Gender Differentials in Disability and Mortality Transitions:
The Case of Older Adults in Japan

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Introduction

* This paper focuses on gender differentials in 'disability-free' or 'active' life expectancy among older Japanese

* Active life expectancy divides total life expectancy into states of health, e.g. with or without disability

* Active life expectancy estimates derived from multi-state life tables

* Probabilities for the multi-state life tables derived from hazard rate parameters describing a set of transitions

Justification

1. Questions about the gender – disability association remain

2. Gender – health association has been less studied in Asia and results may differ from the West

3. Urgency for disability research in Japan

Data

* Nihon University Longitudinal Japanese Study on Aging (PI: Yasuhiko Saito)

* Nationally representative sample aged 65+

* Data collected in 1999, 2001 and 2003

* N= about 5,000 per wave

* Follow-ups included add-ons

* http://www.usc.edu/dept/gero/CBPH/nujlsoa/

Data

Episodic data is stacked

Baseline 1999 ──────────────▶ Follow-up 2001

Baseline 2001 ──────────────▶ Follow-up 2003

Total N ~ 8,400

Measures

A person is considered 'disabled' if they cannot perform at least one of the following ADLs independently

1. Bathing
2. Dressing
3. Eating
4. Rising
5. Walking
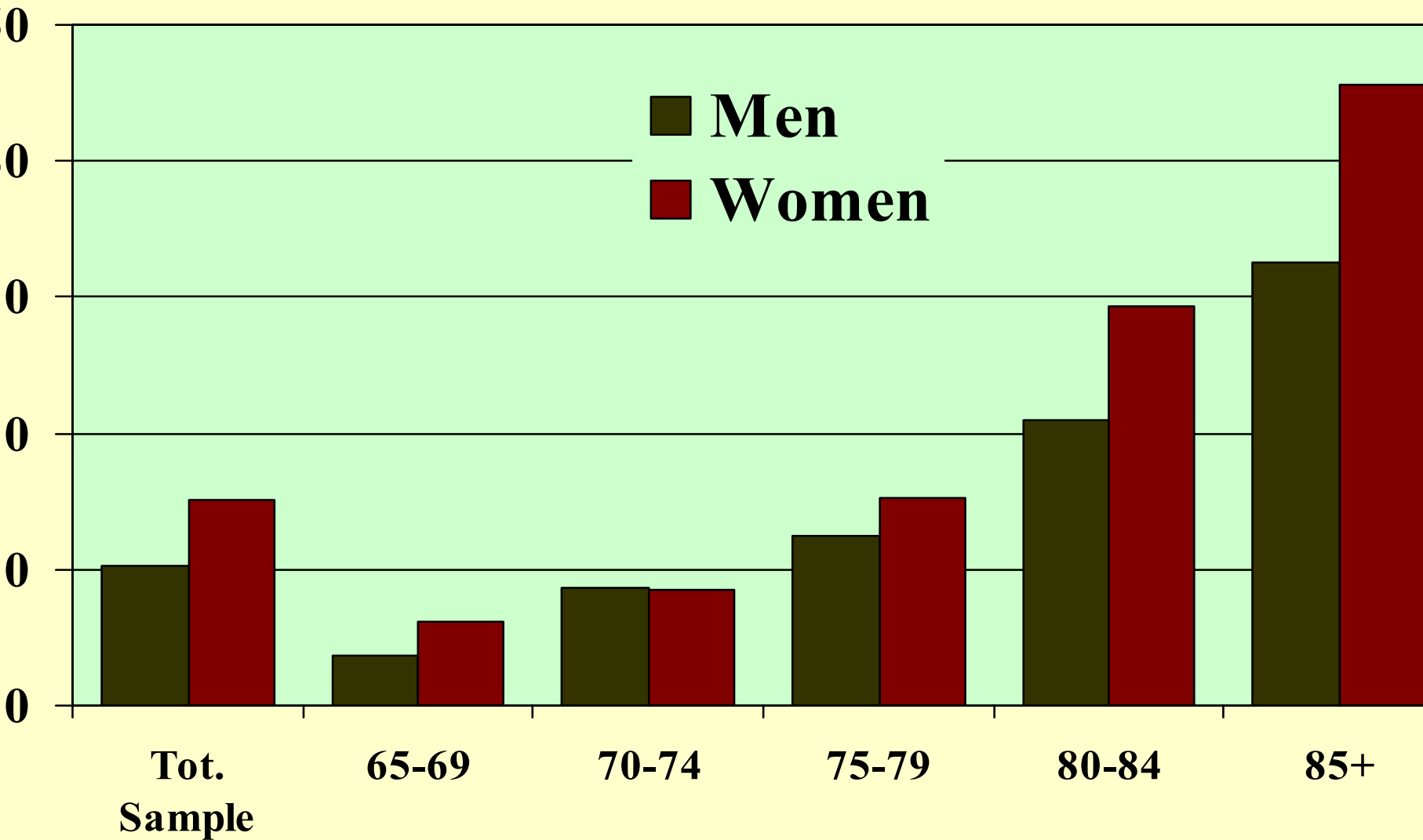6. Leaving house
7. Using toilet

