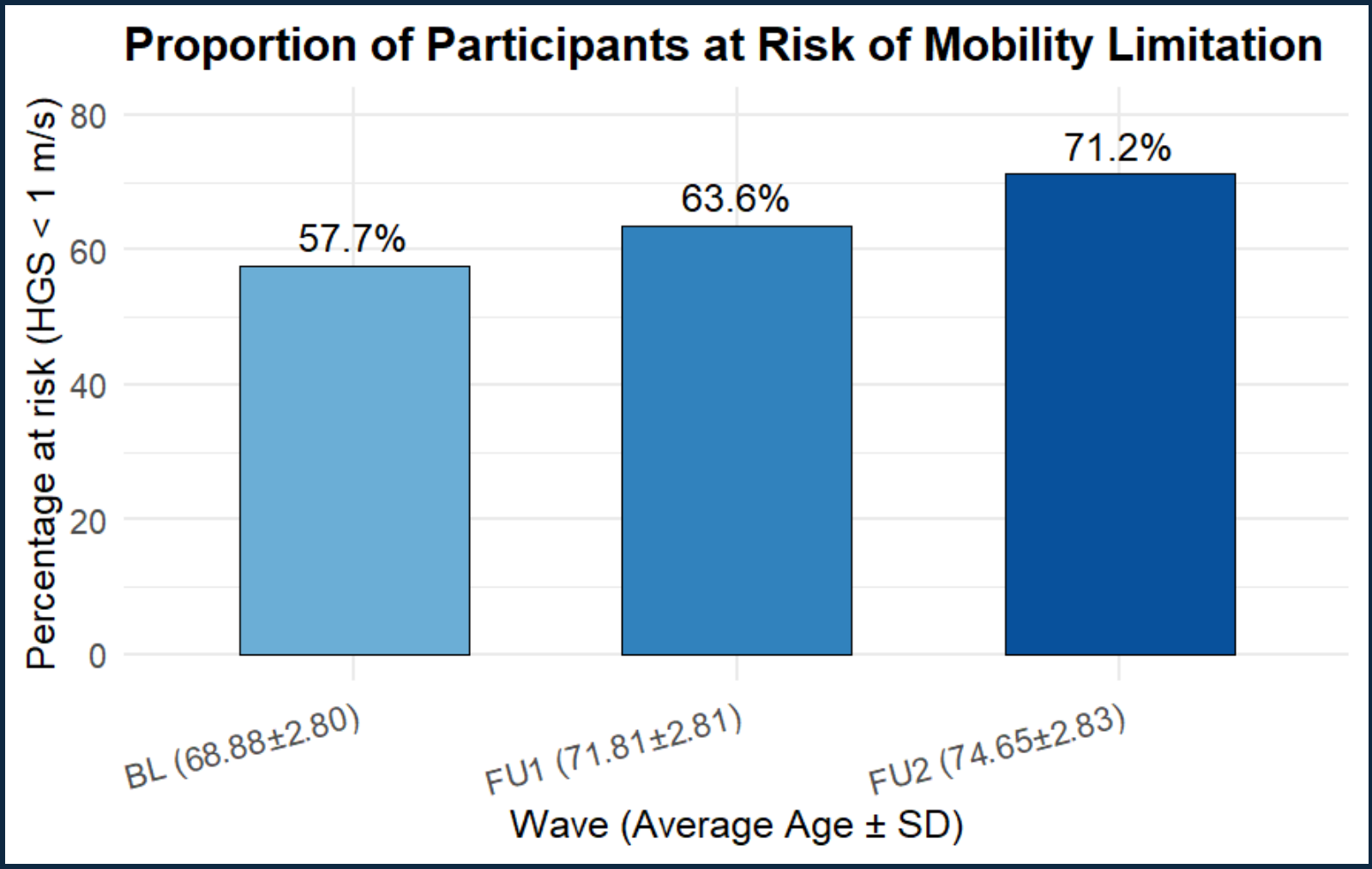
- At baseline, 52% were women, 70.4% were married (n=3882).
- Mean±SD: Age = 68.82±2.78 years, TUG = 9.59±1.98 s, and 4MWT = 4.29±0.95 s.
- Strong concurrent validity of TUG & 4MWT (r=0.65, 0.74, & 0.75).
- Prevalence of mobility limitation (HGS < 1.00 m/s) = 57.7%.
- 6-year mobility decline predicted by: older age, being a woman, retired, Canadian born, non-Caucasian, tenant, having no spouse/partner, household income, wealth/investment, lower social status, lower education, and Provinces.

