

Chapter 4

Health Status

Josefina N. Natividad

December 2019

This chapter should be cited as

Natividad, J. N. (2019), 'Health Status', in G. T. Cruz, C. J. P. Cruz, and Y. Saito (eds.), *Ageing and Health in the Philippines*, Jakarta, Indonesia: Economic Research Institute for ASEAN and East Asia, pp. 47-74.

Health Status

Josefina N. Natividad

The primary objective of the Longitudinal Study of Ageing and Health in the Philippines (LSAHP) is to study the health status of older Filipinos, its correlates and determinants, and the health transitions that will ensue upon follow-up 2 years after the 2018 baseline survey. Health status can be described through a multiplicity of measures because health, based on the definition of the World Health Organization (WHO), consists of multiple dimensions. The LSAHP provides data on various aspects of health that will be of use in understanding the status of health and health transitions of older Filipinos. These data will provide the evidence base that can guide the crafting of appropriate programmes and policies to address the needs of this important and growing segment of the population.

Self-assessed Health

Self-assessed or self-rated health (SRH) is one of the most often used indicators of health in surveys on older adults and one of the oldest measures, having been around since the 1950s (Suchman, Philips, and Streib, 1958). To measure SRH, respondents are asked to rate their health on a 4- or 5-point scale, with the endpoints indicating the best and the poorest states. Because SRH has no clear objective referent, respondents are left to assess their health however they conceive it. Thus, SRH can be considered ‘a summary statement about the way in which numerous aspects of health, both subjective and objective, are combined within the perceptual framework of the individual’ (Tissue, 1972: 93).

Jylhä (2009) proposed that SRH be determined by an individual’s consideration of a combination of biological and social processes that then converge into one assessment. SRH is not only determined by knowledge of one’s medical condition and

the experience of physiological changes but also strongly influenced by one's social milieu and the assessment of one's state of health in relation to others of the same cohort, or of one's self at a prior point in time. It is not always strongly linked to age, but it is highly predictive of mortality. In one study of the old and very old, SRH was associated more with functional capacity, diagnoses of illness, and medications than with chronological age, which suggests that SRH may be 'more useful than age per se as an index of overall health' (Linn and Linn, 1980: 314). Using the United States Longitudinal Study on Aging, Lee (2000: 126) likewise reported that 'self-assessed global, physical, and mental health measures were predictive of functional decline and mortality in community-dwelling older adults.

In the LSAHP, SRH is elicited using a 5-point scale (1 = very healthy, 2 = healthier than average, 3 = of average health, 4 = somewhat unhealthy, 5 = very unhealthy). Results show that the most common self-assessment by older Filipino adults (about 4 in 10) is 'of average health', with the proportion slightly higher amongst women and the young old (60–69) (Table 4.1). About 3 in 10 assessed themselves as 'somewhat or very unhealthy', whilst 1 in 5 said they are either 'very healthy' or 'healthier than average'. Overall, women have better SRH than men, whilst the young old have better SRH than the middle (70–79) and oldest age cohort (80+). Older person (OP) respondents had a more positive assessment of their health whilst growing up, with 68% claiming to have been very healthy, and 23% healthier than average.

Table 4.1. Self-assessed Health by Sex and age

Self-assessed Health	SEX			AGE GROUP				TOTAL
	Male	Female	Sig	60-69	70-79	80+	Sig	
Current								
Very healthy	7.6	12.2		11.4	9.3	4.5		10.3
Healthier than average	14.6	10.0		13.6	8.9	6.9		11.9
Of average health	46.3	48.4	n.s.	49.2	45.0	42.6	***	47.6
Somewhat unhealthy	29.1	26.6		23.9	33.6	38.7		27.6
Very unhealthy	2.4	2.9		1.9	3.2	7.3		2.7
<i>N</i>	2,193	3,255		3,613	1,397	437		5,447
While growing up (from birth to age 16)								
Very healthy	70.0	67.0		68.1	67.1	73.2		68.3
Healthier than average	22.7	22.9		22.5	24.2	20.6		22.8
Of average health	6.8	9.1	n.s.	8.7	7.7	5.6	n.s.	8.2
Somewhat unhealthy	0.2	0.9		0.6	0.8	0.6		0.6
Very unhealthy	0.3	0.1		0.2	0.1	0.1		0.1
<i>N</i>	2,196	3,259		3,614	1,400	439		5,454

*** $p < .001$. n.s. = not significant.

Source: Calculated by DRDF using original LSAHP data.

Diagnosed Illnesses

The respondents were presented a list of diseases, mostly chronic in nature and prevalent amongst older adults, and asked if they had been told by a doctor that they currently have any of those diseases listed in the LSAHP questionnaire. Because the question is premised on a medical diagnosis, the possibility of underreporting is high given the differential access to healthcare in the country, but the likelihood of correct diagnosis is also higher for those who do have access to healthcare.

Following the suggestion of Zimmer, Natividad, Ofstedal, and Lin (2002), the diseases in the list are grouped into two. Group-1 diseases are not life-threatening and are recognisable to the respondent even without a medical diagnosis (arthritis, neuralgia, and rheumatism; chronic back pain; cataracts; fractures of the hip, thigh, and pelvis; and other fractures). Group-2 diseases require a medical diagnosis to be recognised by the respondent (Table 4.2).

The prevalence of the group-1 diseases is generally low. About 18% reported being told by a doctor that they have arthritis, 17% cataracts, and less than 3% chronic back pain or fractures. The proportion diagnosed with a group-1 disease is generally higher amongst women but with no consistent pattern by age.

Table 4.2. Diagnosed Illnesses by Sex and Age

Diagnosed Illnesses	SEX			AGE GROUP				TOTAL
	Male	Female	Sig	60-69	70-79	80+	Sig	
GROUP 1								
Arthritis, neuralgia or rheumatism	13.9	20.3	n.s.	16.6	20.1	18.8	n.s.	17.7
Chronic back pain	2.0	2.8	n.s.	2.2	2.3	4.0	n.s.	2.5
Cataracts	12.8	19.5	*	12.4	24.7	23.2	***	16.8
Fractures of the hip, thigh and pelvis/ broken hip	2.0	2.7	n.s.	1.8	2.5	5.6	*	2.4
Other fractures	1.6	1.2	n.s.	1.1	1.8	1.7	n.s.	1.4
GROUP 2								
High blood pressure	38.4	50.3	***	43.4	49.5	47.7	n.s.	45.5
Angina/myocardial infarction, etc.	8.8	14.4	***	11.6	13.9	11.3	n.s.	12.2
Cerebrovascular disease (hemorrhage, infarction, stroke, etc.)	7.3	6.4	n.s.	6.2	7.2	8.7	n.s.	6.8
Diabetes	11.9	13.1	n.s.	12.7	14.0	9.1	n.s.	12.6
Respiratory illness (chronic, such as asthma, emphysema)	10.0	7.5	n.s.	6.2	12.4	12.4	***	8.5
Digestive illness (stomach or intestinal)	6.0	4.1	n.s.	5.0	4.7	4.8	n.s.	4.9
Renal or urinary tract ailments/kidney	9.4	13.4	n.s.	12.4	10.6	11.0	n.s.	11.8
Osteoporosis	0.2	0.9	n.s.	0.4	0.6	1.7	n.s.	0.6
Tuberculosis	6.8	2.3	**	4.1	4.7	2.7	n.s.	4.1
Ailments of the liver or gallbladder	2.3	1.7	n.s.	1.7	2.4	2.2	n.s.	2.0
Glaucoma	0.7	1.4	n.s.	1.0	1.1	1.6	n.s.	1.1
Cancer	0.7	0.7	n.s.	0.7	0.6	1.1	n.s.	0.7
Slipped disc	0.6	0.5	n.s.	0.5	0.6	0.6	n.s.	0.6
<i>N</i>	2,411	3,574		3,760	1,552	673		5,985

* $p < .05$. ** $p < .01$. *** $p < .001$. n.s. = not significant.

Source: Calculated by DRDF using original LSAHP data.