Measures

A person is considered 'disabled' if they cannot perform at least one of the following ADLs independently

1. Bathing
2. Dressing
3. Eating
4. Rising
5. Walking
6. Leaving house
7. Using toilet

<u>Baseline</u>   <u>Follow-up</u>

Disabled   Disabled

Not-disabled   Not-disabled

Died
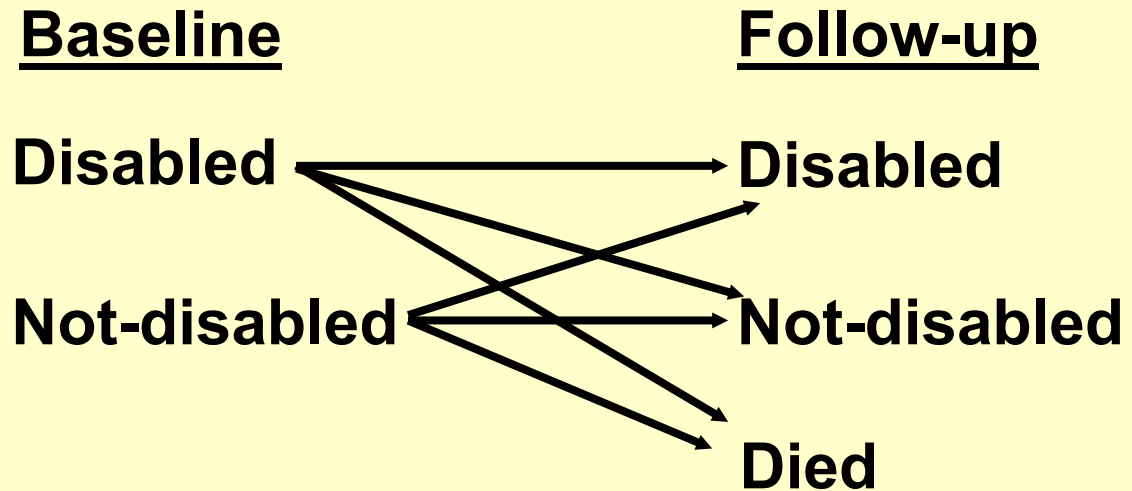
Percent reporting a disability at baseline by age and sex

Legend: Men, Women

X-axis categories: Tot. Sample, 65-69, 70-74, 75-79, 80-84, 85+

Disability and mortality status at follow-up by status at baseline and sex

Disability status at follow-up		Disability status at baseline	
		No disability	Has disability
MEN	No disability	89.7%	21.5%
	Has disability	5.9	50.4
	Died	4.4	28.1
WOMEN	No disability	88.2%	26.8%
	Has disability	9.0	53.1
	Died	2.8	20.1

