

# TRANSITIONS IN HEALTH, EMPLOYMENT, SOCIAL ENGAGEMENT AND INTERGENERATIONAL TRANSFERS IN SINGAPORE STUDY (THE SIGNS STUDY) – I

Descriptive Statistics and Analysis of  
Key Aspects of Successful Ageing

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## **Funding**

Transitions in Health, Employment, Social Engagement and Inter-generational Transfers in Singapore Study (THE SIGNS Study) Study – I was funded by Singapore’s Ministry of Health (MOH) under agreement number MOH-NUS RL2015-053. We also acknowledge funding for dynamometers and electronic blood pressure monitors used in THE SIGNS Study – I through a grant obtained by the Nihon University Population Research Institute from the “Academic Frontier” Project for Private Universities: matching fund subsidy from Japan’s Ministry of Education, Culture, Sports, Science and Technology (MEXT), 2006-2010.

## **Author Contributions**

A Chan and R Malhotra, the Principal Investigator (PI) and Co-PI, of THE SIGNS Study respectively, supervised the data collection, and contributed to development of the study questionnaires, development of data analysis plans, interpretation of analysis findings, and writing or editing of all chapters of the report. NB Manap contributed to interpretation of the analysis findings, especially in terms of their relevance for health and social care policies, and to writing or editing all chapters of the report. YY Ting conducted and interpreted the data analysis for the chapters providing descriptive statistics, and contributed in writing the first draft of these chapters. A Visaria and GH-L Cheng contributed to development of data analysis plans and interpretation of analysis findings for the chapters providing descriptive statistics, and in writing or editing these chapters. A Visaria, GH-L Cheng, VSM Goh, PKC Tay, JML Lee and A Maulod conducted and interpreted the data analysis for the analytical chapters they authored, and wrote the first draft of these chapters. JML Lee also contributed in the supervision of data collection.

## **Acknowledgements**

We would like to acknowledge DB Matchar and T Østbye, Co-Investigators of THE SIGNS Study. We also acknowledge the contribution of S Ang and Shweta Ajay in development of the study questionnaires and supervision of data collection, and of Y Saito in development of the study questionnaires.

## **Suggested Citation**

Chan A, Malhotra R, Manap NB, Ting YY, Visaria A, Cheng GH-L, Goh VSM, Tay PKC, Lee JML, Maulod A. *Transitions in Health, Employment, Social Engagement And Intergenerational Transfers In Singapore Study (THE SIGNS Study) – I: Descriptive Statistics and Analysis of Key Aspects of Successful Ageing*. 2018. Singapore: Centre for Ageing Research and Education, Duke-NUS Medical School.

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## Executive Summary

We summarise below the key findings from the Transitions in Health, Employment, Social Engagement and Inter-generational Transfers in Singapore Study (THE SIGNS Study) – I, a nationally-representative survey on transitions in health, employment and social lives of 4549 community-dwelling older Singaporeans, aged 60 years and above. THE SIGNS Study – I was conducted in 2016-2017 by the Centre for Ageing Research and Education (CARE), Duke-NUS Medical School, Singapore.

### 1. Demographic characteristics

- The average age of older Singaporeans included in the survey was 70.9 years. Those aged 60-69 years formed the largest proportion (53%), followed by those aged 70-79 years (31%) and 80 years and above (16%).
- More females (53%) than males (47%) were surveyed.
- Majority were of Chinese ethnicity (83%), followed by Malays (10%), Indians (6%) and Others (1%).
- In terms of educational level, 28% had no formal education, 31% had primary education and 29% had secondary education. T with tertiary education constituted the smallest percentage (13%).
- Most were living with a child and their spouse (42%), followed by those who lived with their spouse (23%), or with a child only (20%). A minority were living alone or only with a foreign domestic worker (8.8%), or with others only (6.4%).
- The most common type of residence were 4-room HDB flats (36%). The same proportion (24%) resided in 3-room and 5-room flats, while fewer lived in 1-2 room flats (8%) and private housing (9%).
- While the majority were currently married (67%), 21% were widowed, 8% had never married and 4% were divorced.
- On average, older Singaporeans had 2.6 living children, with a higher average among those aged 80 years and above (4.2) compared to those aged 60-69 years (2.0). Across ethnicities, Malays had a higher average number of living children (3.3), compared to Indians (2.7), and Chinese (2.5) and Others (2.2).
- Majority followed Buddhism or Taoism (55%), followed by Christianity (18%), Islam (12%), and Hinduism (3%).

#### *Income and financial adequacy*

- In terms of total monthly household income, the largest proportion comprised of those reporting a monthly income of \$1000-\$1999 (17%) followed by those reporting \$5000 or more (15%).
- About 30% of older Singaporeans reported that they had ‘enough money with some left over’ – this proportion declined with age from 60-69 years (33%) to 80 years and above (25%). Nearly half (49%) reported having ‘just enough money and no difficulty’. The proportion of those who reported ‘some or much difficulty in meeting expenses’ was the highest for those aged 70-79 years (21%), and lower for those aged 60-69 years (17%) and 80 years and above (18%)

- Among the three major ethnicities, the proportion of those who experienced ‘some or much difficulty in meeting expenses’ was the highest among Indians (31%), followed by Malays (28%) and Chinese (16%).

## 2. Physical and Functional Health

### *Self-rated health*

- Overall, about 38% of older Singaporeans rated their health as fair or poor (versus excellent or very good or good). This percentage increased with age, reaching 50% among those aged 80 years and above.

### *Chronic diseases*

- 38% of older Singaporeans reported being diagnosed with three or more chronic diseases. This percentage increased with age – from 31% among those aged 60-69 years to 49% among those aged 80 years and above. Indians (54%) compared to Malays (42%), Chinese (36%) and Others (25%) were more likely to have been diagnosed with three or more chronic diseases.
- The five most common chronic diseases older Singaporeans reported having been diagnosed with, were high blood pressure (56%), high blood cholesterol (49%), cataract (31%), joint pain, arthritis, rheumatism or nerve pain (29%) and high blood sugar or diabetes (25%).
- The proportion of older Singaporeans who had been diagnosed with high blood pressure was highest among those with no formal education (62%). The proportion decreased as level of education increased.
- Indians (44%) were most likely, to have been diagnosed with high blood sugar or diabetes, whereas Others (18%) were the least likely.

### *Activity of daily living (ADL) and Instrumental ADL (IADL)*

- About 9% of older Singaporeans reported having difficulty with 1 or more ADLs. Of this percentage, 4% reported difficulty with 1-2 ADLs and 5% with 3 or more ADLs. More females (13%) reported ADL difficulties than males (5%).
- About 20% of older Singaporeans reported having difficulty with 1 or more IADLs. Of this percentage, 12% reported difficulty with 1-2 ADLs and 9% with 3 or more IADLs. The proportion with any IADL difficulty increased with age, and was higher among females (23%) than males (18%).

### *Body mass index (BMI)*

- The most prevalent BMI category among older Singaporeans was pre-obesity (42%), based on the Asian BMI categorization. Nearly 20% of older Singaporeans had obesity.

### *Blood pressure*

- The mean systolic and diastolic blood pressure was 138.4 mmHg and 75.1 mmHg respectively. While the mean values of systolic blood pressure increased with age, those for diastolic blood pressure declined with age. Both mean values were slightly higher for males versus females, and the highest for Malays across the 3 major ethnicities.

#### *Hand grip strength (HGS)*

- The average HGS among older Singaporeans was 21.1 kg. It decreased with age and was lower among females (16.0 kg) compared to males (26.9 kg). Among the three major ethnicities, the Chinese had the highest average HGS, followed by Malays and Indians.
- An education gradient was observed, with average HGS values increasing with education.

### **3. Psychological Health**

- About 12% of older Singaporeans reported clinically relevant depressive symptoms. This proportion increased with age, and was the highest among Indians (19%).
- About 85% of older Singaporeans were in the lowest or middle tertile of the Pearlin personal mastery scale. Nearly half of the males were in the lowest tertile, whereas about half of the females were in the middle tertile.
- The average quality of life (QoL) scores decreased with age, were higher for females versus males, and comparable across the three major ethnicities.

### **4. Health Behaviours**

#### *Smoking*

- About 3 in 4 older Singaporeans had never smoked. This proportion was lowest among those aged 70-79 years (73%).
- On the other hand, a higher proportion of those aged 60-69 years were current smokers (13%) compared to those aged 70-79 years (11%) and those aged 80 and above years (6%).
- A significant majority of females had never smoked (97%) compared to almost half of the males who had never smoked (49%).

#### *Physical activity*

- Two-thirds of older Singaporeans met the World Health Organisation (WHO) recommendations on physical activity for health. As age increased, the proportion of those who met the WHO's recommendations decreased. Fewer females (60%) than males (74%) met the recommendations, while Malays had the lowest percentage of those who met the recommendations (52%) among the ethnic groups.

#### *Health checkup/screening*

- Nearly half of older Singaporeans across age groups and gender had never undergone screening for colorectal cancer. The proportion who underwent this screening within the last year declined with age and was higher among males.
- Nearly 2 in 5 older Singaporean women had never undergone a Pap smear test. Among those aged 60-69 years, only 31% had undergone the test within the last 3 years.



- Nearly 2 in 5 older Singaporean women had never had a mammogram. Among those aged 60-69 years, only 27% had undergone the test within the last 2 years.
- The vast majority of older Singaporeans (94%) reported to have had their blood pressure measured within the last 2 years. The percentage was lowest among Malays (92%) and those aged 60-69 years (93%).
- Nearly 9 in 10 of older Singaporeans reported to have had a blood test for diabetes or blood sugar level within the last 3 years. This proportion was higher among males (92%) than females (87%), and higher for Indians (96%) than Chinese (90%) and Malays (89%).
- Similarly, 91% of older Singaporeans had a blood test for cholesterol or lipid level within the last 3 years. This proportion was higher among males (93%) than females (89%), and highest for Indians (96%) compared to Malays (90%) and Chinese (90%).

#### *Prescription medication use and adherence*

- Nearly 3 in 4 older Singaporeans took prescription medications on a regular basis, and 14% took 5 or more prescription medications on a regular basis.
- The proportion of older Singaporeans who forgot to take their prescription medications at times was the highest among those aged 60-69 years (29%) than those aged 70-79 years (26%) and lowest among those aged 80 years and above (21%).

#### *Health insurance*

- The vast majority of older Singaporeans (94%) had a Medisave Account. About one-third had private health insurance and one-fifth had health benefits through their current or previous employer.

#### *Healthcare utilisation*

- Considering the 3 months prior to their survey interview (hereafter, past 3 months), the type of health professionals whom older Singaporeans had visited at least 1 time were a doctor at a polyclinic (42%), followed by a private general practitioner (31%). A higher proportion had consulted specialists at a specialist outpatient clinic than at a private practice, overall and across demographic groups (age groups, gender and ethnicities). And, 11% of older Singaporeans had consulted Traditional Chinese Medicine (TCM) practitioners or traditional healers.
- The proportion with at least 1 visit to a *private GP* in the past 3 months was comparable (~30%) across age groups, gender and the three major ethnicities.
- The proportion with at least 1 visit to a *doctor at a polyclinic* in the past 3 months was similar among those aged 70-79 years (47%) and 80 years and above (46%), but lower for those aged 60-69 years (38%). This proportion was slightly higher among males (43%) versus females (41%), and highest for Indians (48%) across the three major ethnicities.
- The proportion with at least 1 visit to a *doctor at a specialist outpatient clinic* in the past 3 months increased with age, but was similar for males and females. Across the three major ethnicities, it was the lowest for Malays (19%) and the highest for Indians (32%).

- The proportion with at least 1 visit to a *specialist doctor in private practice* was low, around 4%, across age groups, gender and the three major ethnicities.
- The proportion who had consulted *Traditional Chinese Medicine (TCM) practitioners or traditional healers* in the past 3 months was slightly higher in the younger age groups and for females (12%) versus males (10%), and was the highest for Chinese (13%) across the three major ethnicities.
- Overall, 8% of older Singaporeans had visited a *hospital emergency room* in the past 6 months. This proportion increased with age, was comparable across gender, and was the highest for Indians (12%) and Malays (11%).
- *Admission to a public or private hospital* in the past 12 months was reported by 12% of older Singaporeans. This proportion increased with age, was higher for males than females, and was the lowest for Chinese (13%) across the three major ethnicities.
- Admission to a nursing home in the past 12 months was low overall, at less than 1%.

#### *English health literacy*

- Nearly 3 in 4 older Singaporeans had limited English health literacy. This proportion increased with age, and was the highest among Malays (81%).

#### *Analysis of the Correlates of Healthcare Utilisation*

- Older Singaporeans with low personal mastery and poor physical health had more primary care outpatient visits, tertiary care outpatient visits, at least 1 hospital emergency room visit and at least 1 hospital admission.
- Loneliness was associated with a lower use of tertiary care outpatient and hospital emergency room services.
- Malay ethnicity was associated with greater use of hospital emergency room and hospital inpatient services, and lower use of tertiary care outpatient services.
- Paying heed to the impacts of psychological factors, such as personal mastery, and social factors, such as loneliness, ethnicity and socio-economic status, in addition to the commonly considered physical health factors, in influencing healthcare utilisation among older Singaporeans is critical when planning changes and developments to Singapore's healthcare system.

## **5. Social Engagement**

#### *Living alone*

- About 9% of older Singaporeans lived alone. This proportion increased with age, was higher for females (11%) relative to males (6%), and was the highest for the Chinese (9%) compared to Malays (6%) and Indians (5%).
- Among those who lived alone, the top three reasons given for living alone were that they chose to live alone (46%), that they had outlived their family members (20%) and that they had never had children (17%).

#### *Social network outside the household*

- The extent of social network outside the household was the highest among older Singaporeans aged 60-69 years, and declined with age.

#### *Attendance in social activities*

- The most frequent social activity was visiting a church, mosque or other place of worship (72% participants visited at least weekly or occasionally).
- Around half (53%) went for a walk for exercise at least weekly or occasionally, while only 17% and 13% attended neighbourhood events and senior activity centre (SAC) at this frequency, respectively.

#### *Loneliness*

- Nearly a third of older Singaporeans (34%) reported being sometimes or mostly lonely. This proportion increased with age, reaching 40% among those aged 80 years and above. More males (37%) reported being sometimes or mostly lonely, relative to females (31%).

#### *Analysis of the Correlates of Social Engagement*

- Multivariate analysis of social networks indicated that older persons with weaker social networks were more lonely and depressed compared to those with stronger social networks.
- A key barrier to older Singaporeans' social connectedness, in terms of both their social network and participation in social activities, was their IADL limitations. Additionally, individuals who were not married, older, and lived in 1 or 2-room flats had weaker social connections.
- Social and community agencies can intensify outreach efforts to groups and individuals at a higher risk of weaker social connections. Additionally, they can organise activities and programmes that are more targeted and responsive to the preferences of specific older adult sub-groups such as men and Malays, who are less likely to participate in SAC-organized activities.
- Given the preponderance of participation in religious activities, initiatives to enhance social connectedness among older Singaporeans can consider structuring activities using various religious platforms.

## **6. Provision and Receipt of Transfers**

- The most prevalent provision of transfer by older Singaporeans was provision of emotional support (41%). Those aged 60 to 69 years (versus older) and males (versus females) were more likely to provide support.
- Overall, 57-61% of participants received transfers in the past 12 months. The most prevalent receipt of transfer was receipt of monetary support (61%). Across age groups, those aged 80 years and above received the most transfers.
- Females were more likely to receive monetary and emotional support.
- Males were more likely to receive housework help.
- Males were more likely to provide support of all types, including monetary, material and emotional support, as well as housework help.

### *Analysis of the Correlates of Transfers*

- Older Singaporeans who were employed, had a higher level of education, and had better functional health were more likely to provide support to their kin. Simultaneously, older age and greater functional limitations were associated with a lower chance of offering help.
- The strength and quality of family networks outside the household were positively related to support provision. Receipt and provision of support were positively associated with each other, indicating the significance of the reciprocity norm of family support in Singapore.
- With Singapore's policy focus on enhancing the health, social connectedness and financial status of older Singaporeans - all of which were positively associated with provision of transfers - one may expect that future cohorts of older persons will continue to provide support to younger members of their family and community.

## **7. Work and Retirement**

### *Current work status*

- About one-fourth (24%) of older Singaporeans worked full-time, and 13% worked part-time, with both proportions declining with age. Overall, a lower proportion of females worked full-time (14%) compared to males (36%).
- In the 60-64 year age group specifically, 27% of males and nearly half (49%) of the females were not working.
- The most common stated reason for working was income (included in 77% of the responses), followed by maintenance of good health (50%), and enjoying work (41%). Social contact and contribution to society were included in 31% and 18% of the responses respectively.

### *Early Retirement*

- The proportion of older Singaporeans who reported that they had retired early was 39% overall, with the highest being those aged 60-69 years (51%), followed by those aged 70-79 years (34%) and those aged 80 years and above (22%). The proportion of females who had retired early (49%) was nearly twice that of males (26%).
- The most frequently cited reason for taking early retirement was caregiving responsibilities: taking care of a family member, relative, or friend (45% overall, 60% and 10% among females and males respectively), followed by the participants' own ill health (26% overall, 19% and 43% among females and males respectively). Reasons related to the workplace, such as made redundant/had no choice (14%), fed up with job and wanted a change (7%), and offered early retirement incentive (2%) when combined, formed the third most frequently cited reason.

### *Analysis of the Correlates of Work and Retirement*

- Current employment was negatively associated with both functional limitations and chronic diseases. Older persons who were currently not working and had chronic diseases were less likely to be looking for work compared to those without chronic diseases.

- Workplace adaptations and interventions such as more age-friendly physical environments, greater availability of part-time or more flexible hours, may encourage older workers to work longer.
- Females compared to males were more likely to have retired early, less likely to be currently working, and also less likely to be currently looking for work, even after accounting for demographic, socioeconomic and health differences across gender.
- Enabling females at all ages to remain in and return to the workforce is a key policy challenge for policymakers that requires a focus on providing females with appropriate alternatives for their caregiving responsibilities.
- Older persons who reported difficulty in meeting monthly household expenses were less likely to be currently employed, but more likely to be looking for work compared to those who reported adequate income.

## 8. Lifelong Learning

- Over the past 12 months, 13% of older Singaporeans had attended a course/training in the past 12 months. This proportion comprised of 8% who took 1 course/training, 3% who took 2 courses/trainings, and 2% who took 3 or more courses/trainings.
- The highest proportion who had attended a course/training was among those aged 60-69 years (18%), followed by those aged 70-79 years (11%) and 80 years and above (2%).
- The proportion who took only 1 course/training was marginally lower for females (8%) than males (9%), though the distribution between genders was more equal among those who took 2 or more courses/trainings. Indians and Others were the most likely to have taken a course/training, and had the highest proportion of having taken 3 or more courses/trainings.
- Among those who attended courses/trainings, an equal proportion took them for only job-related reasons (48%) and only non-job related reasons (48%). The remaining 4% took them for both job and non job-related reasons.
- The proportion of those who took courses/trainings for only *job-related* reasons was the highest among those aged 60-69 years (52%), followed by those aged 70-79 years (40%) and 80 years and above (16%). More males (65%) took courses/trainings for only *job-related* reasons versus females (31%). This proportion was highest among Indians across the three major ethnicities.
- The proportion of those who took courses/trainings for only *non job-related* reasons was the highest among those aged 80 years and above (84%), followed by those aged 70-79 (56%) and 60-69 years (44%). More females (64%) took courses/trainings for only *non job-related* reasons versus males (31%). This proportion was highest among Chinese across the three major ethnic groups.

### *Analysis of the Correlates of Lifelong Learning*

- Engagement in learning was positively associated with social networks outside the household.

- Those who engaged in learning were more likely to be younger (aged 60-69 years), female, have formal education, Malay, working full-time, and have better health and functional status.
- Males, those of Malay and Indian ethnicity, and those working full-time were more likely to attend courses/trainings for job-related reasons. On the other hand, females were more likely to attend for non-job related reasons.
- Lifelong learning can be made more inclusive by specifically targeting those who face barriers to participation, such as those at older ages, those of a low socioeconomic status, and in poorer health. It is also important to adapt course/training content and pedagogy in order to meet the developmental and learning needs of older persons.

## 9. Volunteering and Monetary Donation

### *Formal volunteering*

- About 14% of older Singaporeans had engaged in formal volunteering in the past 12 months. Those aged 60-69 years were most likely to engage in formal volunteering (17%), followed by those aged 70-79 years (12%), and 80 years and above (5%). This proportion was comparable among males and females (14%).
- Among those who had volunteered formally in the past 12 months, the three most common ways of volunteering were organizing or helping to run an activity or event (48%), visiting people (32%), and befriending or mentoring people (24%).

### *Informal volunteering*

- About 20% of older Singaporeans engaged in informal volunteering in the past 12 months. Older Singaporeans aged 60-69 years had the highest proportion of engagement in informal volunteering (26%), followed by those aged 70-79 years (19%) and 80 years and above (7%). Males were more likely to engage in informal volunteering (24%) versus females (18%).
- Among those who had volunteered informally in the past 12 months, the three most common ways of volunteering were helping a person keep in touch with someone who had difficulty getting out and about (55%), helping a person in shopping, collecting pension or paying bills (22%), and helping transport or escort someone (17%).

### *Analysis of the Correlates of Volunteering*

- More educated older persons, those with strong social networks outside the household and those with more frequent social participation were more likely to volunteer both formally and informally.
- The oldest-old, those with higher depressive symptoms, and males overall were less likely to volunteer informally.
- Given the association between social engagement and volunteering, merging these two aspects together through creative localized community activities into programmes can facilitate a wide appeal.

## Chapter 1: Introduction

*Angelique Chan*

In 2015, the Singapore Ministry of Health (MOH) commissioned the Centre for Ageing Research and Education (CARE), Duke-NUS Medical School, to conduct a longitudinal study on productive and active ageing in Singapore. In partnership with MOH, CARE developed the *Transitions in Health, Employment, Social Engagement, and Intergenerational Transfers in Singapore Study* (THE SIGNS Study). The goal of this longitudinal study is to provide evidence for policy makers interested in promoting productive and active ageing among the older population in Singapore. Specifically, it is designed to identify the patterns, determinants, and outcomes of health, work, retirement, social engagement, volunteerism, and intergenerational transfers among older Singaporean citizens and permanent residents, aged 60 years and above.

This report is a synopsis of the results from the first wave (THE SIGNS Study – I) of the longitudinal study, which CARE conducted in 2016-2017. As such, it presents a snapshot of productive and active ageing in Singapore in 2016-17.

Singapore's population is ageing rapidly. Recent estimates suggest that by 2030, approximately one-quarter of the population will be above the age of 65. Longevity has been increasing steadily in Singapore; average life expectancy is currently 82 years. Concomitantly, fertility rates are at record low levels (1.19 children per average woman).

One of the challenges in this demographic environment is how to extend health span, that is, how to extend the number of years that individuals spend productive and active, and in good health. In order to answer this question, we need information on how individuals age over time. In THE SIGNS Study we will be following a cohort of older Singaporeans aged 60 years and above at least twice (2 years apart) in order to investigate the influence of growing older on activity, productivity, and health. Firstly, we seek to understand whether expanding the definition of productivity to include volunteerism is significant in the Singapore context. Post retirement, individuals may perform various roles within and outside the family. Volunteerism is one such role that the government would like to encourage as volunteerism has been shown to be associated with better mental and physical outcomes among those who volunteer.

A second way in which older adults may remain active and productive is via providing intergenerational transfers within the family. At present, many older adults already do provide intergenerational transfers, however, in this report we will quantify the extent to which older adults provide support within the family as well as the extent to which they receive support. These data will also give us an idea of intergenerational solidarity among multigenerational Singaporean families today.

A third area of active and productive ageing may be realised via life-long learning. The recently introduced National Silver Academy represents strong government interest in providing older adults with avenues to participate in learning for learning's sake, not only for skills development. This innovative scheme provides individuals with S\$500 to take courses provided under the NSA. In this report we examine the characteristics of older adults who participate in life-long learning in order to identify target populations that can be better encouraged to participate.

This report also contains information on the work and retirement patterns of adults aged 60 years and above in Singapore. The longitudinal nature of the data will allow for defining predictors of transitions in and out of the labour force. The report will contain information on physical and mental health as potential drivers of retirement. We also consider family care needs as “push factors” out of the work force. In this baseline report we will be unable to speak to predictors of transitions in and out of the labour force, however, we can provide baseline descriptions of the proportion of older adults who are working or retired, stratified by key social, demographic, and health characteristics.

Given the key importance of health as a predictor of activity and productivity in later life, we spend some time in this report describing the current mental and physical health of older adults aged 60 and above in Singapore. We also include a description of their health behaviours in order to identify target populations for improving health behaviours.

Health care utilisation patterns of the older population are essential to understand in order to generate evidence for planning. We examine the correlates of healthcare utilisation in this report. While the cross-sectional data limits us to examining correlates, the follow-up data will allow us to examine predictors of healthcare utilisation in more detail. The report also includes a section on health literacy in order to gauge the health literacy of our older population (60+) and the correlates of lower health literacy.

In all our analyses we acknowledge the presence of a cohort effect such that the young-old will differ in outcomes compared to the oldest-old. We thus stratify our descriptive analyses by age categories: 60-69, 70-79, and 80+. We are also cognizant of the fact that men and women age differently and that the level of education has been shown to impact behaviours and outcomes among older adults. Thus, in our descriptive analyses we stratify by gender and education level.

An interesting addition to the reporting on the descriptive data for this report is the stratification by living arrangements. Recently, there has been a steady increase in the proportion of one and two-person households. As this is a growing trend in Singapore, we stratified the data by living arrangements in order to examine whether persons who



live alone have worse outcomes. This will be valuable information for policy makers involved in housing policy.

This report includes both descriptive and analytical chapters. A descriptive chapter consisting of bivariate associations on a topic is presented, followed by a more analytical chapter that uses multivariate analysis to take a deeper dive into the topic. The deep dive is not exhaustive, and we will continue further analyses of the data and also discuss specific research questions in conversations with MOH.

The methodology of the survey and a brief description of various scales used in the survey are presented next. This is followed by descriptive data on demographic characteristics, physical and functional health, psychological health, and health behaviors. Substantive chapters are presented on healthcare utilisation, social engagement, social networks and participation, intergenerational transfers, work and retirement, lifelong learning, and volunteering.

The report findings reinforce the notion that older adults are not a homogenous group but rather differ significantly by age, gender, ethnicity, and educational level. In most of the substantive chapters in this report, the recommendation is for more targeted policies and programs to address objective and subjective concerns of older Singaporeans.

Key findings from the report include the significant influence of psychological health (personal mastery and loneliness) on health care utilisation. Lower levels of personal mastery are associated with higher healthcare utilisation. Being lonely, on the other hand, is associated with lower levels of healthcare use. Approximately one-third of older adults forget to take their prescription medications. In addition, one-third of older adults report daily pain which would significantly decrease their quality of life. Continuing with health related factors, 42% of our sample were categorized at pre-obese, highlighting the need to address lifestyle habits among older adults.

This report also addresses social engagement and participation with others living outside the household, and intergenerational transfers within families. Social engagement and participation is mainly limited by the presence of instrumental activities of daily living which highlights the need to improve access to services such as financial management, and environmental access in order to allow older adults to go about their daily activities, e.g., grocery shopping, using public transport. Within families, 40-60% of older adults are connected in some way; either receiving or providing support (financial, emotional, housework help, material support). Conversely, a large proportion of older adults are not receiving or providing support suggesting a need to improve intergenerational ties in the current environment. We have also found in CARE's previous research that over time, younger Singaporeans have been providing more financial support and less time support, which may lead to disengagement across the generations.

The final sections of the report focus on work and retirement, lifelong learning and volunteering. Interesting findings emerge from each of these contexts. In terms of work and retirement, we see that older women retire early primarily in order to provide care to others. Older men, on the other hand, retire early mainly for their own health reasons. Older adults who continue to work cite financial reasons as the main factor. Older females are more likely to cite social engagement and enjoying work as reasons to continue to work compared to older men.

Lifelong learning is not a major activity in the lives of older Singaporeans. Only 13% of older Singaporeans took a course in the 12 months prior to our survey. Major barriers to learning include older age (70+), lower socioeconomic status, and poor health. Older women are more likely to engage in lifelong learning compared to older men. These age, gender, socioeconomic and health difference are important factors to consider in increasing access to lifelong learning.

In addition to work and lifelong learning, productive and active ageing can involve volunteering. In fact, volunteering has been shown to significantly increase quality of life generally of older adults. Given the positive association between volunteering and well-being, the Singapore government has been encouraging older adults to volunteer. At present, our data shows that 14-20% of adults over age 60, engage in some form of volunteering; either formal or informal. More educated older persons, those with strong social networks outside the household and greater social participation were more likely to volunteer formally as well as informally. Older males are less likely to volunteer compared to older females. These results suggest the need to develop more opportunities for older men to volunteer.

This report provides a rich and detailed description of the lives of older Singaporeans aged 60 years and over. There are areas to be addressed in order for older adults to have productive and active lives. The report is comprehensive in highlighting what these areas are in order to inform on-going policy discussions and stimulate innovation.

## Chapter 2: Methodology

*Abhijit Visaria, Rahul Malhotra, Angelique Chan*

Transitions in Health, Employment, Social Engagement and Intergenerational Transfers in Singapore Study (THE SIGNS Study) – I is a nationally-representative survey of community-dwelling older Singaporeans (citizens and permanent residents) aged 60 years and above. The study received approval from the Institutional Review Board at National University of Singapore.

A representative sample of 9,736 Singaporeans aged 60 years and above, stratified by 5-year age groups from 60 to 84, and those aged 85 and above, gender, and ethnicity (Chinese, Malay, Indian, and Others) was drawn based on the estimated 2015 mid-year population distribution. Individuals aged 75 years and older, and those of Malay and Indian ethnicity were oversampled by a factor of two to ensure that there were enough respondents for analysis in these groups.

An independent survey firm was contracted to conduct the fieldwork. All individuals in the sample (called potential respondents hereafter) were first sent a letter by post informing them that they had been randomly selected to participate in a study on transitions in health, employment, and social lives of the elderly, what their participation entailed, the amount of compensation the study provided, and contact information of a project manager if they had any questions about the study. The letter stated that an interviewer from the survey firm would contact them within the next six weeks to seek their participation in the study, and also provided telephone numbers and an e-mail address to contact if they wanted to opt out of the study.

Of all potential participants, 342 opted out by contacting the survey team after they had received the letter of intimation. An additional 2031 individuals refused to participate in the study when interviewers visited their address. A total of 2373 potential respondents (24.4% of 9736) thus refused participation in the survey.

814 potential respondents were deemed not eligible to participate in the study because they were either deceased or institutionalized in a nursing home, old-age care home, or jail at the time of the survey, or their registered address was found to be invalid. In 51 cases, this information was based on letters of intimation that were returned undelivered, with notifications that no one by the name of the addressee lived at the address; the addressee had moved without providing a forwarding address; the address was incorrect; the inhabitants of the address had refused to accept the letter; the location was vacant; or that the letter box was unavailable. In 763 instances, the letters of intimation were not returned undelivered but when interviewers visited the address, they found that no individual by the name of the potential respondent lived there; that the potential respondent had passed away or was now institutionalized; that the location was vacant; or in some cases that the building had been demolished.

Interviewers were required to make 4 attempts to meet a potential respondent before the potential respondent was deemed uncontactable. In a majority of cases (59.6%), respondents were interviewed the first time that an interviewer visited their address. About one-third (33.7%) of the respondents were interviewed during a second visit; thus about 93% of the interviews required one or two visits (Table 2.1).

**Table 2.1: Interviewer visits to potential respondents and successful interviews**

Visit number	Number of successful interviews	%
1	2713	59.6
2	1535	33.7
3	255	5.6
4	38	0.8
5	8	0.2

The response rate presented in Table 2.2 below is calculated based on the number of successful interviews as a proportion of all potential respondents who were considered eligible for the study. We also present the proportion of successful interviews based on the number of individuals who could be contacted.

As seen in Table 2.2., 2000 potential respondents could not be contacted even after interviewers had visited their address 4 times. In most instances this was due to no one answering the door but the current status or location of the potential respondent could not be ascertained in any way. Therefore, we do not assume that they were not community-dwelling older adults at the time of the survey, and instead retain them as potential respondents who were eligible for the study in our calculation of the response rate.

**Table 2.2. Calculation of the survey response rate**

A	Sample, i.e., potential respondents	9736
B	Potential respondents not eligible for the study	814
C	Eligible potential respondents (A-B)	8922
D	Eligible potential respondents who were uncontactable after 4 home visits, but current status could not be ascertained	2000
E	Number of eligible potential respondents who could be contacted (C-D)	6922
F	Eligible potential respondents who refused participation in the study	2373
G	Total non-responses (uncontactable + refusal) (D+F)	4373
H	Successful interviews	4549
I	<b>Survey response rate:</b> Successful interviews as a % of all eligible potential respondents (H/C*100)	50.98%
J	Successful interviews as a % of eligible potential respondents who could be contacted (H/E*100)	65.72%

The survey involved the administration of a screener followed by written consent taking, after which a main questionnaire was administered and then measurements were taken for an anthropometry and performance questionnaire. Initially, 4552 respondents were administered the screener and consented to participate in the study. However, 2 respondents withdrew their consent before starting the main questionnaire. Further, 1 respondent completed both the main questionnaire and the anthropometry and performance measurements, but later requested to withdraw from the study. No data that had been collected for these 3 individuals was retained in the

study. Thus, the final number of respondents to THE SIGNS Study – I is 4549. All interviews were conducted face-to-face.

The screener, participation information sheet and consent form were administered using paper copies for all respondents. Computer Assisted Personal Interviewing (CAPI) versions for administration on tablets were developed for the main and the anthropometry and performance measurement questionnaires in English, Chinese, and Malay. The CAPI system was unable to host a Tamil questionnaire, therefore all participants who responded in Tamil (n=18) were administered a paper questionnaire. Interviewers also administered a paper questionnaire if they faced technical issues with the tablets. A total of 85 participants responded to the questionnaires on paper, the rest responding on CAPI.

The screener included the Abbreviated Mental Test – Singapore,<sup>1</sup> a cognitive status test. If a potential respondent answered fewer than 5 AMT-Singapore questions correctly (n=124), a proxy was approached for the study. A proxy was also eligible to answer the survey if the potential respondent (i.e. the index elderly) could not do so due to a physical or psychological issue such as hearing or speaking difficulty, memory loss or dementia, current sickness, etc. (n=340). The criteria for selecting a proxy respondent was they had to be aged 21 years and above, be either a family member or someone who had been living with the index elderly, and have been helping the index elderly in his/her daily living for some time. Out of 4549 respondents, there were thus 464 proxy respondents (10.2%). The index elderly remained eligible to participate in the anthropometry and performance measurements.

There were two versions of the main questionnaire, version A and version B. The decision to create two versions was based on feedback that some respondents in a pre-testing phase of the survey (n=48) found the questionnaire to be too long. Both questionnaires had modules on basic attributes and family make-up, social network, quality of life, volunteering, lifelong learning, employment, health status, physical disabilities and limitations, income and health insurance, and healthcare utilisation. Questionnaire A additionally included items on physical activity, medication use, health literacy, and a wider range of questions on health status and health behaviours. Questionnaire B was designed to be able to correlate physical health with psychological health and family relationships, and therefore uniquely included measures of religiosity, loneliness, depressive symptoms, personal mastery, and provision and receipt of transfers.

Stratified block randomization, with a block size of two, was used to assign respondents to either version A or B of the questionnaire, with the strata based on 5-year age group, gender, and ethnicity. The randomization schedule, drawn up a priori, was hosted on a centralized online platform to which tablets being used for the CAPI administration of the survey could connect. After a respondent consented to participate in the study, the interviewer entered the age, gender, and ethnicity of the respondent on the opening page of the CAPI software, and the tablet then displayed either version A or version B of the questionnaire based on the randomization scheme. In the event a

paper questionnaire was being administered, the interviewer called the project manager who consulted the online platform, made a manual entry, and conveyed the questionnaire version to be administered to the interviewer. Interviewers were not privy to the randomization scheme, and only found out the questionnaire version to be administered at the time of the interview.

The anthropometry and performance measurements included five measures: blood pressure, height, weight, hand grip strength, and walking speed. Prior to each, interviewers explained how the measurement would be conducted, asked questions specifically related to factors which would preclude the administration of the test (for example, if the respondent had a rash, swelling, wound, or bruise on the arm), and also demonstrated how blood pressure, hand grip strength and walking speed were measured. Measurements were taken when respondents confirmed that they understood the instructions and felt it was safe to do the test. Blood pressure was measured on the left arm, unless the respondent had a health condition that prevented it, in which case it was conducted on the right arm. Measurements were taken thrice at about a 1-minute interval between readings. Wherever used in this report, the blood pressure data pertains to the second and third readings. Hand grip strength data used in this report pertains to the measurements of the dominant hand.

Blood pressure was measured using Omron digital blood pressure monitors (Model No. HEM-762), weight using Omron digital weight scales (Model No. HN-286), and hand grip strength using Tanita hand grip meters (Model No. 6103).

Respondents were given tokens of appreciation for their participation in the survey in the form of S\$30 shopping vouchers if they answered the main questionnaire only, and S\$50 if they both answered the main questionnaire and participated in the anthropometry and performance measurements. A total of 4484 (98.6%) of the 4549 respondents received S\$50.

## **DESCRIPTION OF SCALES USED IN THE SIGNS STUDY – I**

**Depressive symptoms** were assessed using the 11-item Centre for Epidemiologic Studies-Depression (CES-D) scale which has been designed as a measure for screening of depressive symptoms.<sup>2</sup> Respondents were asked to what extent in the past week had the eleven statements pertaining to appetite, sleep, sadness, energy, effort, loneliness, etc. been true for them. Response options included none/rarely (corresponding to a score of 0), sometimes (1) and often (2) and score are totalled including for 2 items where they are reverse-scored. The total scores can range from 0 to 22, with higher scores indicating a higher level of depressive symptoms. A score of 7 and above indicates clinically relevant depressive symptoms.<sup>3</sup>

**English health literacy** (EHL) was assessed using the Health Literacy Test for Singapore (HLTS),<sup>4</sup> which was adapted from the Short-Test of Functional Health Literacy in Adults.<sup>5</sup> The HLTS comprises of 2 components, a 4-item numeracy test and

a 36-item reading comprehension test that consists of two prose passages. In THE SIGNS Study – I, only the 36-item comprehension component was administered since numeracy was not assessed. Respondents were allowed 7 minutes to complete the test. The cut-off between “limited EHL” and “adequate EHL” was set at 75% correct responses. Respondents who were unable to read English were not administered the test.

**Loneliness** was assessed using the 3-item UCLA loneliness scale.<sup>6</sup> The scale asks respondents how often they (i) felt they lack companionship; (ii) felt left out; and (iii) felt isolated from others. Respondents answered on a 5-point scale, pertaining to never (scored as 0), rarely (1), occasionally (2), fairly often (3), or always (scored as 4). The total scores can range from 0 to 12, with higher scores indicating a greater extent of loneliness.

**Personal mastery**, i.e. the extent to which individuals feel in control of their lives, was assessed in the study using the 5-item Pearlin Mastery Scale.<sup>7</sup> Respondents were asked how strongly they agreed or disagreed with statements that related to control over things, resolution of problems, changing important things in their lives, feeling helpless in dealing with problems, and feeling of being pushed around. Response choices included strongly agree (scored as 0), agree (1), disagree (2), and strongly disagree (3). The total score can range from 0 to 15 with higher scores indicating greater personal mastery.

**Quality of Life (QOL)** was measured using the CASP-12 scale,<sup>8-9</sup> which comprises of 12 questions with four sub-scales on Control, Autonomy, Self-realization, and Pleasure. Respondents were presented with statements pertaining to each of these domains and asked to respond how often they felt that way. Response choices included often (corresponding to a score of 3), sometimes (2), not often (1), never (corresponding to a score of 0). The total score can range from 0 to 36, with a higher score indicating a higher quality of life.

**Physical activity** was measured using the WHO Global Physical Activity Questionnaire (GPAQ).<sup>10</sup> The GPAQ asks respondents about the time they spent in a typical week in vigorous and moderate activities at work and leisure, as well as during travel and sedentary behaviour. Respondents whose total physical activity Metabolic Equivalent (MET) minutes per week were greater or equal to 600 were classified as meeting the WHO recommendation on physical activity for health.

**Social networks** outside the household are measured using the 12-item Lubben Social Network Scale – Revised (LSNS-R),<sup>11</sup> modified in THE SIGNS Study – I to assess social ties with individuals outside the household. LSNS-R asks respondents about the number of and frequency of contact with relatives and friends. The scale asks six questions about the size of the network: (i) how many relatives/friends did the respondent see or hear from at least once a month; (ii) how many they felt at ease with to talk about private matters; and (iii) how many they felt close to such that they could call on them for help. Respondents answered on a 6-point scale corresponding to the responses of none, 1, 2, 3 to 4, 5 to 8, and 9 or more. The score for each item can range from 0 for none, to 5 for the response of 9 or more. The scale also asks respondents about the frequency of contact: (i) how often did the respondent see or hear from

relatives/friends with whom they had the most contact; (ii) how often would one of their relatives/friends talk to the respondent when the relative/friend had an important decision to make; and (iii) how often was one the respondent's relatives/friends available when the respondent had an important decision to make. Respondents answered on a 6-point scale pertaining to never, seldom, sometimes, often, very often, and always. The score for each item can range from 0 for never to 5 for always. LSNS-R thus has scores from 0 to 60, with lower scores indicating a higher risk of social isolation.



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## Chapter 3: Demographic Characteristics: Descriptive Statistics

This chapter presents descriptive statistics on the age group, gender, ethnicity, educational level, living arrangement, housing type, marital status, number of living children, household income, income adequacy and religion of THE SIGNS Study –I participants.

**Table 3.1a Age by Gender and Ethnicity**

	Total	Gender		Ethnicity			
		Male	Female	Chinese	Malay	Indian	Others
<b>Age (weighted %)</b>							
n	4549	2117	2432	3358	708	449	34
Mean, years	70.9	70.3	71.5	71.1	70.1	70.5	70.4
SD, years	8.0	7.5	8.3	8.0	7.8	8.0	8.1
60-69 years	53.0	55.9	50.4	52.1	58.0	56.2	57.3
70-79 years	30.7	30.5	30.9	31.3	27.6	28.0	27.3
80 years and above	16.4	13.7	18.7	16.6	14.4	15.8	15.4

The mean age of the participants was 71 years overall and similar across gender and ethnic groups. Those aged 60-69 years formed the largest proportion of survey participants (53%), followed by those aged 70-79 years (31%) and those aged 80 years and above (16%). There were fewer females in the 60-69 years age group (50%) compared to males (56%), but a higher proportion of females (19%) than males (14%) in the 80 years and above age group (19%). Across ethnicities, the Chinese had the lowest proportional representation in the youngest age group (52%, aged 60-69 years) but the highest representation in the oldest age group (17%, aged 80 years and above).

**Table 3.1b Age by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Age (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Mean	75.7	70.0	68.4	68.8	70.7	73.6
SD	8.7	7.2	6.5	6.5	7.9	8.2
60-69 years	28.5	56.9	67.9	62.9	54.5	37.7
70-79 years	37.8	30.4	25.0	29.1	30.1	37.2
80 years and above	33.7	12.7	7.1	8.0	15.5	25.2

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

The mean age of those with no formal education was higher (76 years) compared to those with higher educational levels. Increase in age was associated with a decrease in the level of education completed; those aged 70-79 years and 80 years and above were the highest among those with no formal education, while those aged 60-69 years had the highest proportion across all formal education groups. Those living alone were older on average (74 years) compared to those not living alone (71 years).

**Table 3.2a Gender by Age Group and Ethnicity**

	Total	Age Group			Ethnicity			
		60-69	70-79	80 & above	Chinese	Malay	Indian	Others
n	4549	2020	1501	1028	3358	708	449	34
<b>Gender (weighted %)</b>								
Male	46.7	49.3	46.4	39.0	46.6	46.0	48.4	55.1
Female	53.3	50.7	53.6	61.0	53.5	54.0	51.6	44.9

Between the genders, there were more female survey respondents (53%) compared to males (47%), with a greater difference at older ages. The highest proportion of males (49%) was in the 60-69 year age group and of females (61%) in the 80 years and above age group, reflecting the higher life expectancy of females in Singapore. The proportion of males and females among the Chinese, Malays, and Indians were more or less similar.

**Table 3.2b Gender by Educational Level and Living Arrangement**

	Total	Educational Level Completed				Living Arrangement	
		No	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
n	4549	1390	1385	1262	503	4136	407
<b>Gender (weighted %)</b>							
Male	46.7	24.9	53.3	54.4	60.9	48.1	32.7
Female	53.3	75.1	46.7	45.6	39.1	51.9	67.3

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Three-fourths of older Singaporeans with no formal education were females (75%), whereas nearly two-thirds of those with tertiary education were males (61%). There was a higher proportion of females who were higher living alone (67%) compared to those not living alone (52%).

**Table 3.3a Ethnicity by Age Group and Gender**

	Total	Age Group			Gender	
		60-69	70-79	80 & above	Male	Female
<b>Ethnicity (weighted %)</b>						
n	4549	2020	1501	1028	2117	2432
Chinese	82.9	81.6	84.6	84.4	82.6	83.2
Malay	9.5	10.4	8.6	8.4	9.4	9.7
Indian	6.1	6.5	5.6	5.9	6.3	5.9
Others	1.4	1.6	1.3	1.4	1.7	1.2

Majority of the older Singaporeans were Chinese (83%), followed by Malays (9.5%), Indians (6%) and Others (1%) – these proportions were similar across age groups and gender. The weighted distribution of ethnicity by age-group and gender in THE SIGNS Study – I participants mirrors the national distribution, thus speaking to the representativeness of the study.

**Table 3.4a Educational Level by Age Group, Gender and Ethnicity**

	Age Group				Gender		Ethnicity			
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Educational Level (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
No formal education	27.5	14.8	33.9	56.7	14.6	38.8	28.8	25.5	19.8	1.3
Primary	30.6	32.9	30.4	23.8	35.0	26.9	30.1	34.2	33.5	27.1
Secondary	29.2	37.4	23.7	12.7	34.0	25.0	28.2	36.3	32.9	25.2
Tertiary	12.6	14.9	11.9	6.2	16.4	9.2	13.0	3.6	13.5	46.4

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

While older Singaporeans were approximately equally distributed across the categories of no formal education (28%), primary education (31%) and secondary education (29%), only 13% had tertiary education. By age-group, the younger cohorts had higher educational attainment – about 52% of those aged 60-69 years had secondary or tertiary education, compared to 36% of those aged 70-79 years, and 19% of those aged 80 years and above. Females were more likely to have no formal education (39%) than males (15%), and less likely to have any of the higher levels of education. Among the three major ethnic groups, the Chinese had the highest proportion with no formal education (29%) compared to Malays (26%), and Indians (20%). On the other hand, Indians had the highest proportion with tertiary education (14%), followed by the Chinese (13%), and Malays (4%).

**Table 3.4b Educational Level by Living Arrangement**

	Living Arrangement	
	Not Living Alone	Living Alone*
<b>Educational Level (weighted %)</b>		
n	4136	407
No formal education	27.1	31.3
Primary	30.8	29.4
Secondary	29.6	24.8
Tertiary	12.4	14.5

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
Percentages may not add up to 100% as responses of 'Refused/Don't Know' have been omitted.

Both the proportions for no formal education and tertiary education were higher among those living alone compared to those not living alone.

**Table 3.5a Detailed Living Arrangement by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Detailed Living Arrangement (weighted %)</b>										
n	4543	2018	1499	1026	2114	2429	3352	708	449	34
Living alone or with maid only	8.8	6.3	10.7	13.5	6.2	11.1	9.3	5.7	5.3	16.0
With spouse only	22.8	22.1	27.8	15.9	26.7	19.5	23.6	17.1	19.9	30.1
With child only	19.6	10.6	20.2	47.3	7.4	30.2	18.7	24.6	24.2	16.5
With child and spouse	42.4	52.9	36.2	20.4	53.5	32.8	42.1	47.7	41.9	29.4
With others only	6.4	8.2	5.2	2.8	6.3	6.5	6.4	4.8	8.7	8.1

Majority of older Singaporeans lived with a child and spouse (42%), followed by those who lived with a spouse only (23%) and with a child only (20%). The proportion who lived alone or with a foreign domestic worker (maid) was the highest among those aged 80 years and above (14%) and the lowest for those aged 60-69 years (6%). A higher proportion of females lived alone or with a foreign domestic worker (11%) compared to males (6%), and this proportion, across the three major ethnicities, was highest for the Chinese (9%), followed by the Malays (6%) and Indians (5%).

**Table 3.5b Detailed Living Arrangement by Educational Level**

	Educational Level Completed				Living Arrangement
	None	Primary	Secondary	Tertiary	Not Living Alone
<b>Detailed Living Arrangement (weighted %)</b>					
n	1388	1383	1261	503	4136
Living alone or with maid only*	10.0	8.5	7.5	10.1	0.0
With spouse only	17.3	23.3	25.2	28.4	25.0
With child only	37.3	16.6	10.9	7.5	21.4
With child and spouse	30.6	43.5	50.4	47.4	46.5
With others only	4.8	8.1	6.0	6.6	7.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Among older Singaporeans with no formal education, the highest proportion lived with a child only (37%), followed by those who lived with a child and spouse (31%). Those with higher educational levels and those not living alone were most likely to live with a child and spouse and then followed by living with a spouse only.

**Table 3.6a Housing Types by Age Group, Gender and Ethnicity**

	Age Group				Gender		Ethnicity			
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Housing Types (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
1-2 room	7.7	7.1	8.3	8.4	8.5	7.0	7.0	12.6	7.6	16.0
3 room	23.8	22.7	25.5	24.2	23.1	24.5	23.9	25.7	24.1	3.6
4 room	35.9	37.0	35.0	34.0	36.0	35.8	35.7	39.8	32.0	38.1
5 room & above	23.7	25.3	22.7	20.4	24.0	23.5	23.9	20.8	26.9	20.3
Private housing	8.8	7.9	8.5	12.6	8.4	9.2	9.4	1.2	9.3	22.0
Shop house	0.1	0.1	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.0

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The largest proportion resided in 4-room Housing Development Board (HDB) flats in all age groups, genders and ethnicities. Between the three major ethnicities, a greater proportion of Malays (13%) resided in 1-2 room HDB flats as compared to Indians (8%) and Chinese (7%).

**Table 3.6b Housing Type by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Housing Types (weighted %)</b>						
n	1390	1385	1262	503	4136	407
1-2 room	10.3	9.4	5.9	1.8	5.8	27.4
3 room	28.8	30.0	19.1	8.6	22.1	41.3
4 room	39.4	38.6	35.7	22.0	37.3	22.4
5 room & above	17.1	19.6	29.9	34.3	25.6	4.0
Private housing	4.3	2.4	9.4	33.0	9.3	4.4
Shop house	0.1	0.0	0.0	0.4	0.0	0.4

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The highest proportion with no formal education and those with primary education lived in 4-room HDB flats (39%) followed by 3-room flats (29%). The highest proportion of those with secondary education lived in 4-room flats (36%) followed by 5-room flats (30%), whereas those with tertiary education were most likely to live in 5-room flats (34%) followed by living in private housing (33%). Older Singaporeans living alone were more likely to reside in 1-2 room flats (27%) or 3-room flats (41%) compared to those not living alone (1-2 room flats: 6%; 3-room flats: 22%).

A majority of the participants had joint ownership of the house they were living in with their spouse (47%) while 4.5% of the participants were living in public rental flats. The distribution of house ownership by age group, gender, ethnicity, educational level, and living arrangement is provided in Appendix Tables A3d-A3e.

**Table 3.7a Marital Status by Age Group, Gender and Ethnicity**

	Age Group			Gender		Ethnicity				
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Marital Status (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Married	66.9	76.2	66.3	38.0	82.1	53.6	67.1	66.5	64.6	66.1
Widowed	21.1	9.3	22.7	56.2	7.2	33.3	20.3	25.7	26.7	10.8
Separated from spouse	0.5	0.5	0.8	0.2	0.7	0.4	0.5	0.4	0.9	0.0
Divorced	3.7	4.6	3.3	1.5	3.6	3.8	3.7	4.2	2.0	9.6
Never married	7.7	9.3	6.9	4.0	6.6	8.7	8.3	3.1	5.9	13.5

Percentages may not add up to 100% as responses of ‘Refused/Don’t Know’ are not shown.

