4 Multimorbidity and Medication Usage

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Staidéar Fadaimseartha na hÉireann um Dhul in Aois
The Irish Longitudinal Study on Ageing

4 Multimorbidity and Medication Usage

Key Findings

- 64% of adults aged 75 years and older report the presence of three or more chronic conditions compared to 34% of adults aged 58-64 years. A higher proportion of adults reporting low physical activity also report three or more chronic conditions (59%) compared to adults reporting high physical activity (37%).
- Hypertension and high cholesterol are the most commonly reported cardiovascular diseases in adults. Angina and heart attack became increasingly prevalent in older ages for both men and women. Diabetes also increases in prevalence with age, but only in men.
- Experience of a stroke is over twice that in adults aged 75 years and older (4%) compared to adults aged 58-64 years (1%). The proportion of mini-stroke or a transient iscahemic incident is twice that in adults reporting low physical activity (6%) compared to adults reporting high physical activity (3%).
- The prevalence of cancer increases with age in men, increasing from 6% in adults aged 58-64 to 17% in adults aged 75 years and older.
- The proportion of adults reporting asthma or lung disease is 13% and 9% respectively. A higher proportion of women report asthma compared to men between ages 58-74 years. Twice as many current smokers (14%) report lung disease compared to never or past smokers (8%), and a lower proportion of those reporting high physical activity (10%) report asthma compared to low physical activity (15%).
- Almost half of adults (46%) report arthritis, increasing to 60% in adults aged 75 years and older.
- Just one-fifth (20%) of adults report no medication use, with 92% of adults aged 75 years and older reporting use of at least one medication. The proportion of adults aged 75 years and older (48%) using five or more medication is over twice that of those aged 58-64 years (18%).
- Almost half of adults use anti-hypertensive medication (49%), increasing from 33% to 69% in adults aged 58-64 years and 75 years and older respectively.

4.1 Introduction

The occurrence of medical conditions increases with age. (1, 2) Multimorbidity is defined as the co-existence of two or more chronic conditions, and evidence suggests this is the norm rather than the exception in older adults in Ireland. (1) Multimorbidity has been associated with worse quality of life, functional status, increased healthcare utilisation and risk of mortality. (2, 3) The current and projected rise in prevalence of chronic disease and multimorbidity in older adults in Ireland presents a challenge for the Irish health and social care system and for the older population. Integrated Care Programmes have been established by the Health Service Executive (HSE), two of which focus on care for the older population and for those living with a chronic condition. (4) Adults with chronic disease or multimorbidity are also considered a high-risk category for COVID-19. (5, 6) Describing the distribution of disease prevalence and medication use in community-dwelling older adults may help to inform these programmes and policies targeting health conditions, to improve the health and wellbeing of the older population.

The aim of this chapter is to describe the prevalence of cumulative chronic conditions (multimorbidity), cardiovascular, respiratory and other chronic conditions, many of which are thought to be risk factors for COVID-19, and medication use amongst TILDA participants aged 58 years and older at Wave 5 (n=4,908). Estimates are categorised by three age groups: 58-64 years (n=1,467), 65-74 years (n=1,933) and 75 years and older (n=1,508), and by sex: men (n=2,202) and women (n=2,706). Prevalence of multimorbidity is also described by smoking status and physical activity.

Longitudinal weights are used to account for participant attrition between Wave 1 and Wave 5.

4.2 Measures of Chronic conditions collected in TILDA

The following section describes the individual conditions collected in TILDA that are used to define and describe cumulative multimorbidity in this chapter: chronic conditions, medication use and behavioural health.

4.2.1 Chronic Conditions

During the computer-assisted personal interview conducted at each wave of data collection, TILDA participants are asked if they have ever been diagnosed by a doctor with cardiovascular, cerebrovascular, cancer, respiratory and other chronic conditions. These are detailed in Table 4.1:

Table 4.1. List of chronic conditions

Cardiovascular Conditions	Cerebrovascular Conditions	Respiratory Conditions	Other Chronic Conditions
Hypertension	**Stroke**	Chronic Lung Disease	Cancer
Angina	**Mini-Stroke or a Transient Ischaemic Attack**	Asthma	Arthritis
Heart Attack			Osteoporosis
Congestive Heart Failure			Varicose Ulcer
Diabetes			Thyroid Problems
High Cholesterol			

The prevalence estimates for chronic conditions include both reporting of the condition at any previous wave of TILDA, and incidence of the condition at Wave 5.

4.2.2 Medication Use

Regular use of medications is common in older adults. TILDA participants are asked to report the medications they take on a regular basis, including prescription medications and over-the-counter medications. Medications are assigned WHO Anatomic Therapeutic Chemical (ATC) classification codes. Anti-depressant medication is classified as Anatomical Therapeutic Chemical (ATC) code N06A. Anti-hypertensive medication is identified as ATC codes C02 (antiadrenergic agents), C03 (diuretics), C07 (beta blockers), C08 (calcium-channel blockers) and C09 (angiotension-converting enzyme inhibitors). Sleep medication is identified as ATC codes N05A (antipsychotic agents), N05B (anxiolytics), N05C (hypnotics and sedatives) and R06A (antihistamines).

4.2.3 Behavioural Health

TILDA collects detailed information on behavioural health. Participants are asked about smoking and physical exercise, two major determinants of health which may exacerbate chronic disease (7). Participants are classified as current smokers (12%), and never or past smokers (88%). Physical activity is measured using the Short-Form International Physical Activity Questionnaire which asks participants to self-report how many days, and for how long, they have engaged in vigorous activity, moderate activity and walking in the past seven days. The time spent is converted to MET-minutes, weighted by the intensity of the activity. Participants are then classified as participating in high (24%), moderate (36%) or low (40%) physical activity by meeting one of the criteria for each classification of physical activity as outlined in Table 4.2.

Table 4.2. Physical Activity Classificiations

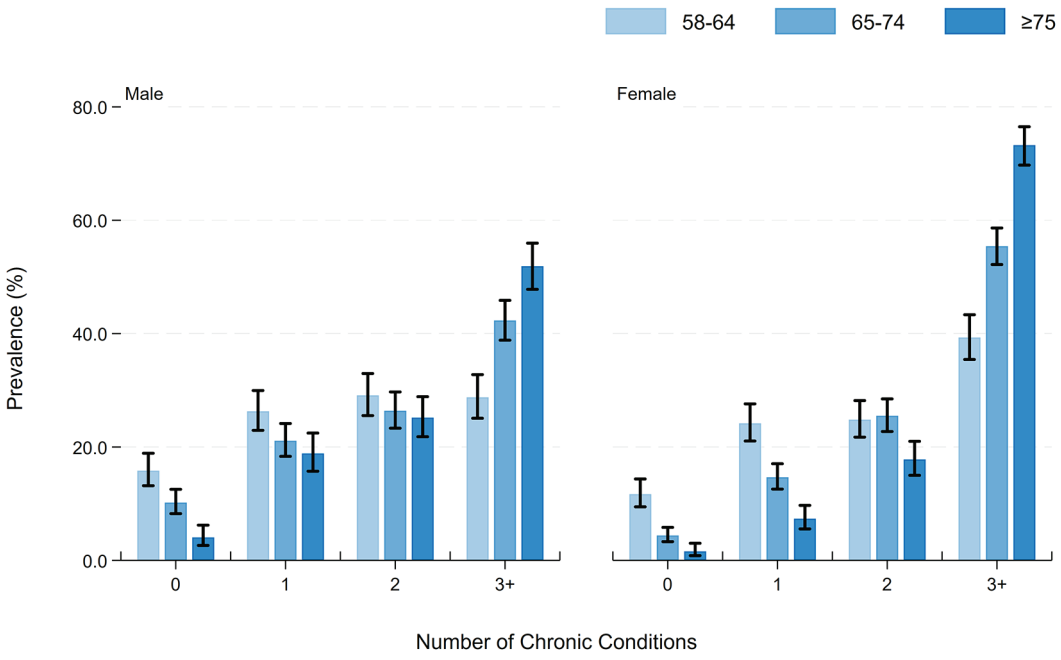
High	Moderate	Low
≥1500 MET-minutes with 3 or more days of vigorous activity ≥3000 met minutes of combined activity for 7 days	**≥20 minutes vigorous activity for more than 3 days** **≥30 minutes combined walking and moderate activity for at least five days** **≥600 metabolic minutes of any combination of exercise for at least five days**	Meeting none of the criteria for either high or moderate activity

4.3 Multimorbidity

Almost three quarters (74%) of adults aged 58 years and older report the presence of two or more medical conditions. Just 8% report no chronic conditions. The number reporting the presence of three or more chronic conditions in the oldest age group (64%, 75 years and older) is almost twice that in the youngest age group (34%, 58-64 years).