Of the group-2 diseases, hypertension has the highest prevalence (46%). Diabetes, angina or myocardial infarction, and renal or urinary ailments are the next highest although at much lower levels than hypertension, all below 13%. For all four most commonly reported diagnosed illnesses, the prevalence is higher for women but there is no discernible pattern by age.

About 4% of all respondents have had a heart attack, with no difference between the sexes, although the average age at heart attack is higher for men (mean of 63 years) than women (mean of 59 years) (Table 4.3). The percentage of those who have had a heart attack increases slightly with age as does the mean age at heart attack. Amongst those who have experienced a heart attack, only half were taking medication for their heart condition at the time of the survey, with the proportion highest amongst the oldest age cohort (67%).

Table 4.3. Experience of Heart Attack by Sex and Age

Experience of Heart Attack	SEX			AGE GROUP				TOTAL
	Male	Female	Sig	60-69	70-79	80+	Sig	
Ever had a heart attack	3.1	3.9	n.s.	3.2	4.3	4.4	n.s.	3.6
N	2,411	3,574		3,760	1,552	673		5,985
Mean age experienced heart attack	63.40	58.79	n.s.	53.03	65.92	76.97	***	60.47
N	76	131		113	65	29		207
Currently taking medicine for heart condition	50.5	49.0	n.s.	48.3	44.4	66.6	n.s.	49.6
N	75	140		118	67	30		215

***p < .001. n.s. = not significant.

Source: Calculated by DRDF using original LSAHP data.

Oral Health

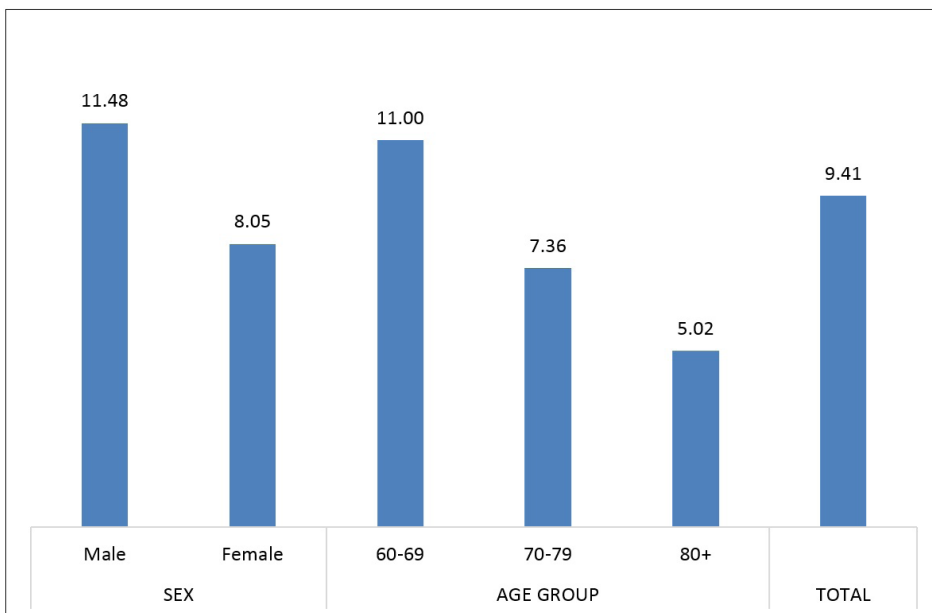
One of the most neglected areas of the study on health and well-being in the older years is oral health, yet oral health problems can have profound impacts on the quality of life and can be a risk factor for major diseases. For example, studies have shown a relationship between periodontal disease and diabetes (Borgnakke, Ylöstalo, Taylor, and Genco, 2013); cardiovascular diseases (Beck et al., 2005; Joshipura, Wand, Merchant, and Rimm, 2004); and possibly dementia and/or cognitive impairment (Gil-Montoya et al., 2014; Zuluaga, Montoya, Contreras, and Herrera, 2011). Furthermore, untreated caries and periodontal diseases can lead to edentulism or tooth loss, either partial or complete. In turn, edentulism is directly related to mastication or chewing and nutritional problems (Zhu and Hollis, 2014). Two major epidemiologic studies in the United States and the United Kingdom showed that edentulism was a risk factor for inadequate dietary intake (Nowjack-Raymer and Sheiham, 2003; Walls and Steele, 2004). Being toothless, with or without dentures, limited the consumption of healthier but harder-to-chew foods such as fruits and vegetables as well as proteins and micronutrients whilst increasing carbohydrate intake. Difficulties with chewing food also affect quality of life (Moynihan et al., 2009).

The retention of 20 natural teeth for good oral health is a goal advocated by the World Health Organization (WHO) (Fernandes and Chitre, 2008) and reiterated in The Global Goals for Oral Health 2020 (Hobdell, Petersen, Clarkson, and Johnson, 2003). This recommended goal is based on successful public health campaigns for improved oral health extending to the older years. One such programme cited by

WHO is the Government of Japan's 80/20 Movement, launched in 1989 to promote oral health with a target of having 20 natural teeth by age 80 (Chiu et al., 2016; Nakayama and Mori, 2012; Shinsho, 2001; Global Review on Oral Health in Aging Societies, 2002). A newer concept, that of shortened dental arches, first proposed by Kayser (1990), refers to the loss of posterior teeth (molars and premolars). In this view, tooth loss has less severe consequences if the remaining teeth include occluding or antagonist premolar or molar pairs (Kanno and Carlson, 2006).

From the LSAHP results, it is immediately apparent that the state of oral health of older Filipinos is poor based on the goal of 20 natural teeth, as the recorded average number of natural teeth is only 9, with men having significantly more (average of 11) than women (8) (Table 4.4). The mean number of natural teeth decreases steadily with age from 11 amongst the 60-69 age group to only 5 amongst the oldest age group, 80 years old and older. The mean number of occluding pairs will be presented in subsequent reports.

Figure 4.1 Mean Number of Natural Teeth by Sex and Age



Source: Calculated by DRDF using original LSAHP data.

Table 4.4. Oral Health by Sex and Age

Oral Health Indicators	SEX			AGE GROUP				TOTAL
	Male	Female	Sig	60-69	70-79	80+	Sig	
Mean number of natural teeth	11.48	8.05	***	11.00	7.36	5.02	***	9.41
N	2,289	3,484		3,657	1,490	626		5,773
% with no teeth	16.6	35.4	***	21.4	36.0	47.1	***	28.0
N	2,292	3,483		3,475	1,713	594		5,782
Mean number of functioning teeth	3.48	2.32	***	3.37	2.00	1.16	***	2.78
N	2,271	3,457		3,631	1,478	629		5,728
% who have dentures	19.3	40.1	***	28.6	38.1	34.3	n.s.	31.7
N	2,411	3,574		3,760	1,552	673		5,985
% who always use dentures when they eat	82.0	86.9	n.s.	89.3	81.3	80.3	*	85.7
N	464	1,435		1,077	591	232		1,900
% who are satisfied with their dentures	81.1	75.7	n.s.	80.6	72.3	72.2	n.s.	77.0
N	465	1,435		1,077	591	231		1,899

*p < .05. ***p < .001. n.s. = not significant.

Source: Calculated by DRDF using original LSHP data.

In all, 28% of older Filipinos are completely edentulous or have no remaining natural teeth. The gender difference is marked; whilst 17% of men have no remaining natural teeth, the comparative proportion for women is 35%. The proportion of those who are completely edentulous increases monotonically with age such that amongst the oldest age group, close to half (47%) have no remaining natural teeth.

The use of prosthesis or dentures alleviates the effects of the loss of natural teeth. Results show that 32% of older Filipinos have dentures; the proportion is much higher amongst women (40%) than men (19%). But amongst those who have no natural teeth and thus need dentures the most, only 60% have dentures (data not shown). This means that 4 in 10 of older Filipinos with no remaining natural teeth suffer the consequences of having no teeth at all, neither natural nor prosthesis. Results show that 86% of OPs always use their dentures when they eat and only 77% are satisfied with them.

