INEQUALITIES IN DISABILITY-FREE AND DISABLING MULTIMORBID LIFE EXPECTANCY IN COSTA RICA, MEXICO, AND THE UNITED STATES

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AGENDA

Background

Methods

Results

Discussion

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Discussion

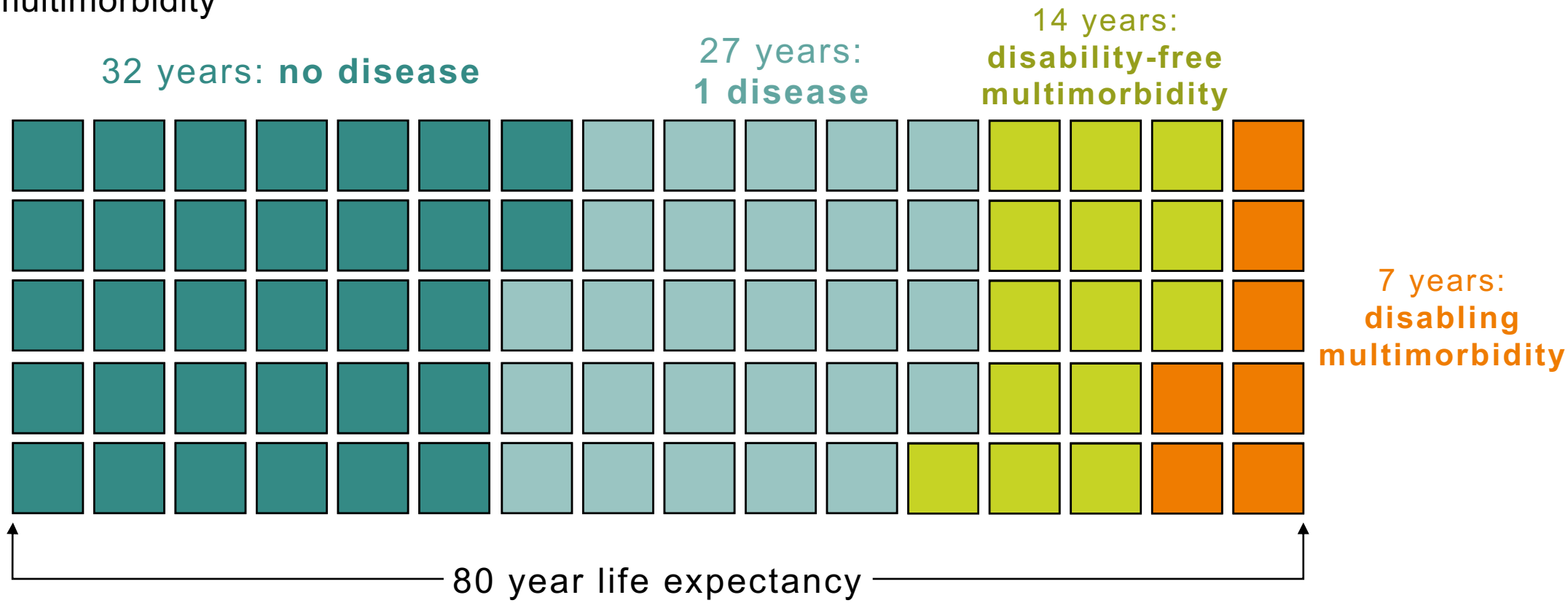
- Multimorbidity
- Multimorbid life expectancy
- Disability
- Country context
- Research questions

WHAT WE DO AND DON'T KNOW ABOUT MULTIMORBIDITY

- Multimorbidity is usually defined as 2+ co-occurring chronic diseases
- It is common and well-studied in high-income countries
  - But there is a rising prevalence and lack of research in low- and middle-income countries, where almost 80% of NCD-related deaths occur and populations are rapidly ageing *(WHO 2022)*
  - Some LMICs also have different disease constellations compared to HICs, e.g., tuberculosis, HIV/AIDS, and malnutrition
- Most studies describe multimorbidity prevalence or disease clusters at single time-points
  - Sparse evidence on multimorbidity longitudinally *(Cezard et al. 2021)*
  - Few studies on time spent living with multimorbidity (or chronic morbidities) *(Tetzlaff et al. 2017, Botes et al. 2018, Kingston et al. 2018, Chan et al. 2019, Payne 2022)*

WHAT IS MULTIMORBID LIFE EXPECTANCY?