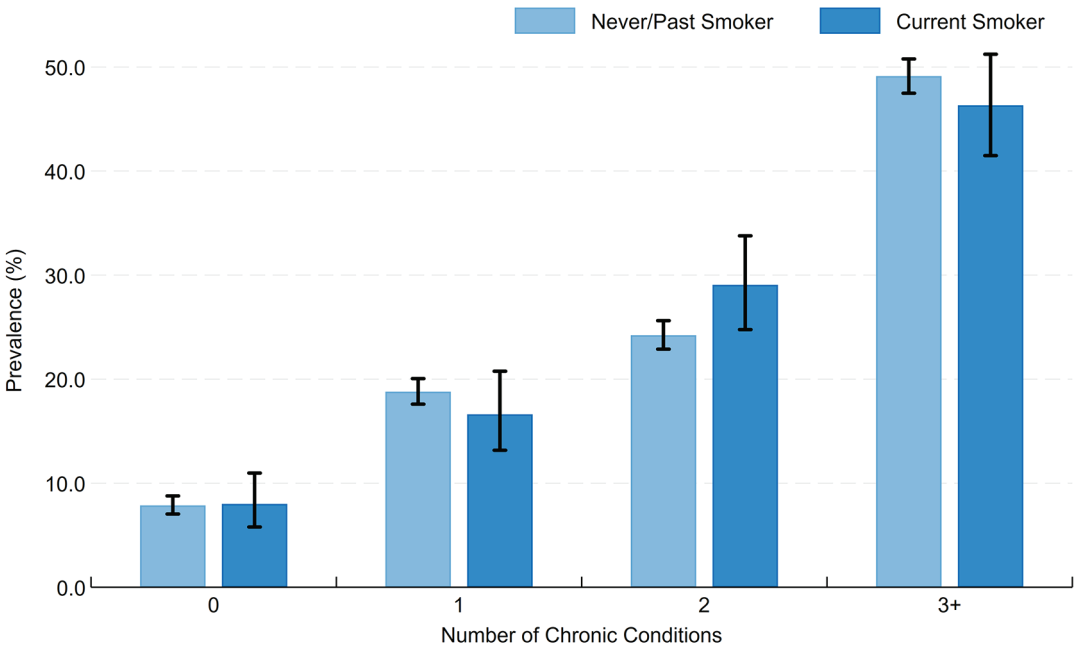
The increase in the proportion of adults with co-existing chronic conditions with age is higher in women compared to men (Figure 4.1). In men, the presence of three or more conditions increases from 29% in the youngest age group to 52% in those aged 75 years and older, while for women this increases from 39% to 73% respectively.

Figure 4.1. Prevalence of chronic conditions by age group and sex



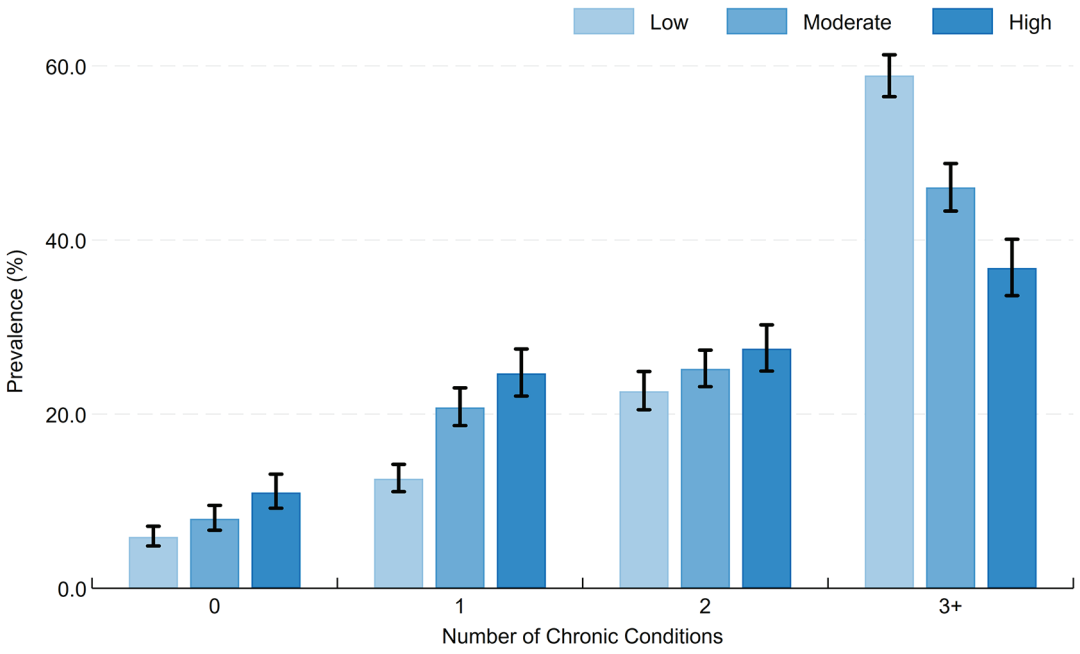
This did not differ by smoker status with the prevalence of the number of conditions similar between older adults who report never smoking or being past smokers compared to those who are current smokers (Figure 4.2).

Figure 4.2. Prevalence of chronic conditions by smoker status



Some differences were however present between physical activity categories in those with three or more chronic conditions where a decreasing trend in prevalence was found as the level of physical activity increased (Figure 4.3). 59% of older adults who report low physical activity also report three or more chronic conditions, compared to 46% of those reporting moderate physical activity and 37% of those reporting high physical activity.

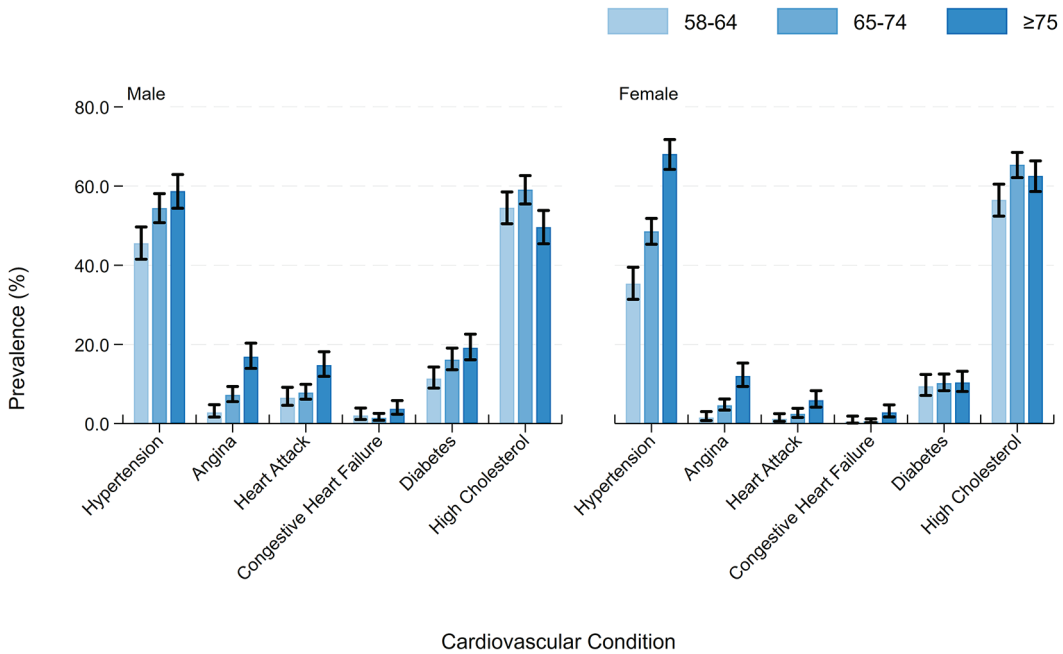
Figure 4.3. Prevalence of chronic conditions by physical activity category