Sleep

For the layperson, amongst the most often mentioned changes associated with getting on in years are the noticeable alterations in sleeping patterns. The common self-reported sleep complaints of OPs are difficulties in falling asleep and staying asleep, waking up too early, and not feeling rested after a night of sleep (Maggi et

al., 1998). Sleep-related daytime disturbances include daytime fatigue, excessive daytime sleepiness, and an increased likelihood of falling asleep during the day. Ageing is further associated with the tendency to fall asleep early and to wake up early. Furthermore, OPs are less tolerant of shifts in sleep-wake schedules such as those produced by shift work and jet lag (Vitiello, 2006).

In a meta-analysis of data from 2,391 adults aged 19–102, Ohayon, Carskadon, Guilleminault, and Vitiello (2004) confirmed four major age-related changes in sleep patterns: decreased total sleep time, decreased sleep efficiency, decreased slow-wave sleep, and more frequent wakefulness after sleep onset. These changes occur not only in the older years but gradually over the full adult life span. In the same study, analysis done only of older adults (60+) found that only sleep efficiency declined significantly from age 60–70 to 70 and over, and even then, only at a modest rate. This finding contradicts previous studies showing progressive age-related changes in sleep patterns in the older population. Vitiello (2006) attributed this to the strict criteria used by Ohayon et al. (2004) to select the sample for the meta-analysis, confining it to healthy older adults. In contrast, in other studies on sleep patterns of older adults using more heterogeneous samples that included both the healthy and unhealthy, findings indicate a higher prevalence of sleep disturbances such as excessive daytime sleepiness, regular napping, and disturbed sleep, which may be due to the presence of comorbidities and not to advanced age per se. Still, an age-related change is observed in both healthy and unhealthy older adults, which is a shift in the circadian rhythm towards an early sleep and wake-up time as well as a shorter sleep duration (Vitiello, 2006).

The shorter sleep duration in the older years is supported by the current data on older Filipinos, who report an average sleep duration of 6 hours (Table 4.5). There is no notable gender and age difference in mean sleep duration. Still, despite the seemingly shorter sleep duration, about 8 in 10 expressed satisfaction with their sleep.

Other common sleep-related disturbances are not highly prevalent; only 15% report having trouble falling asleep most of the time, and 15% say they have trouble with waking up during the night most of the time. Evidence of a shift in the circadian rhythm can be inferred from the relatively high prevalence (25%) of those who report waking up too early and being unable to fall asleep again most of the time. About half of all older Filipinos report feeling rested when waking up in the morning most of the time. At the other extreme, close to one in five rarely or never feels rested

upon waking up in the morning. There is no significant gender or age difference in this experience. Overall, only 1% report taking any medication or using treatments to induce sleep in the past 2 weeks.

Table 4.5. Sleeping Habits by Sex and Age

Sleeping Habits	SEX			AGE GROUP				TOTAL
	Male	Female	Sig	60-69	70-79	80+	Sig	
Mean no. of hours of sleep per night	6.16	6.18	n.s.	6.28	5.95	6.01	**	6.17
<i>N</i>	2,194	3,240		3,600	1,399	435		5,434
% who are satisfied with their sleep	82.8	81.6	n.s.	81.7	83.1	82.0	n.s.	82.1
<i>N</i>	2,161	3,144		3,504	1,370	431		5,305
Have trouble falling asleep								
Most of time	12.4	17.1		13.7	18.4	17.9		15.2
Sometimes	29.3	34.2	**	32.7	30.8	33.1	n.s.	32.2
Rarely	31.1	30.1		32.4	26.4	28.1		30.5
Never	27.2	18.6		21.2	24.4	21.1		22.0
<i>N</i>	2,170	3,257		3,590	1,396	438		5,424
Have trouble with waking up during the night								
Most of time	13.8	15.5		13.9	16.1	18.4		14.8
Sometimes	27.7	36.1	**	31.4	34.8	37.4	n.s.	32.8
Rarely	35.8	28.2		33.7	25.9	28.8		31.3
Never	22.6	20.2		21.1	23.2	15.5		21.2
<i>N</i>	2,171	3,254		3,589	1,398	437		5,424
Have trouble with waking up too early and not being able to fall asleep again								
Most of the time	23.7	26.0		23.8	26.5	31.0		25.1
Sometimes	27.5	34.5	n.s.	31.3	32.5	32.7	n.s.	31.7
Rarely	30.0	27.3		29.8	25.3	26.7		28.4
Never	18.8	12.2		15.1	15.7	9.7		14.8
<i>N</i>	2,170	3,256		3,588	1,399	439		5,426
Feels really rested when waking up in the morning								
Most of time	54.3	52.0		52.9	53.4	52.1		52.9
Sometimes	26.8	28.6	n.s.	27.3	29.1	28.3	n.s.	27.8
Rarely	16.4	16.2		17.2	13.9	16.0		16.3
Never	2.5	3.3		2.6	3.6	3.6		3.0
<i>N</i>	2,170	3,255		3,589	1,398	438		5,425
% who have taken any medications or used other treatments to help induce sleep in the past two weeks	0.7	1.5	*	0.8	1.3	3.3	**	1.2
<i>N</i>	2,411	3,570		3,757	1,551	673		5,981
% who take naps regularly	41.5	39.1	n.s.	32.8	50.1	57.6	***	40.1
<i>N</i>	2,410	3,573		3,760	1,552	672		5,984
Mean duration of naps (in minutes)	76.24	77.72	n.s.	68.88	81.33	94.86	***	77.10
<i>N</i>	977	1,349		1,197	757	373		2,327

*p < .05. **p < .01. ***p < .001. n.s. = not significant.

Source: Calculated by DRDF using original LSHP data.

Another age-related change in sleep is daytime napping; 40% of OPs say they nap regularly. There is a significant difference by age. Amongst the oldest cohort, 58% say they nap regularly; amongst the youngest (60–69), 33%. The mean nap duration also increases with age, from an average of 69 minutes amongst the 60–69 cohort to 95 minutes amongst the oldest (80+).

Pain

In recent years, a conspicuous increase in interest in pain and ageing has been evident in the rising number of publications on this topic. Underlying this interest is the rapid increase in the proportion of OPs in most countries and in the world's population, and the unique vulnerabilities of this age sector. Pain is not a normal consequence of ageing, but OPs are at greater risk of pain because they usually have the highest rates of surgery, hospitalisation, injury, and disease in the population (Gibson and Lussier, 2012).

In a review article on the epidemiology of pain amongst older adults, Helme and Gibson (2001) report that results from many studies on pain converge around the conclusion that its occurrence increases with age, but only up to the seventh decade. Pain in older adults is mainly a result of degenerative joint and spine diseases coupled with leg and foot disorders. The authors raised methodological concerns in interpreting studies on pain amongst older people, such as sample bias (e.g. too-small samples, non-probability samples, overrepresentation of community-dwelling older adults, and underrepresentation of the institutionalised); response bias (e.g. lack of comparable scales across studies); and age-associated physiologic changes in the pain pathways.

Other studies delve into the consequences of pain, especially the chronic kind, i.e. pain that is recurrent or persistent and lasts longer than 3 months. Generally, chronic pain can affect the ability to function and to perform activities of daily living. Pain of long duration is also often associated with adverse psychological outcomes. Studies have shown that chronic pain leads to mood disturbance, which in many cases exacerbates the experience of pain regardless of the pathophysiological cause. The longer the pain persists, the greater the likelihood of the individual becoming depressed, withdrawn, and irritable as well as having an overall poor quality of life. Depression has been identified as one of the consequences of long-term chronic pain (Gibson, Katz, Corran, Farrel, and Helme, 1994).

Research has shown too that not all pain has a physical origin; sometimes pain is the effect of severe emotional distress. In one study conducted with patients in a multidisciplinary clinic, about 15% of the older adult patients had no known organic cause for their pain but were primarily diagnosed with primary depression or ‘somatoform pain disorder, a condition where there is a preoccupation with pain not attributable to any other mental or physical disorder, or complaints of pain grossly in excess of what would be expected from any physical finding’ (Gibson et al., 1994: 130). Having pain of psychosomatic rather than organic cause does not make it any less distressing for the sufferer.

