

National University of Singapore

## Community Health @ Queenstown: a Report on the Baseline Survey

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## Introduction

The Community Health @Queenstown study was conceptualised jointly by the Queenstown Constituency Office led by Member of Parliament (MP) of Tanjong Pagar Group Representation Constituency, Dr Chia Shi-lu, and organizations of the National University Health System (NUHS) – Saw Swee Hock School of Public Health’s Epidemiology Domain, the NUHS Regional Health System (RHS) Planning Office and the Geriatric Medicine Division.

The study has 3 objectives:

- 1) *Surveillance*. To assess the health status of the Queenstown residents aged 21 and above who are Singapore citizens or Permanent Residents. For those who are aged 65 and over, additional assessments were included to study specifically elderly health.
- 2) *Intervention*. To identify opportunities for interventions that promote health and interventions that manage disease progression.
- 3) *Research*. The Queenstown cohort is part of the nation-wide cohort, the Singapore Population Health Studies (SPHS)<sup>1</sup> that prospectively follows up some 50,000 Singaporeans and Permanent Residents of Chinese, Malay or Indian ethnicities over time to determine risk factors that led to the development and progression of complex diseases.

This report presents the findings from the baseline assessment and identifies opportunities for programmatic interventions.

## Study Protocol

The Community Health @Queenstown study recruitment began in September 2015 and concluded in July 2016. A total of 2949 residents were interviewed, of which 1575 underwent the health screening

Publicity began with the help of the Queenstown Community Club office, the Queenstown Active Ageing Committee and Stirling View Residents’ Committee (RC) in July 2015. Banners were put up at public amenities such as the marketplace and the Club, posters were displayed at the bulletin boards at each lift lobby of each HDB block and invitation letters were sent to the first RC zone that would be surveyed.

Each participant would have received an invitation letter to participate in the Community Health @Queenstown study at least 2 weeks before he or she would be contacted by a trained interviewer from NUHS. Interviewers went door to door or attended Queenstown Community Club’s social events to screen for residents who would be eligible for the study.

At the first meeting, participants were presented full information about the study to enable them to decide whether to take part. Written consent was obtained from those willing or from the legal guardians of those with mental conditions. A face-to-face interview would take place immediately after or at another arranged time. Most of the interviews were conducted in the participant’s home or at Stirling View RC centre. All interviews were audio-recorded for quality control and training purposes. A \$10 token of appreciation was provided to each participant at the end of the interview.

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<sup>1</sup> More information on the SPHS is available at <https://blog.nus.edu.sg/sphs/>.

Interviewed participants were given an option to undergo a health screening that was held at the RC centre, which included collection of blood and urine samples for immediate tests and storage for future research. Participants were advised to fast from the night before and the health screening was conducted only in the morning. Each participant received a \$20 token of appreciation for completing the health screening. Table 1.1 shows the type of data collected from the interview and the health screening. The consent forms and data collection forms are accessible at <https://blog.nus.edu.sg/sphs/community-health-study/>.

**Table 1.1. Types of data collected in the study**

Interview data	Physical examination	Laboratory tests
<ul style="list-style-type: none"> <li>• Socio-demography</li> <li>• Smoking</li> <li>• Alcohol consumption</li> <li>• Physical activity</li> <li>• Medication</li> <li>• Medical history</li> <li>• Medical screening practice</li> <li>• Health-related Quality of Life (EQ-5D)</li> <li>• Mental health (Mini-International Neuropsychiatric Interview (M.I.N.I.) – depression, mania and generalized anxiety disorder)</li> </ul> <p><i>Additional for participants aged 65 and over</i></p> <ul style="list-style-type: none"> <li>• Oral health</li> <li>• Activities of Daily Living (Barthel)</li> <li>• Instrumental Activities of Daily Living (Lawton)</li> <li>• Cognitive test (MMSE)</li> <li>• Falls risk</li> </ul>	<ul style="list-style-type: none"> <li>• Height, weight, hip and waist circumferences</li> <li>• Blood pressure</li> <li>• Ankle Brachial Index</li> <li>• Visual acuity</li> <li>• Screening audiometry</li> <li>• Hand grip strength</li> <li>• * Timed-Up-&amp;-Go</li> </ul>	<ul style="list-style-type: none"> <li>• Serum creatinine</li> <li>• Fasting glucose</li> <li>• Glucose tolerance test</li> <li>• Lipids</li> <li>• HbA1c</li> <li>• Albumin/creatinine ratio</li> <li>• C-reactive protein (hsCRP)</li> </ul>

All the data was collected real-time via tablets and stored securely at SSHSPH servers, where the research data would be de-identified. Blood and urine samples were labelled with non-identifying codes and couriered to National University Hospital laboratories within the same day.

Participants who were eligible for a faecal immunochemical test (FIT) or mammogram screening were identified when they attended the health screening. Participants who are 50 years old or older and who had not done a FIT or a colonoscopy or sigmoidoscopy in the past 10 years would be issued a free FIT kit. Female participants who are 50 years old or older and have not had a mammogram screening in the last 2 years would be encouraged to do so at the Queenstown Polyclinic or the Singapore Cancer Society.

Within 4 weeks of their health screening, participants would receive personal reports of their results through mail, and which would include, if applicable, referral letters to their family doctor, optometrist or dentist. Participants who have the conditions picked up through the study

assessments as shown in Table 1.2 were mailed a general practitioner (GP) consultation fee waiver voucher<sup>2</sup> worth \$35 along with their health screening report.

**Table 1.2. List of abnormal screening results that would be highlighted in the post-screening report with a recommendation to the participant to follow up with a GP**

Aged 21 and over	Additional results for aged 65 and over
<ul style="list-style-type: none"> <li>• Low / High BMI</li> <li>• Low / High Ankle Brachial Index</li> <li>• Very low / elevated blood glucose</li> <li>• Elevated blood pressure, HbA1c, serum creatinine, low-density lipoprotein cholesterol (LDL-C), total cholesterol, triglycerides, C-reactive protein, albumin/creatinine ratio or random urine albumin</li> <li>• Low high-density lipoprotein cholesterol (HDL-C)</li> <li>• Major depressive episode (current, past or recurrent)</li> <li>• Manic episode (current or past)</li> <li>• Hypomanic episode (current or past)</li> <li>• Generalized anxiety disorder</li> </ul>	<ul style="list-style-type: none"> <li>• Impaired cognition (low MMSE score)</li> <li>• Suspected malnutrition</li> <li>• High falls risk (at least 1 fall in the last 12 months or took more than 12sec to complete the Timed-Up-and-Go test)</li> <li>• Low serum albumin, hemoglobin, vitamin B12, serum ferritin or serum transferrin</li> <li>• Low / High serum iron</li> </ul>

Between 3 weeks to 3 months after the report had been mailed, NUHS RHS care coordinators and health ambassadors would call each participant who had been issued a GP consultation fee waiver voucher to highlight the use of the voucher. NUHS RHS monitored the utilization of the vouchers within the 3-month validity period.

The study proposal was reviewed and approved by the National Healthcare Group Domain Specific Review Board.

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<sup>2</sup> The voucher could only be used at 9 participating GP clinics within the Bukit Panjang Constituency and has a 3-month validity period.

## Socio-Demographic Profile

Table 1.3 shows socio-demographic characteristics of the study participants in Queenstown. It should be noted that the number of Malay (N=247) and Indian (N=476) ethnicity was modest. Therefore, ethnic differences in the prevalence of health conditions that are less common should be interpreted with caution.

**Table 1.3. Socio-demographic characteristics of the Queenstown study participants**

	All (N)	All (%)
<b>Number</b>	2949	100.0
<b>Gender</b>		
Male	1272	43.1
Female	1677	56.9
<b>Age group</b>		
21-29	269	9.1
30-39	455	15.4
40-49	547	18.5
50-59	565	19.2
60-69	593	20.1
70-79	369	12.5
80-92	151	5.1
<b>Ethnicity</b>		
Chinese	2150	72.9
Malay	247	8.4
Indian	476	16.1
Others	76	2.6
<b>Highest education</b>		
No formal education/Primary/PSLE	759	25.7
Secondary, GCE O/N level	942	32.0
GCE A level, Polytechnic & other diploma, degree, professional qualification	1247	42.3
<b>Work status</b>		
Working	1773	60.2
Homemaker/ Housewife	511	17.3
Retired	452	15.3
Others	211	7.2
<b>Average monthly household earnings (\$)</b>		
Below 2,000	1064	40.6
2,000-5,999	944	36.0
Above 5,999	612	23.4
Refused to answer/ Dont know	329	11.2
<b>Type of housing</b>		
HDB 1-3 room flat	1831	62.1
HDB 4-5 room flat	1116	37.8
Private	0	0
Others	2	0.1

## Medical Conditions

### Diabetes Mellitus

Participants are classified into different diabetes and normal categories based on self-reported diagnosis, and where available, the results of fasting blood glucose and glycated haemoglobin (HbA1c) tests. 1487 (50.4%) participants have fasting blood glucose.

The current recommendation test for the diagnosis of diabetes by the Ministry of Health (MOH) is the Oral Glucose Tolerance Test (OGTT) which requires two blood samples to be drawn from a subject. The first for a fasting sample and the second to be taken 2 hours after a 75g glucose liquid has been consumed right after the first blood sample was taken. The glucose levels in the 2 samples would then classify the subject as normal, with impaired glucose tolerance or with diabetes. The primary objective of this study was to screen, not diagnose, residents at risk and therefore, OGTT was not performed on all who are not diagnosed diabetics. It was offered to the participants whose fasting blood glucose results classify them as at-risk, however, as the OGTT would have to be performed on another occasion, not everyone offered took up the test.

Presently, the HbA1c test is used in standard medical practice in Singapore only to monitor the control of blood glucose levels in diabetics. It indicates the average level of blood glucose for the past 3 months and is not affected by short-term dietary changes including fasting. From 2011 onwards, the World Health Organization (WHO) recommends the use of HbA1c test as an additional test for the diagnosis of diabetes mellitus.<sup>3</sup> To estimate the number of participants who are undiagnosed, we use both the fasting blood glucose and HbA1c results.

**Table 2.1. Classification of blood glucose levels**

Classification	Criteria
Normal blood glucose	Fasting blood glucose <7mmol/l and HbA1c <6.5%
High blood glucose	Fasting blood glucose ≥7mmol/l or HbA1c ≥6.5%

**Table 2.2. Classification of diabetes status**

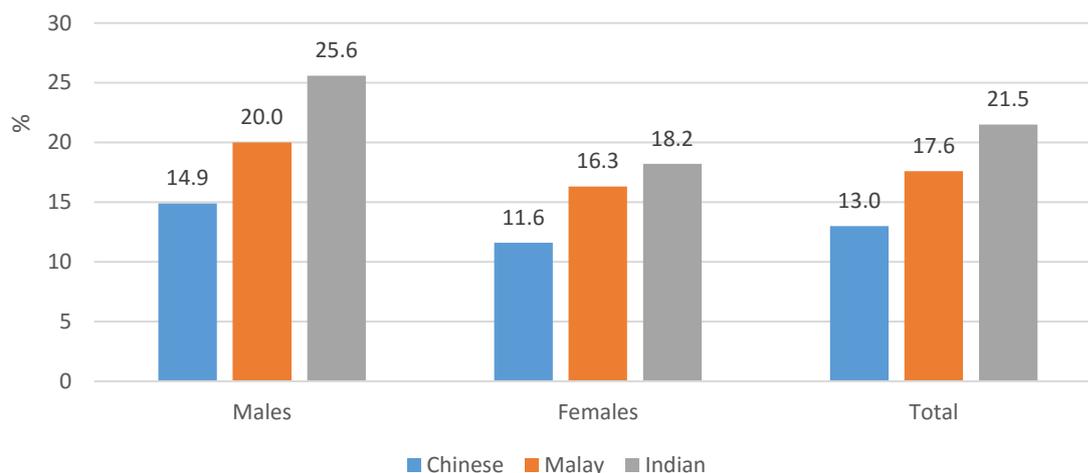
Classification	Criteria
Diagnosed diabetic	Had been told by doctor to have diabetes or was taking medications for diabetes
Undiagnosed with high blood glucose	Participants who met all of these criteria <ul style="list-style-type: none"><li>• Had not been told by a doctor to have diabetes, not sure if had been told by a doctor to have diabetes, or had been told to have prediabetes</li><li>• Was not on medication for diabetes</li><li>• Fasting glucose ≥7mmol/l or HbA1c ≥6.5%</li></ul>

<sup>3</sup> WHO. Use of glycated haemoglobin (HbA1c) in the diagnosis of diabetes mellitus: Abbreviated report of a WHO consultation. 2011

## Prevalence of diagnosed and undiagnosed diabetes

14.6% of the participants had diagnosed diabetes or had high blood glucose levels. The proportion of these participants was higher in males (17.0%) than in females (12.9%), and the proportion in Indians (21.5%) was highest amongst the ethnic groups, followed by Malays (17.6%) and then Chinese (13.0%).