4.4 Cardiovascular Conditions

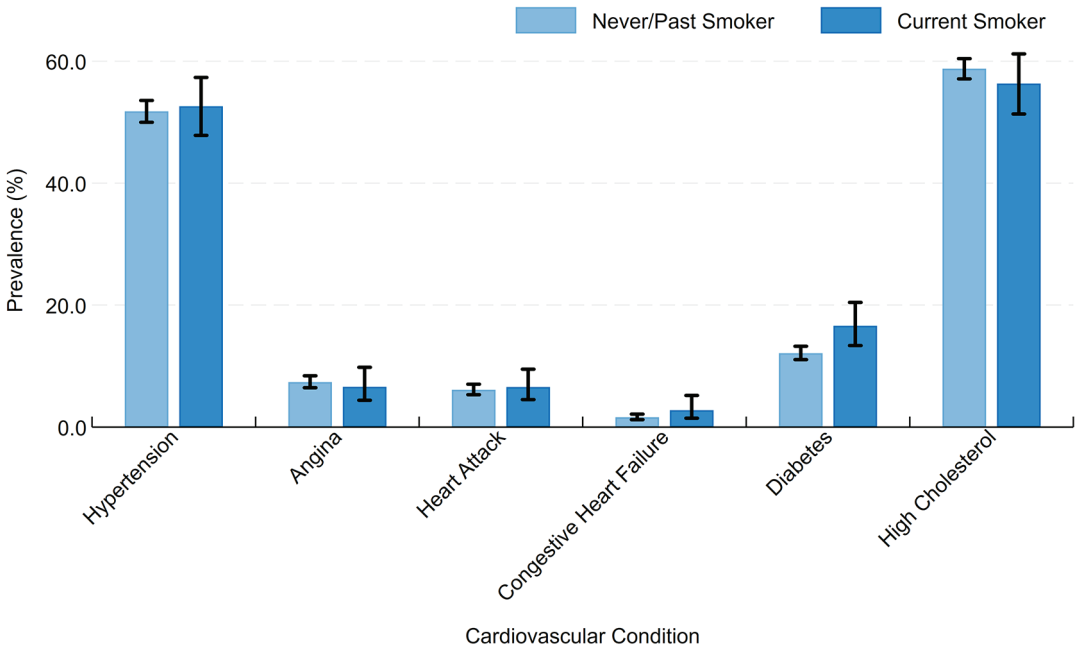
Cardiovascular disease is a leading cause of mortality in Ireland and contributes to an increased risk of physical limitations, worse self-rated health and poorer quality of life in older adults. (8) Hypertension and high cholesterol are the two most commonly reported cardiovascular conditions in adults in Ireland (Figure 4.4). Overall, 59% of adults report high cholesterol and 52% of adults report hypertension. For high cholesterol, the prevalence is higher in adults aged 65-74 years (62%) compared to those aged 58-64 years (56%) but decreased to 57% in those aged 75 years and older. The prevalence in both men and women was similar in those aged between 58-74 years, but there is a difference in the oldest age group, with 63% of women reporting high cholesterol compared to 50% of men. In hypertension however, prevalence increases with age, with the highest prevalence reported in those aged 75 years and older (62%). A higher prevalence is reported by men (46%) compared to women (35%) in the youngest age group, while women aged 75 years and older have a higher prevalence (68%) compared to men in the same age group. Angina and heart attack become increasingly prevalent in older age groups for both men and women. A similar trend is seen for diabetes in men however there is no age difference in women.

Figure 4.4. Prevalence of cardiovascular conditions by age group and sex



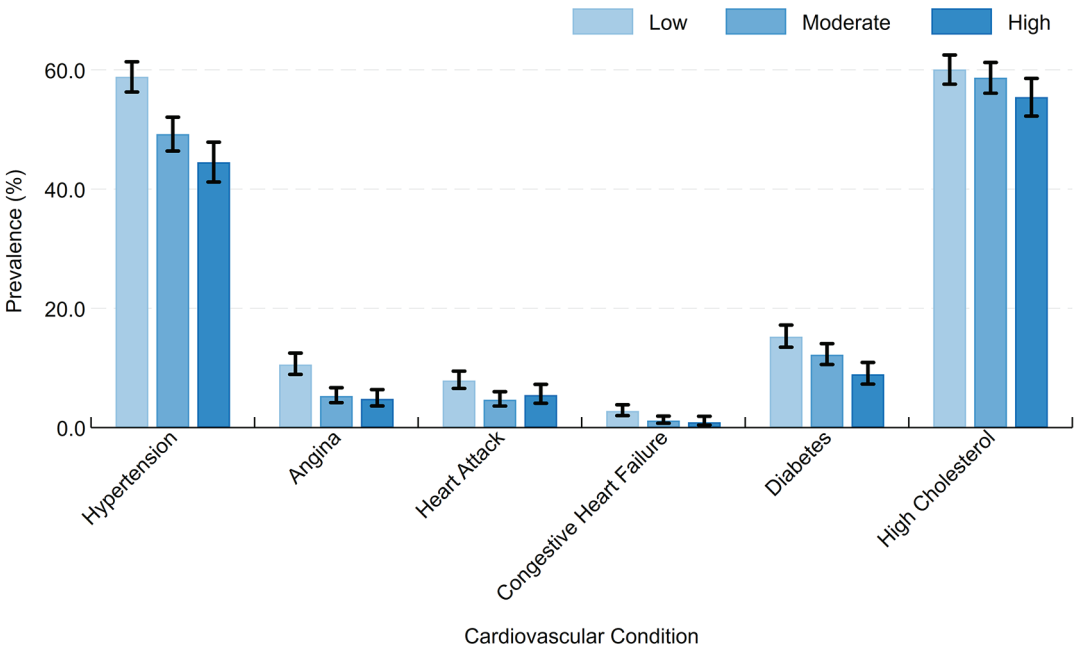
Adults who report being current smokers have a higher prevalence of diabetes (17%) compared to those who are never or past smokers (12%), although this difference was not statistically significant. Both never/past smokers and current smokers have similar prevalence of all other cardiovascular conditions.

Figure 4.5. Prevalence of cardiovascular conditions by smoker status



Adults reporting higher levels of physical activity have the lowest prevalence of hypertension, angina, diabetes and high cholesterol. The largest difference is in the prevalence of hypertension, with 59% of adults who report low physical activity reporting that they have been diagnosed with hypertension compared to 45% of adults reporting moderate physical activity, and 42% who report high physical activity.

