

Mid-Life Patterns in Functional Limitation and Their Earlier-Life Determinants among a High Fertility Cohort of Women in the Philippines

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1 BACKGROUND / RESEARCH QUESTIONS

Functional health is a global concern.¹ Prevalence of functional problems is high among women in high fertility developing countries.^{2,3} Childbearing itself has consequences for functional health.⁴ Little if any research exists on patterns of functional health as women age, post-childbearing, through mid-life, in developing countries. Understanding these patterns and their determinants can help to comprehend the experience of late-life disability.

Thus, focusing on a population of high fertility women (N=1,437) in a high fertility setting, we ask the following:

1. What is the distribution of functional limitations prevalence and transitions across mid-life?
2. What common long-term patterns are detected over an 18 year observation period?
3. How do these patterns associate with earlier-life demographic and childbearing, socioeconomic, and health characteristics?

2 DATA

Data from the Cebu Longitudinal Health and Nutrition Study (CLHNS).⁵

The sample consists of women, all of whom:

- a) were pregnant and gave birth in 1983 or early 1984
- b) were 16 to 35 years old when giving birth
- c) survived and were followed through multiple survey waves from 1994 to 2012.

Average number of live births per woman in the sample is 5.7

Functional limitation measured five times over 18 years: 1994, 1998, 2002, 2007, 2012

CITATIONS
¹Murray, C.J. & A.D. Lopez. 1997. "Global mortality, disability, and the contribution of risk factors: Global Burden of Disease Study." *The Lancet* 349(9063):1436-1442.
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³World Health Organization. 2011. *World Report on Disability: Summary, 2011*. WHO/NMH/VIP/11.01. Available at <http://www.refworld.org/docid/50854a322.html> [September 6, 2014].
⁴Spence, N.J. 2008. "The long-term consequences of childbearing physical and psychological well-being of mothers in later life." *Research on Aging* 30(6):722-751.
⁵Adair, L.S., B.M. Popkin, J.S. Akin, D.K. Guilkey, S. Gultiano, J. Borja, L. Perez, C.W. Kuzawa, T. McEade, and M.J. Hindin. 2011. "Cohort profile: the Cebu longitudinal health and nutrition survey." *International Journal of Epidemiology* 40(3):619-625.

3 SAMPLE SIZE BY AGE AT DIFFERENT DATA POINTS

Baseline: Age when giving birth in 1983	Age when functional limitation first recorded in 1994	Age when functional limitation last recorded in 2012	N
16-20	27-31	55-59	230
21-25	32-36	60-64	505
26-30	37-41	65-69	442
31-35	42-46	70-74	260
Total			1,437

4 MEASURES

OUTCOME

Functional limitation: Has difficulty with one or more of:
 1) walking 1 km; 2) carrying 5 kg; 3) climbing stairs/hill

COVARIATES

Patterns in functional limitation are considered to be a function of a set of covariates representing four domains:

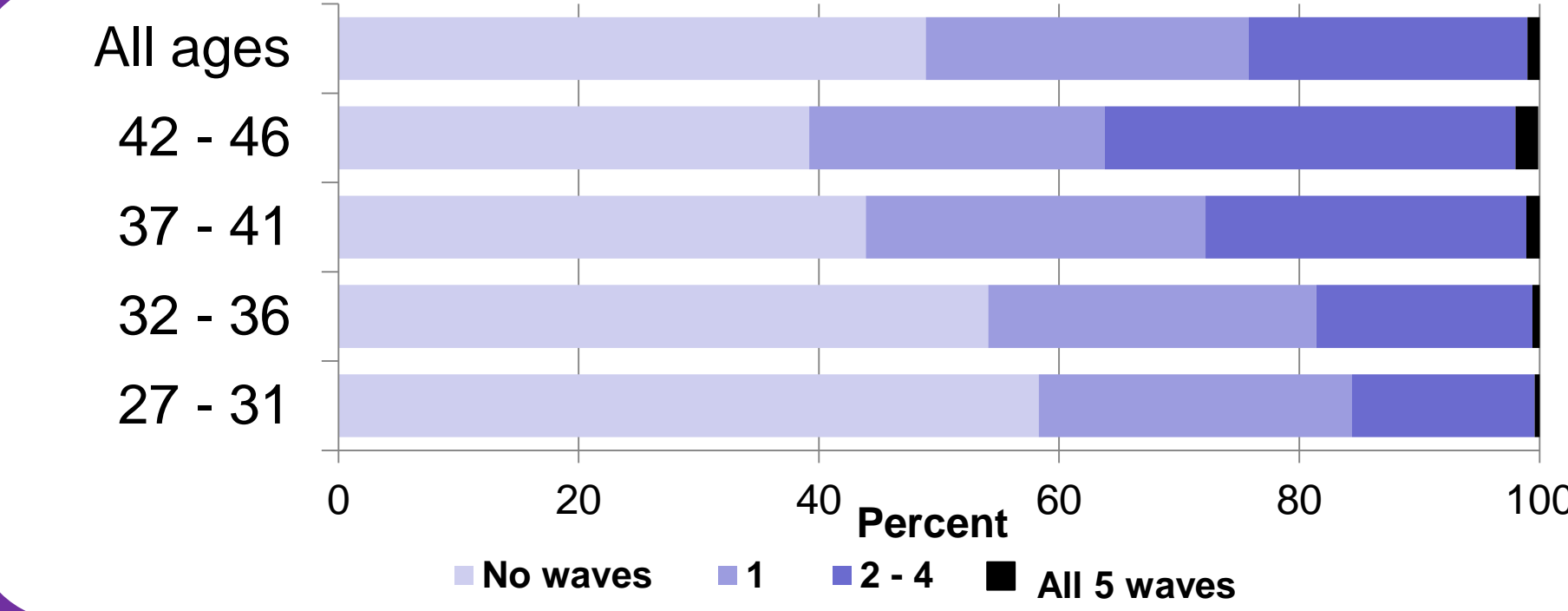
1. Demographic characteristics (e.g., age)
2. Childbearing Characteristics (e.g., number of pregnancies)
3. Earlier-life SES (e.g., education)
4. Earlier-life health (e.g., BMI at birth of indexed child)