Linear trend

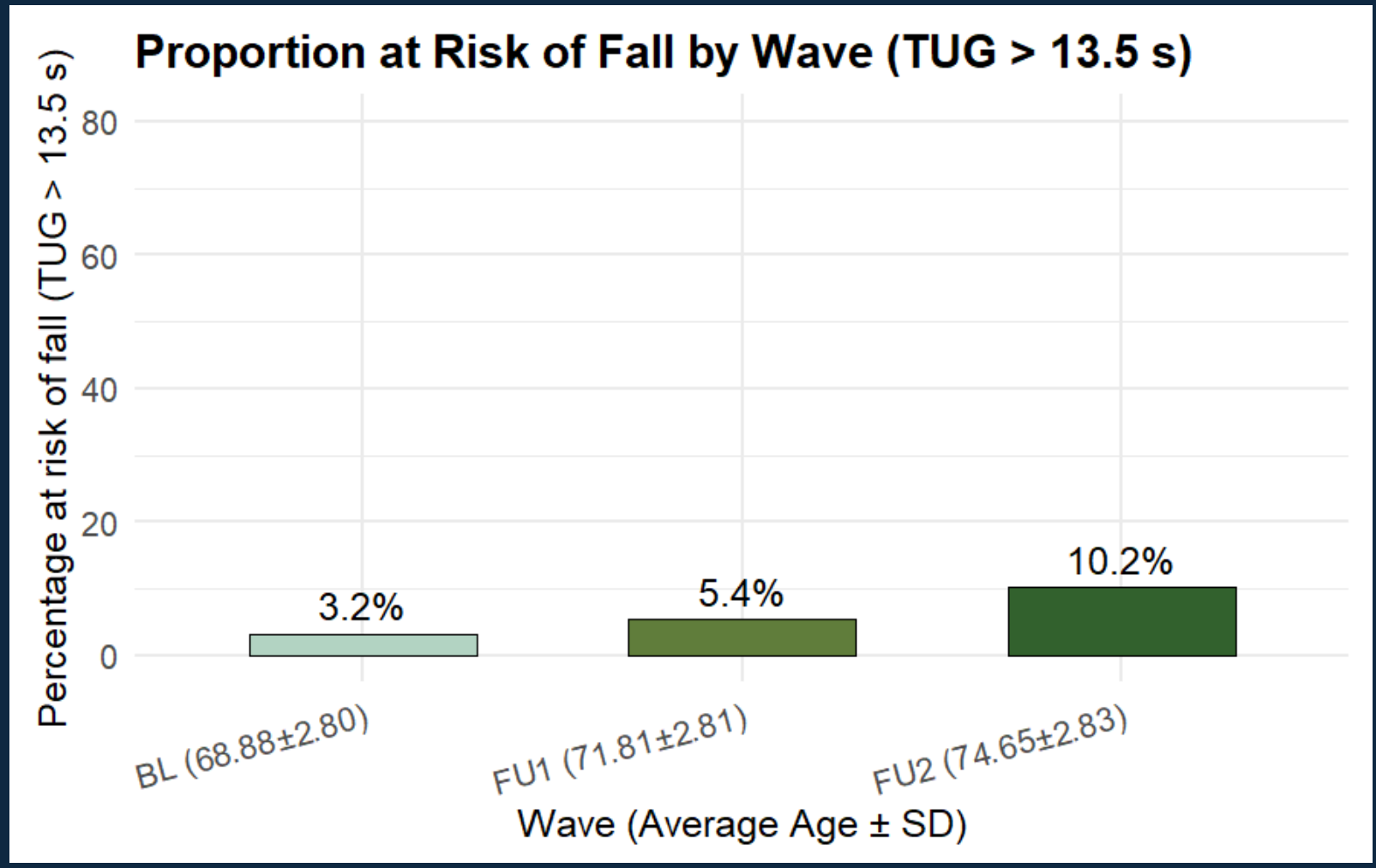




Prevalence and risk

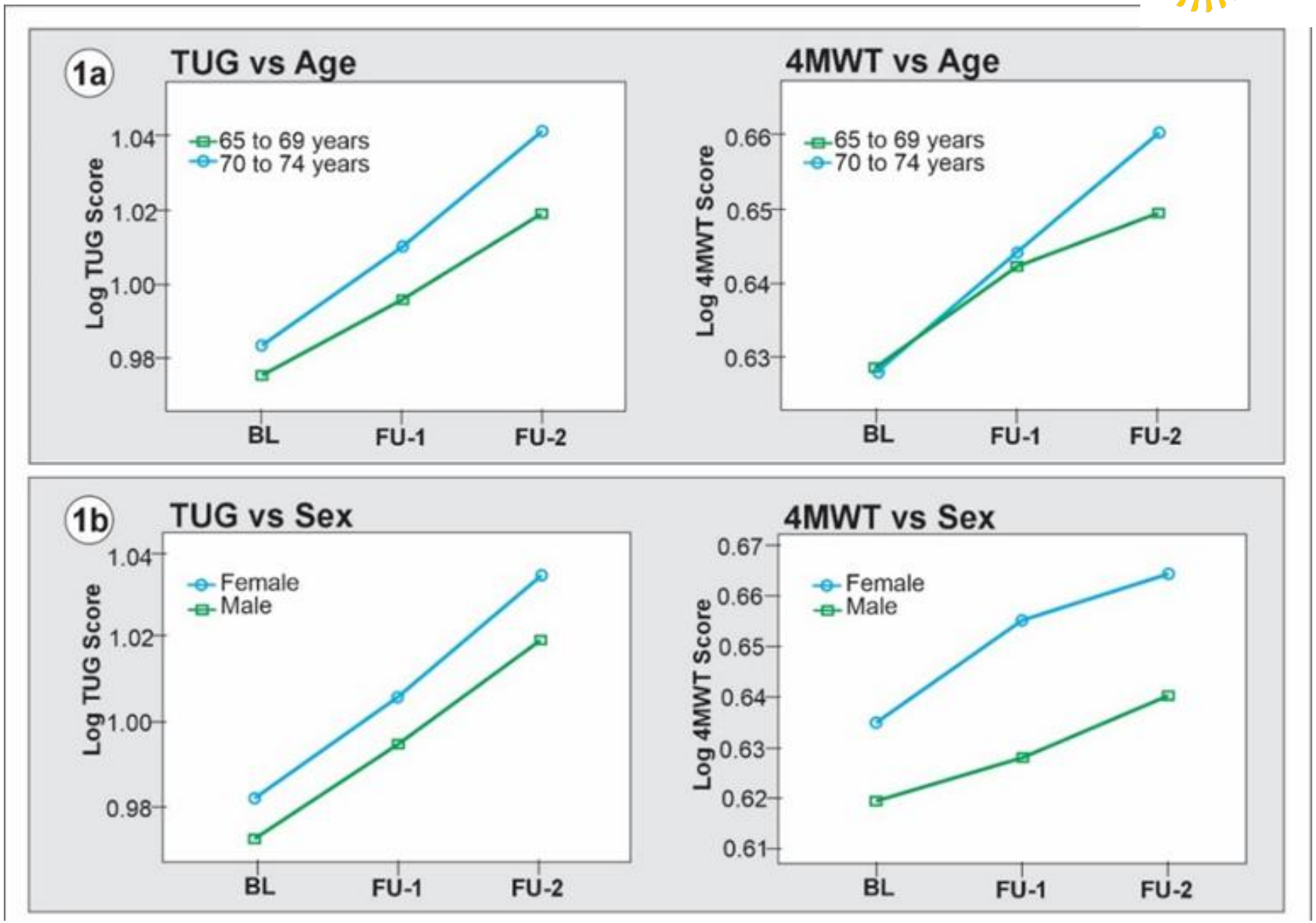


Prevalence and risk



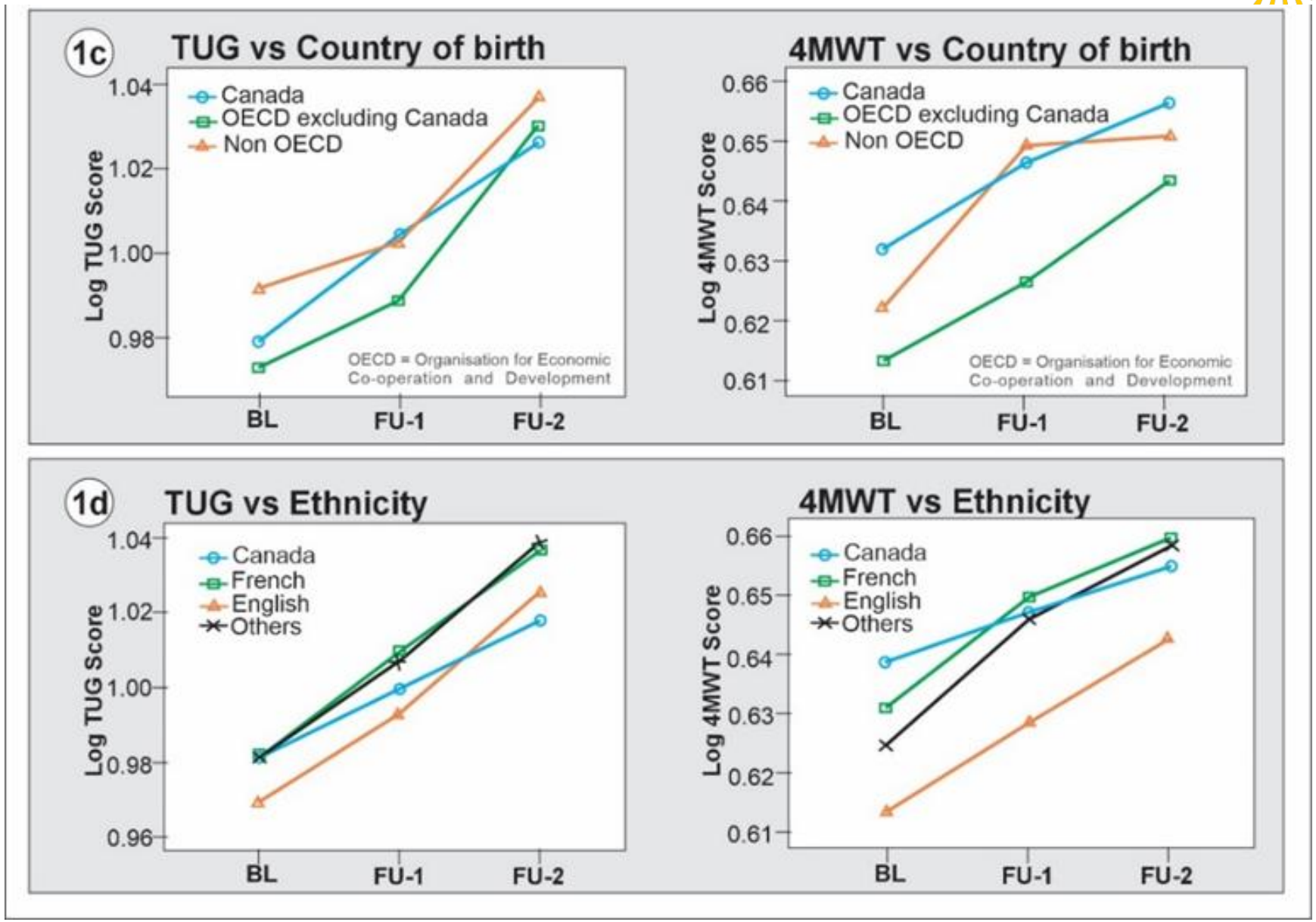
Results and discussion

Non-modifiable factors