At the point of the study, a majority of older Singaporeans were married, (67%), 21% were widowed, and 4% were divorced. The proportion of those who had never married was 8% overall, and highest for those aged 60-69 years (9%), followed by those aged 70-79 years (7%) and 80 years and above (4%). A third of the females were widowed (33%) compared to males (7%), indicating both the higher life expectancy of females and the spousal age gap.

The distribution of marital status by educational level and living arrangement is provided in Appendix Table A3f.

**Table 3.8a Number of Living Children by Age Group, Gender and Ethnicity**

	Age Group			Gender		Ethnicity				
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Number of Living Children</b>										
N	4541	2018	1497	1026	2115	2426	3354	705	448	34
Mean	2.6	2.0	2.7	4.2	2.4	2.7	2.5	3.3	2.7	2.2
SD	1.8	1.2	1.6	2.5	1.5	2.0	1.7	2.1	1.6	1.6

Older Singaporeans had an average of 2.6 living children with the number being higher among those aged 80 years and above (4.2) compared to those aged 60-69 years (2.0). Across ethnicities, Malays had the highest average number of living children (3.3) followed by Indians (2.7), and Chinese (2.5) then Others (2.2).

**Table 3.8b Number of Living Children by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Number of Living Children</b>						
n	1387	1383	1261	502	4131	406
Mean	3.5	2.5	2.1	1.9	2.7	1.8
SD	2.2	1.7	1.3	1.2	1.7	2.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

The mean number of living children declined as education level increased— older Singaporeans with no formal education had the highest number (3.5), followed by those with primary education (2.5), secondary education (2.1) and tertiary education (1.9). Those living alone had an average number of 1.8 living children, lower than those not living alone (2.7).

The distribution of the number of persons living in the household by age group, gender, ethnicity, educational level and living arrangement is provided in Appendix Tables A3g-A3h.

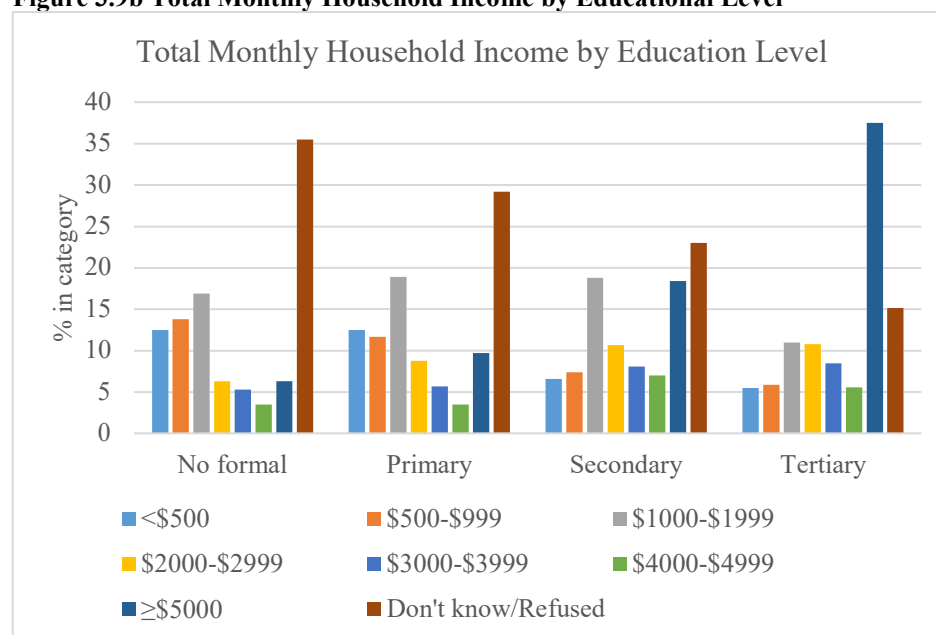
**Table 3.9a Total Monthly Household Income by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Total monthly household income (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
<\$500	9.9	6.4	12.7	16.2	10.7	9.2	9.8	11.8	7.8	13.9
\$500-\$999	10.3	8.3	14.1	9.7	8.0	12.4	10.4	9.8	11.4	3.6
\$1000-\$1999	17.3	18.0	17.6	14.3	17.4	17.2	17.5	16.5	16.7	14.8
\$2000-\$2999	9.0	9.7	7.8	8.6	9.9	8.1	8.4	10.6	13.5	11.5
\$3000-\$3999	6.6	7.9	5.6	4.6	7.7	5.7	6.3	8.1	8.0	12.3
\$4000-\$4999	4.8	6.4	2.6	3.6	6.4	3.3	4.4	8.1	5.8	0.0
≥\$5000	14.8	20.5	8.5	8.2	20.6	9.8	15.0	9.8	16.3	30.5
Don't know/ Refused	27.4	22.8	31.2	34.9	19.5	34.3	28.3	25.3	20.6	13.4

The largest proportion for total monthly household income comprised of those who reported \$1000-\$1999 (17%), followed by those reporting \$5000 or more (15%). Around 28% refused to share their total monthly household income.



**Figure 3.9b Total Monthly Household Income by Educational Level**



As education level increased, the proportion of older Singaporeans who reported a total monthly household income of below \$500 and \$500-\$999 decreased. However, those who reported a monthly household income of above \$5000 increased.

**Table 3.9c Total Monthly Household Income by Living Arrangement**

	Living Arrangement	
	Not Living Alone	Living Alone*
<b>Total monthly household income (weighted %)</b>		
n	4136	407
<\$500	7.6	33.7
\$500-\$999	8.8	26.3
\$1000-\$1999	16.8	22.6
\$2000-\$2999	9.3	5.9
\$3000-\$3999	7.1	1.8
\$4000-\$4999	5.1	1.0
≥\$5000	16.1	1.6
Don't know/Refused	29.3	7.1

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

A greater proportion of older Singaporeans living alone reported a total monthly household income of below \$500 (34%) compared to those not living alone (8%). The reverse is observed for monthly household income of above \$5000 –a significantly smaller proportion of those living alone reported as such (2%) compared to those not living alone (16%).

**Table 3.10a Income Adequacy by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Income Adequacy (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Enough money, with some left over	29.5	32.9	26.0	25.2	39.8	20.4	30.2	22.0	28.1	41.5
Just enough money, no difficulty	49.3	48.5	50.1	50.4	39.5	57.9	50.4	48.2	40.0	33.9
Some difficulty to meet expenses	14.6	13.8	15.9	14.5	14.5	14.7	13.0	20.6	24.1	22.2
Much difficulty to meet expenses	3.8	3.1	5.1	3.8	5.4	2.4	3.3	7.0	6.6	2.5

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Respondents were asked if they thought they had adequate income to meet their household monthly expenses. Overall, about 30% of older Singaporeans thought that they had enough money with some left over, however this proportion declined with age, from 60-69 years (33%) to 80 years and above (25%). Nearly half of all older Singaporeans, overall and in all age groups, reported having just enough money and no difficulties. The proportion with some or much difficulty in meeting expenses was the highest for those aged 70-79 years (21%), and lower for those aged 60-69 years (17%) and 80 years and above (18%).

There was an almost equal proportion between females (79%) and males (78%) who reported having enough money (combining the subgroups 'with some left over' and 'just enough'). However, looking closely at the subgroup with some left over, the proportion of females (20%) nearly doubled for males (40%).

Among the three major ethnic groups, the proportion of those who reported either degree of difficulty was highest among Indians (31%), followed by Malays (28%) and Chinese (16%).

**Table 3.10b Income Adequacy by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Income Adequacy (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Enough money, with some left over	15.1	26.2	36.3	53.6	30.0	24.6
Just enough money, no difficulty	55.0	51.4	48.5	33.7	48.6	55.5
Some difficulty to meet expenses	18.8	15.7	11.8	8.8	14.4	16.2
Much difficulty to meet expenses	5.3	4.5	2.4	2.3	3.9	2.7

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Income adequacy increased as educational level increased. Of those who reported having enough money or just enough money, those with tertiary education comprised the largest proportion (87%), followed by those with secondary education (85%), primary education (77%), and those with no formal education (70%).

In terms of living arrangements, the proportions of those who reported having either enough or just enough money were similar between older Singaporeans living alone (80%) and those not living alone (79%). However, there was a slightly higher proportion of those not living alone (30%) than those living alone (25%) who had enough money with some left over.

**Table 3.11a Religion by Age Group**

	Total	Age Group		
		60-69	70-79	80 & above
<b>Religion (weighted %)</b>				
n	4549	2020	1501	1028
Christianity	17.7	16.5	16.5	23.6
Buddhism/Taoism	54.7	53.5	56.6	55.1
Islam	11.5	12.7	10.4	9.7
Hinduism	3.4	3.6	3.4	2.8
Others	0.5	0.6	0.3	0.8
No religion	12.1	13.1	12.8	7.5

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Majority of older Singaporeans followed Buddhism or Taoism (55%), followed by Christianity (18%), Islam (12%), and Hinduism (3%). Twelve percent of the proportion reporting no religion; this proportion was the highest about those aged 60-69 years (13%) followed by those aged 70-79 years (13%) and those aged 80 years and above (8%).

The distribution of religion by gender, ethnicity, educational level and living arrangement is provided in Appendix Tables A3i-A3j.

## Chapter 4: Physical and Functional Health: Descriptive Statistics

This chapter presents descriptive statistics on the age group, gender, ethnicity, educational level and living arrangement of self-rated health, the overall number of and top 5 chronic diseases diagnosed, difficulty with activities of daily living (ADLs) and instrumental ADLs (IADLs), body mass index (BMI), blood pressure values and hand grip strength.

**Table 4.1a Self-Rated Health, Overall by Age Group, Gender, Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Self-Rated Health (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Excellent	3.0	3.3	2.8	2.6	3.3	2.7	3.1	2.3	3.9	0.0
Very Good	11.4	13.4	10.3	6.7	11.4	11.3	11.6	9.0	10.5	17.2
Good	47.5	50.8	46.2	39.4	48.5	46.7	46.8	51.8	48.0	57.6
Fair	29.9	27.3	31.2	36.2	27.6	32.0	30.1	29.0	30.8	23.8
Poor	8.0	5.1	9.4	14.6	9.1	7.0	8.2	7.6	6.7	1.5

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Nearly 4 in 10 older Singaporeans reported their health to be fair or poor. The proportion reporting their health to be fair or poor increased with age, reaching 51% among those aged 80 years and above. This combined proportion (of fair and poor) was similar throughout both genders and all three major ethnicities – males (37%) females (39%), Chinese (38%), Malays (37%) and Indians (38%).

**Table 4.1b Self-Rated Health, Overall by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Self-Rated Health (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Excellent	2.0	2.5	3.5	5.7	3.0	3.0
Very Good	8.0	9.5	14.3	16.5	11.2	12.7
Good	43.9	47.3	50.0	50.5	47.5	47.5
Fair	33.4	32.0	27.3	23.5	30.1	28.2
Poor	12.4	8.4	5.0	3.9	7.9	8.5

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

An education gradient was observed for self-rated health. As educational level increased, the proportion of older Singaporeans who rated their health as fair or poor decreased while the proportion who rated their health as very good or excellent increased. Self-rated health status was similar between both living arrangements.

The distribution of self-reported vision and hearing status by age group, gender, ethnicity, educational level, and living arrangement is provided in Appendix Tables A4a-A4b.

**Table 4.2a Number of Chronic Diseases (Mean, None/At Least One and Categorized) by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Number of Chronic Diseases</b>										
n	4546	2019	1501	1026	2117	2429	3355	708	449	34
Mean	2.1	1.8	2.2	2.5	2.0	2.1	2.0	2.1	2.7	1.8
SD	1.5	1.4	1.5	1.6	1.5	1.5	1.5	1.5	1.6	1.6
<b>Number of Chronic Diseases (weighted %)</b>										
None	17.8	21.7	14.9	10.7	18.8	16.9	18.6	16.1	9.6	17.9
At Least 1	82.2	78.3	85.1	89.3	81.2	83.1	81.4	83.9	90.4	82.1
0	17.8	21.7	14.9	10.7	18.8	16.9	18.6	16.1	9.6	17.9
1	21.7	24.7	18.9	16.8	22.2	21.2	22.0	19.4	17.1	35.4
2	22.9	22.3	23.9	23.3	21.5	24.2	23.2	22.8	19.4	21.6
≥3	37.6	31.3	42.3	49.3	37.5	37.8	36.2	41.7	54.0	25.1

Chronic disease statuses were based on older Singaporeans' self-reporting if they have 'ever been diagnosed' of a condition/disease by a health professional, using a list of common conditions/diseases as a guide. Nearly 40% of older Singaporeans reported that they had ever had 3 or more chronic diseases. While this proportion increased with age and was highest among the Indians, it was comparable between males and females.

**Table 4.2b Number of Chronic Diseases (Mean, None/At Least One and Categorized) by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Number of Chronic Diseases</b>						
n	1389	1384	1262	503	4134	407
Mean	2.3	2.0	1.9	2.0	2.1	2.2
SD	1.5	1.5	1.5	1.5	1.5	1.6
<b>Number of Chronic Diseases (weighted %)</b>						
None	14.5	19.6	19.7	16.1	18.0	15.6
At Least 1	85.6	80.4	80.3	83.9	82.0	84.4
0	14.5	19.6	19.7	16.1	18.0	15.6
1	19.0	20.8	23.2	26.0	21.6	21.9
2	23.7	22.2	22.9	23.2	23.0	22.5
≥3	42.8	37.4	34.2	34.7	37.4	40.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

The proportions of the number(s) of chronic diseases were more or less similar across strata defined by education level and living arrangement.

The top 5 chronic diseases among older Singaporeans are reported below.

**Table 4.3a High Blood Pressure or Hypertension by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>High Blood Pressure or Hypertension</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	55.8	47.6	63.5	67.8	56.0	55.6	55.4	58.0	62.3	33.3
<b>Treated with medicine or surgery (weighted %)</b>										
n	2644	979	974	961	1206	1438	1934	410	286	14
Yes	96.3	96.3	96.9	95.5	96.4	96.3	96.2	96.3	98.2	100.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	2549	944	944	661	1161	1388	1857	397	281	14
Yes	1.1	1.2	0.7	1.4	1.0	1.2	1.1	1.1	1.0	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	27	13	6	8	12	15	20	4	3	0
Mean	1.4	1.5	1.6	1.1	1.2	1.6	1.4	1.3	2.4	0.0
SD	0.9	0.8	1.4	0.4	0.9	0.9	0.8	0.5	2.3	0.0

More than half (56%) of older Singaporeans had been diagnosed with high blood pressure, with the highest proportion among those aged 80 and above. Of those diagnosed, nearly all of them reported having been treated, whereas nearly none of them had been hospitalised due to this condition in the past 6 months. Among those who were hospitalised, the average number of hospitalisations in the past 6 months was 1.4.

**Table 4.3b High Blood Pressure or Hypertension by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>High Blood Pressure or Hypertension</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	62.3	57.2	50.5	50.3	55.7	57.3
<b>Treated with medicine or surgery (weighted %)</b>						
n	888	807	678	264	2395	247
Yes	95.8	96.7	96.4	96.7	96.3	97.1
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	851	781	655	255	2307	240
Yes	0.9	1.7	1.0	0.0	1.1	1.0
<b>Number of times hospitalised in the past 6 months</b>						
n	8	13	6	0	24	3
Mean	1.6	1.2	1.6	0.0	1.5	1.0
SD	1.0	0.9	0.9	0.0	0.9	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

The proportion of older Singaporeans diagnosed with high blood pressure was the highest among those with no formal education (62%). This proportion decreased as education level increased.

**Table 4.3c Prescription Medication for High Blood Pressure or Hypertension by Age Group, Gender, Ethnicity**

	Age Group				Gender		Ethnicity			
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Taking prescribed medication for high blood pressure (weighted %)</b>										
n	2648	980	974	694	1206	1442	1938	410	286	14
Yes	95.7	95.3	96.0	96.0	95.1	96.2	95.6	95.4	97.8	88.2
No	3.7	4.1	3.8	2.9	4.4	3.2	3.8	4.3	16.0	11.8
Not taking regularly	0.3	0.2	0.1	0.5	0.4	0.2	0.3	0.0	0.6	0.0
Not prescribed medication	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.0	0.0

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Nearly 96% of older Singaporeans diagnosed with high blood pressure reported that they were taking prescribed medication for it. This proportion was similar across all age groups, genders and the three major ethnicities.

**Table 4.3d Prescription Medication for High Blood Pressure or Hypertension by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Taking prescribed medication for high blood pressure (weighted %)</b>						
n	890	808	678	264	2398	247
Yes	96.3	95.1	95.7	96.0	95.6	96.3
No	3.1	3.9	4.1	4.0	3.8	3.0
Not taking regularly	0.3	0.5	0.0	0.0	0.3	0.1
Not prescribed medication	0.1	0.4	0.2	0.0	0.2	0.6

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

This proportion of older Singaporeans diagnosed with high blood pressure who reported that they taking their prescribed medication for it was also similar (~95-96%) across strata defined by education level and living arrangement.

**Table 4.4a High Blood Cholesterol or Lipids by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>High Blood Cholesterol or Lipids</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	49.2	46.3	51.4	54.7	46.3	51.8	47.9	55.5	60.3	38.7
<b>Treated with medicine or surgery (weighted %)</b>										
n	2334	966	804	564	1023	1311	1653	391	274	16
Yes	95.0	93.3	97.1	95.9	95.2	94.8	94.8	95.5	96.0	92.8
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	2225	905	779	541	978	1247	1571	375	264	15
Yes	0.3	0.4	0.2	0.2	0.1	0.5	0.3	0.3	0.4	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	6	4	1	1	1	5	4	1	1	0
Mean	1.7	1.8	1.0	2.0	2.0	1.6	1.7	1.0	2.0	0.0
SD	0.9	1.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0

About half of older Singaporeans had been diagnosed with high blood cholesterol by a medical professional (49%). Among the three major ethnicities, this proportion was the highest among the Indians, followed by the Malays and Chinese. Nearly all (95%) who had been diagnosed reported being treated for the condition.

**Table 4.4b High Blood Cholesterol or Lipids by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>High Blood Cholesterol or Lipids</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	54.6	47.4	46.3	48.8	49.3	49.3
<b>Treated with medicine or surgery (weighted %)</b>						
n	768	684	616	260	2125	208
Yes	95.7	94.6	95.9	92.1	94.9	96.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	735	650	592	242	2024	201
Yes	0.3	0.4	0.2	0.0	0.3	0.0
<b>Number of times hospitalised in the past 6 months</b>						
n	2	3	1	0	6	0
Mean	2.7	1.2	1.0	0.0	1.7	0.0
SD	0.7	0.5	0.0	0.0	0.9	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

The proportion who had been diagnosed with high blood cholesterol was the highest for those with no formal education (55%), and marginally lower (46-48%) for those with higher education levels.



**Table 4.4c Prescription Medication for High Cholesterol or Lipids by Age Group, Gender, Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Taking prescribed medication for high cholesterol (weighted %)</b>										
n	2336	966	804	566	1023	1313	1655	391	274	16
Yes	93.1	90.7	96.4	93.9	92.6	93.5	92.6	95.4	96.5	86.9
No	6.3	8.7	3.5	4.7	7.3	5.6	6.7	4.3	3.5	13.1
Not taking regularly	0.3	0.2	0.2	0.6	0.0	0.5	0.3	0.3	0.0	0.0
Not prescribed medication	0.1	0.2	0.0	0.0	0.1	0.1	0.2	0.0	0.0	0.0

Percentages may not add up to 100% as responses of ‘Refused/Don’t Know’ are not shown.

Almost all (93%) older Singaporeans who had been diagnosed with high blood cholesterol were taking prescribed medication for it.

**Table 4.4d Prescription Medication for High Cholesterol or Lipids by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Taking prescribed medication for high cholesterol (weighted %)</b>						
n	769	685	615	260	2126	208
Yes	94.5	93.7	93.3	88.3	93.0	94.5
No	5.1	5.8	5.9	11.3	6.4	5.5
Not taking regularly	0.2	0.1	0.5	0.0	0.3	0.0
Not prescribed medication	0.0	0.0	0.2	0.5	0.1	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
Percentages may not add up to 100% as responses of ‘Refused/Don’t Know’ are not shown.

Across education levels, the proportion of those taking prescribed medication for high blood cholesterol was the lowest for those with tertiary education.

**Table 4.5a Cataract by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Cataract</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	30.9	19.4	38.7	53.4	30.5	31.3	31.9	22.5	32.5	25.0
<b>Treated with medicine or surgery (weighted %)</b>										
n	1524	390	599	535	697	827	1183	171	160	10
Yes	78.9	69.2	83.7	83.7	84.3	74.2	78.6	80.2	80.6	77.7
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	1224	272	502	450	592	632	944	139	133	8
Yes	1.4	0.4	1.9	1.6	1.2	1.5	1.5	1.0	0.4	0.0

Nearly one-third of older Singaporeans had been diagnosed with cataract. This proportion increased with age, and was lower among the Malays and Others relative to the Chinese and Indians. The proportion who had been treated for cataract also increased with age, and was higher among males (84%) than females (74%).

**Table 4.5b Cataract by Educational Level and Living Arrangement**

		Educational Level Completed				Living Arrangement	
		None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Cataract</b>							
<b>Diagnosed by a medical professional (weighted %)</b>							
n		1390	1385	1262	503	4136	407
Yes		38.3	28.1	27.2	30.2	30.3	37.4
<b>Treated with medicine or surgery (weighted %)</b>							
n		554	421	374	172	1357	165
Yes		82.3	80.2	74.3	75.9	78.4	82.8
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>							
n		463	341	285	133	1085	137
Yes		1.6	1.7	1.0	0.6	1.3	1.2

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Those with no formal education comprised of the largest proportion that had been diagnosed with cataract as well as had been treated for it were the highest across all education levels. These levels were also higher for those living alone (37%) versus not living alone (30%).

**Table 4.6a Joint Pain, Arthritis, Rheumatism or Nerve Pain by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Joint Pain, Arthritis, Rheumatism or Nerve Pain</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	28.7	25.4	29.6	37.8	26.0	31.1	28.6	27.5	32.9	25.4
<b>Treated with medicine or surgery (weighted %)</b>										
n	1358	541	459	385	575	783	977	201	151	9
Yes	70.8	68.2	74.8	70.7	75.7	67.2	70.0	74.0	77.4	60.5
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	977	356	343	278	443	534	703	152	116	6
Yes	4.2	4.4	3.5	4.7	4.5	3.9	4.2	3.3	3.0	18.0
<b>Number of times hospitalised in the past 6 months</b>										
n	39	15	10	14	17	22	29	5	4	1
Mean	1.1	1.1	1.1	1.0	1.0	1.1	1.0	1.5	1.7	1.0
SD	0.4	0.4	0.4	0.0	0.2	0.5	0.0	0.8	1.1	0.0

Nearly 3 in 10 (29%) older Singaporeans had been diagnosed with joint pain, arthritis, rheumatism or nerve pain. This proportion increased with age, was higher for females versus males, and was the highest for Indians across ethnicities.

**Table 4.6b Joint Pain, Arthritis, Rheumatism or Nerve Pain by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Joint Pain, Arthritis, Rheumatism or Nerve Pain</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	33.2	26.5	27.4	27.6	28.5	31.5
<b>Treated with medicine or surgery (weighted %)</b>						
n	473	389	351	144	1223	135
Yes	71.1	71.8	69.3	71.1	70.6	73.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	344	281	249	102	877	100
Yes	4.9	3.7	4.9	1.8	4.4	2.5
<b>Number of times hospitalised in the past 6 months</b>						
n	17	10	10	2	36	3
Mean	1.1	1.1	1.0	1.7	1.1	1.0
SD	0.3	0.3	0.0	1.4	0.4	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

While older Singaporeans with no formal education were most likely to have been diagnosed with joint pain, arthritis, rheumatism or nerve pain, the proportion who had been treated for the condition was similar across education levels (Primary and above).

**Table 4.7a High Blood Sugar or Diabetes by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>High Blood Sugar or Diabetes</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	25.1	23.3	27.1	26.9	26.9	23.5	23.2	30.6	43.8	17.6
<b>Treated with medicine or surgery (weighted %)</b>										
n	1220	507	428	285	598	622	797	214	201	8
Yes	93.4	93.2	94.2	92.7	92.7	94.2	92.5	96.8	96.1	100.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	1147	475	406	266	560	587	737	208	194	8
Yes	1.9	2.1	1.7	1.6	1.9	1.8	1.9	2.5	1.5	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	22	11	7	4	12	10	14	5	3	0
Mean	1.6	1.4	2.0	1.5	1.6	1.7	1.6	1.2	2.8	0.0
SD	1.0	0.7	1.5	0.6	1.1	0.9	0.9	0.5	2.0	0.0

One in four of older Singaporeans reported having been diagnosed with high blood sugar or diabetes. This proportion was higher for those aged 70 years and above, versus 60-69 years, higher for males than females, and highest for Indians across all ethnicities. Overall as well as across age groups, gender and ethnicities, more than 90% of those diagnosed with high blood sugar or diabetes reported being treated with medicine or surgery for it.

**Table 4.7b High Blood Sugar or Diabetes by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>High Blood Sugar or Diabetes</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	27.0	25.1	23.5	24.5	25.2	23.7
<b>Treated with medicine or surgery (weighted %)</b>						
n	385	373	331	129	1115	105
Yes	95.4	94.8	92.0	88.4	93.4	94.3
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	368	355	306	116	1048	99
Yes	2.4	2.8	1.1	0.0	1.8	3.1
<b>Number of times hospitalised in the past 6 months</b>						
n	9	9	4	0	19	3
Mean	1.6	1.7	1.3	0.0	1.6	1.5
SD	0.9	1.2	0.5	0.0	1.0	1.1

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Among older Singaporeans who had been diagnosed with and treated for high blood sugar or diabetes, those who received tertiary education and those who were not living alone were less likely to be hospitalised due to high blood sugar or diabetes within the past 6 months.

**Table 4.7c Prescription Medication for High Blood Sugar or Diabetes by Age Group, Gender, Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Taking prescribed medication for high blood sugar or diabetes (weighted %)</b>										
n	1224	508	428	288	598	626	801	214	201	8
Yes	91.8	91.5	92.7	90.8	91.2	92.4	90.3	96.7	96.0	100.0
No	7.4	7.5	7.1	7.3	8.3	6.5	8.6	3.3	3.3	0.0
Not taking regularly	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Not prescribed medication	0.6	0.7	0.2	0.7	0.6	0.5	0.6	0.0	0.7	0.0

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Among older Singaporeans who had been diagnosed with high blood sugar or diabetes, 92% reported taking their prescribed medication. The proportion was similar across age groups and gender, although it was higher for the Indians and Malays across ethnicities.

**Table 4.7d Prescription Medication for High Blood Sugar or Diabetes by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Taking prescribed medication for high blood sugar or diabetes (weighted %)</b>						
n	387	374	331	129	1118	105
Yes	93.2	90.3	94.0	87.9	91.6	94.4
No	6.1	7.9	5.8	12.1	7.5	5.6
Not taking regularly	0.0	0.0	0.0	0.0	0.0	0.0
Not prescribed medication	0.3	1.4	0.2	0.0	0.6	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Among older Singaporeans who had been diagnosed with high blood sugar or diabetes, across education levels, those with tertiary education were least likely to take their prescribed medication.

The distribution of other chronic diseases assessed from the survey participants, by age group, gender, ethnicity, educational level, and living arrangement is provided in Appendix Tables A4c-A4au.

### Activities of daily living (ADL) difficulty

Activities of daily living (ADL) difficulty were measured in terms of difficulty in performing daily self-care activities due to a health or physical condition without the assistance of a person or assistive device. Respondents were asked whether they found an activity difficult or not difficult (reported in Table 4.8.1a) and among those who reported that an activity was difficult, they were asked how difficult it was for them to perform this activity by themselves (reported in Appendix Table 4av-4aw).

**Table 4.8.1a ADL Difficulty by Age Group, Gender and Ethnicity – Part (i)**

Difficulty in...	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>ADL Difficulty (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Take a bath/shower	5.1	1.4	3.9	19.5	3.0	7.1	5.0	6.0	6.3	3.4
Dress up	4.1	1.1	3.3	15.7	2.8	5.3	4.0	4.4	5.6	3.4
Eat	1.7	0.6	1.3	6.0	1.4	2.0	1.6	2.2	2.1	1.5
Stand up from a bed/chair; sitting down on a chair	6.9	2.5	5.6	23.4	3.3	10.0	6.4	10.0	9.1	5.3
Walk (around the house)	7.5	2.2	6.4	26.5	4.5	10.1	7.1	11.1	7.6	5.3
Use the sitting toilet	3.6	0.9	3.0	13.7	2.6	4.6	3.5	5.2	3.7	1.5
<b>Number of ADL Difficulty(ies) (weighted %)</b>										
No ADL difficulty	90.7	96.6	91.8	69.5	94.7	87.1	91.1	87.5	88.3	94.7
1-2 ADL difficulties	4.4	2.1	4.5	11.5	2.2	6.2	4.2	5.6	5.2	1.9
≥3 ADL difficulties	4.9	1.3	3.7	18.7	3.1	6.5	4.6	6.9	6.5	3.4

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

About 9% of older Singaporeans reported experiencing difficulty with at least one ADL; 4% experienced difficulty with 1-2 ADLs and 5% with 3 or more ADLs.

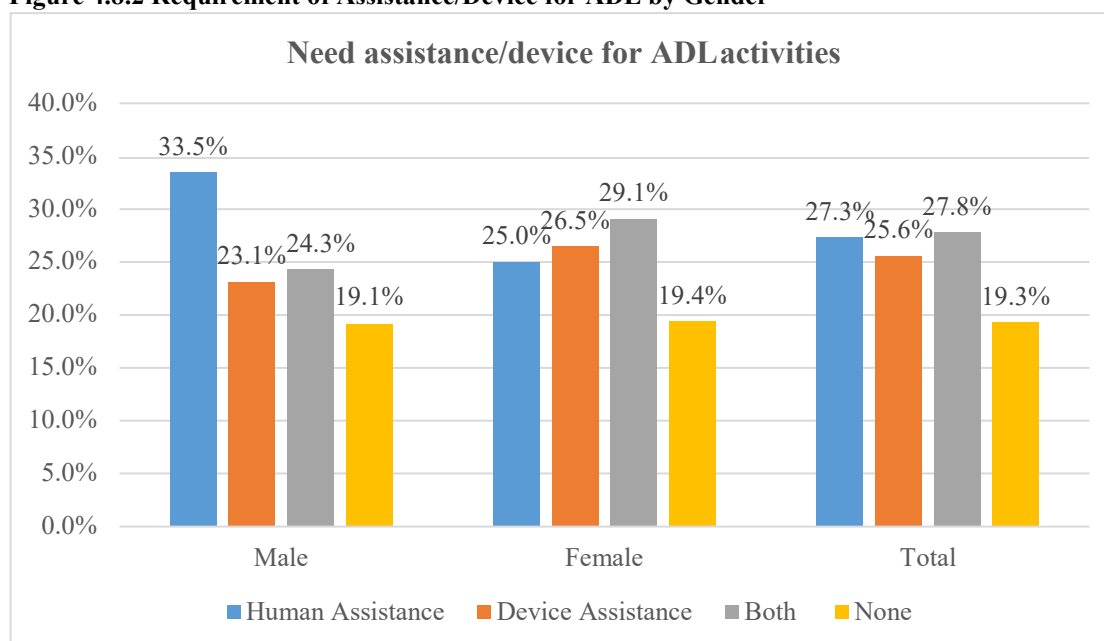
The largest proportion was for difficulty in walking around the house (8%), followed by difficulty with standing up from a bed/chair or sitting down on chair (7%). The proportion with any ADL difficulty increased by age, doubling from the 60-69 years age group to the 70-79 years age group, and rising sharply for those aged 80 years and above. More females (13%) reported at least one ADL difficulty than males (5%). The proportion with at least one ADL difficulty was highest among the Malays (13%), followed by the Indians (12%), Chinese (9%) and Others (5%).

**Table 4.8.1b ADL Difficulty by Educational Level and Living Arrangement – Part (i)**

Difficulty in...	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>ADL Difficulty (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Take a bath / shower	11.1	3.5	2.4	2.2	5.1	5.5
Dress Up	8.5	2.7	2.0	2.6	4.1	4.5
Eat	3.1	1.1	1.2	1.1	1.8	1.2
Stand up from a bed / chair; sitting down on a chair	14.4	4.8	3.5	2.8	6.7	8.6
Walk (around the house)	15.7	5.8	3.0	3.6	7.4	8.3
Use the sitting toilet	7.7	2.6	1.6	1.2	3.6	3.7
<b>Number of ADL Difficulty(ies) (weighted %)</b>						
No ADL difficulty	81.2	92.7	95.6	95.7	90.7	90.0
1-2 ADL difficulties	7.9	4.0	2.2	2.3	4.3	4.5
≥3 ADL difficulties	10.7	3.2	2.2	2.1	4.9	5.5

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Across education levels, older Singaporeans with no formal education were the most likely to have experience at least one ADL difficulty (19A further 11% of them reported difficulty with 3 or more ADLs versus 2-3% of those with higher education levels. The proportion reporting at least one ADL difficulty was similar across living arrangements.

**Figure 4.8.2 Requirement of Assistance/Device for ADL by Gender**

Among older Singaporeans who reported at least one ADL difficulty, a higher proportion of males (34%) needed human assistance in performing these activities compared to females (25%). On the other hand, the proportion of females needing device assistance was higher (27%) compared to males (24%), and the proportion needing both human and device assistance was also higher among females (29%) compared to males (24%).

The distribution of the requirement of assistance or device for ADL by age group, ethnicity, education level and living arrangement is provided in Appendix Tables A4ax-A4ay.



**Instrumental activities of daily living (IADL) difficulty**

IADL difficulty was measured in terms of difficulty in performing daily activities of independent living considered more complex than ADL, due to a health or physical condition and without the assistance of a person or assistive device. Respondents were asked whether they found an activity difficult or not difficult (reported in table 4.8.3a) and among those who reported that an activity was difficult, they were asked how difficult it was for them to perform this activity by themselves (reported in Appendix Table A4az-4aaa). Individuals who reported that they did not perform the activity due to a non-health reason (possibly due to gender roles etc.) were considered not to have difficulty due to a health/physical reason.

**Table 4.8.3a IADL Difficulty Status (Due to Health/Physical Reason) by Age, Group, Gender and Ethnicity – Part (i)**

Difficulty in...	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>IADL Difficulty (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Prepare own meals	6.4	2.0	5.1	23.1	3.3	9.1	6.2	8.3	7.4	3.4
Leave the home to purchase necessary items or medication	9.9	3.0	9.3	33.6	5.9	13.4	9.2	15.2	13.6	3.4
Take care of financial matters e.g. paying utilities (electricity, water)	3.1	0.8	2.5	11.4	2.1	3.9	3.1	3.7	2.5	1.5
Use the phone	4.5	0.9	4.0	17.3	3.2	5.7	4.4	6.0	4.3	3.4
Dust, clean-up and other light housework	7.5	2.6	6.8	24.3	3.8	10.6	7.2	10.0	8.2	3.4
Take public transport to leave home	11.3	3.0	11.0	39.0	7.5	14.7	10.4	17.7	15.9	3.4
Take medication as prescribed	4.7	0.8	3.6	19.5	3.6	5.7	4.7	5.3	4.9	1.5
Use the Internet for e-mail or other purpose e.g. making purchases or travel reservations, communicating with relatives & friends or searching for information	8.0	6.3	8.2	13.0	10.0	6.2	7.9	10.7	5.8	1.5
<b>Number of IADL Difficulty(ies) (weighted %)</b>										
No IADL difficulty	79.8	89.9	79.3	47.9	82.4	77.4	80.7	71.8	75.4	94.7
1-2 IADL difficulties	11.6	8.0	13.4	19.8	12.5	10.8	11.0	15.6	15.3	1.9
≥3 IADL difficulties	8.6	2.1	7.4	32.0	5.1	11.7	8.2	12.6	9.3	3.4

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

About 20% of older Singaporeans reported having at least one IADL difficulty. Of them, 12% had difficulty with 1-2 ADLs and 9% with 3 or more ADLs. The IADLs for which difficulty were reported the most were those that required going out, i.e. taking public transport and leaving the home to purchase necessary items or medication. As with ADL difficulty, the proportion of those with at least one IADL difficulty increased with

age, doubling from the 60-69 year age group to the 70-79 year age group, and rising sharply for those aged 80 years and above. More females than males reported at least one IADL difficulty (23% versus 18%) with the highest differences for 3 or more IADL difficulties (12% versus 5%). The proportion with at least one IADL difficulty was the highest among the Malays (28%), followed by the Indians (25%), Chinese (19%) and Others (5%).

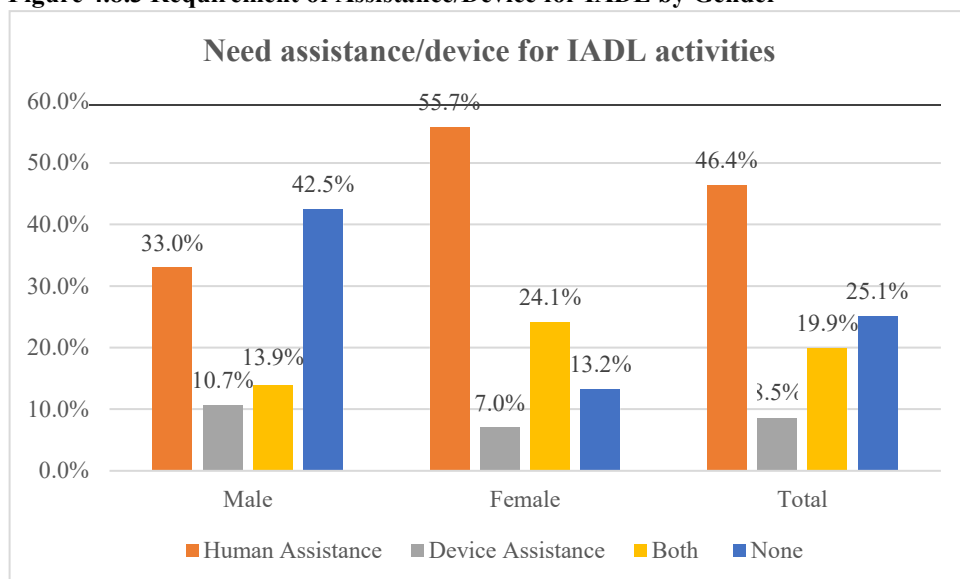
**Table 4.8.3b IADL Limitation Status (Due to Health/Physical Reasons) by Educational Level and Living Arrangement – Part (i)**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
n	1390	1385	1262	503	4136	407
<b>IADL Difficulty (weighted %)</b>						
Prepare own meals	14.3	4.8	2.3	2.3	6.4	6.9
Leave the home to purchase necessary items or medication	20.8	7.7	4.3	4.3	9.8	11.0
Take care of financial matters such as paying utilities (electricity, water)	6.4	2.4	1.3	1.5	3.0	3.4
Use the phone	10.0	3.5	1.5	1.5	4.8	2.1
Dust, clean up and other light housework	15.7	6.4	2.8	2.3	7.3	9.1
Take public transport to leave home	24.4	9.1	4.5	3.9	11.3	12.4
Take medication as prescribed	10.6	3.3	1.7	1.9	4.9	3.3
Use the Internet for e-mail or for any other purpose, such as making purchases or travel reservations, communicating with relatives and friends, or searching for information	13.9	8.7	4.0	2.4	8.0	6.9
<b>Number of IADL Difficulty(ies) (weighted %)</b>						
No IADL limitation	61.5	80.2	90.8	93.5	79.7	80.7
1-2 IADL limitations	19.0	13.5	6.1	3.5	11.8	9.5
≥3 IADL limitations	19.4	6.2	3.1	3.0	8.5	9.8

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
Percentages may not add up to 100% as responses of 'Refused/Don't know' are not shown.

An education gradient was observed for IADL difficulties. The proportion who reported at least one IADL difficulty was the highest for those with no formal education (38%), followed by those with primary education (20%), secondary education (9%) and tertiary education (7%). The most common IADL difficulty among those with no formal education, primary education and secondary education, was taking the public transport. Whereas it was leaving the home to purchase necessary items or medications for those with tertiary education. The proportion with at least one IADL difficulty was similar between those living alone and those not living alone.

**Figure 4.8.3 Requirement of Assistance/Device for IADL by Gender**



Among those with at least one IADL difficulty, a higher proportion of males (43%) than females (13%) did not need assistance to perform the activity. The proportion of those needing human assistance to perform the activity was higher among females (56%) compared to males (33%). The proportion of those needing both types of assistance was also higher among females (24%) compared to males (14%).

The distribution of requirement of assistance or device for IADL difficulty by age group, ethnicity, education level and living arrangement is provided in Appendix Tables A4aab-A4aac.

## Body Mass Index (BMI)

BMI (weight in kilograms divided by height in meters squared) was calculated using measured weight and height of the survey participants. Two classifications of BMI were used – the WHO version and a version adapted for Asian body types. The below pie charts measure the classifications of older Singaporeans according to the two classifications.

Figure 4.9a Distribution of BMI categories

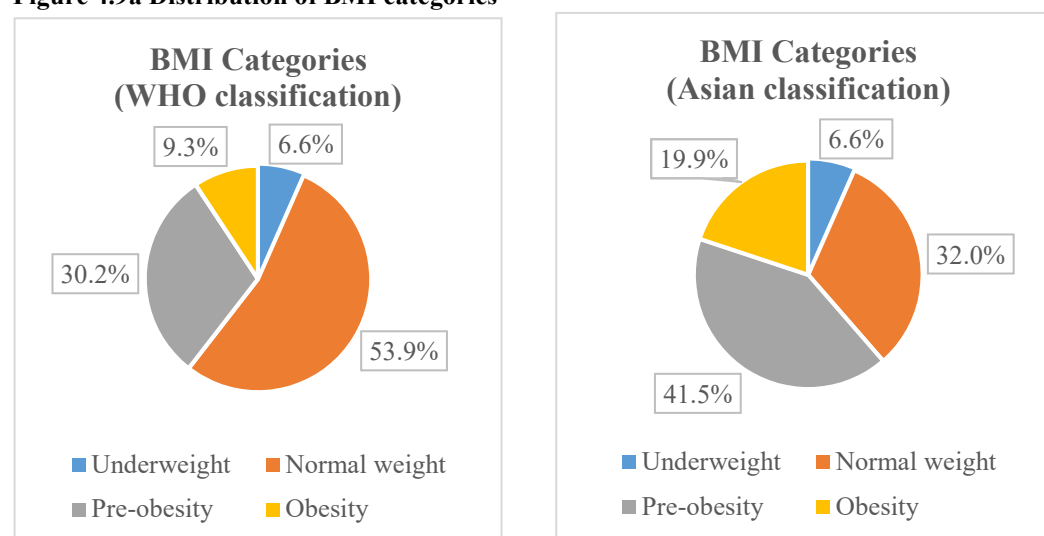


Table 4.9b BMI, Mean and Categories, by Age Group, Gender and Ethnicity

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
n	3854	1821	1298	735	1723	2131	2841	599	385	29
Mean	24.4	24.9	24.0	23.1	24.2	24.5	23.9	26.9	26.7	25.2
SD	4.6	4.5	4.6	4.4	4.1	4.9	4.1	6.4	4.8	4.6
<b>BMI Categories (WHO classification) (weighted %)</b>										
Underweight	6.6	4.7	7.4	12.4	6.4	6.7	7.2	4.1	1.2	7.7
Normal weight	53.9	51.5	56.3	58.2	56.5	51.9	57.2	37.9	38.3	39.0
Pre-obesity	30.2	33.3	27.5	23.9	29.8	30.6	28.9	34.5	40.0	39.3
Obesity	9.3	10.5	8.8	5.5	7.3	10.9	6.7	23.5	20.5	14.0
<b>BMI Categories (Asian classification) (weighted %)</b>										
Underweight	6.6	4.7	7.4	12.4	6.4	6.7	7.2	4.1	1.2	7.7
Normal weight	32.0	28.6	35.2	38.9	30.6	33.2	34.3	21.9	20.6	20.6
Pre-obesity	41.5	44.6	38.7	35.3	45.4	38.4	42.5	35.2	38.8	38.3
Obesity	19.9	22.1	18.8	13.5	17.6	21.7	16.0	38.8	39.4	33.4

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The average BMI of older Singaporeans was 24.4 kg/m<sup>2</sup>. The average BMI was lower among those aged 80 years and older compared to those in the younger age groups, similar between males and females, and higher for Malays and Indians than Chinese and Others.

Based on the Asian BMI categorization, the most prevalent group was pre-obesity (42%), and nearly 20% of older Singaporeans had obesity. In general, Singaporeans aged 80 years and above tended to be underweight or normal weight, whereas those

aged 60-69 years tended to have pre-obesity or obesity. A higher proportion of Malays (39%), Indians (39%) and Others (33%) had obesity as compared to the Chinese (16%).

**Table 4.9c BMI, Mean and Categories, by Education Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
n	1148	1174	1082	447	3501	349
Mean	24.2	24.5	24.4	24.3	24.4	24.0
SD	4.8	4.6	4.5	4.0	4.6	4.6
<b>BMI Categories (WHO classification) (weighted %)</b>						
Underweight	8.1	6.7	6.2	3.9	6.2	10.2
Normal weight	52.1	53.0	54.8	57.7	54.0	53.7
Pre-obesity	29.7	31.0	30.0	29.9	30.4	27.9
Obesity	10.0	9.2	9.0	8.6	9.4	8.3
<b>BMI Categories (Asian classification) (weighted %)</b>						
Underweight	8.1	6.7	6.2	3.9	6.2	10.2
Normal weight	34.4	30.2	30.8	34.1	32.1	31.2
Pre-obesity	38.1	41.7	43.7	43.3	41.9	37.6
Obesity	19.5	21.4	19.3	18.7	19.8	21.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The average BMI was similar across strata defined by education and living arrangement using the WHO classification. However, when classified using the Asian BMI categorization, older Singaporeans with no formal education were more likely to be underweight, and this proportion decreased with education. And in terms of living arrangement, those living alone were more likely to be underweight (10% versus 6%) than those not living alone.

## Blood Pressure

**Table 4.10a Blood Pressure Values by Age Group and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Systolic Blood Pressure (based on mean of last two of three readings)</b>										
n	4373	1989	1448	936	2026	2347	3222	684	434	33
Mean	138.4	136.8	139.6	142.1	139.9	137.2	138.3	141.5	137.3	133.6
SD	19.8	19.3	19.9	21.0	19.3	20.3	19.5	22.1	19.8	21.3
<b>Diastolic Blood Pressure (based on mean of last two of three readings)</b>										
Mean	75.1	77.1	73.7	70.4	76.1	74.1	74.8	77.4	74.9	75.2
SD	11.2	10.8	11.1	11.3	11.3	11.1	11.1	12.3	11.4	9.9

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

While the mean values of systolic blood pressure increased with age, those for diastolic blood pressure declined with age. Both mean values were slightly higher for males versus females, and the highest for Malays across ethnicities.

**Table 4.10b Blood Pressure by Education Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Systolic Blood Pressure (based on mean of last two of three readings)</b>						
n	1312	1335	1229	491	3976	393
Mean	140.0	139.2	137.6	135.3	138.5	137.7
SD	20.9	19.8	19.3	18.2	20.0	18.8
<b>Diastolic Blood Pressure (based on mean of last two of three readings)</b>						
Mean	73.2	75.5	76.3	75.3	75.1	74.1
SD	11.5	11.2	11.2	10.3	11.3	10.8

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

While the mean values of systolic blood pressure decreased with increasing education level, those for diastolic blood pressure were largely similar across education levels. Both mean values were comparable across living arrangement strata.

## Hand Grip Strength

Hand grip strength was measured using a Smedley spring-type dynamometer (Hand Grip Meter 6103, Tanita, Tokyo, Japan) among all survey participants who consented to the anthropometric and performance measurement and had not had any physical condition/problem related to their hand in the past six months.

**Table 4.11a Hand Grip Strength by Age Group and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Hand Grip Strength (Mean value for dominant hand from two measurements)</b>										
n	4297	1971	1425	901	2006	2291	3177	665	422	33
Mean	21.1	23.3	20.1	15.3	26.9	16.0	21.3	20.0	19.8	23.0
SD	7.8	7.7	6.9	6.2	6.6	4.4	7.8	7.5	7.4	7.8

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The average hand grip strength among older Singaporeans was 21.1 kg. The average value decreased with age, was lower among females versus males, and was higher for the Chinese compared to Malays and Indians.

**Table 4.11b Hand Grip Strength by Education Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Hand Grip Strength (Mean value for dominant hand from two measurements)</b>						
n	1270	1324	1217	481	3904	389
Mean	16.7	21.6	23.2	24.3	21.3	19.2
SD	6.4	7.3	7.7	7.6	7.8	7.1

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

An education gradient was observed in hand grip strength, with mean values increasing with education. Older Singaporeans who lived alone had a lower average hand grip strength (19.2kg) compared to those not living alone (21.3kg).



## Chapter 5: Psychological Health: Descriptive Statistics

In this chapter, we look at the overall descriptive statistics for depressive symptoms, personal mastery, quality of life and cognitive status as well as stratified by age group, gender, ethnicity, educational level and living arrangement.

### Depressive Symptoms

Depressive status was assessed using the 11-item CES-D scale (detailed in Chapter 2: Methodology). A score of 7 and above was considered to represent clinically relevant depressive symptoms.

**Table 5.1a Depressive Symptom Status (Mean CES-D Score and Clinically Relevant Symptoms) by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Center of Epidemiologic Studies Depression (CES-D) Score</b>										
n	2033	985	697	351	991	1042	1518	303	197	15
Mean	3.0	2.8	3.2	3.7	3.1	2.9	2.9	3.1	3.8	3.3
SD	3.2	3.0	3.4	3.2	3.0	3.3	3.1	3.1	3.8	4.4
Symptoms clinically relevant (weighted %)	11.7	10.1	13.2	15.0	10.9	12.4	11.1	12.7	18.7	8.7

About 12% of older Singaporeans had clinically relevant depressive symptoms. The prevalence of clinically relevant depressive symptoms increased with age, was slightly higher for females than males, and highest for the Indians across ethnicities.

**Table 5.1b Depressive Symptom Status (Mean CES-D Score and Clinically Relevant Symptoms) by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	No	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Center of Epidemiologic Studies Depression (CES-D) Score</b>						
n	541	634	616	241	1828	202
Mean	3.6	3.1	2.7	2.5	2.9	3.8
SD	3.4	3.4	2.7	2.8	3.1	3.7
Symptoms clinically relevant (weighted %)	17.0	12.0	8.6	8.2	10.9	19.2

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

The prevalence of clinically relevant depressive symptoms decreased as education level increased. Older Singaporeans who lived alone were twice as likely as those who did not live alone to have clinically relevant depressive symptoms.

### Personal Mastery

This was assessed using the Pearlin Mastery scale (detailed in Chapter 2: Methodology). The total score can range from 0 to 15 with higher scores indicating greater personal mastery.

**Table 5.2a Personal Mastery (Pearlin Mastery Score – Mean and Tertile) by Age Group, Gender and Ethnicity**

	Age Group				Gender		Ethnicity			
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Pearlin Mastery Score</b>										
n	1969	974	672	323	981	988	1470	295	189	15
Mean	9.2	9.3	9.1	9.0	9.2	9.3	9.2	9.3	8.9	9.2
SD	2.2	2.3	2.2	2.2	2.4	2.0	2.2	2.3	2.6	2.4
<b>weighted %</b>										
Lowest tertile	44.2	42.6	45.1	50.3	51.0	37.7	42.6	48.1	56.1	65.0
Middle tertile	41.2	41.1	42.5	37.6	28.9	53.1	43.2	36.7	24.6	17.8
Highest tertile	14.6	16.3	12.4	12.1	20.1	9.2	14.2	15.2	19.2	17.2

Higher score indicate higher levels of personal mastery.

About 85% of older Singaporeans had a personal mastery score classified into the lowest or middle tertile of the score’s distribution. About half of the males were in the lowest tertile, whereas about half of the females were in the middle tertile. Between the three major ethnic groups in Singapore, Indians were more likely to be in the lowest tertile.

**Table 5.2b Personal Mastery (Pearlin Mastery Score – Mean and Tertile) by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Pearlin Mastery Score</b>						
n	505	616	608	240	1774	192
Mean	9.1	9.0	9.4	9.5	9.2	9.1
SD	2.0	2.2	2.2	2.7	2.2	2.4
<b>weighted %</b>						
Lowest tertile	40.8	47.2	42.2	48.3	44.2	45.1
Middle tertile	51.6	40.8	39.6	27.2	41.5	37.7
Highest tertile	7.6	12.0	18.1	24.6	14.4	17.2

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Higher score indicated higher levels of personal mastery.