- **Multimorbid life expectancy (MMLE)** describes the years someone is expected to live with multimorbidity



WHY DISABILITY AND MULTIMORBIDITY?

- Multimorbidity is associated with increased disability
  - The amount of disability seems to depend on disease counts and multimorbidity patterns *(Jindai 2016, Quinones 2016, Sheridan 2019)*
- Less is known about the burden of multimorbidity in terms of disability-adjusted life years (DALYs) or years lost to disability (YLD) *(Academy of Medical Sciences 2018)*
- In this study, I use disability as a proxy to determine multimorbidity severity/progression

WHY COMPARE COSTA RICA, MEXICO, AND THE UNITED STATES?

- Data availability
- Geographic proximity, varying economic, health, and educational system structures
- Costa Rica and Mexico have similar GDP, but Costa Rica has higher life expectancy
- In contrast, the US has much higher GDP and spends a greater percentage of their GDP on health (in 2018, 17% vs 7% in Costa Rica and 5% in Mexico), but has lower life expectancy than Costa Rica *(World Bank 2022)*
- Many more historical, cultural, structural differences…

INEQUALITIES IN DISABILITY-FREE AND DISABLING MULTIMORBID LIFE EXPECTANCY IN COSTA RICA, MEXICO, AND THE UNITED STATES

What is it?

DISABILITY-FREE AND DISABLING MULTIMORBID LIFE EXPECTANCY IN COSTA RICA, MEXICO, AND THE UNITED STATES

What is it?

INEQUALITIES IN DISABILITY-FREE AND DISABLING MULTIMORBID LIFE EXPECTANCY IN COSTA RICA, MEXICO, AND THE UNITED STATES

Within and between countries

What is it?

By gender & education

INEQUALITIES IN DISABILITY-FREE AND DISABLING MULTIMORBID LIFE EXPECTANCY IN COSTA RICA, MEXICO, AND THE UNITED STATES

Within and between countries

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- Data sources
- Definitions
- State space
- Statistical analysis

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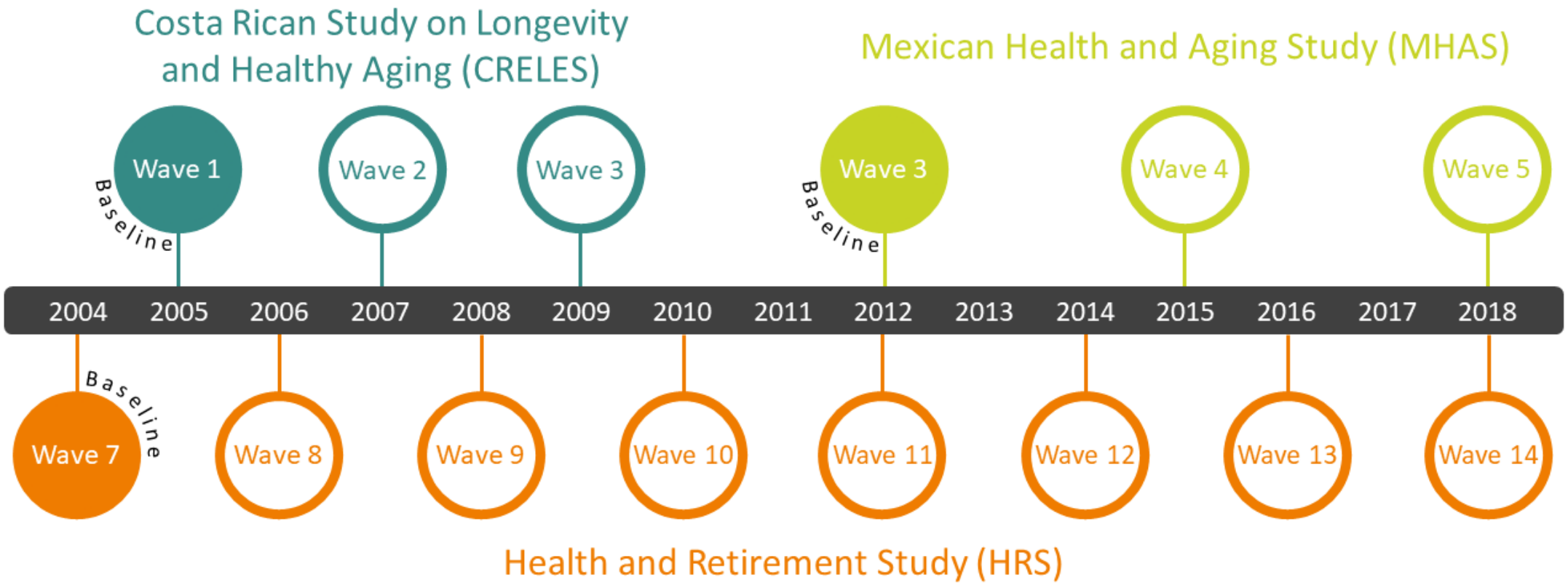
DATA SOURCES