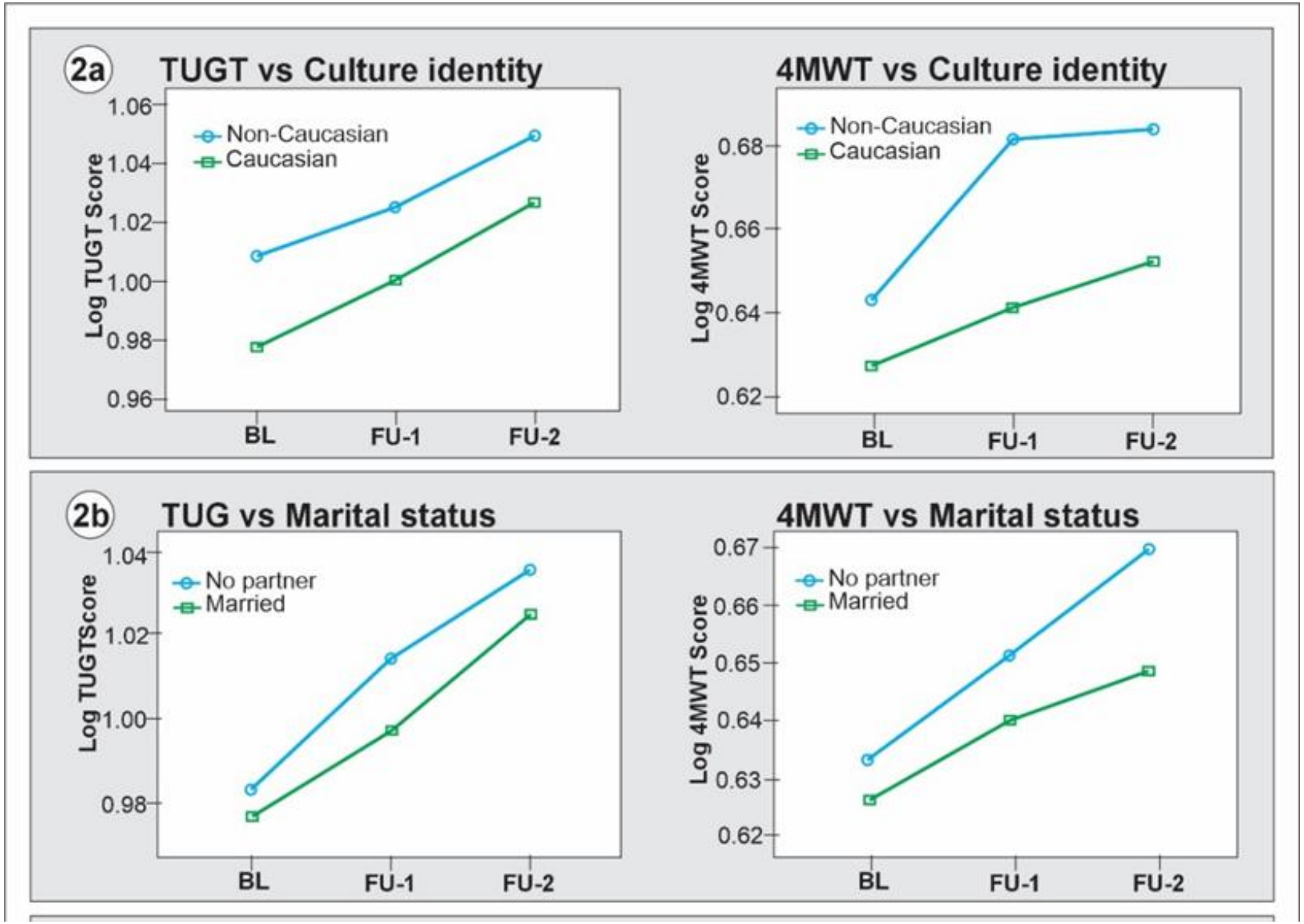
Results and discussion

Non-modifiable factors



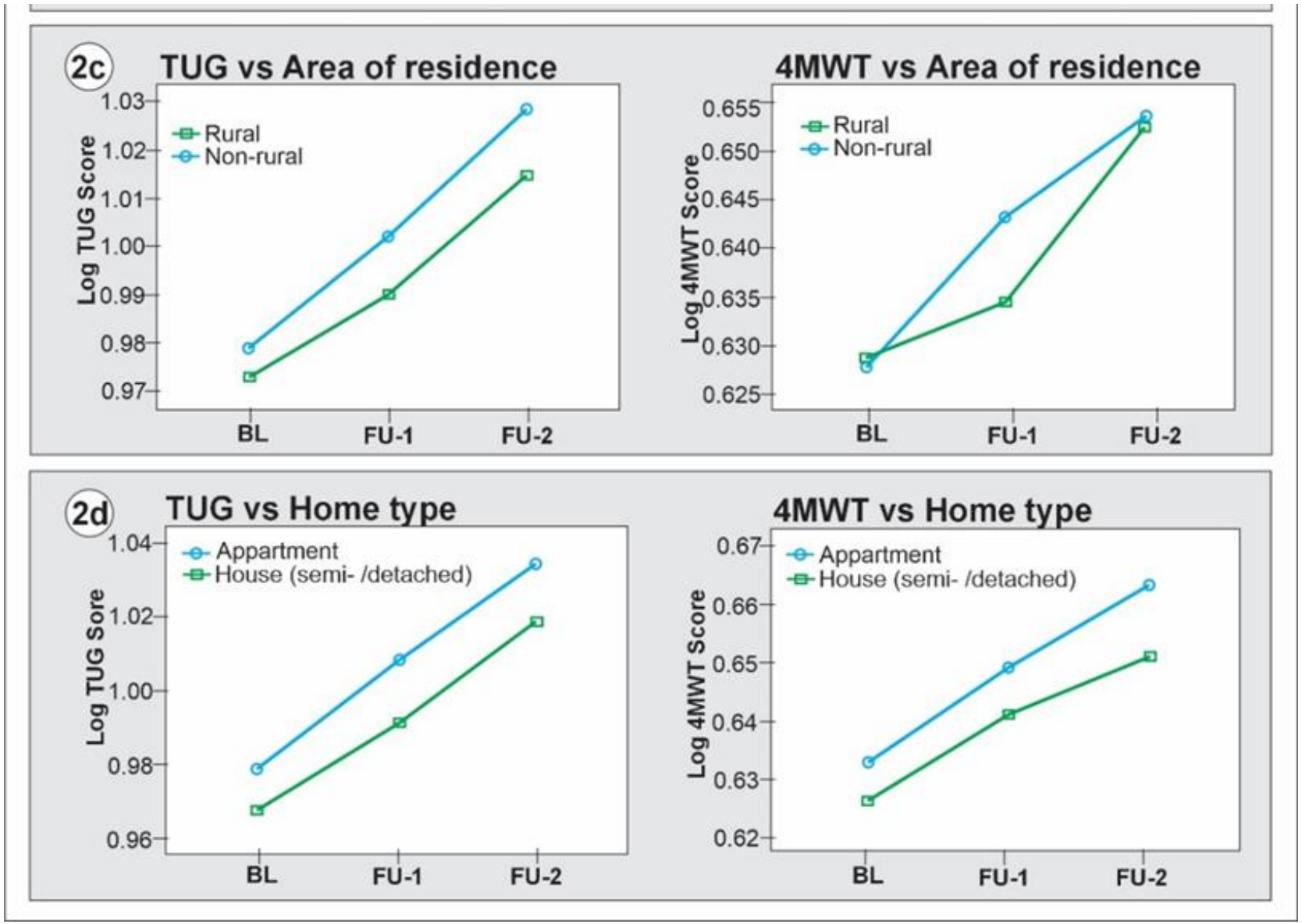
Results and discussion

Modifiable factors



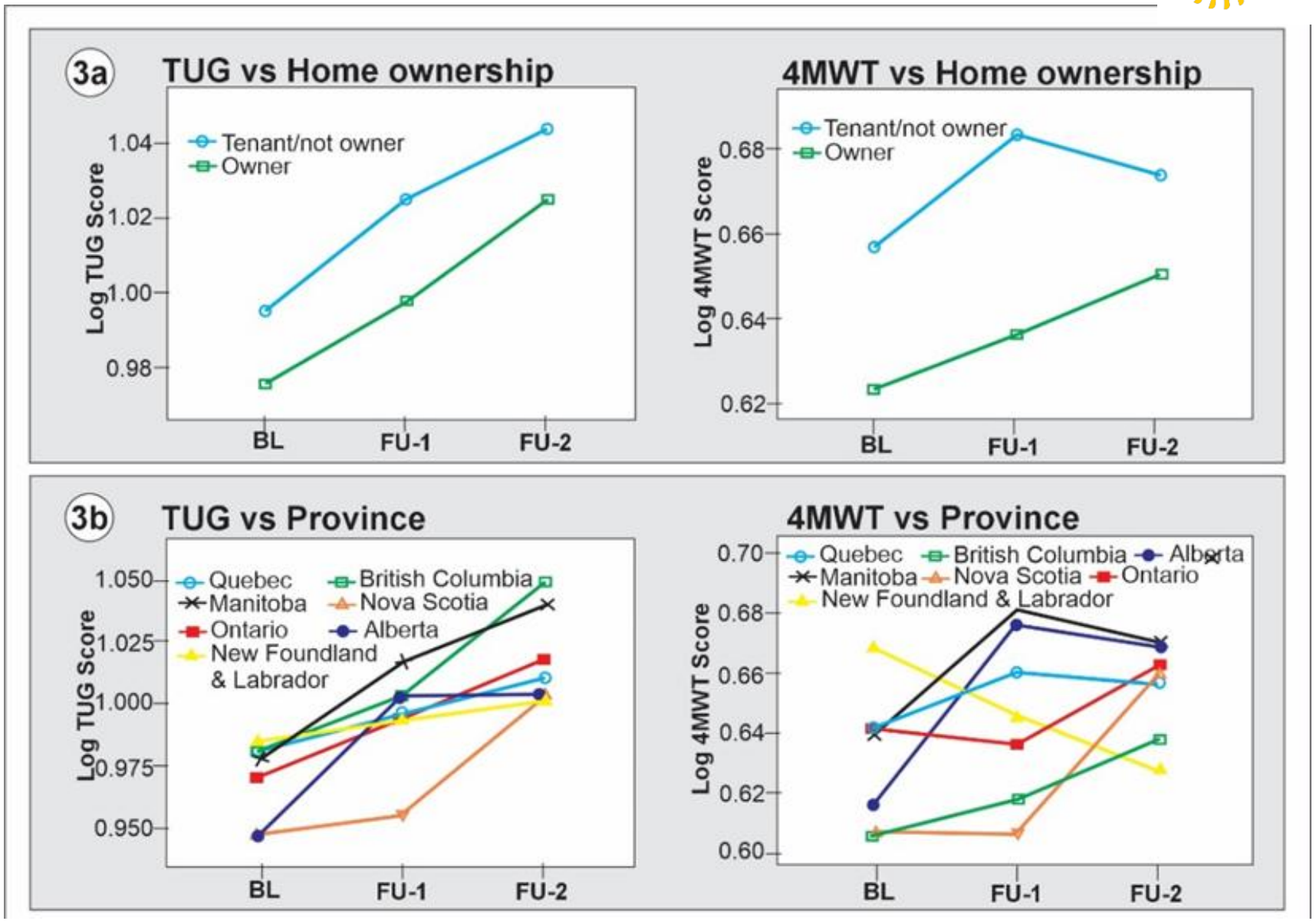
Results and discussion

