
Disability trajectories by age, sex, and education, among older adults in Taiwan

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Introduction

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 - * At the individual level, trends in prevalence are a function of:
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 - * **There is a vast range of possible individual disability experiences, or disability pathways.**
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Current study

*** Focus on disability pathways or trajectories**

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 - * **Uses four waves of data from Taiwan (1996 to 2007)**
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Current study

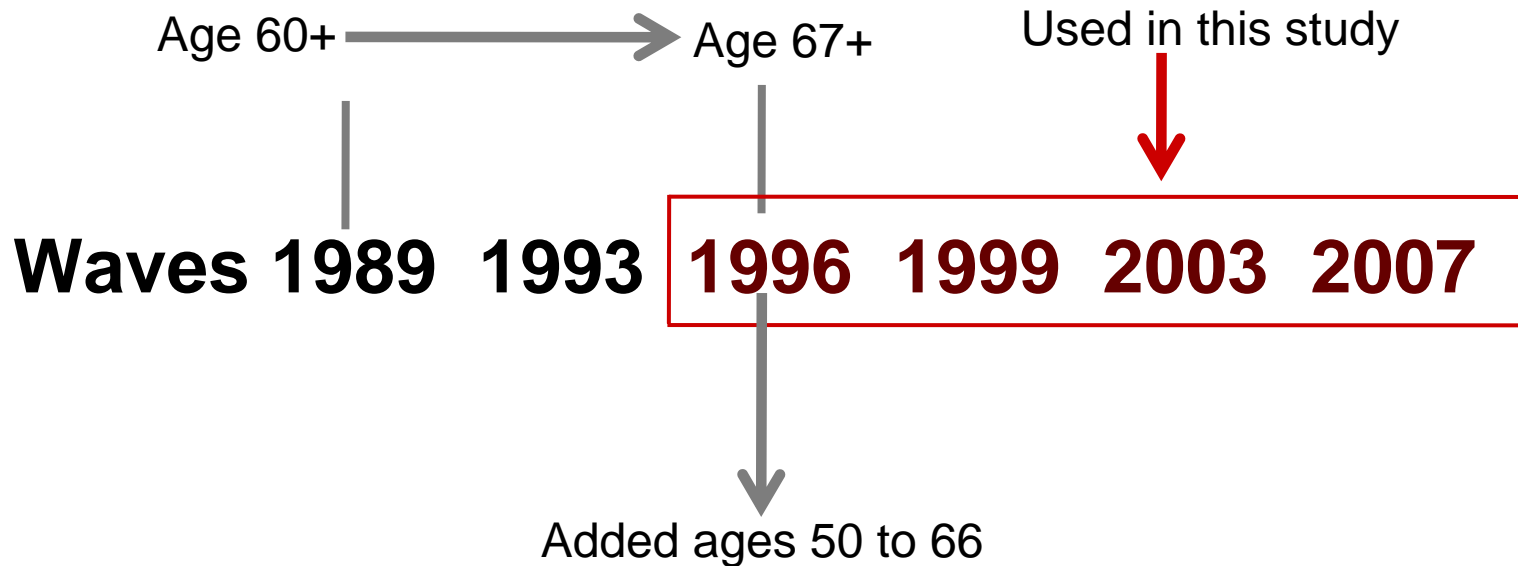
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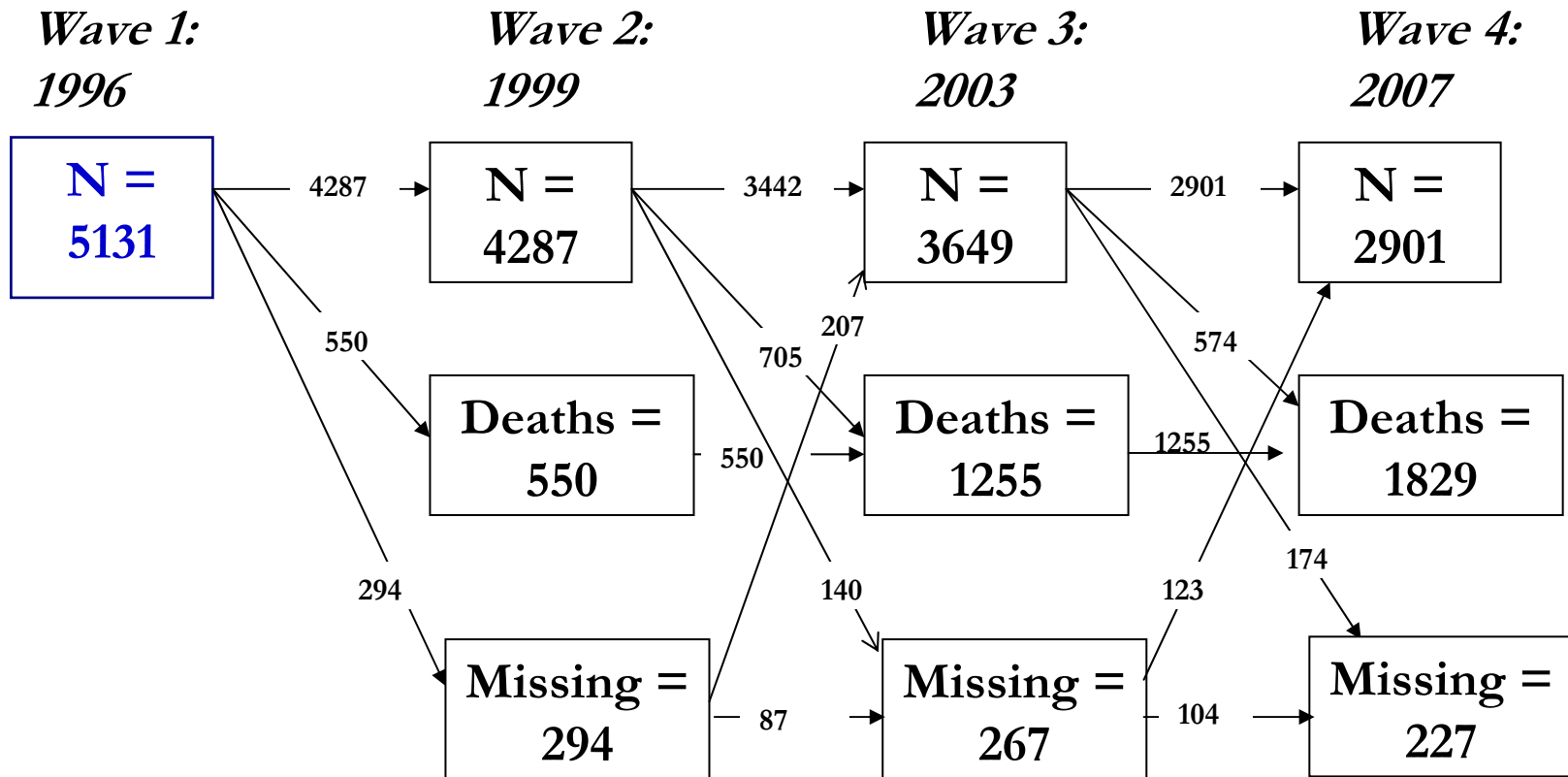
- * Focus on disability pathways or trajectories
 - * Uses four waves of data from Taiwan (1996 to 2007)
 - * Population aging in Taiwan adds urgency to the study of disability
 - * **Past research suggests that sex and education are of prime importance. We test their importance for determining disability trajectories.**
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Dataset