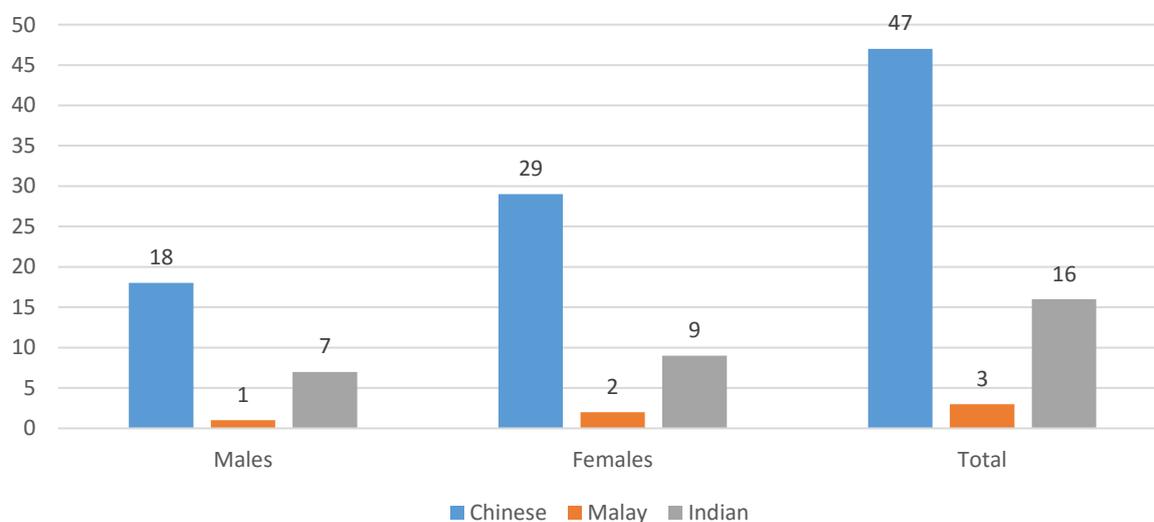
**Figure 2.1.** Percentage of participants who were diagnosed with diabetes or had high blood glucose levels, by gender and ethnic group



## Prevalence of undiagnosed diabetes

34.9% of the participants who had high blood glucose levels had not been previously diagnosed with diabetes. The proportion of this group was similar in females (42.7%) and males (27.3%), and the proportion in Chinese (36.4%) and Indians (32.0%) was higher than in Malays (25%).

**Figure 2.2.** Number of participants with high blood glucose levels who were previously undiagnosed, by gender and ethnic group



## Control of blood glucose levels in diagnosed diabetics

**Table 2.3. Classification of poorly controlled blood glucose levels**

Classification	HbA1c result (%)
Well controlled	<8%
Poorly controlled	≥8%

29.4% of diagnosed diabetics had poorly controlled blood glucose levels. The proportion of males who were known diabetics and had poorly controlled blood glucose levels (30.2%) was similar to females (28.4%).

**Table 2.4. Control of blood glucose in diagnosed diabetics**

Control of blood glucose	N (%)
Well controlled	113 (70.6%)
Poorly controlled	47 (29.4%)
Total	160

**Table 2.5. Control of blood glucose levels in diagnosed diabetics, by gender and ethnic group**

Blood glucose level control	Male				Female			
	Chinese	Malay	Indian	Other	Chinese	Malay	Indian	Other
Well controlled	44	2	13	1	35	4	13	1
Poorly controlled	14	2	10	0	13	1	7	0

## Hypertension

**Table 2.6. Classification of blood pressure**

Classification	Blood pressure range
Normal blood pressure	Systolic <140mmHg and diastolic <90mmHg
High blood pressure	Systolic ≥140mmHg or diastolic ≥90mmHg

Source: MOH Clinical Practice Guidelines on Hypertension, 2005.

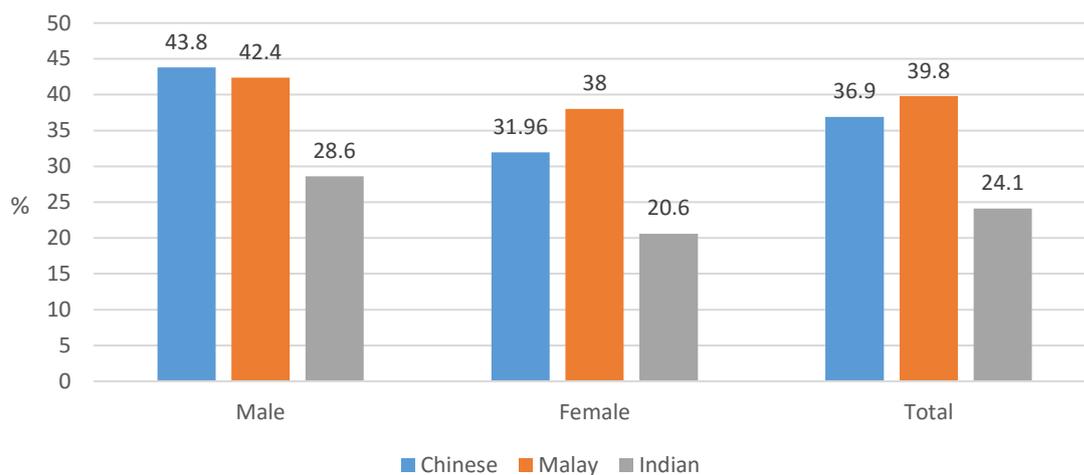
**Table 2.7. Classification of participants with high blood pressure**

Classification of participants with high blood pressure	
Diagnosed hypertensive	Had been told by doctor to have high blood pressure or was taking medications for high blood pressure
Undiagnosed with high blood pressure	Participants who met all of these criteria <ul style="list-style-type: none"> <li>• Had not been told by a doctor to have high blood pressure or not sure if had been told by a doctor to have high blood pressure</li> <li>• Was not on medication for high blood pressure</li> <li>• Systolic BP ≥140mmHg or diastolic BP ≥90mmHg</li> </ul>

## Prevalence of diagnosed and undiagnosed hypertension

34.4% of participants had been previously diagnosed to have hypertension or had blood pressure in the hypertension range. The prevalence of hypertension was higher in males (40.8%) than in females (29.6%), and the Chinese (36.9%) and Malays (39.8%) had higher proportion than the Indians (24.1%).

**Figure 2.3.** Percentage of participants who were diagnosed with hypertension or had high blood pressure results, by gender and ethnic group



## Prevalence of undiagnosed hypertension

38.7% of the participants who had high blood pressure had not been previously diagnosed. The proportion of this group was similar in both males (38.8%) and females (38.6%), and the proportion in Malays (56.2%) was highest amongst the ethnic groups, followed by Indians (46.2%) then Chinese (36.9%).

## Control of blood pressure in diagnosed hypertensives

**Table 2.8.** Classification of poorly controlled blood pressure levels

Classification	Blood pressure levels
Well controlled	Systolic <180mmHg and diastolic <110mmHg
Poorly controlled	Systolic BP ≥180mmHg or diastolic ≥110mmHg

Only 12 (2.7%) of the participants diagnosed with hypertension had poorly controlled blood pressure. The proportion of males with poorly controlled blood pressure (3.5%) was higher than that of females (1.9%).

**Table 2.9. Control of blood pressure levels in participants diagnosed with hypertension**

Control of blood pressure	N (%)
Well controlled	429 (97.3%)
Poorly controlled	12 (2.7%)
Total	441

**Table 2.10. Control of blood pressure levels in participants diagnosed with hypertension, by gender and ethnic group**

Blood pressure control	Male				Female			
	Chinese	Malay	Indian	Other	Chinese	Malay	Indian	Other
Controlled	174	9	29	6	169	13	25	4
Poorly controlled	6	2	0	0	4	0	0	0

## Abnormal Blood Cholesterol Levels

**Table 2.11. Classification of blood cholesterol levels**

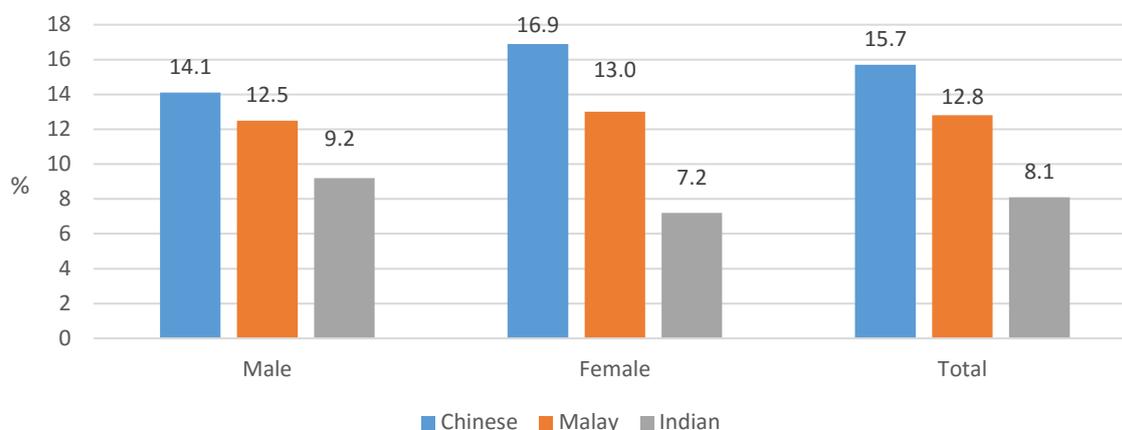
	Classification	Cholesterol concentration (mmol/l)
Total cholesterol	Desirable	<5.2
	Borderline high	5.2-6.1
	High	≥6.2
High density lipoprotein cholesterol (HDL-C)	Low	<1.0
	Desirable	1.0-1.5
	Optimal	≥1.6
Low density lipoprotein cholesterol (LDL-C)	Optimal	<2.6
	Desirable	2.6-3.3
	Borderline high	3.4-4.0
	High	4.1-4.8
	Very high	≥4.9

Source: MOH Clinical Practice Guidelines on Lipids, 2016.

## Prevalence of high total cholesterol

14.2% of participants had been measured to have high total cholesterol. The proportion of this group was similar in both males (13.3%) and females (15%). The proportion in Chinese was the highest (15.7%), followed by Malays (12.8%) then Indians (8.1%).

**Figure 2.4.** Percentage of participants with high total cholesterol, by gender and ethnic group



### Prevalence of undiagnosed total cholesterol

53.4% of the participants who had high total cholesterol had not been previously diagnosed. The proportion of this group was higher in females (57.6%) than males (47.2%), and the proportion in Malays (60%) was slightly higher than amongst Chinese (53.3%) and Indians (45.5%).

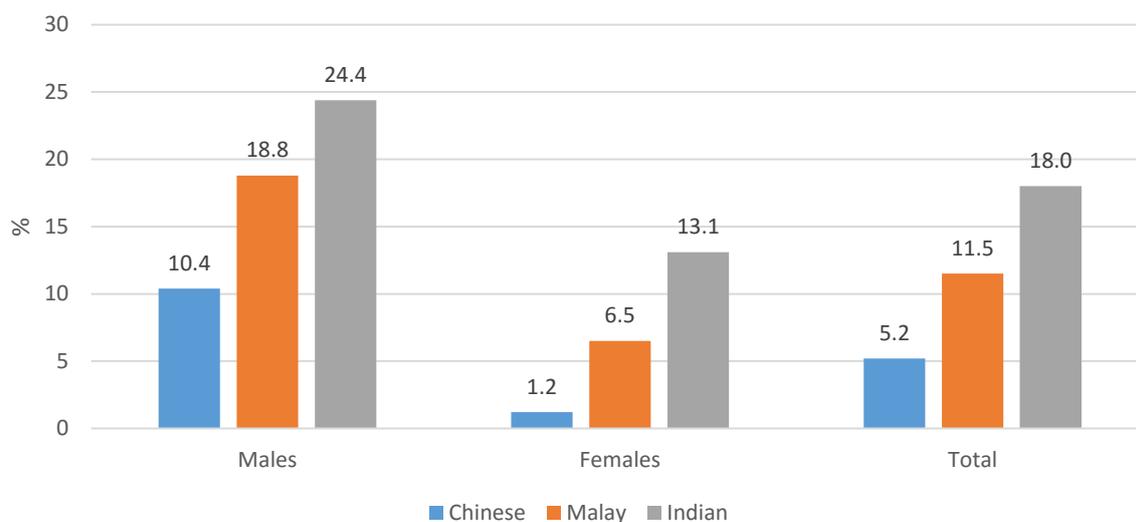
### Prevalence of low HDL-C

7.7% of the participants had low levels of HDL-C. The proportion of this group of participants was higher in males (13%) than in females (3.6%). The proportion in Indians was the highest (18%), followed by Malays (11.5%) then Chinese (5.2%).