Personal mastery was positively associated with education level; the proportion in the highest tertile was twice as high for those with tertiary education than those with no formal education. The proportion in the highest tertile was also higher for those who lived alone versus those who did not live alone.

## Quality of Life

Quality of Life was assessed using the Control, Autonomy, Self-realization and Pleasure scale (detailed in Chapter 2: Methodology). The total score can range from 0 to 36, with a higher score indicating a higher quality of life.

**Table 5.3a Control, Autonomy, Self-realization and Pleasure Scale (CASP) Score by Age Group, Gender and Ethnicity**

		Age Group			Gender		Ethnicity			
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Control, Autonomy, Self-realization and Pleasure Scale (CASP) Score</b>										
n	4037	1986	1384	667	1975	2062	3013	601	391	32
Mean	27.1	27.9	26.6	24.7	25.5	28.6	27.1	26.9	26.4	29.7
SD	6.3	6.0	6.5	6.3	6.1	6.1	6.3	5.8	6.8	5.4

The average quality of life scores decreased with age, were higher for females than males, and comparable across the three major ethnicities.

**Table 5.3b Control, Autonomy, Self-realization and Pleasure Scale (CASP) Score by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	No	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Control, Autonomy, Self-realization and Pleasure Scale (CASP) Score</b>						
n	1051	1280	1216	489	3653	379
Mean	25.8	26.3	27.9	29.4	27.2	26.2
SD	6.7	6.3	5.9	5.3	6.3	6.6

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

The average quality of life scores increased as education level increased and were slightly higher for those who did not live alone than those who lived alone.

## Cognitive Status

Cognitive Status was assessed using the Abbreviated Mental Test (AMT) – Singapore (detailed in Chapter 2: Methodology).

**Table 5.4a AMT score by Age Group and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Abbreviated Mental Test (AMT) Score</b>										
n	4209	1995	1420	794	2001	2208	3138	630	409	32
Mean	9.2	9.6	9.2	7.7	9.6	8.9	9.3	9.1	9.0	9.8
SD	1.4	0.8	1.3	2.4	0.9	1.6	1.4	1.5	1.5	0.6

Percentages may not add up to 100% as responses of ‘Refused/Don’t Know’ are not shown.

Older Singaporeans aged 80 and above had poorer cognitive function, indicated by lower average AMT scores, than those in the younger age groups. The average AMT scores were higher for males than females, and comparable across the three major ethnicities.

**Table 5.4b AMT score by Education Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	No	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Abbreviated Mental Test (AMT) Score</b>						
n	1177	1315	1223	491	3812	391
Mean	8.2	9.3	9.7	9.8	9.3	9.1
SD	2.0	1.2	0.7	0.5	1.4	1.5

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of ‘Refused/Don’t Know’ are not shown.

A slight gradient by education level in average AMT scores was observed; those with tertiary education had the highest average score.

## Chapter 6: Health Behaviours: Descriptive Statistics

This chapter reports the descriptive statistics, overall and by age group, gender, ethnicity, educational level and living arrangement, for smoking, physical activity, participation in cancer screenings (blood stool test, Pap smear test, and mammogram) and in tests for chronic diseases (blood pressure check, blood test for diabetes or blood sugar level, and blood test for cholesterol or lipid level). We further provide descriptive statistics for prescription medication use, medication adherence, health insurance, and contact with health professionals and services.

### Smoking

Respondents were first asked if they had smoked at least 100 cigarettes in their lifetime, defining those who had not as ‘never smoker’. Those who responded that they had were asked if they now smoked every day or on some days (defined as ‘current smoker’) or not at all (defined as ‘ex-smoker’).

**Table 6.1a Smoking by Age Group, Gender and Ethnicity**

	Age Group				Gender		Ethnicity			
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Smoking (weighted %)</b>										
n	4528	2012	1495	1021	2110	2418	3343	704	448	33
Never Smoker	74.4	74.2	72.7	78.2	48.9	96.8	75.5	67.5	75.6	47.5
Ex-smoker	14.5	13.1	16.4	15.9	29.4	1.5	14.2	15.9	13.8	26.4
Current smoker	11.1	12.8	10.9	5.9	21.7	1.7	10.2	16.6	10.6	26.1

About 3 in 4 older Singaporeans were never smokers; this proportion was lower among those aged 60-69 (74%) and 70-79 years (73%) compared to those aged 80 years and above (78%). On the other hand, a higher proportion of those aged 60-69 years were current smokers (13%) compared to those aged 70-79 years (11%) and those aged 80 years and above (6%).

Most females were never smokers (97%), compared to about half of the males (49%). The proportion of never smokers was higher among the Chinese and Indians (76%) compared to Malays (68%) and Others (48%).

**Table 6.1b Smoking by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Smoking (weighted %)</b>						
n	1381	1379	1259	501	4117	406
Never Smoker	81.1	68.2	73.0	78.1	74.2	76.7
Ex-smoker	9.7	17.2	15.6	15.9	14.4	15.2
Current smoker	9.2	14.6	11.4	6.0	11.4	8.1

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

The proportion of never smokers was higher among older Singaporeans with no formal education (81%) and tertiary education (78%) compared to those with secondary education

(73%) and primary education (68%). The proportion of current smokers was the lowest among those with tertiary education (6%) and highest for those with primary education (15%). Smoking status of those living alone and those not living alone were similar.

### Physical Activity

Physical activity was measured using the Global Physical Activity Questionnaire (GPAQ) which asked respondents about the time they spend in a typical week doing vigorous and moderate activities at work and leisure, as well as the time spent during travel and sedentary behaviour. Respondents whose total physical activity Metabolic Equivalent (MET) minutes per week were greater or equal to 600, were classified as meeting the World Health Organisation (WHO) recommendation on physical activity for health.

**Table 6.2a Physical Activity by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Total Physical Activity (weighted %)</b>										
n	2240	1005	739	496	1048	1192	1657	346	219	18
Meets WHO recommendations	66.4	75.6	67.1	34.7	74.1	59.6	68.1	52.1	62.0	77.6
Does not meet WHO recommendations	33.6	24.4	32.9	65.3	25.9	40.4	31.9	47.9	38.0	22.4

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Two-thirds of older Singaporeans met the WHO recommendations on physical activity for health. This proportion decreased with age, was lower among females (60%) compared to males (74%), and was the lowest among Malays (52%), compared to Indians (62%), Chinese (68%), and Others (78%).

**Table 6.2b Physical Activity by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	No	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Total Physical Activity (weighted %)</b>						
n	667	697	617	255	2052	187
Meets WHO recommendations	46.9	32.1	30.5	16.4	33.4	35.8
Does not meet WHO recommendations	53.1	67.9	69.5	83.3	66.6	64.2

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The intensity of physical activity declined as education level increased, with only 16% of those with tertiary education meeting the WHO recommendations on physical activity for health, compared to 47% of those with no formal education. The proportion was similar among those living alone and those not living alone.

## Participation in Cancer Screening

### Blood Stool Test

The [MOH Clinical Practice Guidelines for Cancer Screening, 2010](#) and recommendations from the [National University Cancer Institute, Singapore](#) state that those aged 50 years or older should undergo screening for colorectal cancer annually. .

**Table 6.3a Blood Stool Test by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Last Blood Stool Test (weighted %)</b>										
n	2277	1020	754	503	1059	1218	1682	351	226	18
Within the last 1 year	20.9	22.8	19.9	16.6	25.1	17.1	21.3	14.4	20.8	37.8
More than 1 year ago	26.1	25.2	27.9	25.7	22.1	29.7	27.7	15.7	24.1	14.3
Never	51.5	51.3	51.3	52.2	51.4	51.5	49.6	67.2	52.4	47.9

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Nearly half of older Singaporeans, overall, and across age groups, gender and ethnicities had never undergone screening for colorectal cancer. The proportion of those who underwent the screening within the last year was the highest for those aged 60-69 years (23%) versus 70-79 years (20%) or 80 years and above (17%). The proportion was higher among males (25%) compared to females (17%), and the highest among Others (38%), followed by Chinese and Indians (21%) and lowest among Malays (14%).

**Table 6.3b Blood Stool Test by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Last Blood Stool Test (weighted %)</b>						
n	684	709	623	257	2084	191
Within the last 1 year	17.4	15.8	22.7	35.9	21.3	16.1
More than 1 year ago	23.5	24.4	29.0	29.7	26.4	23.0
Never	56.0	58.2	47.9	33.6	50.8	59.2

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The proportion of older Singaporeans who had never undergone a blood stool test decreased as education level increased, and was higher for those living alone versus those not living alone. Those with tertiary education were the most likely to have gone for a blood stool test within the last 1 year (36%), compared to those with secondary education (23%), no formal education (17%) and primary education (16%). This proportion was higher among those not living alone (21%) compared to those living alone (16%).

## Pap Smear Test

The [MOH Clinical Practice Guidelines for Cancer Screening, 2010](#) and recommendations from the [National University Cancer Institute, Singapore](#) state that all women who have ever had sexual intercourse should undergo screening for cervical cancer through Pap smear test once every 3 years, starting at age 25 years till age 69 years (unless otherwise indicated).

**Table 6.4a Pap Smear Test by Age Group and Ethnicity**

	Total	Age Group			Ethnicity			
		60-69	70-79	80 & above	Chinese	Malay	Indian	Others
<b>Last Pap Smear Test (weighted %)</b>								
n	1218	516	398	304	906	179	124	9
Within the last 3 years	20.3	30.7	14.6	1.6	20.4	15.1	28.4	13.1
More than 3 years ago	33.1	36.1	36.7	18.9	33.8	31.1	25.0	38.1
Never	44.5	32.8	46.5	72.8	43.6	50.7	45.5	48.8

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Nearly 2 in 5 older Singaporean women had never undergone a Pap smear test, with the proportion increasing with age. Among those aged 60-69 years, only 31% had undergone the test within the last 3 years.

Even among those aged 70-79 years and 80 years and above, only 15% and 2% respectively had undergone the test within the last 3 years; however, we are unable to comment on the appropriateness of this screening given the lack of details on the respondents' reproductive and medical history. Across ethnicities, the proportion of women who had never undergone a Pap smear test was the highest for Malays.

**Table 6.4b Pap Smear Test by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Last Pap Smear Test (weighted %)</b>						
n	528	323	266	97	1092	124
Within the last 3 years	12.3	18.1	29.5	37.3	21.6	7.9
More than 3 years ago	25.5	33.7	42.8	38.6	33.1	33.6
Never	58.6	46.2	27.2	24.1	43.3	55.6

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The proportion of older Singaporean women who had never undergone a Pap smear test decreased by educational level, and was higher among those living alone (56%) compared to those not living alone (43%).



## Mammogram

For women aged 50 to 69 years, [MOH Clinical Practice Guidelines for Cancer Screening, 2010](#) and recommendations from the [National University Cancer Institute, Singapore](#) state that all women should undergo screening for breast cancer through mammograms once every two years (unless otherwise indicated).

**Table 6.5a Mammogram by Age Group and Ethnicity**

	Total	Age Group			Ethnicity			
		60-69	70-79	80 & above	Chinese	Malay	Indian	Others
<b>Last Mammogram (weighted %)</b>								
n	1218	516	398	304	906	179	124	9
Within the last 2 years	20.9	27.3	19.6	5.9	21.0	19.0	24.9	13.3
More than 2 years ago	36.9	41.4	39.1	20.9	37.5	32.6	35.3	31.8
Never	40.5	31.0	40.0	66.8	39.8	45.3	38.8	54.9

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Almost 2 in 5 older Singaporean women never undergone a mammogram, with the proportion increasing with age. Among those aged 60-69 years, only 27% had undergone the test within the last 2 years. Even among those aged 70-79 years and 80 years and above, only 20% and 6% respectively had undergone a mammogram within the last 2 years; however, we are unable to comment on the appropriateness of this screening given lack of details on the respondents' reproductive and medical history. Across ethnicities, the proportion of women who had never undergone a mammogram was the highest for Malays.

**Table 6.5b Mammogram by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	No	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Last Mammogram (weighted %)</b>						
n	528	323	266	97	1092	124
Within the last 2 years	14.0	17.7	29.3	38.9	21.0	19.2
More than 2 years ago	30.6	38.7	41.4	46.9	36.9	37.1
Never	52.2	42.2	29.0	14.2	40.5	40.1

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The proportion of older Singaporean women who had never undergone a mammogram decreased by educational level, and was similar between those living alone and not living alone.

## Participation in Health Exams/Tests for Chronic Diseases

### Blood Pressure Examination

The Ministry of Health, Singapore [recommends](#) that adults aged 50 years and above should undergo screening for high blood pressure every 2 years.

**Table 6.6a Last Blood Pressure Check by Age Group, Gender, Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Last blood pressure check (weighted %)</b>										
n	2277	1020	754	503	1059	1218	1682	351	226	18
Within the last 2 years	93.9	92.6	95.3	95.1	93.8	93.9	93.9	91.7	96.2	95.9
More than 2 years ago	3.4	4.1	2.7	2.2	3.4	3.3	3.3	4.0	2.4	4.1
Never	2.2	2.9	1.5	1.5	2.9	1.7	2.4	2.4	1.0	0.0

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The vast majority of older Singaporeans had a blood pressure examination within the last 2 years, overall as well as across age groups, gender and ethnicities. Nonetheless, this proportion was the lowest for those aged 60-69 years (93%) and for Malays (92%).

**Table 6.6b Last Blood Pressure Check by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	No	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Last blood pressure check (weighted %)</b>						
n	684	709	623	257	2084	191
Within the last 2 years	92.8	91.5	96.1	96.8	93.8	94.8
More than 2 years ago	3.6	4.7	2.0	2.5	3.4	2.8
Never	2.4	3.5	1.5	0.7	2.2	2.5

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The proportion of older Singaporeans who had a blood pressure examination within the last 2 years was very high for all levels of education and across living arrangements, albeit higher among those with secondary (96%) and tertiary education (97%).

## Blood Test for Diabetes or Blood Sugar Level

The Ministry of Health, Singapore [recommends](#) that adults aged 50 years and above should undergo screening for diabetes every 3 years.

**Table 6.7a Last Blood Test Check for Diabetes or Blood Sugar Level by Age Group, Gender, Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Last blood test check for diabetes or blood sugar level (weighted %)</b>										
n	2276	1020	754	502	1059	1217	1682	351	225	18
Within the last 3 years	90.2	88.6	92.6	90.9	92.1	88.6	89.9	88.9	95.6	95.9
More than 3 years ago	3.9	5.0	2.5	2.7	2.9	4.7	4.2	2.9	2.5	0.0
Never	4.7	5.3	3.9	4.0	4.6	4.8	4.8	6.1	1.3	4.1

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

9 in 10 older Singaporeans had a blood test check for diabetes or blood sugar level within the last 3 years. This proportion was higher among males (92%) compared to females (87%), and higher for Indians (96%) versus Chinese (90%) and Malays (89%), when comparing the three major ethnicities.

**Table 6.7b Last Blood Test Check for Diabetes or Blood Sugar Level by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Last blood test check for diabetes or blood sugar level (weighted %)</b>						
n	683	709	623	257	2083	191
Within the last 3 years	87.3	90.0	91.2	94.7	90.4	88.7
More than 3 years ago	4.3	3.4	4.4	3.2	3.7	6.0
Never	5.8	5.7	3.9	1.5	4.7	4.3

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The proportion of older Singaporeans who had a blood test check for diabetes or blood sugar level within the last 3 years was the highest for those with tertiary education (95%).

## Blood Test for Blood Cholesterol or Lipid Level

The Ministry of Health, Singapore [recommends](#) that adults aged 50 years and above should undergo screening for high blood cholesterol every 3 years.

**Table 6.8a Last Blood Test Check for Blood Cholesterol or Lipid Level by Age Group, Gender, Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Last blood test check for cholesterol or lipid level (weighted %)</b>										
n	2277	1020	754	503	1059	1218	1682	351	226	18
Within the last 3 years	90.6	89.1	92.8	91.7	92.6	88.9	90.2	89.9	96.1	95.9
More than 3 years ago	3.8	4.8	2.7	2.5	2.8	4.7	4.0	3.4	2.7	0.0
Never	4.7	5.4	3.8	3.9	4.2	5.1	4.9	4.9	0.8	4.1

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

9 in 10 older Singaporeans had a blood test check for cholesterol or lipids level within the last 3 years. This proportion was higher among males (93%) compared to females (89%), and higher for Indians (96%) compared to Malays (90%) and Chinese (90%).

**Table 6.8b Last Blood Test Check for Blood Cholesterol or Lipid Level by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
n	684	709	623	257	2084	191
<b>Last blood test check for cholesterol or lipid level (weighted %)</b>						
Within the last 3 years	88.2	90.6	91.3	94.1	90.7	90.0
More than 3 years ago	4.1	3.7	4.2	2.8	3.6	5.9
Never	5.6	5.1	4.3	2.7	4.7	4.1

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The proportion of older Singaporeans who had a blood test check for cholesterol or lipids level within the last 3 years was the highest for those with tertiary education (94%).

## Prescription Medication Use and Adherence

**Table 6.9a Prescription Medication Use by Age Group, Gender and Ethnicity**

	Age Group				Gender		Ethnicity			
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Take prescription medications on a regular basis (weighted %)</b>										
n	2277	1020	754	503	1059	1218	1682	351	226	18
Yes	74.1	66.7	81.4	84.7	72.8	75.4	73.6	75.7	82.7	59.6
<b>Number of prescription medications</b>										
n	2257	1012	747	498	1050	1207	1665	351	223	18
Mean	2.3	1.9	2.7	3.2	2.3	2.3	2.4	2.8	2.9	1.4
SD	2.3	2.1	2.4	2.6	2.4	2.3	2.3	2.6	2.4	1.7
<b>Number of prescription medications (categories), weighted %</b>										
0	26.0	33.5	18.7	15.5	27.5	24.8	26.6	24.3	17.5	40.4
1-4	59.7	57.2	64.0	59.9	57.0	62.1	60.0	56.3	61.3	56.9
≥5	14.3	9.4	17.3	24.6	15.5	13.2	13.4	19.4	21.2	2.7

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Nearly 3 in 4 older Singaporeans took prescription medications on a regular basis, and 14% had polypharmacy (i.e. took 5 or more prescription medications on a regular basis). These proportions increased with age, were relatively similar for females and males, and were the highest among Indians – 83% for over across ethnicities. A similar pattern – for age group, gender and ethnicity – was also observed for the mean number of prescription medications.

**Table 6.9b Prescription Medication Use by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Take prescription medications on regular basis (weighted %)</b>						
n	684	709	623	257	2084	191
Yes	79.3	74.6	68.2	75.4	74.4	72.3
<b>Number of prescription medications</b>						
n	675	702	620	256	2064	191
Mean	2.8	2.3	2.0	2.1	2.3	2.3
SD	2.5	2.2	2.2	2.4	2.3	2.6
<b>Number of prescription medications (categories), weighted %</b>						
0	21.0	25.4	32.0	24.7	25.8	27.7
1-4	58.9	61.8	56.5	63.9	59.9	57.9
≥5	20.2	12.8	11.5	11.4	14.3	14.4

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Across educational levels, those with no formal education comprised of the highest proportions of those who took prescription medications regularly (79%), those who had polypharmacy (20%) and the mean number of prescription medications (3%). An education gradient was observed in the context of polypharmacy; as the proportion of those who had polypharmacy increased, the level of education level decreased. The various indicators for prescription medications were similar between those living alone and not living alone.

**Table 6.10a Medication Adherence by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Forget to take prescription medications at times (weighted %)</b>										
n	1737	690	623	424	787	950	1269	268	190	10
Yes	26.4	29.2	25.7	20.5	32.9	20.9	25.7	30.5	24.4	59.0

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The proportion of older Singaporeans who forgot to take their prescription medications at times decreased with age, was higher among males (33%) compared to females (21%), and was the highest for Malays (59%) among the three major ethnicities.

**Table 6.10b Medication Adherence by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Forget to take prescription medications at times (weighted %)</b>						
n	550	540	445	199	1594	142
Yes	21.7	27.6	30.4	26.3	27.1	18.8

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The proportion of older Singaporeans who forgot to take their prescription medications at times was the lowest for those with no formal education (22%), and lower for those living alone (19%) compared to those not living alone (27%).

## Health Insurance

**Table 6.11a Medisave Account by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Health Insurance (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Medisave account	93.9	96.4	93.7	86.1	95.7	92.3	93.9	94.0	94.7	90.6
Private health insurance	32.6	43.2	26.2	10.1	35.9	29.7	34.1	23.0	24.7	41.8
Health benefits through current or previous employer	20.7	29.3	14.0	5.6	27.7	14.6	19.6	24.9	26.1	33.5

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The vast majority of older Singaporeans had a Medisave Account, about one-third had private health insurance and one-fifth had health benefits through their current or previous employer. These proportions decreased with age and was higher among males versus females. Comparing Chinese, Malays and Indians, while the proportion with a Medisave Account was similar, the Chinese proportion had the highest proportion for private health insurance and the lowest for health benefits through their current or previous employer.

**Table 6.11b Medisave Account by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	No	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Health Insurance (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Medisave account	88.1	94.6	97.3	96.9	94.1	92.2
Private health insurance	16.9	31.0	42.1	49.0	33.5	24.0
Health benefits through current or previous employer	8.9	19.0	28.6	32.7	21.2	15.5

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The proportion of those with private health insurance and health benefits through current or previous employer increased with education level, and was higher among those not living alone compared to those living alone.

## Healthcare Utilisation

**Table 6.12a Healthcare utilisation by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Healthcare Utilisation (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
<b>In the past 3 months</b>										
Private general practitioner (GP)	30.5	30.6	30.6	29.9	30.5	30.5	30.2	31.8	30.9	36.3
Doctor at polyclinic	42.1	38.3	46.5	46.0	43.1	41.2	41.5	42.0	48.3	49.3
Doctor at specialist outpatient clinic	24.3	22.7	25.1	27.7	24.8	23.8	24.1	18.9	31.7	37.7
Private specialist	3.8	3.6	3.8	4.0	4.0	3.6	3.8	2.0	3.7	10.6
Traditional Chinese Medicine (TCM) practitioner or traditional healer	11.0	11.4	11.8	8.3	9.6	12.2	12.7	1.7	2.4	10.7
<b>In the past 6 months</b>										
Hospital emergency room	8.3	6.7	8.4	13.5	7.8	8.9	7.8	10.8	12.2	9.0
<b>In the past 12 months</b>										
Admitted to nursing home	0.5	0.3	0.5	1.2	0.7	0.4	0.5	0.5	0.4	0.0
Admitted to public or private hospital	12.4	8.6	14.0	21.3	14.3	10.7	11.4	16.8	15.6	24.7

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The most frequent types of health professionals whom older Singaporeans had visited at least once in the 3 months prior to their survey interview (hereafter, past 3 months) were a doctor at a polyclinic (42%), followed by a private general practitioner (GP; 31%). Across all demographic groups as well as overall numbers, a higher proportion of older Singaporeans had consulted specialists at a specialist outpatient clinic compared to private specialists (overall: 24% and 4% respectively). Additionally, 11% of older Singaporeans had consulted Traditional Chinese Medicine (TCM) practitioners or traditional healers. Overall, 8% of older Singaporeans had visited a hospital emergency room within the past 6 months. Admissions to a nursing home was low overall, at less than 1%. Admission to a public or private hospital in the past 12 months was reported by 12% of respondents.

The proportion with at least 1 visit to a *private GP* in the past 3 months was comparable (~30%) across age groups, gender and the three major ethnicities. The proportion with at least 1 visit to a *doctor at a polyclinic* in the past 3 months was similar among those aged 70-79 years (47%) and 80 years and above (46%), but lower for those aged 60-69 years (38%). This proportion was slightly higher among males (43%) versus females (41%), and highest for Indians (48%) across the three major ethnicities. The proportion with at least 1 visit to a *doctor at a specialist outpatient clinic* in the past 3 months increased with age, but was similar for males and females. Across the three major ethnicities, it was the lowest for Malays (19%) and the highest for



Indians (32%). The proportion with at least 1 visit to a *specialist doctor in private practice* was low, around 4%, across age groups, gender and the three major ethnicities. The proportion who had consulted *Traditional Chinese Medicine (TCM) practitioners or traditional healers* in the past 3 months was slightly higher in the younger age groups and for females (12%) versus males (10%), and the highest for Chinese (13%) across the three major ethnicities. The proportion of older Singaporeans who had visited a *hospital emergency room* in the past 6 months increased with age, was comparable across gender, and was the highest for Indians (12%) and Malays (11%). The proportion of older Singaporeans who had been *admitted to a public or private hospital* in the past 12 months increased with age, was higher for males versus females, and the lowest for Chinese (13%) across the three major ethnicities.

**Table 6.12b Healthcare utilisation by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Healthcare Utilisation (weighted %)</b>						
n	1390	1385	1262	503	4136	407
<b>In the past 3 months</b>						
Private general practitioner (GP)	31.1	30.2	30.8	29.5	30.8	28.3
Doctor at a polyclinic	45.4	43.6	39.5	36.8	41.9	43.4
Doctor at specialist outpatient clinic	22.5	21.5	24.3	34.8	23.9	28.4
Private specialist	3.1	2.5	3.2	9.8	3.6	4.8
Traditional Chinese Medicine (TCM)	11.4	11.0	10.3	11.6	10.8	12.8
<b>In the past 6 months</b>						
Hospital emergency room	10.2	8.3	6.9	7.7	8.3	8.4
<b>In the past 12 months</b>						
Admitted to nursing home	0.7	0.5	0.5	0.2	0.5	0.5
Admitted to public or private hospital	15.5	13.8	9.5	8.2	12.2	14.2

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
 Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

While the proportion with at least 1 visit to a *private GP* was similar across education levels, the proportion with at least 1 visit to a *doctor at a polyclinic* decreased with increasing education. Those with tertiary education were most likely to visit *specialist doctors*. Across educational levels, older Singaporeans with no formal education had the highest proportion with at least 1 *hospital emergency room visit* (10%), admission to *nursing home* (1%) and to a *public or private hospital* (16%). Contact with health professionals was largely similar between living arrangements, except for at least 1 visit to specialist doctors, which was higher among those living alone.

The distribution of healthcare utilisation, and the length of last admission to a public or private hospital by age group, gender, ethnicity, educational level and living arrangement is provided in Appendix Tables A6a-A6d.

## English Health Literacy

**Table 6.13a English Health Literacy (Adequacy and Mean Health Literacy Test for Singapore [HLTS] Score) by Age Group, Gender and Ethnicity**

	Age Group				Gender		Ethnicity			
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Limited English Health Literacy (HLTS Score below 27) (weighted %)</b>										
	67.4	63.8	71.8	86.7	67.1	67.7	66.0	80.5	70.8	32.8
<b>Health Literacy Test for Singapore (HLTS) Score</b>										
n	1052	643	296	113	597	455	657	209	169	17
Mean	18.6	20.1	16.8	10.2	19.0	18.1	19.4	14.1	16.8	24.7
SD	12.3	11.9	12.5	11.7	12.1	12.5	12.2	11.5	12.9	11.4

Nearly 3 in 4 older Singaporeans had limited English health literacy. This proportion increased with age, was similar between genders, and was the highest among Malays (81%) across ethnicities. The mean HLTS score – where a higher score indicates a greater extent of English health literacy- decreased with age, was similar between genders, and was the lowest among Malays across ethnicities.

**Table 6.13b English Health Literacy (Adequacy and Mean Health Literacy Test for Singapore [HLTS] Score) by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Limited English Health Literacy (HLTS Score below 27) (weighted %)</b>						
	94.1	89.5	68.9	39.7	67.0	71.0
<b>Health Literacy Test for Singapore (HLTS) Score</b>						
n	51	266	504	230	962	89
Mean	8.2	11.8	19.0	25.7	18.7	17.7
SD	9.1	9.9	11.6	11.6	12.4	11.8

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

A strong gradient by educational level was observed for limited English health literacy and mean HLTS score. The proportion with limited English health literacy declined from 94% for those with no formal education to 40% for those with tertiary education. In terms of living arrangement, those living alone were more likely to report limited English health literacy than those not living alone.

The distribution of reading ability in English, Chinese, Malay, Tamil and other languages by age group, gender, ethnicity, educational level and living arrangement are provided in Appendix Tables A6e-A6n.

## Chapter 7: Correlates of Healthcare Utilisation

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### INTRODUCTION

A key implication of an ageing population is the increase in utilisation of healthcare services. However, not all older persons are alike in their healthcare utilisation, and an understanding of the demographic, health and social characteristics of older Singaporeans that correlate with healthcare utilisation is necessary to identify the key drivers.

In conceptualising the correlates of healthcare use, we turn to the Anderson model of healthcare use.<sup>3</sup> It posits that three types of inter-related variables – predisposing, enabling and need – explain healthcare use. Predisposing variables are individual characteristics such as age, gender, race and education level, which predicts an individual's propensity to use healthcare services more so than other individuals. Most predisposing variables have low mutability or are non-modifiable in the short term, thus are not be appropriate targets for intervention. Enabling variables refer to conditions that facilitate an individual's use of healthcare services. These conditions are more likely to be modifiable and include factors such as income, health insurance, and accessibility of social support and care. Finally, need is an individual's perception of his/her health status and the need for health care. This variable is also potentially modifiable through interventions such as health education.

Previous studies from Singapore, using administrative or electronic medical record data,<sup>1,2</sup> identify some demographic and physical health characteristics, such as age or number of chronic diseases, as correlates of healthcare utilisation. These, somewhat obvious correlates, fall in the predisposing or need domains of the Anderson's model. However, the role of psychological health or social characteristics, such as personal mastery, loneliness or social networks, is less clear. As such, an insight into the presence and direction of association of a wide range of characteristics, especially psychological health or social characteristics, with healthcare utilisation is both timely and required. This will be useful for policymakers and planners of healthcare services in Singapore in at least two ways. First, determination of modifiable psychological health or social characteristics, such as personal mastery<sup>4,5</sup> or social network,<sup>6-8</sup> over and above physical health characteristics, will help identify additional targets for intervention. Second, delineation of non-modifiable characteristics, such as age, gender and educational status, concurrent with projections of the distribution of such characteristics in future cohorts of older Singaporeans, will enable more informed planning for healthcare service provision.

Healthcare services in Singapore range from primary care services, such as general practitioner (GP) clinics or polyclinics and tertiary care outpatient services, such as private specialists and specialist outpatient clinics to hospital services, such as emergency rooms and inpatient hospital admissions. The relatively low cost of primary care services are expected to

cover screening and management of chronic disease while higher cost tertiary care and hospital services address more complex and acute health needs. Individuals who do not utilise primary care and tertiary outpatient services may turn up at emergency rooms with more severe and complex medical conditions. Therefore, as part of optimising overall healthcare utilisation, shifting the balance from tertiary care services to primary care services is key to manage costs and the growing demand for healthcare services.

Understanding the correlates for use of different types of healthcare services, rather than a single type, provides a more holistic view of the determinants of healthcare utilisation. If we can identify characteristics which are consistently associated with utilisation across the various types, then addressing them if they are modifiable or accounting for them in planning for healthcare services if they are non-modifiable, may have a higher impact than focusing on characteristics that are correlated only with a single type of healthcare service.

Using data from baseline wave (or Wave 1) of the nationally representative “Transitions in Health, Employment, Social engagement and Inter-Generational transfers in Singapore Study (THE SIGNS Study)”, we assess the association of a wide range of demographic, social and health characteristics of older Singaporeans with utilisation of various types of healthcare services, viz. primary care outpatient visits, tertiary care outpatient visits, emergency room visits, and acute hospital admissions among community-dwelling older Singaporeans.

## METHODS

### *Analytical sample*

Details on the sampling design and response rate of THE SIGNS Study are provided in the Methodology section of the report. The analytical sample for this analysis was restricted to those responding to Version B of the main questionnaire since data on psychological health and social characteristics were collected only in this version. We further excluded proxy interviews (conducted with a family member, if the older person was unable to respond due to health reasons) as proxies were not administered the scales or measures assessing psychological health and social characteristics.

### *Dependent variable: Healthcare utilisation*

We examined 4 types of healthcare utilisation: (i) primary care outpatient visits in the last 3 months; (ii) tertiary care outpatient visits in the last 3 months; (iii) emergency room visit in the last 6 months; and (iv) hospital admission in the last 12 months.

*Primary care outpatient visits in the last 3 months* were assessed by 2 questions: (a) did you see or talk to a private practitioner (GP) for a health problem in the last 3 months and (b) did you see or talk to a doctor in a polyclinic for a health problem in the last 3 months. For each question, those responding “Yes”, were asked to specify the number of visits; the reported number of visits for each question was capped at 12, with values more than 12 (n=2 for question (b)) rounded down to 12. And, the number of visits was coded as 0 for those responding as “No”, “Don’t know” or “Refused”. Finally, the number of visits reported for GPs and for polyclinics

were summed to arrive at the total number of primary care outpatient visits in the last 3 months. Those who reported “Don’t know” or “Refused” to both questions (a) and (b) were excluded from the analyses (n=6).

*Tertiary care outpatient visits in the last 3 months* were assessed by 2 questions in: (a) did you see or talk to a doctor at a specialist outpatient clinic for a health problem in the last 3 months and (b) did you see or talk to a private specialist for a health problem in the last 3 months. For each question, those responding “Yes”, were asked to specify the number of visits; the reported number of visits for each question was capped at 12 visits, with values more than 12 (n= 4 and 1, for questions (a) and (b) respectively) rounded down to 12. And, the number of visits was coded as 0 for those responding “No”, “Don’t know” or “Refused”. Finally, the number of visits reported for specialist outpatient clinics and for private specialists were summed to arrive at the total number of tertiary care outpatient visits in the last 3 months. Those who reported “Don’t know” or “Refused” to both questions (a) and (b) were excluded from the analyses (n=11).

*Hospital emergency room visit in the last 6 months* was assessed by asking, ‘During the last 6 months, did you go to a hospital emergency room for help with a health problem you were facing?’ While those responding “Yes” were asked about the number of visits, 82% of them reported only 1 visit. Due to lack of variability in the number, hospital emergency room visit in the last 6 months was thus considered as a binary variable (yes/no) in further analysis.

*Hospital admission in the last 12 months (yes/no)* was assessed by asking, ‘During the last one year, were you admitted to a public or private hospital (by admitted, I mean you were kept in a hospital for at least one night in a hospital bed)?’

### ***Potential correlates of healthcare utilisation***

#### *Demographic characteristics*

These included age (60-69/ 70-79/  $\geq 80$  years), gender (male/ female), ethnicity (Chinese/ Malay/ Indian/ Other), education (no formal/ primary/ secondary or ITE or vocational/ above secondary), housing type (HDB 1-2 rooms/ HDB 3 rooms/ HDB 4 rooms/ HDB 5 room and above or HUDC or Executive/ Private and others), employment status (working full-time/ working part-time/ retired and-or not working/ never worked), perceived income adequacy (enough money, with some left over *or* just enough money, no difficulty/ some or much difficulty to meet expenses), private health insurance (yes/ no) and health benefits from current or previous employer (yes/ no).

#### *Physical health characteristics*

These were number of activities of daily living (ADL) limitations (0/ 1/ 2/  $\geq 3$ ) and number of chronic health conditions diagnosed by a health professional (0/ 1/ 2/  $\geq 3$ ). Assessed ADLs included taking a bath, dressing up, eating, standing up and sitting down from a bed/chair, walking around the house, going out of the house and using the toilet. For each ADL the respondent was considered to have a limitation if he/she reported that he/she found it difficult to

perform the activity alone without the assistance of a person or assistive device due to his/her health or physical state.

### *Psychological health characteristics*

These included clinically relevant depressive symptoms, personal mastery and cognition. Clinically relevant depressive symptoms were assessed using a modified version of the 11-item Center for Epidemiologic studies for Depression (CES-D) scale, where each item was scored 0 to 2 (none/rarely; sometimes; often) depending on how often the respondent felt that way during the past week.<sup>9</sup> The total score ranged from 0 to 22. A higher score indicates a greater extent of depressive symptoms. A cut-off of 7 was used to categorise respondents into clinically relevant depressive symptoms (yes/no). For personal mastery, a five-item version of the Pearlin Mastery Scale was used.<sup>10</sup> Responses for each item, scored on a 4-point agree-disagree format, were summed up to form a single score (higher score indicates higher personal mastery). The score was categorised into tertiles for further analysis. Cognition was assessed using the Abbreviated Mental Test (AMT).<sup>11</sup> Its score was used as a continuous variable in the analysis; a higher score indicating better cognition.

### *Social characteristics*

These included living arrangement, loneliness and social network. Living arrangement was classified as living alone or only with a foreign domestic worker (FDW) or maid; living with spouse only; living with child only; living with spouse and child and living with others. Loneliness was determined using the University of California Los Angeles 3-item loneliness scale, in which each item measures a specific dimension of loneliness: (i) relational connectedness, (ii) social connectedness and (iii) self-perceived loneliness. The respondent rated each item on a Likert Scale from 0 to 4. The scale score ranges from 0 to 12, with a higher score indicating a higher level of loneliness. For our analysis, scores were categorised as not lonely (score of 0)/ sometimes lonely (score 1-3) / lonely (score >3). Social network was assessed using a modified version of the Lubben Revised Social Network Scale.<sup>12</sup> The scale consists of 12 items assessing network size, frequency of contact, closeness, and perceived support from friends (six items) and relatives (six items). Each item was scored on a six-point scale from 0 to 5 (higher scores indicate stronger network). The cumulative score, ranging from 0 to 60, was divided into tertiles for further analysis.

### *Statistical analysis*

The unadjusted and adjusted association of the potential correlates detailed above with the number of primary care and tertiary care outpatient visits was assessed using two-part regression models. These models are used when the distribution of the outcome has a mix of discrete and continuous features, such as for number of outpatient visits, where many respondents would have no visit (thus, a '0' value) and then among those who had at least 1 visit, there would be a right-skewed distribution of the number of visits. In such situations, the use of standard linear regression methods is not recommended. In our case, in the two-part regression models for primary care outpatient visits and for tertiary care outpatient visits, the 1<sup>st</sup> part was a logistic regression model estimated on the entire sample, where the dependent

variable equalled 1 if the respondent had at least 1 visit and 0 otherwise, and the 2<sup>nd</sup> part was generalised linear model (GLM) estimated on only respondents with  $\geq 1$  visit. We developed the two-part regression models using the *twopm* command in Stata; due to over dispersion of the outcome, we used the *glm* command with a log link and negative binomial family. The two-part model allowed for a single joint statistical significance test and an overall predicted value for both parts of the model.

The unadjusted and adjusted association of the potential correlates detailed above with emergency room visit in the last 6 months (yes/no) and with hospital admission in the last 12 months (yes/no) was determined using logistic regression models.

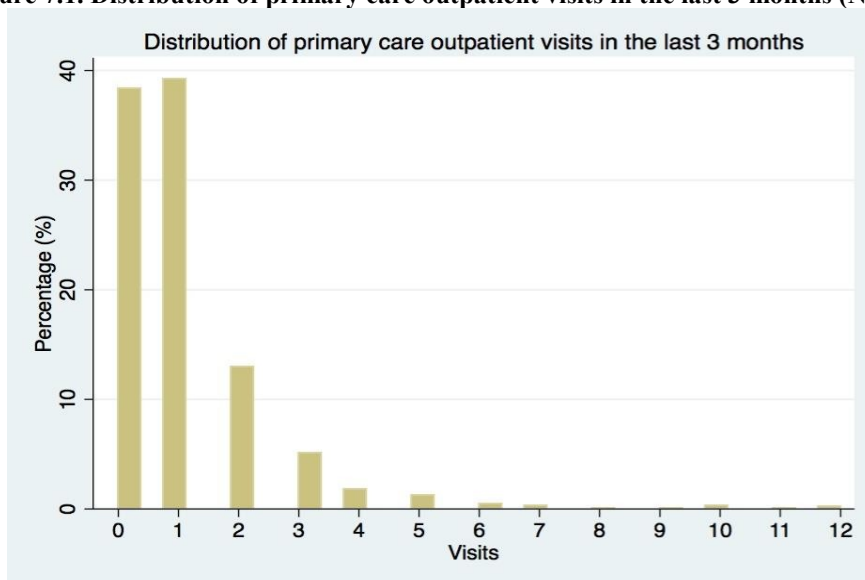
For each of the 4 healthcare utilisation outcomes, we first considered each potential correlate individually in the appropriate regression model (two-part or logistic) to obtain the unadjusted coefficients (Results provided in Appendix Tables A7A to A7D). Then, the adjusted coefficients were determined by including all the potential correlates together in the appropriate regression model.

## RESULTS

### **Outcome: Primary care outpatient visits in the last 3 months**

Distribution of number of primary care outpatient visits in the last 3 months is provided in Figure 7.1. The number ranged from 0 to 12 visits, with 38.2% respondents having no visit and 39.3% having only 1 visit.

**Figure 7.1. Distribution of primary care outpatient visits in the last 3 months (N=1880)**



In the adjusted analyses (Table 7.1), only the marginal effect (i.e. the number of primary care outpatient visits were higher or lower relative to the reference group of the characteristic) for number of chronic health conditions and number of tertiary care outpatient visits on primary care outpatient visits in the last 3 months was significant. Relative to those with no chronic health condition, those with 1, 2 and  $\geq 3$  conditions had 0.41, 0.57, and 0.62 *more* primary care visits – the higher number of visits was driven by a significantly higher chance of having at least 1 visit.

For each additional tertiary care visit, primary care visits *increased* by 0.12 – the increase was the result of significantly higher number of tertiary care visits among those who had at least 1 visit.

While housing type, living arrangement and personal mastery were not associated with the total number of primary care visits, they were associated with the chances of having at least 1 primary care visit. Those living with child only (versus living with child and spouse) had significantly *higher* likelihood of having at least 1 primary care visit and those living in private and other housing (versus HDB 3 room) and in the highest (versus lowest) tertile of personal mastery had significantly *lower* likelihood of having at least 1 primary care visit.

**Table 7.1. Older person characteristics associated with primary care (general practitioner and polyclinic) outpatient visits in the last 3 months: Results of the adjusted two-part model <sup>+</sup>**

Characteristics	Two-part model for number of primary care outpatient visits		
	Logit	Negative binomial	Overall
N	1880	1159	1880
	Regression Coefficients		Marginal Effects (number of visits versus reference group)
<b>Housing Type</b>			
HDB 1-2 rooms	-0.05	-0.09	-0.12
HDB 3 room	Reference		
HDB 4 rooms	-0.01	-0.04	-0.04
HDB 5 room and above/ HUDC/ Executive	-0.18	-0.03	-0.10
Private and others	-0.45*	-0.18	-0.33
<b>Living arrangement</b>			
Living alone or with FDW/maid	-0.14	-0.11	-0.15
With spouse only	0.21	-0.05	0.02
With child only	0.35*	-0.002	0.12
With child and spouse	Reference		
With others only	0.28	0.12	0.24
<b>Number of chronic health conditions</b>			
0 condition	Reference		
1 condition	1.17***	-0.06	0.41**
2 conditions	1.53***	-0.04	0.57***
3 or more conditions	1.60***	-0.02	0.62***
<b>Personal mastery</b>			
Lowest tertile	Reference		
Middle tertile	0.004	0.11	0.12
Highest tertile	-0.53**	0.08	-0.12
<b>Number of tertiary care outpatient visits in last 3 months</b>	0.07	0.09**	0.12**

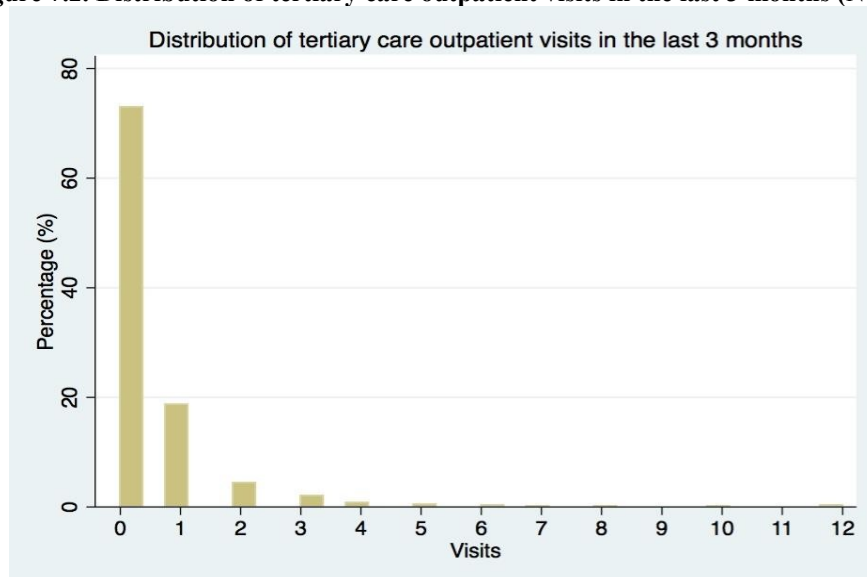
\*<0.05; \*\*<0.01 \*\*\*<0.001

<sup>+</sup>Other characteristics included in the model, which did not have a significant association: age, gender, ethnicity, education, ADL limitations, employment status, income adequacy, private health insurance, health benefits from current or previous employers, clinically significant depressive symptoms, loneliness, social network and cognition.

### **Outcome: Tertiary care outpatient visits in the last 3 months**

Distribution of number of tertiary care outpatient visits in the last 3 months is provided in Figure 7.2. The number of visits ranged from 0 to 12, with 72.6% of respondents having no visit and 18.7% having only 1 visit.



**Figure 7.2. Distribution of tertiary care outpatient visits in the last 3 months (N=1880)**

In the adjusted analyses (Table 7.2), the marginal effect (i.e. the number of tertiary care outpatient visits were higher or lower, relative to the reference group of the characteristic) of living arrangement, number of chronic health conditions, personal mastery, and number of primary care outpatient visits on tertiary care outpatient visits in the last 3 months, was significant. Those residing in private housing (versus HDB 3 room flats) and with  $\geq 3$  chronic health conditions (versus none) had 0.34 and 0.35 *more* tertiary care visits, respectively – the higher number of visits was driven by significantly higher chance of having at least 1 visit. For each unit increase in primary care visits, tertiary care visits *increased* by 0.08 – the increase resulting from significantly higher chance of having at least 1 visit. Those in the highest (versus lowest) tertile of personal mastery had 0.24 *fewer* tertiary care visits – the reduction resulting from significantly lower chance of having at least 1 visit.

Additionally, ethnicity, education, receipt of health benefits from current or previous employer, and loneliness were associated with having at least 1 tertiary care visit. Older persons who were Malay (versus Chinese), living with others only (versus living with spouse and child) and were sometimes and mostly lonely (versus not lonely) had a significantly *lower* likelihood of having at least 1 tertiary care outpatient visit in the last 3 months. On the other hand, those with above secondary education (versus no formal education), living alone or with a FDW/maid (versus living with spouse and child), 1 chronic health condition (versus none), receiving health benefits from current or previous employer, and higher cognition score had a significantly *higher* likelihood of having at least 1 tertiary care outpatient visit in the last 3 months.

**Table 7.2. Older person characteristics associated with tertiary care (specialist outpatient clinic and private specialist) outpatient visits in last 3 months: Results of the adjusted two-part model<sup>+</sup>**

Variables	Two-part model for number of tertiary care outpatient visits		
	Logit	Negative binomial	Overall
N	1880	510	1880
	Regression Coefficients		Marginal Effects (number of visits versus reference group)
<b>Ethnicity</b>			
Chinese	Reference		
Malay	-0.47**	-0.04	-0.14
Indian	0.11	-0.04	0.01
Others	-0.17	-0.03	-0.06
<b>Education</b>			
No formal education	Reference		
Primary	0.16	-0.09	0.01
Secondary/ITE/Vocational	0.32	-0.16	0.02
Above Secondary	0.67**	-0.17	0.12
<b>Housing Type</b>			
HDB 1-2 rooms	-0.29	0.06	-0.05
HDB 3 room	Reference		
HDB 4 rooms	0.09	0.18	0.10
HDB 5 room and above/ HUDC/ Executive	0.17	0.17	0.12
Private and others	0.62**	0.28	0.34*
<b>Living arrangement</b>			
Living alone or with FDW/maid	0.51*	0.07	0.20
With spouse only	0.07	0.08	0.06
With child only	-0.08	-0.05	-0.04
With child and spouse	Reference		
With others only	-0.67*	0.01	-0.16
<b>Number of chronic health conditions</b>			
0 condition	Reference		
1 condition	0.45*	-0.01	0.11
2 conditions	0.40	-0.06	0.08
3 or more conditions	1.20***	-0.002	0.35***
<b>Health benefits from current or previous employer</b>			
No	Reference		
Yes	0.34*	0.01	0.11
<b>Loneliness</b>			
Not lonely	Reference		
Sometimes lonely	-0.30*	0.02	-0.08
Mostly lonely	-0.55**	0.14	-0.10
<b>Personal Mastery</b>			
Lowest tertile	Reference		
Middle tertile	-0.24	-0.04	-0.09
Highest tertile	-0.68***	-0.14	-0.24**
<b>Number of primary care outpatient visits in last 3 months</b>	0.23***	0.03	0.08***
<b>Cognition</b>	0.14*	0.03	0.06

\* $<0.05$ ; \*\* $<0.01$  \*\*\* $<0.001$ 

<sup>+</sup> Other characteristics included in the model, which did not have a significant association: age, gender, ADL limitations, employment status, income adequacy, private health insurance, clinically significant depressive symptoms and social network.

**Outcome: Hospital emergency room visit in the last 6 months**

A total of 9% of the respondents had a hospital emergency room visit in the last 6 months (Figure 7.3).

**Figure 7.3. Distribution of hospital emergency room visit (yes/no) in the last 6 months (N=1879)**

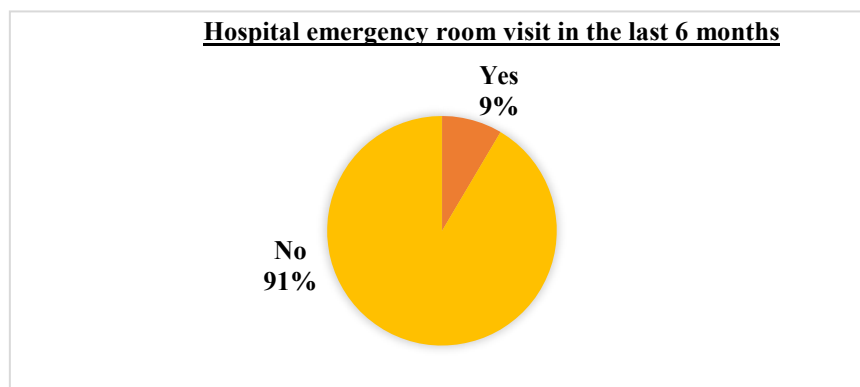


Table 7.3 provides the older person characteristics that had a statistically significant association with for hospital emergency room visit in the last 6 months in the adjusted logistic regression analysis. The odds were significantly *higher* for older persons who were Malay (versus Chinese), and had 2 and 3 or more ADL limitations (versus none), and increased significantly with an increase in the number of primary care and tertiary care outpatient visits. Conversely, the odds were significantly *lower* for older persons with who lived with others (versus with spouse and children), were mostly lonely (versus not lonely), and had the highest (versus lowest) tertile of personal mastery.

**Table 7.3. Older person characteristics associated with hospital emergency room visit in the last 6 months: Results of the adjusted logistic regression model (N=1879) <sup>+</sup>**

Characteristics	Adjusted Odds Ratio
<b>Ethnicity</b>	
Chinese	Reference
Malay	1.64*
Indian	1.68
Others	0.78
<b>Living arrangement</b>	
Living alone or with FDW/maid	1.05
With spouse only	0.96
With child only	1.05
With child and spouse	Reference
With others only	0.29*
<b>ADL limitations</b>	
0	Reference
1	1.89
2	3.49*
3 or more	3.13**
<b>Loneliness</b>	
Not lonely	Reference

Sometimes lonely	0.85
Mostly lonely	0.48*
<b>Personal mastery</b>	
Lowest tertile	Reference
Middle tertile	0.66*
Highest tertile	0.47*
<b>Number of primary care visits in last 3 months</b>	1.17**
<b>Number of tertiary care visits in last 3 months</b>	1.38***

\* $<0.05$ ; \*\* $<0.01$  \*\*\* $<0.001$

+ Other characteristics included in the model, which did not have a significant association: age, gender, education, housing type, employment status, number of chronic conditions, income adequacy, private health insurance, health benefit from current or previous employer, clinically significant depressive symptoms, social network and cognition.