* Survey of Health and Living Status of the Middle Aged and Elderly in Taiwan

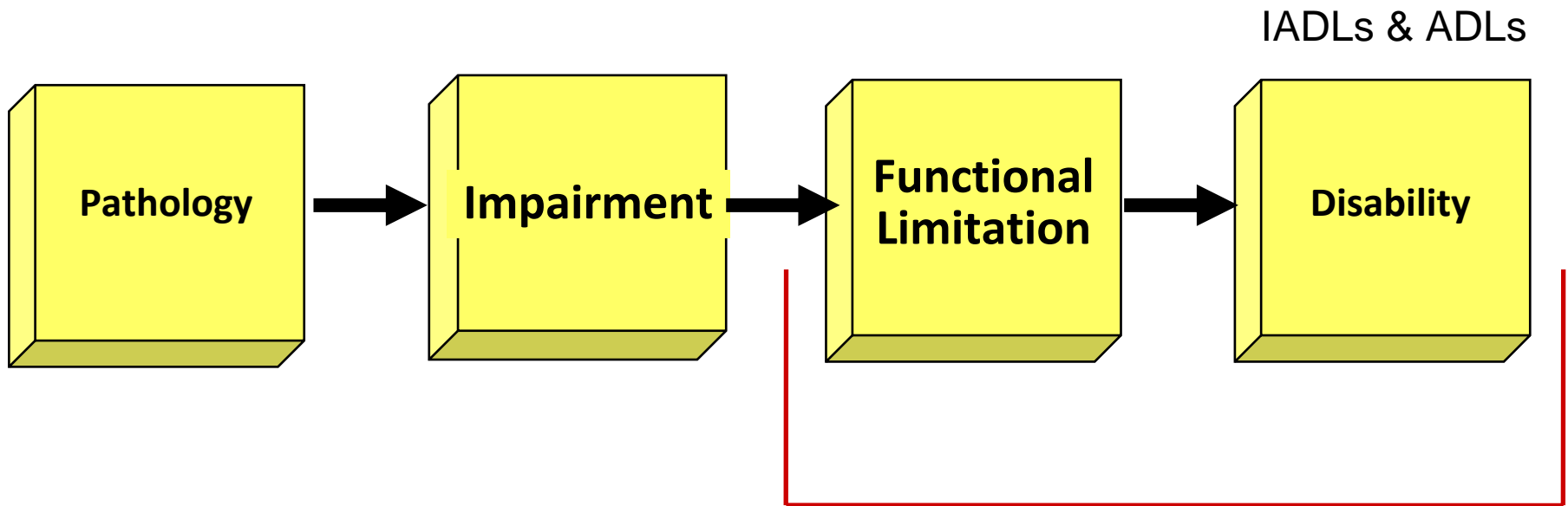


Study sample



Respondents are allowed to be missing and re-enter survey at later wave. This results in very high response rates.

Disablement process



Source: adapted from Nagi 1965; Pope & Tarlov 1991; Verbrugge & Jette 1994

Measures of difficulty

	Functional limitations	IADLs	ADLs
Waves	4	4	3
Years	1996 - 2007	1996 – 2007	1999 - 2007
Age of sample	50+	50+	53+
N at baseline	5131	5131	4287
Has as at least one of the following limitations	grasping raising hands lifting standing squatting running climbing stairs	shopping managing money using phone light housework heavy housework transportation	bathing dressing eating transferring moving in house using toilet