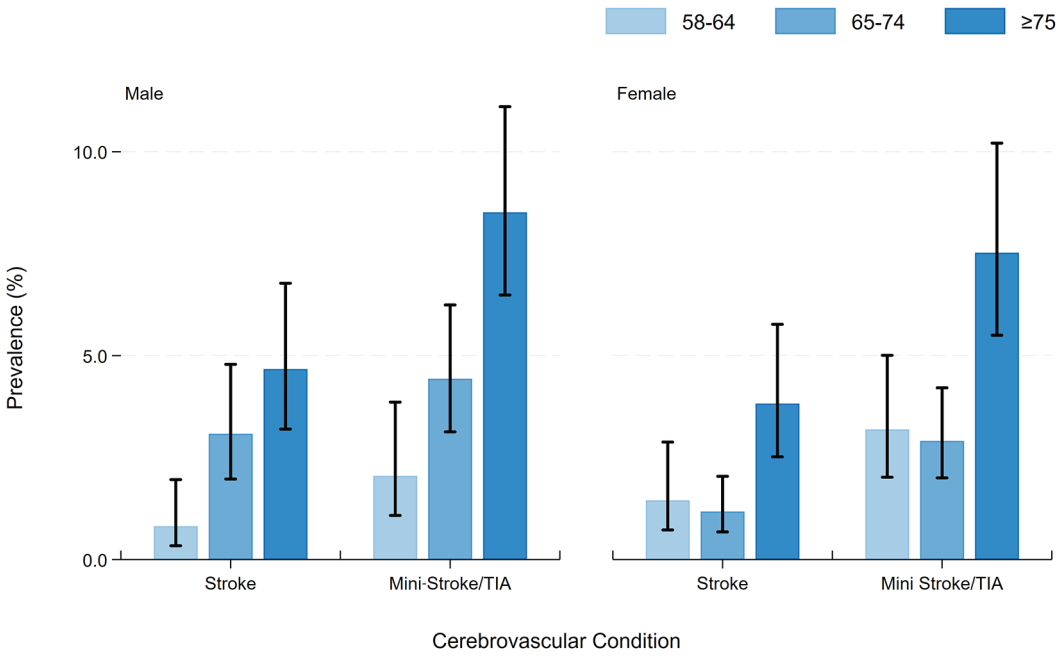
Figure 4.6. Prevalence of cardiovascular conditions by exercise category



4.5 Cerebrovascular Conditions

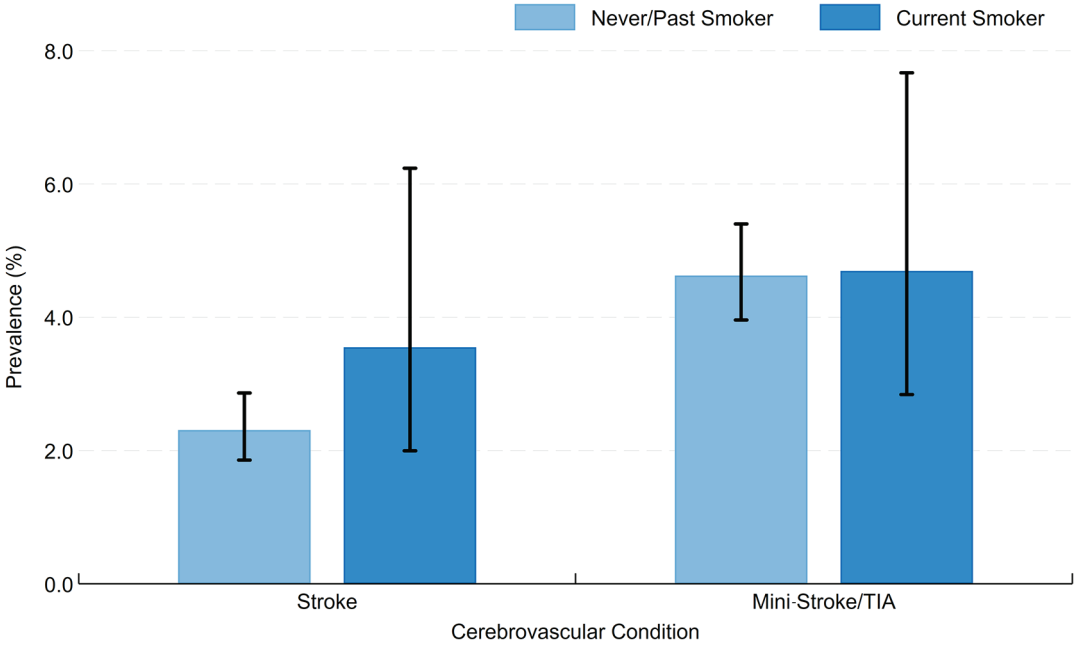
Cerebrovascular conditions may have long lasting impacts on health. Experience of a stroke in older ages can result in mortality or disability and is associated with worse quality of life, mental health, increased care needs and a loss of independence. (9, 10) Many of the risk factors for cerebrovascular conditions are modifiable, including cardiovascular disease, and health behaviours such as smoking. (9) Overall, 2% and 5% of adults report experiencing a stroke, or mini-stroke / transient ischaemic attack (TIA) respectively and prevalence of both increases with age for both men and women (Figure 4.7). Experience of a stroke increases from 1% in adults aged 58-64 years to 4% in those aged 75 years and older, while the prevalence of mini-stroke / TIA is over twice as high in adults aged 75 years and older (8%) compared to those aged 58-64 years (3%).

Figure 4.7. Prevalence of cerebrovascular conditions by age group and sex



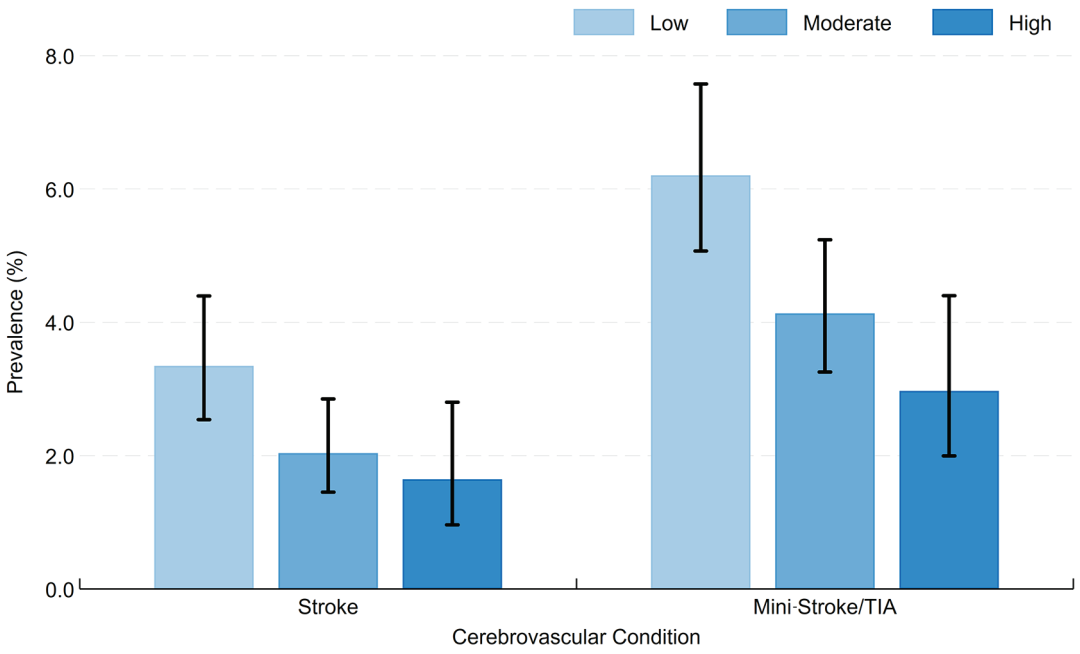
The prevalence of stroke or mini-stroke / TIA is similar between both never or past smokers, and current smokers (Figure 4.8).

Figure 4.8. Prevalence of cerebrovascular conditions by smoker status



The prevalence of stroke is similar across all physical activity categories, however those reporting low physical activity are more likely to report a mini-stroke / TIA (6%) compared to those reporting high physical activity (3%) (Figure 4.9).

