Impact of Functional Difficulty on Mortality Among Older Filipinos

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Introduction

The Philippines is expected to join the ranks of aging societies in Asia, with the proportion of older adults projected to exceed 10% before the end of the current decade. The recent sharp decline in the country's fertility rate, now below replacement level, is likely to accelerate this demographic transition, resulting in both a growing number and share of older adults in the population. This new demographic challenge is particularly concerning given the country's relatively low level of economic development.

While increasing longevity reflects improvements in the overall health of the population, existing evidence does not indicate that the additional years gained are healthy years (Cruz et al., 2022). This suggests that rising life expectancy may simply result in more years lived in poor health and disability. As vulnerability increases with advancing age, a higher prevalence of functional disability is expected, leading to a greater demand for healthcare services, particularly geriatric care. Additionally, the need for caregiving will grow. In the Philippine context, care for older family members is predominantly provided by female relatives.

Ensuring longer, healthier, and happier lives for the growing number of older Filipinos requires a deeper understanding of the critical link between functional ability and survival rates. Utilizing the first nationally representative panel data on older adults in the Philippines, this paper aims to shed light on the functional abilities of older Filipinos, the severity of their difficulties, and their transitions rates. More importantly, it seeks to examine how functional difficulties impact on survival rates. This pioneering study aims to provide a scientific basis for developing interventions that improve health outcomes, particularly for the estimated one-fifth of the current cohort of older Filipinos who experience functional difficulties.

Data and Methods

The study will employ data from the Longitudinal Study of Ageing and Health in the Philippines (LSAHP), the first nationally representative panel survey on older Filipinos. It is designed to gather comprehensive data aimed at improving the well-being of older Filipinos. The LSAHP has two primary objectives: (1) to examine the health status and well-being of elderly Filipinos and identify the factors that influence these outcomes, and (2) to provide data for analyzing the determinants of health status and tracking changes over time.

The LSAHP baseline survey (Wave 1 or W1) was conducted from December 2018 to March 2019 and covered 5,985 older individuals aged 60 and above, with a response rate of 95%. Four years later, all baseline respondents were revisited at their addresses. Of these, 4,397 were still alive, 1,579 had passed away, and 9 could not be located. Both the baseline (W1) and the follow-up survey (Wave 2 or W2) achieved 95% and 94% response rates, respectively.

Using LSAHP linked data, this study aims to:

(1) describe the level, severity, and differentials of functional difficulty among older Filipinos at W1;

(2) Estimate the transition rates from initial functional status (with or without functional difficulty) to functional status and mortality by W2; and

(3) Assess the effect of initial functional status on the likelihood of dying in W2, controlling for socio-demographic characteristics, health-related behaviors, and health status.

The outcome of this study is the functional and mortality status at W2 (dead or still living). Mortality information at W2 was gathered during the follow-up survey conducted in 2023. Death status was reported by an informant, typically the deceased respondent's closest kin or friends, who were most familiar with the circumstances surrounding the death. When available, the death was further validated through death certificates.

Functioning is measured by self-reported difficulty in performing activities of daily living (ADLs), which assess an individual's ability to perform basic self-care tasks. Those who report difficulty performing at least one of seven ADLs (bathing/showering, dressing, eating, standing up from or sitting on a bed or chair, walking around the house, going outside, or using the toilet) are classified as having functional difficulty. Those who did not report any difficulty performing any of the seven ADLs are categorized as having no functional difficulty.

This study examined three sets of potential covariates: socio-demographic factors (age, sex, education, and wealth index), health behaviors (smoking, drinking, exercise), and health status (body mass index, presence, and number of diagnosed illnesses).

The proportion of individuals who experienced functional difficulty is calculated at W1. The IMaCH program will be used to estimate the transition rates with 95% confidence intervals from initial functional ability at W1 to functioning and mortality status at W2. IMaCH was developed by Brouard and Lievre to compute for Multistate Life Table. Multinomial logistic regression will be used to examine the effect of initial functional limitations on mortality, adjusting for the three sets of covariates (socio-demographic characteristics, health behaviors, and health status).

Initial findings

At baseline, over a fifth (22%) of older people have difficulty performing at least one of the seven ADLs (Table 1). Functional difficulty is more prevalent among women, older cohorts, with lower education and those who were diagnosed by a doctor to have at least one of 13 illnesses including high blood pressure, angina/myocardial infarction, diabetes, respiratory illnesses, renal or urinary tract ailments, cerebrovascular diseases and the like (Table 1). There is also an increasing proportion with functional difficulty with increasing number of reported diagnosed illnesses. Data show that 13% among those who reported no diagnosed illness have functional difficulty as compare to 20% and 34% among those with one and two or more diagnosed illnesses, respectively. The average number of diagnosed illnesses is 1.2.

Health-related behaviors such as smoking and drinking as well as health behavior such as exercise are also significantly associated with functional ability. Better health and health-related behaviors associated with higher functional difficulty as indicated for example with 23% of those not currently smoking having functional difficulty as compared to 15% among current smokers. The same pattern is observed for drinking and exercise. It is possible that those who have functional difficulties tend to adopt better health behavior.