Group-based modeling

- * **Identification of clusters of individuals following similar pathways with age**
 - * **Maximum likelihood application of a finite mixture model**
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- * Identification of clusters of individuals following similar pathways with age
 - * Maximum likelihood application of a finite mixture model
 - * Flexibility in pathway forms, including higher order polynomials
 - * **Determination of number and shape of groups by BIC and significance of parameters**
 - * **Added capability of modeling drop-out due to death as a joint outcome**
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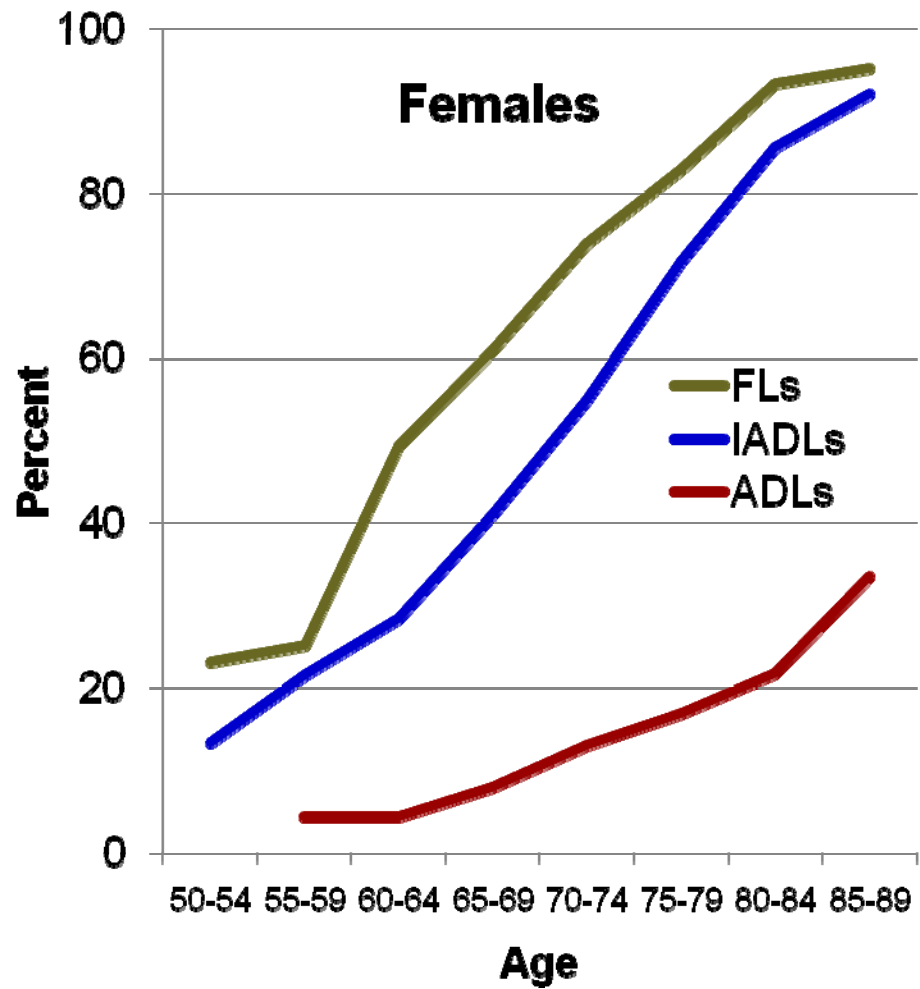
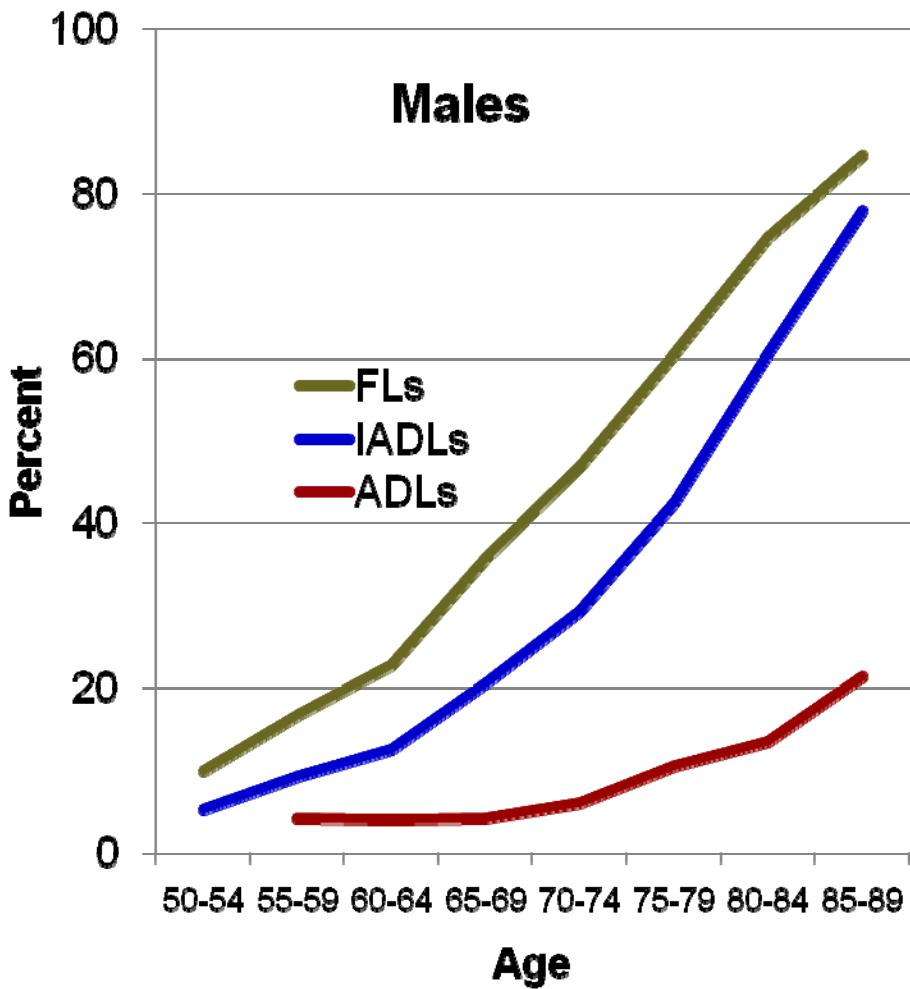
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 3. **Probability of loss due to death for each group across ages**
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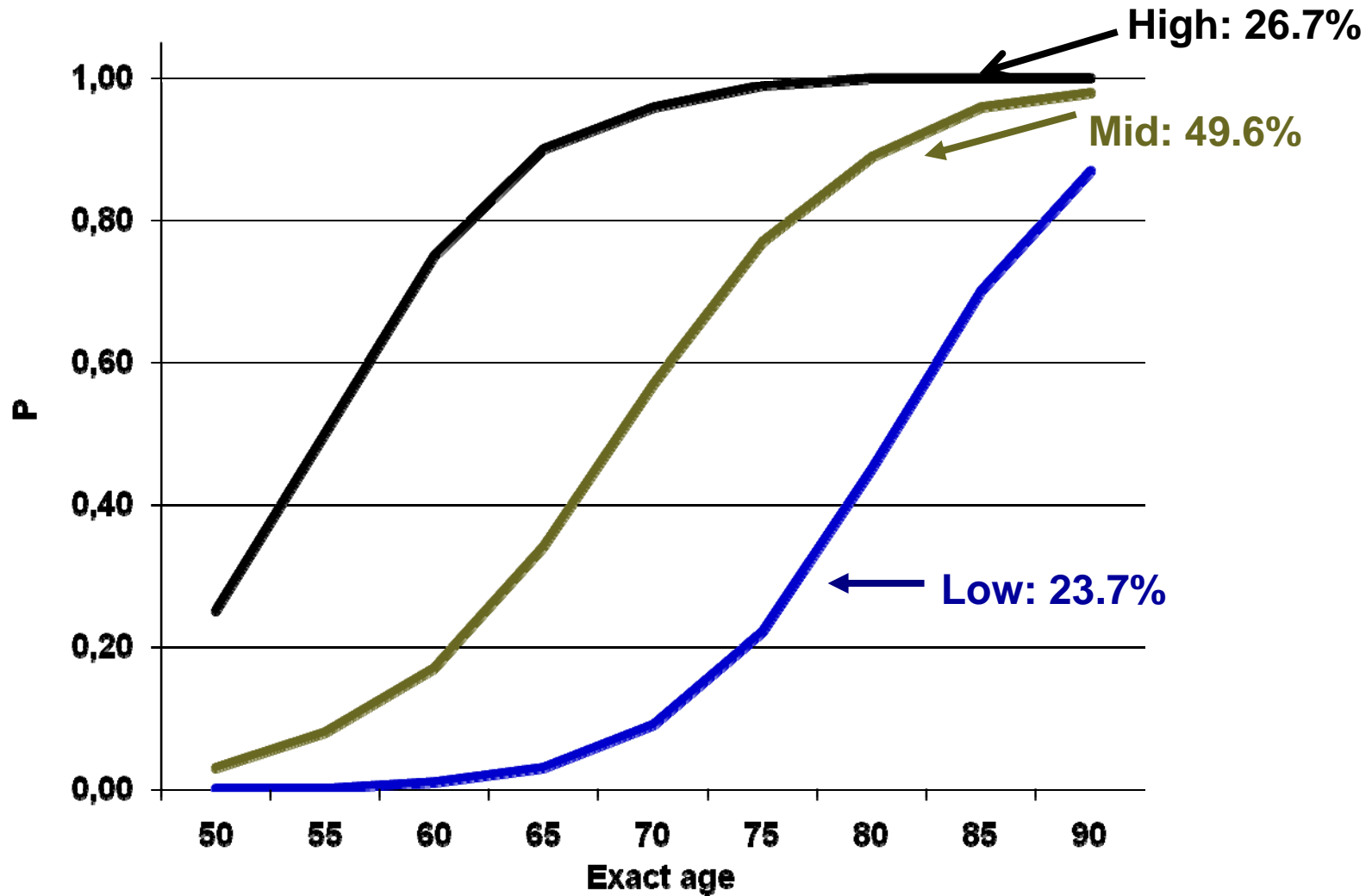
Outputs of group-based trajectory analysis