Pain is primarily a subjective experience; hence, the level of severity, as well as the tolerance for it, may be affected by individual differences. Some evidence shows that OPs may have a higher tolerance for pain because they expect it as a natural consequence of ageing and are therefore more stoic in bearing it (Gibson et al., 1994).

In the LSAHP, the pain question is, ‘Are you often troubled with pain?’ Although no specific time is referenced, the question implies that the pain is recurrent enough to be troublesome and thus suggests chronic pain. One in three (33%) older Filipinos reports being often troubled with pain, with about the same prevalence for men and women but increasing with age. More than half (58%) of those who are troubled with pain assess its severity to be moderate whilst 1 in 10 report being in severe pain (Table 4.6).

Table 4.6. Experience of Pain by Sex and Age

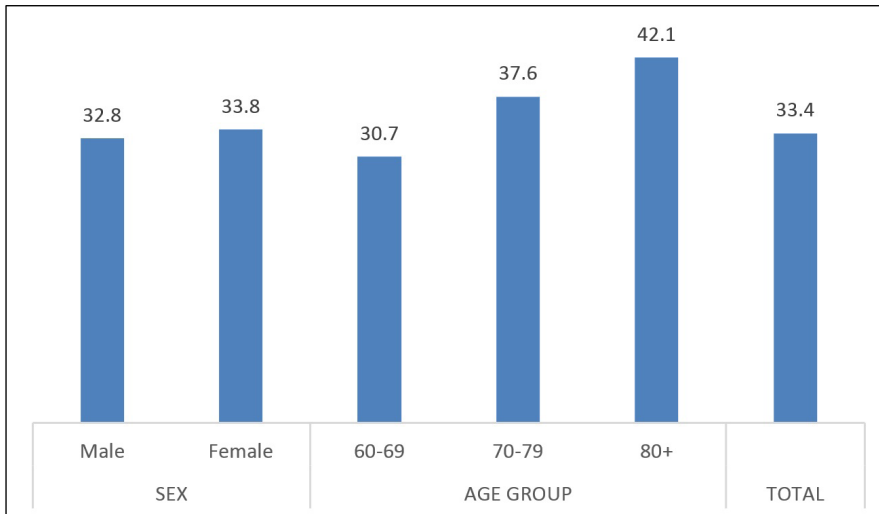
Pain Experience	SEX			AGE GROUP				TOTAL
	Male	Female	Sig	60-69	70-79	80+	Sig	
% who are often troubled with pain	32.8	33.8	n.s.	30.7	37.6	42.1	**	33.4
N	2,195	3,258		3,615	1,400	439		5,454
Severity of pain experienced								
Mild	31.6	31.6	n.s.	35.9	22.8	30.8	*	31.6
Moderate	55.7	60.3	n.s.	53.2	69.5	58.8	*	58.5
Severe	12.8	8.1	n.s.	10.9	7.7	10.5	*	9.9
N	719	1,101		1,108	527	185		1,820
% who said pain make it difficult for them to do their usual activities	60.0	60.0	n.s.	58.8	61.8	61.9	n.s.	60.0
N	718	1,101		1,107	526	186		1,819
Body parts that felt pain								
Head	45.5	44.2	n.s.	44.2	46.1	44.2	n.s.	44.7
Neck	9.0	14.8	n.s.	12.6	13.5	8.8	n.s.	12.5

Pain Experience	SEX			AGE GROUP				TOTAL
	Male	Female	Sig	60-69	70-79	80+	Sig	
Shoulders	48.8	51.6	n.s.	46.6	58.5	51.2	**	50.5
Back	17.7	30.8	*	25.3	27.9	21.2	n.s.	25.6
Lower back	21.1	23.6	n.s.	18.9	29.3	25.8	*	22.6
Joints of the hands/arms	21.8	32.0	***	28.1	30.2	20.8	n.s.	28.0
Hip joint	6.3	6.2	n.s.	5.4	7.7	6.6	n.s.	6.2
Others (knees, ankles, feet, etc.)	22.6	18.2	n.s.	21.5	17.0	18.9	n.s.	19.9
<i>N</i>	720	1,101		1,109	527	185		1,821

*p < .05. **p < .01. ***p < .001. n.s. = not significant.
 Source: Calculated by DRDF using original LSAHP data.

Six in ten of those who are troubled with pain say that the pain makes it difficult for them to do their usual activities. The body parts most often reported as the sites of pain are the shoulders (51%), head (45%), joints of the hands (28%), back (26%), and lower back (23%).

Figure 4.2. Older Persons Often Troubled with Pain, by Sex and Age (%)



Source: Calculated by DRDF using original LSAHP data.

Falls

A highly prevalent health risk amongst older adults is the risk of falls. Falls are a leading cause of fatal and nonfatal injuries in this age group. Falls can lead to hospitalisation and impairment in the ability to perform activities of daily living, thus negatively

affecting the quality of life. Amongst the risk factors for falls reported in several studies are older age, less walking, presence of comorbidities and disabilities, severe psychological distress, or poorer health in general (Qin and Baccaglini, 2016). Impaired balance and gait, polypharmacy, and a history of previous falls are other major risk factors for falls in older adults (Ambrose, Paul, and Hausdorff, 2013).

Other studies suggest that the risk of falls may also be related to age-associated declines in cognitive function. Specifically, studies have shown that executive function, which ‘involves the ability to think abstractly and to plan, initiate, sequence, monitor, and stop complex behavior’ (American Psychiatric Association, 1994: 135), may play an essential role in the regulation of gait (or manner of walking). Age-associated decline in physical coordination can be exacerbated when the OP who needs to navigate complex everyday situations (e.g. talking whilst walking, crossing a busy street, or walking on uneven surfaces) suffers from impaired executive function and thus has a compromised ability to maintain a fall-free gait. In a 5-year prospective study of community-dwelling elderly, Mirelman and colleagues (2012) demonstrated that the risk of future falls was predicted by performance in executive function and attention tests 5 years earlier. Better performance in executive function and attention tests were associated with a lower risk of falls after controlling for age, sex, and fall history.

LSAHP respondents were asked whether they had had a fall in the last 12 months and, if they had, how many times they had fallen in that period. In all, 19% report a fall in the past 12 months, with an average of 1.7 falls during that period (Table 4.7).

Table 4.7. History of Falls by Sex and age

History of Fall	SEX			AGE GROUP				TOTAL
	Male	Female	Sig	60-69	70-79	80+	Sig	
% who fell in the past 12 months	18.5	20.0	n.s.	18.7	20.3	21.3	n.s.	19.4
N	2,407	3,571		3,756	1,549	672		5,977
Mean number of times fallen in the past 12 months	1.89	1.62	n.s.	1.59	1.91	2.01	**	1.73
N	444	711		698	314	143		1,155
% who injured self seriously enough to need medical treatment	18.0	13.4	n.s.	12.5	17.5	23.1	n.s.	15.1
N	445	714		703	314	143		1,160

**p < .01. n.s. = not significant.

Source: Calculated by DRDF using original LSAHP data.

The average frequency of falls increases with age. The oldest cohort (80+) report an average of two falls in 12 months. Of those who had had a fall, 15% report being injured seriously enough to need medical treatment.

Incontinence

Like pain, urinary incontinence is not a normal part of ageing, but its prevalence tends to increase with age. According to Resnick (1987), certain changes in the urinary system occur with advancing age – primarily an increased likelihood of involuntary bladder contractions; changes in the pattern of fluid excretion so that OPs excrete more of their daily fluid intake at night (after 8 or 9 pm), resulting in a higher likelihood of awakening at night to urinate; shrinkage of the bladder; and decline in the strength of the urethral sphincter. None of these changes alone causes incontinence, ‘but each reduces the reserve capacity of the lower urinary tract to withstand an additional insult’ (Resnick, 1987: 68). Such additional insult can be in the form of medications that OPs are more likely to be taking and comorbidities that OPs are more likely to have.