**Table 2.12. Prevalence of low HDL-C levels**

HDL-C levels (mmol/l)	N (%)
≥1.0	1432 (92.3%)
<1.0	119 (7.7%)
Total	1551

**Figure 2.5.** Percentage of participants with low HDL-C, by gender and ethnic group



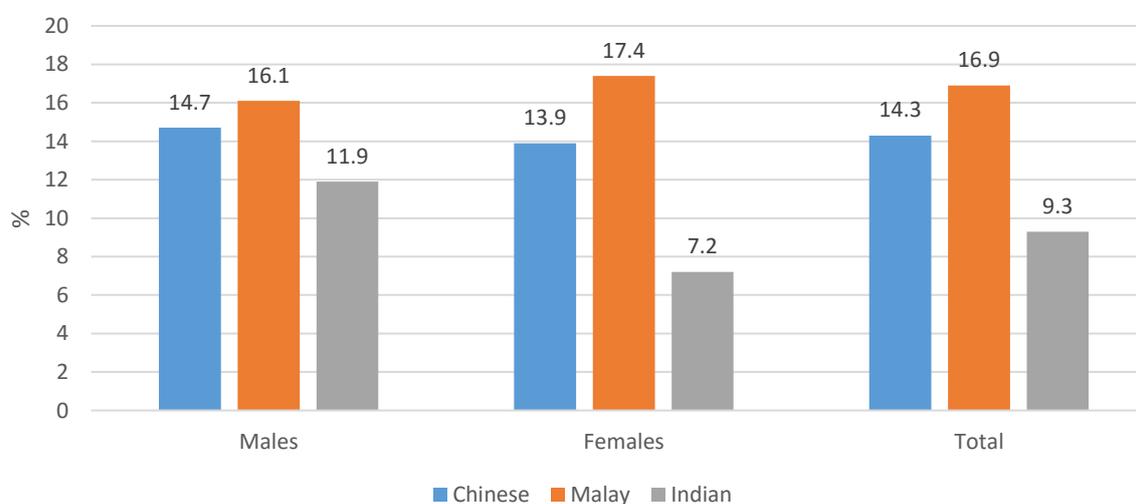
### Prevalence of high LDL-C

13.8% of the participants had high levels of LDL-C. The proportion of this group of participants was similar in both females (13.2%) than in males (14.5%). The proportion in Malays was the highest (16.9%), followed by Chinese (14.3%) and then Indians (9.3%).

**Table 2.13.** Prevalence of high LDL-C levels

LDL-C levels (mmol/l)	N (%)
<4.1	1327 (86.2%)
≥4.1	212 (13.8%)
Total	1539

**Figure 2.6.** Percentage of participants with high LDL-C, by gender and ethnic group



## Obesity

**Table 2.14. Classification of weight status**

Asian Classification	Body Mass Index (BMI) (kg/m <sup>2</sup> )
Underweight	<18.5
Normal	18.5-22.9
Overweight	23-27.4
Obese	≥27.5

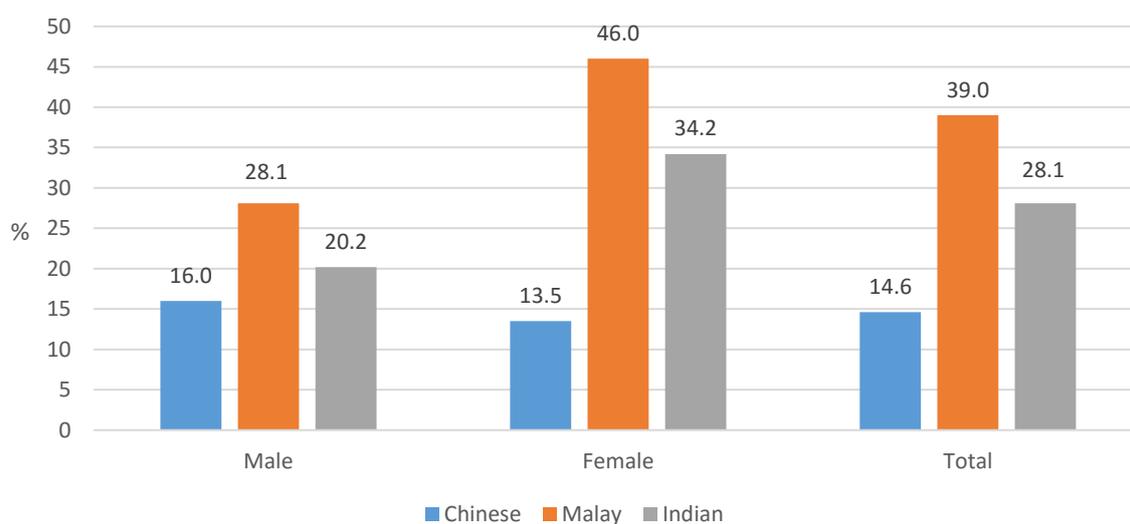
### Prevalence of obesity

37.6% of the participants were overweight and 18.5% were obese. The proportion of obese adults was similar in females (19.3%) and in males (17.5%). The proportion in Malays was the highest (39%), followed by Indians (28.1%) and then Chinese (14.6%).

**Table 2.15. Prevalence of obesity**

Classification	N (%)
Underweight	90 (5.7%)
Normal	600 (38.2%)
Overweight	590 (37.6%)
Obese	291 (18.5%)
Total	1571

**Figure 2.7. Percentage of participants who were obese, by gender and ethnic group**



## Abdominal adiposity

The ratio of waist to hip circumference is a measure of an abdominal fat distribution which is often an indicator of the metabolic syndrome. Metabolic syndrome refers to a cluster of conditions that include excess fat around the waist, high blood pressure and glucose, and abnormal levels of cholesterol or triglycerides. The concurrence of all these conditions increases the risk of diabetes, heart disease and stroke.

**Table 2.16. Classification of abdominal adiposity, by gender**

Gender	Recommended Waist-Hip Ratios
Males	≥0.90
Females	≥0.85

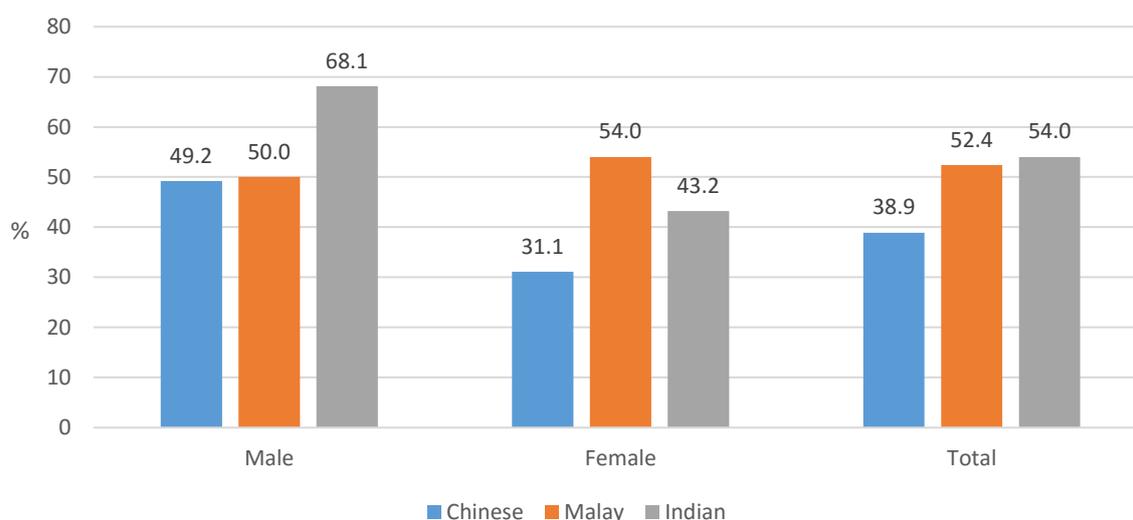
## Prevalence of abdominal adiposity

42.6% of the participants had high waist-hip ratios. This was more common in males (52.8%) than in females (34.9%). The proportion of participants with high waist-hip ratio was the highest in Indians (54%), followed by Malays (52.4%) then Chinese (38.9%).

**Table 2.17. Prevalence of abdominal adiposity**

Classification	N (%)
Normal	902 (57.4%)
Abdominal adiposity	669 (42.6%)
Total	1571

**Figure 2.8.** Percentage of participants with abdominal adiposity, by gender and ethnic group



## Cardiovascular Disease

### Heart Disease

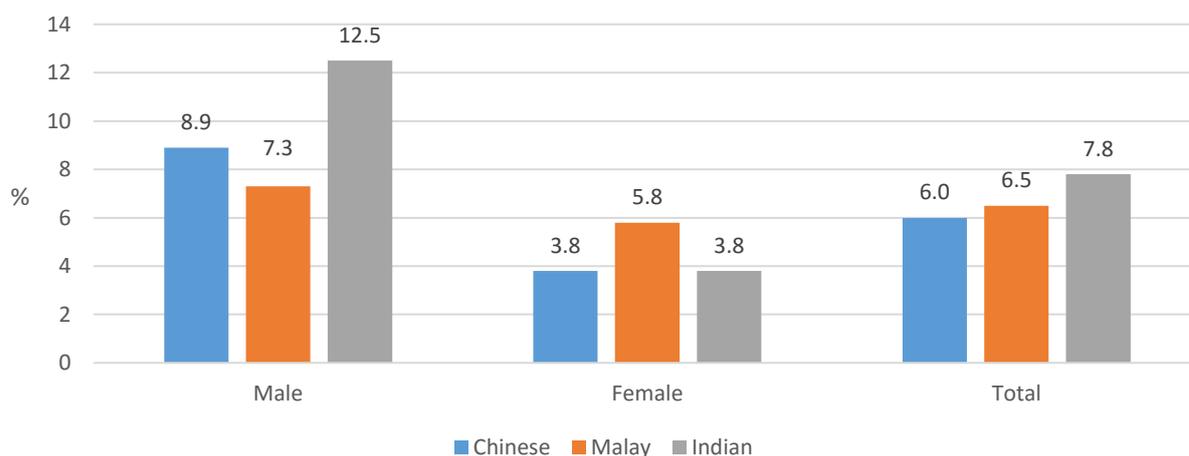
#### Prevalence of heart disease

6.2% of the participants had a history of heart disease. This was more common in males (9.2%) than in females (3.9%). The proportion of participants with heart disease was the highest in Indians (7.8%), followed by Malays (6.5%) and then Chinese (6%).

**Table 2.18. Prevalence of heart disease**

Classification	N (%)
Normal	2766 (93.8%)
Heart disease	183 (6.2%)
Total	2949

**Figure 2.9.** Percentage of participants with heart disease, by gender and ethnic group



## Stroke

#### Prevalence of stroke

1.6% of the participants had a history of stroke. This was more common in males (2.5%) than in females (1.0%). The proportion of participants with stroke was the highest in Malays (3.2%), followed by Chinese (1.7%) and then Indians (0.6%).

**Table 2.19. Prevalence of stroke**

Classification	N (%)
Normal	2901 (98.4%)
Stroke	48 (1.6%)
Total	2949

## Peripheral Arterial Disease

### Prevalence of peripheral arterial disease

1% of the participants had been diagnosed with peripheral arterial disease (PAD). This was more common in males (1.5%) than in females (0.6%).

**Table 2.20. Prevalence of peripheral arterial disease**

Classification	N (%)
Normal	2920 (99%)
Peripheral arterial disease	29 (1%)
Total	2949

### Abnormal Ankle Brachial Index

The ankle brachial index (ABI) test helps screen for individuals at risk of PAD. 16 (1%) of the participants had abnormal ABI values. There are 8 males and 8 females with abnormal ABI values.

## Coronary Artery Disease Risk

Participants were first classified into very high and high risk of developing coronary artery disease (CAD) based on their medical history, medication information and blood test results.

**Table 2.21. Classification of risk levels**

Risk Level	Medical history, medication and blood test results
Very High	Participant had at least one of these: <ol style="list-style-type: none"><li>1. LDL-C &gt;4.9mmol/l or total cholesterol &gt;7.5mmol/l and has a first degree relative who had high cholesterol/lipids or heart attack before age 60</li><li>2. Had been told to have blockage of artery supplying blood to heart</li><li>3. Had had heart attack</li><li>4. Had been told to have blockage of arteries in the leg or was taking medication for this</li><li>5. Had been told to have atherosclerosis and had stroke</li><li>6. Had been told to have diabetes or was taking diabetes medication, and has weak or failing kidney</li></ol>
High Risk	Participant did not have any of the above, but had one of these: <ol style="list-style-type: none"><li>1. Had been told to have diabetes or was taking diabetes medication</li><li>2. Fasting glucose <math>\geq</math>7mmol/l or HbA1c <math>\geq</math>6.5%</li></ol>

The 10-Year CAD Risk Score which takes into account gender and ethnicity was then applied to further classify those participants who do not fall within the above classifications into high, intermediate and low risk.<sup>4</sup>

<sup>4</sup> The two-tier risk classification method is adapted from the MOH Clinical Practice Guidelines on Lipids, 2016. The first tier risk classification should be based on clinical presentation. In this report, medical records data

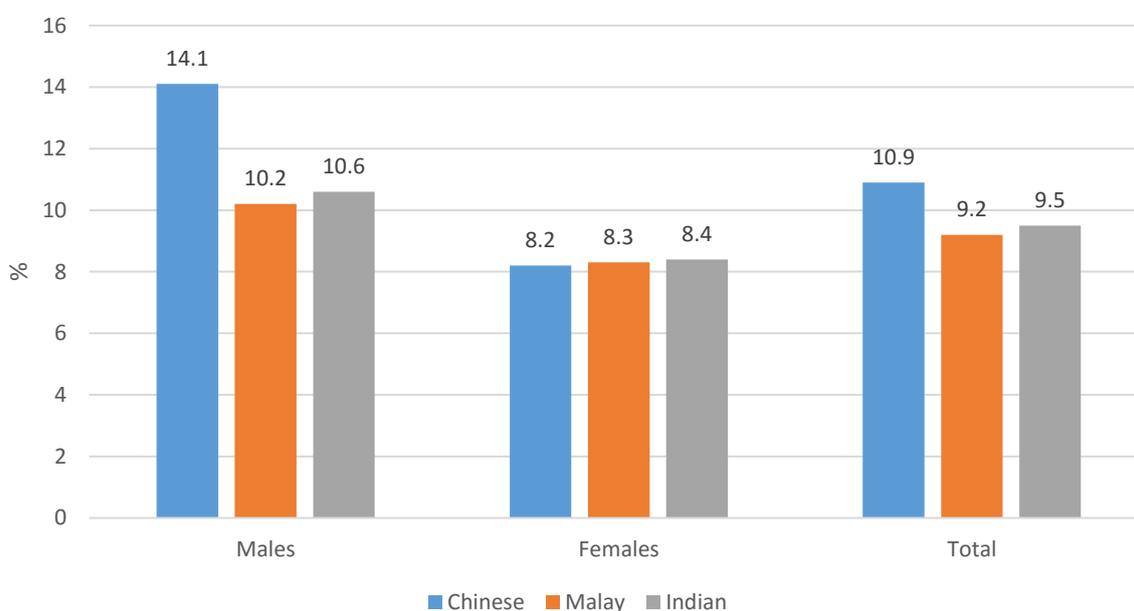
## Prevalence of high and very high CAD risk

10.4% of the participants had high or very high risk. The proportion of this group of participants was higher in males (13.0%) than in females (8.1%). The proportion in Chinese was the highest (10.9%), followed by Indians (9.5%) then Malays (9.2%).