Hazard base model parameters predicting disability transitions

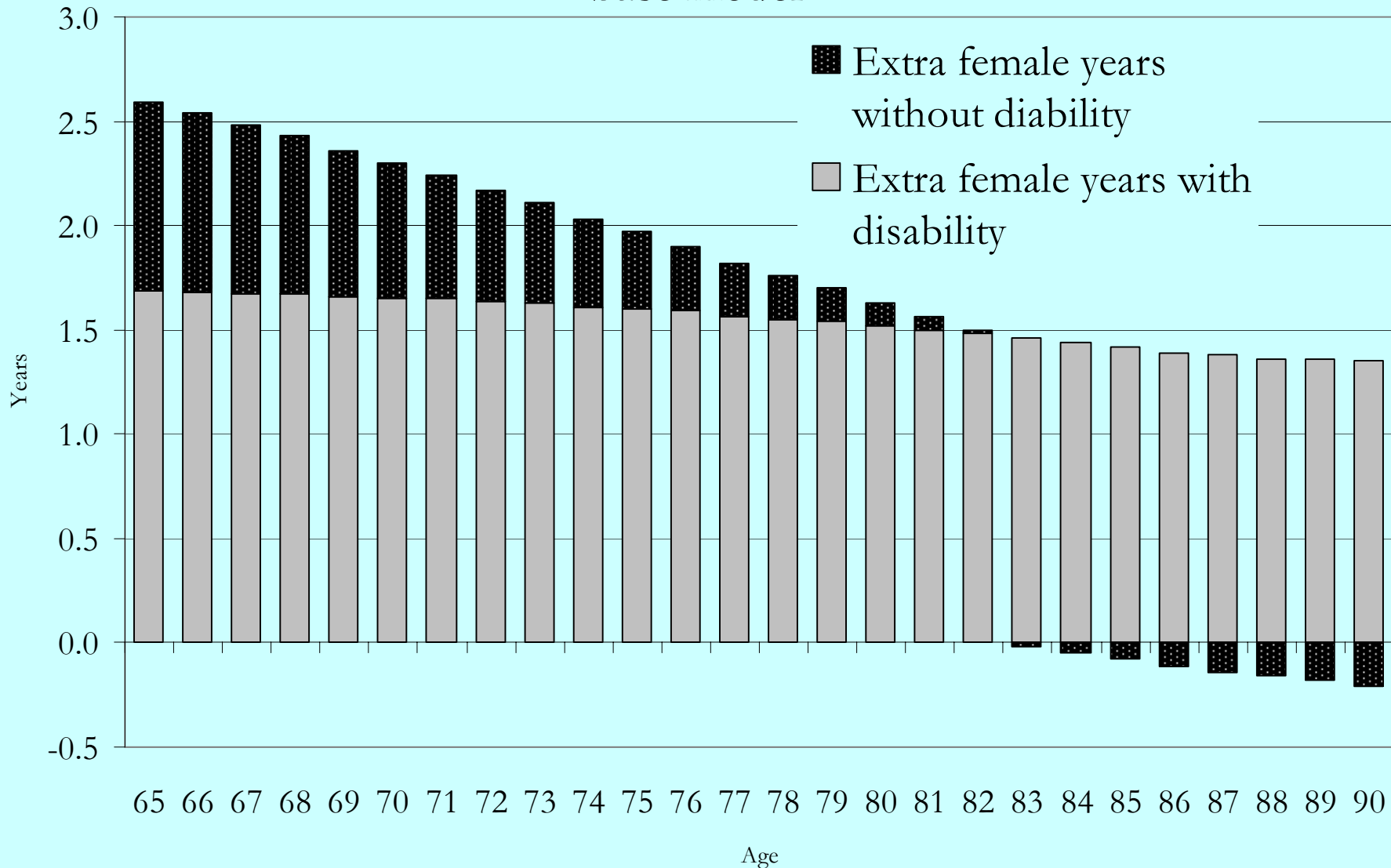| Baseline status ⟶	Without	Without	With	With
Follow-up status ⟶	With	Deceased	Without	Deceased
Sex (1=female)	+.34**	-.55**	+.23	-.47**
Age	+.11**	+.11**	-.05**	+.07**