The consequences of urinary incontinence depend on its severity, both real and perceived. Incontinence may cause social and psychological problems if the OP shies away from social activities and from going out in public for fear of embarrassment or social stigma. Despite this, many older adults do not seek help for urinary incontinence, which may be because they assume that it is ‘an inevitable, irreversible, and normal part of ageing’ (Stoddart, Donovan, Whitley, Sharp, and Harvey, 2001: 548). Urine and faecal incontinence are likely to be more prevalent amongst the oldest age group, those in long-term care, or those with multiple morbidities.

Questions on incontinence in the LSAHP asked about the loss of bladder and bowel control and the frequency of its occurrence. The question was also asked of the proxy respondent. In all, more than 8 in 10 (82%) older Filipinos report no loss of control in either bladder or bowel movement; hence, incontinence is not highly prevalent (Table 4.8). Still, urinary incontinence is the most prevalent form of incontinence at 11% (12% in women and 9% in men) and increases with age; 4% of older Filipinos have loss of both bowel and bladder control, and 2% have loss of bowel control only.

Table 4.8. Incontinence by Sex and Age

Incontinence	SEX			AGE GROUP				TOTAL
	Male	Female	Sig	60-69	70-79	80+	Sig	
Loss of bladder or bowel movement								
Both bladder or bowel movement control	4.3	4.6		3.2	4.3	12.0		4.5
Bladder control only	9.2	12.2	n.s.	9.2	13.3	16.0	***	11.0
Bowel movement control only	2.1	2.0		2.1	1.8	2.5		2.0
No loss of control	84.5	81.2		85.6	80.6	69.5		82.5
N	2,409	3,568		3,759	1,551	667		5,977
Frequency								
Very often	12.4	10.2		8.3	11.8	16.6		11.0
Often	16.4	16.6		16.5	13.5	21.0		16.5
Sometimes	29.6	33.8	n.s.	30.3	35.4	33.1	n.s.	32.3
Seldom	21.9	28.8		28.7	28.5	16.9		26.3
Very seldom	19.8	10.7		16.2	10.8	12.5		13.9
N	375	677		542	302	209		1,053

***p < .001. n.s. = not significant.

Source: Calculated by DRDF using original LSAHP data.

Mental Health

Depression

Depression has been identified by WHO as one of the major contributors to global disability. It is known to affect people of all ages, but findings on the age pattern of prevalence have been mixed and sometimes contradictory. For example, in the 2017 WHO estimates of the global prevalence of depression across age groups, the prevalence peaks at ages 55–74 and drops thereafter (WHO, 2017). Sutin et al. (2013), using data from the Baltimore Longitudinal Study on Aging, reported a curvilinear pattern with a high prevalence in young adulthood, a dip in middle adulthood, and a rise in old age. Most studies find a gender difference, with more women depressed than men, although the gender gap narrows in the older ages. Still, there is a consensus in the literature that depression or depressive symptoms may be higher in the older years because of the many possible age-related triggers such as health problems, bereavement from the loss of loved ones, and retirement. In the LSAHP, depressive symptoms were measured using the 11-item version of the 20-item Center for Epidemiologic Studies Depression (CES-D) scale first used by Kohout, Berkman, Evans, and Cornoni-Huntley (1993). The scoring is as follows: 0 = rarely/not at all, 1 = some of the time, and 2 = all the time. The total possible score

is 22. Results show that older Filipinos have an average score of 5, significantly higher amongst women and highest amongst the oldest age group (6).

Table 4.9. Mean Depressive Scores of Older Persons by Sex and Age

CES-D	SEX			AGE GROUP				TOTAL
	Male	Female	Sig	60-69	70-79	80+	Sig	
Mean depression score	4.70	5.55	**	5.09	5.25	6.00	*	5.21
N	2,195	3,259		3,615	1,400	439		5,454

***p < .001. n.s. = not significant.

Source: Calculated by DRDF using original LSAHP data.

Health Risk Behaviours

Smoking

Smoking is a known risk factor for many chronic diseases, including cancer and coronary heart disease. Generally, the prevalence of smoking is lower amongst older adults than amongst younger ones. This may be attributed to the earlier mortality of smokers, resulting in fewer smokers reaching older adulthood. Lower smoking prevalence in older adults may also be attributed to the high rates of quitting the habit in this age group due to the onset of chronic diseases caused or aggravated by smoking. Amongst these diseases are emphysema, chronic obstructive pulmonary disease, and heart disease.

In general, the LSAHP results support these findings, as only 17% of respondents are current smokers whilst 32% are former smokers (Table 4.10). Current smoking is clearly gender differentiated; 30% of men currently smoke compared with only 9% of women. The prevalence of current smoking is lowest amongst the oldest age cohort (11%). Amongst current smokers, the average number of cigarettes smoked daily is 9, and higher amongst male smokers (11) than female smokers (7). Current smokers started smoking at an average age of 21, younger amongst males than females (17 years vs. 28 years).

Former smokers are also overwhelmingly male. They smoked more cigarettes on average (16) than current smokers. The average age at which they quit smoking is 52 years.

Table 4.10. Smoking by Sex and Age

Smoking	SEX			AGE GROUP				TOTAL
	Male	Female	Sig	60-69	70-79	80+	Sig	
A. Current smokers								
% who currently smoke	29.7	8.6	***	19.6	13.4	11.1	***	17.1
N	2,411	3,574		3,760	1,551	673		5,985
Mean number of cigarettes/cigars smoked per day	10.62	6.51	***	9.28	9.72	9.52	n.s.	9.39
N	716	306		738	208	75		1,022
Mean age started smoking	17.46	27.86	***	19.97	22.41	21.18	n.s.	20.55
N	710	300		738	208	64		1,010
B. Former smokers								
% who used to smoke	66.9	13.4	***	31.0	32.1	34.0	n.s.	31.7
N	1,695	3,268		3,022	1,343	598		4,963
Mean number of cigarettes/cigars smoked per day	18.39	9.31	***	16.44	15.55	13.86	n.s.	15.86
N	1,134	437		937	431	203		1,571
Mean age started smoking	18.09	28.44	***	19.96	21.98	23.18	**	20.91
N	1,124	420		932	422	190		1,544
Mean age stopped smoking	52.53	52.10	n.s.	48.49	56.41	62.59	***	52.41
N	1,125	410		924	418	192		1,535

p < .01. *p < .001. n.s. = not significant.

Source: Calculated by DRDF using original LSAHP data.

Drinking

Much of the concern about drinking behaviour focuses on alcohol abuse or excessive drinking for its obvious health and social implications. But the study of drinking behaviour and its consequences in older adults may need to shift focus from excessive drinking to drinking behaviour per se, regardless of the level of consumption. Because of age-related changes in physiology and interactions of alcohol use with comorbidities and with medication, even lower levels of alcohol consumption may produce adverse outcomes (Moore et al., 1999).

To gauge drinking behaviour amongst older Filipinos, respondents were asked whether they currently drink alcohol and how frequently. Overall, only 29% report they are currently drinking. As with smoking, current drinking is much higher amongst men (49%) than women (15%) (Table 4.11). There is a steep age-related decline in the prevalence of current drinking. As to frequency, a little over half report being only occasional drinkers whilst, at the other extreme, 5% of current drinkers report drinking every day or almost every day. Significantly more males than females currently drink alcohol daily (7% vs. 1%). Males started drinking at an average age of 20 compared with 37 amongst females.

As with smokers, the proportion of former drinkers is higher than that of current drinkers. The mean age at which they stopped drinking is 56 years.