Modifiable factors



Results and discussion

Modifiable factors



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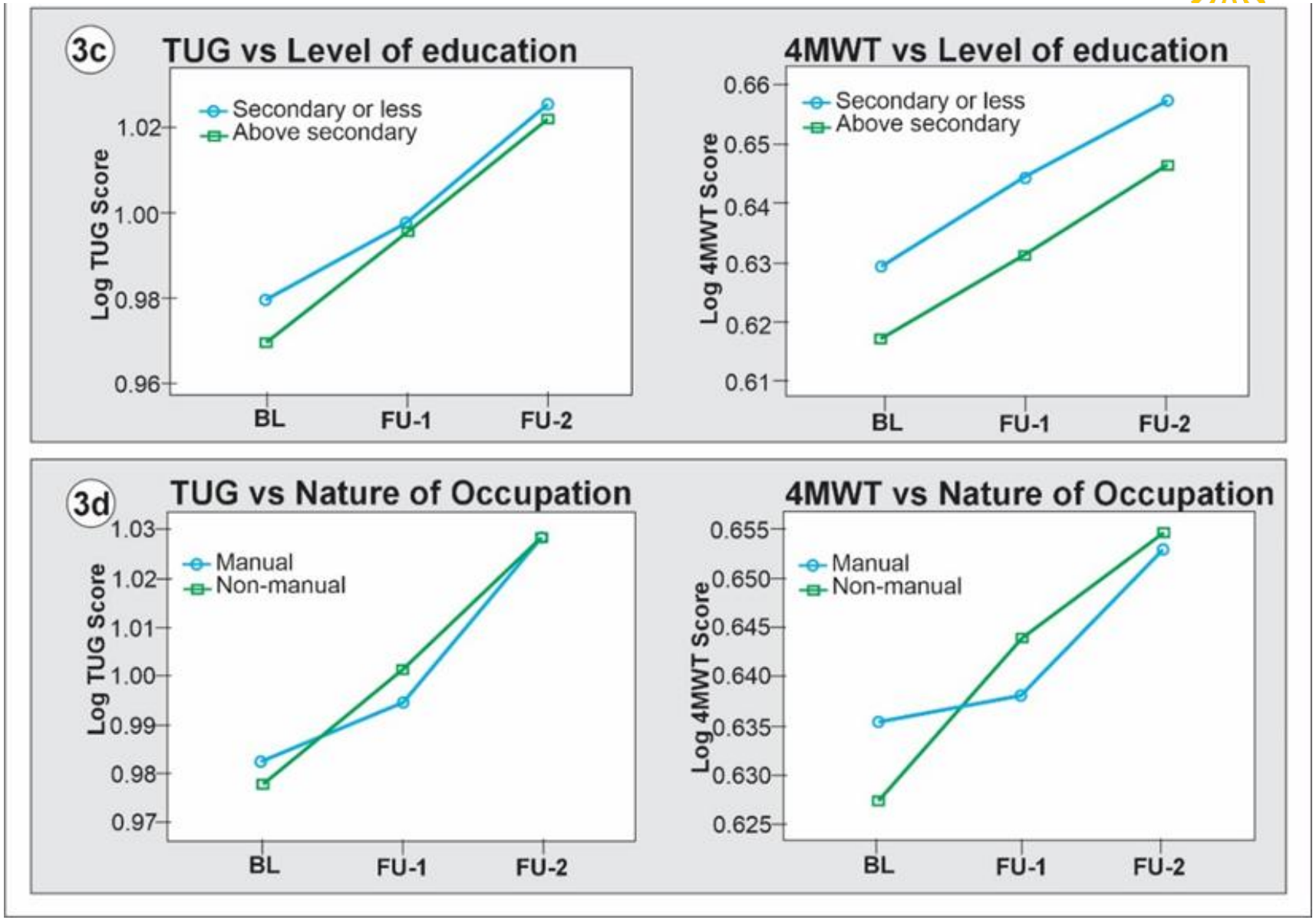
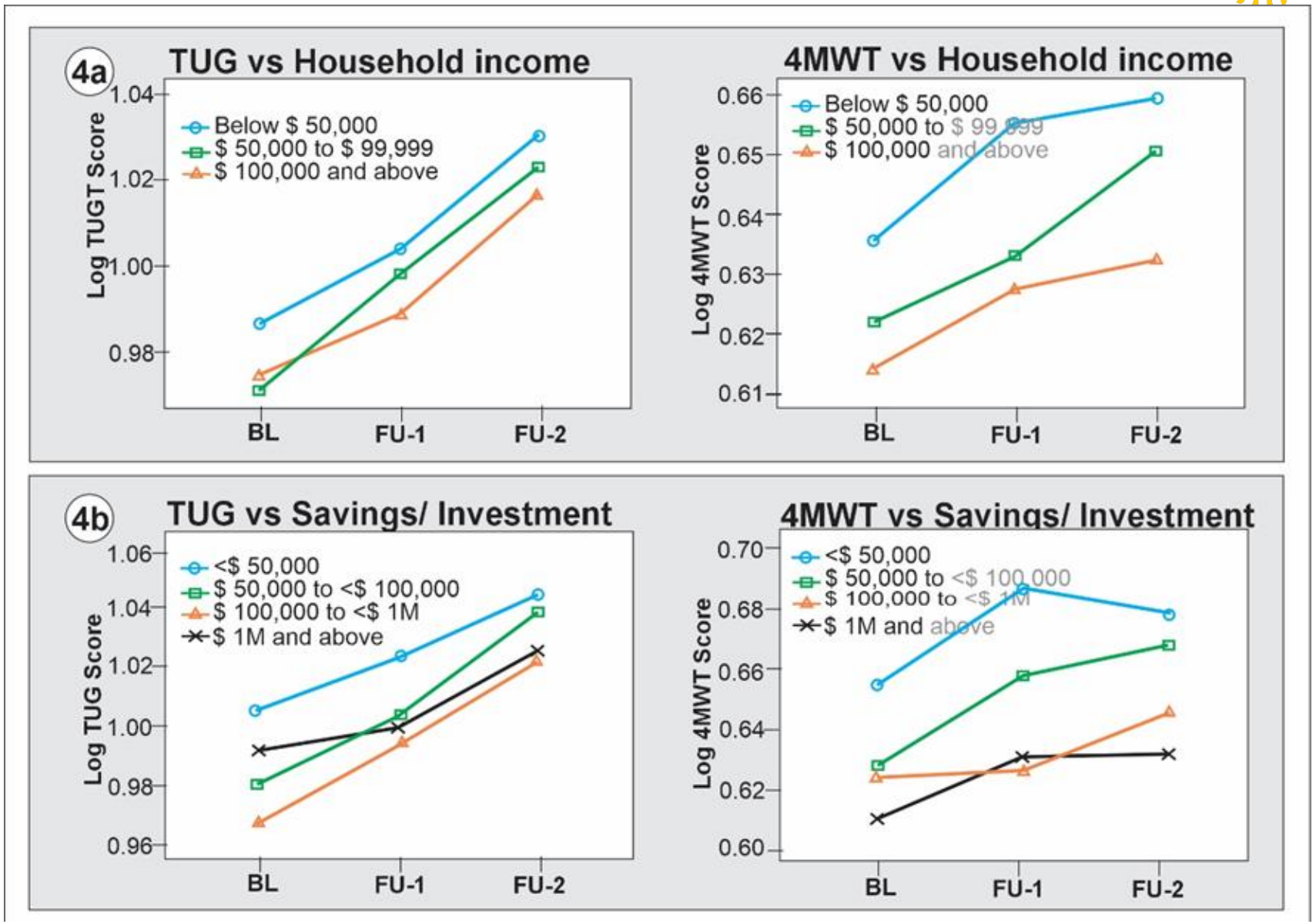
Modifiable factors