### ***Outcome: Hospital admission in the last 12 months***

About 13% of the respondents had a hospital admission in the last 12 months (Figure 7.4).

**Figure 7.4. Distribution of hospital admission (Yes /No) in the last 12 months (N=1873)**

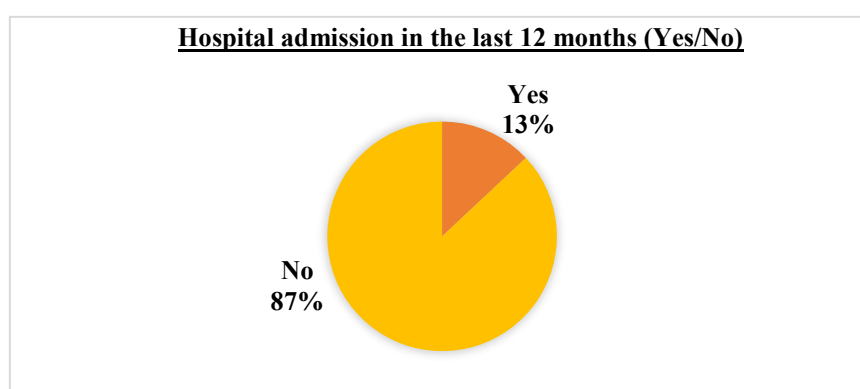


Table 7.4 provides the adjusted odds ratio for older person characteristics that had a statistically significant association with hospital admission in the last 12 months. The odds were significantly *higher* for older persons who were Malay (versus Chinese), lived alone or with FDW/maid (versus with spouse and child), had 2 and 3 or more ADL limitations (versus none) and had 3 or more chronic health conditions (versus none) and increased significantly with an increase in the number of primary care and tertiary care outpatient visits. Conversely, the odds were *lower* for older persons who were female (versus male) and had the highest (versus lowest) tertile of personal mastery.

**Table 7.4. Older person characteristics associated with hospital admission in the last 12 months: Results of the adjusted logistic regression model (N=1873) <sup>+</sup>**

Characteristics	Adjusted Odds Ratio
<b>Gender</b>	
Male	Reference
Female	0.49***
<b>Ethnicity</b>	
Chinese	Reference
Malay	2.02***
Indian	1.02
Others	0.52
<b>Living arrangement</b>	
Living alone or with FDW/maid	2.02*
With spouse only	1.06
With child only	1.27
With child and spouse	Reference
With others only	0.88
<b>ADL limitations</b>	
0	Reference
1	1.45
2	4.62**
3 or more	3.40**
<b>Number of chronic health conditions</b>	
0 condition	Reference
1 condition	1.05
2 conditions	1.62
>=3 conditions	2.12**
<b>Personal mastery</b>	
Lowest tertile	Reference
Middle tertile	0.92
Highest tertile	0.45**
<b>Number of primary care visits in last 3 months</b>	1.10*
<b>Number of tertiary care visits in last 3 months</b>	1.45***

\*<0.05; \*\*<0.01 \*\*\*<0.001

<sup>+</sup> Other characteristics included in the model, which did not have a significant association: age, education, housing type, employment status, income adequacy, private health insurance, health benefit from current or previous employer, loneliness, clinically significant depressive symptoms, social network and cognition.

## **DISCUSSION**

Our analysis revealed several older person characteristics, in demographic, physical health, psychological health and social domains, to be associated with utilisation of the various types of healthcare services. While some, like gender and education were associated with utilisation of only 1 type of service, personal mastery, loneliness, Malay ethnicity, number of chronic health conditions, and number of ADL limitations were associated with utilisation of 2 or more services.

The association of physical health characteristics, i.e. number of chronic health conditions (associated with more primary care and tertiary care outpatient visits, and greater odds of hospital admission) and number of ADL limitations (associated with greater odds of hospital emergency room visit and of hospital admission) with several types of healthcare utilisation is not surprising. In fact, these are associations which one would expect a priori, thus they lend confidence in the results of our analysis.

We also observed the use of the 4 types of healthcare services to be linked with each other. Older persons who had tertiary care outpatient visits were also more likely to have primary care outpatient visits, and vice-versa. And, both tertiary care and primary care outpatient visits were associated with higher odds of emergency room visit and hospital admission. One possible explanation is that older persons with higher healthcare utilisation have more advanced stages of health conditions, which we could not fully account for in our analysis, and thus have a higher likelihood of utilizing all 4 types of healthcare services. An alternative explanation could be the referral system in the current healthcare model in Singapore, wherein to receive subsidised services, individuals have to go to primary care (i.e. polyclinics) for referral to tertiary care. This inadvertently results in the need to utilise both primary and tertiary outpatient care for a single health issue.

What is relatively novel in the local setting, and more interesting, is the role played by personal mastery – the extent to which individuals feel in control of their lives<sup>10</sup> – in healthcare utilisation. For each of the 4 considered types of healthcare services, older persons who had higher personal mastery had lower utilisation, either in terms of number of visits or the odds of having at least 1 visit/admission. Our finding is aligned with previous studies from other countries. A longitudinal study among Americans aged 50 years and above found that respondents with high mastery over their health and finances had lower odds of doctor visits and hospitalisation.<sup>13</sup> Higher levels of personal mastery have been reported to be associated with resilience outcomes, such as pain management<sup>14</sup> and self-rated health.<sup>13</sup> In terms of a possible mechanism for such findings, several studies on stress (i.e. caregiving and negative life events) suggest that high personal mastery may protect individuals from depression and even reduce their cardiovascular risk via biological stress response mechanisms such as sympathetic arousal.<sup>15,16</sup> Thus, our observed link of higher personal mastery with lower utilisation of all four types of healthcare services, it is a potential focus for interventions among older adults, especially those who consume healthcare services frequently.

Loneliness has been linked to healthcare use previously. In contrast to international studies, conducted in the west,<sup>17,18</sup> we found that loneliness was associated with lower likelihood of tertiary care outpatient visits and emergency room visits. Our results corroborate previous local findings, which reported chronic and recently-developed loneliness to be associated with 24% and 30% lower odds of physician visits compared to never being lonely.<sup>19</sup> The difference in findings across local and international studies may be due to cultural differences. Singapore is a collectivist society, placing a high importance on relationships, whereas people in the west prioritize autonomy and personal goal. It is likely that while lonely older persons in the west may independently seek out support, lonely older persons in Singapore may fear troubling other people around them with their healthcare visits, thus our observation.

We observed Malay older persons, regardless of income and education level, to be more likely to use emergency room and hospital inpatient services, albeit they had lower odds of using tertiary care outpatient services. This suggests that they may not be seeking healthcare services early and are only using these services when their medical conditions are at a more advanced and complex stage. Other local studies also report Malays to have more health risks and lower health screening uptake.<sup>20,21</sup> More effort should be taken to outreach to Malay older persons to increase their use of primary and tertiary care outpatient services, which may reduce their use of hospital based services. While we did adjust for educational status and housing type, residual confounding by socio-economic status can also be an alternative explanation for our observation. We also acknowledge that our analysis is unable to determine the cultural and socio-economic factors, such as health literacy and health beliefs, which may be contributing to the variability in the type of healthcare services being used across ethnicities – future studies should address this.

In summary, low personal mastery and poor physical health were associated with a higher use of all four considered types of healthcare services, loneliness was associated with a lower use of tertiary care outpatient and emergency room services, and being of Malay ethnicity, perhaps a proxy for socio-economic status, was associated with greater use of emergency room and hospital inpatient services and lower use of tertiary care outpatient services. Personal mastery is a modifiable factor, making it a potential target for preventive intervention for older adults, especially those who consume healthcare services frequently, and maybe even earlier, for middle aged adults before they enter old age. The results also suggest the existence of a vulnerable population of lonely older adults who do not access the healthcare system. As such, programs such as the community network for seniors can help to identify these individuals, and enable them to seek early and appropriate healthcare services. On the whole, healthcare utilisation is a product of physical health, psychological and social factors. Planning for Singapore's healthcare system will benefit from being attentive to the role played by psychological factors, such as personal mastery, and social factors, such as loneliness, ethnicity and socio-economic status, in addition to the commonly considered physical health factors, in influencing healthcare utilisation among older Singaporeans.

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## Chapter 8: Social Engagement: Descriptive Statistics

In this chapter, we look at the distribution of living alone, reasons for living alone, loneliness, social network, religiosity and attendance of social activities, overall and by age group, gender, ethnicity, education and living arrangement.

### Living Alone

**Table 8.1a Living Alone by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Living Arrangement (weighted %)</b>										
n	4543	2018	1499	1026	2114	2429	3352	708	449	34
Living alone*	8.8	6.3	10.7	13.5	6.2	11.1	9.3	5.7	5.3	16.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

A total of 9% of older Singaporeans lived alone. This proportion increased with age, was higher for females compared to males, and was the highest for the Chinese (9%) than Malays (6%) and Indians (5%).

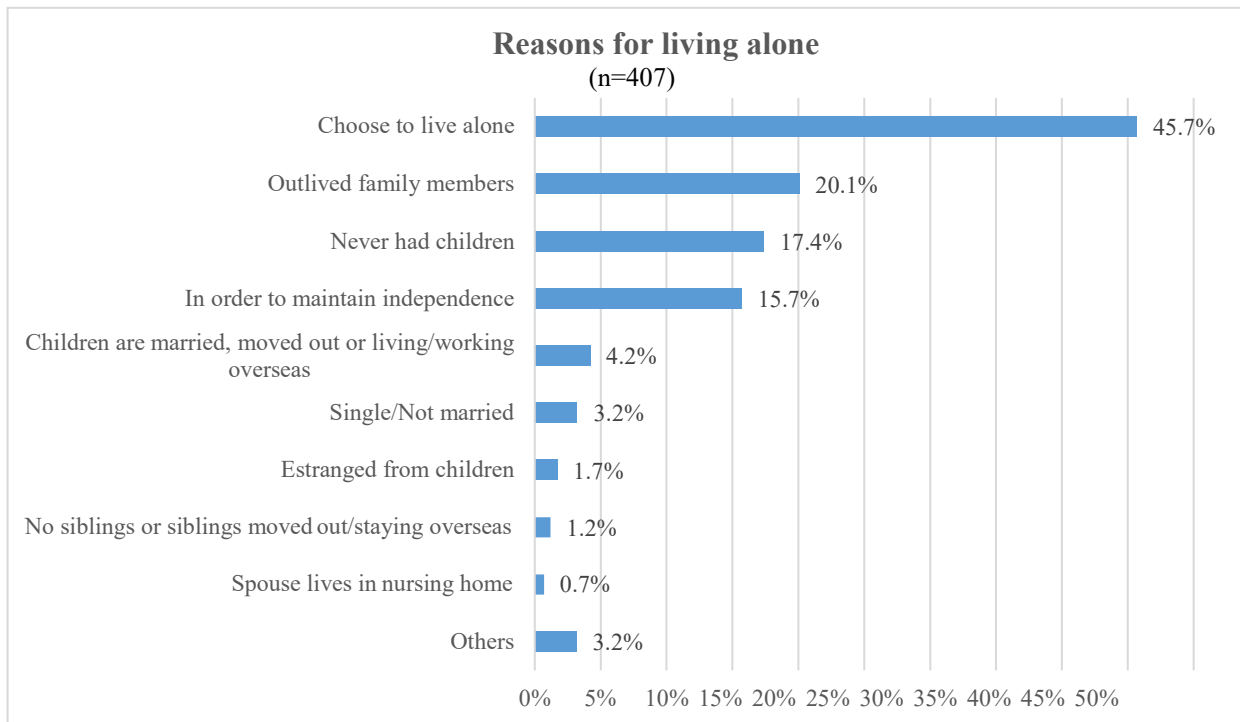
**Table 8.1b Living Alone by Educational Level**

	Educational Level Completed			
	None	Primary	Secondary	Tertiary
<b>Living Arrangement (weighted %)</b>				
n	1388	1383	1261	503
Living alone*	10.0	8.5	7.5	10.1

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

The proportion of older Singaporeans who lived alone was higher for those with no formal education as well as those with tertiary education, compared to those with primary or secondary education.

Figure 8.1c Reasons for Living Alone



Percentages exceed 100% as multiple responses were allowed.

Among those who lived alone, the top three reasons for doing so were that they chose to live alone (46%), they had outlived their family members (20%) and they had never had children (17%).

## Loneliness

Loneliness was assessed using the UCLA 3-item loneliness scale (detailed in Chapter 2: Methodology). Those with scores of 0, 1-3 and 4 and above, were classified as not lonely, sometimes lonely and mostly lonely respectively.

**Table 8.2a Loneliness by Age Group, Gender and Ethnicity**

	Age Group				Gender		Ethnicity			
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Loneliness (weighted %)</b>										
n	2030	986	692	352	988	1042	1516	303	196	15
Not Lonely	66.1	67.8	65.5	59.6	62.7	69.3	66.9	59.9	61.8	76.6
Sometimes Lonely	21.8	21.6	21.9	22.4	23.8	19.9	21.6	23.9	21.7	17.6
Mostly Lonely	12.1	10.7	12.6	18.0	13.5	10.8	11.5	16.2	16.5	5.8

Nearly a third of older Singaporeans (34%) reported being sometimes or mostly lonely. This proportion increased with age, reaching 40% among those aged 80 years and above. More males (37%) reported being sometimes or mostly lonely relative to females (31%). Across ethnicities, this proportion was the highest for Malays and Indians (around 40%).

**Table 8.2b Loneliness by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	No	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Loneliness (weighted %)</b>						
n	543	632	614	240	1825	202
Not Lonely	67.0	64.7	68.3	62.4	67.0	56.7
Sometimes Lonely	20.5	20.2	22.1	27.4	21.6	23.5
Mostly Lonely	12.5	15.1	9.6	10.2	11.3	19.8

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Across educational levels, the proportion of older Singaporeans who reported sometimes or mostly lonely was the highest among those with tertiary education. This proportion was nearly 10% higher among those who lived alone (43%) compared to those not living alone (33%).

### Social Network outside the household

Social network outside the household was assessed using the Lubben Social Network Scale Revised (LSNS-R) (detailed in Chapter 2: Methodology). The score ranges from 0 to 60, and the distribution of the continuous scale as well as a categorization by tertiles are presented below. A higher mean score and tertile indicate a greater extent of respondents' social network outside the household.

**Table 8.3a Lubben Social Network Scale Revised (LSNS-R) Score (Continuous and Tertiles) by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Lubben Social Network Scale Revised (LSNS-R) Score</b>										
n	4039	1970	1384	685	1960	2079	3017	597	393	32
Mean	26.6	27.6	26.3	23.0	26.6	26.6	26.4	27.5	27.3	31.0
SD	11.2	11.0	11.4	10.8	11.3	11.1	11.1	11.1	12.2	11.2
<b>weighted %</b>										
Lowest tertile	33.5	29.9	35.4	45.4	34.3	32.8	34.3	28.2	33.0	22.7
Middle tertile	32.1	32.2	31.4	32.9	30.1	33.9	31.7	36.9	31.2	26.2
Highest tertile	34.4	37.8	33.2	21.6	35.6	33.4	34.0	34.9	35.8	51.1

The extent of social network outside the household, exemplified by the mean score of LSNS-R and the proportion in the highest LSNS-R tertile, was highest among older Singaporeans aged 60-69 years, and declined with age. The extent was similar for males and females, and across ethnicities except for Others.

**Table 8.3b Lubben Social Network Scale Revised (LSNS-R) Score (Continuous and Tertiles) by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Lubben Social Network Scale Revised (LSNS-R) Score</b>						
n	1060	1281	1209	488	3654	380
Mean	23.3	25.1	28.2	32.4	26.7	25.6
SD	10.6	10.8	11.0	10.9	11.2	11.6
<b>weighted %</b>						
Lowest tertile	43.5	38.1	28.5	16.2	32.9	39.2
Middle tertile	34.3	32.9	30.7	29.3	32.5	28.4
Highest tertile	22.2	29.0	40.8	54.5	34.6	32.5

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

The extent of social network outside the household, represented by the mean score of LSNS-R and the proportion in the highest LSNS-R tertile, increased with rising educational level. Regarding living arrangement, a higher proportion of those who were living alone (39%) were in the lowest LSNS-R tertile compared to those who were not living alone (33%), suggesting that those who lived alone had a lower extent of social network outside the household compared to those not living alone.

## Social Activities

The frequency of participation in four distinct types of social activities was assessed.

**Table 8.4a Attendance of Social Activities by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
n	2272	1000	747	525	1058	1214	1676	357	223	16
<b>Attend Residents' Committee (RC) / Neighbourhood Committee (NC) / Community Club (CC) / Community Development Council (CDC) / Neighbourhood event (weighted %)</b>										
At least weekly	5.3	5.1	6.0	4.8	2.9	7.4	5.5	2.9	3.1	18.4
Occasionally	11.4	11.1	13.3	8.8	9.8	12.8	11.6	9.3	12.8	8.8
Not at all	83.1	83.8	80.3	85.8	87.2	79.4	82.6	87.5	84.1	72.8
<b>Attend Senior Activity Centre for exercise/activities (weighted %)</b>										
At least weekly	6.6	5.0	8.1	8.7	5.6	7.4	6.9	4.6	5.2	3.4
Occasionally	6.2	4.9	9.1	4.9	6.0	6.3	6.6	3.1	6.0	0.0
Not at all	87.0	90.0	82.6	85.6	88.3	85.8	86.2	91.4	88.8	96.6
<b>Attend church, mosque or other places of worship (weighted %)</b>										
n	2277	1020	754	503	1059	1218	1682	351	226	18
At least weekly	23.3	25.0	21.8	20.9	25.1	21.8	18.5	49.8	39.8	61.0
Occasionally	48.0	51.6	51.7	29.0	47.3	48.6	51.5	21.9	44.0	31.1
Not at all	28.3	22.9	26.1	49.7	27.5	28.9	29.6	27.3	15.4	7.9
<b>Go for a walk (for exercise purpose) (weighted %)</b>										
At least weekly	45.1	46.3	47.7	36.2	48.7	41.9	45.8	38.3	48.7	29.5
Occasionally	7.4	8.1	7.3	5.6	6.3	8.4	7.2	9.1	4.4	26.8
Not at all	47.3	45.5	44.9	57.6	45.0	49.3	46.8	52.6	46.9	43.7

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Around three-quarters older Singaporeans attended a church, mosque or other place of worship at least weekly or occasionally (71%) compared to the other three social activities. The proportion who attended places of worship at least weekly decreased with age, was comparable between genders and was the highest among Malays compared to Chinese and Indians. Older Singaporeans who attended neighbourhood events at least weekly or occasionally was the highest among those aged 70-79 years, females, and Chinese (17%) compared to Malays (12%) and Indians (16%).

The proportion of older Singaporeans who attended senior activity centre for exercise or activities at least weekly or occasionally was higher among those aged 70-79 years compared to those aged 80 years and above, comparable between genders, and highest among the Chinese. Finally, those aged 60-79 years were more likely to go for a walk for exercise at least weekly. This proportion was higher among males and Indians.

Overall, religious participation is the most prominent social activity among older Singaporeans relative to the other three activities. Furthermore, the Malays' participation in social networks outside the household are most likely to be defined by their religious affinities, as seen from their high attendance rate at places of worship.

**Table 8.4b Attendance of Social Activities by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	No	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
n	706	676	639	246	2052	216
<b>Attend Residents' Committee (RC) / Neighbourhood Committee (NC) / Community Club (CC) / Community Development Council (CDC) / Neighbourhood event (weighted %)</b>						
At least weekly	3.9	4.5	7.2	6.0	4.9	9.7
Occasionally	10.6	9.5	12.0	16.6	10.9	16.2
Not at all	85.2	85.9	80.8	76.9	84.0	74.1
<b>Attend Senior Activity Centre for exercise/activities (weighted %)</b>						
At least weekly	7.0	5.6	7.2	6.3	6.0	12.3
Occasionally	8.9	4.3	5.4	6.4	5.5	12.5
Not at all	83.5	89.9	87.3	87.3	88.2	75.2
<b>Attend church, mosque or other places of worship (weighted %)</b>						
n	684	709	623	257	2084	191
At least weekly	12.4	20.6	31.7	34.3	22.2	35.6
Occasionally	51.8	52.3	43.9	39.1	49.0	36.8
Not at all	35.2	26.6	24.1	26.4	28.4	26.7
<b>Go for a walk (for exercise purpose) (weighted %)</b>						
At least weekly	37.8	46.5	48.4	50.3	45.4	41.2
Occasionally	5.8	6.1	10.4	7.4	7.4	8.1
Not at all	55.7	47.4	41.2	42.3	47.0	50.8

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

An education gradient was observed for going for a walk for exercise and attending places of worship at least weekly, with those with no formal education being the least likely to participate in the aforementioned activities. On the other hand, older Singaporeans who lived alone were more likely to attend a place of worship at least weekly (36%) compared to those not living alone (22%).

The distribution of attendance of religious services, praying in private places and importance of religion in life by age group, gender, ethnicity, educational level, and living arrangement is provided in Appendix Tables A8a-A8b.

## Chapter 9: Correlates of Social Networks and Participation

*Peter Kay Chai Tay*

### INTRODUCTION

The lack of social connectedness has been highlighted as a critical issue to address among older Singaporeans<sup>1</sup> given its association with physical and mental health outcomes. Studies have highlighted that being socially connected to other people is related to having fewer depressive symptoms<sup>2</sup> and better self-rated physical health.<sup>3</sup> Furthermore, social connectedness uniquely predicts health and well-being of older people more than social support.<sup>4</sup>

In THE SIGNS Study – I, social connectedness is conceptualised to encompass both social networks and social participation, similar to previous studies.<sup>3,4</sup> Social networks refers to the frequency of interaction one has with relatives and friends living outside the household<sup>5</sup> and social participation refers to the frequency of attending communal events, activities at the Senior Activity Centres (SACs), going for walks for exercising purposes, and attending activities at places of worship. This conceptualisation of social participation is in recognition that social connectedness for older Singaporeans is often fostered in these communal settings.

The correlates for social connectedness are multifactorial and can include sociodemographic factors, as well as physical and mental health factors. For instance, women tend to have weaker social networks compared to men, and weaker social networks is related to more depressive symptoms.<sup>6</sup> Older people from low socio-economic backgrounds and having weak social networks also tend to experience depression.<sup>7</sup>

In the context of age-related losses, one would expect poorer health and disabilities to impact older people's social connectedness.<sup>3,8</sup> Thus, individuals with deteriorating physical health and functions may change the types of social activities they engage in.<sup>8,9</sup> As such, it is critical to examine how losses in physical health and functional limitations lead to changes in social networks and participation in social activities among older people. In this analysis, poorer physical health is measured by the number of chronic conditions and functional limitations are measured by limitations on the Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL). The psychosocial correlates of social connectedness, such as loneliness and social isolation, may be more nuanced. Older people, for example, may even feel lonely and isolated even though they live with their families or participate in social activities.<sup>10</sup> Weaker social networks are related to poorer perceived mental and physical health.<sup>3,11</sup> Thus, it is necessary to examine the impact of social networks on potential outcomes such as loneliness and depressive symptoms. Similarly, older people who participate in social activities may have fewer and less intense experiences of loneliness and depression. Previous research has shown positive effects of social participation on psychosocial wellbeing.<sup>12,13</sup> For instance, a local study found that most community-dwelling older people who participated in SAC activities made more friends and their social connectedness appeared to be associated with fewer depressive symptoms.<sup>14</sup>

In this study, using data from THE SIGNS Study – I, we aim to develop a deeper understanding into the correlates of social connectedness for older Singaporeans. Defined as social networks and participation, an understanding of the impact of these correlates will enable us to develop both more pro-active and targeted interventions at the social networks and social participation of older Singaporeans that can ameliorate or prevent the negative effects of their weak social connections. .

## METHODS

The analytical sample involved a sub-sample of THE SIGNS Study – I respondents (N=1910), who answered the relevant study variables described in Table 9.1.

**Table 9.1. Sample statistics**

		N=1910
<b>Sociodemographics</b>		
<b>Gender</b>		<b>%</b>
Male		50.8
Female		49.2
<b>Age</b>		<b>%</b>
60-69		49.8
70-79		34.2
80-89		14.9
90+		1.1
<b>Ethnicity</b>		<b>%</b>
Chinese		74.6
Malay		14.9
Indian		9.7
Others		0.8
<b>Marital Status</b>		<b>%</b>
Married		69.5
Widowed/divorced/separated		23.6
Never married		7.0
<b>Education Level</b>		<b>%</b>
No formal education		25.0
Primary		31.3
Secondary		31.3
Tertiary		12.4
<b>Housing Type</b>		<b>%</b>
1-2 room HDB		8.3
3 room HDB		24.3
4-5 room HDB and others		67.4
<b>Living Arrangements</b>		<b>%</b>
Alone		8.4
With spouse only		23.6
With child only		16.4
With child and spouse		44.4
With others only (including FDWs)		7.2
<b>Income Adequacy</b>		<b>%</b>
Enough money to meet expenses		82.2
Difficulty to meet expenses		17.8
<b>Physical and Functional Health</b>		
<b>Number of chronic conditions</b>		<b>Mean (SD)</b>
		2.07 (1.53)
<b>ADL Limitation</b>		<b>%</b>
No limitations		94.3
1-2 limitations		3.2



		N=1910
≥ 3 limitations		2.4
<b>IADL Limitation</b>		<b>%</b>
No limitations		84.8
1-2 limitations		10.6
≥ 3 limitations		4.6
<b>Psychosocial Health</b>		
<b>Depressive symptoms</b>		<b>Mean (SD)</b>
		3.06 (3.18)
<b>Mastery</b>		<b>Mean (SD)</b>
		5.80 (2.21)
<b>Loneliness</b>		<b>%</b>
Not lonely		64.0
Sometimes lonely		22.4
Mostly lonely		13.2
<b>Social Connectedness</b>		
<b>Social Networks outside the household</b>		<b>Mean (SD)</b>
		26.82 (11.07)
<b>Social Participation: RC, CC, etc.</b>		<b>%</b>
Not at all		82.1
Occasionally		12.4
At least weekly		5.4
<b>Social Participation: SAC</b>		<b>%</b>
Not at all		86.4
Occasionally		6.5
At least weekly		6.9
<b>Social Participation: Walking</b>		<b>%</b>
Not at all		45.3
Occasionally		7.3
At least weekly		47.3
<b>Social Participation: Religious Activities</b>		<b>%</b>
Not at all		14.7
Occasionally		22.4
At least weekly		12.7

Note. Religious activities variable is based on a separate sub-sample (N=2266).

## Measures

Social connectedness is presently conceptualized as the presence of social networks and social participation.

### Dependent Variables

**Social networks outside the household.** This was assessed using the revised Lubben Social Networks Scale (LSNSR).<sup>5,15</sup> The scale consists of twelve items; six for social networks with friends and another six with relatives beyond the household, eliciting the frequency of contact and level of closeness for each group of people. Each item is scored on a six-point scale, from 0 to 5. The scores are summed with higher scores indicating greater social networks outside the household.

**Social participation.** We elicited the frequency of participation in four activities including attending residents' committee (RC)/Neighbourhood Committee (NC)/Community Club (CC)/Community Development Council (CDC)/neighbourhood event, attending senior activity centre for exercise/activities, going for a walk for exercise purposes and attending church, mosque or other places of worship. The participants indicated whether they never

attend '1,' attend less than once a month '2,' attend once monthly '3,' attend once weekly '4,' or attend everyday '5'. The responses were categorized as 'not at all' (rated 1), 'once a month or less' (rated 2 or 3), and 'every week or everyday' (rated 4 or 5).

### **Independent Variables**

Psychosocial health of the participants in terms of loneliness and depressive symptoms, were assessed as associates for social connectedness. Mastery was included as a covariate.

**Loneliness.** The UCLA 3-item loneliness scale was used to assess participants' level of loneliness.<sup>16</sup> The participants were asked "How often do you feel you lack companionship?" "How often do you feel left out?" and "How often do you feel isolated from others?" Each question is scored on a 5-point scale indicating never '0,' rarely '1,' occasionally '2,' fairly often '3,' or always '4'. Based on a score range of 0-12, participants were categorized into 'not lonely' '0,' for scores of 0, 'sometimes lonely' '1,' for scores of 1 to 3, and 'mostly lonely' '2' for scores of 4 to 12.

**Depressive symptoms.** The 11-item version of the Centre for Epidemiologic Studies Depression (CES-D) scale was used to assess participants' depressive symptoms.<sup>17</sup> The CES-D scale includes eleven items each rated as none/rarely '0,' sometimes '1,' or often '2'. A total score obtained by summing up the scores for the eleven items was retained as a continuous variable given that dichotomizing the variable would reduce the power for analysis.<sup>18</sup>

**Mastery.** The participants' mastery level was assessed using the Pearlin Mastery scale,<sup>19</sup> based on the level of agreement or disagreement for five items. Response choices include strongly disagree '0,' disagree '1,' agree '2,' and strongly agree '3'. The items are reverse scored and summed such that higher scores indicate higher levels of mastery.

**Sociodemographic variables.** These included gender, age, ethnicity, marital status, education level, housing type, living arrangements (alone, with child/ren, spouse, or others including as foreign domestic worker) and income adequacy (enough money or having difficulty meeting expenses).

### **Statistical Analysis**

We conducted multiple linear regression to predict social networks outside the household and multinomial logistic regression to predict social participation at community centres (CCs), resident centres (RCs), senior activity centres (SACs), walking for exercising purposes and religious activities.

## RESULTS

The multiple regression findings for the prediction of the strength of social networks outside the household are summarised in Table 9.2. People who were older, particularly those aged 80-89 years (compared to those aged 60-69 years), those who were never married, and those staying in 1-2 room HDB tended to have weaker social networks. On the other hand, Malays, those living with their spouse, people with secondary or tertiary education and people staying in 4-5 room HDB or above tended to have stronger social networks. The analysis also highlighted that older Singaporeans with more chronic conditions and more ADL limitations reported stronger social networks compared to those without. However, only those with more IADL limitations reported weaker social networks. In addition, those with weaker social networks reported more depressive symptoms and were lonelier.

**Table 9.2. Factors associated with the strength of social networks outside the household among older adults (aged 60+), in Singapore**

N=1894	
<b>Socio-demographics</b>	
Age (60-69)	
70-79	-0.81 (.54)
80-89	-2.56 (.74)**
≥90	-1.07 (2.31)
Gender	
Female	0.48 (.50)
Ethnicity (Chinese)	
Malay	2.53 (.67)***
Indian	1.44 (.81)
Others	2.51 (2.62)
Marital Status (Married)	
Widowed/Divorced/Separated	0.86 (1.73)
Never married	-4.09 (1.96)*
Living arrangement (with child/spouse)	
Alone	2.82 (1.90)
Spouse only	2.74 (.61)***
Child only	0.40 (1.74)
Others only	2.76 (1.92)
Education (No formal education)	
Primary	1.13 (.65)
Secondary	2.24 (.68)**
Tertiary	6.51 (.87)***
Housing Type (3 room HDB)	
1-2 room HDB	-2.87 (.95)**
4-5 room and above	1.43 (.58)*
Income adequacy (Enough money)	
Difficulty to meet expenses	-0.41 (.65)
<b>Physical and Functional Health</b>	
Chronic conditions	0.36 (.16)*
ADL limitations (None)	
1-2 limitations	3.37 (1.43)*
≥3 limitations	1.67 (1.84)
IADL limitations (None)	
1-2 limitations	-1.55 (.80)
≥3 limitations	-6.71 (1.44)***
<b>Psychosocial Health</b>	
Depressive symptoms	-0.80 (.09)***
Loneliness (Not lonely)	
Sometimes lonely	-1.54 (.58)**

	N=1894
Mostly lonely	-3.02 (.78)***
Mastery	0.06 (.12)

\* $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

Note. Unstandardized Coefficients, B (Standard errors) are reported. Variable names in parentheses refer to the referent groups.

The multinomial logistic regression findings for social participation are summarised in Table 9.3 and 9.4. Women, those who were living alone, those with secondary education and those living in 1-2 room HDB were more likely to participate in social activities at RC, CC and other community agencies. People aged 70 years and above, those who were living alone and those living in 1-2 room HDB were more likely to participate in social activities at the SACs. On the other hand, Malays and those with any education were less likely to. Women tended to walk for exercise more frequently than men while people who expressed difficulty in meeting financial expenses tended to walk less frequently than those without financial difficulty. Those in the older age group tended to attend religious activities less frequently, but Malays and Indians, and people with secondary or tertiary education tended to attend religious activities at least once weekly. Older Singaporeans with more chronic conditions tended to attend religious activities more, but not other social activities. It was also noted that those with more ADL and IADL limitations were less likely to participate in social activities at RCs, CCs, walking and attend religious activities compared to those without ADL or IADL limitations.

With regards to psychosocial health, individuals who participated in social activities at RCs, CCs and take walks were lonelier than those who do not participate. Additionally, social participation was observed to be unrelated to depressive symptoms.

**Table 9.3. Factors associated with older adults (aged 60+) social participation at Residents' Committee (RC)/Community Club (CC) etc. and Senior Activity Centre (SAC) for exercise/activities. Occasionally and At Least Weekly versus Not at All.**

Sociodemographics	RC, CC, etc. (N=1901)				SAC (N=1900)			
	Odds ratio	Occasionally 95% CI	At least weekly Odds ratio	At least weekly 95% CI	Odds ratio	Occasionally 95% CI	At least weekly Odds ratio	At least weekly 95% CI
Age (ref: 60-69)								
70-79	1.39	(1.00 – 1.93)	1.41	(0.87 – 2.29)	1.83**	(1.19 – 2.82)	1.76*	(1.14 – 2.72)
80-89	1.25*	(0.79 – 1.97)	1.89	(1.00 – 3.58)	1.08	(0.57 – 2.03)	2.18**	(1.27 – 3.75)
≥90	3.68	(0.90 – 15.01)	1.43	(0.16 – 12.95)	6.43*	(1.39 – 29.83)	1.20	(0.14 – 10.29)
Gender (ref: Males)								
Female	1.78***	(1.31 – 2.42)	3.06***	(1.90 – 4.93)	1.04	(0.69 – 1.56)	1.36	(0.91 – 2.02)
Ethnicity (ref: Chinese)								
Malay	0.87	(0.56 – 1.34)	0.50	(0.23 – 1.08)	0.35**	(0.16 – 0.77)	0.75	(0.42 – 1.33)
Indian	1.34	(0.84 – 2.15)	0.62	(0.26 – 1.50)	1.05	(0.55 – 2.00)	0.85	(0.43 – 1.66)
Others	1.03	(0.21 – 4.95)	0.91	(0.11 – 7.78)	-	-	0.86	(0.11 – 7.01)
Marital Status (ref: Married)								
Widowed/Divorced/Separated	0.58	(0.19 – 1.72)	0.42	(0.11 – 1.52)	0.35	(0.12 – 1.08)	1.39	(0.26 – 7.57)
Never married	0.47	(0.14 – 1.56)	0.11	(0.02 – 0.57)	0.31	(0.09 – 1.10)	1.58	(0.26 – 9.62)
Living arrangement (ref: with child/spouse)								
Alone	2.51	(0.79 – 7.92)	5.01*	(1.21 – 20.73)	5.39**	(1.60 – 18.19)	0.83	(0.14 – 5.00)
Spouse only	1.03	(0.71 – 1.48)	1.46	(0.85 – 2.50)	1.16	(0.70 – 1.91)	1.16	(0.71 – 1.88)
Child only	0.93	(0.31 – 2.82)	1.84	(0.49 – 6.89)	1.64	(0.52 – 5.13)	0.58	(0.11 – 3.25)
Others only	1.37	(0.42 – 4.44)	3.71	(0.85 – 16.1)	3.54*	(1.04 – 12.01)	0.87	(0.14 – 5.24)
Education (ref: No formal education)								
Primary	0.94	(0.62 – 1.40)	1.36	(0.74 – 2.51)	0.44**	(0.26 – 0.73)	0.92	(0.55 – 1.55)
Secondary	1.12	(0.74 – 1.70)	2.03*	(1.11 – 3.72)	0.45**	(0.27 – 0.76)	1.30	(0.78 – 2.19)
Tertiary	1.55	(0.95 – 2.54)	1.85	(0.86 – 3.98)	0.44*	(0.22 – 0.86)	1.05	(0.52 – 2.10)
Housing Type (ref: 3 room HDB)								
1-2 room HDB	1.89*	(1.09 – 3.25)	2.26*	(1.05 – 4.87)	2.80**	(1.40 – 5.58)	3.00***	(1.66 – 5.41)
4-5 room and above	1.30	(0.88 – 1.91)	1.05	(0.61 – 1.83)	1.67	(0.99 – 2.82)	0.81	(0.51 – 1.30)
Income adequacy (ref: Enough money)								
Difficulty to meet expenses	0.76	(0.49 – 1.16)	0.61	(0.30 – 1.25)	0.91	(0.53 – 1.55)	0.85	(0.49 – 1.46)
<b>Physical and Functional Health</b>								
Chronic conditions	0.94	(0.86 – 1.04)	0.90	(0.77 – 1.04)	1.04	(0.92 – 1.18)	1.07	(0.95 – 1.21)
ADL limitations (ref: None)								
1-2 limitations	1.04	(0.41 – 2.65)	0.90	(0.19 – 4.24)	0.59	(0.12 – 2.88)	1.39	(0.49 – 4.00)

	RC, CC, etc. (N=1901)				SAC (N=1900)			
≥3 limitations	0.40	(0.05 – 3.28)	2.97	(0.43 – 20.53)	2.00	(0.33 – 12.20)	1.37	(0.31 – 6.06)
IADL limitations (ref: None)								
1-2 limitations	1.04	(0.64 – 1.69)	0.28*	(0.08 – 0.92)	0.55	(0.26 – 1.15)	0.70	(0.36 – 1.37)
≥3 limitations	0.19*	(0.04 – 0.92)	0.57	(0.10 – 3.15)	0.15*	(0.03 – 0.93)	0.79	(0.25 – 2.51)
<b>Psychosocial Health</b>								
Depressive symptoms	0.94	(0.89 – 1.00)	0.92	(0.83 – 1.01)	0.97	(0.89 – 1.05)	0.93	(0.86 – 1.01)
Loneliness (ref: Not lonely)								
Sometimes lonely	1.85***	(1.32 – 2.59)	1.12	(0.65 – 1.95)	1.76*	(1.12 – 2.76)	0.93	(0.58 – 1.51)
Mostly lonely	2.38***	(1.52 – 3.71)	1.87	(0.95 – 3.68)	1.93*	(1.06 – 3.52)	1.47	(0.82 – 2.63)
Mastery	1.03	(0.95 – 1.11)	1.02	(0.91 – 1.15)	1.02	(0.92 – 1.13)	1.02	(0.92 – 1.12)

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Note. Odds ratios and (95% confidence intervals) are reported.

**Table 9.4. Factors associated with older adults (aged 60+) social participation for walking for exercise purposes and attending religious activities. Occasionally and At Least Weekly versus Not at All.**

Sociodemographics	Walking for exercise purposes (N=1902)				Attending religious activities (N=2186)					
	Odds ratio	Occasionally		At least weekly		Odds ratio	Occasionally		At least weekly	
		95% CI	Odds ratio	95% CI	95% CI		Odds ratio	95% CI		
Age (ref: 60-69)										
70-79	1.34	(0.88 – 2.05)	1.28	(1.02 – 1.61)	0.84	(0.65 – 1.08)	0.98	(0.73 – 1.32)		
80-89	0.98	(0.52 – 1.84)	1.13	(0.83 – 1.54)	0.39***	(0.28 – 0.55)	0.86	(0.59 – 1.24)		
≥90	0.94	(0.11 – 8.40)	0.72	(0.25 – 2.04)	0.13***	(0.06 – 0.31)	0.26*	(0.09 – 0.76)		
Gender (ref: Males)										
Female	1.63*	(1.10 – 2.43)	0.94	(0.76 – 1.16)	1.11	(0.87 – 1.42)	0.93	(0.71 – 1.22)		
Ethnicity (ref: Chinese)										
Malay	1.13	(0.68 – 1.90)	0.88	(0.66 – 1.17)	0.46***	(0.33 – 0.66)	3.57***	(2.58 – 4.93)		
Indian	0.75	(0.35 – 1.57)	1.10	(0.79 – 1.55)	2.01**	(1.29 – 3.13)	5.01***	(3.17 – 7.93)		
Others	2.21	(0.42 – 11.62)	0.91	(0.29 – 2.83)	2.06	(0.39 – 11.06)	6.60*	(1.36 – 32.05)		
Marital Status (ref: Married)										
Widowed/Divorced/Separated	0.37	(0.09 – 1.50)	0.72	(0.34 – 1.51)	1.50	(0.70 – 3.21)	1.57	(0.66 – 3.74)		
Never married	1.13	(0.24 – 5.27)	0.58	(0.25 – 1.34)	1.08	(0.45 – 2.61)	1.24	(0.46 – 3.36)		
Living arrangement (ref: with child/spouse)										
Alone	1.36	(0.30 – 6.20)	0.86	(0.38 – 1.95)	0.56	(0.23 – 1.32)	1.58	(0.60 – 4.13)		
Spouse only	1.12	(0.70 – 1.80)	0.97	(0.75 – 1.26)	0.85	(0.64 – 1.14)	1.23	(0.89 – 1.70)		
Child only	1.07	(0.26 – 4.33)	1.20	(0.57 – 2.34)	0.65	(0.30 – 1.39)	0.64	(0.27 – 1.53)		
Others only	1.13	(0.24 – 5.42)	1.06	(0.47 – 2.41)	0.54	(0.23 – 1.28)	0.55	(0.20 – 1.47)		

Correlates of Social Networks and Participation

	Walking for exercise purposes (N=1902)				Attending religious activities (N=2186)			
Education (ref: No formal education)								
Primary	1.06	(0.62 – 1.81)	1.21	(0.92 – 1.59)	0.78	(0.58 – 1.05)	1.32	(0.91 – 1.90)
Secondary	1.68	(0.99 – 2.84)	1.44*	(1.08 – 1.92)	0.64**	(0.46 – 0.88)	2.12***	(1.44 – 3.13)
Tertiary	0.97	(0.47 – 2.00)	1.40	(0.97 – 2.01)	0.46***	(0.30 – 0.69)	1.79*	(1.12 – 2.89)
Housing Type (ref: 3 room HDB)								
1-2 room HDB	0.79	(0.33 – 1.86)	1.06	(0.71 – 1.57)	0.83	(0.53 – 1.30)	0.98	(0.60 – 1.59)
4-5 room and above	1.36	(0.83 – 2.21)	0.95	(0.75 – 1.22)	0.93	(0.71 – 1.21)	1.06	(0.78 – 1.45)
Income adequacy (ref: Enough money)								
Difficulty to meet expenses	0.48*	(0.27 – 0.86)	0.54***	(0.41 – 0.72)	1.00	(0.76 – 1.31)	0.92	(0.67 – 1.26)
<b>Physical and Functional Health</b>								
Chronic conditions	1.04	(0.92 – 1.19)	1.06	(0.99 – 1.14)	1.12**	(1.04 – 1.20)	1.09	(1.00 – 1.18)
ADL limitations (ref: None)								
1-2 limitations	0.67	(0.21 – 2.11)	0.55	(0.29 – 1.03)	0.73	(0.42 – 1.26)	0.91	(0.48 – 1.73)
≥3 limitations	1.19	(0.27 – 5.20)	0.42	(0.17 – 1.10)	0.53*	(0.28 – 1.00)	1.06	(0.51 – 2.17)
IADL limitations (ref: None)								
1-2 limitations	1.66	(0.95 – 2.91)	0.69*	(0.49 – 0.98)	0.57***	(0.41 – 0.77)	0.53**	(0.37 – 0.77)
≥3 limitations	0.42	(0.10 – 1.75)	0.57	(0.30 – 1.09)	0.24***	(0.14 – 0.40)	0.19***	(0.10 – 0.35)
<b>Psychosocial Health</b>								
Depressive symptoms	1.05	(0.97 – 1.13)	0.97	(0.93 – 1.01)	-	-	-	-
Loneliness (ref: Not lonely)								
Sometimes lonely	2.26***	(1.47 – 3.46)	1.42**	(1.11 – 1.83)	-	-	-	-
Mostly lonely	1.70	(0.87 – 3.32)	2.44***	(1.74 – 3.42)	-	-	-	-
Mastery	0.87**	(0.79 – 0.95)	0.92**	(0.87 – 0.97)	-	-	-	-

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Note. Odds ratios and (95% confidence intervals) are reported. Attending religious activities variable comes from a different subsample (N=2266) which did not answer questions on their psychosocial health.

## **DISCUSSION**

Given the strong link between social connectedness and older persons' overall health and wellbeing, we investigated the correlates of social connectedness as defined by two key dimensions, namely social networks outside the household and social participation. Understanding the impact of these on a broad spectrum of older Singaporeans will help us to understand the specific levers and interventions that can be developed to facilitate older Singaporeans' social connectedness.

A significant finding is that indeed as per the wider literature, older Singaporeans' social networks outside the household did impact their mental health, with those having weaker social networks being lonelier and more likely to be depressed compared to those with stronger social networks. The picture was more varied with loneliness; we found that there is no correlation between loneliness and frequent participation in social activities but did find that older persons with lower participation tended to be lonelier. Interestingly, this seems to suggest that those who are lonely were in some ways making the effort to participate, probably to alleviate their loneliness. This inference is in some ways corroborated by the findings which highlighted that older persons with weaker social networks, namely those from lower SES and living alone, tended to participate more in social activities.

The SIGNS Study – I highlighted a number of significant barriers and facilitators to social connectedness among older Singaporeans. One of the most important barriers to older Singaporeans' social connectedness both in-terms of their social network outside the household and their social participation are their IADL limitations. With increasing longevity, we can expect the number of older persons with such limitations to increase, which points to the urgent need to plan for ageing in place to enable older persons to remain connected despite their IADL limitations. It is critical to facilitate these older persons' social connectivity to mitigate further risk to their overall well-being. Both hardware and software access need to be ramped up.

With hardware, the neighbourhood environment should be further improved/redesigned to allow for greater ease of mobility by those with IADL limitations. Social and community agencies and facilities like the SACs should co-sited with where older persons live. Mobility aides and community transport schemes need to be scaled up substantially as transportation is also a major impediment to access to medical services (see chapter on healthcare utilisation).

In terms of software, social and community agencies can intensify outreach efforts to those with weaker social connections either by virtue of their functional limitations or social circumstances such as those who are older, not married, and living in 1 and 2 rooms flats, based on our findings. The study's findings also highlighted the need for these agencies to organise activities and programmes that are more targeted and responsive to the varied needs of their target clientele such as men who tended to



participate less than women and Malays who tended not to participate in SACs. The study findings also corroborates previous research.<sup>14</sup>

The SIGNS Study highlighted religious activity as a significant facilitator of social participation. It is evident that participation in religious activities is an important factor in the lives of older Singaporeans such that even those who are sick, as defined by their chronic conditions, who tended not to participate in other social activities, continued with their religious participation. Malays, Indians and the more educated, who tended not to participate in SAC and activities at the RC and CC, did participate in religious activities on a weekly basis. As such it is worthwhile harness the potential of these religious platforms to enhance the social connectedness of older Singaporeans.

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## Chapter 10: Provision and Receipt of Transfers: Descriptive Statistics

In this chapter, we provide descriptive statistics on provision and receipt of transfers and their distribution overall and by age group, gender, ethnicity, educational level and living arrangement.

**Table 10.1a Provision of Transfers by Age Group, Gender, Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Provision of transfers to family members (including spouse), relatives, friends, or a foreign domestic worker in the past 12 months (weighted %)</b>										
n	2272	1000	747	525	1058	1214	1676	349	216	31
Monetary support	26.6	35.1	21.8	8.0	38.5	16.1	25.3	32.0	35.4	26.2
Housework help	38.8	45.7	37.8	18.7	48.0	30.8	38.8	42.5	37.6	21.7
Material support	34.2	41.8	30.2	17.3	42.7	26.8	33.8	34.3	37.0	45.7
Emotional support	40.9	48.0	38.0	23.7	53.0	30.3	39.8	47.8	44.4	44.8

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The most prevalent type of provision of transfers was the provision of emotional support (41%). In general, those aged 60-69 years were more likely to provide support compared to the other age groups. Regarding gender difference, males were more likely to provide support.

**Table 10.1b Provision of Transfers by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Provision of transfers to family members (including spouse), relatives, friends, or a foreign domestic worker in the past 12 months (weighted %)</b>						
n	706	676	589	296	2052	216
Monetary support	15.9	25.0	30.7	43.2	28.1	12.3
Housework help	33.5	39.5	41.6	42.6	41.7	10.5
Material support	27.8	31.0	38.6	45.3	36.3	14.5
Emotional support	29.2	39.4	45.3	59.1	43.3	18.3

\*Living alone includes those who live alone only or with only a foreign domestic worker/maid.

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Older Singaporeans who had tertiary education and those who were not living alone were also more likely to provide support.

**Table 10.2a Receipt of Transfers by Age Group, Gender, Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Receipt of transfers to family members (including spouse), relatives, friends, or a foreign domestic worker in the past 12 months (weighted %)</b>										
n	2272	1000	747	525	1058	1214	1676	349	216	31
Monetary support	60.9	52.7	68.5	73.1	51.1	69.5	60.7	64.9	64.2	35.3
Housework help	56.5	52.9	56.3	68.7	62.0	51.7	55.8	58.2	69.5	41.1
Material support	57.6	52.0	60.7	70.6	54.3	60.6	57.4	59.2	63.3	43.5
Emotional support	59.1	57.0	60.0	64.6	49.5	67.5	58.5	63.2	64.0	47.8

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Around 57 to 61% of respondents received transfers within the 12 months prior at the point of the survey. In general, those aged 80 years and above were more likely to receive support. Regarding gender difference, females were more likely to receive monetary and emotional support, whereas males were more likely to receive housework help. We also observed that older Singaporeans who were not of the three major ethnicities ('Others') were less likely to receive support.

**Table 10.2b Receipt of Transfers by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	No	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Receipt of transfers to family members (including spouse), relatives, friends, or a foreign domestic worker in the past 12 months (weighted %)</b>						
n	706	676	589	296	2052	216
Monetary support	74.7	66.3	54.0	35.7	62.5	45.8
Housework help	58.2	56.1	55.2	57.0	60.2	21.2
Material support	67.8	58.5	51.4	48.0	59.5	39.8
Emotional support	64.7	59.1	54.8	56.3	60.7	43.8

\*Living alone includes those who live alone only or with only a foreign domestic worker/maid.

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Older Singaporeans who had tertiary education were also less likely to receive monetary and material support. In terms of living arrangements, those who lived alone tended not to receive support, particularly housework help, compared to those not living alone.

# Chapter 11: Predictors of Support Provision to Family Members

*Grand Hak-Land Cheng*

## INTRODUCTION

Despite their declining health and functioning, older adults are not passive and are often productive, making contributions to their family and society.<sup>1-3</sup> In 2016, the Singapore government invested S\$3 billion into the ‘Action Plan for Successful Ageing’ to create opportunities where older Singaporeans are able to be active in their personal and social lives through contributive activities such as volunteering and employment building trainings and workshops.<sup>4</sup> These activities have been found to be beneficial in alleviating loneliness and stimulating cognitive function, essentially improving overall well-being.<sup>5,6 7-9</sup>

When it comes to contributory behaviors of older adults, the provision of support older adults and their family members, such as those of financial, housework and emotional natures have not been sufficiently studied.<sup>1</sup> This knowledge gap is particularly disconcerting for Singapore, a country where family values and cohesion are important pillars for Singapore society.<sup>10</sup> A recent study<sup>11</sup> used data from the second wave (conducted in the year 2011) of the Panel on Health and Ageing of Singaporean Elderly (PHASE) and found that depending on the type of support, 10 to 39% of older adults provided support to their family members within the prior year (at the point of the study). The study also found that 30 to 80% of older adults had received family support. Older adults who received support from family members were likely to also be reciprocating and providing support. In the current analyses, we utilise data from the THE SIGNS Study – I to investigate older Singaporeans’ support provision to family members.

The Singapore government’s policy on care of older people is that it should be principally provided by the family. . It is thus common place in Singapore for older Singaporeans to receive support from their family members.<sup>11</sup> Hence, it is important to understand how receiving support relates to the provision of support. Similar to prior research,<sup>11</sup> we anticipate a positive association between receiving support from and providing support to family members. This expectation is based on the reciprocity norm.<sup>12</sup> As people return favors for those received, reciprocity forms the basis for social bonding and trust including the family context.