Table 4.11. Drinking by Sex and Age

Drinking	SEX			AGE GROUP				TOTAL
	Male	Female	Sig	60-69	70-79	80+	Sig	
A. Current drinkers								
% who are currently alcohol drinkers	49.4	14.8	***	33.3	24.5	13.1	***	28.8
N	2,411	3,574		3,760	1,552	673		5,985
On average, frequency drinking alcohol among current alcohol drinkers								
(Almost) everyday	7.3	0.7		5.4	5.0	4.3		5.3
Once every two or three days	11.0	2.6		9.5	5.7	4.6		8.4
Once a week	14.4	6.7		11.4	11.6	22.7		12.0
Once or twice a month	17.0	10.0	**	15.2	16.0	4.5	n.s.	14.8
Less than once a month	3.4	2.9		3.2	2.8	5.7		3.3
Occasional	47.0	77.0		55.3	58.8	58.0		56.2
N	1,192	528		1,252	380	88		1,720
Mean age started drinking regularly among those who are current alcohol drinkers								
	20.17	36.52	***	24.57	26.52	26.31	n.s.	25.08
N	1,183	507		1,241	362	87		1,690
B. Former drinkers								
% who used to drink	78.6	15.8	***	33.0	35.2	33.8	n.s.	33.7
N	1,220	3,045		2,507	1,172	585		4,264
Mean age started drinking regularly among those who used to drink alcohol								
	19.96	33.83	***	24.08	25.75	23.91	n.s.	24.54
N	944	466		817	407	185		1,410
Mean age stopped drinking regularly among those who used to drink alcohol								
	55.91	56.40	n.s.	53.08	57.30	66.10	***	56.07
N	920	453		793	392	189		1,373

p < .01. *p < .001. n.s. = not significant.

Source: Calculated by DRDF using original LSHP data.

Objective Measures of Health

The inclusion of objective measures in ageing surveys is increasingly becoming standard practice. These measures can complement, supplement, or cross-validate the information obtained from self-reports and subjective assessments. The measures provide additional information about respondents that can be analysed separately on its own merit, not in relation to the survey responses. The most common of these measures are the anthropometric ones, which are a set of quantitative measurements that assess the composition of the body. The core elements of anthropometry are height, weight, waist circumference, and skinfold

Indicators	SEX			AGE GROUP				TOTAL
	Male	Female	Sig	60-69	70-79	80+	Sig	
Side-by-side	97.4	98.6	**	98.5	98.4	95.0	***	98.1
<i>N of cases</i>	2,175	3,312		3,587	1,380	490		5,486
Semi tandem	96.0	92.2	**	97.3	91.4	72.7	***	93.7
<i>N of cases</i>	2,132	3,194		3,561	1,301	464		5,326
Tandem	83.0	67.0	**	81.2	61.5	39.5	***	73.5
<i>N of cases</i>	2,023	2,946		3,419	1,188	363		4,970
Gait speed								
% who were able to perform gait speed	92.0	93.1	n.s.	94.9	92.8	79.3	***	92.6
<i>N of cases</i>	2,411	3,573		3,760	1,552	674		5,985
Mean duration (sec)	10.62	11.67	*	9.94	12.69	16.17	***	11.25
<i>N of cases</i>	2,217	3,325		3,568	1,441	534		5,542

*p < .05. **p < .01. ***p < .001. n.s. = not significant.

Source: Calculated by DRDF using original LSAHP data.

Body Mass Index

Body mass index (BMI) is a measure of nutritional status in adults and is derived by dividing the person's weight in kilograms by the height in metres squared (kg/m^2). WHO (n.d.) recommends BMI cut-off values to demarcate underweight (< 18.5), normal weight (18.5–24.99), overweight (25–29.99), and obese (≥ 30). By these standards, 56% of older Filipinos fall within the normal BMI range, with a significantly higher proportion of men (64%) than women (50%) (Table 4.12). The proportions at either end of the range are both low, although more older Filipinos are underweight (14%) than obese (8%). The proportion who are underweight increases progressively with age, whilst the proportions of overweight and obese decrease with age. Overall, more men are underweight whilst more women are overweight or obese.

Other researchers have suggested alternatives to the BMI as a summary measure of nutritional status, arguing that the BMI does not consider age-related changes in the relative distribution of body fat (mainly an increase in central adiposity) and the loss of lean body mass, amongst others. One of the simplest measures of excess body fat is waist circumference. The WHO-recommended cut-off for obesity is a waist circumference equal to or higher than 102 cm (40 inches) for men and 88 cm (34.5 inches) for women. Using these cut-offs, 7% of men and 55% of women are obese (data not shown).

The cut-offs for BMI and waist circumference have been developed for all ages, but there are concerns that these may not be applicable to the older population

(Babiarczyk and Turbiarz, 2012). Andres (1985) reported that the BMI values associated with the lowest mortality increase with age. This became the basis of the recommendation for age-adjusted desirable BMI in relation to age (National Research Council, 1989). At age 65 and over, the report recommends a BMI range of 25–29. This range is consistent with findings from a meta-analysis of studies on the predictors of mortality and major chronic diseases, including diabetes, hypertension, and cardiovascular diseases; studies using the BMI as a predictor reported that ‘the optimal BMI range for the lowest mortality was overweight and mildly obese’ (Chang, Beason, Hunleth, and Colditz, 2012).

Whilst a higher BMI may be protective at older ages, being underweight is a risk factor for mortality. The relationship between mortality and body weight is curvilinear, with elevated risk at both under- and overweight. The BMI profile of older Filipinos suggests that underweight is more prevalent than obesity, but both conditions need attention.

Grip strength is one of the performance measures in the LSAHP. Measured via a hand-held dynamometer, grip strength value is recorded in kilograms. An indicator of overall strength, grip strength is related to nutritional status, muscle mass, and functional and physical health status. Many studies have confirmed its predictive value for mortality, physical function, and length of hospital stay (Bohannon, 2008). Results on grip strength for older Filipinos show the same age and gender differentiation observed in other populations – that is, the mean grip strength declines with age and men have significantly higher values than do women.

The LSAHP results show that older Filipinos registered a much lower grip strength than similar samples of older adults in Brazil (Amaral et al., 2019); Singapore (Malhotra et al., 2016); Japan (Seino et al., 2014); and Hong Kong (Auyeung, Lee, Leung, Kwok, and Woo, 2014).

The other objective measures of health, such as the mean waist circumference, arm length, balance test, and gait speed, can be used for further studies on conditions such as frailty and sarcopenia.

Summary, Conclusions, and Recommendations

In keeping with its primary objective to study the health of older Filipinos, the LSAHP contains multiple indicators of health status classifiable into three broad categories: self-rating (e.g. SRH); self-reports (e.g. diagnosed illness, experience of pain, oral health); and objective measures (e.g. height, weight, waist circumference, grip strength, functional reach, balance test, gait speed, and peak flow).

Self-rating requires the individuals to evaluate their status on a given indicator using their own judgment as they are not provided any referents with which to compare themselves. For SRH, most older Filipinos assessed themselves to be of average or better than average health. Looking at the extreme end of SRH, the percentage who are very unhealthy increases with age. Evidently, increasing age has highly different implications for how older Filipinos assess themselves, depending on what aspect of their lives they are evaluating. This is something to be investigated in further analyses of the LSAHP data.

Amongst the self-reported diseases included in the survey, the most common diagnosed illnesses are hypertension, arthritis, cataracts, diabetes, angina and heart disease, and renal and urinary tract illness, in that order. By confining the self-report to diseases that have been diagnosed by a physician, the true prevalence of these illnesses cannot be deduced from the LSAHP data, but the list gives a fair picture of the most common diseases experienced by older Filipinos. The observed differences in prevalence by sex and by age for some of these diseases will have to be further investigated to tease out the effects of health-seeking behaviour from the true prevalence, as the capability to obtain a medical diagnosis is not equal for all older adults. One worrisome finding is that of those who have had a heart attack, only half are taking medication for their heart condition. This is a health concern that will need to be addressed urgently.

The oral health status of older Filipinos is generally poor. Compared with the goal of retaining 20 natural teeth into the older years as advocated by Japan's 80/20 Movement, which WHO cites as worth emulating, the data show many older Filipinos falling short of this goal, with an average of only 9 remaining natural teeth; the number is higher amongst men and decreases with age.

On the average, older Filipinos sleep for 6 hours, with about a third regularly taking a daytime nap. About 3 in 10 report that they are often troubled with pain; of these, about half report the pain to be of moderate intensity. Half of those often troubled with pain say the pain makes it difficult for them to do their usual activities.