**Table 2.22. Prevalence of high and very high CAD risk groups**

Classification	N (%)
Low and Intermediate	1393 (89.6%)
High and Very high	161 (10.4%)
Total	1554

**Figure 2.10. Percentage of participants with high and very high CAD risk, by gender and ethnic group**



## Control of LDL-C in high and very high risk groups

LDL cholesterol target levels in the four risk group categories:

**Table 2.23. Classification of LDL-C target levels by risk group categories**

Risk group category	LDL-C target level (mmol/l)
Very high risk	<2.1
High risk	<2.6
Intermediate risk	<3.4
Low risk	<4.1

Source: MOH Clinical Practice Guidelines on Lipids, 2016

was not available for analysis and therefore, self-reported information on medical history and medication was used instead to estimate the level of risk.

**Table 2.24. Control of LDL-C in high and very high risk groups**

Control of LDL-C	Very high risk	High risk
Well controlled	15	8
Poorly controlled	55	22
Proportion poorly controlled (%)	70.0	73.3

## Prevalence of Other Physical Health Conditions

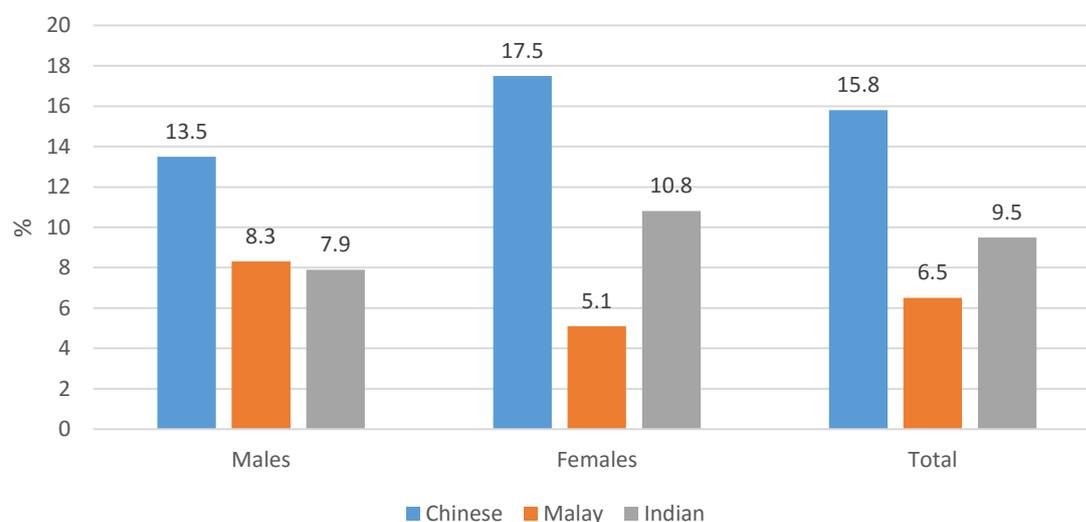
### Cataract

13.7% of the participants had cataract. The proportion of females who had cataract (15.2%) was higher than males (11.8%). The proportion of participants with cataract was highest in Chinese (15.8%), followed by Indians (9.5%) then Malays (6.5%).

**Table 2.25. Prevalence of cataract**

Classification	N (%)
Normal	2544 (86.3%)
Cataract	405 (13.7%)
Total	2949

**Figure 2.11. Percentage of participants with cataract, by gender and ethnic group**

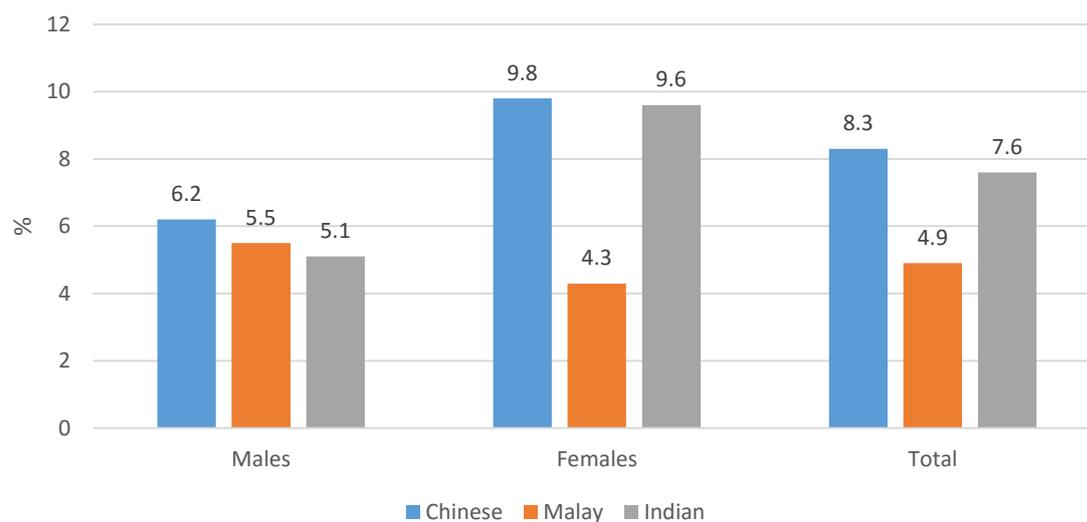


### Osteoarthritis

7.7% of the participants had osteoarthritis. The proportion of this group of participants was higher in females (9.2%) than in males (5.8%). The proportion in Chinese was the highest (8.3%), followed by Indians (7.6%) then Malays (4.9%).

**Table 2.26. Prevalence of osteoarthritis**

Classification	N (%)
Normal	2721 (92.3%)
Osteoarthritis	228 (7.7%)
Total	2949

**Figure 2.12. Percentage of participants with osteoarthritis, by gender and ethnic group**

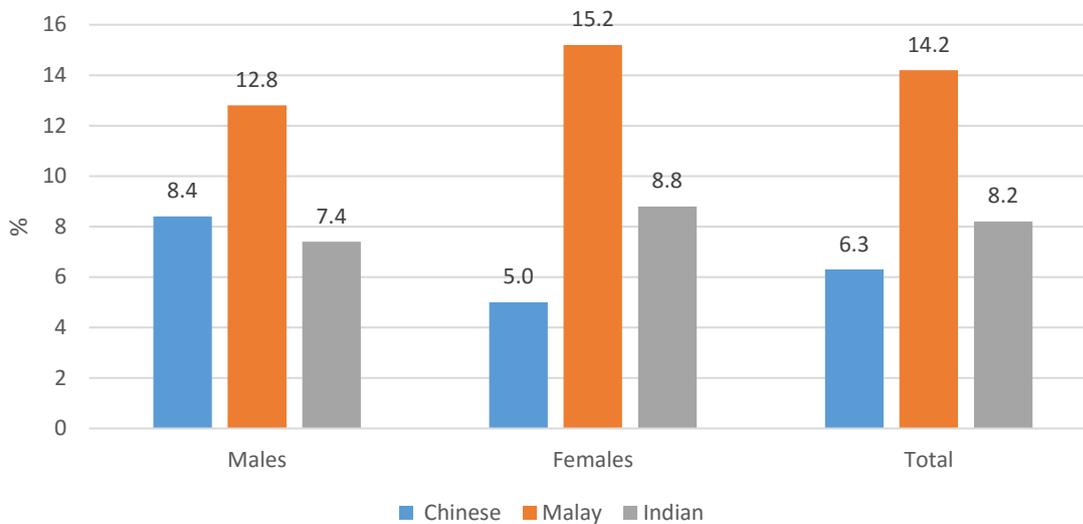
## Asthma

7.2% of the participants had asthma. This was more common in males (8.4%) than in females (6.3%). The proportion of participants with asthma was the highest in Malays (14.2%), followed by Indians (8.2%) then Chinese (6.3%).

**Table 2.27. Prevalence of asthma**

Classification	N (%)
Normal	2736 (92.8%)
Asthma	213 (7.2%)
Total	2949

**Figure 2.13.** Percentage of participants with asthma, by gender and ethnic group



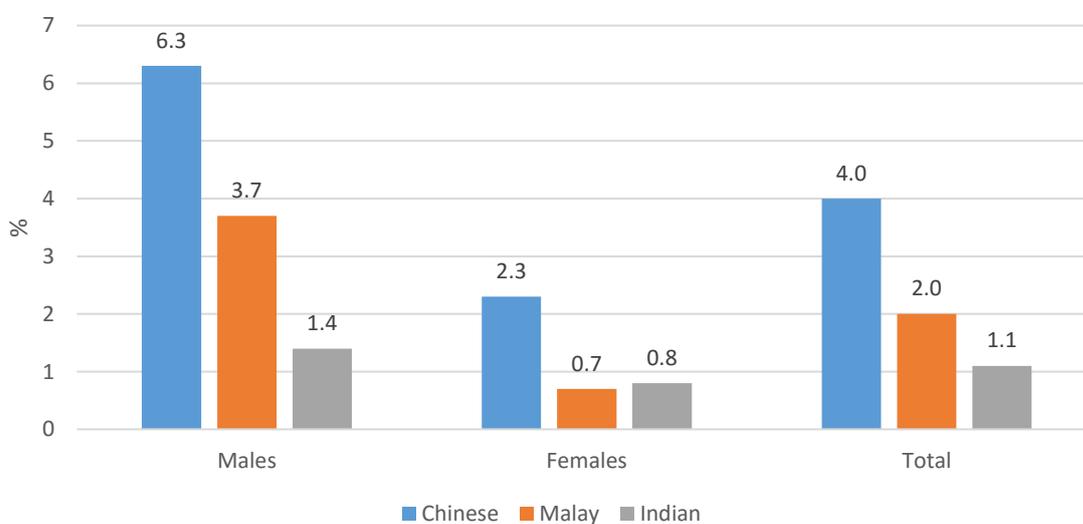
## Gout

3.4% of the participants had gout. The proportion of this group of participants was higher in males (5.3%) than in females (2%). The proportion in Chinese was the highest (4%), followed by Malays (2%) and then Indians (1.1%).

**Table 2.28.** Prevalence of gout

Classification	N (%)
Normal	2848 (96.6%)
Gout	101 (3.4%)
Total	2949

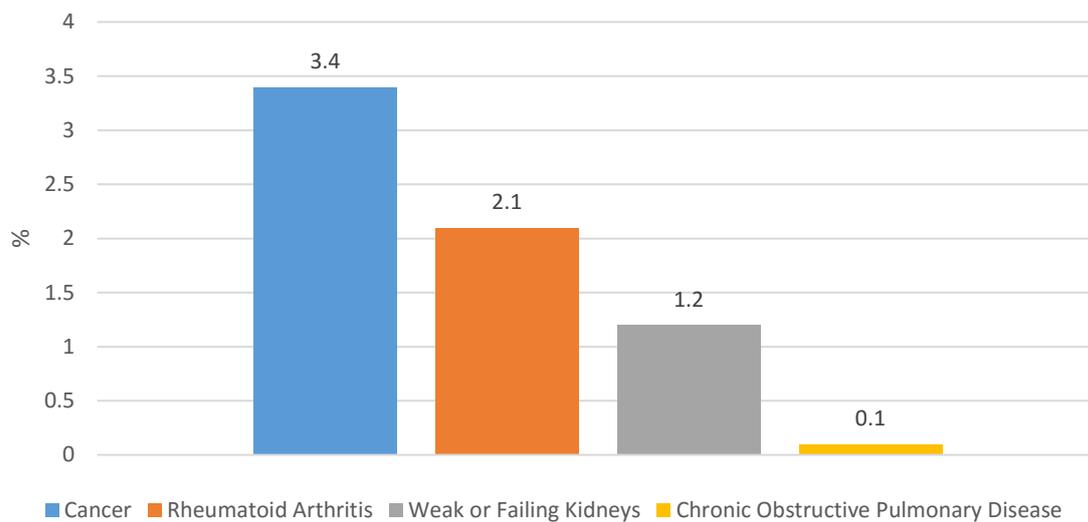
**Figure 2.14.** Percentage of participants with gout, by gender and ethnic group



## Cancer, Rheumatoid Arthritis, Weak or Failing Kidneys, and Chronic Obstructive Pulmonary Disease

3.4% of the participants reported that they had cancer, 2.1% with rheumatoid arthritis, 1.2% had weak or failing kidneys, and 0.1% had chronic obstructive pulmonary disease.