DEFINITIONS

Multimorbidity

Have you ever been told you had **at least 2** of the following diseases:

- Arthritis
- Cancer
- Diabetes
- Hypertension*
- Heart problems
- Respiratory problems
- Stroke

Disability

Reported some difficulty with **at least 1** of the following activities of daily living:

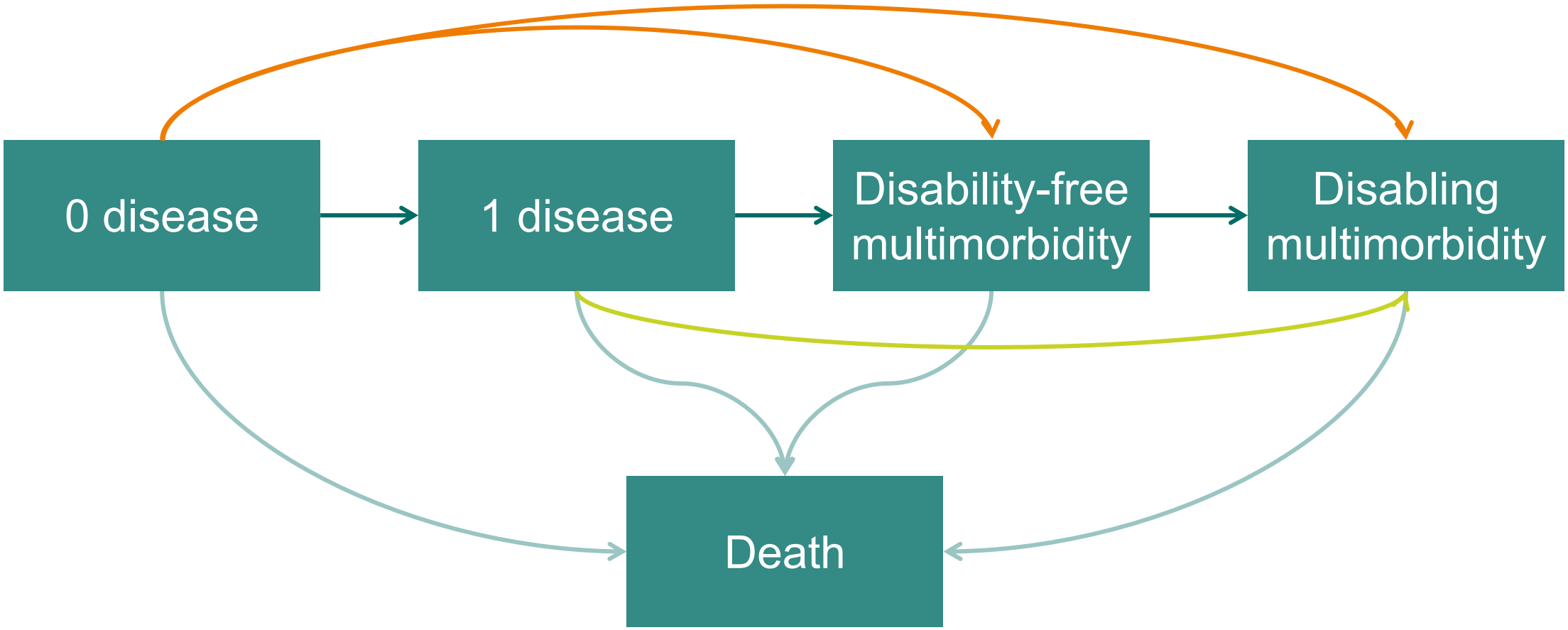
- Bathing
- Eating
- Getting in/out of bed
- Walking