Estimates of active life expectancy
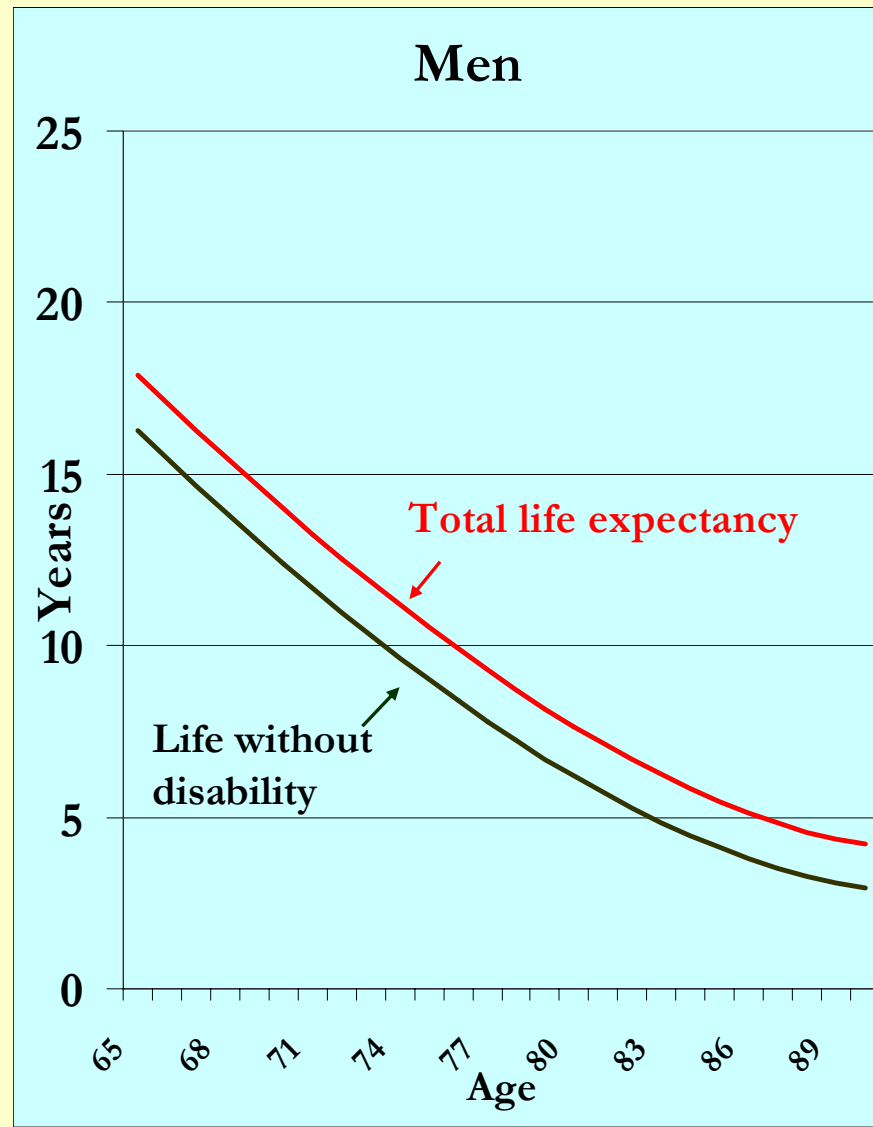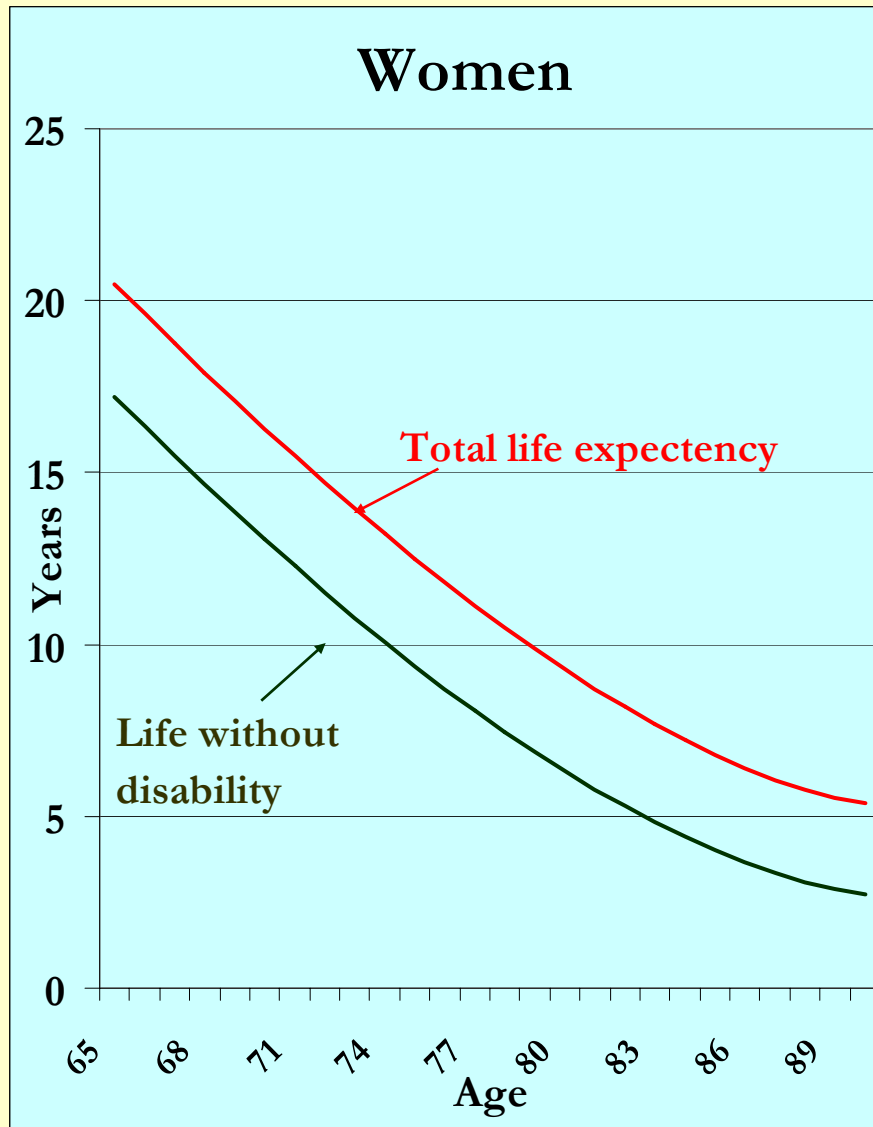