To understand the dynamics that shape support provision, we document how sociodemographic factors and health status relate to support provision to and from family members. The data indicates which sub-populations transfer more and which transfer less. Given the gendered division of labor, especially in Asia where men are more likely to be the breadwinners and women the homemakers,<sup>12</sup> we also anticipate that gender will play a role in the dynamics of support provision in Singapore.

Education and employment status are factors that could influence the probability of support provision; for example, those with higher income and savings would have

more means to provide support. Marriage, living with someone, and stronger family networks outside the household have also been found to provide more opportunities for support provision. Hence, we also look into these factors predict support provision. With regards to physical health, we anticipate a negative association between poor health and support provision among older adults, as poor health could limit the capacity for helping. .

## METHOD

The analytical sample included 2,008 older Singaporeans who answered all study variables. Table 11.1 reports the descriptive characteristics of this analytical sample.

**Table 11.1. Descriptive statistics of the analytical sample (N=2008)**

<u>Dependent variables</u>	
Provided financial support, n (%)	819 (40.8)
Provided housework support, n (%)	782 (38.9)
Provided emotional support, n (%)	835 (41.6)
<u>Predicting variables</u>	
Received financial support, n (%)	1438 (71.6)
Received housework support, n (%)	1083 (53.9)
Received emotional support, n (%)	1148 (57.2)
Age, n (%)	
60-69	977 (48.7)
70-79	690 (34.4)
80 and above	341 (17.0)
Female gender, n (%)	1029 (51.3)
Ethnicity, n (%)	
Chinese	1496 (74.5)
Malay	292 (14.5)
Indian	190 (9.5)
Other	30 (1.5)
Education, n (%)	
None	527 (26.3)
Primary	628 (31.3)
Secondary	563 (28.0)
Post-secondary	290 (14.4)
Housing type, n (%)	
1-2 room HDB	166 (8.3)
3 room HDB	485 (24.2)
4-5 room HDB/ private	1357 (67.6)
Employed, n (%)	694 (34.6)
Married, n (%)	1371 (68.3)
Living alone, n (%)	163 (8.1)
Family networks outside the household, n (%)	
Lowest tertile	747 (37.2)
Middle tertile	600 (29.9)
Highest tertile	661 (32.9)
Depressive symptoms, mean (SD) (scale range: 0 to 22)	3.13 (3.23)
Chronic diseases, mean (SD)	2.09 (1.54)
ADL limitations, n (%)	
No limitations	1872 (93.2)
1-2 limitations	81 (4.0)
≥ 3 limitations	55 (2.7)
IADL limitations, n (%)	
No limitations	1683 (83.8)

1-2 limitations	212 (10.6)
≥ 3 limitations	113 (5.6)

Note: The reported % may not sum to 100 due to rounding.

## **Measures**

Dependent variables included the provision of financial (money, food, clothes or other material goods), housework, and emotional support. Respondents reported whether they had provided these three types of support to any of their family members in the past 12 months.

Predicting variables included receipt of financial support, housework support, and emotional support. Similar to support provision, respondents indicated whether they had received these 3 kinds of support from any of their family members in the past 12 months.

Sociodemographic variables included age, gender, ethnicity, education level, housing type, employment status, marital status, living alone, and family networks outside the household. The modified Lubben social network scale<sup>13</sup> assessed strength and quality of social networks with friends and relatives outside the household. We included the questions on relatives to capture strength and quality of family networks outside the household.

For health, we measured depressive symptoms using the 11-item Center for Epidemiological Studies Depression (CES-D) Scale.<sup>14</sup> We also considered a number of chronic diseases (maximum= 20), ADL limitations (maximum= 6), and IADL limitations (maximum= 7).

## **Statistical analysis**

We developed 3 logistic regression models. Each model focused on a certain dependent variable (provision of financial, housework, or emotional support). The dependent variable was regressed on a total of 16 predicting variables, which included receipt of (financial, housework, emotional) support, sociodemographic (age, gender, ethnicity, education level, housing type, employment status, marital status, living alone, family networks outside the household), and health status (depressive symptoms, chronic diseases, ADL limitations, IADL limitations).

## **RESULTS**

In our sample, 39% to 42% of older adults had provided financial, housework, and emotional support to their family members in the past 12 months (Table 11.1). A higher proportion had received support (54% to 72%) from their family members. Table 11.2 reports the bivariate association among different kinds of support provision and support receipt. We found that all types of support receipt were positively correlated with support provision.

**Table 11.2. Correlation between support provision and support receipt (N= 2008)**

	1.	2.	3.	4.	5.	6.
1. Provided financial support	-					
2. Provided housework support	.59	-				
3. Provided emotional support	.62	.66	-			
4. Received financial support	.13	.21	.20	-		
5. Received housework support	.20	.22	.27	.47	-	
6. Received emotional support	.14	.22	.32	.57	.45	-

Note: All relationships were significant ( $p < .001$ ).

Table 11.3 shows the logistic regression findings for the prediction of provision of financial support. Receipt of financial, housework, and emotional support were positively associated with provision of financial support. Regarding sociodemographic factors, older Singaporeans were more likely to provide financial support when they were more educated, employed, married, and had stronger family networks outside the household. Simultaneously, older age, living alone and females were negatively related with provision of financial support. Regarding health, those with ADL limitations were less likely to offer financial support.

**Table 11.3. Predicting provision of financial support (no provision of financial support as the reference group; N= 2008)**

	Odds ratio (OR)
Received financial support	1.70***
Received housework support	1.43**
Received emotional support	1.42**
Age (ref.: 60-64)	
70-79	0.62***
80 and above	0.52***
Female gender	0.56***
Ethnicity (ref.: Chinese)	
Malay	1.28
Indian	1.23
Other	0.66
Education (ref.: none)	
Primary	0.79
Secondary	0.94
Post-secondary	1.64**
Housing type (ref.: 1-2 room HDB)	
3 room HDB	1.08
4-5 room HDB/ private	0.83
Employed	2.26***
Married	1.40*
Living alone	0.32***
Family networks (ref. lowest tertile)	
Middle tertile	1.29
Highest tertile	1.60***
Depressive symptoms	1.01
Chronic diseases	1.01
ADL limitations (ref.: no limitations)	
1-2 limitations	.23***
≥ 3 limitations	.10***
IADL limitations (ref.: no limitations)	
1-2 limitations	1.23



≥ 3 limitations 0.71

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Receipt of financial, housework, and emotional support were positively associated with provision of housework support (Table 11.4). Individuals who were older, female, living alone, had any ADL limitations, and had any IADL limitations were less likely to provide housework support.

**Table 11.4. Predicting provision of housework support (no provision of housework support as the reference group; N= 2008)**

	Odds ratio (OR)
Received financial support	2.05***
Received housework support	1.32*
Received emotional support	2.17***
Age (ref.: 60-64)	
70-79	0.74*
80 and above	0.44***
Female gender	0.45***
Ethnicity (ref.: Chinese)	
Malay	1.23
Indian	0.93
Other	0.48
Education (ref.: none)	
Primary	0.87
Secondary	0.95
Post-secondary	0.91
Housing type (ref.: 1-2 room HDB)	
3 room HDB	1.00
4-5 room HDB/ private	0.91
Employed	1.24
Married	1.07
Living alone	0.15***
Family networks (ref. lowest tertile)	
Middle tertile	1.12
Highest tertile	1.05
Depressive symptoms	1.01
Chronic diseases	0.98
ADL limitations (ref.: no limitations)	
1-2 limitations	0.19***
≥ 3 limitations	0.09**
IADL limitations (ref.: no limitations)	
1-2 limitations	0.90
≥ 3 limitations	0.33**

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Respondents who received housework and emotional support were more likely to provide emotional support (Table 11.5). Malays, those with higher education levels, and those who were employed were more likely to provide emotional support. In contrast, those who were older, female, living alone, and had ADL limitations were less likely to provide emotional support.

**Table 11.5. Predicting provision of emotional support (no provision of emotional support as the reference group; N= 2008)**

	Odds ratio (OR)
Received financial support	1.34
Received housework support	1.44**
Received emotional support	5.15***
Age (ref.: 60-64)	
70-79	0.75*
80 and above	0.65*
Female gender	0.30***
Ethnicity (ref.: Chinese)	
Malay	1.62**
Indian	1.19
Other	1.14
Education (ref.: none)	
Primary	0.90
Secondary	1.30
Post-secondary	2.00***
Housing type (ref.: 1-2 room HDB)	
3 room HDB	0.80
4-5 room HDB/ private	0.73
Employed	1.51**
Married	1.24
Living alone	0.32***
Family networks (ref. lowest tertile)	
Middle tertile	1.07
Highest tertile	1.23
Depressive symptoms	1.00
Chronic diseases	1.06
ADL limitations (ref.: no limitations)	
1-2 limitations	0.31***
≥ 3 limitations	0.25**
IADL limitations (ref.: no limitations)	
1-2 limitations	0.99
≥ 3 limitations	0.56

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

## **DISCUSSION**

Around 40% of respondents provided some types of support to their family members in the past 12 months, and over half of them received some types of family support. Older Singaporeans provided family support to the extent that they received family support. The positive association between receipt of support and provision of support points to the significance of reciprocity norm.<sup>11,12</sup> It also corroborates our understanding that family cohesion is a key cultural value for many Singaporeans.<sup>10</sup>

Furthermore, older Singaporeans who had higher education levels, employed, and had better functional health (fewer ADL and IADL limitations) were more likely to provide support to their kin. At the same time, older age and greater functional limitations were associated with a lower chance of offering help. These observations altogether suggest that older people who have more resources and capability have a stronger tendency to offer help to their kin and vice versa. These findings attest to the strong desire of older Singaporeans to provide support - in all its different forms - to the next generation with the main impediments being their own limited resources.

Another positive finding is that those who are married and live with someone had a higher likelihood of offering help to their kin, suggesting that co-residence has benefits. In addition, strength and quality of family networks outside the household were positively related to support provision. These findings suggest that the more the older adults are socially connected, the more they are likely to contribute.

Dissecting the findings further, we found that there are gender and ethnic differences with support provision among older Singaporeans. We found that older males were more likely to provide financial, housework and emotional support to family members compared to their female counterparts. Whilst this may seemingly be counter-intuitive based on traditional caring roles of females in the family, it is consistent with the key finding that those who are more educated, employed and in better health are more likely to provide support. Older males, versus females in Singapore, tend to be more educated, employed and in better health. Among the ethnicities, we found that Malays tended to provide more emotional support to their kin than the Chinese, which suggests cultural differences in family dynamics play an important role in predicting the type of support provided.

In summary, the findings on support provision among older adults are highly encouraging, and augur well for intergenerational relations in Singapore. Older Singaporeans provide support especially when they have the financial means and are in good health. With Singapore's successful ageing framework, which seeks to improve the overall wellbeing of older adults through initiatives that aim to enhance their health, social and economic status, we can expect that new cohorts of older Singaporeans will continue to provide support to younger generations. The inclination to provide support as pointed out, is augmented when older adults are socially connected both within their homes and beyond.

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## Chapter 12: Work and Retirement: Descriptive Statistics

This chapter reports the descriptive statistics on current work status, reasons to be working, early retirement, and reasons for early retirement, overall and by age group, gender, ethnicity, educational level and living arrangement.

**Table 12.1a Current Work Status by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Current Work Status (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Working full-time	24.3	37.5	13.7	1.7	35.7	14.3	23.8	24.8	29.3	32.2
Working part-time	12.5	16.2	11.5	2.2	11.8	13.1	13.5	6.2	8.7	7.7
Retired and/or not working	54.8	43.1	65.5	72.7	52.2	57.1	55.0	55.6	50.4	55.0
Never worked	8.3	3.2	9.4	22.9	0.3	15.4	7.6	13.3	11.7	5.1

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Overall, 24% of older Singaporeans worked full-time, and 13% worked part-time, with both proportions declining with age. A lower proportion of females worked full-time (14%) compared to males (36%) but a slightly higher proportion worked part-time (13%) compared to males (12%). About 8% older Singaporeans overall had never-worked; 23% of those aged 80 years and above never worked compared to only 3% of those aged 60-69 years; 15% of females never worked compared to less than 1% of males. The Chinese had the lowest proportion of full-time work (24%) among the three major ethnicities but had the highest proportion of part-time work (14%).

**Table 12.1b Current Work Status by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Current Work Status (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Working full-time	11.6	25.1	33.2	29.9	25.1	15.5
Working part-time	10.6	12.4	12.7	16.2	12.3	14.2
Retired and/or not working	58.6	55.9	50.7	53.3	54.3	60.7
Never worked	19.0	6.5	3.4	0.6	8.2	9.5

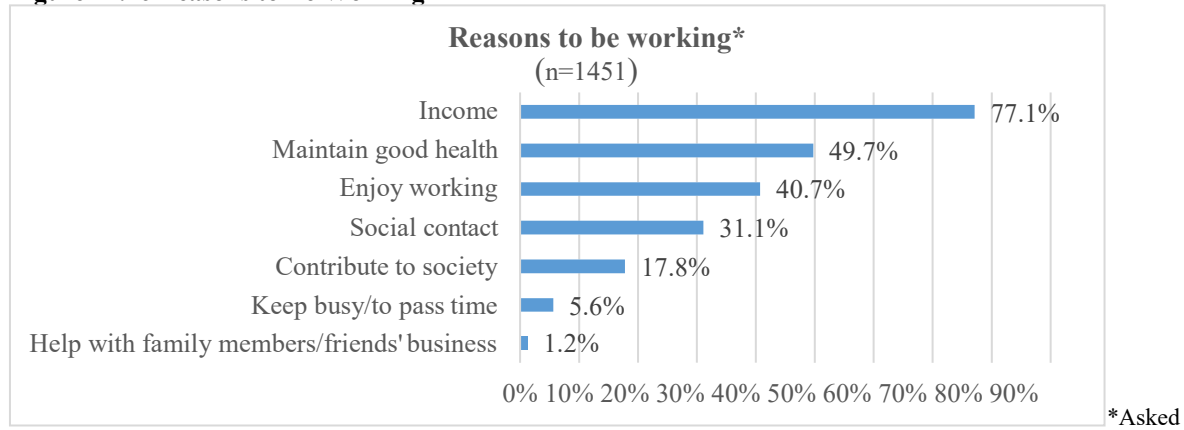
\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

The proportion of older Singaporeans who worked either full-time or part-time increased with education, ranging from 22% among those with no formal education to 46% among those with secondary and among those with tertiary education. A lower proportion of older Singaporeans living alone worked full-time (16%) compared to those not living alone (25%) but a higher proportion of those living alone worked part-time (14%) compared to those not living alone

(12%). The proportion of those never worked was highest among those with no formal education (19%), declining sharply for those with primary or higher education.

The distribution of current and longest engaged occupation by age group, gender, ethnicity, educational level, and living arrangement is provided in Appendix Tables A12a-A12b and A12f-A12g.

**Figure 12.1c Reasons to Be Working**



only to participants who are working full-time or part-time  
Percentages exceed 100% as multiple responses were allowed.

All survey participants who were working either full-time or part-time were asked about their reasons for working. The most common reason for working was reported to be income (included in 77% of the responses), followed by maintenance of good health (50%), and enjoying work (41%). Social contact and contribution to society were included in 31% and 18% of the responses respectively.

**Table 12.2a Early Retirement among Retired/Not Working by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Early Retirement (weighted %)</b>										
n	2623	868	1012	743	1209	1414	1962	410	232	19
Yes	38.6	51.0	34.3	22.3	25.8	48.9	38.0	43.8	40.6	33.6

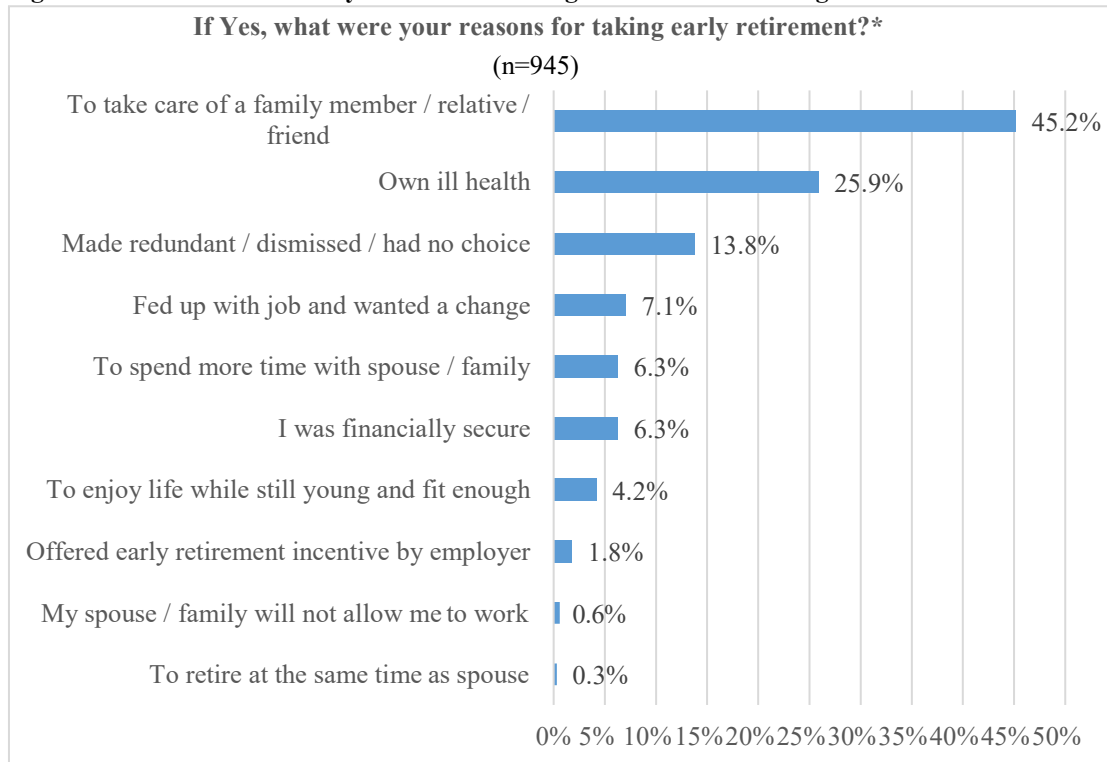
Older Singaporeans who reported that they had retired or were currently not working were asked if they had retired early. The proportion of those who reported that they had retired early was 39% overall, and the highest among those aged 60-69 years (51%), and lower for those aged 70-79 years (34%) and 80 years and above (22%). The proportion of females who had retired early (49%) was nearly twice that of males (26%). Malays had the highest proportion of those who had retired early (44%), followed by Indians (41%), Chinese (38%) and Others (34%).

**Table 12.2b Early Retirement among Retired/Not Working by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	No	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Early Retirement (weighted %)</b>						
n	835	817	683	282	2363	258
Yes	32.2	40.0	42.6	41.9	39.0	35.9

The proportion of those retiring early was the lowest for older Singaporeans with no formal education (32%), but similar across other educational levels. Those living alone had a lower proportion of early retirement (36%) compared to those not living alone (39%).

**Figure 12.2c Reasons for Early Retirement among Retired/Not Working**



\*Asked only to participants who are retired and/or not working, and who took early retirement  
 Percentages exceed 100% as multiple responses were allowed.

Respondents who reported that they had retired early were asked their reasons for taking early retirement. The most frequently cited reason was caregiving responsibilities specifically taking care of a family member, relative, or friend (45%), followed by the respondents’ own ill health (26%). Reasons related to the workplace, i.e. made redundant/had no choice (14%), fed up with job and wanted a change (7%), and offered early retirement incentive (2%) when combined, formed the third most frequently cited reason.

The proportion of employment seeking among the retired or not working, and reasons for doing or not doing so, is provided in Appendix Tables A12c-A12e. The proportion of those who never worked and their reasons for not seeking employment is provided in the Appendix Tables A12h-A12i.



## **Chapter 13: Correlates of Work and Early Retirement**

*Abhijit Visaria*

### **INTRODUCTION**

A key aspect of promoting successful ageing is affording the opportunity to older adults to voluntarily work, while also maintaining their social contacts and an active lifestyle. For individuals there may also be obvious financial benefits, because the longer the period of time spent in formal employment, the shorter the duration of dependence on savings and others for meeting regular expenses. Research also suggests that the work environment and other contextual factors, before and during the time of exiting the workforce, play a strong role in whether retirement is beneficial or has adverse consequences for psychological and physical health;<sup>1,2,3</sup> For example, if workers retire from the workforce involuntarily, or when they perceive little control during this period of transition, they have higher stress and worse physical health after retirement.<sup>4</sup> Extant research shows that older workers do contribute to the larger economy; that productivity, profits or wage levels are not negatively associated with a larger proportion of older workers; and that mixed-age working teams comprising of younger and older workers enhance productivity of all workers.<sup>5,6,7</sup>

The issue of employment of older workers is an important aspect of understanding an ageing society such as Singapore. A low total fertility rate well below the replacement level and increases in life expectancy over the last five decades have meant that Singapore is a rapidly ageing society. An ageing population implies that the working age population and the old age support ratio will decline, with consequences for the welfare of older adults, as well as economic output and growth.<sup>8</sup> The old-age support ratio, i.e. the number of persons in the age-group of 20-64 per 1 person aged 65 and above, has steadily declined in Singapore, from 11.4 in 1980, to 8.4 in 2000, 4.2 persons in 2018, and projected to further decline to just over 2 persons aged 20-64 for every 1 person aged 65 and above by 2030.<sup>10</sup>

If the total fertility rate in Singapore remains low, and immigration and labour force participation rates remain constant, Singapore will face a shrinking labour force within the next two decades.<sup>8,11</sup> A key policy lever to cope with the prospects of a declining old age support ratio and a shrinking labour force is to retain existing older workers in the workforce through legislation to extend working age. The results of the current legislation that requires employers to offer re-employment from the ages of 62 to 65 has resulted in an increase in the proportion of older adults in the labour force: among women aged 65 and over, the employment rate has increased from about 4 percent in 1991 to 8 percent in 2006, and to nearly 18 percent in 2017. For older men the rate was at 20 percent in 1991, increased a little to 21 percent in 2006 and to 36 percent in 2017. These changes suggest that there are increasing opportunities as well as reasons for older adults to be engaged in the workforce, and that there may be possibilities of improving these rates even further.

In this chapter, we seek to throw additional light on the prospects for older workers especially women to remain in the workforce, analysing the profile of both older workers and older retirees in Singapore. We analyse three aspects of work and retirement among older adults in Singapore. We study the characteristics of older adults currently working to investigate the social and health correlates of continuing to work. Among those who are currently retired and/or not working, we study the correlates of early retirement and looking for work. In order to make the analysis most meaningful, we examine two specific age cohorts; the young-old, those aged 60-64 years and those aged 65-69 years at the time of the survey. Individuals at these ages have been in the workforce most recently, and it is at these ages that many older adults formally retire from long-held jobs, some transiting from full-time to part-time work, and others responding to re-employment opportunities. It is in providing this cohort of 60-69 year old adults with the opportunity, incentive, and a conducive environment in which they can continue to work if they wish, that there exists potentially the greatest possibility of retaining older adults in the workforce.

### **Research Questions**

The analysis presented in this chapter seeks to answer three research questions:

1. Among ever-worked older adults in Singapore, what are the correlates of current employment? Which factors – demographic, socioeconomic, and health – are correlated with work among older adults?
2. Among currently retired and non-working older adults, what are the correlates of early retirement?
3. What are the correlates of recently looking for work among ever-worked older adults who are currently retired or not working?

## **METHODS**

### **Measures of Employment**

**Current work:** In THE SIGNS Study – I, all respondents were asked their current work status. The options provided were working full-time, working part-time, retired and/or not working, never worked, don't know, or refused. In our analysis, we combine the two working categories and operationalize it as 'current work'. We excluded individuals who reported that they had never worked (N=469) to ensure that the study of correlates of current work is made among comparable individuals who have ever worked.

**Early retirement:** Among those who reported that they are currently retired and/or not working, respondents are asked, "Did you take early retirement, that is did you retire before the normal retirement age?" The measure of early retirement is thus based on the respondents' self-report.

**Looking for work:** Looking for work is operationalized using the question, “Have you been doing anything to find work during the last four weeks?” asked of all currently retired and/or not working individuals.

Each of these is dichotomized into a yes/no variable.

### **Explanatory Variables**

The explanatory variables that we use in our analysis are demographic characteristics including age, gender, ethnic group, marital status, and the older adult’s current living arrangement. We include educational attainment, housing type, and income adequacy as measures of socioeconomic status. Income adequacy is operationalized using the question, “Do you feel that you have adequate income to meet your expenses per month?” Response options include ‘enough money, with some left over’, ‘just enough money, no difficulty’, ‘some difficulty to meet expenses’, and ‘much difficulty to meet expenses’. We reclassify these options into two categories: enough money and any difficulty. In all multivariate analysis, we include a variable for the occupation in which individuals report that they spent the longest, to control for any differences in employment decisions and work trajectories that may depend on the nature of the industry. Given the wide range of specific occupations reported by survey respondents outside of the major categories (professional, administrative and managerial, associate professional and technician, clerical, sales and services, production and related, cleaners and labourers, and homemaker), the multivariate analysis controls for occupation, but the results are not reported.

### **Statistical Analysis**

We first study the bivariate relationship between each of the three employment variables and the independent variables of interest. Given the dichotomous nature of the employment variables, we use logistic regression models to analyse the bivariate relationships in a multivariate framework. THE SIGNS Study – I dataset includes rich information on the reasons reported by older persons for currently working, for early retirement, as well as for currently looking for work. We present the distribution of these variables by age group and by gender in each of the three results section to provide more detail about the motivations and context of working and retired older adults in Singapore.

## **RESULTS**

### ***Current Employment***

We present the bivariate relationship between current work and the independent variables of interest in Table 13.1. Overall, the bivariate distribution clearly shows that a substantial proportion of older men as well as older women are currently working either full-time or part-time. In the full analytical sample, about 45 percent men and 31 percent women are currently employed. As one may expect, the proportion of both men and women who are working is higher at younger ages, with about 73 percent of men and 51 percent women in the 60-64 age group working, compared to 60 percent of the men and 38 percent women in the 65-

69 age group. Within different ethnic groups, the proportion of working older adults is lower among Malays compared to others.

The bivariate relationship between education and current work is especially interesting. We see that when we compare the two age groups of 60-64 and 65-69 years, the proportion is the least different for those with no formal education. In absolute terms, the difference between the two age cohorts is about 6.5 percentage points among those with no formal education, compared to 10 percentage points among those with some primary education, 12 percentage points among those with some secondary education, and 22 percentage points among those with JC/polytechnic/university or other tertiary education attainment. Older adults with no formal education stay on longer in the workforce compared to others.

**Table 13.1: Bivariate distribution of current full-/part-time work among ever-worked older Singaporeans by age groups, 2016-2017**

Demographics	60-64 years	65-69 years	All ages
<b>Gender</b>			
Male	72.9	59.4	45.0
Female	50.9	38.1	31.4
<b>Ethnic group</b>			
Chinese	62.4	50.9	38.5
Malay	53.5	45.7	36.4
Indian	70.3	46.9	43.1
Others	77.8	37.5	40.0
<b>Marital Status</b>			
Currently married	64.0	51.4	43.1
Widowed/separated/divorced	52.7	41.7	25.1
Never married	55.1	47.9	37.9
<b>Living arrangements</b>			
Living alone	54.6	48.4	31.6
Living with spouse only	55.3	48.7	36.1
Living with child only	49.0	40.4	22.8
Living with child and spouse	66.7	52.7	47.1
Living with others	61.2	47.1	38.3
<b>Socioeconomic Status</b>			
<b>Education</b>			
No formal education	55.8	49.3	27.5
Primary	58.2	47.7	38.0
Secondary/vocational/ITE	64.7	53.0	44.9
JC/Polytechnic/University and above	66.7	44.6	44.5
<b>Housing type</b>			
HDB 1-2 rooms	66.7	39.1	32.7
HDB 3-4 rooms	58.9	55.6	38.5
HDB 5 room	62.5	50.0	41.0
Private and others	58.1	37.3	28.7
<b>Income adequacy</b>			
Enough	63.2	51.0	39.8
Some/much difficulty to meet monthly expenses	55.4	43.0	33.9
<b>Social Networks</b>			
Lowest tertile	58.2	49.6	34.7
Middle tertile	60.0	49.7	37.4
Higher tertile	65.7	49.4	43.6
<b>Physical/Functional Health</b>			
No ADL limitations	62.9	50.5	40.4
Any ADL limitations	23.1	20.7	8.7
No IADL limitations	63.2	51.1	42.3

Any IADL limitation	43.5	37.3	19.1
No chronic conditions	69.8	56.7	54.4
Any chronic conditions	59.2	48.0	35.4
Observations	923	946	3615

The bivariate relationship does not show a significant difference between social network tertiles, with about 60-65 percent of older adults within each tertile currently employed. With health factors, we can see that among older adults with any ADL, IADL limitations, or chronic conditions, the proportion of those who work is sharply lower compared to those without these limitations or chronic conditions.

These relationships between work and demographic, socioeconomic, and health factors are subsequently analysed in a multivariate framework, the results of which are presented in Table 13.2. When we account together for the full set of independent variables, we see that there remains a strong effect of gender in all age groups. Women are significantly less likely to be currently working in the overall sample and at both 60-64 and 65-69.

With the 60-64 age group, Indians are twice as likely as the Chinese to be currently working. We do not have evidence for a statistically significant or consistent association between current work status and marital status or living arrangements, except that individuals who live only with a spouse are less likely, compared to those who live with a spouse and a child, to be currently working. Poor health at these ages precludes employment; we also see a negative relationship between work and ADL limitations and between work and the presence of a chronic health condition in the age group of 60-64 years.

For the 65-69 age group, i.e. those who have crossed the retirement age but may still be eligible for reemployment, tertiary educated older adults are 50% less likely to be currently working compared to those without a formal education. We also see evidence for a non-linear relationship between work and housing type, which as discussed above, is a proxy for economic status. Compared to those living in 3-room HDB apartments, individuals who may be worse off and live in 1-2 room apartments as well as those who live in private and other types of housing are less likely to work. The results also show that those with a difficulty in meeting their household monthly expenses are in fact less likely to work compared to those who report that they have enough or even a surplus income. We also see that independent of other factors, individuals are less likely to work as they age, for each additional year within this 5-year age interval of 65-69 years is associated with 14% lower odds of current work.

**Table 13.2: Results of logistic regression models predicting current full-/part-time work among ever-worked older Singaporeans by age groups, 2016-2017**

Variables	Odds Ratios		
	60-64 years	65-69 years	All Ages
<b>Demographics</b>			
Age (in years)	0.98	<b>0.86**</b>	<b>0.87***</b>
Gender (Ref. = Male)			
Female	<b>0.47***</b>	<b>0.41***</b>	<b>0.50***</b>
Ethnic group (Ref. = Chinese)			
Malay	0.78	0.91	0.81
Indian	<b>2.04**</b>	0.97	<b>1.35*</b>
Others	1.63	0.76	0.98
Marital status (Ref. = Currently married)			
Widowed/separated/divorced	0.79	0.78	0.80
Never married	0.58	0.64	0.62
Living arrangement (Ref. = with child and spouse)			
Alone	0.89	1.68	1.17
With spouse only	<b>0.61*</b>	0.95	0.83
With child only	0.88	1.10	0.86
With others	1.14	1.48	1.35
<b>Socioeconomic Status</b>			
Education (Ref. = No formal education)			
Primary	0.75	0.64	<b>0.75*</b>
Secondary/vocational/ITE	0.82	0.72	0.81
JC/Polytechnic/University and above	0.81	<b>0.50*</b>	0.91
Housing type (Ref. = HDB 3 rooms)			
HDB 1-2 rooms	1.52	<b>0.47*</b>	0.86
HDB 4-5 rooms	0.93	0.73	<b>0.82*</b>
Private housing and others	0.57	<b>0.37**</b>	<b>0.46***</b>
Income adequacy (Ref. = Enough)			
Some/much difficulty	0.74	<b>0.68*</b>	<b>0.74**</b>
<b>Social Networks</b>			
Social networks (Ref. = Lowest tertile)			
Middle tertile	1.16	1.07	1.01
Higher tertile	1.41	1.04	1.13
<b>Physical/Functional Health</b>			
ADL limitations (Ref. = None)	<b>0.29*</b>	0.40	<b>0.33***</b>
IADL limitations (Ref. = None)	0.58	0.69	<b>0.64***</b>
Chronic conditions (Ref. = None)	<b>0.63**</b>	0.82	<b>0.57***</b>
Observations	923	946	3615

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

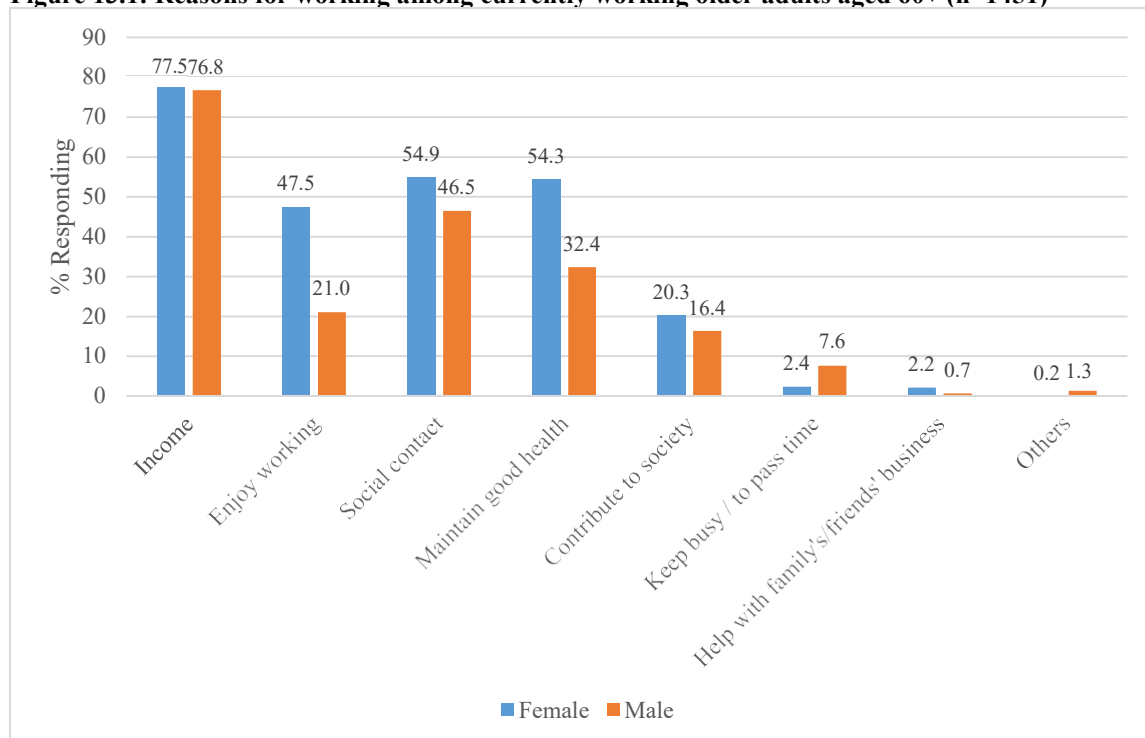
Statistically significant results are highlighted in bold.

All models control for the occupation in which respondents spent the longest.

Given the cross-sectional nature of the data, we do not purport here to make any causal inferences about the effect of these socioeconomic characteristics on work. However, the results offer some clues about the possible directions of these relationships. Educational attainment and, to a certain extent housing type, are likely to be a function of past socioeconomic status and achievements for older adults. Given this, it is possible that those in the 65-69 age cohort with tertiary education and those who currently live in private housing have accumulated the means that afford them the privilege of not needing to work. At the same time, individuals in circumstances that are more modest, defined in terms of smaller housing, or those faced with income inadequacy may not have had the opportunity to accumulate savings.

In Figure 13.1, we present the reasons for working by gender. THE SIGNS Study – I questionnaire offered respondents the option of choosing multiple response categories so that they could articulate all reasons for working. The percentages presented in Figure 13.1 pertain to the number of men (n=899) and women (n=552) in the sample who were currently working and chose that particular reason.

**Figure 13.1: Reasons for working among currently working older adults aged 60+ (n=1451)**



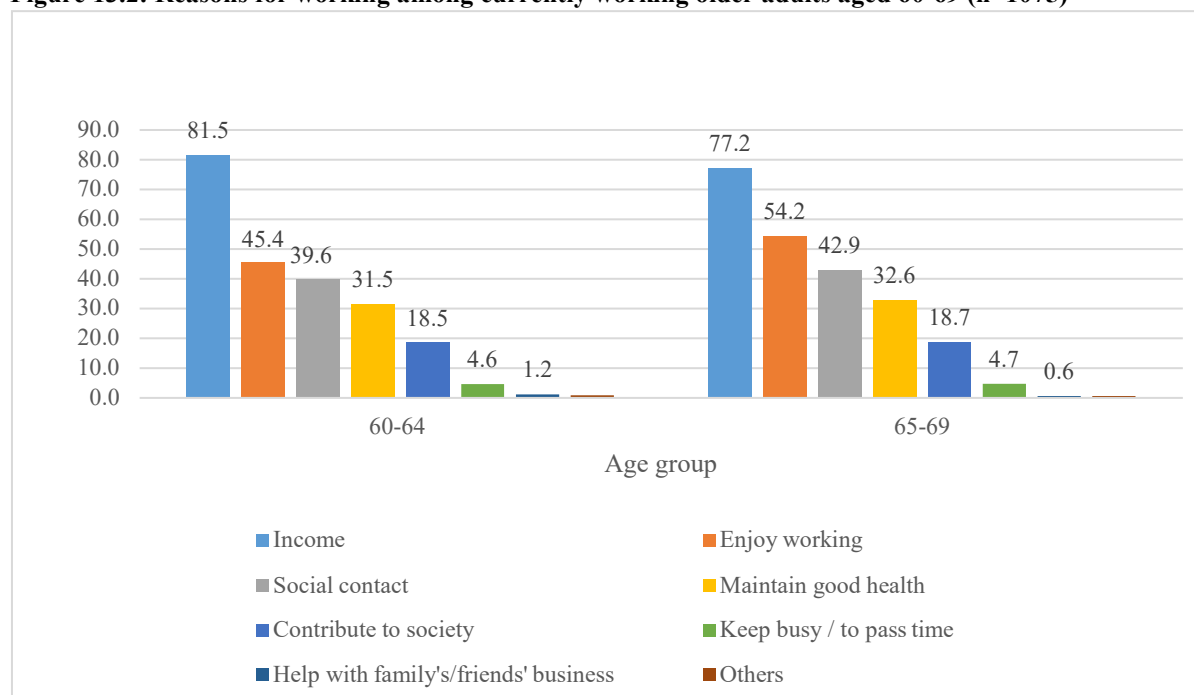
Note: Multiple responses allowed, therefore the percentages do not add up to 100.

A key take-away from Figure 13.1 is that income is the most widely cited reason for working for both men and women at older ages. The second largest proportion of responses pertain to social contact. Interestingly, nearly 50% of the women report that enjoying work is the reason for work, relative to about 20% of the men. More women also report social contact, maintenance of good health, and contributing to society, as reasons for working compared to men. These results suggest that for women, work provides, or at least is seen to provide, social



and health benefits, beyond being an income-generating activity. Men are less likely to report these additional benefits from work.

**Figure 13.2: Reasons for working among currently working older adults aged 60-69 (n=1075)**



In Figure 13.2, we examine the reasons for working for the two age groups of 60-64 (n=588) and 65-69 (n=487) separately. The distribution of responses is roughly similar for the two age groups, but we note some differences in the top three reasons. One, income is a little more widely felt reason for working at the younger 60-64 ages. Two, a higher frequency of those aged 65-69 years report that they ‘enjoy working’ compared to those aged 60-64 years. And three, the importance of work providing social contact is marginally higher at older ages.

### **Early Retirement**

In Table 13.3, we see the bivariate distribution of early retirement and the independent variables of interest. For the rest of this section, we will use the term retired to refer to individuals who are both retired and stopped working.

Women are more likely compared to men to report that they retired before the normal retirement age. Nonetheless, about half of all men already retired in the 60-64 age group report that they retired early. The proportion declines to about a third of the men and about half of the women in 65-69 age group. There are no significant differences among ethnic groups in either age group, although in the full sample, fewer Chinese older adults reported that they retired early.

The bivariate distribution in Table 13.3 does not suggest many demographic or socioeconomic differences in the proportions of individuals at 60-64 reporting early retirement. We do note, however, that among health factors, 85% of individuals with any ADL limitation reported early retirement compared to 63% of individuals any ADL limitations. In addition, 60-64 year olds with any chronic conditions are more likely to have retired early compared to

individuals without any chronic condition. At ages 65-69, older adults living with a child only, report early retirement compared to those in other living arrangements, suggesting that there may be an association between early retirement and dependency on children in the absence of a spouse. About 56 percent of the 65-69 year old individuals report early retirement, compared to 42 percent of the currently married in the same age group.

**Table 13.3: Bivariate distribution of early retirement among older Singaporeans currently retired/not working, by age groups, 2016-2017**

Demographics	60-64 years	65-69 years	All ages
<b>Gender</b>			
Male	51.2	32.3	22.8
Female	71.3	56.3	52.8
<b>Ethnic group<sup>^</sup></b>			
Chinese	63.3	44.4	36.6
Malay	65.8	49.3	42.3
Indian	65.5	49.0	42.6
<b>Marital Status</b>			
Currently married	64.8	42.2	36.6
Widowed/separated/divorced	61.0	56.3	40.8
Never married	63.3	52.1	40.2
<b>Living arrangements</b>			
Living alone	63.2	45.5	34.6
Living with spouse only	59.7	40.9	33.9
Living with child only	62.5	62.1	41.1
Living with child and spouse	67.4	42.0	38.7
Living with others	56.0	54.8	44.7
<b>Socioeconomic Status</b>			
<b>Education</b>			
No formal education	58.1	49.2	32.8
Primary	64.8	43.2	39.0
Secondary/vocational/ITE	65.9	45.4	40.2
JC/Polytechnic/University and above	62.2	49.3	41.4
<b>Housing type</b>			
HDB 1-2 rooms	57.9	42.5	26.8
HDB 3-4 rooms	54.1	48.5	36.3
HDB 5 room	68.8	45.9	40.4
Private and others	56.0	41.3	39.5
<b>Income adequacy</b>			
Enough	65.2	47.0	38.3
Some/much difficulty to meet monthly expenses	60.0	40.5	37.1
<b>Social Networks</b>			
Lowest tertile	64.4	41.6	37.9
Middle tertile	61.8	47.7	36.2
Higher tertile	65.6	47.3	40.0
<b>Physical/Functional Health</b>			
No ADL limitations	62.7	44.8	37.5
Any ADL limitations	85.0	63.6	44.3
No IADL limitations	63.7	45.3	38.6
Any IADL limitation	66.7	48.3	35.7

No chronic conditions	70.5	42.3	40.1
Any chronic conditions	62.6	46.4	37.7
Observations	339	455	2112
Notes: ^ The "others" ethnic group category drops out in the analytical sample stratified by age groups because there is no variance in the dependent variable for 'others' because of their small sample size.			

Table 13.4 presents odds ratios from the multivariate logistic regression models predicting early retirement. In the 60-64 age group as well as 65-69 age group, women had 2.5 times higher odds of early retirement compared to men. Among the younger cohort of older adults, those with higher education including secondary and tertiary levels of education compared to those with no formal education were between 2.5 and 4 times more likely to have retired early. Compared to individuals in 3-room HDB apartments, those in 4-5 room HDB apartments were more likely to have retired early, but older adults in private housing were not statistically more or less likely compared to those in 3-room HDB apartments to retire early. Our analysis also shows that current health status in terms of ADL or IADL limitations or chronic health conditions is not associated with older adults' early retirement in the past for older adults aged 60-64 or 65-69. For the full sample of all older adults on the other hand, we do see that the presence of an ADL limitation is associated with 63% higher odds of early retirement. This suggests a positive relationship between early retirement and adverse health at older ages in this sample.

**Table 13.4: Results of logistic regression models predicting early retirement among older Singaporeans currently retired/not working by age, 2016-2017**

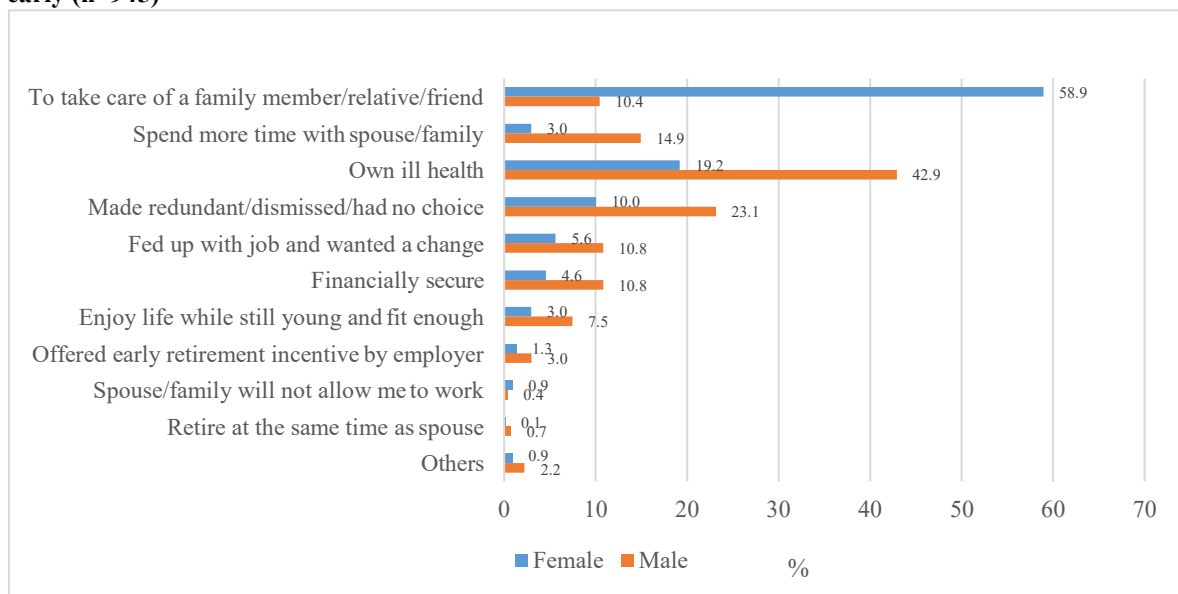
	Odds Ratios		
	60-64 years	65-69 years	All Ages
<b>Demographics</b>			
Age (in years)	1.09	<b>0.85*</b>	<b>0.93***</b>
Gender (Ref. = Male)			
Female	<b>2.46**</b>	<b>2.65***</b>	<b>3.25***</b>
Ethnic group (Ref. = Chinese)			
Malay	0.74	1.17	1.12
Indian	0.69	1.23	1.10
Marital status (Ref. = Currently married)			
Widowed/separated/divorced	1.29	0.30	1.19
Never married	1.95	0.41	0.87
Living arrangement (Ref. = with child and spouse)			
Alone	0.84	3.36	0.99
With spouse only	0.73	0.84	0.92
With child only	0.54	5.78	0.92
With others	0.55	5.61	1.41
<b>Socioeconomic Status</b>			
Education (Ref. = No formal education)			
Primary	2.04	0.97	<b>1.46**</b>
Secondary/vocational/ITE	<b>2.56*</b>	1.26	<b>1.42*</b>
JC/Polytechnic/University and above	<b>4.03*</b>	2.04	<b>1.91**</b>
Housing type (Ref. = HDB 3 rooms)			
HDB 1-2 rooms	1.63	0.95	0.72
HDB 4-5 rooms	<b>1.87*</b>	0.88	1.14
Private housing and others	1.02	0.78	1.19
Income adequacy (Ref. = Enough)			
Some/much difficulty	0.84	0.69	0.96
<b>Social Networks</b>			
Social networks (Ref. = Lowest tertile)			
Middle tertile	0.88	1.38	<b>0.76*</b>
Higher tertile	0.92	1.41	0.85
<b>Physical/Functional Health</b>			
ADL limitations (Ref. = None)	4.25	2.18	<b>1.63*</b>
IADL limitations (Ref. = None)	1.07	1.05	1.12
Chronic conditions (Ref. = None)	0.77	1.15	1.00
Observations	339	455	2112

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

All models control for the occupation in which respondents spent the longest.

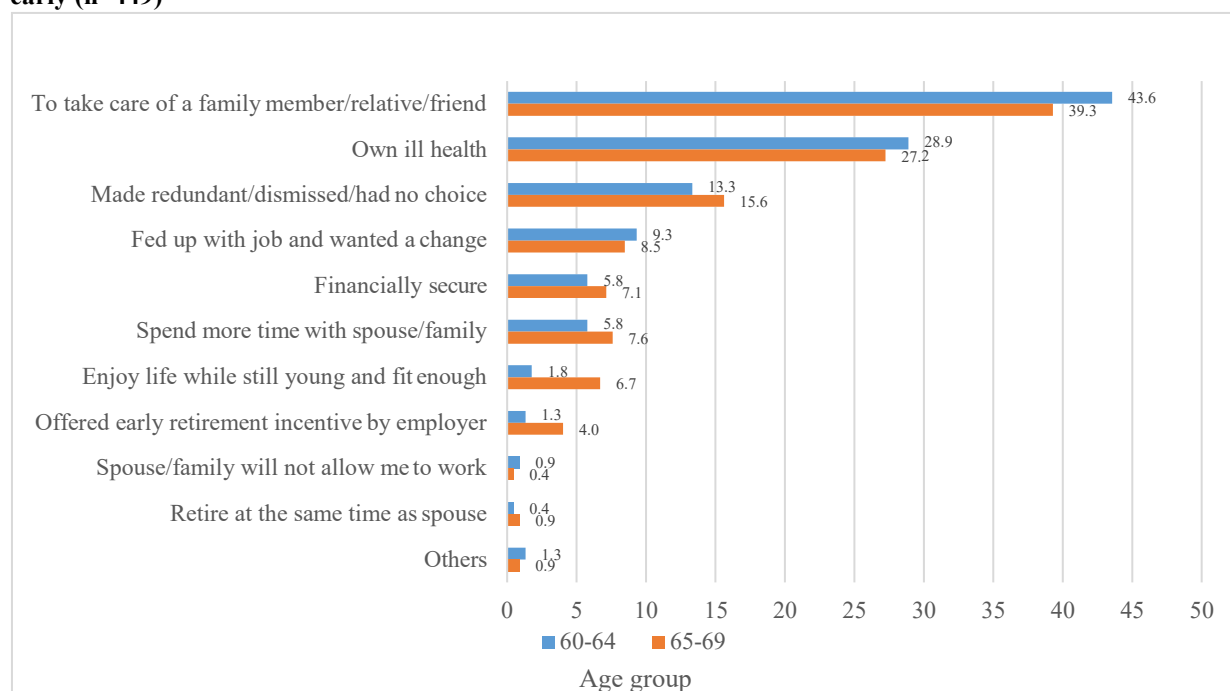
In Figure 13.3, we present the distribution of the reasons for early retirement for men and women. We see at the outset that among women who had retired early, nearly 60% of the responses are that they retired in order to take care of a family member, relative, or friend. In contrast, the category with the most responses for men is their own ill health. Most responses (37%) for early retirement for men pertain to work-related factors including: being made redundant, being offered early retirement incentive by the employer, and being fed up with a job, and seeking a job change. For women, these reasons make up only about 17% of the reasons for early retirement. About 10% of men and 4% of women report being financially secure as the reason for early retirement.

**Figure 13.3: Reasons for early retirement among older adults aged 60+ who reported that they retired early (n=945)**



In Figure 13.4, we present the distribution of the reasons for early retirement for the 60-64 and 65-69 age groups. The reasons for early retirement across these two age cohorts are broadly similar. Interestingly, enjoying life while still young and fit forms about 7% of the reasons for early retirement for 65-69 year old individuals, compared to only about 2% for those in the 60-64 age group. It is possible that this is an effect of a post-facto re-examination of the reasons for early retirement in the context of their current lives. In order to study reasons for early retirement in more detail, future research studies may be designed that allow for collecting this data closer to the actual event of exiting the workforce.

**Figure 13.4: Reasons for early retirement among older adults aged 60-69 who reported that they retired early (n=449)**



### Looking for work

We analyse the correlates of looking for work among those who ever-worked, and are currently retired, or not working. Only 89 respondents out of the total 2,623 older adults retired and/or not working report that they have been doing anything to find work during the four weeks preceding the survey. Given this small number, we present results of our analysis for the entire sample instead of stratifying it into different age groups.