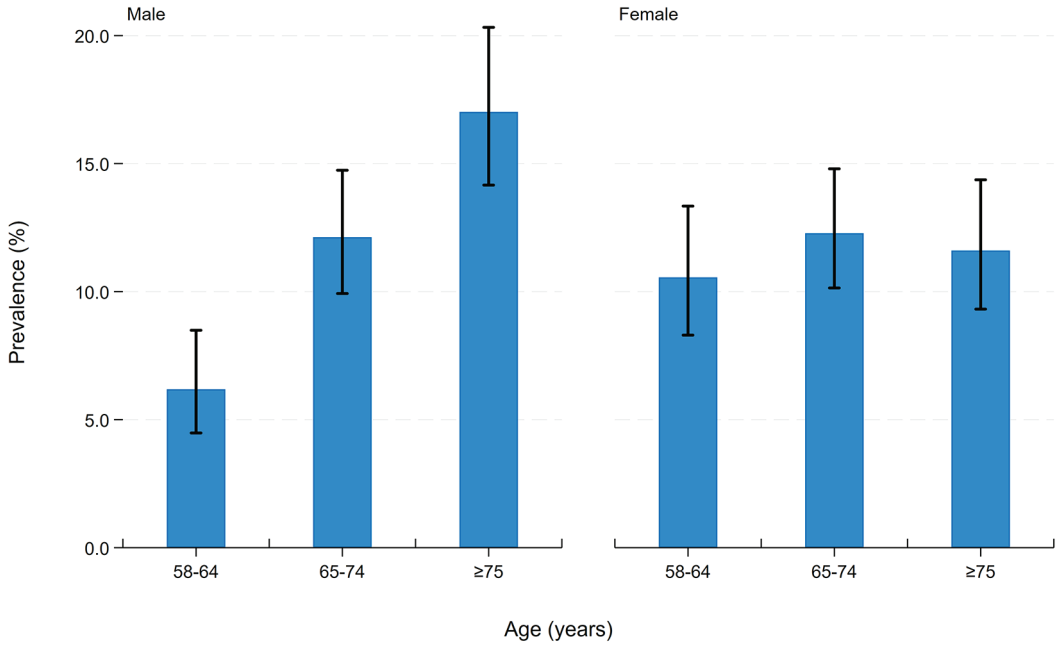
Figure 4.9. Prevalence of cerebrovascular conditions by exercise category



4.6 Cancer or a malignancy

Mortality rates of cancer have declined in recent years, but remain a significant cause of mortality. (7) 12% of adults report a cancer diagnosis (Figure 4.10). The prevalence increases from 8% in adults aged 58-64 years, to 14% in those aged 75 years and older. An age gradient is apparent in men, increasing from 6% in those aged 58-64 years to 17% in those aged 75 years and older. The prevalence is similar across all age groups in women.

Figure 4.10. Prevalence of cancer or a malignancy by age group and sex



The prevalence a reported cancer or malignancy is similar between both never or past smokers, and current smokers, and all physical activity categories (Figure 4.11 & Figure 4.12).

Figure 4.11. Prevalence of cancer or a malignancy by smoker status

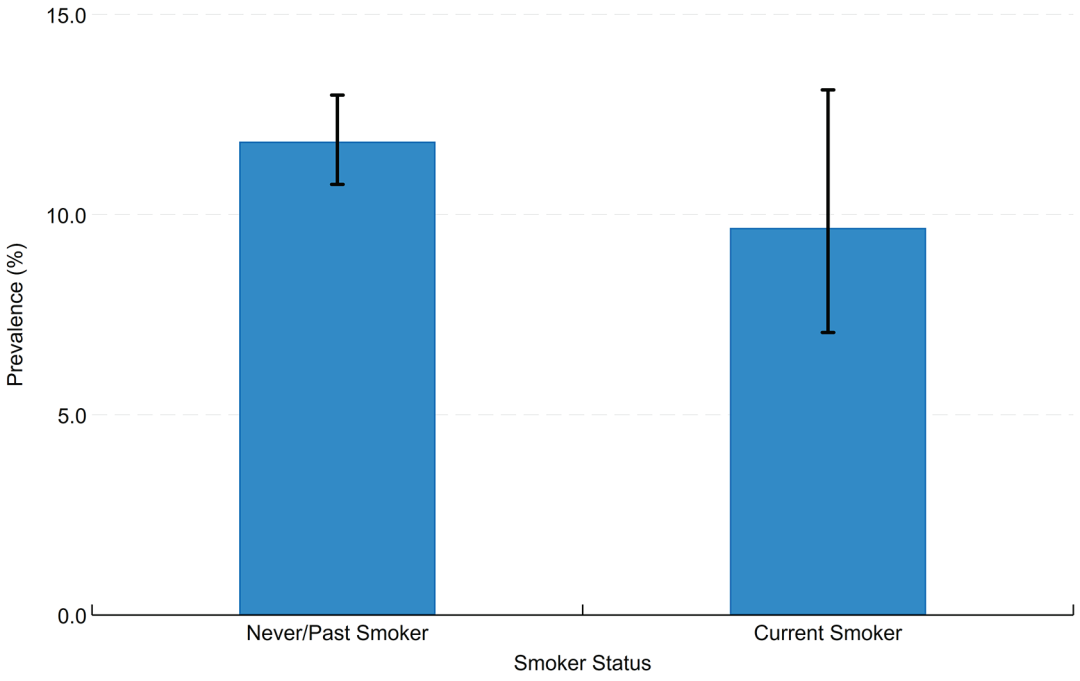
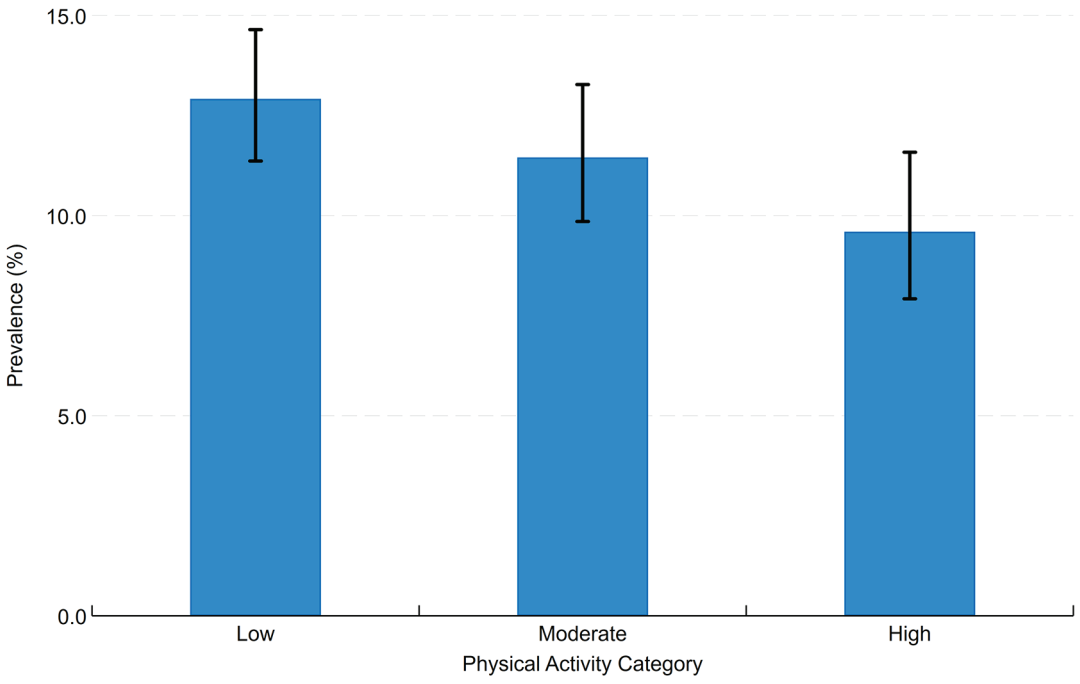