Percent of remaining life without disability by age and sex, base model
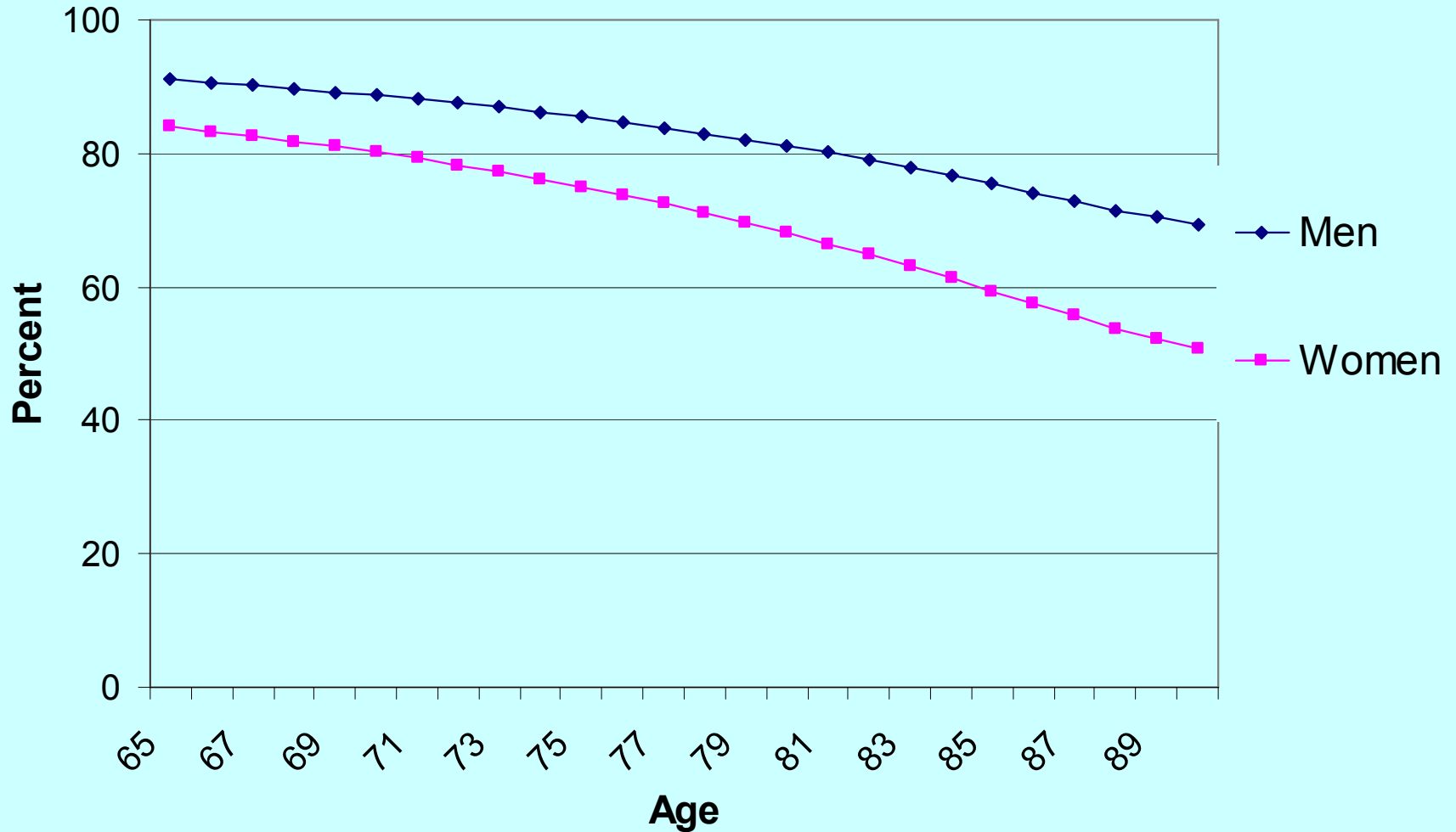
Extra years lived by women by age and states of disability, base model