**Figure 2.15.** Prevalence of Cancer, Rheumatoid Arthritis, Weak or Failing Kidneys, and Chronic Obstructive Pulmonary Disease



## Mental Health

0.7% of the participants were screened positive for any of the 3 categories of mental conditions. The number of participants who were screened positive for episodes of major depression or mania, or generalised anxiety disorder is shown in Table 2.29.

**Table 2.29.** Prevalence of mental health

Types of mental health conditions	Male N	Female N	Total number with this disorder	Percentage of total surveyed (%)
Current/recurrent/ past major depressive episode	32	48	80	2.7
Current/ past manic/hypomanic episode, or hypomanic symptoms	17	25	42	1.4
Generalized anxiety disorder	5	16	21	0.7
Any of the above	42	68	110	3.7

## Lifestyle

### Smoking

**Table 3.1. Classification of smoking status**

Classification	
Non smoker	Never smoked or never smoked at least 100 cigarettes
Former smoker	Have stopped smoking completely
Light smoker	<1 pack years <sup>5</sup> or occasionally smoking
Heavy smoker	≥ 1 pack years

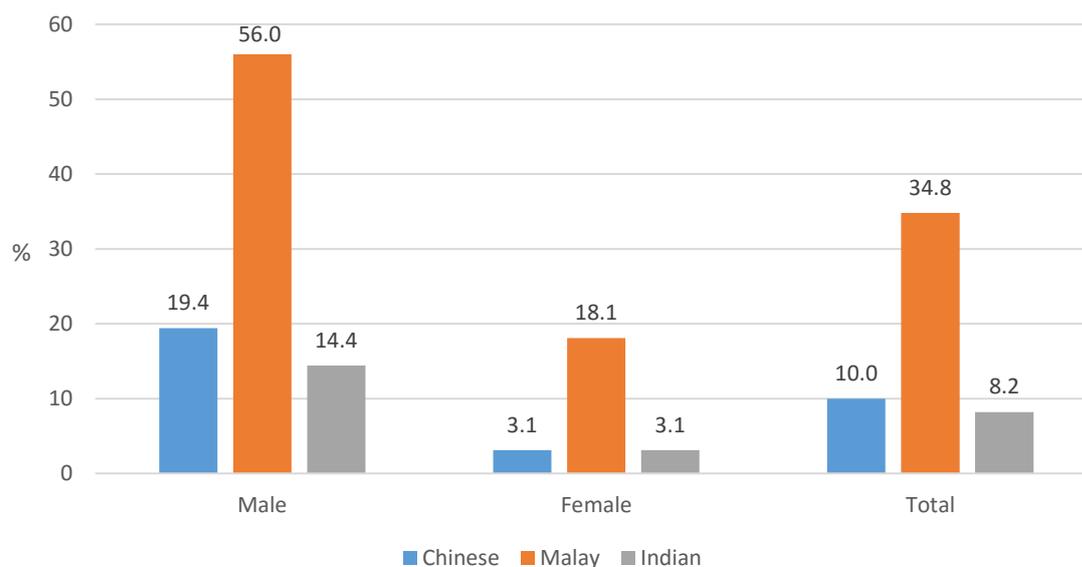
### Prevalence of smoking

11.7% of the participants were heavy smokers. The proportion of this group of participants was higher in males (21.5%) than in females (4.3%). The proportion in Malays was the highest (34.8%), followed by Chinese (10%) then Indians (8.2%).

**Table 3.2. Prevalence of smoking**

Classification	N (%)
Non smoker	2260 (76.6%)
Former smoker	256 (8.7%)
Light smoker	88 (3%)
Heavy smoker	345 (11.7%)
Total	2949

**Figure 3.1. Percentage of heavy smokers, by gender and ethnic group**



<sup>5</sup> 1 pack-year is equal to smoking 20 cigarettes (1 pack) per day for 1 year

## Factors associated with smoking

Males were more likely to be smokers than females. Smokers were more likely to be Malays and have PSLE or lower education. Adults aged between 21 and 64 years were more likely to be smokers than those aged 65 years and older.

## Alcohol

**Table 3.3. Classification of heavy drinking, by gender**

Classification	Frequency of alcohol consumption
For males	>2 servings per day
For females	>1 servings per day

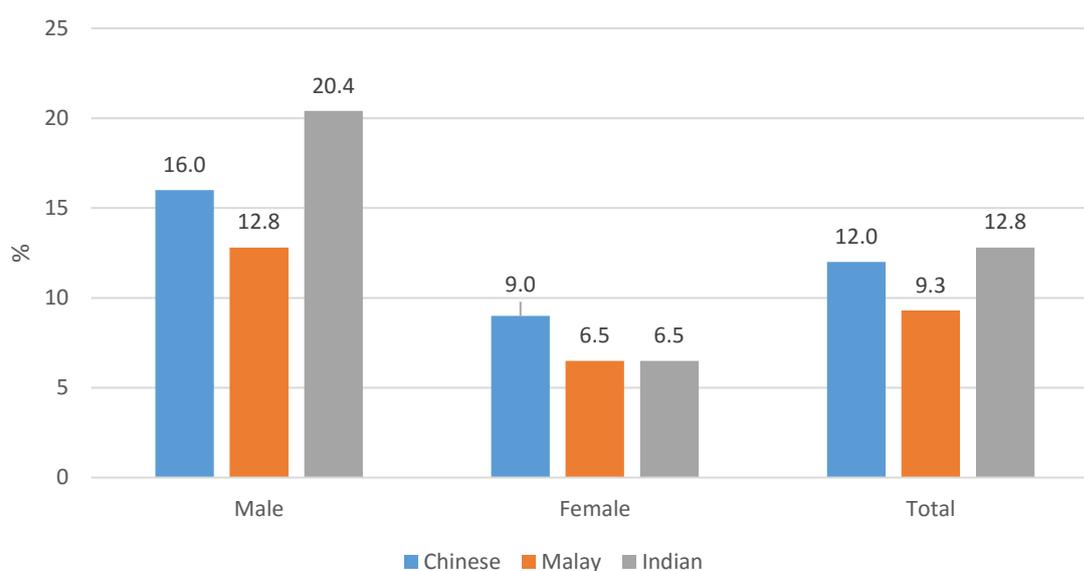
## Prevalence of heavy drinkers

12.1% of the participants were heavy drinkers. The proportion of this group of participants was higher in males (16.7%) than in females (8.6%). The proportion in Indians was the highest (12.8%), followed by Chinese (12.0%) then Malays (9.3%).

**Table 3.4. Prevalence of heavy drinkers**

Classification	N (%)
Non heavy drinkers	2592 (87.9%)
Heavy drinkers	357 (12.1%)
Total	2949

**Figure 3.2. Percentage of heavy drinkers, by gender and ethnic group**



## Factors associated with heavy drinking

Heavy drinkers were more likely to be males, have higher monthly income and are younger. Adults aged between 21 and 64 years were more likely to be heavy drinkers than those aged 65 and above.

## Physical Activity

Insufficient physical activity is defined as less than 150 minutes of moderate intensity or less than 75 minutes of vigorous intensity exercise or a combination per week.

## Prevalence of insufficient physical activity

19.5% of the participants were not doing sufficient physical activity. The proportion of males (18.1%) in this group of participants was similar to females (20.5%). The proportion in Chinese was the highest (20.7%), followed by Indians (19.3%) then Malays (10.5%).

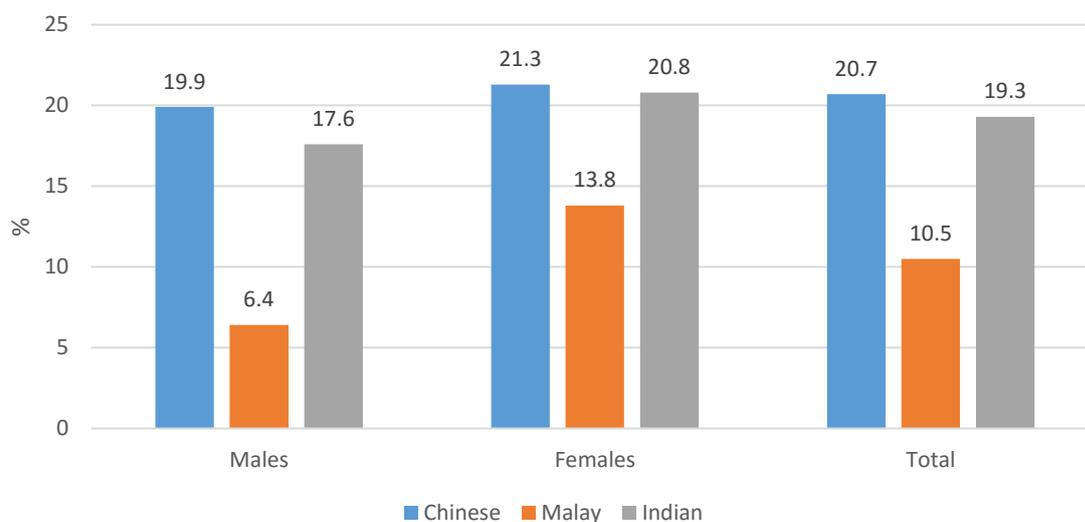
**Table 3.5. Prevalence of insufficient physical activity**

Classification	N (%)
At least 150 minutes per week	2375 (80.5%)
Less than 150 minutes per week	574 (19.5%)
Total	2949

**Table 3.6. Prevalence of insufficient physical activity, stratified by age groups**

	Aged 21-64	Aged 65 and above
At least 150 minutes per week	1809	566
Less than 150 minutes per week	330	244
Proportion who were not doing sufficient physical activity (%)	15.4	30.1

**Figure 3.3.** Percentage of participants who were not doing sufficient physical activity, by gender and ethnic group



### Prevalence of insufficient physical activity in those with no mobility problems

There were 23 participants who reported any problems with mobility<sup>6</sup> in the age group 65 years old and above. The exclusion of these participants does not reduce the proportion of the participants in this age group who were not doing sufficient physical activity by much (30.1% to 28.3%).

**Table 3.7. Prevalence of insufficient physical activity in those with no mobility problems**

Aged 65 and above	
At least 150 minutes per week	562 (71.7%)
Less than 150 minutes per week	222 (28.3%)
Total	784

### Factors associated with insufficient physical activity

Among participants aged below 65 years, those who had post-secondary education were more likely to be doing sufficient physical activity compared to those with PSLE and lower education.

Among participants aged 65 years and above, Indians were less likely to be doing sufficient physical activity compared to Chinese. Those who were immobile were less likely to be doing sufficient physical activity as compared with those who were mobile. Those with lower education level were also less likely to be doing sufficient physical activity.

<sup>6</sup> In the questionnaire section on activities of daily living.

## Health Screening

### Screening for Diabetes, Hypertension and Lipid Disorders

**Table 4.1. Number of participants last screened for diabetes, hypertension and abnormal lipid levels, by recency**

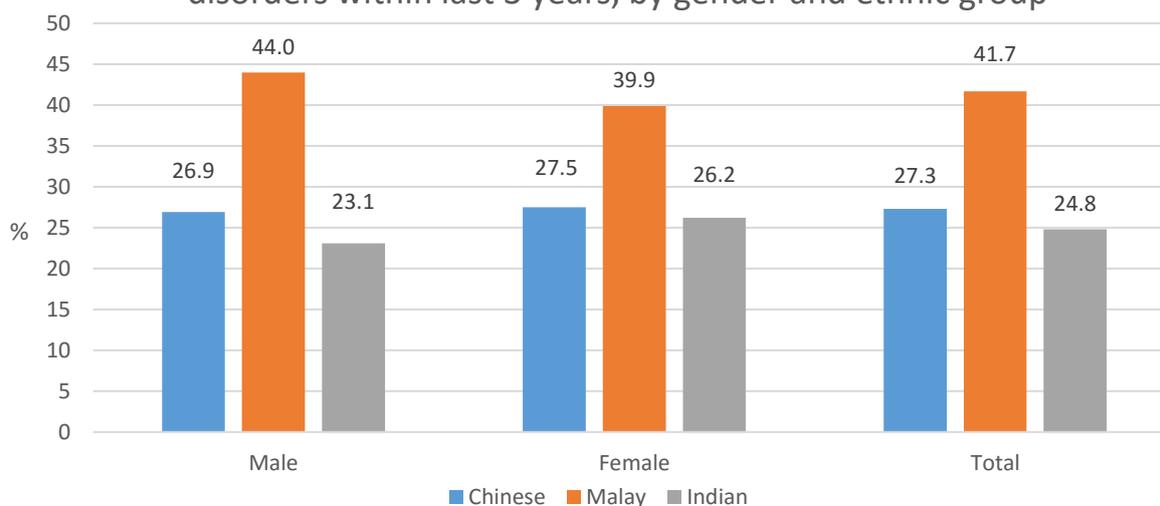
Screening for	0 – 1 year	1-3 years	3-5 years	>5 years	Never been checked
Hypertension	2396	353	56	99	45
Diabetes <sup>7</sup>	1655	599	120	185	390
Lipid Disorders <sup>7</sup>	1687	614	112	198	338

28.1% of the participants had not been screened for either diabetes, hypertension or lipid disorders within last 3 years. The proportion of males (27.7%) in this group of participants was similar to females (28.4%). The proportion in Malays was the highest (41.7%), followed by Chinese (27.3%) then Indians (24.8%).