5 ANALYSIS

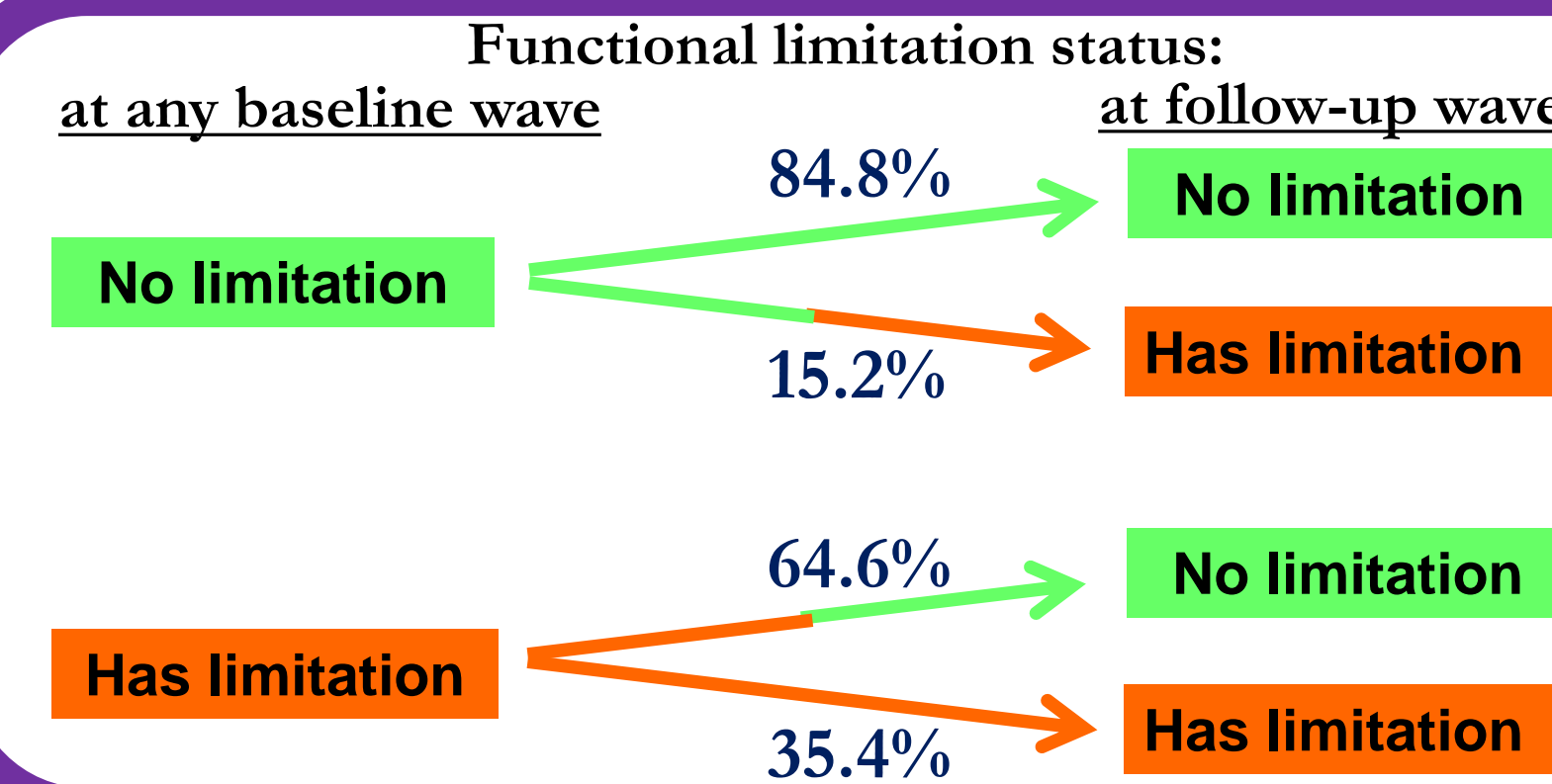
1. Describe the distributions of functional limitation and the probability of transitioning in and out of states between survey waves.
2. Given five data waves, number of potential patterns = 2⁵ = 32. Each of these possible patterns is represented in the data. A **Latent Class Analysis** is used to sort out the common patterns best fitting the data.
3. Once common patterns are determined, a multinomial regression is used to determine the covariates that relate to these patterns.

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6 DISTRIBUTION OF # WAVES IN WHICH LIMITATION IS REPORTED BY AGE FIRST IN 1994



7 PROBABILITY OF FUNCTIONAL LIMITATION TRANSITIONS FROM ANY WAVE TO THE NEXT



8 LATENT CLASS ANALYSIS SHOWING PROBABILITY OF A FUNCTIONAL LIMITATION

Functional limitation class	← Wave →				
	1994	1998	2002	2007	2012
1. Unlikely at any wave (67.0%)	Light Green	Light Green	Light Green	Light Green	Light Green
2. Onset/modulating (26.4%)	Light Green	Light Green	Light Green	Dark Green	Dark Green
3. Chronic (6.6%)	Light Green	Light Green	Light Green	Dark Green	Dark Green

9 STATISTICALLY SIGNIFICANT MULTINOMIAL REGRESSION COVARIATES

Covariate	Onset/modulating	Chronic
	vs. Unlikely at any wave	
Total pregnancies	-	
% pregnancies successful	-	
Household size	+	
Nuclear hh formation	-	
Age	+	+
Urban residence	+	+
Low BMI	+	
High BMI	+	+
Chronic conditions	+	+

10 CONCLUSION

1. This high-fertility population of women displays high levels of functional limitation.
2. Over 18 years, transitions in and out of functional limitation are common.
3. Three typical patterns observed:
 i.) some are unlikely to have limitations at any time;
 ii.) some experience an onset of or modulating probability;
 iii.) some are chronically limited.
4. Favorable patterns are a function of: successful and frequent childbearing; better health in earlier-life.

LEGEND