1. Number of distinct trajectory groups, each of which defines the probability of a limitation as a function of age
 2. Estimates of the proportion of the sampled population following each trajectory
 3. Probability of loss due to death for each group across ages
 4. **Multinomial regression to examine associations of group membership with sex, years of education, mainlander status, marital status, urban/rural residence, and sex X education interactions.**
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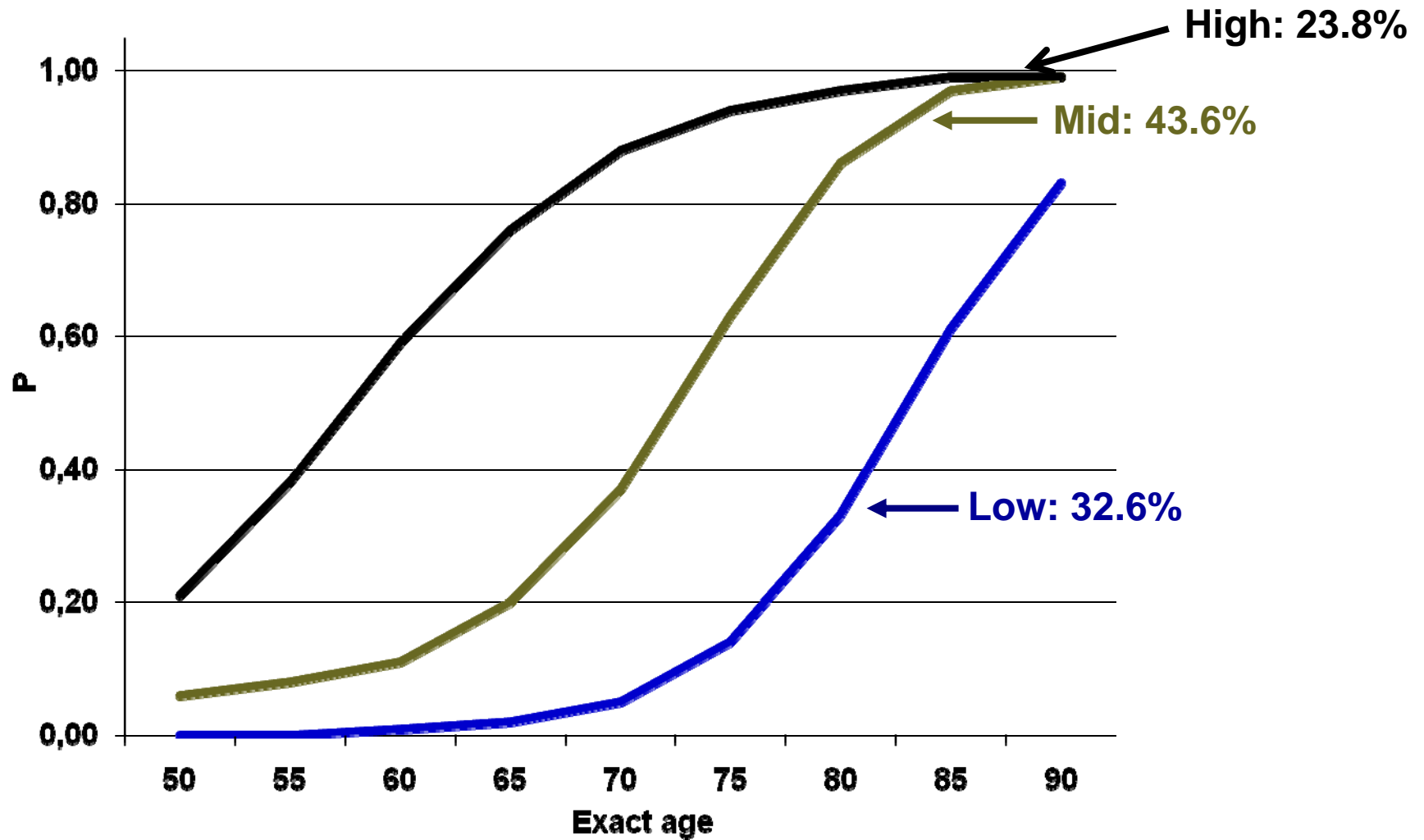
**Raw prevalence of at least one difficulty by age and sex
(FLs & IADLs, 1996-2007; ADLs, 1999-2007)**