In Table 13.5, we present the bivariate distribution of the dependent and independent variables in the analytical sample. Overall, the proportion of currently retired older adults looking for work is low. Interestingly, we see that more men have been trying to find work in the four weeks preceding the survey (about 5%) compared to women (about 3%). Relatively older adults of Indian and other ethnic groups are looking for work compared to the Chinese and Malay ethnic groups. We also see that older adults who report that they have any difficulty in meeting household expenses are more likely to have been looking for work. Individuals without ADL or IADL limitations and without chronic health conditions are more likely to be looking for work relative to those with these health factors.

**Table 13.5: Bivariate distribution of looking for work in last four weeks among older Singaporeans currently retired/not working, 2016-2017 (n=2001)**

Demographics	All ages
<b>Gender</b>	
Male	5.4
Female	2.6
<b>Ethnic group</b>	
Chinese	4.0
Malay	3.3
Indian	5.8
Others	6.3
<b>Marital Status</b>	
Currently married	4.5
Widowed/separated/divorced	3.2
Never married	3.2
<b>Living arrangements</b>	
Living alone	2.3
Living with spouse only	4.5
Living with child only	4.4
Living with child and spouse	4.1
Living with others	3.3
<b>Socioeconomic Status</b>	
<b>Education</b>	
No formal education	3.3
Primary	4.2
Secondary/vocational/ITE	4.2
JC/Polytechnic/University and above	4.8
<b>Housing type</b>	
HDB 1-2 rooms	4.3
HDB 3-4 rooms	5.5
HDB 5 room	4.0
Private and others	1.0
<b>Income adequacy</b>	
Enough	3.1
Some/much difficulty to meet monthly expenses	7.6
<b>Social Networks</b>	
Lowest tertile	4.9
Middle tertile	3.8
Higher tertile	3.4
<b>Physical/Functional Health</b>	
No ADL limitations	4.4
Any ADL limitations	0.6
No IADL limitations	4.2
Any IADL limitation	3.4



No chronic conditions	7.0
Any chronic conditions	3.6
Observations	2001

In Table 13.6, we present the results of the multivariate logistic regression analysis. Our results are similar to the analysis for employment and reasons for early retirement. We include four age intervals in this analysis, and see that as expected, compared to the 60-64 age group, all older age groups have significantly lower odds of looking for work. We see that women have 50% lower odds of looking for work compared to men. Compared to living with the spouse and a child, older adults who live with a child only have 5.8 times higher odds of looking for work. Although there is no statistically significant relationship between education and looking for work, we see that older adults of a higher economic status, measured in terms of their housing type, are less likely to be looking for work. At the same time, individuals who report that they have some or much difficulty in meeting monthly household expenses are more than twice as likely to be looking for work compared to older adults who have an adequate income. The presence of one or more chronic conditions is associated with lower odds of looking for work. We also include a covariate in the model for whether the individual reported that he/she had retired early, and we find a negative association between early retirement and finding for work. Individuals who retired early have significantly lower odds of looking for work, compared to those who retired at the usual retirement age, suggesting that the reasons for early retirement are compelling and operate over a long period of time.

**Table 13.6: Results of logistic regression models predicting looking for work in last four weeks among older Singaporeans currently retired/not working, 2016-2017 (n=2001)**

	<u>Odds Ratios</u>
	<u>All Ages</u>
<b>Demographics</b>	
Age group (Ref. = 60-64 years)	
65-69 years	<b>0.26***</b>
70-74 years	<b>0.26***</b>
75 and above	<b>0.07***</b>
Gender (Ref. = Male)	
Female	<b>0.50*</b>
Ethnic group (Ref. = Chinese)	
Malay	0.60
Indian	1.55
Others	1.12
Marital status (Ref. = Currently married)	
Widowed/separated/divorced	0.31
Never married	0.28
Living arrangement (Ref. = with child and spouse)	
Alone	1.47
With spouse only	1.25
With child only	<b>5.77**</b>
With others	2.07
<b>Socioeconomic Status</b>	
Education (Ref. = No formal education)	
Primary	0.95
Secondary/vocational/ITE	1.07
JC/Polytechnic/University and above	1.63
Housing type (Ref. = HDB 3 rooms)	
HDB 1-2 rooms	0.84
HDB 4-5 rooms	<b>0.54*</b>
Private housing and others	<b>0.11**</b>
Income adequacy (Ref. = Enough)	
Some/much difficulty	<b>2.17**</b>
<b>Social Networks</b>	
Social networks (Ref. = Lowest tertile)	
Middle tertile	0.71
Higher tertile	0.57
<b>Physical/Functional Health</b>	
ADL limitations (Ref. = None)	0.13
IADL limitations (Ref. = None)	1.31
Chronic conditions (Ref. = None)	<b>0.49*</b>
<b>Work</b>	
Early retirement	<b>0.30***</b>
Duration of employment in total	1.01

Observations	2001
<p>Note: * <math>p &lt; 0.05</math>, ** <math>p &lt; 0.01</math>, *** <math>p &lt; 0.001</math>.  All models control for the occupation in which respondents spent the longest.</p>	

## DISCUSSION

Life expectancy at the age of 60 in Singapore is currently at 27 years for women and 23.2 years for men.<sup>14</sup> If the current statutory retirement age of 62 years were to remain constant, older Singaporean men can expect to be out of the workforce for an average of 21 years and older Singaporean women an average of 25 years. However, the analysis in this chapter shows that compared to men, women are significantly more likely to retire early and more likely to be outside the workforce even in the 60-64 years age-group. Their years outside the workforce can therefore be expected to be even longer than 25 years. The social, material, and financial resources that women will need to spend these years in comfort will be substantial. We find consistent gender effects across all the analysis: women are more likely to have retired early, less likely to be currently working, and also less likely than men to be currently looking for work. To the extent that formal employment contributes to material and financial resources, a shorter period of formal employment for women due to time spent out of the workforce earlier in their lifetimes, early retirement, or a lower likelihood of looking for work at older ages has a direct impact on the amount of the savings that they will have generated via their own as well as employer contributions to their central provident fund accounts.<sup>15</sup>

The age-distribution of women's employment rates in Singapore shows that after peaking at about 90% at the ages of 25-29, women's employment rates decline steadily, with the rate of decline increasing after the age of 45-49 years. A challenge and pressing domain for Singapore policymakers to address is how to enable these women to return to the workforce.

Older women are more likely to report family-related factors as the reason for early retirement, specifically taking care of a family member, relative, or friend. It is likely that women's reasons for leaving the workforce are similar at younger age groups as well. From a policy perspective, this suggests that increasing the opportunity for women to remain in the workforce at all ages requires a specific focus on addressing women's caregiving responsibilities. The possibility of enabling women to tap on alternate caregiving resources such as childcare agencies and foreign domestic workers need to be explored and encouraged further especially for those with responsibilities for their ageing relatives including spouses and parents. Further research is needed to understand how women who remain in the workforce manage their "second-shift" or the twin responsibilities of work and caregiving to facilitate developing the appropriate support that will enable these women to continue to work.

The most frequently cited reason by men for early retirement relates to their health. The multivariate analysis also showed a positive association between health limitations and current work, and between chronic conditions and current work, as well as looking for work. Worse health at older ages may be leading individuals to drop out of the workforce. It is also possible

that a past and potentially early exit from the workforce has led to worse health among the 60-64 years old cohort. Over the years the government has been ramping up its health promotion and disease prevention efforts which may mean that future cohorts of older Singaporeans will be healthier than the current ones. These initiatives could be stepped up even further with more intensive on-site programmes, whether in the community or workplace to facilitate participation. In addition to these proactive health programmes where the outcomes are more long-term, a more direct intervention would be in terms of modifications that can be organised at the workplace to make it more elder friendly and accommodating of age-related limitations. Work processes can also be similarly organised such as flexible arrangements, part time work and job sharing which can incentivise the desire and willingness for work. The importance of developing initiatives and incentives to make workplaces more amenable for older persons becomes more urgent when we consider the second main reason why older men stop working. As highlighted earlier, 37% of men who retired early cited work related factors for their decision namely - being made redundant, fed up and seeking change, and offered retirement incentive. Concerted efforts must be mounted by employers to encourage older Singaporeans to work longer.

Another aspect to the findings with relevance to public policy in Singapore is that in the 60-64 years age group, a significant proportion of men (27%) and women (49%) is not working. The Retirement and Reemployment Act (RRA) 2012 in Singapore mandated reemployment of eligible employees aged 62 up to the age of 65 years, and the RRA (Amendment) Act 2017 increased the reemployment age to 67 effective 1 July 2017. Although the policy of re-employment has reduced the potential time outside the workforce, it would apply only to cohorts of individuals who are still within the workforce. Older adults who were in the 60-64 years age group at the time of THE SIGNS Study – I in 2016-2017 were younger than 62 years in 2012 and among them, all working individuals would have been eligible for reemployment until 65. The proportion of men (73%) and women (51%) who reported either part-time or full-time work in the age group of 60-64 years suggests that there are opportunities for the RRA to more effective. It is also possible that the proportion of those working may have been even lower in the absence of the RRA, and further research is needed to determine to what extent the RRA encourages older workers to remain in the workforce, for how long, and how it addresses the reasons for older workers to exit the workforce.

Our analysis also shows that compared to those who report adequate income, individuals who report difficulty in meeting monthly household expenses are less likely to be currently employed, but more likely to be looking for work. Both findings suggest that employment is associated with financial well-being. Current employment can enable older adults to have income adequacy. Many older adults may be dependent on their current incomes, and not have the necessary accumulated savings to sustain themselves outside the workforce. At the same time, among those who are already retired or not working, older adults who are looking for work may precisely be those who have difficulty in meeting their monthly expenses. Employment at older ages when seen from the perspective of successful ageing often implies that older adults should be provided the opportunity to work in order to maintain their social connections, to remain engaged and contribute to society. At the same time however,

employment at older ages for others may relate to the precariousness of their financial situation and the need for an income just to meet regular expenses.

In Singapore overall, there is a tremendous opportunity for the government as well as industries and unions to harness local human capital as well as contribute globally to other ageing societies with practical innovations and policy interventions that make employment *work* for everyone especially older workers. Showcasing examples of age-friendly workplaces and distilling the key principles of good practices can encourage older workers and motivate other employers to adapt them more widely. As this analysis shows it remains important to address the challenges faced by older workers to remain in the workforce.

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## Chapter 14: Lifelong Learning: Descriptive Statistics

In this chapter, we provide descriptive statistics on the number of courses/trainings taken in the last 12 months and primary reason for course/training engagement, overall and by age group, gender, ethnicity, educational level and living arrangement.

**Table 14.1a Number of Courses/Trainings Taken by Age Group, Gender and Ethnicity**

	Age Group				Gender		Ethnicity			
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Number of courses/trainings taken in the last 12 months (weighted %)</b>										
None	86.6	82.0	88.6	98.1	86.0	87.2	87.0	85.9	84.5	81.6
1	8.1	10.9	7.2	0.8	8.9	7.5	8.0	9.1	8.9	7.7
2	3.1	4.4	2.3	0.2	3.0	3.2	3.0	3.9	3.0	5.5
3 or more	2.0	2.6	1.8	0.4	2.2	1.8	1.9	1.1	3.7	5.2

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

Nearly 9 in 10 (87%) of older Singaporeans did not take any course/training in the last 12 months. The 13% who took courses/trainings comprised of 8% who took only 1 course/training and 5% who took more than 2 courses/trainings. The proportion who took any courses/trainings declined with age. The proportion of those who took only 1 course/training was slightly lower for females (8%) than males (9%), but the gender distribution was similar among those who took 2 or more courses/trainings. Indians and Others were the most likely to have taken any courses/trainings and had the highest proportion of having taken 3 or more courses/trainings.

**Table 14.1b Number of Courses/Trainings Taken by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Number of courses/trainings taken in the last 12 months (weighted %)</b>						
None	95.0	89.8	81.8	72.1	86.9	84.2
1	3.2	6.4	12.0	14.1	8.0	9.5
2	1.1	2.9	3.8	6.5	3.1	3.0
3 and above	0.3	0.8	2.5	7.4	1.9	3.1

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

The proportion of older Singaporeans who had taken any course/training as well as those who took 2, or 3 or more courses/trainings increased with education. The majority of older Singaporeans with no formal, primary or secondary education who took a course, had taken only 1 course/training. However, among those with tertiary education, an equal proportion took 1 and 2 or more courses/trainings. A higher proportion of older Singaporeans living alone took 1 or 3 or more courses/trainings compared to those not living alone.

**Table 14.2a Primary reason for Course/Training Engagement by Age Group, Gender and Ethnicity**

	Age Group				Gender		Ethnicity			
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Primary reason for Course/Training Engagement (weighted %)</b>										
n	533	369	148	16	278	255	379	89	60	5
Only Job-related	48.0	51.5	40.2	16.4	65.3	31.1	42.5	63.2	78.6	78.0
Only non job-related	47.9	44.0	56.4	83.6	31.2	64.3	53.6	32.4	14.6	22.0
Both job and non job-related	4.1	4.5	3.4	0.0	3.6	4.6	3.9	4.5	6.8	0.0

The proportion of those took courses/trainings for only job-related reasons was the highest among older Singaporeans aged 60-69 years (52%). They were also most likely to have taken courses/trainings for both job- and non job-related reasons (5%). Among males, two-thirds who took courses/trainings took them for only job-related reasons and one-third took only for non job-related reasons, whereas the proportions were reversed for females. A greater proportion of Malays (63%) and Indians (79%) took courses/trainings for only job-related reasons relative to Chinese (43%).

**Table 14.2b Primary reason for Course/Training Engagement by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Primary reason for Course/Training Engagement (weighted %)</b>						
n	54	128	220	131	480	53
Only Job-related	41.8	48.1	50.2	46.7	48.8	40.9
Only non job-related	56.2	49.9	46.1	46.0	46.9	57.2
Both job and non job-related	2.1	2.0	3.7	7.3	4.4	1.9

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

The proportion of those taking courses/trainings for only job-related reasons and only non job-related reasons was similar among those with primary and tertiary education. Among those with no formal education, more than half (56%) took courses/trainings for only non job-related reasons. The proportion of those who took courses/trainings for both types of reasons increased with rising educational level. Among those living alone, a majority (57%) took courses/trainings for only non job-related reasons, while the proportion stating job- and non job-related reasons was similar among those not living alone.



## **Chapter 15: Impact and Determinants of Lifelong Learning among Older Singaporeans**

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### **INTRODUCTION**

The phenomenon of older adult learning has received considerable interest and attention in multiple sectors including education, health and employment. Older adult learning has also become a key feature in policies promoting productive and healthy ageing. The World Health Organization (WHO), for example, has identified learning as a key functional enabler to the healthy ageing process and has recommended initiatives to encourage older adults to learn and to facilitate learning opportunities and processes.<sup>1</sup>

In the field of educational gerontology, research suggests potential benefits associated with older adult learning—such as increased life satisfaction,<sup>2,3</sup> higher levels of wellbeing,<sup>4,5</sup> and expanded social networks, increased civic and social engagement.<sup>6</sup> Additionally, studies also highlight that the benefits of older adult learning may extend beyond the duration of learning.

In Singapore, lifelong learning has been promoted as a solution to the country's acute labour and skills shortage in the workforce. This objective has been communicated through the launch of numerous initiatives such as SkillsFuture SG and Workforce Singapore under the Continued Education Training 2020 Masterplan agenda.<sup>7</sup> Singaporeans are encouraged to continue learning and/or upgrading their skills to remain relevant and engaged in the community.<sup>8</sup> Since most of the courses offered in the Post-Education Training (PET) and Continued Education Training (CET) landscape tend to be skills-driven and job-related, numerous scholars have remarked upon the rational and pragmatic approach to lifelong learning in Singapore, driven by the needs of the future economy.<sup>9,10</sup>

At the same time, there is growing realization that learning objectives or needs may differ across the life-course. The Action Plan for Successful Ageing (2015) for instance, has considered older Singaporeans' needs to continue learning in both job-related and non-job related (recreation) domains. In consultative feedback sessions, older Singaporeans mentioned wanting opportunities to learn for both work and interest/ pleasure in their later lives. They believed that learning keeps their minds active and helps them stay connected with their family, friends and also take stock of current affairs.<sup>11</sup>

In the current learning landscape, a wide variety of courses have been offered to older Singaporeans; categorized broadly in terms of their learning objectives and outcomes—as (i) “Job-related courses” and (ii) “Non-job related courses”.

“Job-related courses” refer to PET and CET initiatives designed to enhance peoples' employability through skills mastery and applications in changing labour markets. For example, through the Employability Skills Workforce Skill Qualification (WSQ), an older worker can

enhance their technical skills and competencies in a new industry such as early childhood care and education.<sup>12</sup> On the other hand, “Non-job related courses” refer to courses developed primarily for older adults to pursue personal, social or recreational learning that caters to their interests or hobbies and not necessarily for employment. The launch of the National Silver Academy (NSA), the nation-wide lifelong learning programme for older Singaporeans, in mid-2016 addresses such gaps in the post-secondary education landscape by engaging the diverse interests and learning preferences of older Singaporeans and removing prerequisites that are based on educational or training certifications.

In this chapter, we seek to identify the demographic, social and health determinants of engagement in learning and of the primary reason or motivation, whether job-related or non-job related, to engage in learning – this would enable an understanding of how learning can be more relevant in the lives of older Singaporeans. We also explore the relationship of learning with psychosocial outcomes.

## **METHODS**

### **Measures**

The *Methodology* chapter of this report provides and discuss the measurement of sociodemographic characteristics, health status and psychosocial measures used in our analysis.

Study participants’ self-reported on course enrolment (either attended or were attending courses) in the last 12 months from the study interview date – those who attended or were attending were classified as ‘Yes’ for the outcome of “engagement in learning”, else ‘No’. To arrive at the primary reason or motivation to engage in learning, participants self-reported, for each course they had attended/were attending, if they took/were taking it primarily for job-related or non-job related reasons. For example, an older adult could have attended a cleaning course for job-related reasons as it was a pre-requisite before he or she could start work as a cleaner. On the other hand, attending a course such as Chinese calligraphy, could serve as a channel for the older adult to delve deeper into his or her personal interests outside of work, thus an older adult would choose his/her motivation as non-job related. Those who reported only one type of reason (job-related or non-job related), irrespective of the number of courses taken, were classified as taking courses for “job-related reasons” or “non-job related reasons”, based on the selected reason. Those who took 2 or more courses and selected both types of reasons, were classified based on the reason selected for majority of the courses.

### **Analysis**

The association of demographic, social and health characteristics with engagement in learning (Yes/No) and with the primary reason or motivation to engage in learning (job-related or non-job related) reasons were explored using logistic regression models. Linear, logistic or ordered logistic regression models (unadjusted as well as adjusted [for gender, age, ethnic group, marital status, education, living arrangement, employment status, income adequacy, self-rated health status, ADL and IADL limitations, and volunteering]) investigated the relationship between learning (Yes/No) and psychosocial measures.

## **RESULTS**

Nearly 9 in 10 (87%) of older Singaporeans did not engage in learning, i.e. did not attend any course in the last 12 months.

### **I. Significant association of gender, education levels, ethnicity, age-cohort, employment and health status with engagement in learning**

Comparing older Singaporeans who engaged in learning with those who did not, it was noted that those who engaged were more likely to be younger (age 60-69 years); women; have formal education; Malay; working full-time; have self-reported good/excellent health status and vision status and no IADL limitations (i.e. better functional status) (Table 15.1).

### **II. Characteristics associated with the primary reason or motivation to engage in learning (job-related vs non-job related)**

In refining the analysis further to understand the characteristics of older Singaporeans who are learning for job related reasons against non-job related reasons, we observed that men, those of Malay and Indian ethnicity, and those working full-time were more likely to engage in learning for job-related reasons.

**Table 15.1: Demographic, social and health factors associated with engagement in learning, and the primary reason or motivation to engage in learning**

Demographic, social and health factors	Odds ratio	
	Engagement in learning – Yes ( <i>versus</i> No)	Primary reason or motivation to engage in learning - job-related ( <i>versus</i> non-job related)
N	4485	510
Gender (ref: Male)		
Female	1.30*	0.31***
Age (ref: 60-69)		
70 – 79	0.90	0.91
80 and above	0.25***	0.35
Ethnic group (ref: Chinese)		
Malay	1.36*	3.12**
Indian	1.17	2.76*
Others	0.80	1.86
Marital status (ref: Married)		
Widowed	0.94	0.60
Separated/Divorced	1.09	1.75
Never married	0.99	3.58
Education level (ref: No formal education)		
Primary	1.58*	1.40
Secondary (Secondary/Vocational/ITE)	2.62***	1.34
Tertiary (JC/Polytechnic/University)	4.53***	0.98
Housing type (ref: 3 room HDB flat)		
1-2 room HDB flat	0.92	0.92
4 room HDB flat	1.14	0.62
5 room HDB flat	1.18	0.57
Private housing & Shophouse	1.10	1.27
Living arrangement (ref: Not living alone)		
Living alone or with maid only	1.46	0.71
Employment status (ref: Working full-time)		
Working part-time	0.79	0.42**
Retired and/or not working	0.33***	0.037***
Never worked	0.09***	-
Income adequacy (ref: Enough money)		
Difficulty to meet expenses	1.05	1.79
Missing	0.75	-
Number of chronic diseases (ref: 0)		

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1-2	1.04	1.09
3+	1.07	0.82
State of health (ref: Excellent/Very Good)		
Good	0.85	0.85
Fair	0.95	0.59
Poor	0.45*	3.11
ADL limitations (ref: 0)		
At least one ADL difficulty	0.99	0.27
IADL limitations (ref: 0)		
At least one IADL difficulty	0.67*	0.71
Vision (ref: Excellent/Very Good/Good)		
Fair/Poor	0.70**	1.22
Hearing (ref: Excellent/Very Good/Good)		
Fair/Poor	0.94	0.82

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

### III. Effect of engagement in learning with psychosocial outcomes

Tables 15.2 to 15.5 present the effect of engagement in learning on several psychosocial measures, namely: social networks outside the household, depressive symptoms, loneliness and quality of life. Quality of life is further broken down into items measuring control, autonomy, self-realization and pleasure – Tables 15.6 to 15.9)

The unadjusted results showed that engagement in learning was associated with increased social networks, in terms of number and quality of social connections such as with friends and family members, quality of life as well as sense of control, autonomy, self-realization and pleasure. Taking courses was linked with reduced depressive symptoms, such as feeling sad or having poor appetite. However, in the adjusted analyses, after controlling for potential confounders, learning was positively associated with only social networks.

**Table 15.2: The effect of engagement in learning on social networks**

	Odds ratio	
	Model 1	Model 2
N	4033	4033
Engagement in learning – Yes (versus No)	2.20***	1.37***

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Dependent variable: 3-categorical summary measure of Lubben’s social network scale (reference group: weak social networks (first tertile score))

**Table 15.3: The effect of engagement in learning on depressive symptoms**

	Odds ratio	
	Model 1	Model 2
N	2023	2023
Engagement in learning – Yes (versus No)	0.50**	0.78

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Dependent variable: Dichotomized summary measure of CES-D scale (reference group: symptoms not clinically relevant (score less than 7))

**Table 15.4: The effect of engagement in learning on loneliness**

	Odds ratio	
	Model 1	Model 2
N	2011	2011
Engagement in learning – Yes (versus No)	0.83	1.02

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Dependent variable: Dichotomized summary measure of UCLA loneliness scale (reference group: not lonely (score of 0))

**Table 15.5: The effect of engagement in learning on quality of life**

	Regression coefficients	
	Model 1	Model 2
N	4032	4032
Engagement in learning – Yes (versus No)	2.37***	0.42

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Dependent variable: Summary score of Control, Autonomy, Self-realization and Pleasure scale

**Table 15.6: The effect of engagement in learning on control**

	Regression coefficients	
	Model 1	Model 2
N	4040	4040
Engagement in learning – Yes (versus No)	0.95***	0.13

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Dependent variable: Summary score of Control domain from the Control, Autonomy, Self-realization and Pleasure scale

**Table 15.7: The effect of engagement in learning on autonomy**

	Regression coefficients	
	Model 1	Model 2
N	4031	4031
Engagement in learning – Yes (versus No)	0.63***	0.14

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Dependent variable: Summary score of Autonomy domain from the Control, Autonomy, Self-realization and Pleasure scale

**Table 15.8: The effect of engagement in learning on self-realization**

	Regression coefficients	
	Model 1	Model 2
N	3714	3714
Engagement in learning – Yes (versus No)	0.35***	0.09

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Dependent variable: Summary score of Self-realization domain from the Control, Autonomy, Self-realization and Pleasure scale

**Table 15.9: The effect of engagement in learning on pleasure**

	Regression coefficients	
	Model 1	Model 2
N	3850	3850
Engagement in learning – Yes (versus No)	0.46***	0.06

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Dependent variable: Summary score of Pleasure domain from the Control, Autonomy, Self-realization and Pleasure scale

## DISCUSSION

### WHY ARE OLDER ADULTS NOT LEARNING?

One of the most significant observation from THE SIGNS Study – I was that older Singaporeans were not engaging in learning. This important issue warrants further scrutiny given the resounding data on the positive impact of lifelong learning. Our data also reveals particular sociodemographic and health traits that characterised older Singaporean learners. In this section, key findings are elaborated with the following objectives:

- a. Explore the impact of lifelong learning on older Singaporeans; and
- b. Identify the determinants of lifelong learning for older Singaporeans, through an analysis of the characteristics of older learners/non-learners and their patterns of course/non-course engagement. An understanding of these determinants will enable us to understand the possible barriers to learning faced by older Singaporeans which might account for the low uptake of learning among them.

In our discussion, we also bring in insights from the NSA evaluation study, a longitudinal study, conducted by CARE, evaluating the benefits of older adult learning at the NSA.

## **Impact of Older Adult Learning in Singapore**

One of the key findings from THE SIGNS Study – I is that social networks outside the household were stronger among those who engaged in learning versus those who did not. However, due to the cross-sectional design of the study, it is not plausible to conclude this association as causal — i.e. engagement in learning leads to enhancement of older people’s social networks, as the reverse may be as likely. Taken as such, older learners who attended courses may also be individuals with stronger social networks and likely to participate in courses because of their involvement in their social networks. Nonetheless, the significant association between learning and social networks reveals an important facet of learning as a form of social engagement for older people. Supportive social networks may facilitate learning among older adults and engagement in learning may facilitate better social networks among older adults.

The impact of learning on social support and social participation, however, is evident in a longitudinal study, conducted by CARE, evaluating the benefits of older adult learning at the NSA. The NSA evaluation study measured gains in social capital among NSA study participants (aged 50 years and above). It did so by looking at percentage changes in informational support (extent to which older people know about where and who to go for advice or support to deal with problems or what to do in terms of crisis, and the belief that the information received is useful and relevant to their lives); civic engagement attitude and behavior (involvement in volunteering activities, doing work that makes a difference to others, contributing to charitable organizations as well as keeping up to date with community events and affairs); and loneliness. And, it was observed that among NSA course attendees, there were significant positive changes, from pre-course to post-course as well as 6 months post-course, in informational support and civic engagement.

Taken together, findings from both THE SIGNS – I Study and NSA evaluation study amplify the positive impact of learning on older learners’ social networks, access to social support, social participation and contributions to the community. In this regard, older adult learning programmes have the potential to remedy issues of social isolation among older Singaporeans. These impacts provide a strong ground for the continuation of lifelong learning initiatives such as the NSA and SkillsFuture for older Singaporeans. The knowledge and social connections gained through learning will serve further to consolidate their psycho-social resources.

## **Identifying barriers to learning among older Singaporeans**

Understanding the demographic, social and health determinants of engagement in learning and of the primary reason or motivation to engage in learning, allowed us to gain insights into the barriers (and facilitators) to learning. This can inform policy and social measures needed to enhance the role and impact of lifelong learning in Singapore.

### **a) Educational advantages correlate with birth-cohort and impact learning activities in later life**



One important determinant of engagement in learning in THE SIGNS – I study was the age group of the older person, with higher engagement among the younger old (aged 60-69 years) compared to those older. This likely reflects a birth cohort effect, such that the greater access that the younger cohorts of older persons had to education probably influenced their predisposition or motivation to learn in their later life.<sup>13</sup>

A birth cohort effect, siding with the younger-old in terms of higher education levels, was also observed in the NSA evaluation study. The vast majority of the NSA evaluation study participants (n=558) were aged 50-59 (42%) or 60-69 years (44.5%) and/ or had tertiary education (55%). It is evident that earlier gains in terms of literacy and educational opportunities conferred cumulative advantages that facilitated learning in later life. Conversely, due to the lack of access to formal education in their earlier lives, older-old Singaporeans faced cumulative disadvantages over their life-course as they may lack the relevant human capital resources (e.g. literacy skills) to engage in courses in later life.

**b) Poor health and negative age perception affect motivations to learn**

Another significant determinant of engagement in learning was health status. Those in “poor” health, as defined through self-reported poor state of health, presence of at least one IADL difficulty and/or fair or poor vision or hearing, were less likely to engage in learning; all of these health factors invariably affect learning intention and behaviour.

In the qualitative component of the NSA evaluation study, the impact of negative age perceptions related to declining health and cognitive functions was evident. Older-old participants tend to express more learning challenges and difficulties compared to their younger-old counterpart. Some of their concerns with learning include feeling too old to learn, poor memory because of old age and teaching content too difficult or abstract to process because of old age. These negative perceptions, coupled with poor health status and hearing/ vision impairments, formed a major stumbling block to learning in later life, especially among the older-old Singaporeans.

**c) Being employed is both a facilitator and barrier to learning in later life**

Findings on older adult engagement in learning in THE SIGNS Study – I reveal full-time employment as both a facilitator and barrier to continued learning in later life. In terms of a facilitator, working older adults may have access to learning opportunities through their jobs. Additionally, the qualitative component of the NSA evaluation study also showed that younger-old participants who were engaged in full/ part-time employment were more interested in learning in order to improve work outcomes or employability compared to non-working or retired participants.

At the same time, being engaged in full/part-time employment may also present a barrier to taking courses in later life. In the qualitative component of the NSA evaluation study, older participants who were still working cited time and work schedules as a major barrier that impedes their continued participation in the NSA—which was developed primarily to cater to learning for recreation and interest rather than for work related skills. If time is a major barrier, older people who are still working

are more likely to prioritize learning for job-related reasons over learning for recreation (e.g. i.e. learning for non-job related reasons). They may also bypass learning opportunities completely whether for job or non-job related reasons.

Another major reason why older adults are not learning is to the types and variety of courses available in the older adult learning landscape. Prior to the NSA, only introduced in 2016, the range of non-job related courses were rather limited and relatively costly. In comparison, job related courses—largely due to the national emphasis on retraining and reskilling through initiatives such as SkillsFuture—were much more accessible, both in terms of availability and cost. Given this context, it might take some time before patterns of older adult learning incline towards non “job-related” motivations as more affordable recreational courses catered to older adults are being offered and promoted.

#### **d) Gendered barriers to older adult learning**

Older women were more likely to take up courses for non-job related reasons (or less likely to engage in courses for job-related reasons) compared to older men. This observation highlights how learning activities in later life are gendered and may be the outcome of cumulative disadvantages in earlier life.

The lag in taking courses for non-job related reasons among older women can be explained through a lower workforce participation compared to men and consequently, access to job-related courses. Among THE SIGNS Study – I participants, only 14% of older women were still working compared to 36% of older men. Further, a substantial number of women exited the workforce throughout the life-course. Similar gendered patterns were also observed from the national data on labour force participation.<sup>14</sup>

Conversely, older female learners may also engage in learning as a way to compensate for the lack of educational opportunities in their earlier lives, considering that educational opportunities for sons culturally preceded daughters.<sup>8</sup>

Additionally, the qualitative component of the NSA evaluation study also found that older men and women have different preferences and motivations for learning. Older male learners expressed interest in production-oriented or achievement-oriented learning activities that are often prevalent in “job-related” courses while older female learners preferred taking courses that would improve their social and emotional competencies.

#### **e) Socioeconomic barriers to older adult learning**

Another possible barrier highlighted by THE SIGNS Study – I was the influence of socioeconomic status on individuals’ learning. Irrespective of ethnicity, those from lower socioeconomic backgrounds, exemplified by lower education levels, were less likely to take courses. Ethnicity was also associated with both the outcomes, however, we think that this likely reflects residual or unmeasured confounding by socio-economic status, since we do observe in THE SIGNS Study – I that those who occupy a lower socio-economic status are more likely to be Malays and Indians.

Taking up courses for job-related reasons seemed to be driven by socioeconomic considerations. Those of lower SES were more likely to engage in learning activities in later life to upgrade their skills to remain employable and ensure retirement income adequacy and security. In this regard, the cumulative lack of economic and social resources impact older people's intentions to learn in later life.<sup>15</sup>

## **POLICY IMPLICATIONS**

Findings from both the wider literature on lifelong learning as well as the Singapore data from THE SIGNS Study – I and the NSA evaluation study point towards the positive impacts of lifelong learning. This evidence provide strong justifications for the continuation of such efforts for older Singaporeans.

The rate of participation in lifelong learning is low. The low rate may be attributed to the fact that the availability of lifelong learning opportunities was, until very recently, largely limited to job-related courses and may have excluded a significant proportion of potential older learners who are no longer working or may not be eligible for such work skills-based courses. It was only with the introduction of the NSA that non-job related courses became widely available. As such, we can expect that the participation rate will improve over the years with the continuation of both SkillsFuture and the NSA.

Nonetheless, THE SIGNS Study – I and the NSA evaluation study have highlighted significant barriers to learning faced by older Singaporeans. Those in the older-old age group; having lower socio-economic status and in poorer health were likely to be excluded from learning opportunities. These constitute the very same segments of the population that can benefit the most from such opportunities.

There is an urgent need for lifelong learning initiatives to be more targeted and hence inclusive. Policies/programmes need to take into consideration the different developmental and learning needs of older adults across (a) age-cohorts—pedagogical and course content needs for older vs younger baby boomers; (b) gender—different preferences for learning between men and women, including those who are working/not working; (c) educational levels—different pedagogical approach for older adults who are illiterate, (d) ethnic communities—language preferences and cultural sensitivities and (f) levels of functional health status—classroom and learning environments should be sensitive to the needs of those with visual, hearing and cognitive impairment. The marketing and promotion strategies of such lifelong learning programmes must be similarly refined such that they reach out to the differentiated needs of older adults in Singapore.

The design of courses for older adults should be age-friendly to accommodate the needs of frail seniors and those with various impairments. Some possibilities could be learning venues that are highly accessible and course content that is friendly to older adults who are less IT-savvy and includes, for example, larger fonts or audio-notes for people with visual or hearing impaired.

Outreach efforts for and the appeal of job-related courses should speak more to the aged and women to increase their representation in such courses. Efforts need to be made to address age- and gender- related prejudice to enhance training opportunities for those older and older women in the workforce. On the other hand, the range, outreach and marketing of non-job related courses should speak more to the aged and men to increase their representation in such courses. These strategies should also provide more options that cater to the way older Singaporean men prefer to learn. Some suggestions include designing non-job related courses with highly structured pedagogical content accompanied by some form of certification since older men tend to be more achievement/ task-oriented and value recognition as well as validation for their efforts in continued learning.

Learning in later life was positively associated with enhanced social networks, hence, learning programmes could potentially be an effective intervention in alleviating social isolation and disengagement among older Singaporeans. Learning modes and platforms can be re-organised to be more inclusive and accessible to those who tend to be excluded yet are the most vulnerable – the older ages, the poor, the illiterate and the frail. Additional provisions can include home-learning programmes, learning through gamification or learning through meal provisions. In Singapore, centres that provide daily meals to older adults can also include mini-lessons that can interest older adults to engage in learning. If transportation is a barrier to learning, making transportation free to learning centres may benefit the poor and frail older adults who require financial and physical assistance to get to these centres. Providing free transportation through a ride-sharing app has been rather effective in increasing the quality of life of older adults as shown in a small pilot study conducted in the US.<sup>16</sup>

Finally, just like younger people, older adults need to be able to recognize the viability and positive impact of lifelong learning on their lives. Course providers should assist in the process, for example, through highlighting course-specific benefits of learning in their information materials to enable older persons to make an informed selection based on their actual needs.

To sum up, current initiatives to older adult learning in Singapore are still in the developmental stages. Patterns of older adult learning in THE SIGNS Study – I are useful in directing and refining future interventions to lifelong learning.

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## Chapter 16: Volunteering and Monetary Donation: Descriptive Statistics

This chapter reports descriptive statistics for formal and informal volunteering, overall and by age group, gender, ethnicity, educational level and living arrangement.

### Formal Volunteering

**Table 16.1a Frequency of Formal Volunteering by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Formal volunteering in the past 12 months (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	692	431	68
At least once a week	4.7	5.4	4.9	1.6	4.7	4.6	4.5	4.1	4.1	18.2
Less than once a week but at least once a month	3.1	3.8	3.1	0.5	2.8	3.3	2.9	2.8	4.9	4.7
Less than once a month	3.3	4.2	3.2	0.9	3.7	3.0	3.5	2.0	4.5	0.8
One-off	2.5	3.8	1.1	1.1	2.6	2.5	2.4	2.3	3.5	6.9
None	85.8	82.1	87.1	95.1	85.9	85.7	86.1	88.3	83.0	69.4

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

About 14% of older Singaporeans engaged in formal volunteering in the past 12 months. Older Singaporeans aged 80 years and above (4%), and those who are not Chinese, Malay and Indian (31%) had a low and high tendency respectively of formal volunteering.

**Table 16.1b Frequency of Formal Volunteering by Educational Level and Living Arrangement**

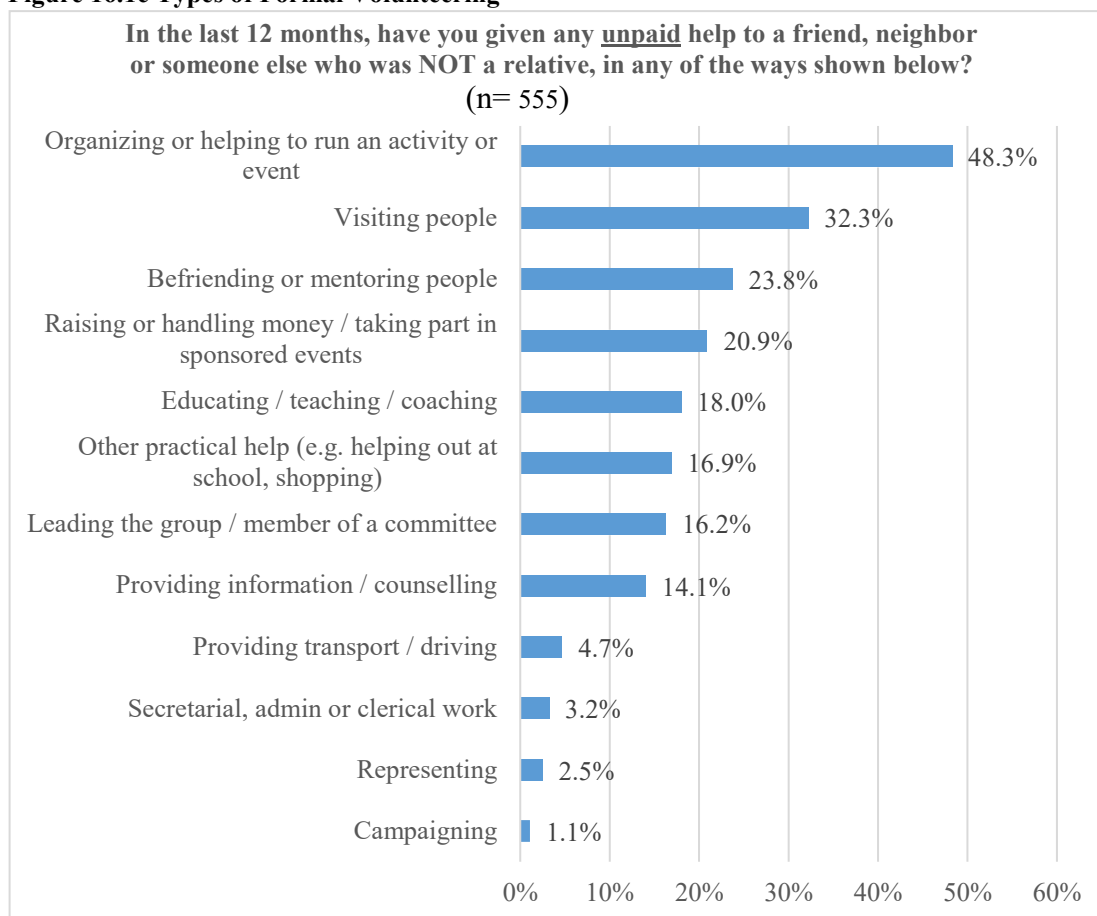
	Educational Level Completed				Living Arrangement	
	No	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Formal volunteering in the past 12 months (weighted %)</b>						
n	1390	1385	1157	608	4136	407
At least once a week	1.4	2.1	6.2	13.2	4.4	7.5
Less than once a week but a least once a month	1.2	1.9	5.0	5.5	3.0	3.5
Less than once a month	1.5	2.9	4.0	6.4	3.5	2.1
One-off	0.9	1.5	4.5	4.2	2.6	2.4
None	93.8	90.9	80.1	70.4	85.9	84.5

\*Living alone includes those who live alone only or with only a foreign domestic worker/maid.

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

An education gradient was observed for engaging in formal volunteering, with older Singaporeans who had received tertiary education most likely to have done so. The proportion who engaged in formal volunteering between those living alone and not living alone were comparable.

**Figure 16.1c Types of Formal Volunteering**



Percentages exceed 100% as multiple responses were allowed.

Among respondents who had volunteered formally in the last 12 months, the three most common ways of volunteering were organizing or helping to run an activity or event (48%), visiting people (32%), befriending or mentoring people (24%).

## Informal Volunteering

**Table 16.2a Frequency of Informal Volunteering by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Informal volunteering in the past 12 months (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	692	431	68
Everyday	0.8	0.8	1.0	0.3	0.7	0.9	0.8	1.5	0.4	0.0
At least once a week	4.0	4.8	4.0	1.0	5.3	2.8	4.0	2.2	3.6	10.1
Less than once a week but a least once a month	3.0	3.9	2.7	0.5	3.0	3.0	2.5	4.4	6.3	6.5
Less than once a month	5.9	7.7	4.8	2.2	4.9	6.9	6.0	4.9	6.2	8.4
One-off	5.8	7.6	5.0	1.7	9.4	2.7	5.9	5.0	6.1	6.7
None	79.4	74.2	81.5	92.6	75.9	82.5	79.7	80.8	76.8	68.3

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

About 20% of older Singaporeans engaged in informal volunteering in the past 12 months. Those aged 80 years and above had a lower tendency to do so versus those younger. Females were more likely to engage in informal volunteering relative to males.

**Table 16.2b Frequency of Informal Volunteering by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Informal volunteering in the past 12 months (weighted %)</b>						
n	1390	1385	1157	608	4136	407
Everyday	0.3	0.8	0.7	2.0	0.8	0.3
At least once a week	1.9	2.8	5.7	7.0	4.0	3.5
Less than once a week but a least once a month	1.4	1.7	4.4	6.0	3.0	2.3
Less than once a month	3.0	5.3	7.6	9.7	5.9	6.8
One-off	2.6	4.8	6.6	12.5	5.9	4.8
None	89.3	84.0	73.9	61.8	79.2	81.6

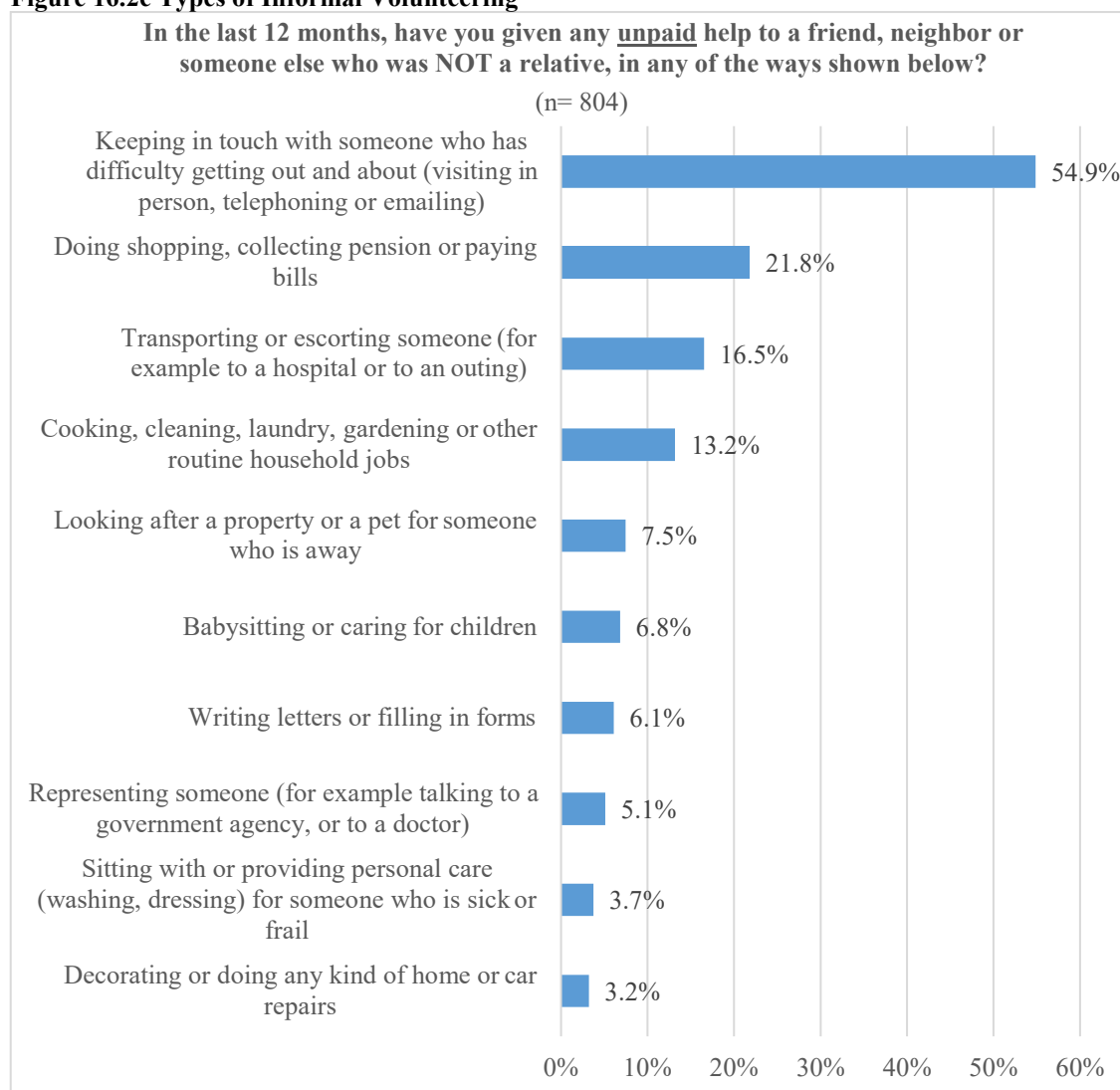
\*Living alone includes those who live alone only or with only a foreign domestic worker/maid.

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

An education gradient was observed for engaging in informal volunteering as well, with older Singaporeans who had received tertiary education most likely to have done so.



**Figure 16.2c Types of Informal Volunteering**



Percentages exceed 100% as multiple responses were allowed.

Among respondents who had volunteered informally in the last 12 months, the three most common ways of volunteering were helping a person keep in touch with someone who had difficulty getting out and about (55%), helping a person in shopping, collecting pension or paying bills (22%), and helping transport or escort someone (17%).

### 16.3 Monetary Donation

The distribution of monetary donation by age group, gender, ethnicity, educational level, and living arrangement is provided in Appendix Tables A16a-A16d.

## Chapter 17: Predictors of Formal and Informal Volunteering

*Grand Hak-Land Cheng*

### INTRODUCTION

Volunteering is a productive activity that benefits older persons' health outcomes<sup>1</sup>, and has been linked to better cognitive functioning<sup>2</sup> and subjective well-being.<sup>3</sup> It has also been associated with less healthcare use<sup>4</sup> as well as lower risks of loneliness,<sup>5</sup> cardiovascular disease,<sup>6</sup> physical disability,<sup>7</sup> and mortality.<sup>8</sup> Hence, it is meaningful to examine the predictors of volunteering.

Formal volunteering is defined as unpaid contributions to organizations or established entities, whereas informal volunteering refers to direct (i.e., not through a formal organization) assistance to non-household individuals including friends and neighbours.<sup>9</sup> Research on volunteering in Western countries typically focus on formal volunteering. In the U.S., 23.5% of individuals aged 65 years and over formally volunteered in the past 12 months.<sup>10</sup> In the U.K. and Australia, the formal volunteering rate in the age group was around 40% and 20%, respectively.<sup>11,12</sup> In Singapore, one main data source for senior volunteering is the National Volunteer and Philanthropy Centre (NVPC) Annual Giving Survey.<sup>13</sup> In 2016, the volunteering rate (including both formal and informal) was 20% for those between 55 and 64 years old and 19% for those 65 years and older. Particularly significant is the substantial increase in the prevalence for those 65 years and older, jumping from 9% in 2014 to 19% in 2016.

In this study, we utilise THE SIGNS Study – I data to address the diverse predictors of volunteering among older Singaporeans. The government has invested S\$3 billion to encourage older persons to take part in various social activities,<sup>14</sup> with one target being to recruit an additional 50,000 older volunteers. In revealing factors positively correlated with volunteering, we identified levers for encouraging this productive activity.

Our study is based on a widely used theoretical framework that integrates formal and informal volunteering, and that posits three kinds of capital – human capital, social capital, and cultural capital.<sup>15</sup> According to this framework, individuals who are facilitated or empowered by more capital or resources are more likely to volunteer. We consider these three types of capital and expect a positive linkage between them and the probability of formal and informal volunteering among older Singaporeans.

#### **Predictors of volunteering**

**Human capital.** Human capital refers to individual resources that contribute to production and output, for example, education. Education imparts knowledge and skills, and is an important predictor of volunteering.<sup>15</sup> Household income is another form of human capital. In general, individuals with higher incomes may be in a better position to contribute to society because they have more resources.<sup>15</sup> Similarly, better health is a resource that may allow more opportunity to volunteer. Individuals with better mental

and physical health have been found to be more likely to volunteer.<sup>15,16</sup> In this study, we assess health status using number of depressive symptoms, chronic diseases, limitations in activities of daily living (ADL limitations), and limitations in instrumental activities of daily living (IADL limitations). We expect poorer health to be associated with a lower likelihood of volunteering.

**Social capital.** Social capital is defined as “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition”.<sup>17</sup> An individual has more social capital if he/she is married, lives with someone, and has stronger social networks with friends and relatives outside the household. We predict that being married, co-residence, and stronger social networks are associated with a higher probability of volunteering.

Work status is commonly regarded as a type of social capital because the expanded networks as a result of having co-workers may increase volunteering opportunities. In addition, employees may be approached by their organizations for volunteering activities.<sup>9,16</sup> Hence, we expect that employees are more likely to volunteer than their non-working counterparts.

We also consider social participation as a form of social capital. Involvement in residents’ committees (RC)/ neighbourhood committees (NC)/ community clubs (CC), and community development council (CDC)/ neighbourhood events may provide more opportunities for volunteering and hence attendance should be associated with a higher probability of volunteering. Similarly, older adults may be more likely to volunteer if they visit senior activity centre (SAC) frequently because they will come into contact with senior’s in need. Senior activity centres are centres that provide social activities for older adults living in rental housing. A large part of their activities are run by volunteers which may encourage volunteering.

**Cultural capital.** Cultural capital refer to beliefs and attitudes that favour morals and benevolence.<sup>16</sup> People who have religious beliefs are more likely to volunteer presumably because religious beliefs typically cultivate the ideas of loving and helping others.<sup>15</sup> Hence, we predict that compared to those who have religious beliefs, nonreligious people should be less likely to engage in volunteering.

## **METHOD**

Table 17.1 reports the descriptive characteristic of the analytical sample (N= 1972) who answered all study variables.