Education

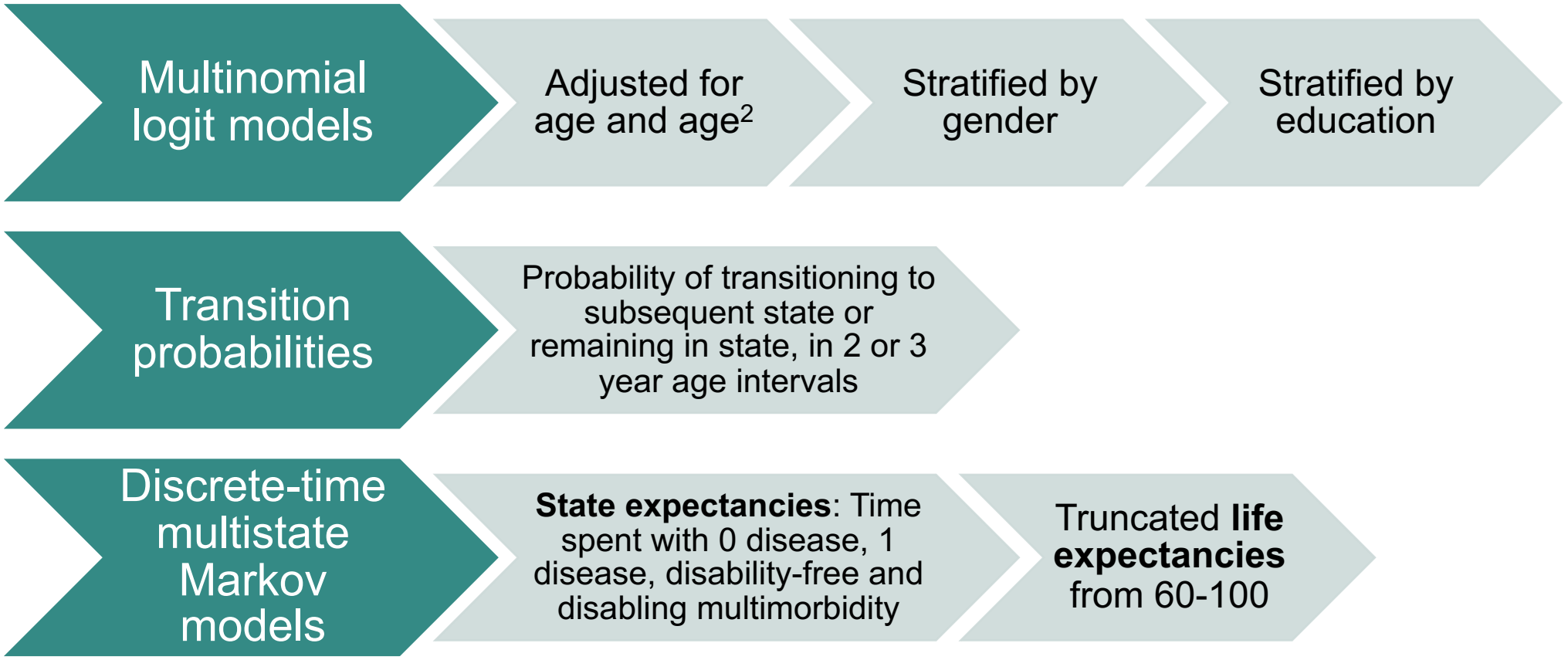
Highest level of reported educational attainment:

- Primary school or less
- Secondary school
- Post-secondary school

STATE SPACE


0 disease
1 disease
Disability-free multimorbidity
Disabling multimorbidity
Death

STATISTICAL ANALYSIS



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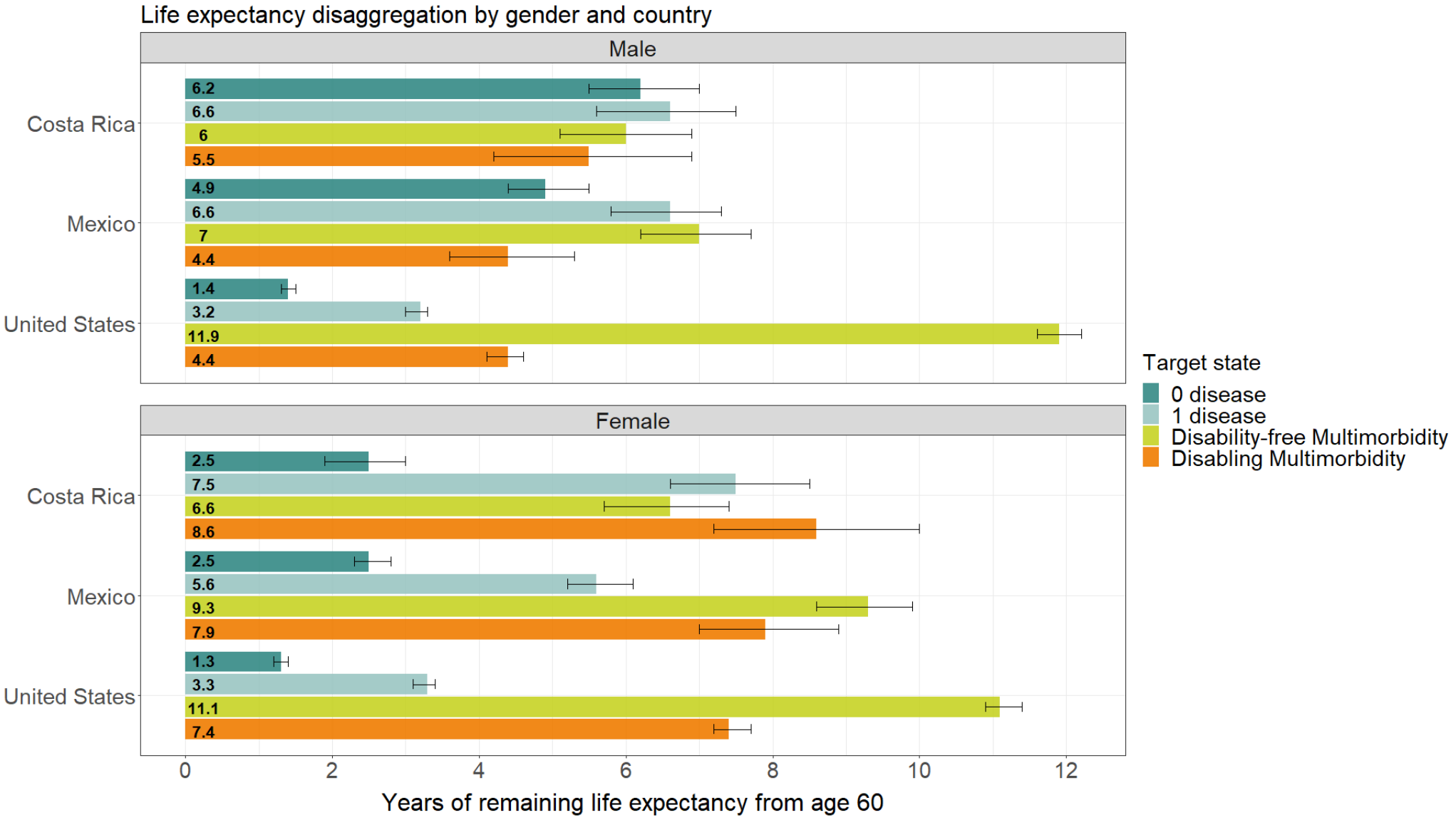
- Descriptive results
- Disease prevalence and combinations
- Total, disability-free, and disabling MMLE
- Educational differences