**Table 4.2. Number and proportion of participants who have not had a screening for either diabetes, hypertension or abnormal lipid levels within last 3 years**

Screening for diabetes, hypertension and lipid disorders	N (%)
All 3 conditions were screened for within last 3 years	2121 (71.9%)
At least one condition had not been checked within last 3 years	828 (28.1%)
Total	2949

**Figure 4.1.** Percentage of participants who reported that they have not had a screening for either diabetes, hypertension or lipid disorders within last 3 years, by gender and ethnic group



<sup>7</sup> Recommended screening frequency for diabetes and lipid disorder is at least once every 3 years.

## Proportion of participants who reported that they have never been screened for diabetes, hypertension or lipid disorders

There are 33 (1.1%) participants who have never been screened for diabetes, hypertension or lipid disorders.

## Breast and Cervical Cancer Screening

**Table 4.3. Number of participants aged 51 to 69 last screened for breast cancer and number of participants aged 40 to 69 last screened for cervical cancer, by recency**

Screening for	0-2 years	2-3 years	3-4 years	4-5 years	>5 years	Never been screened	Did not know when
Breast cancer	240	66	29	18	129	149	4
Cervical cancer	306	84	52	23	206	294	3

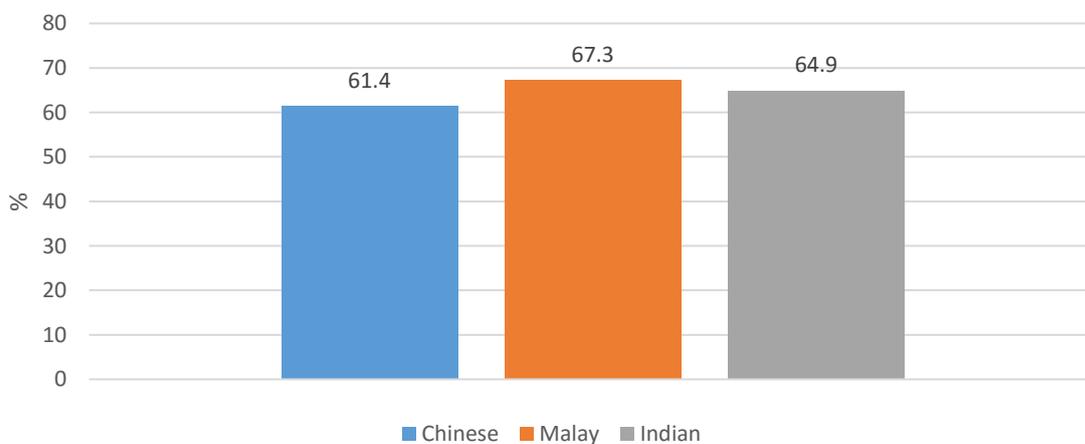
## Mammogram screening

62.2% of the participants have not had a mammogram within the last 2 years. The proportion in Malays was the highest (67.3%), followed by Indians (64.9%) then Chinese (61.4%).

**Table 4.4. Proportion of women aged 51 to 69 who have not had a mammogram within last 2 years**

Screening for breast cancer	N (%)
Had mammography within last 2 years	240 (37.8%)
Did not have mammography within last 2 years	395 (62.2%)
Total	635

**Figure 4.2. Percentage of women aged 51 to 69 who reported that they have not had a mammogram within last 2 years**



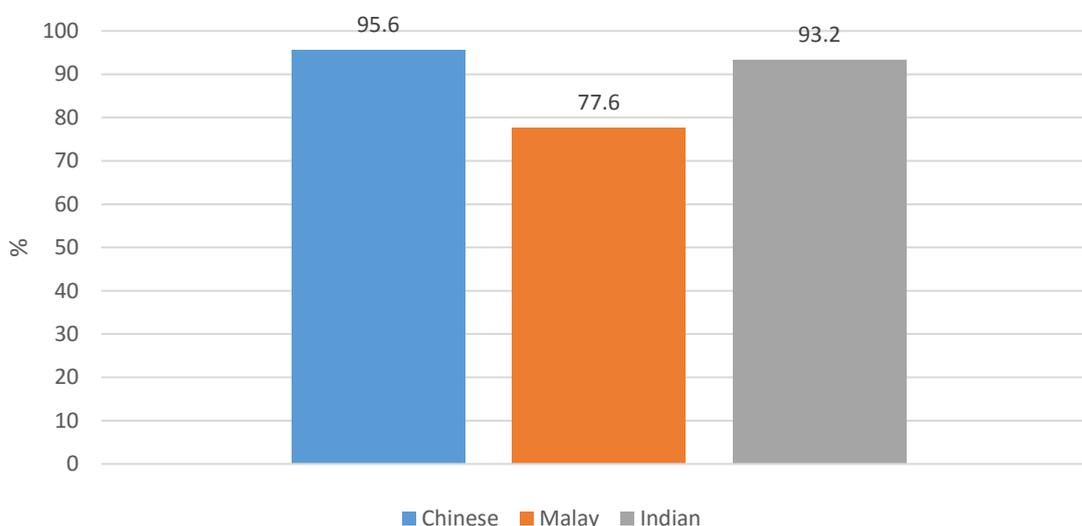
149 (23.5%) of the participants have never had a mammogram. The proportion in Malays was the highest (40.8%), followed by Indians (27%) then Chinese (21.2%).

93.7% of the women aged 51 to 69 were aware of mammography. The proportion in Chinese was the highest (95.6%), followed by Indians (93.2%) then Malays (77.6%).

**Table 4.5. Proportion of women aged 51 to 69 who had knowledge of mammogram**

	N (%)
No knowledge of mammogram	40 (6.3%)
Have knowledge of mammogram	595 (93.7%)
Total	635

**Figure 4.3. Percentage of women aged 51 to 69 who had knowledge of mammogram**



### Factors associated with irregular screening and not screening

Women with post secondary education were more likely to have a mammogram done in the last 2 years.

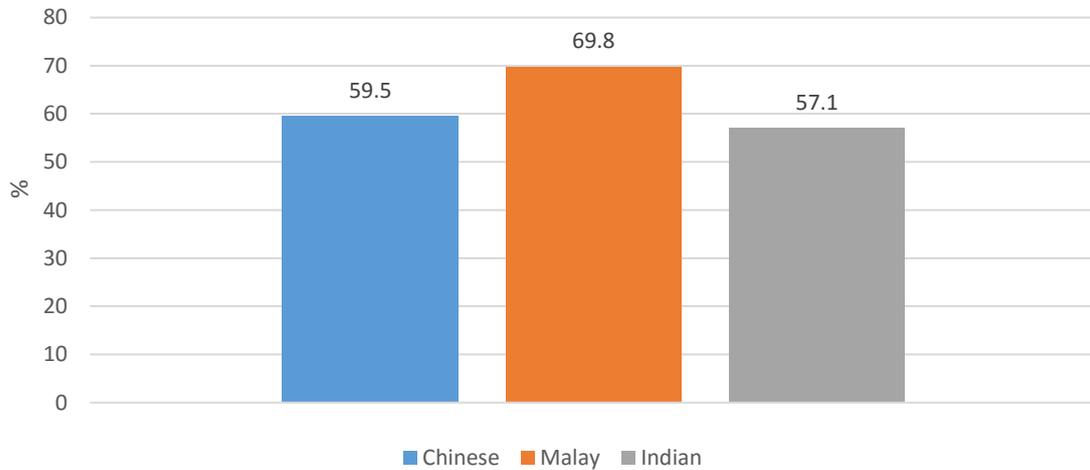
### Pap smear test

59.7% of the participants have not had a Pap smear test within the last 3 years. The proportion in Malays was the highest (69.8%), followed by Chinese (59.5%) then Indians (57.1%).

**Table 4.6. Proportion of women aged 40 to 69 who have not had a Pap smear test within last 3 years**

Screening for cervical cancer	N (%)
Had Pap smear test within last 3 years	390 (40.3%)
Did not have Pap smear test within last 3 years	578 (59.7%)
Total	968

**Figure 4.4.** Percentage of women aged 40-69 who reported that they have not had a Pap smear test within last 3 years



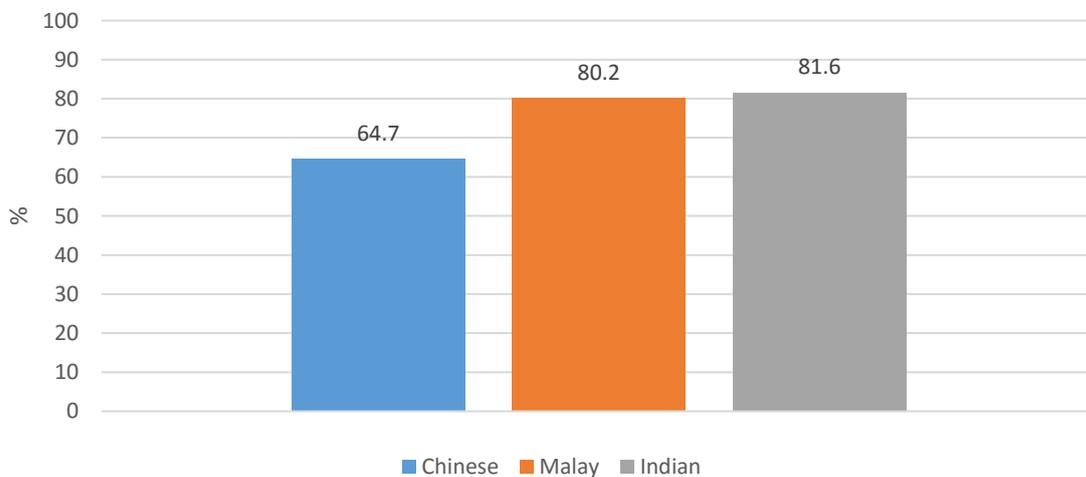
293 (30.3%) of the participants have never had a Pap smear. The proportion in Malays was the highest (43%), followed by Indians (33.3%) then Chinese (28.2%).

68.7% of women aged 40 to 69 were aware of Pap smear tests. The proportion in Indians was the highest (81.6%), followed by Malays (80.2%) then Chinese (64.7%).

**Table 4.7.** Proportion of women aged 40 to 69 who had knowledge of Pap smear

	N (%)
No knowledge of Pap smear	303 (31.3%)
Have knowledge of Pap smear	665 (68.7%)
Total	968

**Figure 4.5.** Percentage of women aged 40-69 who had knowledge of Pap smear test



## Factors associated with irregular screening and not screening

Women with post secondary education and having a higher income were more likely to have a PAP smear test done in the last 2 years.

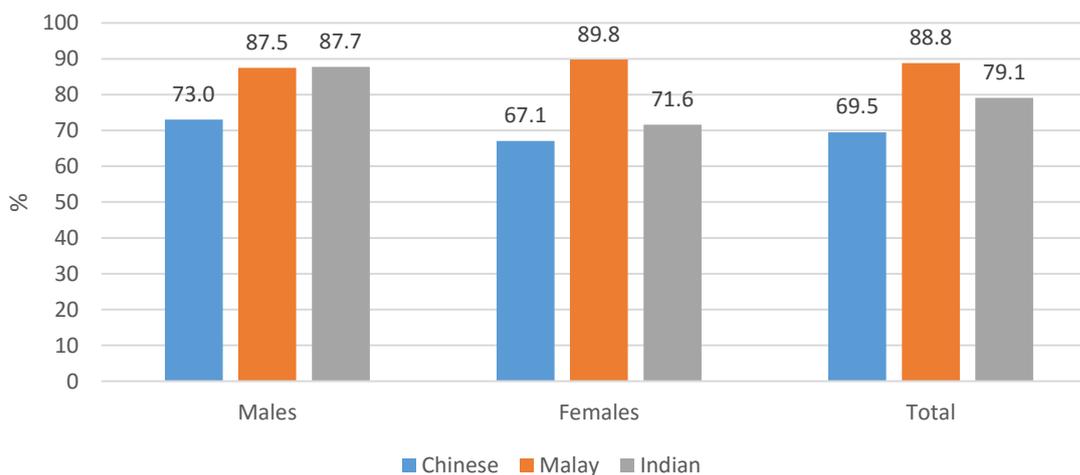
## Colorectal Cancer Screening

**Table 4.8. Proportion of participants aged 51 to 69 last screened for colorectal cancer by stool blood test, colonoscopy or sigmoidoscopy, by recency**

Time last screened for colorectal cancer	N
Within the last 2 years	307
2-5 years ago	123
More than 5 years ago	122
Did not know when	6
Never been screened	544

72.1% of the participants have not had a stool blood test, colonoscopy or sigmoidoscopy within the last 2 years. The proportion in males (76%) was higher than that in females (69.3%). The proportion in Malays was the highest (88.8%), followed by Indians (79.1%) then Chinese (69.5%).