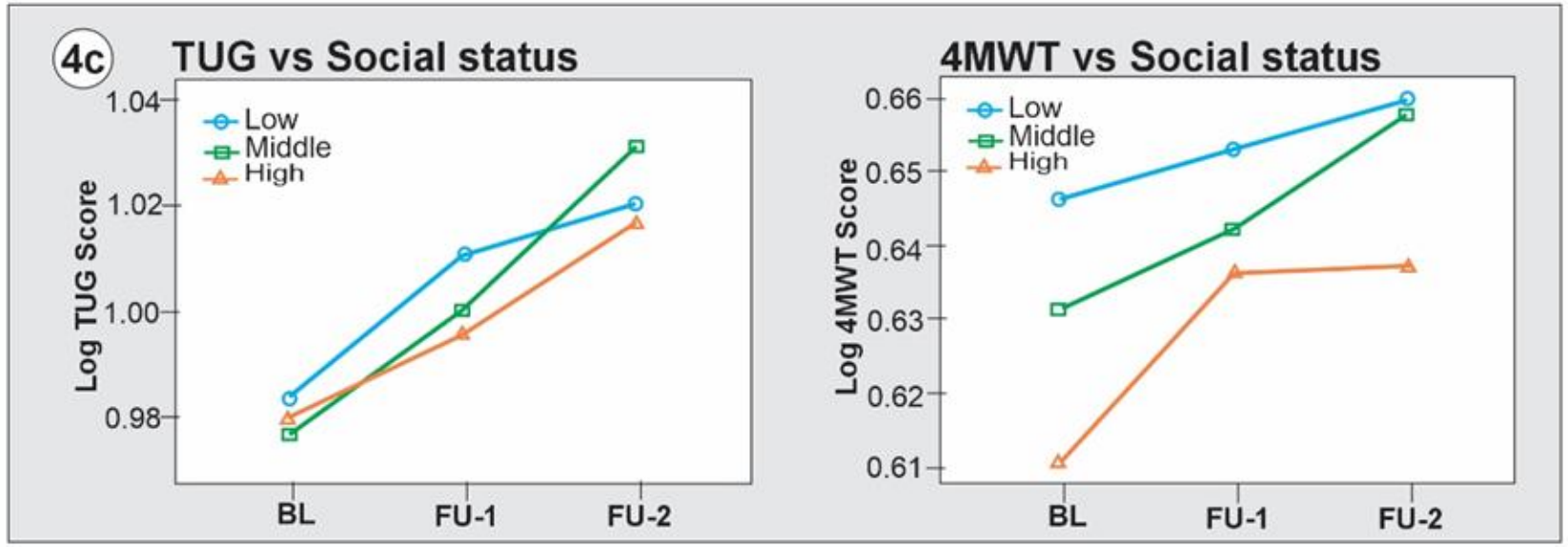
Results and discussion

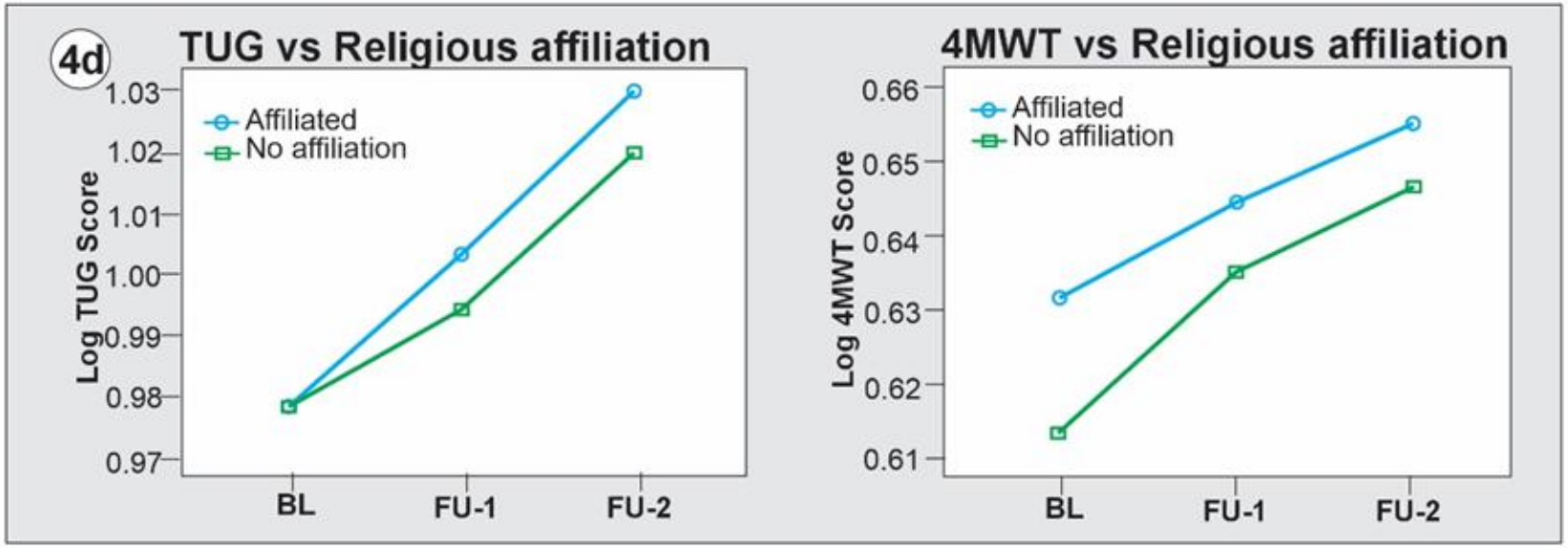
Modifiable factors

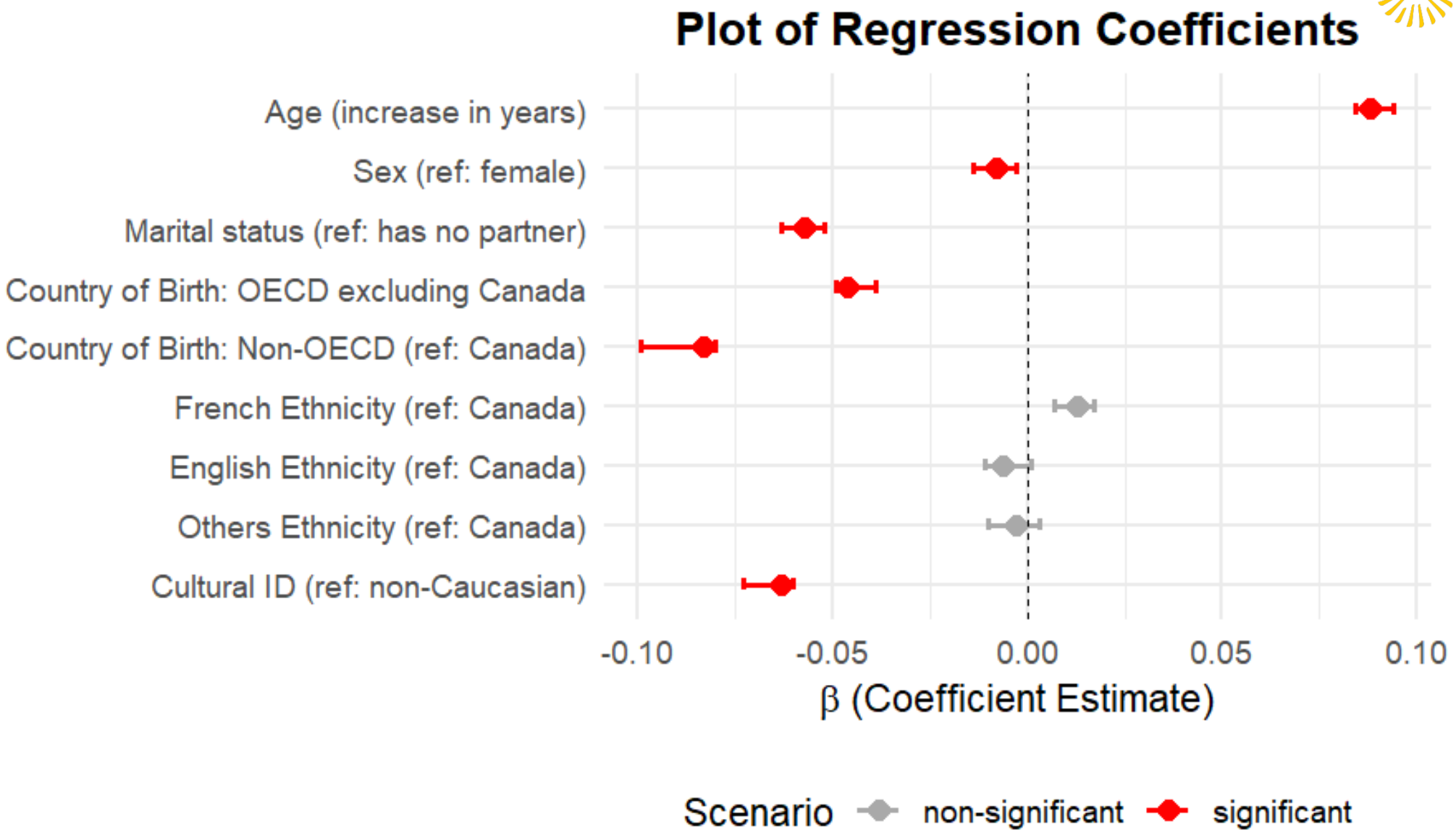


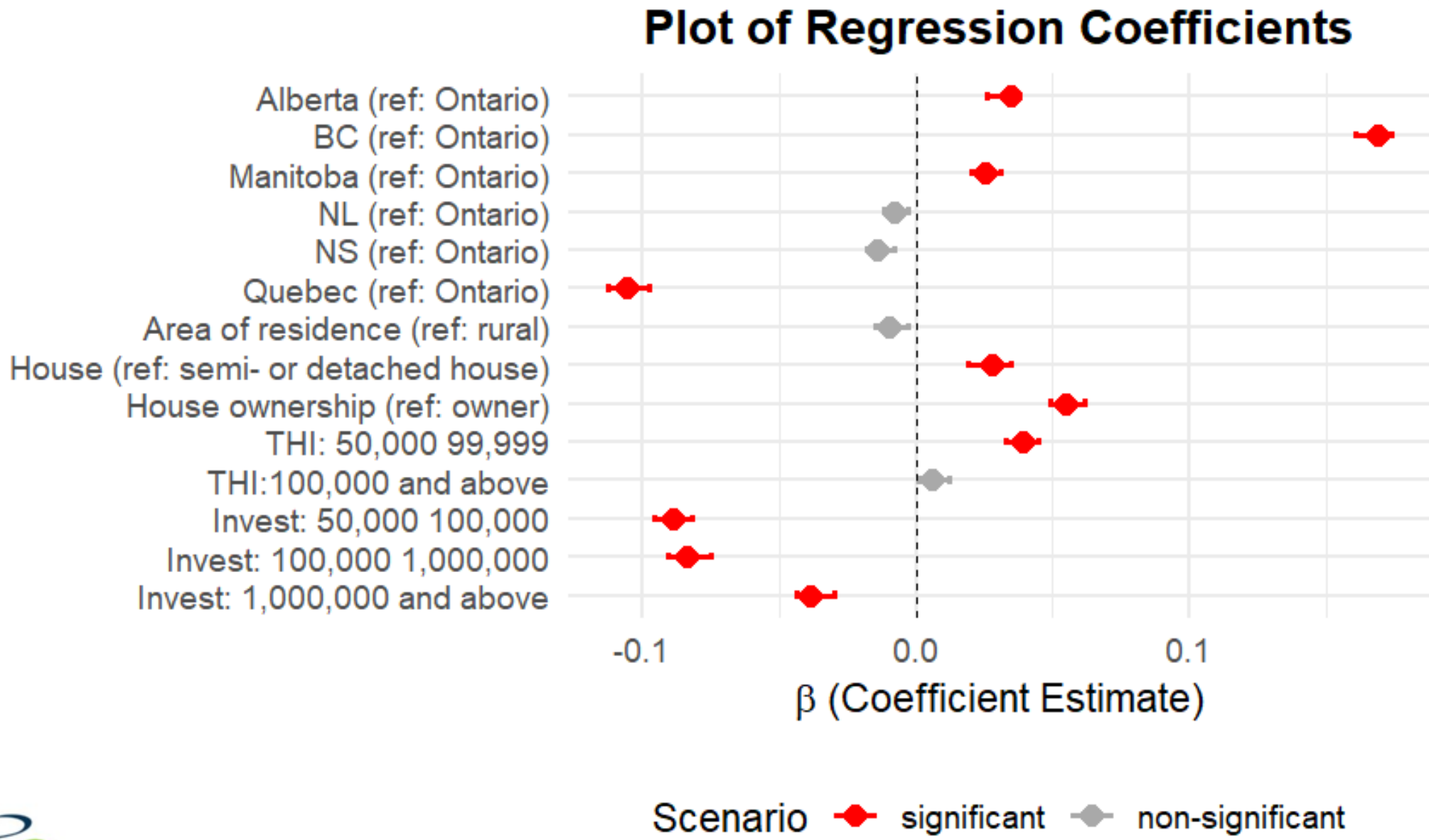
Results and discussion

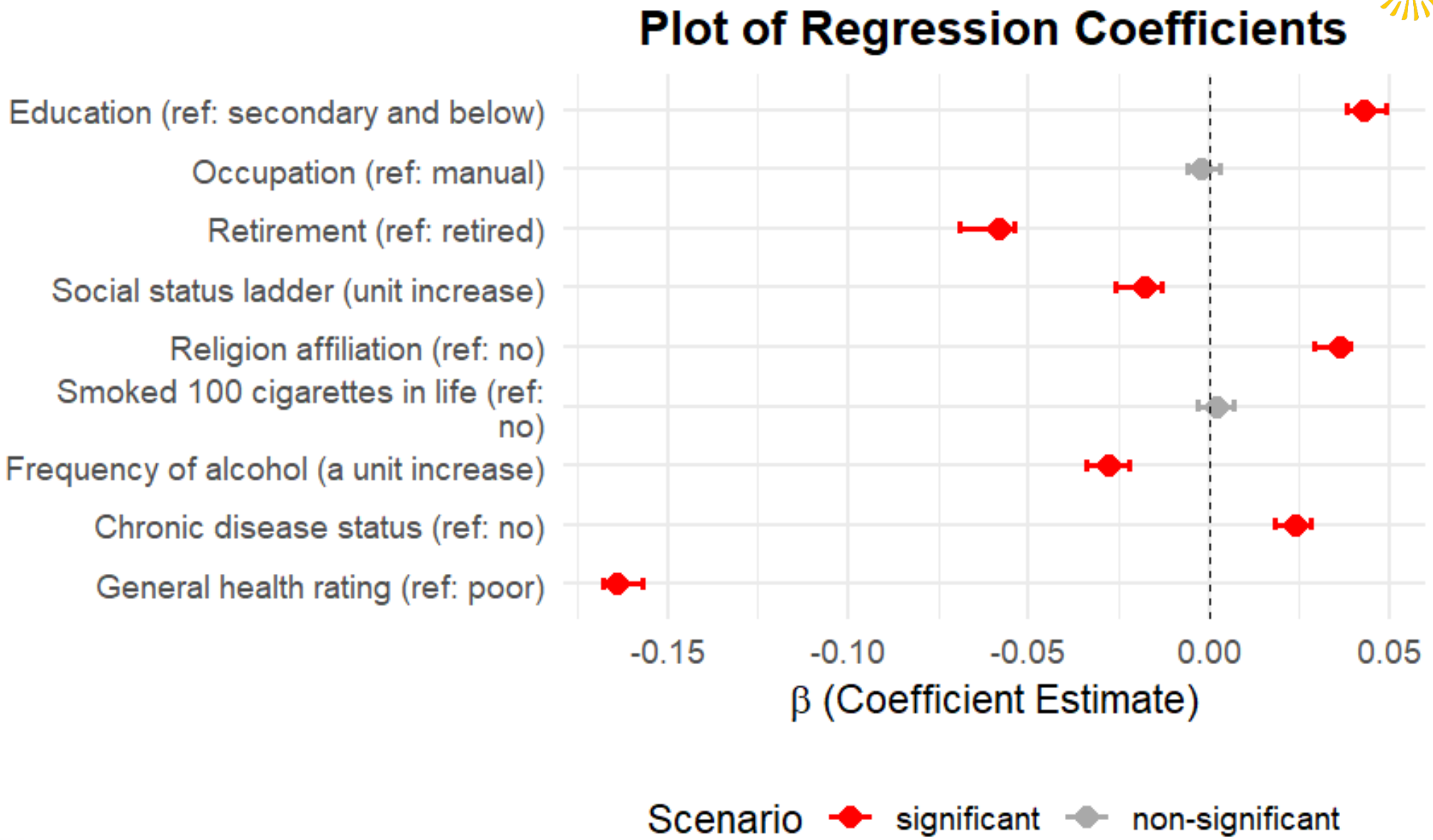
Modifiable factors

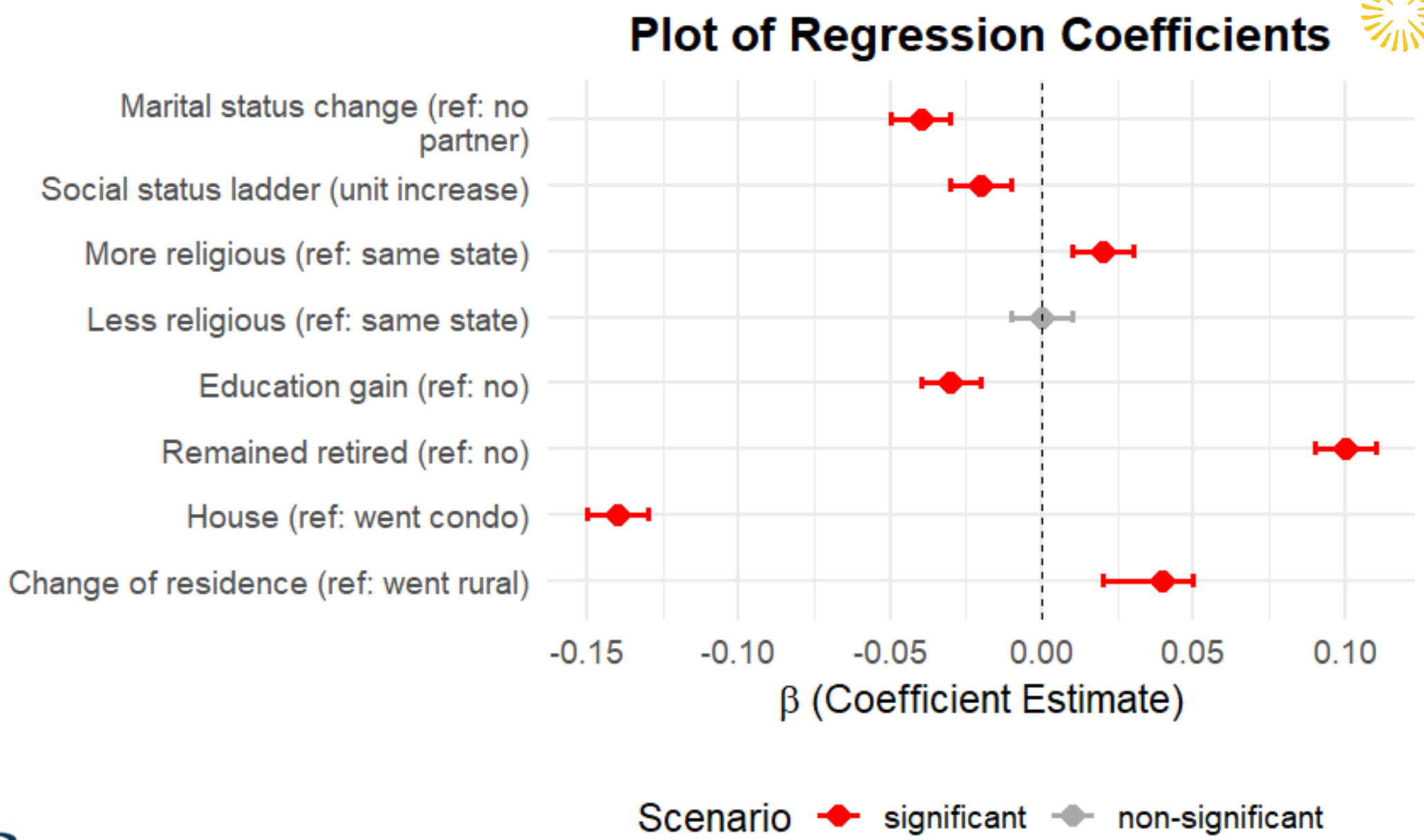




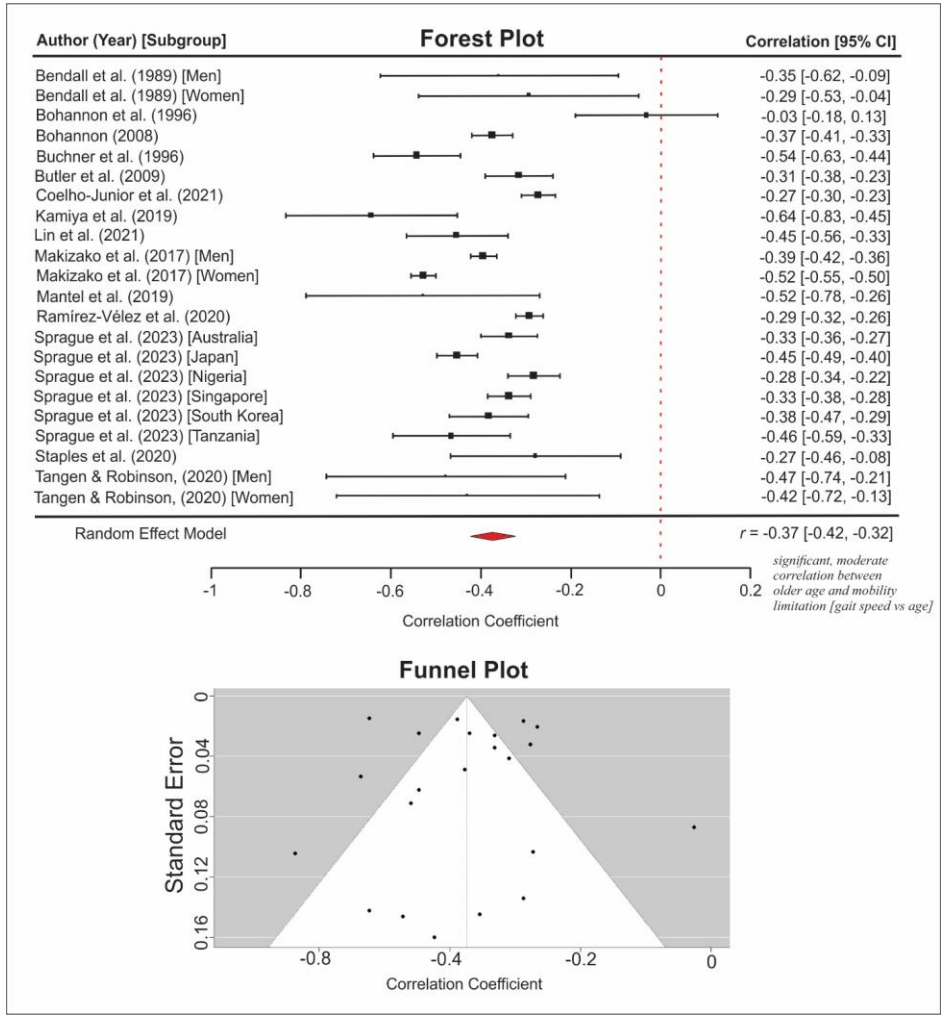

Plot of Regression Coefficients
Age (increase in years)
Sex (ref: female)
Marital status (ref: has no partner)
Country of Birth: OECD excluding Canada
Country of Birth: Non-OECD (ref: Canada)
French Ethnicity (ref: Canada)
English Ethnicity (ref: Canada)
Others Ethnicity (ref: Canada)
Cultural ID (ref: non-Caucasian)
-0.10
-0.05
0.00
0.05
0.10
β (Coefficient Estimate)
Scenario
non-significant
significant