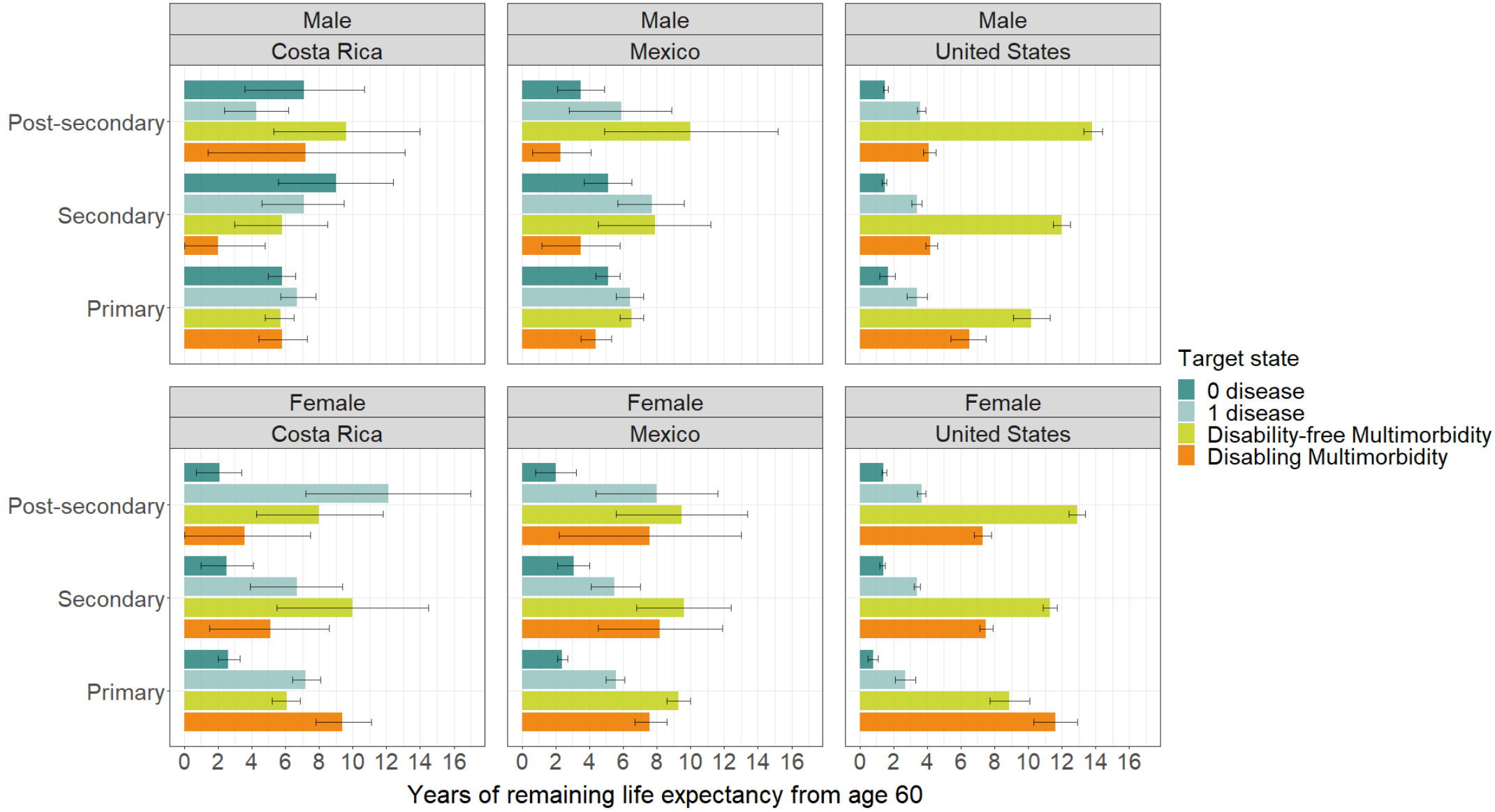
DESCRIPTIVE STATISTICS

	Costa Rica		Mexico		United States	
	Male (N=1,200)	Female (N=1,426)	Male (N=4,994)	Female (N=6,214)	Male (N=9,599)	Female (N=12,746)
Mean age in years (SD)	**76.9 (10.3)**	**76.9 (10.2)**	70.2 (7.9)	69.9 (8.1)	68.6 (8.3)	69.2 (9.2)
Education level						
Primary school or less	**1040 (86.7%)**	**1246 (87.5%)**	**3691 (73.9%)**	**4868 (78.3%)**	680 (7.1%)	776 (6.1%)
Secondary school	93 (7.7%)	107 (7.5%)	784 (15.7%)	1075 (17.3%)	**4540 (47.3%)**	**6969 (54.7%)**
Post-secondary school	67 (5.6%)	71 (5.0%)	519 (10.4%)	271 (4.5%)	**4379 (45.6%)**	**5001 (39.2%)**
Initial 'from' state						
0 disease	**438 (36.5%)**	330 (23.2%)	**1607 (32.2%)**	1048 (16.9%)	1503 (15.7%)	1625 (12.7%)
1 disease	**436 (36.3%)**	**525 (36.9%)**	**1662 (33.3%)**	1973 (31.8%)	2457 (25.6%)	3259 (25.6%)
Disability-free multimorbidity	237 (19.8%)	413 (29.0%)	1337 (26.8%)	**2333 (37.5%)**	**4614 (48.1%)**	**5871 (46.1%)**
Disabling multimorbidity	89 (7.4%)	156 (11.0%)	388 (7.8%)	860 (13.8%)	1025 (10.7%)	1991 (15.6%)

STATE EXPECTANCIES BY GENDER AND COUNTRY



STATE EXPECTANCIES BY GENDER, COUNTRY & EDUCATION



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Summary

Limitations

Conclusions

SUMMARY

- Regardless of gender or education, people in Costa Rica lived longer, healthier lives than people in Mexico or the United States
- Greatest inequalities observed for disability-free multimorbidity, with people in the United States having almost twice the disability-free MMLE than people in Costa Rica
- Women had higher MMLE and LE than men
- Positive education gradient for disability-free MMLE and negative education gradient for disabling MMLE in the United States

LIMITATIONS

- Small samples and limited number of transitions in CRELES and MHAS
  - Wide confidence intervals
- Limited to 7 chronic conditions
  - Overestimate people without disease, underestimate people with disease

CONCLUSIONS

- While we identified gender and educational inequalities, the magnitude of these inequalities differed across all countries, highlighting the fact that contextual factors are likely major contributors to MMLE.
  - E.g., Access, quality, and utilization of healthcare; differences in health behaviors; disease screening, diagnosis, and treatment protocols
- MMLE can act as a complementary measure of population health alongside health-adjusted or disability-free life expectancy to aid healthcare providers with disease management and prevention
  - The concept of MMLE can also be extended further to incorporate e.g., instrumental activities of daily living, cognitive function

THANK YOU FOR YOUR ATTENTION!

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Working paper