Legend:
- Extra female years without diability
- Extra female years with disability

Y-axis: Years

X-axis: Age — 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90

Additional covariates

Domain	Covariates
Social support:	Marital status
	Living with children
	Living with others
	Receiving support from children
Behaviors:	Smoking
	Exercise
Socioeconomic characteristics:	Occupation
	Education
	Income
Disease profile:	Life threatening conditions
	Debilitating conditions

Parsimonious model

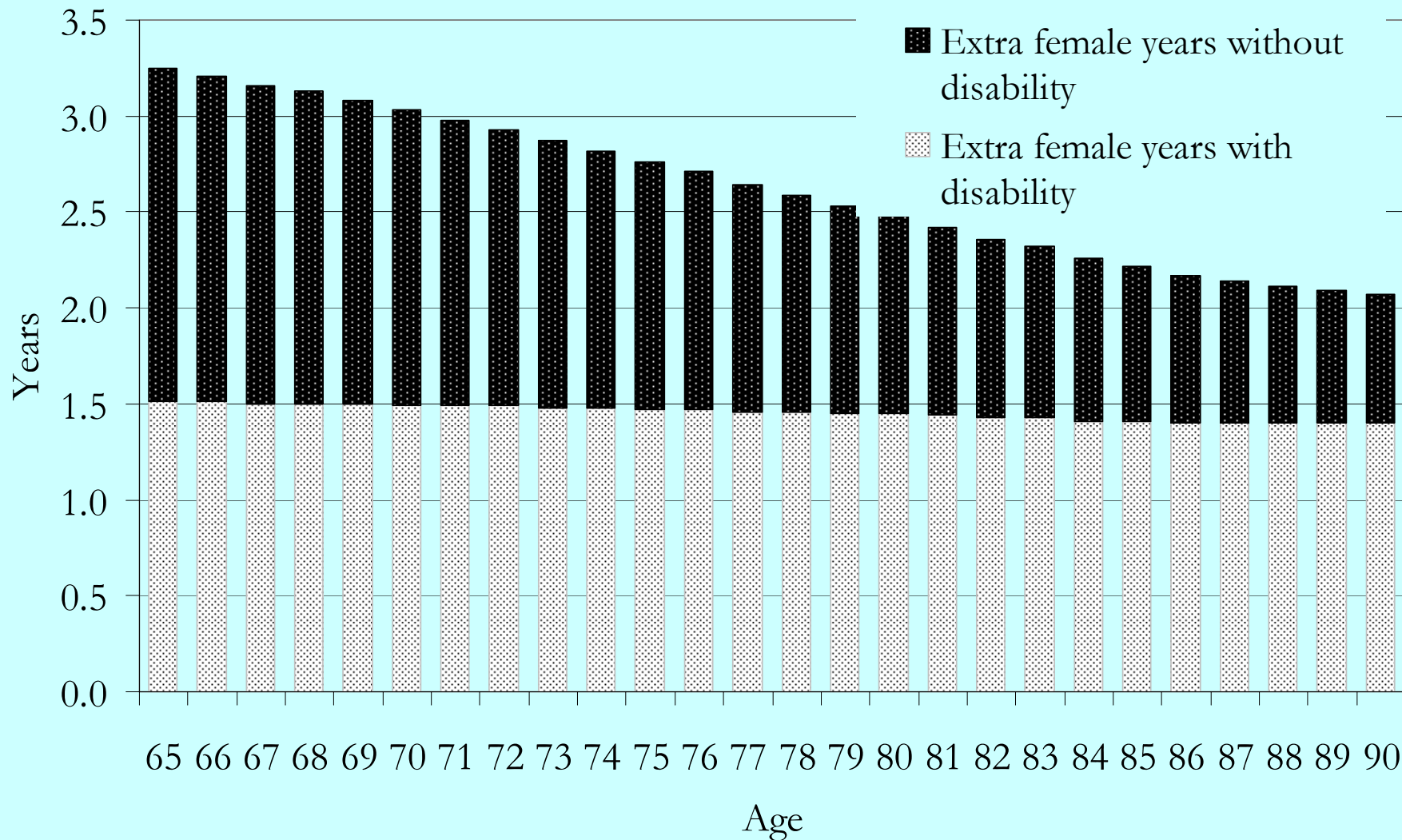| Domain	Covariates
Social support:	
	Receiving support from children
Behaviors:	**Smoking**
	Exercise
Socioeconomic characteristics:	**Education**
	Income
Disease profile:	**Life threatening conditions**
	Debilitating conditions

Sex parameters, comparing base and parsimonious models predicting disability transitions*

Baseline status ➝	Without	Without	With	With
Follow-up status ➝	With	Deceased	Without	Deceased
Base model parameters	+.34**	-.55**	+.23	-.47**
Parsimonious model parameters	+.14	-.43**	+.28	-.42**

* Base model controls only for age and sex.

*Parsimonious model controls for age, sex, receiving support from children, smoking, exercising, education, income life threatening conditions and debilitating conditions.

Extra years lived by women by age and states of disability, parsimonious model

Legend:
- ■ Extra female years without disability
- ▦ Extra female years with disability

Y-axis: Years (0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5)

X-axis: Age (65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90)

Separating sample by disease profile

Disease profile	Number men	Number women
None	1,276	1,318
Life threatening only	376	348
Debilitating only	1,251	2,085
Life threatening and debilitating	732	973

# Next step: comparing parameters for populations with and without life threatening and debilitating conditions

Baseline status ⟶	Without	Without	With	With
Follow-up status ⟶	With	Deceased	Without	Deceased
Base model parameters	+.34**	-.55**	+.23	-.47**
No conditions	+.22**	-.30	+.26	-.09
Life threatening only	+.26	-.90*	+.52	-.45
Debilitating only	+.27	-.55**	+.04	-.34
Life threatening and debilitating	+.55**	-.60*	+.22	-.54**

Comparing parameters for populations with and without life threatening and debilitating conditions

Baseline status →	Without	Without	With	With
Follow-up status →	With	Deceased	Without	Deceased
Base model parameters	+.34**	-.55**	+.23	-.47**
No conditions	+.22**	-.30	+.26	-.09
Life threatening and debilitating	+.55**	-.60*	+.22	-.54**

Women's life expectancy advantage and disability disadvantage increases when there are chronic conditions