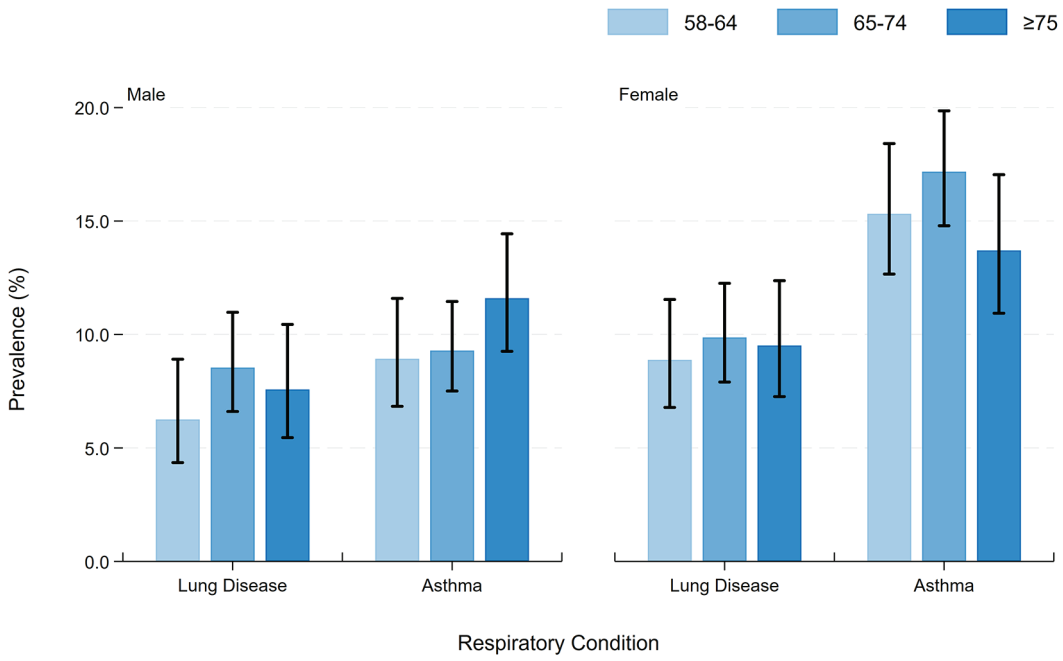
Figure 4.12. Prevalence of cancer or a malignancy by exercise category



4.7 Respiratory conditions

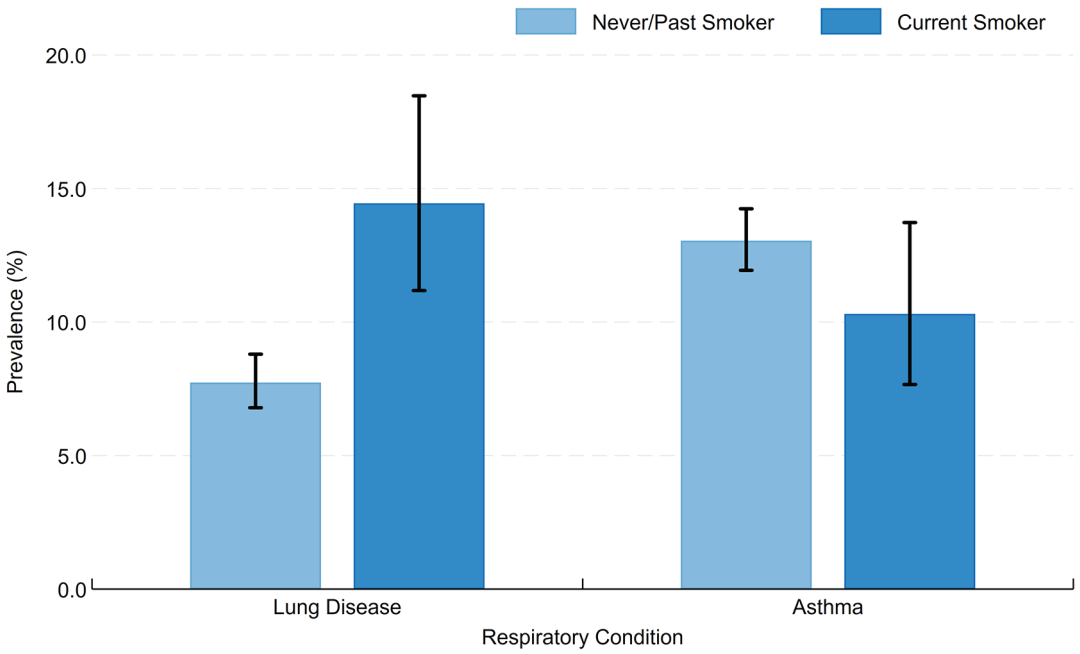
Respiratory disease is another leading cause of mortality in Ireland, with a higher rate compared to the European Union average and expected to increase by between 4-5% per year. (7) The experience of COVID-19 in itself will contribute to worse respiratory health, while those already experiencing a respiratory illness will be at greater risk of worse outcomes in the event of contracting COVID-19. 9% of adults report the presence of chronic lung disease, and 13% of adults report the presence of asthma (Figure 4.13). There is no overall difference between age groups for either asthma or lung disease. Within asthma however, a higher prevalence is reported by women aged 58-64 years (15%) and 65-74 years (17%) compared to men in these respective age groups (9%)

Figure 4.13. Prevalence of respiratory conditions by age group and sex



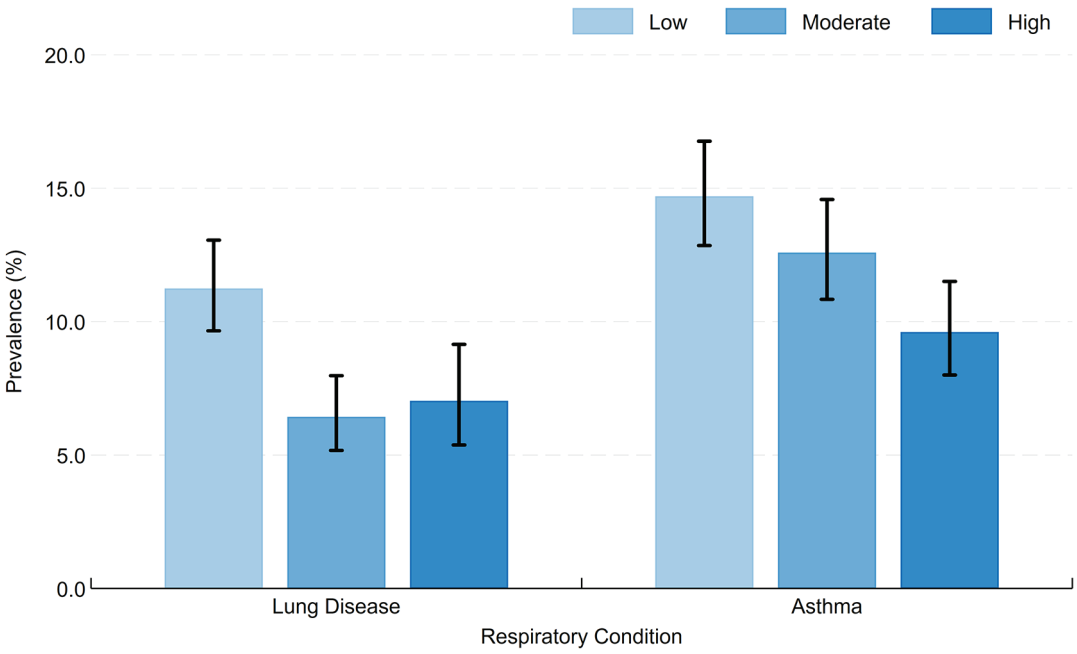
Almost twice as many adults who are current smokers report lung disease (14%) compared to never or past smokers (8%) (Figure 4.14). This difference is not seen in asthma, with a similar prevalence between both never/past smokers and current smokers.

Figure 4.14. Prevalence of respiratory conditions by smoker status



A lower proportion of adults who report either moderate (6%) or high (7%) physical activity report lung disease compared to adults reporting low physical activity (11%) (Figure 4.15). Those who report high physical activity also have the lowest prevalence of asthma (10%), while those with low physical activity have the highest prevalence (15%).