A small percentage had a fall in the 12 months preceding the survey, with an average of about two falls in the past year; this number is higher amongst men and increases with age. Amongst those who had a fall, 15% were injured seriously enough to need medical treatment. Incontinence, most commonly urinary incontinence, was reported by 2 in 10 older Filipinos; it is more prevalent amongst women than men. Using the 11-item CES-D scale (range = 0–22), older Filipinos have a mean depression score of 5; the score is higher amongst women and increases with age.

Two health risk behaviours are included in the survey: smoking and drinking. Results show that both behaviours are much more prevalent amongst men. Only 17% of older Filipinos currently smoke, with the prevalence decreasing as age increases. The prevalence of drinking is higher (29% currently drink), again decreasing with increasing age.

The objective measures are highly useful in drawing a picture of older Filipinos' overall health. Individual height and weight data were transformed into BMI and compared with WHO cut-off scores. Results show that more than half of older Filipinos fall within the normal BMI cut-offs. A little more than 1 in 10 are underweight whilst 8% are obese. More men are underweight whilst more women are overweight or obese. The percentage of underweight increases with age whilst the percentage of overweight or obese decreases as age increases. Measures of grip strength show that older Filipinos, on average, have weaker grip strength than their counterparts in Japan, Singapore, and Hong Kong.

This wealth of information on various dimensions of the health status of the current population of older Filipinos must be further analysed to better understand how the individual measures, alone or in combination, affect mortality risk as well as the overall quality of life. With good-quality data such as that provided by the LSHP, programmes and policies for addressing the health concerns of older Filipinos will be better informed, be more evidence based, and can thus be tailored to the real needs of this sector.

References

- Amaral, C.A., T. L.M. Amaral, G. Torres, R. Monteiro, M.T.L. Vasconcellos, and M.C. Portela (2019), 'Hand Grip Strength: Reference Values for Adults and Elderly People of Rio Branco, Acre, Brazil', *PLoS ONE*, 14(1), p.e0211452. <https://doi.org/10.1371/journal.pone.0211452> (accessed 12 July 2019).
- Ambrose, A.F., G. Paul, and J.M. Hausdorff (2013), 'Risk Factors for Falls Among Older Adults: A Review of the Literature', *Maturitas*, 75(1), pp.51–61. doi:10.1016/j.maturitas.2013.02.009 (accessed 24 June 2019).
- American Psychiatric Association (1994), *Diagnostic and Statistical Manual of Mental Disorders [DSM-IV]* (4th ed.). Washington, DC: American Psychiatric Association.
- Andres, R. (1985), 'Mortality and Obesity: The Rationale for Age-specific Height-Weight Tables', in R. Andres and W. R. Hazzard (eds.), *Principles of Geriatric Medicine*. New York, NY: McGraw-Hill, pp.311–18.
- Auyeung, T.W., S.W. J. Lee, J. Leung, T. Kwok, and J. Woo (2014), 'Age-associated Decline of Muscle Mass, Grip Strength and Gait Speed: A 4-year Longitudinal Study of 3018 Community-dwelling Older Chinese', *Geriatrics and Gerontology International*, 14(Suppl. 1), pp.76–84.
- Babiarczyk, B. and A. Turbiarz (2012), 'Body Mass Index in Elderly People – Do the Reference Ranges Matter?' *Progress in Health Sciences*, 12(1), pp.58–67. <https://pdfs.semanticscholar.org/c9cd/bf63916cbfda852b1dfc78d748a23e04bcb3.pdf> (accessed 11 July 2019).
- Beck, J.D. et al. (2005), 'Periodontal Disease and Coronary Heart Disease: A Reappraisal of the Exposure', *Circulation*, 112(1), pp.19–24. <https://doi.org/10.1161/CIRCULATIONAHA.104.511998> (accessed 10 July 2019).
- Bohannon, R.W. (2008), 'Hand-grip Dynamometry Predicts Future Outcomes in Aging Adults', *Journal of Geriatric Physical Therapy*, 31(1), pp.3–10. https://journals.lww.com/jgpt/Fulltext/2008/31010/Hand_Grip_Dynamometry_Predicts_Future_Outcomes_in.2.aspx#pdf-link (accessed 11 July 2019).
- Borgnakke, W.S., P.V. Ylöstalo, G.W. Taylor, and R.J. Genco (2013), 'Effect of Periodontal Disease on Diabetes: Systematic Review of Epidemiologic Observational Evidence', *Journal of Clinical Periodontology*, 40(Suppl. 14), pp.S135–52. doi:10.1111/jcpe.12080 (accessed 11 July 2019).
- Casadei, K. and J. Kiel (2019), 'Anthropometric Measurement (Updated 2019 Mar 24)', StatPearls (Internet). Treasure Island, FL: StatPearls Publishing. <https://www.ncbi.nlm.nih.gov/books/NBK537315/> (accessed 11 July 2019).

- Chang, S.H., T.S. Beason, J.M. Hunleth, and G.A. Colditz (2012), 'A Systematic Review of Body Fat Distribution and Mortality in Older People', *Maturitas*, 72, pp.175–91. <http://dx.doi.org/10.1016/j.maturitas.2012.04.004> (accessed 12 July 2019).
- Chiu, C. et al. (2016), 'Dental Health Status of Community-dwelling Older Singaporeans: Findings from a Nationally Representative Survey', *Gerodontology*, 34(1), pp.57–67. doi:10.1111/ger.12218 (accessed 12 July 2019).
- Fernandes, V.A. and V. Chitre (2008), 'The Shortened Dental Arch Concept: A Treatment Modality for the Partially Dentate Patient', *The Journal of Indian Prosthodontic Society*, 8(3), pp.134–39. doi:10.4103/0972-4052.49016 (accessed 12 July 2019).
- Gibson, S.J., B. Katz, T.M. Corran, M.J. Farrell, and R.D. Helme (1994), 'Pain in Older Persons', *Disability and Rehabilitation*, 16(3), pp.127–39. doi:10.3109/09638289409166289 (accessed 31 May 2019).
- Gibson, S.J., and D. Lussier (2012), 'Prevalence and Relevance of Pain in Older Persons', *Pain Medicine*, 13(suppl 2), pp.S23–26. doi:10.1111/j.1526-4637.2012.01349.x (accessed 20 September 2019).
- Gil-Montoya, J.A., I. Sanchez-Lara, C. Carnero-Pardo, F. Fornieles, J. Montes, R. Vilchez, and M. Bravo (2014), 'Is Periodontitis a Risk Factor for Cognitive Impairment and Dementia? A Case-control Study', *Journal of Periodontology*, 86(2), pp.244–53. doi:10.1902/jop.2014.140340 (accessed 10 July 2019).
- Helme, R.D. and S.J. Gibson (2001), 'The Epidemiology of Pain in Elderly People', *Clinics in Geriatric Medicine*, 17(3), pp.417–31. doi:10.1016/s0749-0690(05)70078-1 (accessed 10 July 2019).
- Helme, R.D., B. Katz, M. Neufeld, S. Lachal, J. Herbert, and T. Corran (1989), 'The Establishment of a Geriatric Pain Clinic – A Preliminary Report of the First 100 Patients', *Australian Journal of Ageing*, 8, pp.27–30.
- Hobdell, M., P.E. Petersen, J. Clarkson, and N. Johnson (2003), 'Global Goals for Oral Health 2020', *International Dental Journal*, 53(2), pp.285–88.
- Joshipura, K.J., H.C. Wand, A.T. Merchant, and E.B. Rimm (2004), 'Periodontal Disease and Biomarkers Related to Cardiovascular Disease', *Journal of Dental Research*, 83(2), pp.151–5. doi:10.1177/154405910408300213 (accessed 10 July 2019).
- Jylhä, M. (2009), 'What is Self-rated Health and Why Does It Predict Mortality? Towards a Unified Conceptual Model', *Social Science & Medicine*, 69(3), pp.307–16. doi:10.1016/j.socscimed.2009.05.013 (accessed 07 June 2019).
- Kohout, F.J., L.F. Berkman, D.A. Evans, and J. Cornoni-Huntley (1993), 'Two Shorter Forms of the CES-D Depression Symptoms Index', *Journal of Aging and Health*, 5(2), pp.179–93. doi:10.1177/089826439300500202 (accessed 12 July 2019).