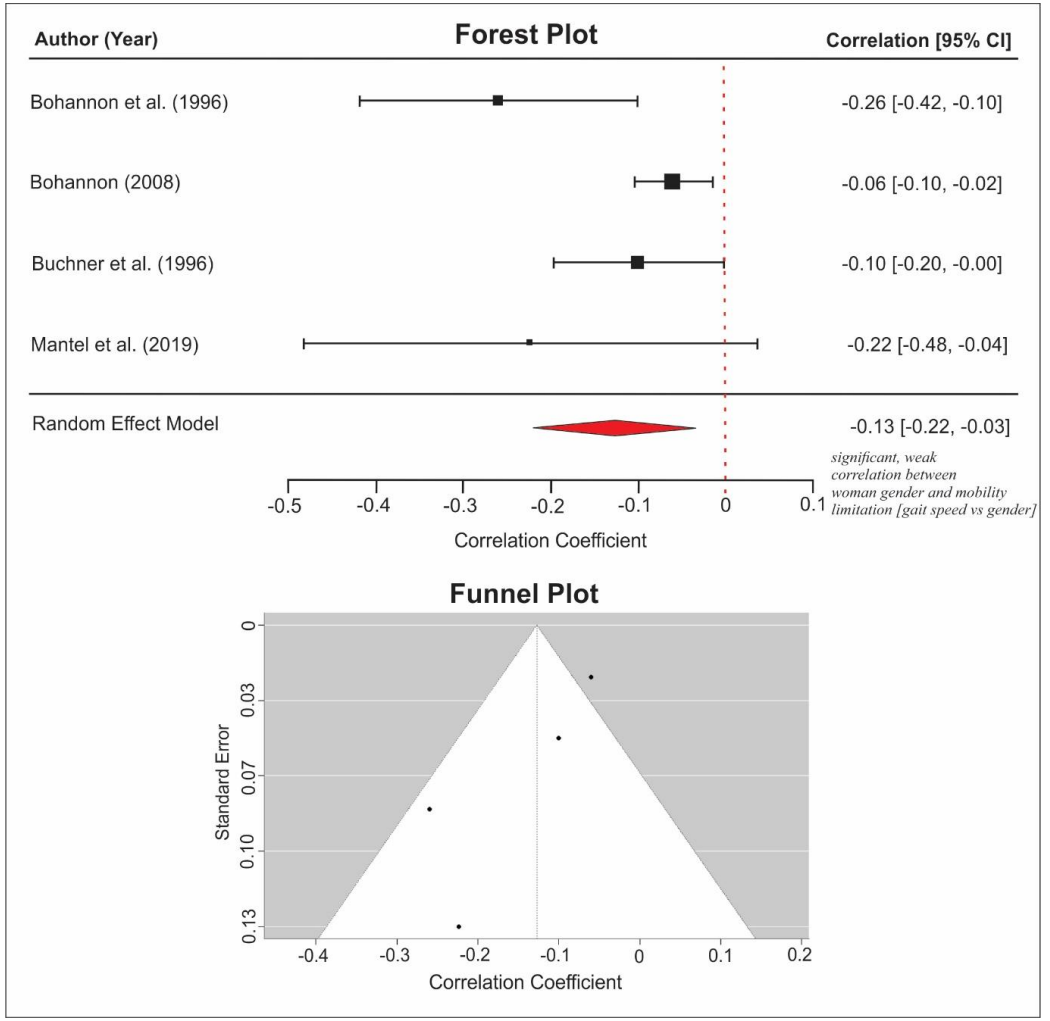

Plot of Regression Coefficients
Alberta (ref: Ontario)
BC (ref: Ontario)
Manitoba (ref: Ontario)
NL (ref: Ontario)
NS (ref: Ontario)
Quebec (ref: Ontario)
Area of residence (ref: rural)
House (ref: semi- or detached house)
House ownership (ref: owner)
THI: 50,000 99,999
THI:100,000 and above
Invest: 50,000 100,000
Invest: 100,000 1,000,000
Invest: 1,000,000 and above
-0.1
0.0
0.1
β (Coefficient Estimate)
Scenario
significant
non-significant


Plot of Regression Coefficients
Education (ref: secondary and below)
Occupation (ref: manual)
Retirement (ref: retired)
Social status ladder (unit increase)
Religion affiliation (ref: no)
Smoked 100 cigarettes in life (ref: no)
Frequency of alcohol (a unit increase)
Chronic disease status (ref: no)
General health rating (ref: poor)
-0.15
-0.10
-0.05
0.00
0.05
β (Coefficient Estimate)
Scenario
significant
non-significant


Plot of Regression Coefficients
Marital status change (ref: no partner)
Social status ladder (unit increase)
More religious (ref: same state)
Less religious (ref: same state)
Education gain (ref: no)
Remained retired (ref: no)
House (ref: went condo)
Change of residence (ref: went rural)
-0.15
-0.10
-0.05
0.00
0.05
0.10
β (Coefficient Estimate)
Scenario
significant
non-significant

Insight from meta-analysis





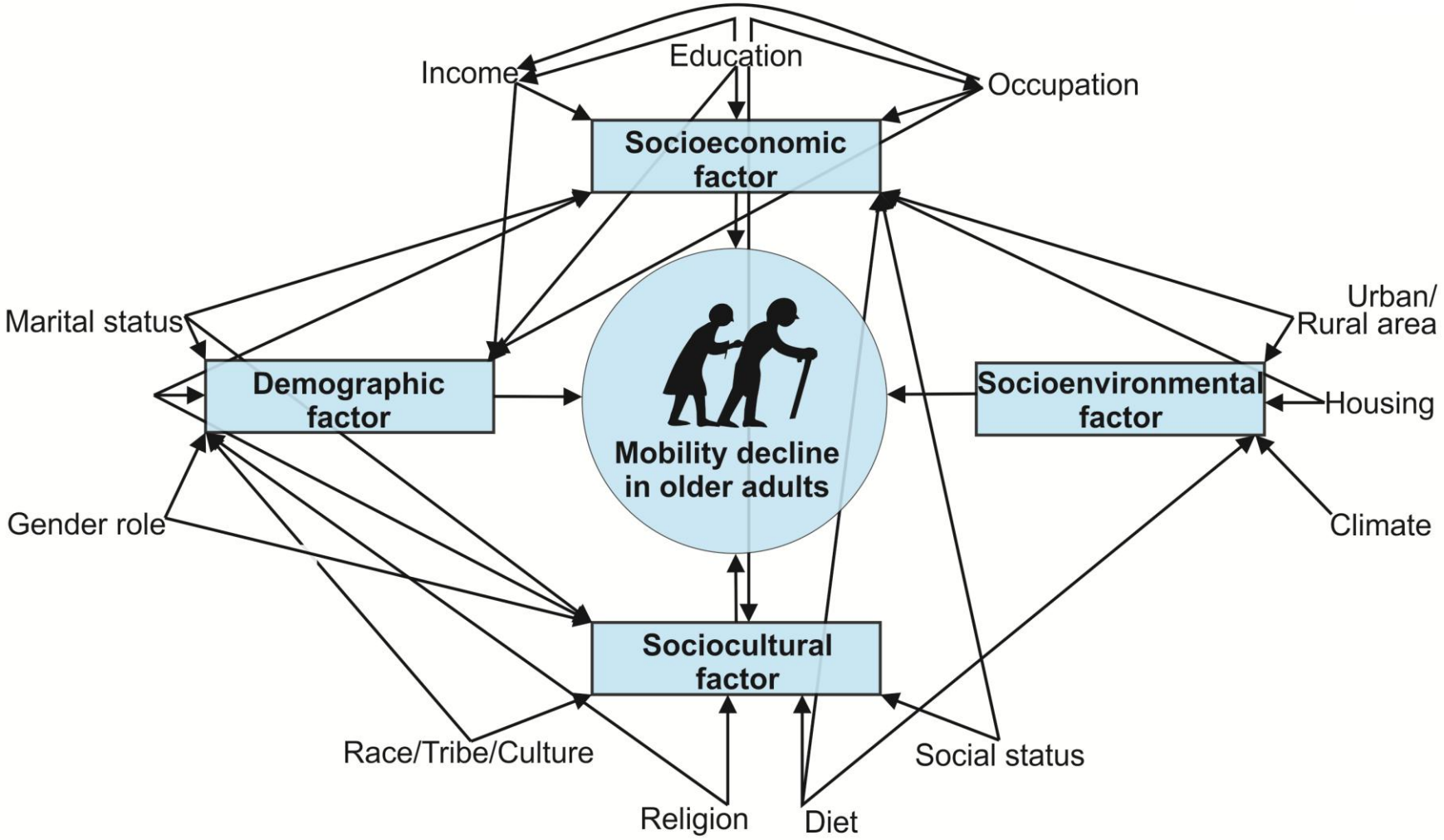
Insight from the qualitative study

- 36 participants aged 65 to 89 years
- 52.8% men, 66.7% married, and 86.1% middle-income earners.

Themes

Demographic	Socioeconomic	Sociocultural	Socioenviron.
• Age/ageism • Gender • Marital status	• Education • Occupation • Income	• Diet pattern • Religion pract. • Socialization	• Location (U/R) • Housing • Climatic

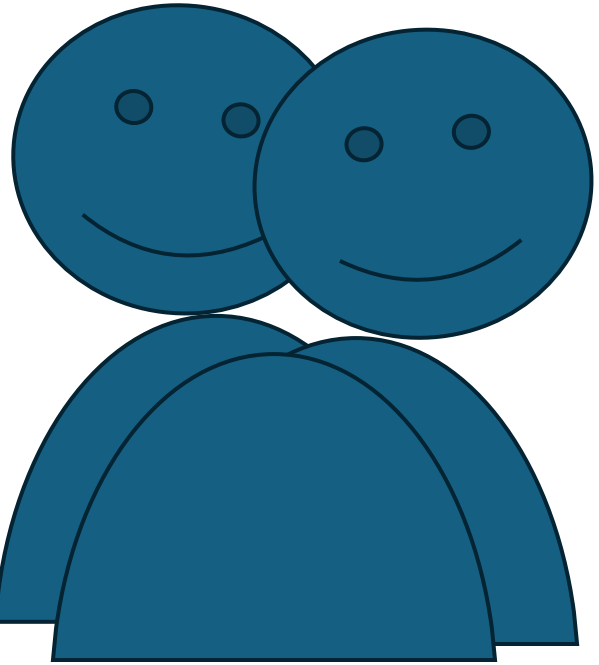
Insight from the qualitative study



Network visualization of the sociodemographic factors affecting mobility decline

Insight from the qualitative study

"I think we are more exposed to the climate. When they're out in the country [environment], the weather in this area, of course, the wind is the major factor, followed by heatwaves in the summertime and cold in the winter." – CA1, Man, 80, Teacher.