**Table 17.1. Descriptive statistics of the analytical sample (N=1972)**

<u>Dependent variables</u>	
Formal volunteering, n (%)	
None	1714 (86.9)
Less than once a month	113 (5.7)
At least once a month	145 (7.4)
Informal volunteering, n (%)	
None	1594 (80.8)
Less than once a month	229 (11.6)
At least once a month	149 (7.6)
<u>Predicting variables</u>	
Education, n (%)	
None	515 (26.1)
Primary	617 (31.3)
Secondary	554 (28.1)
Post-secondary	286 (14.5)
Housing type, n (%)	
1-2 room HDB	163 (8.3)
3 room HDB	477 (24.2)
4-5 room HDB/ private	1332 (67.6)
Depressive symptoms, mean (SD) (scale range: 0 to 22)	3.12 (3.22)
Chronic diseases, mean (SD)	2.10 (1.55)
ADL limitations, n (%)	
No limitations	1841 (93.4)
1-2 limitations	78 (4.0)
≥ 3 limitations	53 (2.7)
IADL limitations, n (%)	
No limitations	1656 (84.0)
1-2 limitations	207 (10.5)
≥ 3 limitations	109 (5.5)
Married, n (%)	1345 (68.2)
Living alone, n (%)	162 (8.2)
Social networks outside the household, n (%)	
Lowest tertile	670 (34.0)
Middle tertile	629 (31.9)
Highest tertile	673 (34.1)
Employed, n (%)	678 (34.4)
Attending RC / NC / CC / CDC / neighbourhood event, n (%)	
None	1629 (82.6)
Less than once a month	159 (8.1)
At least once a month	184 (9.3)
Attending SAC, n (%)	
None	1713 (86.9)
Less than once a month	79 (4.0)
At least once a month	180 (9.1)
No religion, n (%)	207 (10.5)
Age, n (%)	
60-69	957 (48.5)
70-79	676 (34.3)
80 and above	339 (17.2)
Female gender, n (%)	1009 (51.2)
Ethnicity, n (%)	
Chinese	1468 (74.4)
Malay	288 (14.6)
Indian	187 (9.5)
Other	29 (1.5)

Note: The reported % may not sum to 100 due to rounding.

## **Measures**

**Formal and informal volunteering.** We adopted the volunteering measures used in the English Longitudinal Study of Ageing.<sup>18</sup> We used a 3-level ordinal scale for analysis (0 = no volunteering, 1 = volunteering less than once a month, 2 = volunteering at least once a month). For formal volunteering, respondents were asked in the last 12 months, how often they have given any unpaid help to any groups, clubs or organizations in any of the following ways: (1) raising or handling money/ taking part in sponsored events, (2) leading the group / member of a committee, (3) organizing or helping to run an activity or event, (4) visiting people, (5) befriending or mentoring people, (6) educating / teaching / coaching, (7) providing information / counselling, (8) secretarial, administrative or clerical work, (9) providing transport / driving, (10) representing, (11) campaigning, and (12) other practical help (e.g., helping out at school, shopping). They were reminded to include any time spent at home or elsewhere helping with the groups, clubs and/ or organizations, but to exclude giving money and anything that was a requirement of their job.

For informal volunteering, we asked the respondents how often they, as individuals, have offered any of the following unpaid help to other people including friends, neighbours or someone else, but not relatives in the last 12 months:<sup>18</sup> (1) keeping in touch with someone who has difficulty getting out and about (visiting in person, telephoning or emailing), (2) doing shopping, collecting pension or paying bills, (3) cooking, cleaning, laundry, gardening or other routine household jobs, (4) decorating or doing any kind of home or car repairs, (5) babysitting or caring for children, (6) sitting with or providing personal care (e.g., washing, dressing) for someone who is sick or frail, (7) looking after a property or a pet for someone who is away, (8) writing letters or filling in forms, (9) representing someone (e.g., talking to government agency, or to a doctor), and (10) transporting or escorting someone (e.g., to a hospital or to an outing). They were reminded that this help should be apart from any help given through a group, club or organization.

**Human, social, and cultural capital.** For human capital, we included education level, household type, depressive symptoms (measured by the 11-item version of the Center for Epidemiological Studies Depression [CES-D] Scale),<sup>19</sup> the number of presence of any of 20 chronic diseases, 6 ADL limitations, and 7 IADL limitations. For social capital, we included marital status, living alone, social networks outside the household (measured by the modified Lubben social network scale),<sup>20</sup> work status, attendance in RC/ NC/ CC/ CDC/ neighbourhood event, and attendance in SAC. Cultural capital was represented by no religion (vs. having religious beliefs).

**Demographic variables.** These included age, gender, and ethnicity.

## **Statistical analysis**

We conducted multinomial logistic regression to predict formal and informal volunteering. We did not perform ordered logistic regression because the proportional odds assumption was not met.

## **RESULTS**

Results revealed that 13.1% of our sample reported being formal volunteers in the last 12 months, and that 19.2% reported engaging in informal volunteering during this same period of time (Table 17.1). The overall (formal and/ or informal) volunteering rate was 25.9%.

Older Singaporeans who were more educated, had stronger social networks outside the household, and attended RC / NC / CC / CDC / and neighbourhood events, as well as SACs frequently tended to be formal volunteers. Also, females were more likely to be formal volunteers than males. In contrast, individuals who had no religious beliefs had a lower chance of formal volunteering (Table 17.2).

Individuals who were more educated, had stronger social networks outside the household, and attended RC / NC / CC / CDC / neighbourhood event, as well as SAC frequently tended to be informal volunteers (Table 17.3). In contrast, those who were in older age, and those who had more depressive symptoms were not likely to engage in informal volunteering.

**Table 17.2. Predicting formal volunteering (no volunteering as the reference group; N= 1972)**

	Odds ratio (OR)	
	Volunteering less than once a month	Volunteering at least once a month
Education (ref.: none)		
Primary	1.52	1.52
Secondary	3.44**	4.12***
Post-secondary	4.42***	5.08***
Housing type (ref.: 1-2 room HDB)		
3 room HDB	0.61	1.16
4-5 room HDB/ private	0.76	1.17
Depressive symptoms	1.04	0.94
Chronic diseases	0.91	1.03
ADL limitations (ref.: no limitations)		
1-2 limitations	0.45	0.88
≥ 3 limitations	3.93	1.12
IADL limitations (ref.: no limitations)		
1-2 limitations	0.39	0.58
≥ 3 limitations	0.00	0.20
Married	1.02	1.22
Living alone	0.79	1.81
Social networks (ref. lowest tertile)		
Middle tertile	2.72**	1.94*
Highest tertile	4.60***	3.50***
Employed	1.42	1.30
Attending RC / NC / CC / CDC / neighbourhood event (ref.: none)		
Less than once a month	2.80**	1.49
At least once a month	1.80	3.13***
Attending SAC (ref.: none)		
Less than once a month	0.81	0.69
At least once a month	1.98*	1.54
No religion	0.41*	0.24**
Age (ref.: 60-64)		
70-79	0.84	1.20
80 and above	1.12	1.10
Female gender	0.93	2.00**
Ethnicity (ref.: Chinese)		
Malay	0.77	1.13
Indian	0.99	1.38
Other	0.60	2.98

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

**Table 17.3. Predicting informal volunteering (no volunteering as the reference group; N=1972)**

	Odds ratio (OR)	
	Volunteering less than once a month	Volunteering at least once a month
Education (ref.: none)		
Primary	1.20	1.18
Secondary	1.78*	1.49
Post-secondary	3.40***	2.67**
Housing type (ref.: 1-2 room HDB)		
3 room HDB	1.22	0.47
4-5 room HDB/ private	0.89	0.71
Depressive symptoms	1.00	0.91*
Chronic diseases	1.03	1.00
ADL limitations (ref.: no limitations)		
1-2 limitations	0.41	1.05
≥ 3 limitations	0.00	3.53
IADL limitations (ref.: no limitations)		
1-2 limitations	1.20	0.54
≥ 3 limitations	0.70	0.13
Married	0.83	0.86
Living alone	0.90	0.77
Social networks (ref. lowest tertile)		
Middle tertile	1.91**	1.55
Highest tertile	3.62***	3.97***
Employed	1.13	1.1
Attending RC / NC / CC / CDC / neighbourhood event (ref.: none)		
Less than once a month	2.05**	1.87*
At least once a month	0.98	1.65
Attending SAC (ref.: none)		
Less than once a month	1.62	0.82
At least once a month	2.24**	1.09
No religion	1.21	1.09
Age (ref.: 60-64)		
70-79	0.67*	0.83
80 and above	0.52*	0.45*
Female gender	0.81	0.91
Ethnicity (ref.: Chinese)		
Malay	0.67	1.35
Indian	1.00	1.38
Other	0.56	1.42

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

## DISCUSSION

Our study has shown that 26% of older Singaporeans reported volunteering (13% for formal, 19% for informal) in the last 12 months. These data are similar to those collected by the National Volunteer and Philanthropy Centre (NVPC) which reported 20% of the individuals aged 55 to 64, and 19% of those aged 65 and older volunteered. The NVPC data shows that the proportion of older persons who volunteer in Singapore is the lowest compared to other age groups. The number of volunteers among those aged 55 to 64 has been steadily decreasing since 2012.<sup>13</sup> This may be due to the concomitant increase in employment rates among older workers as a result of the 2012 Re-employment and Retirement Act which brought the re-employment age up to 65 years.



Notwithstanding the efforts to engage older Singaporeans in the workforce, efforts to promote voluntarism should continue to be enhanced given its multiple benefits.<sup>1</sup> With increasing longevity, volunteerism can be a powerful resource for continued engagement and productivity for older persons with positive impacts on the wider society as a whole. Here, based on the findings of our study, we highlight some possible levers for promoting volunteerism in Singapore.

Higher education is related to higher likelihoods of volunteering, perhaps because more educated people are empowered by their skills and knowledge to volunteer. As future cohorts of older Singaporeans will be more educated, we can expect to see a continued increase in the prevalence of volunteering. Education through lifelong learning opportunities is an additional lever that can be used to promote volunteering. Hence, the newly launched National Silver Academy, through its learning mandate is a potentially rich platform to inculcate older persons' interest to volunteer.

Our findings also suggest that stronger social networks and more social participation are positively correlated with volunteering. Volunteering can also promote social networks and social participation; with each having a multiplier effect on the other. Efforts on both these fronts - promoting volunteering and social engagement - should be mounted together. The recent Community Network of Seniors (CNS) programme that has befriending as its core thrust is a big step in this direction. The programme's aim of connecting both active and frailer older persons with the wider community would impact positively on their social networks and volunteer interests. With over 80% of the population living in public housing, there is an abundance of opportunities for promoting community activities at very local levels – moving from the constituencies and precinct levels to the block and even floor levels.

There are two demographic factors significantly influence the probability of senior volunteerism: gender and age. Males tend to participate less in formal volunteering compared to females. The oldest-old are significantly less likely to volunteer informally compared to the young-old. The lower participation rate among older males has been a concern on the ground for a while. Opening up avenues that encourage older males to volunteer would be a productive goal. As Singaporeans live longer and healthier lives, creating possibilities which are meaningful for everyone is an important endeavour. Volunteering possibilities as with other avenues for social engagements need to be highly creative and targeted to meet the diverse needs of older Singaporeans.

A significant impediment to volunteering is the older persons' poor mental health as manifested by number of depressive symptoms. The many initiatives which address the holistic well-being of older adults under the Successful Ageing Plan may eventually enhance the tendency to volunteer in this age group.

The volunteering rate among older Singaporeans is healthy with around 1 in 4 older adults being involved in a formal and/or informal capacity. While the prevalence might not be as high as among the younger cohorts of Singaporeans, older persons also (as shown in previous chapters) engage in support transfers with their families and actively partake within their familial networks. With education and social networks and participation fuelling volunteering efforts, we can expect the volunteering rate to keep

increasing through the years.

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## Appendices

**Appendix Table A3a Citizenship Status by Age Group, Gender and Ethnicity**

	Age Group				Gender		Ethnicity			
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Citizenship Status (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Singapore Citizen	97.4	97.0	97.9	98.1	96.7	98.1	98.0	97.8	94.4	74.2
Singapore Permanent Resident	2.6	3.0	2.2	1.9	3.4	1.9	2.0	2.3	5.7	25.8

**Appendix Table A3b Citizenship Status by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Citizenship Status (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Singapore Citizen	99.2	97.4	97.9	92.7	97.3	98.4
Singapore Permanent Resident	0.8	2.6	2.1	7.3	2.7	1.6

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

**Appendix Table A3c Ethnicity by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Ethnicity (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Chinese	86.7	81.4	80.0	85.4	82.5	87.5
Malay	8.8	10.6	11.9	2.7	9.9	6.2
Indian	4.4	6.7	6.9	6.5	6.3	3.7
Others	0.1	1.3	1.2	5.3	1.3	2.6

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

**Appendix Table A3d Property Ownership by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Property Ownership (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Subject	18.5	17.8	18.7	20.4	16.1	20.6	19.1	14.0	17.9	17.3
Child in the household	12.8	6.1	14.0	32.2	6.0	18.8	12.3	18.3	13.2	6.5
Joint ownership with spouse	47.3	57.9	43.2	20.3	55.9	39.7	48.4	40.5	44.3	37.1
Joint ownership with other household member	8.9	6.9	10.1	13.0	6.6	10.8	8.8	9.1	10.9	4.8
Other household member(s)	6.9	6.0	7.9	7.8	8.7	5.2	6.4	9.6	7.8	12.6
Child outside household	0.4	0.2	0.7	0.8	0.3	0.6	0.3	0.7	0.9	7.0
Others outside household	0.6	0.8	0.1	0.7	0.8	0.4	0.5	0.3	0.8	6.8
Public Rental Flat	4.5	4.1	5.2	4.7	5.3	3.8	4.1	7.4	4.2	8.0

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A3e Property Ownership by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Property Ownership (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Subject	16.3	17.4	20.1	22.3	13.2	72.9
Child in the household	24.7	11.6	7.1	2.9	13.9	1.4
Joint ownership with spouse	32.1	47.0	56.7	59.3	51.7	2.0
Joint ownership with other household member	12.2	9.3	6.8	5.5	9.3	4.3
Other household member(s)	6.9	8.4	5.4	6.5	7.5	0.5
Child outside household	55.0	0.3	0.2	1.2	0.4	0.6
Others outside household	32.0	0.7	0.5	1.3	0.5	1.7
Public Rental Flat	6.8	5.3	3.1	0.8	3.4	16.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A3f Marital Status by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Marital Status (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Married	50.1	68.2	77.4	76.6	73.0	4.2
Widowed	42.1	17.7	10.1	8.4	18.6	46.6
Separated from spouse	0.3	0.6	0.6	0.6	0.4	2.0
Divorced	2.1	4.7	3.8	4.6	2.8	13.1
Never married	5.3	8.6	8.1	9.8	5.2	33.7

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A3g Number of Persons Living in the Household by Age Group, Gender and Ethnicity**

	Age Group				Gender		Ethnicity			
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Number of Persons Living in the Household</b>										
n	4543	2018	1499	1026	2114	2429	3352	708	449	34
Mean	3.3	3.8	3.2	3.5	3.4	3.3	3.3	3.9	3.7	2.9
SD	1.7	1.6	1.7	1.8	1.6	1.7	1.6	1.9	1.8	1.5

**Appendix Table A3h Number of Persons Living in the Household by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Number of Persons Living in the Household</b>						
n	1388	1383	1261	503	4136	407
Mean	3.5	3.3	3.3	3.2	3.6	1.2
SD	1.8	1.6	1.6	1.6	1.6	0.4

**Appendix Table A3i Religion by Gender and Ethnicity**

	Gender		Ethnicity			
	Male	Female	Chinese	Malay	Indian	Others
<b>Religion (weighted %)</b>						
n	2117	2432	3358	708	449	34
Christianity	14.7	20.3	19.1	0.0	15.6	61.3
Buddhism/ Taoism	54.1	55.3	65.6	0.5	0.4	13.1
Islam	11.6	11.4	0.3	99.2	24.3	21.3
Hinduism	3.4	3.4	0.0	0.3	55.1	0.0
Others	0.3	0.7	0.3	0.0	4.7	0.0
No religion	15.9	8.8	14.5	0.0	0.0	4.3

**Appendix Table A3j Religion by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Religion (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Christianity	10.2	12.0	24.0	33.1	16.9	25.8
Buddhism/ Taoism	70.4	61.5	42.4	32.7	55.3	48.5
Islam	10.6	12.9	13.8	4.5	11.8	8.5
Hinduism	2.2	4.0	3.6	4.2	3.6	1.9
Others	46.0	0.5	0.6	0.4	0.5	0.6
No religion	5.9	9.0	15.5	25.2	11.8	14.1

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A4a Vision and Hearing Status by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Vision Status (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Excellent	1.4	1.7	1.1	1.2	1.6	1.3	1.5	0.8	1.8	0.0
Very Good	8.1	9.3	8.2	4.4	8.3	8.0	8.3	6.0	7.3	15.0
Good	59.7	63.6	59.1	47.9	58.0	61.1	59.3	62.5	61.8	54.7
Fair	24.1	22.4	23.5	30.5	24.9	23.4	24.1	25.1	21.4	26.9
Poor	6.4	2.9	7.9	14.9	7.0	5.8	6.5	5.4	7.3	3.4
Loss of vision in both eyes	0.2	0.1	0.2	0.6	0.2	0.2	0.2	0.3	0.3	0.0
<b>Hearing Status (weighted %)</b>										
Excellent	1.6	2.0	1.2	1.1	1.8	1.5	1.5	1.5	3.6	0.0
Very Good	9.4	11.7	8.5	4.0	8.2	10.5	9.6	6.4	9.7	19.3
Good	63.2	66.4	66.5	46.4	60.6	65.5	62.6	67.5	63.5	67.9
Fair	18.2	16.6	16.6	26.5	21.0	15.8	18.6	18.2	15.2	9.4
Poor	7.1	3.1	7.1	20.2	8.2	6.2	7.3	6.1	7.7	3.4
Not able to hear in both ears	0.3	0.1	0.1	1.4	0.3	0.3	0.3	0.4	0.0	0.0

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A4b Vision and Hearing Status by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
n	1390	1385	1262	503	4136	407
<b>Vision Status (weighted %)</b>						
Excellent	0.8	0.8	1.8	3.5	1.4	2.0
Very Good	6.1	7.6	8.5	13.3	8.2	8.0
Good	55.4	59.1	63.4	62.0	59.4	62.4
Fair	30.0	26.0	22.9	15.6	24.4	21.2
Poor	10.1	6.4	3.3	5.3	6.4	6.2
Loss of vision in both eyes	0.4	0.1	0.1	0.1	0.2	0.2
<b>Hearing Status (weighted %)</b>						
Excellent	1.1	1.3	1.8	3.1	1.6	2.0
Very Good	6.0	7.8	12.1	14.7	9.1	12.5
Good	61.0	64.6	63.4	64.5	63.4	61.2
Fair	19.0	19.8	18.0	13.0	18.2	18.0
Poor	11.9	6.1	4.6	4.5	7.2	6.0
Not able to hear in both ears	0.7	0.2	0.1	0.1	0.3	0.2

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A4c Heart Attack, Angina, Myocardial Infarction by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Heart Attack, Angina, Myocardial Infarction</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	7.4	5.2	9.7	9.8	10.8	4.3	6.6	9.3	15.3	1.3
<b>Treated with medicine or surgery (weighted %)</b>										
n	377	120	154	103	255	122	241	67	68	1
Yes	95.6	96.7	95.4	94.2	97.5	91.4	96.2	93.0	94.7	100.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	360	116	147	97	248	112	232	62	65	1
Yes	8.0	9.2	6.7	8.4	9.9	3.6	6.6	17.3	8.0	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	32	12	11	9	27	5	16	11	5	0
Mean	1.7	1.4	1.5	2.8	1.7	2.1	1.8	1.9	1.2	0
SD	1.5	1.5	0.8	2.0	1.5	1.4	1.5	1.9	0.5	0

**Appendix Table A4d Heart Attack, Angina, Myocardial Infarction by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Heart Attack, Angina, Myocardial Infarction</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	7.1	7.9	7.2	6.9	7.4	6.6
<b>Treated with medicine or surgery (weighted %)</b>						
n	105	124	105	42	347	30
Yes	94.4	95.1	97.0	96.4	96.2	89.5
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	99	118	101	41	332	28
Yes	5.2	11.5	5.0	10.9	8.3	4.4
<b>Number of times hospitalised in the past 6 months</b>						
n	6	15	6	4	30	2
Mean	2.8	1.6	1.4	1.2	1.8	1.0
SD	2.3	1.5	0.8	0.4	1.5	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)



**Appendix Table A4e Heart Failure by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Heart Failure</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	1.9	1.3	2.0	3.5	1.9	1.9	1.7	2.5	3.7	1.9
<b>Treated with medicine or surgery (weighted %)</b>										
n	99	29	35	35	47	52	64	19	15	1
Yes	90.1	93.3	81.8	95.1	97.3	83.8	88.9	86.4	100.0	100.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	90	27	30	33	45	45	58	16	15	1
Yes	16.2	23.1	11.8	12.1	26.6	5.6	17.6	20.2	6.6	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	14	6	4	4	11	3	10	3	1	0
Mean	1.5	1.6	1.3	1.6	1.5	1.8	1.2	3.2	2.0	0.0
SD	1.4	2.0	0.5	1.1	1.6	1.2	0.6	3.5	0.0	0.0

**Appendix Table A4f Heart Failure by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Heart Failure</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	3.0	2.1	1.1	0.7	1.7	3.7
<b>Treated with medicine or surgery (weighted %)</b>						
n	46	31	17	5	81	18
Yes	91.9	86.2	90.1	100.0	89.6	92.5
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	42	28	15	5	74	16
Yes	19.4	10.9	17.7	16.0	16.6	14.4
<b>Number of times hospitalised in the past 6 months</b>						
n	8	3	2	1	12	2
Mean	1.3	2.5	1.0	2.0	1.6	1.0
SD	0.7	3.2	0.0	0.0	1.6	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Appendix Table A4g Other Forms of Heart Diseases by Age Group, Gender and Ethnicity

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Other Forms of Heart Diseases</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	4.5	3.9	4.4	6.5	5.7	3.4	4.3	4.9	6.6	1.5
<b>Treated with medicine or surgery (weighted %)</b>										
n	222	81	71	70	128	94	149	38	34	1
Yes	87.1	85.1	89.4	88.1	92.1	79.7	86.4	86.7	93.4	100.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	196	70	65	61	118	78	130	33	32	1
Yes	9.8	7.9	11.9	10.9	5.7	16.8	9.0	24.2	1.9	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	22	7	8	7	10	12	14	7	1	0
Mean	1.8	2.2	1.4	1.8	2.5	1.5	1.7	2.2	1.0	0.0
SD	1.4	1.2	0.7	2.2	2.0	0.8	1.5	1.2	0.0	0.0

Appendix Table A4h Other Forms of Heart Diseases by Educational Level and Living Arrangement

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Other Forms of Heart Diseases</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	4.4	3.5	4.8	5.8	4.3	5.9
<b>Treated with medicine or surgery (weighted %)</b>						
n	66	56	68	31	197	25
Yes	88.9	82.4	86.6	92.0	88.1	79.4
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	59	47	60	29	175	21
Yes	20.2	8.1	6.4	2.2	9.9	9.8
<b>Number of times hospitalised in the past 6 months</b>						
n	12	5	4	1	20	2
Mean	2.0	1.4	1.6	3.0	1.9	1.0
SD	1.6	0.9	1.4	0.0	1.5	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

**Appendix Table A4i Cancer (Excluding Skin Cancer) by Age Group, Gender and Ethnicity**

	Age Group				Gender		Ethnicity			
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Cancer (Excluding Skin Cancer)</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	4.9	4.6	5.5	4.9	4.2	5.6	4.8	4.3	4.7	14.5
<b>Treated with medicine or surgery (weighted %)</b>										
n	220	92	79	49	90	130	166	30	20	4
Yes	91.9	92.3	92.1	90.0	97.2	88.3	91.1	89.9	100.0	100.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	203	85	74	44	87	116	152	27	20	4
Yes	9.8	11.7	9.8	3.9	10.4	9.4	8.5	20.2	19.6	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	21	11	8	2	10	11	12	5	4	0
Mean	2.6	3.4	1.7	1.0	2.1	3.1	3.1	1.8	1.3	0.0
SD	2.5	3.0	1.2	0.0	1.9	3.0	2.9	0.5	0.5	0.0

**Appendix Table A4j Cancer (Excluding Skin Cancer) by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Cancer (Excluding Skin Cancer)</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	4.1	4.3	5.4	7.2	4.8	5.7
<b>Treated with medicine or surgery (weighted %)</b>						
n	54	61	70	35	197	22
Yes	92.9	94.2	90.3	89.7	90.9	100.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	51	57	63	32	180	22
Yes	10.5	10.3	11.2	5.5	8.1	23.7
<b>Number of times hospitalised in the past 6 months</b>						
n	5	7	6	3	16	5
Mean	3.8	2.4	2.3	1.4	2.9	2.0
SD	4.4	2.3	1.4	0.6	2.9	1.3

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Appendix Table A4k Cerebrovascular Disease (Such as Stroke) by Age Group, Gender and Ethnicity

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Cerebrovascular Disease (Such as Stroke)</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	4.7	3.1	6.2	7.3	5.8	3.8	4.6	4.2	7.8	3.9
<b>Treated with medicine or surgery (weighted %)</b>										
n	238	63	102	73	131	107	169	30	38	1
Yes	90.7	90.6	94.0	85.3	93.6	86.7	90.3	89.1	93.8	100.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	216	58	96	62	123	93	153	27	35	1
Yes	6.9	10.5	5.6	3.9	6.7	7.2	5.7	15.3	10.3	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	17	7	7	3	11	6	9	4	4	0
Mean	1.5	1.2	1.8	1.8	1.9	1.0	1.6	1.0	1.8	0.0
SD	1.1	0.4	1.7	1.2	1.4	0.0	1.0	0.0	2.2	0.0

Appendix Table A4l Cerebrovascular Disease (Such as Stroke) by Educational Level and Living Arrangement

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Cerebrovascular Disease (Such as Stroke)</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	5.7	4.4	4.6	3.5	4.7	4.6
<b>Treated with medicine or surgery (weighted %)</b>						
n	82	66	65	21	218	20
Yes	90.7	94.3	93.0	75.7	89.8	100.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	74	62	61	16	196	20
Yes	3.1	3.4	15.6	4.5	7.2	3.5
<b>Number of times hospitalised in the past 6 months</b>						
n	3	3	10	1	16	1
Mean	2.0	1.9	1.3	1.0	1.5	1.0
SD	1.7	2.4	0.7	0.0	1.1	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

**Appendix Table A4m Dementia by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Dementia</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	466	28	103	335	130	336	310	101	53	2
Yes	32.7	18.0	33.7	34.3	36.2	31.3	33.7	28.6	29.3	44.4
<b>Treated with medicine or surgery (weighted %)</b>										
n	150	6	32	112	46	104	104	29	16	1
Yes	57.6	72.4	72.7	52.1	73.6	50.4	57.0	50.2	72.2	100.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	86	4	24	58	34	52	60	15	10	1
Yes	3.2	0.0	1.9	4.0	6.6	0.9	2.7	0.0	11.9	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	4	0	1	3	3	1	2	0	2	0
Mean	13.5	0.0	1.0	1.4	1.4	1.0	1.5	0.0	1.0	0.0
SD	0.6	0.0	0.0	0.6	0.6	0.0	0.7	0.0	0.0	0.0

**Appendix Table A4n Dementia by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Dementia</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	311	90	43	14	442	23
Yes	28.1	45.6	35.2	36.9	33.0	28.1
<b>Treated with medicine or surgery (weighted %)</b>						
n	87	39	15	5	143	7
Yes	60.4	51.2	55.3	82.9	58.4	42.5
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	52	20	9	4	83	3
Yes	4.4	2.2	0.0	0.0	3.3	0.0
<b>Number of times hospitalised in the past 6 months</b>						
n	3	1	0	0	4	0
Mean	1.4	1.0	0.0	0.0	1.4	0.0
SD	0.6	0.0	0.0	0.0	0.6	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Appendix Table A4o Chronic Respiratory Illness by Age Group, Gender and Ethnicity

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Chronic Respiratory Illness (e.g. Asthma)</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	5.2	4.8	5.1	6.8	5.8	4.6	4.6	7.9	8.7	6.3
<b>Treated with medicine or surgery (weighted %)</b>										
n	258	106	84	68	133	125	165	53	38	2
Yes	90.7	88.2	97.9	86.3	91.8	89.5	88.7	94.2	98.7	100.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	236	95	82	59	124	112	147	50	37	2
Yes	9.6	5.6	15.8	9.1	9.2	10.1	9.2	8.1	16.1	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	24	6	12	6	13	11	14	5	5	0
Mean	1.5	1.1	1.6	1.8	1.7	1.3	1.4	1.6	1.6	0.0
SD	0.7	0.4	0.6	1.0	0.7	0.7	0.6	0.8	0.9	0.0

Appendix Table A4p Chronic Respiratory Illness by Educational Level and Living Arrangement

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Chronic Respiratory Illness (e.g. Asthma)</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	5.7	5.9	4.6	3.6	5.2	5.0
<b>Treated with medicine or surgery (weighted %)</b>						
n	87	84	66	20	263	22
Yes	90.7	97.1	84.8	86.5	90.9	88.6
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	80	81	58	17	217	19
Yes	12.5	9.3	9.8	0.0	10.1	4.1
<b>Number of times hospitalised in the past 6 months</b>						
n	10	8	6	0	23	1
Mean	1.6	1.4	1.4	0.0	1.5	2.0
SD	0.9	0.5	0.5	0.0	0.7	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

**Appendix Table A4q Digestive Illness (Stomach or Intestinal) by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Digestive Illness (Stomach or Intestinal)</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	7.6	6.8	7.2	10.8	6.7	8.4	8.0	4.6	5.8	11.4
<b>Treated with medicine or surgery (weighted %)</b>										
n	340	132	104	104	142	198	277	34	26	3
Yes	85.9	83.0	89.5	87.2	88.0	84.4	87.0	79.7	92.6	45.5
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	294	111	92	91	124	170	242	27	24	1
Yes	7.7	5.1	12.2	7.0	7.5	7.8	7.5	13.6	7.3	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	25	6	12	7	11	14	19	4	2	0
Mean	1.3	1.7	1.1	1.0	1.6	1.0	1.1	2.8	1.0	0.0
SD	0.9	1.6	0.3	0.0	1.4	0.0	0.3	2.6	0.0	0.0

**Appendix Table A4r Digestive Illness (Stomach or Intestinal) by Educational Level and Living Arrangement**

		Educational Level Completed				Living Arrangement	
		None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Digestive Illness (Stomach or Intestinal)</b>							
<b>Diagnosed by a medical professional (weighted %)</b>							
n		1390	1385	1262	503	4136	407
Yes		8.9	6.6	6.7	9.1	7.3	10.3
<b>Treated with medicine or surgery (weighted %)</b>							
n		122	87	85	45	299	40
Yes		86.8	87.7	89.6	74.5	85.2	90.3
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>							
n		107	76	76	34	257	36
Yes		11.9	7.3	5.1	3.6	8.1	4.9
<b>Number of times hospitalised in the past 6 months</b>							
n		13	7	4	1	23	2
Mean		1.0	1.2	2.2	1.0	1.3	1.0
SD		0.0	0.4	2.0	0.0	0.9	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Appendix Table A4s Renal/Kidney or Urinary Tract Ailments by Age Group, Gender and Ethnicity

	Age Group				Gender		Ethnicity			
	Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Renal/Kidney or Urinary Tract Ailments</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	8.1	6.2	9.7	11.5	11.5	5.2	8.6	5.5	5.8	11.7
<b>Treated with medicine or surgery (weighted %)</b>										
n	379	121	143	115	250	129	303	44	27	5
Yes	84.1	84.7	83.6	84.2	88.7	75.4	83.1	84.8	96.1	100.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	321	103	120	98	223	98	253	38	25	5
Yes	8.4	9.2	8.5	6.9	5.7	14.7	7.0	18.2	19.8	10.9
<b>Number of times hospitalised in the past 6 months</b>										
n	29	11	11	7	15	14	17	6	5	1
Mean	1.7	1.6	1.4	2.6	1.3	2.0	1.6	1.2	3.0	1.0
SD	1.7	0.9	0.7	3.6	0.7	2.2	1.0	0.4	4.4	0.0

Appendix Table A4t Renal/Kidney or Urinary Tract Ailments by Educational Level and Living Arrangement

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Renal/Kidney or Urinary Tract Ailments</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	7.8	8.8	6.6	10.8	8.3	6.0
<b>Treated with medicine or surgery (weighted %)</b>						
n	110	122	89	58	350	28
Yes	83.2	88.7	80.0	82.5	84.2	82.6
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	92	108	73	48	298	22
Yes	10.1	12.1	3.0	5.2	8.2	12.2
<b>Number of times hospitalised in the past 6 months</b>						
n	10	14	3	2	26	3
Mean	2.1	1.7	1.0	1.0	1.7	2.0
SD	2.8	1.0	0.0	0.0	1.8	1.2

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)



**Appendix Table A4u Ailments of the Liver or Gall Bladder by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Ailments of the Liver or Gall Bladder</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	3.3	3.2	3.1	4.2	4.2	2.6	3.6	1.7	2.4	0.0
<b>Treated with medicine or surgery (weighted %)</b>										
n	148	61	47	40	91	57	125	12	11	0
Yes	75.2	66.3	81.1	89.2	82.6	64.6	74.5	100.0	63.4	0.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	115	41	38	36	77	38	96	12	7	0
Yes	5.1	0.0	12.0	5.7	6.9	1.8	5.0	0.0	17.1	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	7	0	5	2	6	1	6	0	1	0
Mean	1.3	0.0	1.2	1.6	1.3	1.0	1.3	0.0	1.0	0.0
SD	0.5	0.0	0.4	0.7	0.5	0.0	0.5	0.0	0.0	0.0

**Appendix Table A4v Ailments of the Liver or Gall Bladder by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Ailments of the Liver or Gall Bladder</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	2.2	2.9	3.2	7.3	3.3	4.0
<b>Treated with medicine or surgery (weighted %)</b>						
n	31	38	42	37	130	18
Yes	83.3	71.7	73.2	75.6	73.4	91.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	27	27	32	29	99	16
Yes	7.6	4.4	4.5	4.6	5.8	0.0
<b>Number of times hospitalised in the past 6 months</b>						
n	2	2	2	1	7	0
Mean	1.6	1.0	1.5	1.0	1.3	0.0
SD	0.7	0.0	0.7	0.0	0.5	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Appendix Table A4w Chronic Back Pain by Age Group, Gender and Ethnicity

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Chronic Back Pain</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	7.2	6.5	7.4	8.8	6.6	7.6	7.1	3.6	9.4	23.7
<b>Treated with medicine or surgery (weighted %)</b>										
n	327	129	109	89	140	187	249	26	45	7
Yes	63.9	66.2	63.5	58.8	75.1	55.4	63.9	53.2	77.9	50.5
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	210	86	72	52	105	105	158	14	34	4
Yes	2.8	0.0	5.6	5.4	2.4	3.1	3.4	0.0	0.0	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	6	0	3	3	3	3	6	0	0	0
Mean	1.1	0.0	1.0	1.3	1.3	1.0	1.1	0.0	0.0	0.0
SD	0.3	0.0	0.0	0.6	0.5	0.0	0.3	0.0	0.0	0.0

Appendix Table A4x Chronic Back Pain by Educational Level and Living Arrangement

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Chronic Back Pain</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	7.0	6.9	5.9	11.0	7.1	7.7
<b>Treated with medicine or surgery (weighted %)</b>						
n	100	95	77	55	294	33
Yes	57.0	72.2	66.2	57.8	64.2	61.2
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	61	65	50	34	190	20
Yes	9.9	1.1	0.0	0.0	3.0	0.0
<b>Number of times hospitalised in the past 6 months</b>						
n	5	1	0	0	6	0
Mean	1.1	1.0	0.0	0.0	1.1	0.0
SD	0.4	0.0	0.0	0.0	0.3	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Appendix Table A4y Osteoporosis by Age Group, Gender and Ethnicity

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Osteoporosis</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	4.9	3.7	4.8	8.7	1.6	7.8	5.2	3.0	4.2	1.9
<b>Treated with medicine or surgery (weighted %)</b>										
n	229	71	75	83	32	197	186	21	21	1
Yes	81.0	78.3	83.9	82.0	62.9	84.2	81.9	86.6	69.4	0.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	187	55	63	69	21	166	154	18	15	0
Yes	1.0	1.0	1.3	0.7	0.0	1.2	0.5	3.5	9.1	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	3	1	1	1	0	3	1	1	1	0
Mean	1.8	3.0	1.0	1.0	0.0	1.8	1.0	1.0	3.0	0.0
SD	1.2	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0

Appendix Table A4z Osteoporosis by Educational Level and Living Arrangement

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Osteoporosis</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	5.8	3.4	5.1	6.0	4.7	7.1
<b>Treated with medicine or surgery (weighted %)</b>						
n	80	51	66	31	198	31
Yes	84.7	76.4	84.6	72.6	80.9	81.9
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	69	39	55	23	163	24
Yes	0.6	0.0	1.3	2.9	1.2	0.0
<b>Number of times hospitalised in the past 6 months</b>						
n	1	0	1	1	3	0
Mean	1.0	0.0	1.0	3.0	1.8	0.0
SD	0.0	0.0	0.0	0.0	1.2	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

**Appendix Table A4aa Fractures of the Hip, Thigh and Pelvis by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Fractures of the Hip, Thigh and Pelvis</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	2.8	1.7	1.5	8.8	2.0	3.5	2.8	1.8	3.8	2.3
<b>Treated with medicine or surgery (weighted %)</b>										
n	146	35	26	85	44	102	112	14	19	1
Yes	87.5	91.6	89.4	84.4	90.8	85.9	88.1	93.2	90.3	0.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	128	32	23	73	40	88	98	13	17	0
Yes	13.4	9.9	17.3	14.4	20.7	9.6	13.6	27.8	0.0	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	17	3	3	11	9	8	13	4	0	0
Mean	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0
SD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

**Appendix Table A4ab Fractures of the Hip, Thigh and Pelvis by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Fractures of the Hip, Thigh and Pelvis</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	5.4	1.9	1.5	2.3	2.7	4.1
<b>Treated with medicine or surgery (weighted %)</b>						
n	80	31	23	11	126	20
Yes	86.1	97.5	94.2	64.6	89.6	74.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	69	30	21	7	113	15
Yes	13.8	12.9	19.3	0.0	13.5	12.1
<b>Number of times hospitalised in the past 6 months</b>						
n	8	4	5	0	15	2
Mean	1.0	1.0	1.0	0.0	1.0	1.0
SD	0.0	0.0	0.0	0.0	0.0	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

**Appendix Table A4ac Other Fractures by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Other Fractures</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	7.5	6.8	7.6	9.6	6.5	8.4	7.5	6.6	8.7	10.8
<b>Treated with medicine or surgery (weighted %)</b>										
n	345	141	112	92	130	215	257	44	40	4
Yes	80.9	78.7	87.7	75.6	90.0	74.7	78.9	82.6	96.6	100.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	282	114	98	70	118	164	204	36	38	4
Yes	4.9	4.4	4.0	7.5	4.6	5.1	4.6	3.5	10.6	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	16	6	5	5	7	9	11	1	4	0
Mean	1.2	1.3	1.2	1.2	1.1	1.3	1.1	1.0	1.6	0.0
SD	0.5	0.7	0.4	0.4	0.4	0.7	0.4	0.0	1.1	0.0

**Appendix Table A4ad Other Fractures by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Other Fractures</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	7.4	7.0	7.5	9.1	7.4	8.6
<b>Treated with medicine or surgery (weighted %)</b>						
n	106	93	100	45	310	35
Yes	81.0	84.9	81.3	72.2	80.6	83.4
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	85	80	83	33	253	29
Yes	7.1	4.8	2.5	5.6	5.2	2.3
<b>Number of times hospitalised in the past 6 months</b>						
n	7	4	3	2	15	1
Mean	1.3	1.0	1.0	1.7	1.2	1.0
SD	0.5	0.0	0.0	1.3	0.6	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Appendix Table A4af Glaucoma by Age Group, Gender and Ethnicity

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Glaucoma</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	4.0	2.7	5.6	5.5	4.6	3.5	4.2	1.9	4.2	6.4
<b>Treated with medicine or surgery (weighted %)</b>										
n	186	49	83	54	101	85	152	14	18	2
Yes	84.4	80.6	84.7	89.9	88.4	79.9	82.1	100.0	100.0	100.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	161	40	72	49	92	49	127	14	18	2
Yes	1.7	5.2	0.0	0.0	3.1	0.0	2.0	0.0	0.0	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	2	2	0	0	2	0	2	0	0	0
Mean	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0
SD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Appendix Table A4ag Glaucoma by Educational Level and Living Arrangement

		Educational Level Completed				Living Arrangement	
		None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Glaucoma</b>							
<b>Diagnosed by a medical professional (weighted %)</b>							
n		1390	1385	1262	503	4136	407
Yes		3.8	4.3	4.0	3.9	3.9	6.0
<b>Treated with medicine or surgery (weighted %)</b>							
n		50	60	53	23	162	24
Yes		78.4	88.1	83.0	91.0	85.3	78.4
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>							
n		41	54	45	21	141	20
Yes		0.0	2.5	3.0	0.0	2.0	0.0
<b>Number of times hospitalised in the past 6 months</b>							
n		0	1	1	0	2	0
Mean		0.0	1.0	1.0	0.0	1.0	0.0
SD		0.0	0.0	0.0	0.0	0.0	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Appendix Table A4ah Age-Related Muscular Degeneration by Age Group, Gender and Ethnicity

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Age-Related Muscular Degeneration</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	9	1	1	7	0	9	9	0	0	0
Yes	51.5	0.0	100.0	57.8	0.0	51.5	51.5	0.0	0.0	0.0
<b>Treated with medicine or surgery (weighted %)</b>										
n	5	0	1	4	0	5	5	0	0	0
Yes	100.0	0.0	100.0	100.0	0.0	100.0	100.0	0.0	0.0	0.0

**Appendix Table A4ai Age-Related Muscular Degeneration by Educational Level and Living Arrangement**

		Educational Level Completed				Living Arrangement	
		None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Age-Related Muscular Degeneration</b>							
<b>Diagnosed by a medical professional (weighted %)</b>							
	n	4	1	1	2	8	0
Yes		50.0	100.0	100.0	100.0	56.8	0.0
<b>Treated with medicine or surgery (weighted %)</b>							
	n	2	0	1	2	5	0
Yes		100.0	0.0	100.0	100.0	100.0	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

**Appendix Table A4aj Autoimmune Disorder by Age Group, Gender and Ethnicity**

		Age Group			Gender		Ethnicity				
		Total	60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Autoimmune Disorder</b>											
<b>Diagnosed by a medical professional (weighted %)</b>											
	n	6	2	0	4	2	4	6	0	0	0
Yes		35.4	49.0	0.0	23.6	100.0	0.0	35.4	0.0	0.0	0.0
<b>Treated with medicine or surgery (weighted %)</b>											
	n	2	1	0	1	2	0	2	0	0	0
Yes		1.0	100.0	0.0	100.0	100.0	0.0	100.0	0.0	0.0	0.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>											
	n	2	1	0	1	2	0	2	0	0	0
Yes		64.2	100.0	0.0	0.0	64.2	0.0	64.2	0.0	0.0	0.0
<b>Number of times hospitalised in the past 6 months</b>											
	n	1	1	0	0	1	0	1	0	0	0
Mean		3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0
SD		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

**Appendix Table A4ak Autoimmune Disorder by Educational Level and Living Arrangement**

		Educational Level Completed				Living Arrangement	
		None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Autoimmune Disorder</b>							
<b>Diagnosed by a medical professional (weighted %)</b>							
	n	2	1	0	2	5	0
Yes		0.0	0.0	0.0	100.0	40.4	0.0
<b>Treated with medicine or surgery (weighted %)</b>							
	n	0	0	0	2	2	0
Yes		0.0	0.0	0.0	0.0	100.0	0.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>							
	n	0	0	0	2	2	0
Yes		0.0	0.0	0.0	64.2	64.2	0.0
<b>Number of times hospitalised in the past 6 months</b>							
	n	0	0	0	1	1	0
Mean		0.0	0.0	0.0	3.0	3.0	0.0
SD		0.0	0.0	0.0	0.0	0.0	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

**Appendix Table A4al Chronic Skin Conditions by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Chronic Skin Conditions (e.g. eczema, psoriasis)?</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	10	5	1	4	2	8	8	1	1	0
Yes	63.2	77.4	100.0	17.5	100.0	50.8	58.5	100.0	100.0	0.0
<b>Treated with medicine or surgery (weighted %)</b>										
n	6	4	1	1	2	4	4	1	1	0
Yes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0

**Appendix Table A4am Chronic Skin Conditions by Educational Level and Living Arrangement**

		Educational Level Completed				Living Arrangement	
		None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Chronic Skin Conditions (e.g. Eczema, Psoriasis)</b>							
<b>Diagnosed by a medical professional (weighted %)</b>							
n		3	2	3	1	9	0
Yes		23.4	47.8	100.0	100.0	68.0	0.0
<b>Treated with medicine or surgery (weighted %)</b>							
n		1	1	3	1	6	0
Yes		100.0	100.0	100.0	100.0	100.0	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

**Appendix Table A4an Epilepsy by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Epilepsy</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	6	2	1	3	1	5	5	1	0	0
Yes	27.8	37.1	100.0	0.0	100.0	17.7	14.5	100.0	0.0	0.0
<b>Treated with medicine or surgery (weighted %)</b>										
n	2	1	1	0	1	1	1	1	0	0
Yes	100.0	100.0	100.0	0.0	100.0	100.0	100.0	100.0	0.0	0.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	2	1	1	0	1	1	1	1	0	0
Yes	55.8	100.0	100.0	0.0	0.0	100.0	0.0	100.0	0.0	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	1	1	0	0	0	1	0	1	0	0
Mean	2.0	2.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
SD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



**Appendix Table A4ao Epilepsy by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Epilepsy</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	3	1	0	1	5	0
Yes	32.8	0.0	0.0	100.0	32.3	0.0
<b>Treated with medicine or surgery (weighted %)</b>						
n	1	0	0	1	2	0
Yes	100.0	0.0	0.0	100.0	100.0	0.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	1	0	0	1	2	0
Yes	100.0	0.0	0.0	0.0	55.8	0.0
<b>Number of times hospitalised in the past 6 months</b>						
n	1	0	0	0	1	0
Mean	2.0	0.0	0.0	0.0	2.0	0.0
SD	0.0	0.0	0.0	0.0	0.0	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

**Appendix Table A4ap Thyroid Disorder by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Thyroid Disorder</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	90	40	26	24	13	77	69	7	13	1
Yes	95.7	97.1	100.0	85.9	100.0	95.0	94.9	100.0	100.0	100.0
<b>Treated with medicine or surgery (weighted %)</b>										
n	86	36	26	21	13	73	65	7	13	1
Yes	95.0	94.3	96.9	94.6	100.0	94.1	94.1	100.0	100.0	100.0
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>										
n	82	37	25	20	13	69	61	7	13	1
Yes	5.3	6.4	6.6	0.0	10.5	4.3	6.0	0.0	3.9	0.0
<b>Number of times hospitalised in the past 6 months</b>										
n	4	2	2	0	1	3	3	0	1	0
Mean	1.6	1.5	1.6	0.0	2.0	1.3	1.4	0.0	4.0	0.0
SD	1.0	0.7	1.7	0.0	0.0	1.1	0.6	0.0	0.0	0.0

**Appendix Table A4aq Thyroid Disorder by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Thyroid Disorder</b>						
<b>Diagnosed by a medical professional (weighted %)</b>						
n	34	22	26	7	82	7
Yes	94.4	93.3	100.0	100.0	96.2	100.0
<b>Treated with medicine or surgery (weighted %)</b>						
n	32	21	26	7	79	7
Yes	97.2	100.0	93.0	83.3	95.5	89.7
<b>Hospitalised due to condition in the past 6 months (weighted %)</b>						
n	31	21	24	6	76	6
Yes	15.8	0.0	0.0	0.0	3.4	27.2
<b>Number of times hospitalised in the past 6 months</b>						
n	4	0	0	0	2	2
Mean	1.6	0.0	0.0	0.0	1.0	2.4
SD	1.0	0.0	0.0	0.0	0.0	1.1

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Appendix Table A4ar Migraine by Age Group, Gender and Ethnicity

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Migraine</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	6	3	0	3	1	5	5	0	1	0
Yes	35.6	60.2	0.0	0.0	100.0	26.3	26.3	0.0	100.0	0.0
<b>Treated with medicine or surgery (weighted %)</b>										
n	2	2	0	0	1	1	1	0	1	0
Yes	35.5	35.5	0.0	0.0	100.0	0.0	0.0	0.0	100.0	0.0

Appendix Table A4as Migraine by Educational Level and Living Arrangement

		Educational Level Completed				Living Arrangement	
		None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Migraine</b>							
<b>Diagnosed by a medical professional (weighted %)</b>							
n		2	2	1	0	5	0
Yes		0.0	34.9	100.0	0.0	40.6	0.0
<b>Treated with medicine or surgery (weighted %)</b>							
n		0	1	1	0	2	0
Yes		0.0	100.0	0.0	0.0	35.5	0.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Appendix Table A4at Parkinsonism by Age Group, Gender and Ethnicity

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Parkinsonism</b>										
<b>Diagnosed by a medical professional (weighted %)</b>										
n	19	5	8	6	9	10	15	2	2	0
Yes	0.8	78.0	100.0	39.8	100.0	59.0	75.6	100.0	100.0	0.0
<b>Treated with medicine or surgery (weighted %)</b>										
n	15	4	8	3	9	6	11	2	2	0
Yes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0

Appendix Table A4au Parkinsonism by Educational Level and Living Arrangement

		Educational Level Completed				Living Arrangement	
		None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Parkinsonism</b>							
<b>Diagnosed by a medical professional (weighted %) (weighted %)</b>							
n		6	6	5	1	17	1
Yes		65.3	79.4	100.0	100.0	80.1	100.0
<b>Treated with medicine or surgery (weighted %)</b>							
n		4	5	5	1	14	1
Yes		100.0	100.0	100.0	100.0	100.0	100.0

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

**Appendix Table A4av ADL Limitation Status by Age Group, Gender and Ethnicity – Part (ii)**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>How difficult do you find it to perform this activity by yourself? (weighted %)</b>										
<b>Take a bath / shower</b>										
n	293	32	69	192	77	216	211	48	32	2
Somewhat difficult	36.3	37.3	49.5	31.2	29.5	38.8	32.8	49.2	53.8	56.1
Very difficult	24.8	29.9	17.3	26.3	28.4	23.5	25.8	23.9	18.3	0.0
Unable to perform	37.3	29.0	33.2	40.9	42.1	35.6	39.5	27.0	27.9	43.9
<b>Dress Up</b>										
n	237	23	59	155	74	163	170	36	29	2
Somewhat difficult	41.8	37.8	49.1	39.9	39.8	42.7	38.9	48.0	61.2	56.1
Very difficult	22.9	26.3	15.6	24.9	21.2	23.6	24.0	22.1	15.6	0.0
Unable to perform	33.4	30.7	35.3	33.2	39.1	30.8	34.7	29.9	23.2	43.9
<b>Eat</b>										
n	100	13	23	64	36	64	68	19	12	1
Somewhat difficult	36.3	14.5	48.2	38.7	35.7	36.7	33.4	65.7	27.9	0.0
Very difficult	25.7	40.9	22.2	22.0	24.9	26.1	28.8	5.6	27.9	0.0
Unable to perform	33.	35.5	29.5	34.1	39.4	29.9	32.1	28.6	44.2	100.0
<b>Stand up from a bed / chair; sitting down on a chair</b>										
n	395	58	102	235	89	306	264	77	51	3
Somewhat difficult	65.1	69.6	73.1	59.9	57.9	67.1	64.4	66.6	68.1	71.7
Very difficult	18.3	18.9	13.0	20.5	18.4	18.3	18.8	18.1	16.3	0.0
Unable to perform	15.5	9.3	13.9	18.2	23.7	13.1	15.3	15.3	15.6	28.3
<b>Walk (around the house)</b>										
n	431	51	117	263	119	312	301	86	41	3
Somewhat difficult	59.7	56.3	74.2	54.1	58.6	60.1	57.8	68.3	61.7	71.7
Very difficult	23.6	28.3	11.8	27.6	23.1	23.8	25.7	16.0	18.0	0.0
Unable to perform	15.6	12.9	14.0	17.1	18.4	14.6	15.1	15.8	20.3	28.3
<b>Use the sitting toilet</b>										
n	213	20	53	140	68	145	149	41	22	1
Somewhat difficult	46.1	41.6	52.8	44.5	48.7	44.9	44.8	56.3	45.0	0.0
Very difficult	25.7	30.7	24.3	25.2	23.7	26.7	26.9	24.3	16.2	0.0
Unable to perform	25.9	21.7	23.0	28.0	27.6	25.2	25.5	19.4	38.8	100.0