Extra years lived by women by age and states of disability, those with life threatening and debilitating conditions
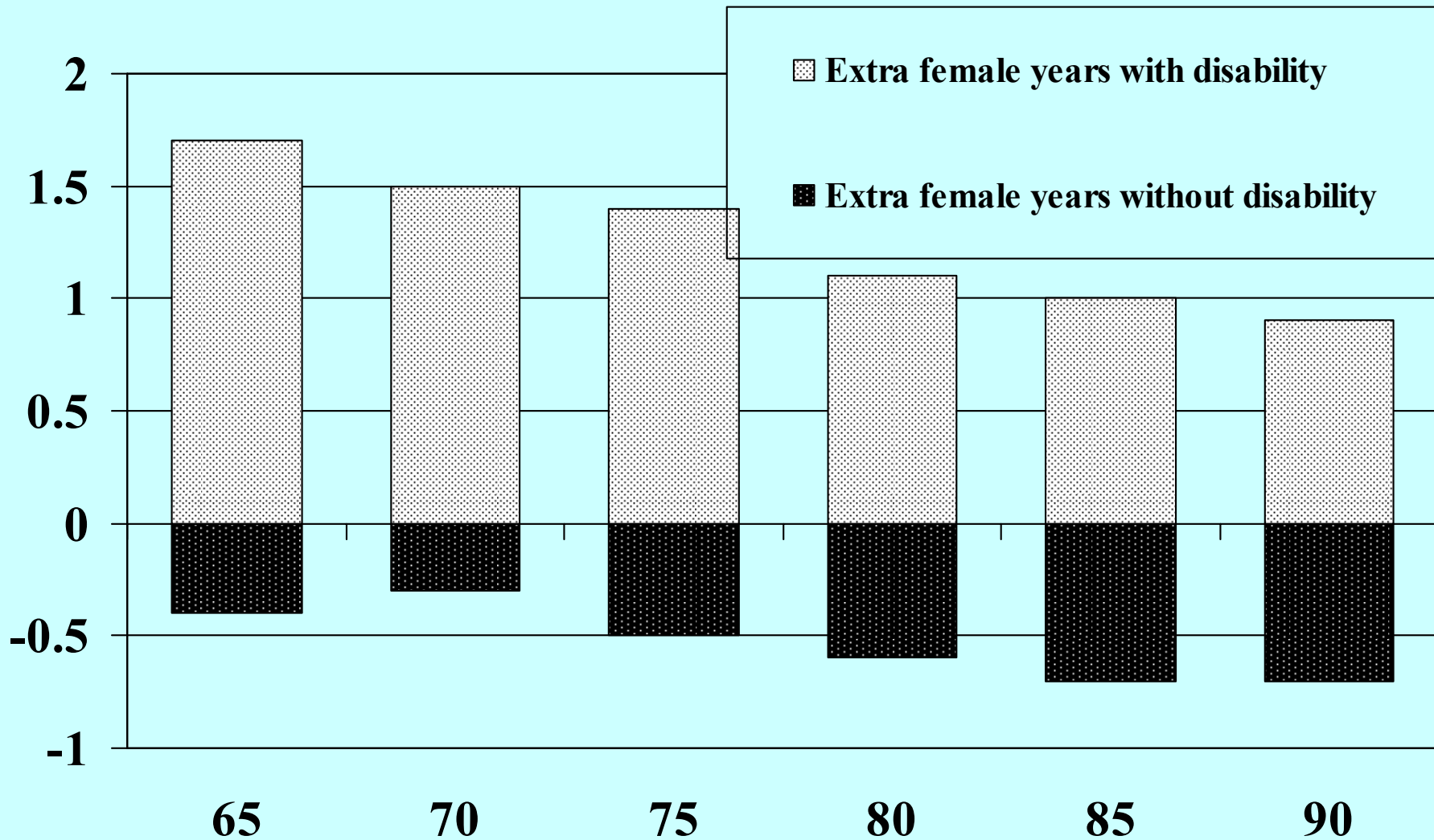
Conclusion

1. **Main contribution of our paper: Are extra years spent in states of disability?**

2. **Women more likely to transition into disability from a non-disability state**

3. **This result is attenuated when including other covariates**

4. **When it comes to those with chronic diseases, differences between men and women increase.**

Thank you