Table 1. Proportion of older Filipinos with at least one ADL difficulty by selected background variables, LSAHP W1

Background characteristics	Percent	Number of cases
Sex***		
Male	19.5	2157
Female	23.2	3828
Age***		
60-69	15.4	2150
70-79	24.0	2343
80 and older	51.4	1492
Education		
Low	24.1	4006
High	15.2	1979
Current smoker***		
Yes	14.8	802
No	23.1	5183
Current drinkers***		
Yes	15.5	1508
No	24.2	4477
Engaged in physical exercise at least once a week***		
Yes	15.5	4194
No	38.2	1791
Diagnosed with at least 1 disease***		
Yes	26.5	4012
No	12.7	1973
Number of diagnosed diseases***		
0	12.7	1973
1	20.1	2074
2+	33.7	1938

ALL	21.7	5985

Note: *** p-value<.001

Functional status has a significant effect on survival of older people. Those initially with ADL difficulty demonstrate diminished survival than those without functional impairment, regardless of their baseline condition. Overall, 40% among those with at least one ADL difficulty at baseline died at follow-up as compared to 14% among those with no ADL difficulty (Table 2). The same pattern holds across all background characteristics although the degree varies across categories. For example, 57% among the oldest cohort (80+) with functional difficulty at baseline died at follow-up as compared to 23% among their youngest counterparts (i.e. 60-69). Having more diagnosed illnesses results in higher mortality. About 44% among those with at least 2 diagnosed illnesses and with functional difficulty at baseline died, much higher compared to their counterparts without diagnosed illness (31%). Education has mixed effect as shown by its moderating effect on mortality for those without ADL (11% died among those better educated compared to 16% among those with lower education). However, for those with functional difficulties, a higher proportion of the better educated died relative to those with lower education (49% vs 38%). We hope to clarify this finding when we run the MLogit model.

While more females than males are more likely to experience functional difficulty (23% among females vs 20% among males), more males than females are likely to die regardless of their initial functional status. Among those initially with functional difficulty 45% of males die at follow-up as compared to 37% among the females. The same male disadvantage is noted among those without any functional difficulties at baseline.

Table 2. Percent distribution of older Filipinos by functional status at Wave 1 by functional and mortality status at Wave 2, LSAHP

Functional status and background characteristics at W1	Wave functional health status (ADL)			TOTAL % (Number of cases)
	At least one ADL difficulty	No ADL difficulty	Dead	
Sex				
Male***				
w/ difficulty	38.8	16.2	45.0	100 (420)
w/o difficulty	73.5	8.2	18.3	100 (1737)
Female***				
w/ difficulty	35.0	28.1	36.9	100 (995)
w/o difficulty	77.8	11.1	11.1	100 (2833)
Age groups				
60-69***				
w/ difficulty	50.9	25.7	23.4	100 (249)
w/o difficulty	84.3	7.3	8.4	100 (1901)
70-79***				

w/ difficulty	31.5	19.1	49.5	100 (482)
w/o difficulty	64.3	13.7	22.1	100 (1861)
80 and older***				
w/ difficulty	17.4	25.8	56.8	100 (684)
w/o difficulty	37.6	21.7	40.7	100 (808)
Educational attainment				
Low***				
w/ difficulty	36.6	25.6	37.8	100 (1044)
w/o difficulty	74.1	10.5	15.5	100 (2962)
High***				
w/ difficulty	35.5	15.9	48.6	100 (371)
w/o difficulty	80.7	8.5	10.8	100 (1608)
Current smoker				
Yes***				
w/ difficulty	49.3	13.2	37.5	107
w/o difficulty	76.2	10.1	13.7	695
No***				
w/ difficulty	34.6	25.2	40.1	1308
w/o difficulty	75.9	9.9	14.2	3875
Current drinkers				
Yes***				
w/ difficulty	51.1	20.1	28.7	223
w/o difficulty	76.1	9.2	14.7	1285
No***				
w/ difficulty	32.5	24.8	42.7	1192
w/o difficulty	75.9	10.2	13.9	3285
Engaged in physical exercise at least once a week				
Yes***				
w/ difficulty	39.2	25.9	34.9	646
w/o difficulty	77.7	9.4	13.0	3548
No***				
w/ difficulty	33.3	21.5	45.2	769
w/o difficulty	69.9	11.8	18.3	1022
Diagnosed with at least 1 disease				
Yes***				
w/ difficulty	34.1	23.7	42.2	1092
w/o difficulty	73.7	10.5	15.8	2920
No***				
w/ difficulty	44.9	24.5	30.6	323
w/o difficulty	79.6	9.0	11.4	1650

Number of diagnosed diseases				
0 (None)***				
w/ difficulty	44.9	24.5	30.6	323
w/o difficulty	79.6	9.0	11.4	1650
1 (One)***				
w/ difficulty	42.8	17.6	39.6	433
w/o difficulty	76.7	8.4	14.9	1641
2+ (Two or more)***				
w/ difficulty	28.3	27.8	43.9	659
w/o difficulty	69.7	13.3	17.0	1279
ALL				
w/ difficulty	36.3	23.9	39.8	1415
w/o difficulty	76.0	9.9	14.1	4570

Note: *** p-value<.001

Next steps:

Further analysis will include the following:

1. Estimation of severity of ADL difficulty and their differentials by background characteristics.
2. Estimation of transition rates from initial functioning status to functioning and mortality status at follow-up using IMaCH (The IMaCH program was updated in September and we still have to study the new features that will run the transition rates with CI.)
3. Estimation of the determinant of mortality controlling for the stated control variables using MLogit.