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A4aw ADL Limitation Status by Educational Level and Living Arrangement – Part (ii)**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>How difficult do you find it to perform this activity by yourself? (weighted %)</b>						
<b>Take a bath / shower</b>						
n	174	60	39	12	266	26
Somewhat difficult	36.1	33.8	44.8	32.6	35.2	48.8
Very difficult	24.0	33.0	21.6	6.1	24.8	25.5
Unable to perform	38.7	30.5	33.7	61.4	38.6	25.8
<b>Dress Up</b>						
n	135	47	33	16	214	22
Somewhat difficult	43.7	35.8	48.4	41.3	41.9	43.0
Very difficult	23.4	26.8	21.2	7.4	21.7	35.0
Unable to perform	31.4	33.8	30.4	51.2	34.7	22.1
<b>Eat</b>						
n	49	21	19	7	92	7
Somewhat difficult	41.4	22.2	52.5	0.0	37.8	18.5
Very difficult	22.4	46.1	26.8	0.0	26.4	18.3
Unable to perform	32.1	23.0	20.7	100.0	31.7	63.3
<b>Stand up from a bed / chair; sitting down on a chair</b>						
n	228	84	57	19	351	43
Somewhat difficult	65.1	65.0	72.2	50.7	64.2	73.7
Very difficult	20.9	17.2	12.8	10.1	19.1	11.9
Unable to perform	13.0	15.8	15.0	39.2	15.6	14.4
<b>Walk (around the house)</b>						
n	249	100	53	22	390	40
Somewhat difficult	60.9	57.9	58.7	61.5	60.1	57.3
Very difficult	25.5	24.6	22.8	5.6	23.2	27.9
Unable to perform	12.8	15.9	18.5	32.9	15.8	14.8
<b>Use the sitting toilet</b>						
n	124	46	28	8	193	19
Somewhat difficult	50.4	40.6	50.1	7.8	46.9	40.0
Very difficult	26.4	33.0	17.8	0.0	25.7	26.9
Unable to perform	21.5	22.8	32.1	92.2	25.3	33.2

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A4ax Requirement of Assistance/Device for ADL by Age Group and Ethnicity**

	Total	Age Group			Ethnicity			
		60-69	70-79	80 & above	Chinese	Malay	Indian	Others
n	521	76	148	297	359	97	62	3
Human Assistance	27.3	24.0	22.1	31.1	28.2	21.6	26.9	28.3
Device Assistance	25.6	21.3	28.1	25.9	26.6	23.5	22.1	0.0
Both	27.8	15.4	22.8	34.9	26.0	39.5	26.6	36.3
None	19.3	39.3	27.0	8.1	19.2	15.5	24.4	35.4

**Appendix Table A4ay Requirement of Assistance/Device for ADL by Education Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
n	294	121	72	27	473	48
Human Assistance	29.0	19.7	27.8	39.2	28.0	19.8
Device Assistance	26.3	24.5	25.8	27.3	24.0	41.0
Both	31.6	26.2	20.3	12.0	28.5	21.8

None	13.2	29.6	26.1	21.6	19.5	17.4
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\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

**Appendix Table A4az IADL Limitation Status by Age Group, Gender and Ethnicity – Part (ii)**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>How difficult do you find it to perform this activity by yourself? (weighted %)</b>										
<b>Prepare own meals</b>										
n	365	46	92	227	88	277	261	65	37	2
Somewhat difficult	26.9	36.1	39.2	19.3	31.8	25.4	23.7	38.2	47.3	0.0
Very difficult	19.0	19.2	16.7	19.8	33.1	14.6	18.3	22.2	12.9	100.0
Unable to perform	52.6	41.9	43.1	59.5	34.2	58.3	56.1	39.6	39.8	0.0
<b>Leave the home to purchase necessary items or medication</b>										
n	577	70	169	338	162	415	387	118	70	2
Somewhat difficult	41.9	53.7	54.3	32.1	47.3	39.8	39.1	47.5	59.7	0.0
Very difficult	19.4	18.0	19.3	19.7	25.8	16.9	17.9	25.5	17.9	100.0
Unable to perform	37.8	26.1	26.4	47.1	27.0	42.0	41.9	26.2	22.4	0.0
<b>Take care of financial matters such as paying utilities (electricity, water)</b>										
n	177	18	46	113	57	120	133	31	12	1
Somewhat difficult	23.7	16.8	33.6	21.3	34.2	18.8	23.5	28.2	19.9	0.0
Very difficult	26.5	22.9	38.5	22.6	29.7	25.1	25.8	29.6	37.0	0.0
Unable to perform	46.5	53.6	25.5	53.4	36.2	51.4	47.6	42.3	30.7	100.0
<b>Use the phone</b>										
n	260	17	71	172	83	177	189	49	20	2
Somewhat difficult	41.0	56.7	47.0	35.8	37.8	42.6	40.6	50.3	24.1	55.6
Very difficult	19.3	18.8	14.4	21.4	32.3	13.0	19.3	7.9	39.4	44.4
Unable to perform	37.9	18.2	38.5	41.0	29.9	41.7	37.9	41.9	36.5	0.0
<b>Dust, clean-up and other light housework</b>										
n	421	60	119	242	100	321	299	79	41	2
Somewhat difficult	33.2	54.0	44.6	20.0	46.0	29.2	29.8	48.7	48.8	0.0
Very difficult	17.8	8.4	22.3	18.9	25.4	15.5	17.4	14.9	20.9	100.0
Unable to perform	47.8	35.5	33.2	59.8	28.6	53.9	51.5	36.5	30.2	0.0
<b>Take public transport to leave home</b>										
n	667	70	201	396	208	459	439	144	82	2
Somewhat difficult	40.8	50.8	51.2	32.9	48.0	37.6	39.1	45.0	50.8	0.0
Very difficult	21.1	22.3	20.2	21.3	25.7	19.1	19.9	25.4	21.1	100.0
Unable to perform	37.3	25.0	28.3	45.0	26.3	42.1	40.1	29.1	28.1	0.0
<b>Take medication as prescribed</b>										
n	277	17	68	192	95	182	202	48	26	1
Somewhat difficult	45.8	23.5	46.8	48.6	42.9	47.3	45.9	49.5	40.8	0.0
Very difficult	21.6	19.6	23.4	21.2	31.5	16.2	22.0	16.8	17.6	100.0
Unable to perform	30.9	50.2	29.8	28.6	25.6	33.8	30.0	33.7	41.6	0.0

<b>Use the Internet for e-mail or for any other purpose, such as making purchases or travel reservations, communicating with relatives and friends, or searching for information</b>										
n	401	130	132	139	238	163	289	83	28	1
Somewhat difficult	20.7	22.4	21.0	17.7	9.7	36.0	20.4	21.4	25.8	0.0
Very difficult	19.0	19.1	20.5	17.2	22.0	14.9	18.5	18.1	26.7	100.0
Unable to perform	58.7	56.2	58.5	62.7	68.3	45.3	59.4	58.9	47.5	0.0

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A4aaa IADL Limitation Status by Educational Level and Living Arrangement – Part (ii)**

	<b>Educational Level Completed</b>				<b>Living Arrangement</b>	
	<b>None</b>	<b>Primary</b>	<b>Secondary</b>	<b>Tertiary</b>	<b>Not Living Alone</b>	<b>Living Alone*</b>
<b>How difficult do you find it to perform this activity by yourself? (weighted %)</b>						
<b>Prepare own meals</b>						
n	223	81	40	14	332	32
Somewhat difficult	25.1	29.5	35.2	28.2	26.4	32.8
Very difficult	14.5	27.9	26.5	17.5	19.5	14.7
Unable to perform	59.3	40.5	36.1	54.3	52.7	52.5
<b>Leave the home to purchase necessary items or medication</b>						
n	334	136	72	28	523	53
Somewhat difficult	36.6	48.6	55.5	43.2	41.6	44.9
Very difficult	17.1	26.0	18.5	19.4	19.2	21.5
Unable to perform	45.5	24.2	25.9	37.4	38.3	33.7
<b>Take care of financial matters such as paying utilities (electricity, water)</b>						
n	105	40	21	9	159	17
Somewhat difficult	19.6	26.9	41.1	16.9	24.2	20.2
Very difficult	26.4	36.4	22.7	0.0	27.5	18.7
Unable to perform	50.9	32.7	36.1	83.1	45.3	61.1
<b>Use the phone</b>						
n	160	59	24	10	248	11
Somewhat difficult	40.2	45.5	43.2	24.1	40.7	53.4
Very difficult	16.8	22.9	26.1	26.6	16.7	10.8
Unable to perform	41.6	28.8	30.8	49.4	38.1	35.8
<b>Dust, clean-up and other light housework</b>						
n	249	104	47	14	377	43
Somewhat difficult	25.0	46.1	53.0	22.5	32.1	42.9
Very difficult	17.2	18.7	17.3	28.2	17.9	17.4
Unable to perform	56.9	33.6	29.7	49.4	48.9	39.7
<b>Take public transport to leave home</b>						
n	394	161	80	25	605	61
Somewhat difficult	36.5	48.5	55.0	24.5	40.8	41.3
Very difficult	19.2	24.7	21.0	28.2	20.6	26.6
Unable to perform	43.6	25.8	24.0	47.4	37.9	32.1
<b>Take medication as prescribed</b>						
n	172	57	29	13	258	18
Somewhat difficult	50.0	41.2	41.4	23.7	45.9	46.7
Very difficult	18.0	31.7	28.4	15.0	21.9	17.0
Unable to perform	30.8	24.2	30.3	61.3	30.7	36.3
<b>Use the Internet for e-mail or for any other purpose, such as making purchases or travel reservations, communicating with relatives and friends, or searching for information</b>						
n	202	126	57	14	366	32
Somewhat difficult	22.9	17.0	21.6	24.1	20.2	26.6
Very difficult	19.8	18.6	19.6	11.8	19.0	16.2

Unable to perform	55.9	62.2	58.8	64.1	59.3	57.2
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\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
 Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A4aab Requirement of Assistance/Device for IADL by Age Group and Ethnicity**

	Total	Age Group			Ethnicity			
		60-69	70-79	80 & above	Chinese	Malay	Indian	Others
n	1091	214	357	520	746	219	123	3
Human Assistance	46.4	45.7	43.6	49.0	47.7	39.6	44.5	63.8
Device Assistance	8.5	5.3	9.4	9.9	8.5	9.6	6.8	0.0
Both	19.9	9.7	16.7	28.7	18.5	26.1	23.5	36.3
None	25.1	39.3	30.3	12.4	25.3	24.8	25.1	0.0

**Appendix Table A4aac Requirement of Assistance/Device for IADL by Education Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
n	589	305	148	43	999	90
Human Assistance	47.9	44.1	44.6	50.9	46.7	44.5
Device Assistance	7.4	9.7	9.1	13.5	8.0	14.2
Both	21.5	15.2	23.6	19.5	19.8	22.5
None	23.3	31.0	22.8	16.0	25.5	18.8

**Appendix Table A4aad Limitation in Activities Due to Health Problem by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Limited in activities due to a health problem in the past 6 months (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Severely limited	4.3	1.4	3.6	15.0	3.4	5.1	4.1	5.8	5.1	1.5
Limited but not severely	14.8	7.9	17.1	32.9	12.5	16.8	13.0	24.3	22.8	20.7
Not limited at all	80.7	90.5	79.2	51.5	84.0	77.7	82.7	69.2	71.9	77.8

**Appendix Table A4aae Limitation in Activities Due to Health Problem by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Limited in activities due to a health problem in the past 6 months (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Severely limited	8.6	3.1	2.4	1.8	4.4	2.8
Limited but not severely	22.5	14.7	10.1	9.0	14.6	17.2
Not limited at all	68.6	81.9	87.2	89.2	80.7	79.8

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Appendix Table A6a Healthcare Utilisation by Age Group, Gender and Ethnicity

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Number of times in the past 3 months</b>										
<b>Private general practitioner (GP)</b>										
n	1379	618	460	301	644	735	1013	223	132	11
Mean	1.6	1.6	1.6	1.7	1.6	1.5	1.5	1.6	1.8	1.5
SD	1.1	1.2	1.0	1.1	1.2	1.1	1.1	1.4	1.4	1.1
<b>Doctor at polyclinic</b>										
n	1963	788	701	474	944	1019	1422	305	218	18
Mean	1.3	1.2	1.4	1.3	1.3	1.2	1.3	1.2	1.3	1.3
SD	1.3	0.7	1.9	0.8	1.5	1.0	1.4	0.8	0.7	0.7
<b>Doctor at specialist outpatient clinic</b>										
n	1126	458	380	288	543	583	830	135	151	10
Mean	1.7	1.7	1.9	1.4	1.7	1.7	1.7	1.9	1.6	1.4
SD	2.6	1.8	4.0	0.9	3.3	1.8	2.6	3.5	2.3	0.7
<b>Private specialist</b>										
n	166	69	57	40	79	87	128	15	19	4
Mean	1.4	1.3	1.4	1.9	1.5	1.3	1.4	1.2	1.8	1.8
SD	1.5	0.9	1.3	2.7	1.5	1.5	1.4	0.4	2.8	1.1
<b>Traditional Chinese Medicine (TCM)</b>										
n	439	204	157	78	182	257	414	12	10	3
Mean	3.7	3.9	3.5	3.7	3.1	4.2	3.8	2.4	2.0	1.0
SD	4.9	5.4	4.1	4.5	4.7	5.0	5.0	2.7	2.6	0.0
<b>Number of visits in the past 6 months</b>										
<b>Hospital emergency room</b>										
n	415	148	132	135	186	229	278	79	55	3
Mean	1.3	1.3	1.2	1.5	1.4	1.3	1.3	1.3	1.3	1.0
SD	0.9	0.8	0.5	1.2	0.9	0.8	0.8	0.9	1.5	0.0
<b>Number of nights in the past 12 months</b>										
<b>Admitted to nursing home</b>										
n	25	6	8	11	14	11	20	3	2	0
Mean	25.6	21.7	37.6	20.0	27.9	22.0	27.8	12.6	13.4	0.0
SD	27.6	29.6	38.0	13.7	34.0	13.8	29.0	13.2	20.3	0.0
<b>Admitted to public or private hospital</b>										
n	616	190	210	216	333	283	407	128	74	7
Mean	12.2	10.1	14.6	11.8	12.0	12.4	12.4	13.7	10.3	3.6
SD	22.1	19.6	27.6	16.5	22.2	22.0	22.7	23.6	16.6	2.0



**Appendix Table A6b Healthcare Utilisation by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Number of times in the past 3 months</b>						
<b>Private general practitioner (GP)</b>						
n	430	414	387	148	1261	118
Mean	1.6	1.5	1.6	1.7	1.6	1.6
SD	1.1	1.2	1.0	1.3	1.1	1.0
<b>Doctor at polyclinic</b>						
n	637	622	516	184	1786	175
Mean	1.3	1.2	1.3	1.5	1.3	1.3
SD	1.3	0.7	1.4	2.0	1.3	0.9
<b>Doctor at specialist outpatient clinic</b>						
n	316	313	319	176	1011	115
Mean	1.6	1.7	1.8	1.6	1.6	2.2
SD	2.1	2.0	3.9	1.1	1.8	6.3
<b>Private specialist</b>						
n	44	34	38	50	148	17
Mean	1.8	1.1	1.4	1.4	1.4	1.4
SD	2.5	0.3	1.0	1.3	1.6	0.7
<b>Traditional Chinese Medicine (TCM)</b>						
n	138	134	114	53	390	49
Mean	3.7	4.0	3.4	3.9	3.7	3.9
SD	4.4	5.5	4.3	5.7	5.0	4.4
<b>Number of visits in the past 6 months</b>						
<b>Hospital emergency room</b>						
n	415	148	122	99	43	376
Mean	1.3	1.4	1.3	1.2	1.4	1.3
SD	0.9	1.1	0.7	0.5	0.9	0.9
<b>Number of nights in the past 12 months</b>						
<b>Admitted to nursing home</b>						
n	10	8	6	1	23	2
Mean	14.7	22.3	30.4	75.0	25.8	22.3
SD	14.1	22.3	36.6	0.0	28.4	15.5
<b>Admitted to public or private hospital</b>						
n	227	205	137	43	555	61
Mean	12.7	12.1	10.9	13.8	11.9	14.5
SD	20.1	22.7	19.3	32.7	21.7	25.1

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
 Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A6c Length of Last Admission to Public or Private Hospital by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>How long was your last admission to a public or private hospital?</b>										
n	619	190	210	219	334	285	411	127	74	7
Mean	8.7	7.2	10.3	8.8	8.1	9.4	9.1	8.3	7.8	3.3
SD	16.1	14.8	19.6	12.6	15.0	17.3	17.3	12.0	12.9	1.7

**Appendix Table A6d Length of Last Admission to Public or Private Hospital by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>How long was your last admission to a public or private hospital?</b>						
n	229	206	137	43	557	62
Mean	8.4	9.0	9.4	6.9	8.3	11.9
SD	12.3	18.0	19.0	13.4	15.2	22.6

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

**Appendix Table A6e English Reading Ability by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Are you able to read in English?</b>										
n	2277	1020	754	503	1059	1218	1682	351	226	18
Yes	47.2	60.4	38.4	20.9	55.9	39.6	42.6	61.9	77.0	94.3

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A6f English Reading Ability by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Are you able to read in English?</b>						
n	684	709	623	257	2084	191
Yes	6.4	34.8	79.8	90.3	47.0	49.4

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A6g Chinese Reading Ability by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Are you able to read in Chinese?</b>										
n	2277	1020	754	503	1059	1218	1682	351	226	18
Yes	63.2	66.6	65.1	48.4	69.4	57.7	75.4	5.1	1.8	0.0

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A6h Chinese Reading Ability by Educational Level and Living Arrangement**

	Total	Educational Level Completed				Living Arrangement	
		None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Are you able to read in Chinese?</b>							
n	2277	684	709	623	257	2084	191
Yes	63.2	53.5	74.3	59.8	64.6	63.2	64.1

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A6i Malay Reading Ability by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Are you able to read in Malay?</b>										
n	2277	1020	754	503	1059	1218	1682	351	226	18
Yes	26.6	31.5	23.7	16.2	39.0	15.8	17.8	88.6	47.8	37.6

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A6j Malay Reading Ability by Educational Level and Living Arrangement**

	Educational Level Completed					Living Arrangement	
	Total	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Are you able to read in Malay?</b>							
n	2277	684	709	623	257	2084	191
Yes	26.6	14.2	27.4	36.7	28.0	27.2	20.3

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
Percentages may not add up to 100% as responses of ‘Refused/Don’t Know’ are not shown.

**Appendix Table A6k Tamil Reading Ability by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Are you able to read in Tamil?</b>										
n	2277	1020	754	503	1059	1218	1682	351	226	18
Yes	3.7	3.6	3.8	3.5	4.1	3.2	0.2	0.7	56.3	0.0

Percentages may not add up to 100% as responses of ‘Refused/Don’t Know’ are not shown.

**Appendix Table A6l Tamil Reading Ability by Educational Level and Living Arrangement**

	Educational Level Completed					Living Arrangement	
	Total	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Are you able to read in Tamil?</b>							
n	2277	684	709	623	257	2084	191
Yes	3.7	1.8	4.3	4.5	4.0	3.9	1.5

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
Percentages may not add up to 100% as responses of ‘Refused/Don’t Know’ are not shown.

**Appendix Table A6m Reading Ability in Other Languages by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Are you able to read in any other language?</b>										
n	2277	1020	754	503	1059	1218	1682	351	226	18
Yes	1.4	1.5	1.3	1.5	2.3	0.7	0.5	2.1	6.6	31.4

Percentages may not add up to 100% as responses of ‘Refused/Don’t Know’ are not shown.

**Appendix Table A6n Reading Ability in Other Languages by Educational Level and Living Arrangement**

	Educational Level Completed					Living Arrangement	
	Total	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Are you able to read in any other language?</b>							
n	2277	684	709	623	257	2084	191
Yes	1.4	0.1	0.4	1.2	7.4	1.5	0.9

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
Percentages may not add up to 100% as responses of ‘Refused/Don’t Know’ are not shown.

**Appendix Table A7A. Distribution of older person characteristics, and their association with number of primary care (general practitioner and polyclinic) outpatient visits in the last 3 months: Results of the unadjusted two-part models**

Characteristics	%	Two-part model for number of primary care visits		
		Logit	Negative binomial	Overall
N	1880	1880	1159	1880
		Coefficients		Marginal Effects (number of visits versus reference group)
<b>Age group</b>				
60-69 years	49.89	Reference		
70-79 years	34.20	0.27*	0.01	0.12
>=80 years	15.90	0.25	0.02	0.12
<b>Gender</b>				
Male	50.53	Reference		
Female	49.47	0.01	-0.11	-0.11
<b>Ethnicity</b>				
Chinese	74.47	Reference		
Malay	14.95	0.03	0.07	0.09
Indian	9.79	0.12	0.01	0.06
Others	0.80	0.24	-0.19	-0.10
<b>Education</b>				
No formal education	24.95	Reference		
Primary	31.33	-0.11	-0.06	-0.10
Secondary/ITE/Vocational	31.33	-0.20	-0.01	-0.09
Above Secondary	12.39	-0.23	0.08	-0.01
<b>Housing Type</b>				
HDB 1-2 rooms	8.24	-0.11	-0.16	-0.20
HDB 3 room	24.20	Reference		
HDB 4 rooms	34.73	-0.07	-0.03	-0.06
HDB 5 room and above/HUDC/Executive	23.88	-0.21	-0.01	-0.09
Private and others	8.94	-0.38*	-0.12	-0.27
<b>Living arrangement</b>				
Living alone or with FDW/maid	9.68	0.07	-0.07	-0.05
With spouse only	23.67	0.25*	-0.07	0.03
With child only	16.60	0.39**	-0.01	0.15
With child and spouse	44.31	Reference		
With others only	5.74	0.28	0.08	0.21
<b>ADL limitations</b>				
0	94.57	Reference		
1	2.18	0.81*	0.09	0.41
2	1.01	0.08	0.25	0.34
3 or more	2.23	0.03	0.33	0.42
<b>Number of chronic health conditions</b>				
0 condition	18.09	Reference		
1 condition	21.76	1.11***	-0.10	0.39**
2 conditions	21.97	1.48***	-0.11	0.52***
3 or more conditions	38.19	1.58***	-0.06	0.61***
<b>Employment status</b>				
Working full-time	23.46	Reference		

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Working part-time	12.07	0.10	-0.05	-0.01
Retired and/or not working	57.02	0.11	-0.07	-0.03
Never worked	7.45	-0.12	-0.06	-0.11
<b>Income adequacy</b>				
Enough money, with some left over/ Just enough money, no difficulty	82.34	Reference		
Some difficulty to meet expenses/ Much difficulty to meet expenses	17.66	-0.06	0.16	0.15
<b>Private Health Insurance</b>				
No	69.20	Reference		
Yes	30.80	-0.01	0.05	0.05
<b>Health benefits from current or previous employer</b>				
No	78.72	Reference		
Yes	21.28	0.05	0.13	0.16
<b>Clinically significant depressive symptoms</b>				
No	88.24	Reference		
Yes	11.76	0.33*	0.25*	0.44**
<b>Loneliness</b>				
Not lonely	64.36	Reference		
Sometimes lonely	22.50	0.15	0.16	0.23*
Mostly lonely	13.14	0.07	0.26*	0.32*
<b>Social network</b>				
Lowest tertile	33.09	Reference		
Middle tertile	32.02	0.04	-0.04	-0.02
Highest tertile	34.89	0.03	-0.02	-0.01
<b>Personal mastery</b>				
Lowest tertile	45.05	Reference		
Middle tertile	40.53	-0.15	-0.03	-0.09
Highest tertile	14.41	-0.60***	-0.03	-0.28*
<b>Number of Tertiary outpatient visits</b>	Mean=0.46	0.13**	0.10**	0.16***
<b>Cognition score</b>	Mean=9.33	-0.002	-0.05	-0.05

\*<0.05; \*\*<0.01 \*\*\*<0.001

**Appendix Table A7B. Distribution of older person characteristics, and their association with number of tertiary care (specialist outpatient clinic and private specialist) outpatient visits in the last 3 months: Results of the unadjusted two-part models**

Characteristics	%	Two-part model for number of tertiary care outpatient visits		
		Logit	Negative binomial	Overall
		Coefficients		Marginal Effects (number of visits versus reference group)
<b>N</b>	<b>1880</b>	<b>1880</b>	<b>510</b>	<b>1880</b>
<b>Age group</b>				
60-69 years	49.89	Reference		
70-79 years	34.20	0.13	0.10	0.09
>=80 years	15.90	0.40**	-0.07	0.10
<b>Gender</b>				
Male	50.53	Reference		
Female	49.47	-0.10	-0.05	-0.06
<b>Ethnicity</b>				
Chinese	74.47	Reference		
Malay	14.95	-0.41*	0.06	-0.10
Indian	9.79	0.26	-0.04	0.07
Others	0.80	0.27	-0.06	0.06
<b>Education</b>				
No formal education	24.95	Reference		
Primary	31.33	0.11	-0.15	-0.02
Secondary/ITE/Vocational	31.33	0.32*	-0.16	0.03
Above Secondary	12.39	0.85***	-0.09	0.27*
<b>Housing Type</b>				
HDB 1-2 rooms	8.24	-0.24	-0.01	-0.07
HDB 3 room	24.20	Reference		
HDB 4 rooms	34.73	-0.01	0.13	0.05
HDB 5 room and above/HUDC/Executive	23.88	0.12	0.03	0.05
Private and others	8.94	0.76***	0.17	0.39**
<b>Living arrangement</b>				
Living alone or with FDW/maid	9.68	0.40*	-0.02	0.13
With spouse only	23.67	0.13	0.07	0.08
With child only	16.60	-0.12	-0.03	-0.05
With child and spouse	44.31	Reference		
With others only	5.74	0.60*	-0.05	-0.18
<b>ADL limitations</b>				
0	94.57	Reference		
1	2.18	0.02	0.72*	0.47
2	1.01	0.92*	0.02	0.36
3 or more	2.23	0.83**	0.43	0.71
<b>Number of chronic health conditions</b>				
0 condition	18.09	Reference		
1 condition	21.76	0.62**	0.09	0.18*
2 conditions	21.97	0.55**	-0.01	0.12
3 or more conditions	38.19	1.43***	0.10	0.48***
<b>Employment status</b>				

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Working full-time	23.46	Reference		
Working part-time	12.07	-0.37	0.17	-0.04
Retired and/or not working	57.02	0.21	0.12	0.12
Never worked	7.45	-0.25	0.07	-0.04
<b>Income adequacy</b>				
Enough money, with some left over/ Just enough money, no difficulty	82.34	Reference		
Some difficulty to meet expenses/ Much difficulty to meet expenses	17.66	0.20	0.17	0.16
<b>Private Insurance</b>				
No	69.20	Reference		
Yes	30.80	-0.19	-0.07	-0.09
<b>Health benefits from current or previous employer</b>				
No	78.72	Reference		
Yes	21.28	0.23	-0.02	0.07
<b>Clinically significant depressive symptoms</b>				
No	88.24	Reference		
Yes	11.76	0.27	0.18	0.20
<b>Loneliness</b>				
Not lonely	64.36	Reference		
Sometimes lonely	22.50	-0.10	0.02	-0.02
Mostly lonely	13.14	-0.25	0.23	0.02
<b>Social network</b>				
Lowest tertile	33.09	Reference		
Middle tertile	32.02	-0.02	0.05	0.01
Highest tertile	34.89	0.13	0.03	0.06
<b>Personal mastery</b>				
Lowest tertile	45.05	Reference		
Middle tertile	40.53	-0.35**	-0.06	-0.15*
Highest tertile	14.41	-0.60***	-0.20	-0.27**
<b>Number of primary care visits</b>	Mean=1.05	0.23***	0.04	0.09***
<b>Cognition score</b>	Mean=9.33	0.12*	-0.004	0.04

\*<0.05; \*\*<0.01 \*\*\*<0.001

**Appendix Table A7C. Distribution of older person characteristics, unadjusted and adjusted odds ratio for Emergency Room visits during the last six months (N=1879)**

Characteristics	%	Unadjusted OR	Adjusted OR
<b>Age group</b>			
60-69 years	49.87	Reference	
70-79 years	34.22	1.44*	1.17
>=80 years	15.91	1.39	1.14
<b>Gender</b>			
Male	50.56	Reference	
Female	49.44	1.00	1.21
<b>Ethnicity</b>			
Chinese	74.45	Reference	
Malay	14.95	1.69*	1.64*
Indian	9.79	1.91**	1.68
Others	0.80	0.91	0.78
<b>Education</b>			
No formal education	24.96	Reference	
Primary	31.35	1.02	1.20
Secondary/ITE/Vocational	31.35	0.93	1.11
Above Secondary	12.35	1.12	1.31
<b>Housing Type</b>			
HDB 1-2 rooms	8.25	0.75	0.79
HDB 3 room	24.22	Reference	
HDB 4 rooms	34.75	0.74	0.76
HDB 5 room and above/HUDC/Executive	23.84	0.80	0.87
Private and others	8.94	0.87	0.83
<b>Living arrangement</b>			
Living alone or with FDW/maid	9.69	1.23	1.05
With spouse only	23.68	1.11	0.96
With child only	16.55	1.25	1.05
With child and spouse	44.33	Reference	
With others only	5.75	0.32	0.29*
<b>ADL limitations</b>			
0	94.57	Reference	
1	2.18	3.00**	1.89
2	1.01	4.41**	3.49*
3 or more	2.24	6.18***	3.13**
<b>Number of chronic health conditions</b>			
0 condition	18.09	Reference	
1 condition	21.77	1.53	1.22
2 conditions	21.98	1.58	1.32
3 or more conditions	38.16	3.11***	1.72
<b>Employment status</b>			
Working full-time	23.47	Reference	
Working part-time	12.08	1.08	1.15
Retired and/or not working	57.00	1.54*	1.24
Never worked	7.45	1.09	0.85
<b>Income adequacy</b>			
Enough money, with some left over/ Just enough money, no difficulty	82.38	Reference	
Some difficulty to meet expenses/ Much difficulty to meet expenses	17.62	1.96***	1.34
<b>Private Insurance</b>			
No	69.24	Reference	



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Yes	30.76	0.58**	0.74
<b>Health benefits from current or previous employer</b>			
No	78.71	Reference	
Yes	21.29	1.08	1.29
<b>Clinically significant depressive symptoms</b>			
No	88.29	Reference	
Yes	11.71	2.13***	1.38
<b>Loneliness</b>			
Not lonely	64.40	Reference	
Sometimes lonely	22.51	1.12	0.85
Mostly lonely	13.09	0.97	0.48*
<b>Social network</b>			
Lowest tertile	33.10	Reference	
Middle tertile	32.04	0.78	0.79
Highest tertile	34.86	0.79	0.83
<b>Personal mastery</b>			
Lowest tertile	45.02	Reference	
Middle tertile	40.55	0.51***	0.66*
Highest tertile	14.42	0.32***	0.47*
<b>Number of primary care visits</b>	Mean=1.05	1.24***	1.17**
<b>Number of tertiary care visits</b>	Mean=0.46	1.50***	1.38***
<b>Cognition score</b>	Mean=9.33	0.94	1.09

\* $<0.05$ ; \*\* $<0.01$  \*\*\* $<0.001$

**Appendix Table A7D. Distribution of older person characteristics, unadjusted and adjusted odds ratio for hospital admission during the last one year (N=1873)**

Characteristics	%	Unadjusted OR	Adjusted OR
<b>Age group</b>			
60-69 years	49.97	Reference	
70-79 years	34.12	1.54**	1.16
>=80 years	15.91	2.07***	1.29
<b>Gender</b>			
Male	50.61	Reference	
Female	49.39	0.58***	0.49***
<b>Ethnicity</b>			
Chinese	74.48	Reference	
Malay	14.95	2.08***	2.02***
Indian	9.77	1.23	1.02
Others	0.80	0.56	0.52
<b>Education</b>			
No formal education	24.93	Reference	
Primary	31.29	1.16	1.20
Secondary/ITE/Vocational	31.39	0.73	0.75
Above Secondary	12.39	0.60	0.58
<b>Housing Type</b>			
HDB 1-2 rooms	8.17	1.35	1.31
HDB 3 room	24.24	Reference	
HDB 4 rooms	34.76	0.77	0.92
HDB 5 room and above/HUDC/Executive	23.87	0.78	1.19
Private and others	8.97	0.69	1.12
<b>Living arrangement</b>			
Living alone or with FDW/maid	9.61	1.72*	2.02*
With spouse only	23.71	1.20	1.06
With child only	16.60	1.30	1.27
With child and spouse	44.37	Reference	
With others only	5.71	0.79	0.88
<b>ADL limitations</b>			
0	94.55	Reference	
1	2.19	2.10	1.45
2	1.01	5.44***	4.62**
3 or more	2.24	5.61***	3.40**
<b>Number of chronic health conditions</b>			
0 condition	18.10	Reference	
1 condition	21.84	1.27	1.05
2 conditions	21.89	1.74*	1.62
3 or more conditions	38.17	3.08***	2.12**
<b>Employment status</b>			
Working full-time	23.49	Reference	
Working part-time	12.12	0.66	0.66
Retired and/or not working	56.91	1.50*	1.02
Never worked	7.47	0.91	0.71
<b>Income adequacy</b>			
Enough money, with some left over/ Just enough money, no difficulty	82.38	Reference	
Some difficulty to meet expenses/ Much difficulty to meet expenses	17.62	1.92***	1.36
<b>Private Insurance</b>			

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No	69.19	Reference	
Yes	30.81	0.55***	0.82
<b>Health benefits from current or previous employer</b>			
No	78.70	Reference	
Yes	21.30	0.89	0.96
<b>Clinically significant depressive symptoms</b>			
No	88.20	Reference	
Yes	11.80	1.63*	0.98
<b>Loneliness</b>			
Not lonely	64.39	Reference	
Sometimes lonely	22.42	1.11	0.88
Mostly lonely	13.19	1.11	0.65
<b>Social network</b>			
Lowest tertile	33.16	Reference	
Middle tertile	31.93	0.89	1.01
Highest tertile	34.92	0.71*	0.87
<b>Personal mastery</b>			
Lowest tertile	45.11	Reference	
Middle tertile	40.47	0.65**	0.92
Highest tertile	14.42	0.31***	0.45**
<b>Number of primary care visits</b>	Mean=1.05	1.20***	1.10*
<b>Number of tertiary care visits</b>	Mean=0.46	1.54***	1.45***
<b>Cognition score</b>	Mean=9.33	0.93	1.04

\*<0.05; \*\*<0.01 \*\*\*<0.001

**Appendix Table A8a Attendance of Religious Services, Praying in Private Places and Importance of Religion in Life by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
n	2040	987	698	355	992	1048	1524	304	197	15
<b>Attendance of religious services in the last year (weighted %)</b>										
More than once a week	7.4	7.9	7.5	4.8	5.8	8.9	5.2	17.6	18.9	21.8
Once a week	17.9	18.4	16.5	19.4	16.3	19.4	15.0	36.9	27.0	30.4
Two or three times a month	13.7	15.4	12.1	10.2	15.4	12.2	14.1	7.3	17.7	15.6
One or more times a year	33.9	35.1	34.5	26.5	35.1	32.8	37.0	14.4	22.5	23.5
Not at all	26.6	23.0	28.9	37.7	26.8	26.4	28.2	23.4	13.4	8.7
<b>Praying in private places (weighted %)</b>										
More than once a day	28.4	28.1	29.4	26.9	31.0	25.9	21.1	77.0	54.1	41.6
Once a day	22.9	24.4	20.1	22.9	26.0	19.9	24.1	5.2	26.4	49.8
More than once a week	3.9	3.7	3.8	5.1	2.9	4.9	4.0	3.8	4.9	0.0
Two or three times a month	4.8	4.6	5.0	4.9	4.2	5.3	5.1	2.7	4.7	0.0
One or more times a year	7.5	7.2	7.8	8.4	5.3	9.6	8.1	3.8	4.3	8.6
Not at all	32.4	32.0	33.7	31.2	30.5	34.2	37.6	7.3	5.6	0.0
<b>Importance of religion (weighted %)</b>										
Very important	45.3	44.3	45.7	48.9	42.1	48.2	36.6	94.0	85.7	75.2
Somewhat important	40.1	42.5	36.6	37.6	40.0	40.1	46.1	5.7	12.0	24.8
Not at all important	12.4	11.1	15.7	10.2	16.2	8.9	14.7	0.3	1.5	0.0

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A8b Attendance of Religious Services, Praying in Private Places and Importance of Religion in Life by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	No	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
n	545	635	617	241	1834	202
<b>Attendance of religious services in the last year (weighted %)</b>						
More than once a week	4.0	5.6	10.7	10.1	7.3	8.4
Once a week	13.0	14.4	22.5	24.6	17.9	18.0
Two or three times a month	14.0	15.5	13.5	9.2	14.3	8.8
One or more times a year	36.1	40.5	28.3	27.6	34.7	26.7
Not at all	31.8	23.8	24.5	28.6	25.3	38.2
<b>Praying in Private Places (weighted %)</b>						
More than once a day	19.1	32.2	31.2	30.2	28.2	30.4
Once a day	22.0	22.4	25.5	19.2	23.4	18.4
More than once a week	3.6	3.7	4.0	5.1	4.0	3.4
Two or three times a month	6.0	4.0	4.6	5.1	5.1	2.2
One or more times a year	9.5	7.2	6.6	6.5	7.6	7.1
Not at all	39.8	30.4	28.1	33.9	31.7	38.6
<b>Importance of Religion (weighted %)</b>						
Very important	36.4	47.3	49.8	46.4	44.8	50.8
Somewhat important	51.0	40.4	34.6	31.9	41.2	30.2
Not at all important	9.4	10.4	13.6	20.2	11.8	17.7

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
 Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A12a Current Engaged Occupation by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Current Engaged Occupation (weighted %)</b>										
n	1451	1075	330	46	899	552	1087	200	152	12
Professionals	7.9	7.6	8.9	7.9	9.6	5.3	7.9	3.1	10.1	26.8
Administrative & managerial	8.6	9.7	4.9	4.4	9.2	7.7	8.4	6.8	10.8	23.7
Associate professionals & technicians	10.1	10.9	7.7	2.2	14.7	3.0	9.7	12.7	12.9	6.9
Clerical workers	4.2	4.3	3.9	0.0	1.1	8.9	4.5	1.7	1.3	10.1
Sales & services	16.4	17.0	14.7	10.1	12.8	21.8	17.2	8.3	15.6	17.1
Production & related	3.3	3.6	2.4	0.0	1.5	5.9	3.3	5.3	0.9	0.0
Cleaners & labourers	19.4	16.3	29.5	31.7	13.6	28.1	19.0	29.6	16.3	0.0
Others	30.1	30.5	27.7	43.7	37.4	19.1	30.0	32.5	32.1	15.4

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A12b Current Engaged Occupation by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	No	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Current Engaged Occupation (weighted %)</b>						
n	246	461	528	216	1346	102
Professionals	0.0	2.8	5.6	31.8	7.8	9.4
Administrative & managerial	0.9	1.7	13.1	20.1	9.0	3.8
Associate professionals & technicians	4.4	9.1	13.9	9.2	10.5	4.8
Clerical workers	0.7	1.1	8.4	4.3	3.9	7.1
Sales & services	18.0	21.3	15.1	8.0	16.1	20.0
Production & related	5.8	4.1	2.9	0.0	3.4	1.4
Cleaners & labourers	49.1	26.3	7.6	1.3	18.6	29.4
Others	21.1	33.6	33.6	24.8	30.7	24.0

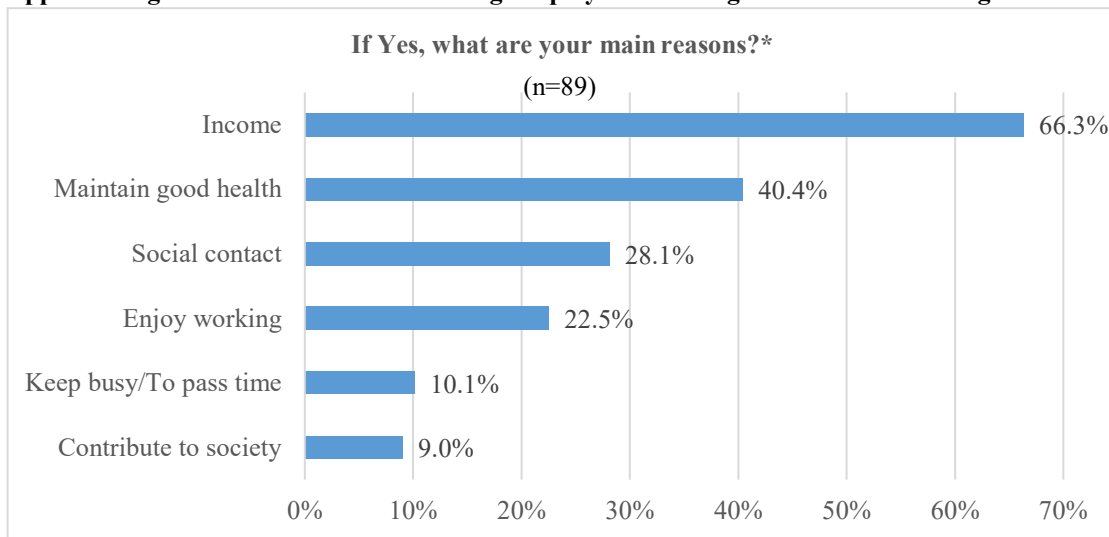
\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

**Appendix Figure A12c Employment Seeking among Retired/Not Working**



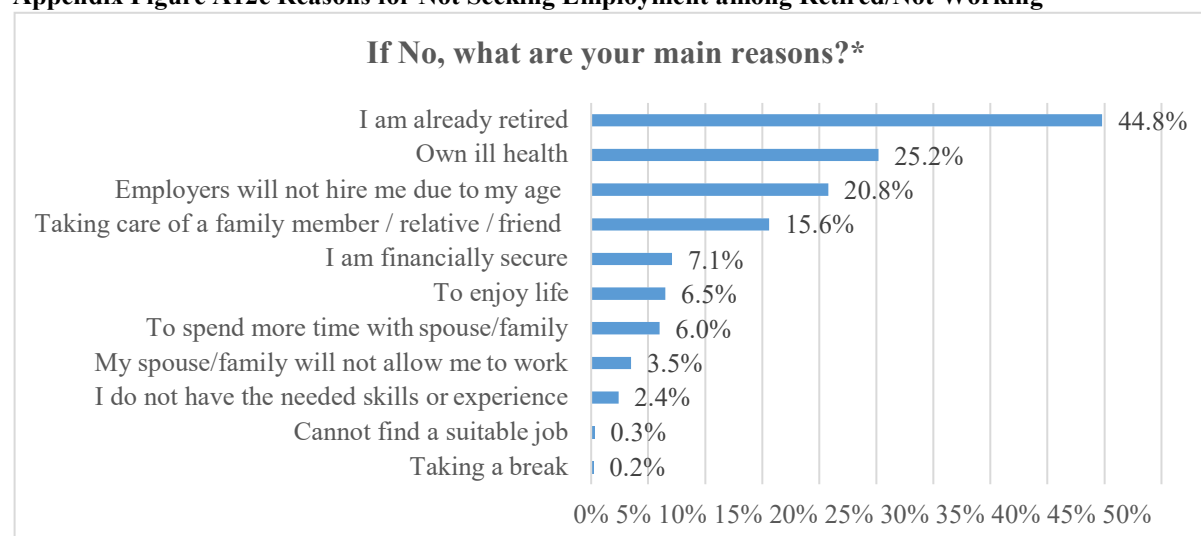
\*Asked only to participants who are retired and/or not working

**Appendix Figure A12d Reasons for Seeking Employment among Retired/Not Working**



\*Asked only to participants who are retired and/or not working and seeking employment during the last four weeks  
Percentages exceed 100% as multiple responses were allowed.

**Appendix Figure A12e Reasons for Not Seeking Employment among Retired/Not Working**



\*Asked only to participants who are retired/not working and not seeking employment during the last four weeks  
 Percentages exceed 100% as multiple responses were allowed.

**Appendix Table A12f Longest Engaged Occupation by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Longest Engaged Occupation (weighted %)</b>										
n	4078	1944	1342	792	2108	1970	3053	610	384	31
Professionals	8.9	8.5	10.6	7.0	12.3	5.4	9.0	4.2	11.5	21.8
Administrative & managerial	7.5	9.1	5.9	4.5	9.2	5.9	7.8	4.1	7.9	10.0
Associate professionals & technicians	10.8	12.1	9.1	9.1	18.8	2.5	10.3	12.7	13.7	18.3
Clerical workers	4.5	5.0	4.0	3.8	1.3	7.9	4.4	4.6	3.8	13.7
Sales & services	13.3	13.9	13.4	10.3	9.8	16.8	14.4	7.3	9.2	2.9
Production & related	11.7	13.7	9.1	9.3	3.6	20.0	11.4	16.4	11.3	0.0
Cleaners & labourers	12.4	9.0	14.8	21.3	6.8	18.2	11.4	20.4	15.8	9.4
Homemaker	0.7	0.5	0.8	1.3	0.0	1.4	0.6	0.5	0.8	4.0
Others	29.3	27.6	31.6	31.7	37.9	20.5	29.9	28.5	25.6	19.8

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

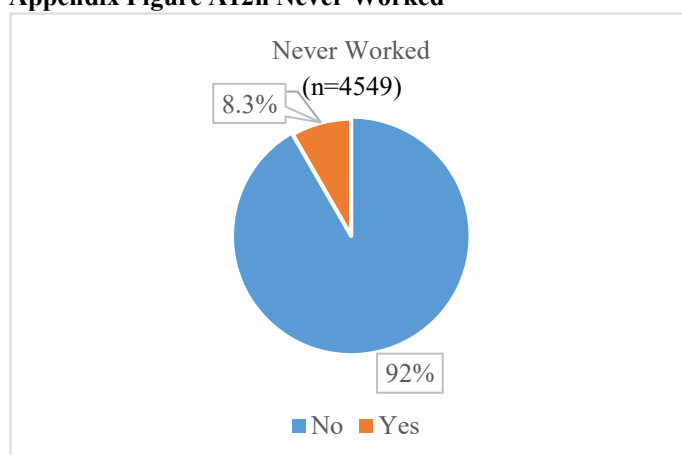


**Appendix Table A12g Longest Engaged Occupation by Educational Level and Living Arrangement**

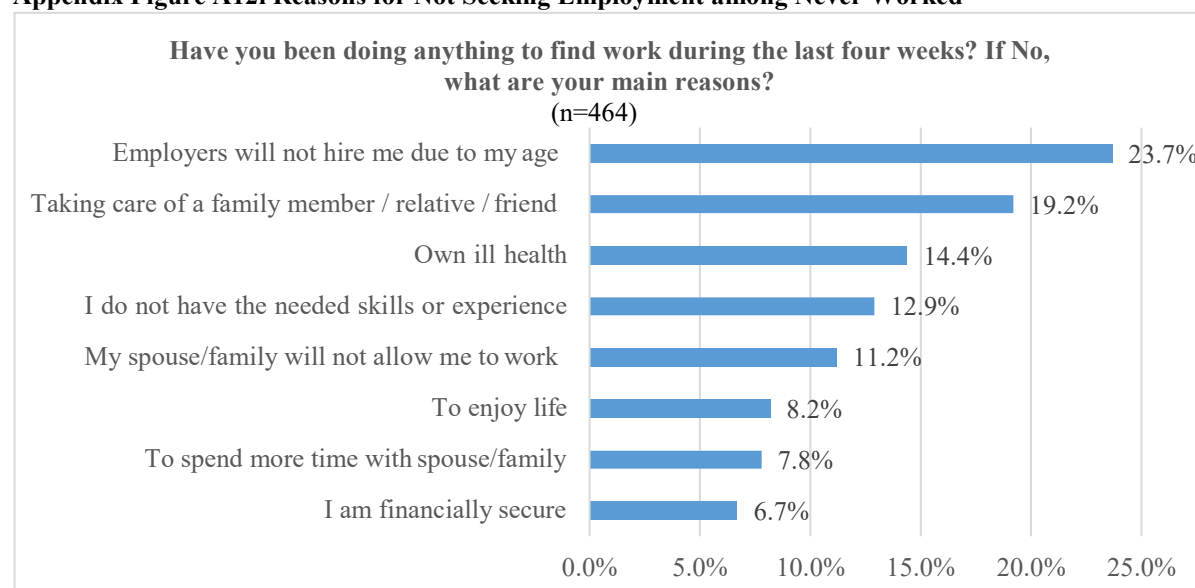
	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Longest Engaged Occupation (weighted %)</b>						
n	1083	1279	1211	498	3712	360
Professionals	0.5	2.9	9.2	37.2	8.9	9.5
Administrative & managerial	0.8	2.1	12.6	20.7	7.7	6.2
Associate professionals & technicians	5.7	12.7	14.2	7.7	11.0	8.3
Clerical workers	0.8	1.7	10.9	3.5	4.2	7.3
Sales & services	14.3	16.1	13.5	4.3	13.3	12.7
Production & related	16.9	16.3	7.4	1.4	11.9	9.3
Cleaners & labourers	31.4	12.9	2.5	0.1	12.2	15.0
Homemaker	1.1	0.5	0.6	0.7	0.7	1.1
Others	27.6	34.0	28.5	23.9	29.3	29.5

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)  
 Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Figure A12h Never Worked**



**Appendix Figure A12i Reasons for Not Seeking Employment among Never Worked**



\*Asked only to participants who indicated they have never worked, or responded 'Don't Know/Refused' to current work status.

Percentages exceed 100% as multiple responses were allowed.

**Appendix Table A16a Donation of Money by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Donated money to any groups, clubs or organizations in the last 12 months (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	708	449	34
Yes	47.9	55.1	44.6	30.5	50.3	45.8	45.8	58.0	54.0	73.4

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A16b Donation of Money by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Donated money to any groups, clubs or organizations in the last 12 months (weighted %)</b>						
n	1390	1385	1262	503	4136	407
Yes	29.5	44.4	58.8	71.5	48.1	46.4

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A16c Frequency of Donation of Money by Age Group, Gender and Ethnicity**

	Total	Age Group			Gender		Ethnicity			
		60-69	70-79	80 & above	Male	Female	Chinese	Malay	Indian	Others
<b>Monetary donation to groups, clubs, or organizations in the past 12 months (weighted %)</b>										
n	4549	2020	1501	1028	2117	2432	3358	692	431	68
At least once a week	7.0	7.6	6.7	5.4	8.2	5.9	5.3	16.1	7.3	36.1
Less than once a week but a least once a month	10.0	12.7	7.7	5.7	10.1	9.9	9.2	12.8	15.5	15.7
Less than once a month	17.9	20.3	17.9	9.8	16.4	19.1	18.5	13.9	16.5	12.1
One-off	12.9	14.3	12.2	9.6	15.5	10.6	12.8	14.2	13.6	10.2
None	51.7	44.6	55.0	68.4	49.4	53.7	53.7	42.1	46.2	26.0

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

**Appendix Table A16d Frequency of Donation of Money by Educational Level and Living Arrangement**

	Educational Level Completed				Living Arrangement	
	None	Primary	Secondary	Tertiary	Not Living Alone	Living Alone*
<b>Monetary donation to groups, clubs, or organizations in the past 12 months (weighted %)</b>						
n	1390	1385	1157	608	4136	407
At least once a week	2.6	4.7	11.7	11.2	7.0	6.4
Less than once a week but a least once a month	4.5	7.4	14.8	17.0	10.2	8.2
Less than once a month	13.6	19.2	17.8	23.1	17.8	19.1
One-off	8.6	13.1	14.3	18.1	13.0	12.7
None	69.8	55.4	40.8	30.1	51.4	53.6

\*Living alone includes those who live alone only (80%) or with only a foreign domestic worker/maid (20%)

Percentages may not add up to 100% as responses of 'Refused/Don't Know' are not shown.

We summarise the key findings from the Transitions in Health, Employment, Social Engagement and Inter-generational Transfers in Singapore Study (THE SIGNS Study) – I, a nationally-representative survey on transitions in health, employment and social lives of 4549 community-dwelling older Singaporeans, aged 60 years and above. THE SIGNS Study – I was conducted in 2016-2017 by the Centre for Ageing Research and Education (CARE), Duke-NUS Medical School, Singapore.

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