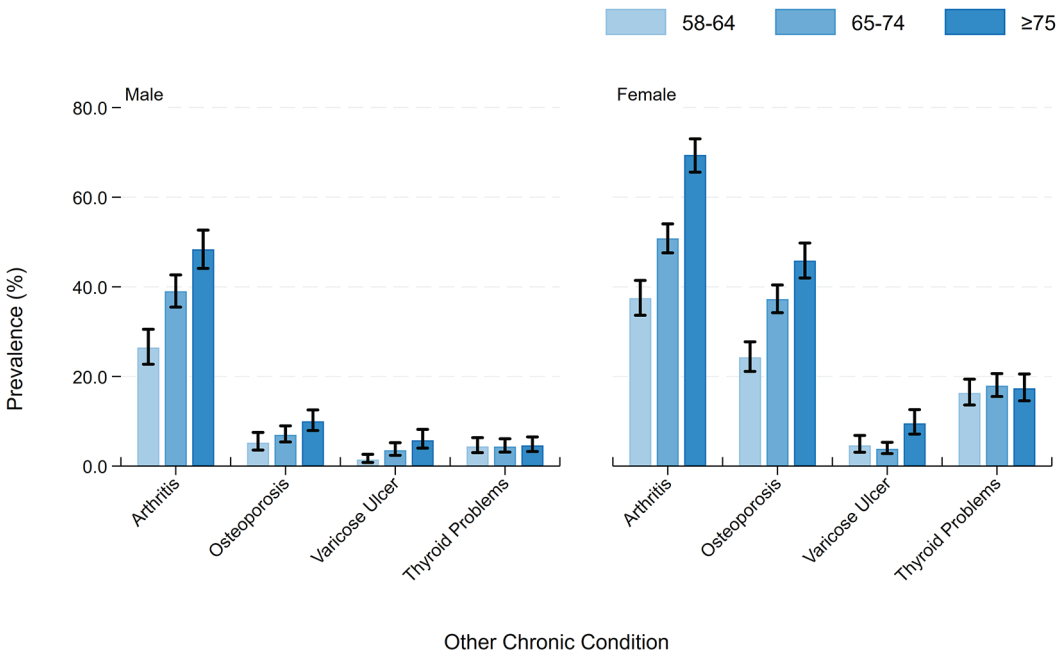
Figure 4.15. Prevalence of respiratory conditions by exercise category



4.8 Other chronic conditions

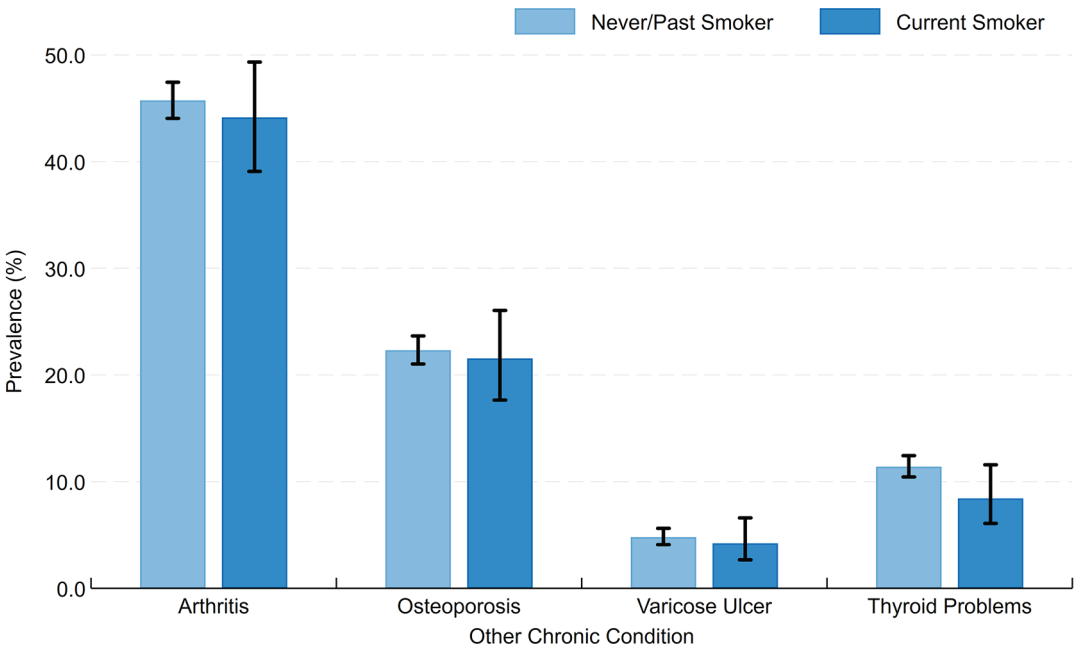
In other reported chronic conditions (Arthritis, Osteoporosis, Varicose Ulcer, Thyroid Problems (Table 4.1)), arthritis is the most prevalent for both men and women (Figure 4.16). Overall, 46% of adults report arthritis, almost doubling from 32% in adults aged 58-64 years, to 60% in those aged 75 years and older. An age gradient is also apparent in both women and men, with a higher prevalence for women in each age group. The largest difference is in those aged 75 years and older, with 69% of women reporting arthritis, compared to 48% of men. There are also age differences for both men and women in osteoporosis and varicose ulcers. For thyroid problems, the prevalence is higher in women across all age groups compared to men, with 17% of women reporting a thyroid problem, compared to just 4% of men.

Figure 4.16. Prevalence of other chronic conditions by age group and sex



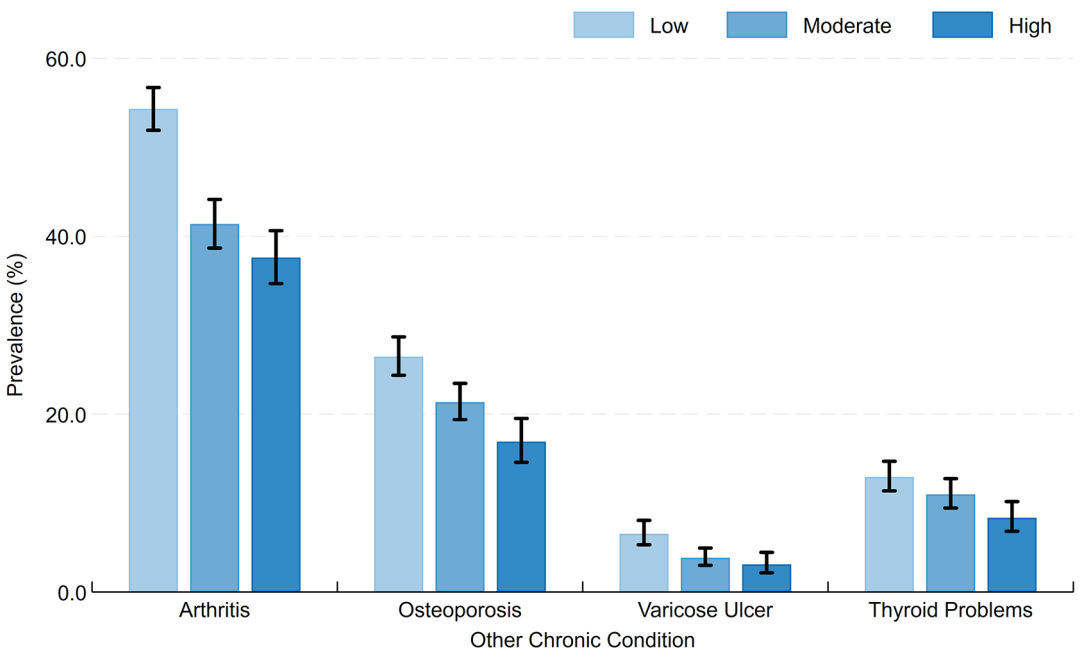
The prevalence of these other chronic conditions is similar for both never/past and current smokers (Figure 4.17).

Figure 4.17. Prevalence of other chronic conditions by smoker status



Adults reporting high physical activity have the lowest prevalence of these other chronic conditions compared to those reporting low physical activity (Figure 4.18). Just 38% of adults who report high physical activity also report arthritis, compared to 54% who report low physical activity.