- Lee, Y. (2000), 'The Predictive Value of Self-assessed General, Physical, and Mental Health on Functional Decline and Mortality in Older Adults', *Journal of Epidemiology & Community Health*, 54(2), pp.123–29. doi:10.1136/jech.54.2.123 (accessed 7 June 2019).
- Linn, B.S. and M.W. Linn (1980), 'Objective and Self-assessed Health in the Old and Very Old', *Social Science & Medicine. Part A: Medical Psychology & Medical Sociology*, 14(4), pp.311–15. doi:10.1016/s0271-7123(80)90223-0 (accessed 7 June 2019).
- Maggi, S., J.A. Langlois, N. Minicuci, F. Grigoletto, M. Pavan, D.J. Foley, and G. Enzi (1998), 'Sleep Complaints in Community-dwelling Older Persons: Prevalence, Associated Factors, and Reported Causes', *Journal of the American Geriatrics Society*, 46(2), pp.161–68. doi:10.1111/j.1532-5415.1998.tb02533.x (accessed 31 May 2019).
- Malhotra, R., S. Ang, J.C. Allen, N.C. Tan, T. Østbye, Y. Saito, and A. Chan (2016), 'Normative Values of Hand Grip Strength for Elderly Singaporeans Aged 60 to 89 Years: A Cross-sectional Study', *JAMDA*, 17, pp.864.e1–864.e7. <http://dx.doi.org/10.1016/j.jamda.2016.06.013> (accessed 12 July 2019).
- Mirelman, A., T. Herman, M. Brozgol, M. Dorfman, E. Sprecher, A. Schweiger, and J.M. Hausdorff (2012), 'Executive Function and Falls in Older Adults: New Findings from a Five-year Prospective Study Link Fall Risk to Cognition', *PLoS ONE*, 7(6), p.e40297. doi:10.1371/journal.pone.0040297 (accessed 12 July 2019).
- Moore, A.A. et al. (1999), 'A New Paradigm for Alcohol Use in Older Persons', *Medical Care*, 37(2), pp.165–79. <https://www.jstor.org/stable/3767222> (accessed 12 July 2019).
- Moynihan, P., M. Thomason, A. Walls, K. Gray-Donald, J.A. Morais, H. Ghanem, and J. Feine (2009), 'Researching the Impact of Oral Health on Diet and Nutritional Status: Methodological issues', *Journal of Dentistry*, 37(4), pp.237–49. doi:10.1016/j.jdent.2008.12.003 (accessed 12 July 2019).
- National Research Council (1989), *Diet and Health: Implications for Reducing Chronic Disease Risk*. Washington, DC: National Academies Press. <https://doi.org/10.17226/1222> (accessed 10 July 2019).
- Nowjack-Raymer, R.E. and A. Sheiham (2003), 'Association of Edentulism and Diet and Nutrition in US Adults', *Journal of Dental Research*, 82(2), pp.123–26. doi:10.1177/154405910308200209 (accessed 10 July 2019).
- Ohayon, M.M., M.A. Carskadon, C. Guilleminault, and M.V. Vitiello (2004), 'Meta-analysis of Quantitative Sleep Parameters from Childhood to Old Age in Healthy Individuals: Developing Normative Sleep Values Across the Human Lifespan', *Sleep*, 27(7), pp.1255–73. doi:10.1016/j.jsmc.2006.04.007 (accessed 10 July 2019).

- Qin, Z. and L. Baccaglini (2016), 'Distribution, Determinants, and Prevention of Falls Among the Elderly in the 2011–2012 California Health Interview Survey', *Public Health Reports*, 131(2), pp.331–39. doi:10.1177/003335491613100217 (accessed 11 July 2019).
- Resnick, N.M. (1987), 'Urinary Incontinence', *Public Health Reports* (1974–), 102, pp.67–70. <http://www.jstor.org/stable/4628227> (accessed 12 July 2019).
- Seino, S. et al. (2014), 'Reference Values and Age and Sex Differences in Physical Performance Measures for Community-dwelling Older Japanese: A Pooled Analysis of Six Cohort Studies', *PLoS ONE*, 9(6), p.e99487. doi:10.1371/journal.pone.0099487 (accessed 12 July 2019).
- Shinsho, F.F. (2001), 'New Strategy for Better Geriatric Oral Health in Japan: 80/20 Movement and Healthy Japan 21', *International Dental Journal*, 51(S3), pp.200–06. doi:10.1002/j.1875-595x.2001.tb00867.x (accessed 12 July 2019).
- Stoddart, H., J. Donovan, E. Whitley, D. Sharp, and I. Harvey (2001), 'Urinary Incontinence in Older People in the Community: A Neglected Problem?' *British Journal of General Practice*, 51, pp.548–54. <https://bjgp.org/content/bjgp/51/468/548.full.pdf> (accessed 12 July 2019).
- Suchman, E.A., B.S. Philips, and G.F. Streib (1958), 'An Analysis of the Validity of Health Questionnaires', *Social Forces*, 36(3), pp.223–32. <http://www.jstor.org/stable/2573809> (accessed 17 July 2019).
- Sutin, A.R., A. Terracciano, Y. Milaneschi, Y. An, L. Ferrucci, and A.B. Zonderman (2013), 'The Trajectory of Depressive Symptoms Across the Adult Life Span', *JAMA Psychiatry*, 70(8), pp.803–11. doi:10.1001/jamapsychiatry.2013.193 (accessed 11 July 2019).
- Tissue, T. (1972), 'Another Look at Self-rated Health Among the Elderly', *Journal of Gerontology*, 27(1), pp.91–94. doi:10.1093/geronj/27.1.91 (accessed 7 June 2019).
- Vitiello, M.V. (2006), 'Sleep in Normal Aging', *Sleep Medicine Clinics*, 1(2), pp.171–76. doi:10.1016/j.jsmc.2006.04.007 (accessed 31 May 2019).
- Walls, A.W.G. and J.G. Steele (2004) 'The Relationship Between Oral Health and Nutrition in Older People', *Mechanisms of Ageing and Development*, 125, pp.853–57. doi:10.1016/j.mad.2004.07.011 (accessed 12 July 2019).
- World Health Organization (n.d.), 'Body Mass Index – BMI'. <http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/a-healthy-lifestyle/body-mass-index-bmi> (accessed 12 July 2019).
- World Health Organization (WHO) (2017), *Depression and Other Common Mental Disorders: Global Health Estimates*. Geneva, Switzerland: WHO.

- WHO Kobe Centre for Health Development (2002), Global Review of Oral Health in Ageing Societies. *Ageing and Health Technical Report Volume 3*. https://apps.who.int/iris/bitstream/handle/10665/67584/WHO_WKC_Tech.Ser._02.2.pdf;jsessionid=3925C150930CFB5C842E4358D9FED1C5?sequence=1 (accessed 12 July 2019).
- Zhu, Y. and J. H. Hollis (2014), 'Tooth Loss and Its Association with Dietary Intake and Diet Quality in American Adults', *Journal of Dentistry*, 42, pp.1428–35. <http://dx.doi.org/10.1016/j.jdent.2014.08.012> (accessed 12 July 2019).
- Zimmer, Z., J.N. Natividad, M.B. Ofstedal, and H.S. Lin (2002), 'Physical and Mental Health of the Elderly', in A.I. Hermalin (ed.), *The Well-being of the Elderly in Asia: A Four-country Comparative Study*. Ann Arbor, MI: University of Michigan Press, pp.361–412.
- Zuluaga, D.J.M., J.A. Gil-Montoya, C.I. Contreras, and R.R. Herrera (2011), 'Association Between Oral Health, Cognitive Impairment, and Oral Health-related Quality of Life', *Gerodontology*, 29(2), pp.e667–e673. doi:10.1111/j.1741-2358.2011.00542.x (accessed 10 July 2019).