**Figure 4.6. Percentage of participants aged 51-69 who reported that they have not had a stool blood test, colonoscopy or sigmoidoscopy within last 2 years**



544 (49.4%) of the participants have never had a stool blood test, colonoscopy or sigmoidoscopy done. The proportion in males (52.9%) was slightly higher than in females (46.8%). The proportion in Malays was the highest (76.4%), followed by Indians (60.4%) then Chinese (44.9%).

## Factors associated with irregular screening and not screening

Females were more likely to have gone for either screening within the last 2 years. Malays and Indians were less likely to have gone for either screening in the last 2 years as compared to Chinese.

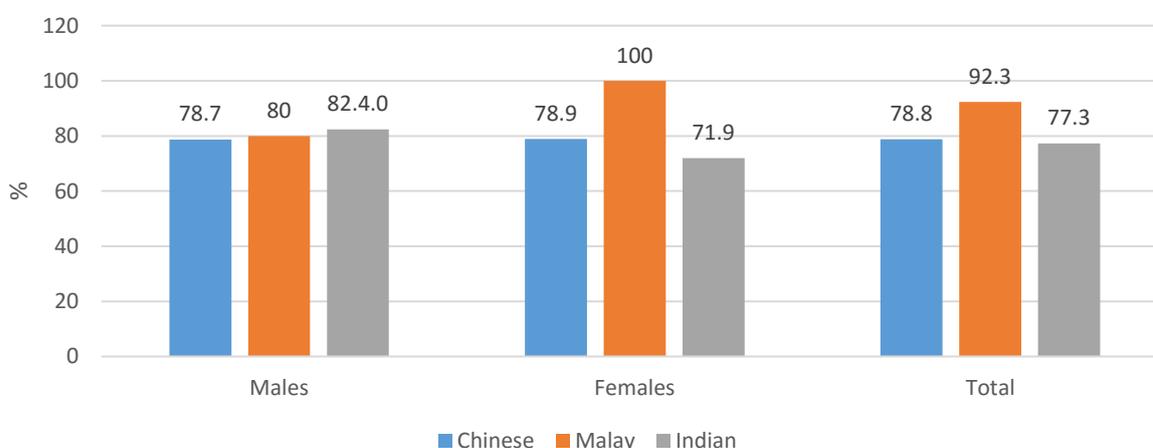
## Sigmoidoscopy and Colonoscopy

79.1% of the participants have not had a colonoscopy or sigmoidoscopy within the last 10 years. The proportion in males (78.8%) was similar to females (79.3%). The proportion in Malays was the highest (92.3%), followed by Chinese (78.8%) then Indians (77.3%).

**Table 4.9. Proportion of participants aged 60 to 69 who reported that they have not had a colonoscopy or sigmoidoscopy, by recency**

Time last had sigmoidoscopy or colonoscopy	N (%)
Within last 10 years	124 (20.9%)
More than 10 years ago	22 (3.7%)
Did not know when	3 (0.5%)
Never had the procedure	444 (74.9%)
Total	593

**Figure 4.7. Percentage of participants aged 60-69 who reported that they have not had sigmoidoscopy or colonoscopy in the last 10 years**



444 (74.9%) of the participants have never had colonoscopy or sigmoidoscopy. The proportion in females (74.7%) was similar to males (75.1%). The proportion in Malays was the highest (88.5%), followed by Indians (75.8%) then Chinese (74.2%).

## Factors associated with irregular screening

Those who had secondary or higher education were more likely to have gone for timely sigmoidoscopy or colonoscopy.

## Vision and Hearing

### Visual Impairment

**Table 5.1. Prevalence of visual impairment**

Categories	N (%)
Any one eye worse than 6/18	320 (20.4%)
Both eyes worse than 6/18	124 (7.9%)

The prevalence of visual impairment was 20.4% for any one eye worse than 6/18 and 7.9% for both eyes worse than 6/18. In both definitions, the prevalence increased rapidly with age.

**Table 5.2. Prevalence of visual impairment stratified by age groups**

Categories	Aged 21-64	Aged 65 and above
Any one eye worse than 6/18	149 (12.4%)	171 (46.5%)
Both eyes worse than 6/18	48 (4%)	76 (20.7%)

## Hearing Loss

**Table 5.3. Prevalence of moderate hearing loss**

Moderate hearing loss ( $\geq 40$ dB)	N (%)
At least 3 out of 4 frequencies not heard in any ear	175 (11.2%)
At least 3 out of 4 frequencies not heard in both ears	78 (5%)
All 4 frequencies not heard in both ears	22 (1.4%)

The prevalence of hearing loss was 11.2% for at least three frequencies out of four affected in at least one ear, 5% for at least three frequencies out of four affected in both ears and 1.4% for all four frequencies affected in both ears. The prevalence of hearing loss was observed to increase with age.

**Table 5.4. Prevalence of moderate hearing loss stratified by age groups**

Categories	Aged 21-64	Aged 65 and above
At least 3 frequencies out of 4 affected in at least 1 ear	59 (4.9%)	116 (31.9%)
At least 3 frequencies out of 4 affected in both ears	17 (1.4%)	61 (16.8%)
All 4 frequencies affected in both ears	4 (0.3%)	18 (4.9%)

## Elderly Health

### Oral Check

56.3% of the participants have not had an oral health check within the last year. The proportion of these participants was similar in both males (56.6%) than in females (56.1%). The proportions of these participants were highest in Malays (76.9%), followed by Chinese (56.3%) then Indians (42.9%).

**Table 6.1. Proportion of participants aged 65 and above who reported that they had not had an oral health check within last year**

Oral health check	N (%)
Screened within last year	353 (43.7%)
Not screened within last year	455 (56.3%)
Total	808

**Table 6.2. Main reasons for not going for oral health check in the last year**

Reasons	N
There is nothing wrong with my teeth	326
I have no more teeth (using dentures)	98
I cannot afford the dental treatment/travel expense	19
I do not like to/am afraid to visit the dentist	15
I have no time to go	15
I cannot find help to travel to the dentist	1
Other reasons	14

### Cognitive Impairment

Cognitive impairment is defined as having a low cognitive screening test score that is below 24. 142 (17.6%) elderly had scored below 24 for the cognitive screening test. The proportion of this group was higher in those aged 80 and above (33.3%) than those aged between 65 and 79 years (14.0%).

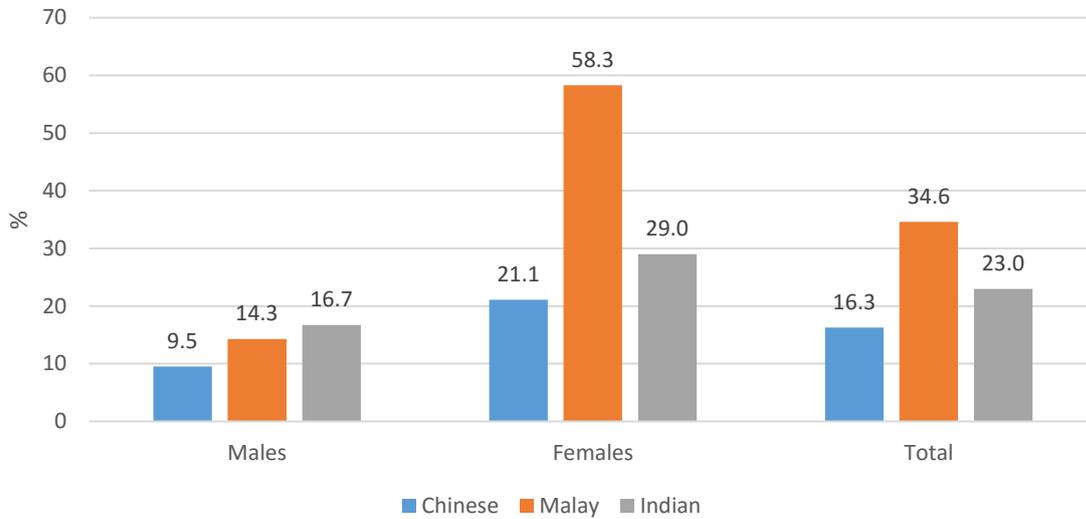
**Table 6.3. Prevalence of cognitive impairment**

Classification	N (%)
Normal	665 (82.5%)
Low cognitive test score	142 (17.6%)
Total	807

**Table 6.4. Prevalence of cognitive impairment stratified by age groups**

	Aged 65-79	Aged 80 and above
Normal	565 (86%)	100 (66.7%)
Low cognitive test score	92 (14%)	50 (33.3%)
Total	657	150

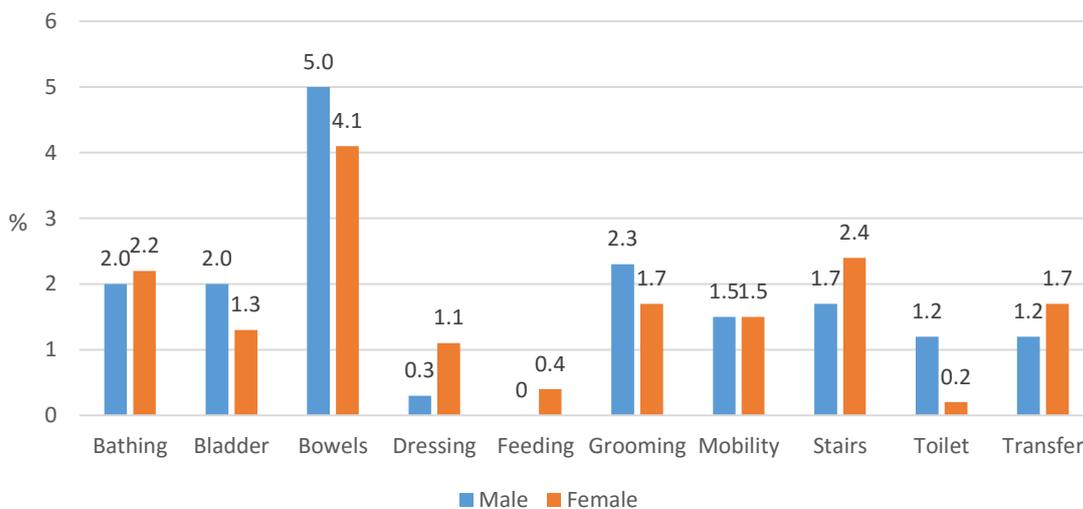
**Figure 6.1.** Percentage of participants aged 65 and above with low cognitive test score, by gender and ethnic group



## Activities of Daily Living

There was a higher proportion of females who had problems with bathing, dressing themselves and taking the stairs as compared to males. There was a higher proportion of males with problems such as bladder and bowels control, grooming themselves and using the toilet.

**Figure 6.2.** Percentage of participants aged 65 and above with problems in ADLs, by gender



Members of the ElderShield scheme who are not able to perform at least 3 of the 6 activities of daily living (ADLs) defined in the scheme will be eligible for insurance payouts (unless the disability pre-dates the commencement of the policy). The 6 ADLs are:

**Table 6.5. Prevalence of cognitive impairment stratified by age groups**

<b>Eldershield scheme list of 6 ADLs</b>	
<b>Washing</b>	Unable to wash in the bath or shower (including getting into and out of the bath or shower) or wash by other means.
<b>Dressing</b>	Inability to put on, take off, secure and unfasten all garments and, as appropriate, any braces, artificial limbs or other surgical or medical appliances.
<b>Feeding</b>	Inability to feed oneself food after it has been prepared and made available.
<b>Toileting</b>	Inability to use the lavatory or manage bowel and bladder function through the use of protective undergarments or surgical appliances if appropriate.
<b>Mobility</b>	Inability to move indoors from room to room on level surfaces.
<b>Transferring</b>	Inability to move from a bed to an upright chair or wheelchair, and vice versa.