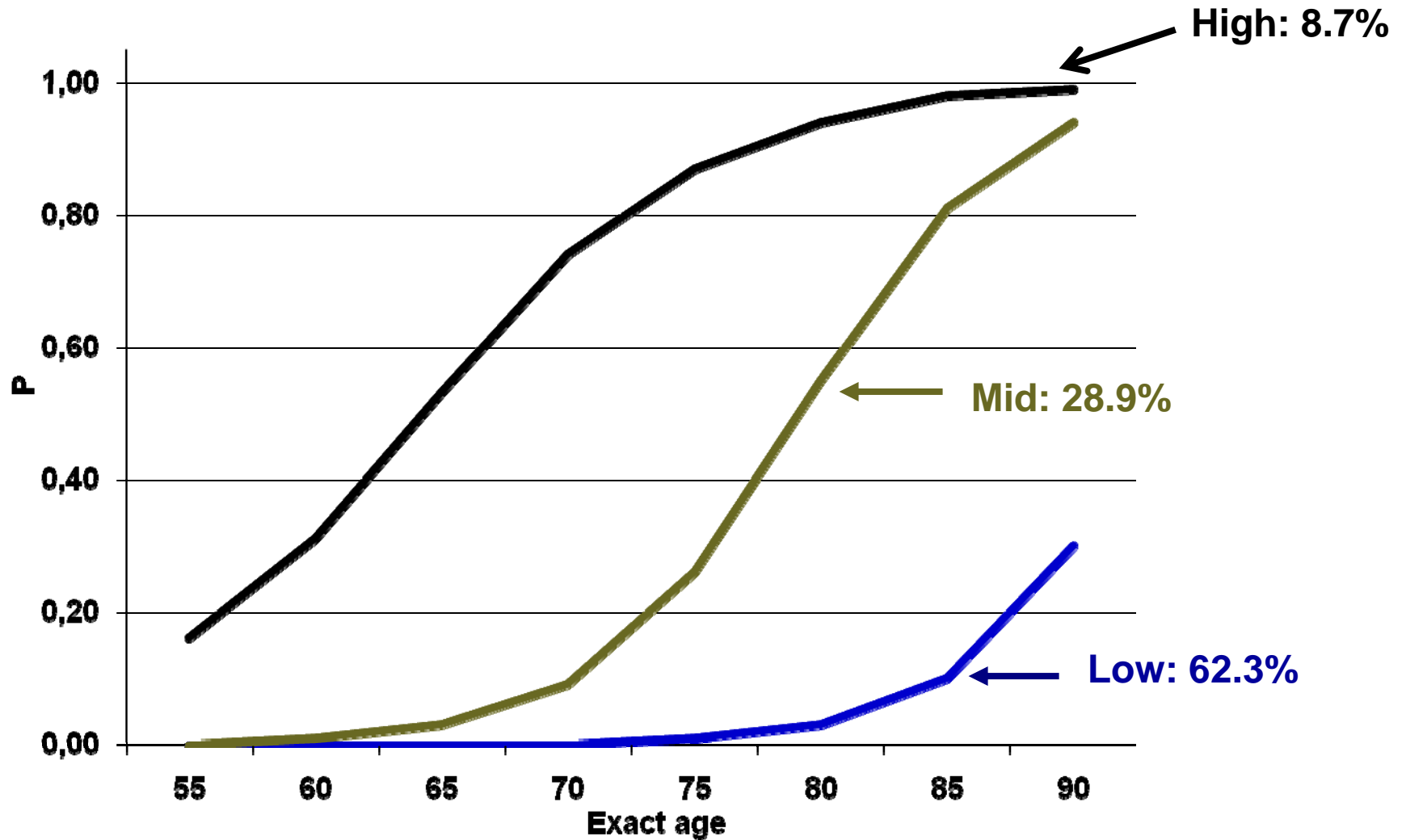
Predicted trajectories – Functional limitations