"Well, if you don't eat the proper food, it will affect your bones and your brain. So, we have the Canadian Food Guide…As you know, there's a lot of obesity, against in the years when people cooked their own food…Someone [Regulatory Agencies] needs to determine how much fat, or sugar could be in a product." – CA4, Woman, 78, Nurse.

Participants asked

"Address the threats of food, housing, social and financial insecurity."

"Communities and Governments to Improve Health Access

- especially for rural dwellers"

"make public spaces/buildings accessible:

considering people with various levels of mobility"

"involve older adults in **decision-making"**

Onyeso *et al. BMC Geriatrics* (2024) 24:972
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BMC Geriatrics

RESEARCH Open Access

Sociodemographic determinants of mobility decline among community-dwelling older adults: findings from the Canadian longitudinal study on ageing

Ogochukwu Kelechi Onyeso[1*], Chiedozie James Alumona[1], Adesola Christiana Odole[2], Janice Victoria Oluwagbohunmi A. Awosoga[1]

Conclusions

Conclusion

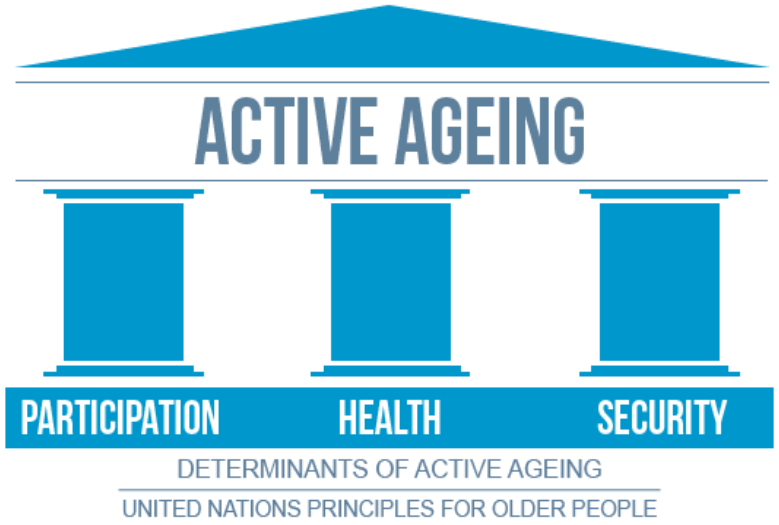
- Few studies on SDFs in mobility decline, outside the USA.
- CLSA baseline TUG = 9.70±2.01s; global estimate = 7.67±3.56 s (95% CI: 7.61, 7.73), range 5.71 to 12.6.
- High prevalence of mobility limitation in CLSA.
- Older adults' perspectives align with the quantitative outcome.
- Modifiable SDFs influence older adults' mobility trajectory; social justice, equity, and fairness may ameliorate the factors.

Limitations

- CLSA's COM may have more urban participants (Provinces = 7 only).
- Non-randomized sampling, self-selection, favours the more educated.
  - Rural dwellers, new immigrants, people of lower economic status, and the BIPOC may be underrepresented.
- Missing values and attrition may affect the result, especially FU2.
- Secondary analysis is limited to variables available.

Policy implications

- Advocacy for culturally sensitive policies.
- Update National and Provincial ageing policies and incorporate relevant international treaties and declarations.
- Enact rights and privileges legislation as a political buffer.
- Ensure financial, social, physical, and food security.
- Expand health access/coverage (UN/WHO's Decade of Healthy Ageing).
- Invest in infrastructure (WHO's Age-friendly Communities).



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Advances in Aging Research

Canadian provincial, territorial, and federal government aging policies: A systematic review

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ABSTRACT

In most countries, population aging is becoming more evident now that the first members of the large babyboom cohort have reached 65 years of age. As an accelerating increase in the num-

ber of persons who not only reach old age but also often reach advanced old age [3,4]. Although some futurists are suggesting that the babyboom cohort is more likely to be healthy and to work past age 65 as compared to previous cohorts [1,5], much concern exists in general about the

Recommendations for future study

- Explore to uncover more SDFs.
- Use a longer follow-up period.
- Intersectionality analysis.
- Disaggregated analysis.
- Need for universal discussion on scale of measurement and the meaning of multidimensional SDFs, such as education and religion.

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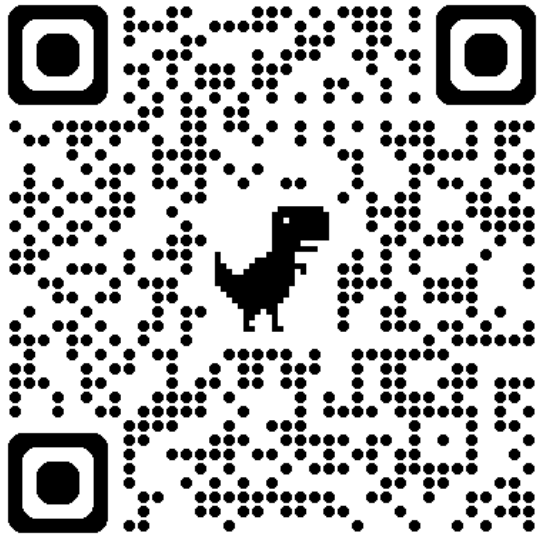

References

References

- Bloom, D. E., Chatterji, S., Kowal, P., Lloyd-Sherlock, P., McKee, M., Rechel, B., Rosenberg, L., & Smith, J. P. (2015). Macroeconomic implications of population ageing and selected policy responses. *Lancet*, *385*(9968), 649-657. https://doi.org/10.1016/s0140-6736(14)61464-1
- Bradshaw, C., Atkinson, S., & Doody, O. (2017). Employing a qualitative description approach in health care research. *Global Qualitative Nursing Research*, *4*, 1-8. https://doi.org/10.1177/2333393617742282
- Caelli, K., Ray, L., & Mill, J. (2003). 'Clear as mud': Toward greater clarity in generic qualitative research. *International Journal of Qualitative Methods*, *2*(2), 1-13. https://doi.org/10.1177/160940690300200201
- Dunlop, D. D., Song, J., Manheim, L. M., Daviglus, M. L., & Chang, R. W. (2007). Racial/ethnic differences in the development of disability among older adults. *Am J Public Health*, *97*(12), 2209-2215. https://doi.org/10.2105/ajph.2006.106047
- Freiberger, E., Sieber, C. C., & Kob, R. (2020). Mobility in older community-dwelling persons: A narrative review. *Front Physiol*, *11*, 881. https://doi.org/10.3389/fphys.2020.00881
- Hill, T. D., Burdette, A. M., Taylor, J., & Angel, J. L. (2016). Religious attendance and the mobility trajectories of older Mexican Americans: An application of the growth mixture model. *Journal of Health and Social Behavior*, *57*(1), 118-134. https://doi.org/10.1177/0022146515627850

References

- Hossain, B., Yadav, P. K., Nagargoje, V. P., & Vinod Joseph, K. J. (2021). Association between physical limitations and depressive symptoms among Indian elderly: Marital status as a moderator. *BMC Psychiatry*, *21*(1), 573. https://doi.org/10.1186/s12888-021-03587-3
- Kyrönlahti, S. M., Stenholm, S., Raitanen, J., Neupane, S., Koskinen, S., & Tiainen, K. (2021). Educational differences in decline in maximum gait speed in older adults over an 11-year follow-up. *J Gerontol A Biol Sci Med Sci*, *76*(4), 703-709. https://doi.org/10.1093/gerona/glaa196
- Lunar, F. R., Marquez, J. P., Quianzon, F. K., Policarpio, B. J., Santelices, L. A., Velasco, M. K., Quinto, R. J., & Gorgon, E. J. (2019). Mobility performance among community-dwelling older Filipinos who lived in urban and rural settings: A preliminary study. *Hong Kong Physiother J*, *39*(2), 91-99. https://doi.org/10.1142/s1013702519500082
- Metz, D. H. (2000). Mobility of older people and their quality of life. *Transport Policy*, *7*(2), 149-152. https://doi.org/https://doi.org/10.1016/S0967-070X(00)00004-4
- Neergaard, M. A., Olesen, F., Andersen, R. S., & Sondergaard, J. (2009). Qualitative description – the poor cousin of health research? *BMC Medical Research Methodology*, *9*(1), 52. https://doi.org/10.1186/1471-2288-9-52

References

- Thorpe, R. J., Jr., Koster, A., Kritchevsky, S. B., Newman, A. B., Harris, T., Ayonayon, H. N., Perry, S., Rooks, R. N., & Simonsick, E. M. (2011). Race, socioeconomic resources, and late-life mobility and decline: Findings from the health, aging, and body composition study. *J Gerontol A Biol Sci Med Sci*, *66*(10), 1114-1123. https://doi.org/10.1093/gerona/glr102
- Webber, S. C., Porter, M. M., & Menec, V. H. (2010). Mobility in older adults: A comprehensive framework. *Gerontologist*, *50*(4), 443-450. https://doi.org/10.1093/geront/gnq013
- Wheaton, F. V., & Crimmins, E. M. (2016). Female disability disadvantage: A global perspective on sex differences in physical function and disability. *Ageing Soc*, *36*(6), 1136-1156. https://doi.org/10.1017/s0144686x15000227

Questions and answers

Thank you for your attention.