Source:

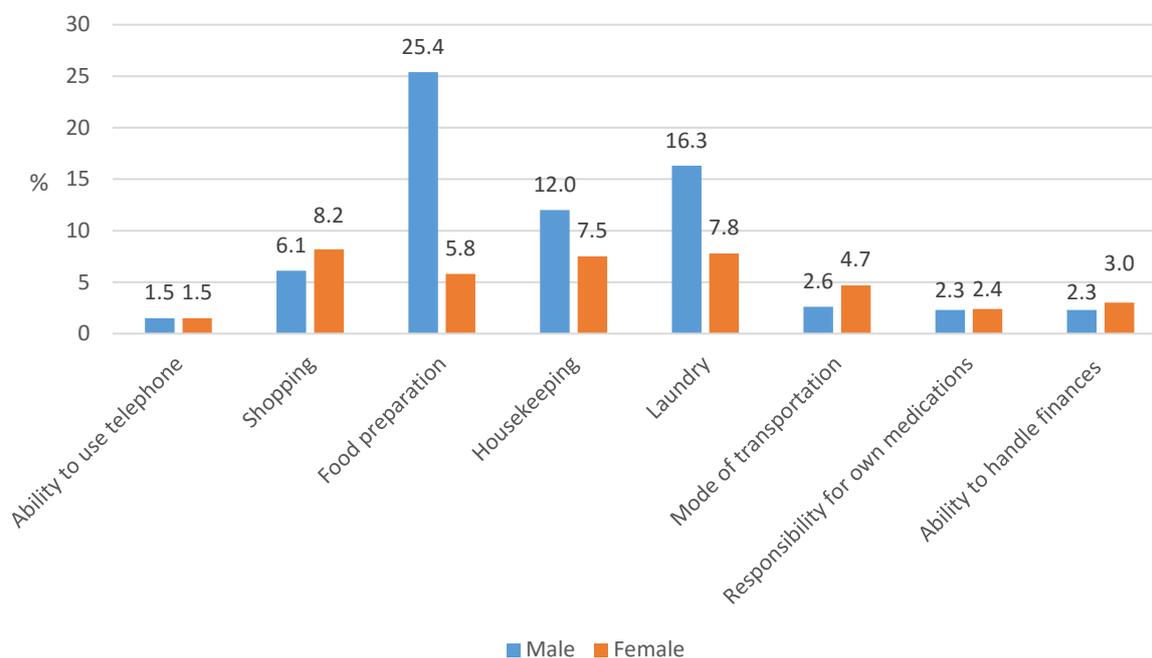
[https://www.moh.gov.sg/content/moh\\_web/home/costs\\_and\\_financing/schemes\\_subsidies/ElderShield/Definition\\_of\\_Disability.html](https://www.moh.gov.sg/content/moh_web/home/costs_and_financing/schemes_subsidies/ElderShield/Definition_of_Disability.html) (accessed 21 July 2017)

There were 8 elderly participants (1%, 3 males and 5 females) who were not able to perform at least 3 of the 6 ADLs as defined above.

## Instrumental Activities of Daily Living

There was a much higher proportion of males with problems such as food preparation, housekeeping and laundry as compared to females. Females had a higher proportion who had problems with shopping, travelling in public and handling finances than males.

**Figure 6.3.** Percentage of participants aged 65 and above with problems in IADLs, by gender



## Risk of Falls

Elderly participants were classified into low to very high risk of sustaining falls by their history of falls and the time taken to complete the Timed-Up-&-Go (TUG) test, a test which assesses mobility and balance. There were 24 elderly participants who had high or very high risk of falls. Within those in age group 65-79 years old, 19.9% had high or very high risk. This proportion was much higher for those who are aged 80 and above (40.8%). There were 5 elderly who were unable to perform the Timed-Up-and-Go test. 3 of them reported problems in mobility section of the questionnaire on activities of daily living.

**Table 6.6.** Number of participants in each risk category

Number of falls in last 12 months	TUG completion on time		
	<10s	10-14s	>14s
0	109	168	40
1	6	20	4
≥2, or ≥1 fall requiring hospitalisation	1	9	9

Colour legend: green= low risk; yellow= moderate risk; orange= high risk; red= very high risk

**Table 6.7.** Proportion of participants aged 65 and above in high and very high risk categories stratified by age group

Risk categories	Aged 65-79	Aged 80 and above
Low	101 (31.9%)	8 (16.3%)
Moderate	153 (48.3%)	21 (42.9%)
High and Very high	63 (19.9%)	20 (40.8%)
Total	317	49

**Table 6.8. Number and proportion of participants aged 65 and above in high and very high risk categories, by gender and ethnic group**

	Male				Female			
	Chinese	Malay	Indian	Other	Chinese	Malay	Indian	Other
N	30	1	4	0	39	3	6	0
%	20.7	16.7	26.7	0	21.8	75	42.9	0

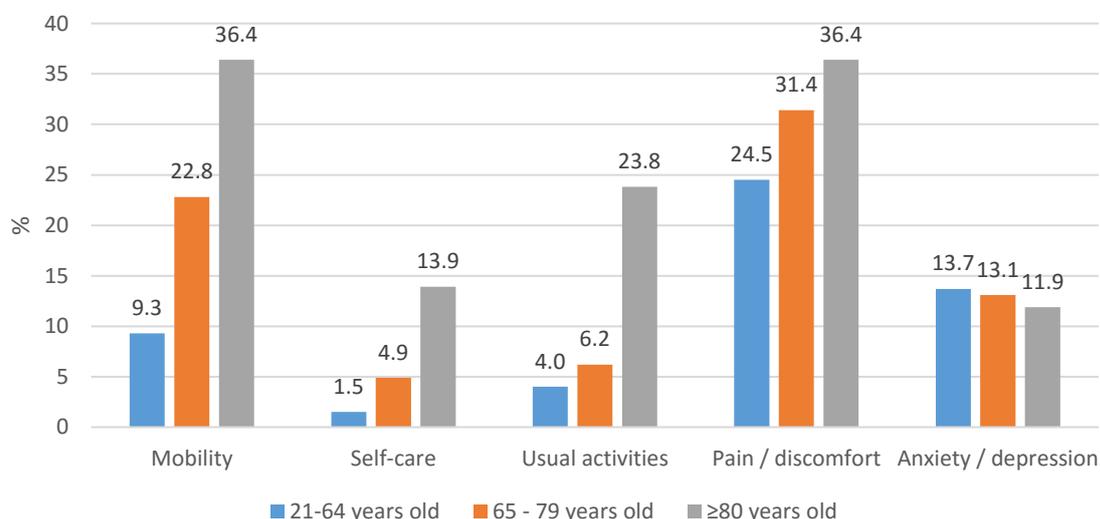
## Health-Related Quality of Life

### Self-Reported Problems

All the participants were administered the EQ-5D questionnaire which comprises two parts. The first part measures five dimensions of health (mobility, self-care, usual activities, pain/discomfort and anxiety/depression), within five levels—corresponding to “no problems,” “slight problems,” “moderate problems,” “severe problems,” and “extreme problems”.

A high proportion of participants aged 80 and above reported having problems with mobility (36.4%) and pain or discomfort (36.4%). Pain or discomfort was both the top problem for participants aged 21 to 64 years old and 65 to 79 years old.

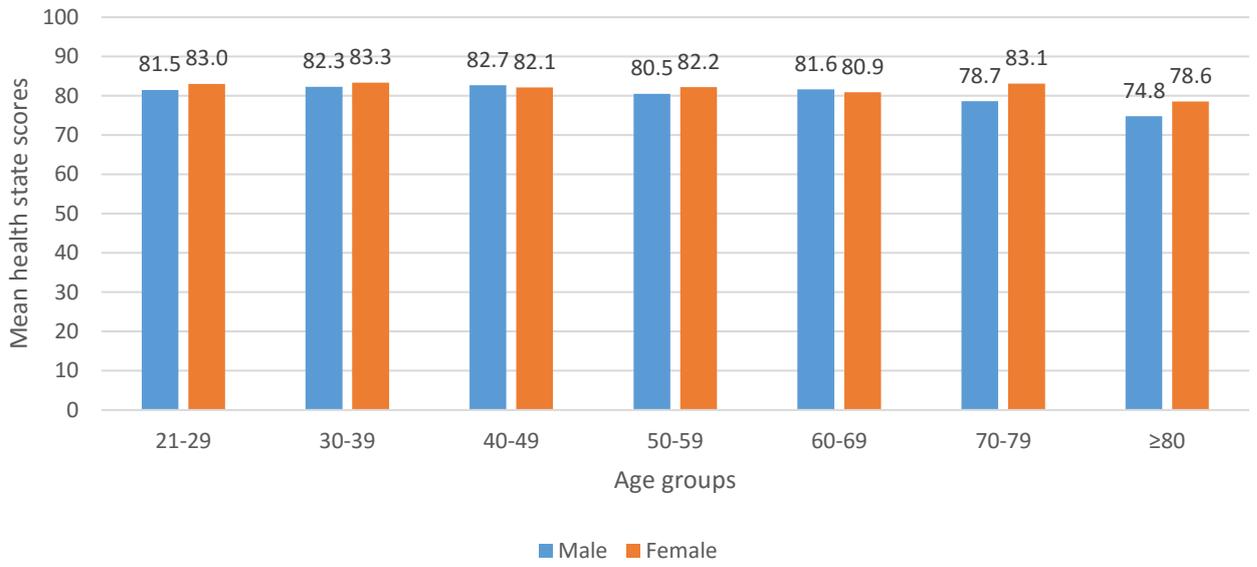
**Figure 7.1.** Percentage of participants who reported having problems, by age group



### Self-Rated Overall Health Score

In the second part of the EQ-5D questionnaire, participants were asked to look at a 20cm long scale with values ranging from 0 (representing the poorest state of health) to 100 (representing the best state of health) and indicate the value that they think best represents their state of health on that day.

**Figure 7.2.** Mean self-rated health scores, by gender and age group



## Key Points

### **Diabetes, hypertension and lipid disorders**

14.6% of the participants had diagnosed diabetes or had high blood glucose levels. The prevalence was higher in males (17.0%) than in females (12.9%), and the prevalence was higher in Indians (21.5%) as compared with other ethnic groups. 34.9% of the participants who had high blood glucose levels had not been previously diagnosed with diabetes. 29.4% of diagnosed diabetics had poorly controlled blood glucose levels.

34.4% of participants had been previously diagnosed to have hypertension or had blood pressure in the hypertension range. The prevalence of hypertension was higher in males (40.8%) than in females (29.6%). 38.7% of the participants who had high blood pressure had not been previously diagnosed. 2.7% of the participants diagnosed with hypertension had poorly controlled blood pressure.

13.8% of the participants had high levels of LDL-C. The proportion in Malays was the highest (16.9%) amongst the ethnic groups.

14.2% of the participants had high total cholesterol. 53.4% of the participants who had high total blood cholesterol had not been previously diagnosed.

### **Obesity**

37.6% of the participants were overweight and 18.5% were obese. The proportion of obese adults in Malays was higher (39%) compared to other ethnic groups.

### **Cardiovascular diseases**

6.2% of the participants had a history of heart disease. This was more common in males (9.2%) than in females (3.9%).

1.6% of the participants had a history of stroke.

10.4% of the participants were at high risk or very high risk of coronary artery disease. The prevalence was higher in males (13.0%) than in females (8.1%).

### **Lifestyle**

11.7% of the participants were heavy smokers. 21.5% of males were heavy smokers while only 4.3% females were heavy smokers. Smokers were also more likely to be Malay, have lower education levels, lower monthly income and be in the 21 to 49 age group.

12.1% of the participants were heavy drinkers. Heavy drinking was more common in males (16.7%) than in females (8.6%).

19.5% of the participants were not doing sufficient physical activity. Among participants aged below 65 years, those who had post-secondary education were more likely to be doing sufficient physical activity compared to those with lower education levels. Those with lower education level were less likely to be doing sufficient physical activity. While problems with mobility were significantly associated with insufficient physical activity in the older age group, the number of participants with mobility problems was too small to affect the overall proportion who were not active enough.

## **Screening**

28.1% of the participants had not been screened for diabetes, hypertension or lipid disorders within last 3 years. The proportions of not being timely screened in Chinese (27.3%) and Indians (24.8%) were similar and lower than in Malays (41.7%).

62.2% of the female participants aged 51 to 69 had not had a mammogram within the last 2 years. 93.7% of females in this age group had knowledge about mammogram.

59.7% of the female participants aged 40 to 69 had not had a Pap smear within the last 3 years. 68.7% of females in this age group were aware of Pap smear tests.

Higher education levels were associated with having a mammogram or a Pap smear done within the recommended timeframe. Higher income levels were also associated with having a Pap smear done within the last 3 years.

72.1% of the participants had not had a stool blood test, colonoscopy or sigmoidoscopy within the last 2 years. Chinese were the most likely to have gone for either screening within last 2 years compared to Malays and Indians. Females were more likely to have gone for either screening within the last 2 years. Those who had higher education levels were more likely to have gone for timely sigmoidoscopy/colonoscopy in the last 10 years.

## **Vision and hearing**

20.4% of the participants were visually impaired in at least one eye. 11.2% had hearing impairment. The prevalence for both of these conditions increased with age.

## **Health of the elderly (aged 65 and older)**

17.6% of the elderly participants had cognitive impairment.

3.5% of the participants had 2 or more falls in the last 12 months. 22.7% of the participants were in high and very high risk groups after taking into account their timing in Timed-up-and-go and the number of falls recorded.

56.3% of the participants have not had an oral health check within the last 1 year.

The top 3 ADL problems that male participants had were bowels control, followed by grooming and then bathing and bladder control. The top 3 for females were bowels control, followed by stairs climbing and then bathing. 8 (1%) elderly participants were not able to perform at least 3 of the 6 ADLs as defined in the ElderShield Scheme.

The top 3 instrumental ADL problems reported by male participants had were food preparation, followed by laundry and then housekeeping. The top 3 for females were shopping, followed by laundry and then housekeeping.

## **Health-related Quality of Life**

Pain/discomfort was the most commonly reported problem in all age groups: 40 to 64 years old (24.5%), 65 to 79 years old (31.4%) and 80 years old and above (36.4%).

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