Predicted trajectories – IADLs



Predicted trajectories – ADLs

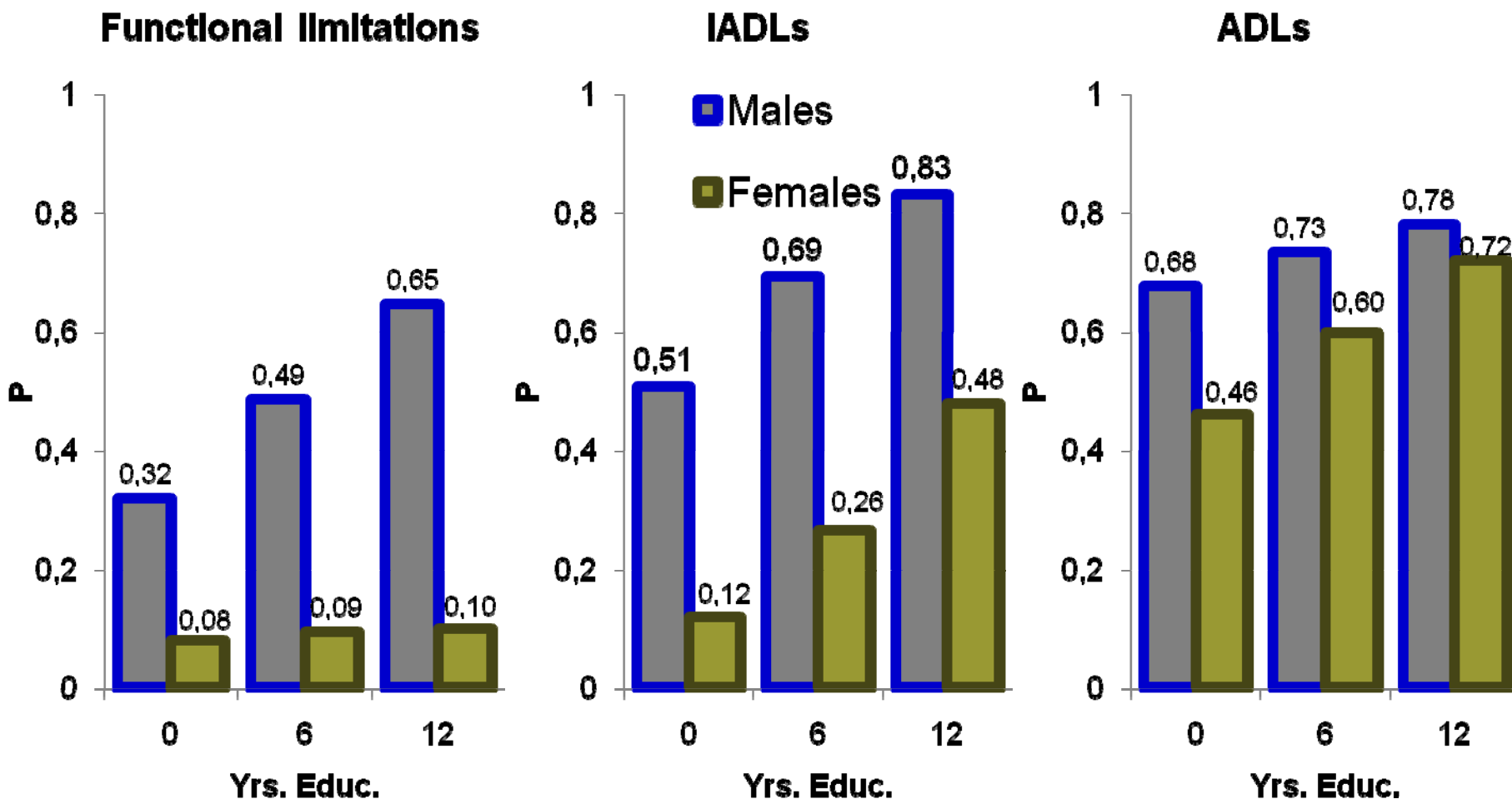


Log odds ratios of membership in trajectory groups

Group comparison	Functional limitations		IADLs		ADLs	
	Middle vs. Low	High vs. Low	Middle vs. Low	High vs. Low	Middle vs. Low	High vs. Low
Female	1.56*	1.81*	2.57*	1.51*	1.21*	0.09
Years of education	-0.09*	-0.15*	-0.13*	-0.13*	-0.03	-0.06*
Fem. * yrs. educ.	0.11*	0.06	-0.01	-0.09*	-0.06	-0.04
Mainlander	0.26	-0.06	0.08	-0.48*	-0.13	-0.20
Married	0.02	-0.02	0.32^	-0.24	0.15	-0.17
Urban residence	-0.11	0.01	0.22	0.08	0.18	-0.37*
Constant	0.24	-0.02	-1.57	-0.17	-1.57	-1.14

* $.05 > p$ ^ $.05 < p < .10$

Probability of being in the lowest trajectory group across outcomes, by sex and years of education



Based on multinomial regression results. Holding other variables constant at overall population modes, which are non-Mainlander, married and urban.

Conclusion

- * Group-based trajectory modeling identifies three significant pathways for functional limitations, IADLs, and ADLs among those 50 and older in Taiwan.**
 - * As expected, more people follow the high trajectory for FLs than for IADLs or ADLs, while very few follow the high trajectory for ADLs.**
 - * The chance of having an ADL difficulty is only about 10% at age 85 for the majority of the population who follow the low trajectory group.**
 - * Males and those with more education are more likely to follow lower trajectories.**
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Work in progress

*** Asking, what do these trajectories mean in a practical sense for onset, progression and mortality, and can we therefore link trajectory groups to patterns in disability-free life expectancy**

Percent of the population with an ADL disability at baseline by age at baseline and trajectory group membership

	50-59	60-69	70+
Group 1	0.0	0.0	0.7
Group 2	0.0	4.8	40.0
Group 3	20.0	62.4	100.0

Percent without ADL disability at baseline who experience an onset, by age at baseline and trajectory group membership

	50-59	60-69	70+
Group 1	0.0	0.0	10.8
Group 2	100.0	100.0	100.0
Group 3	93.6	100.0	No cases*

* All of those 70+ in group 3 have an ADL limitation at baseline

Percent with ADL disability at baseline who experience a recovery, by age at baseline and trajectory group membership

	50-59	60-69	70+
Group 1	No cases*	No cases*	83.3
Group 2	No cases*	100.0	33.4
Group 3	60.0	25.0	0.0

* All of those 50 to 69 in group 1, and 50-59 in group 2, have no ADL limitation at baseline

Other work in progress

- * **Modeling trajectories of number of limitations.**
 - * **Examination of group-based trajectories for different age cohorts. Do disability pathways differ for the younger elderly in comparison to the old-old?**
 - * **Dual trajectory modeling that allows for the joint modeling of different outcomes. Are those in high groups for one outcome also in high trajectory groups for others?**
 - * **Examination of additional covariates, some time-varying, such as family circumstances and health-related behaviors**
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Thank you

Merci