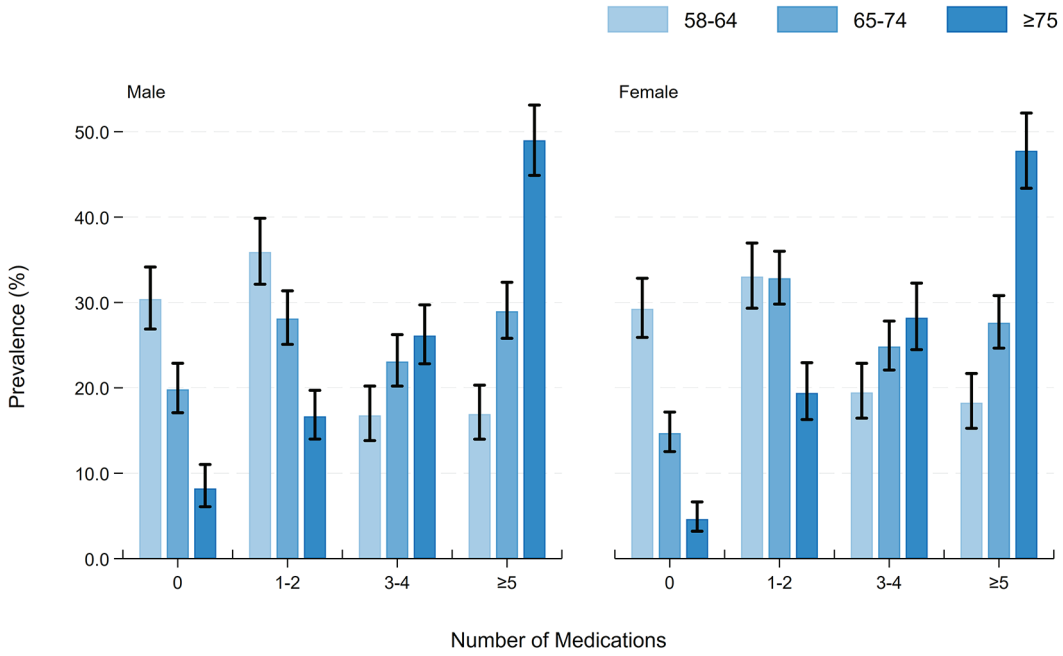
Figure 4.18. Prevalence of other chronic conditions by exercise category



4.9 Medications

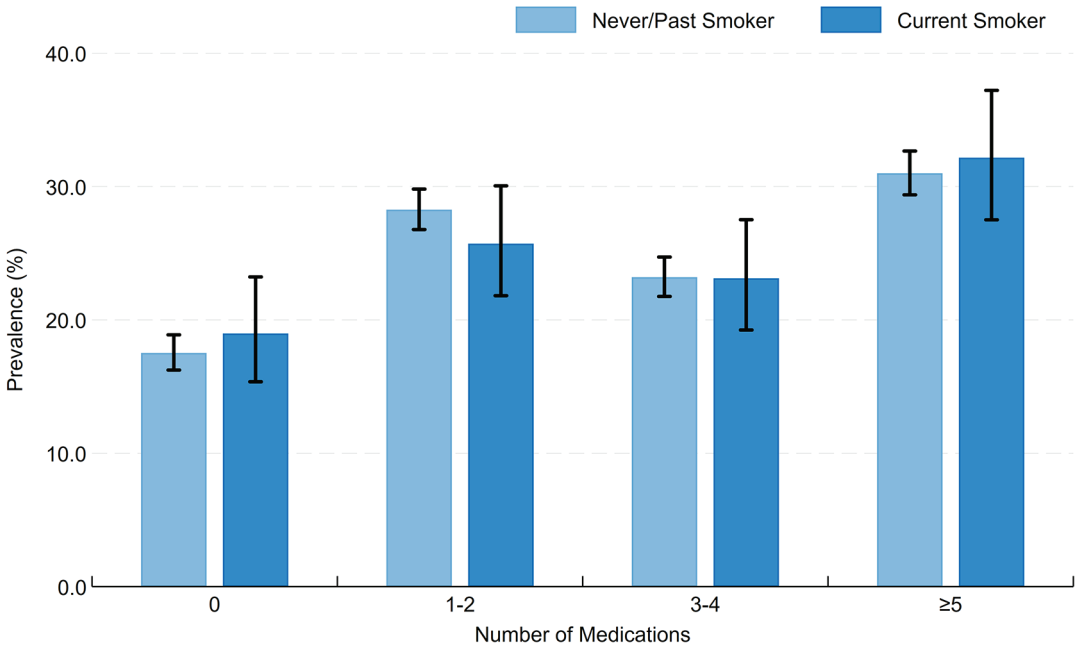
Just one in five adults (20%) report no regular medication use (Figure 4.19). The prevalence of medication use and the number of medications regularly taken increases with age. 92% of adults aged 75 years and older report taking at least one medication regularly. Adults who report taking either 3-4 medications or ≥5 regularly also increases across each age group. The prevalence of use of 3-4 medications increased from 18% in those aged 58-64 years, to 24% in those aged 65-74 years and 27% in those aged 75 years and older. The use of 5 or more medications increases more markedly with age. In the youngest age group, 18% report use of 5 or more medications, which more than doubles to 48% in those aged 75 years and older.

Figure 4.19. Prevalence of medication use by age group and sex



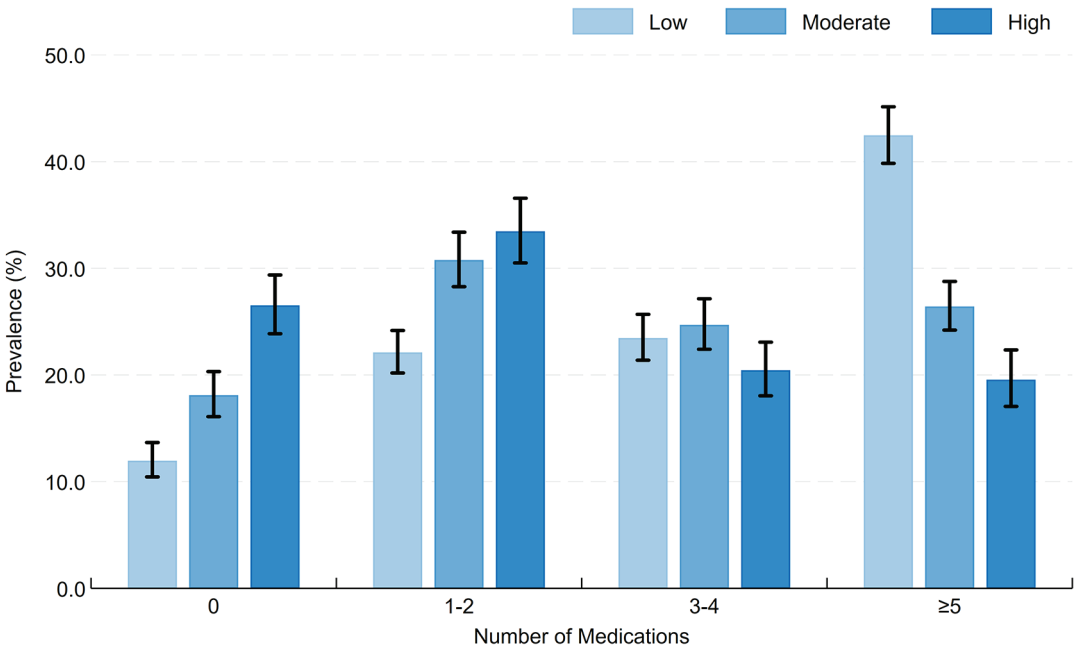
The number of medications taken does not vary by smoking status (Figure 4.20).

Figure 4.20. Prevalence of medication use by smoker status



The number of medications taken differs by level of physical activity, particularly in those reporting taking no medications, and those taking five or more medications (Figure 4.21). Over twice as many adults reporting use of no medications report high physical activity (25%) compared to those reporting low physical activity (11%). Conversely, 47% of those reporting use of five or more medications report low physical activity compared to 23% of those reporting high physical activity.

Figure 4.21. Prevalence of medication use by exercise category

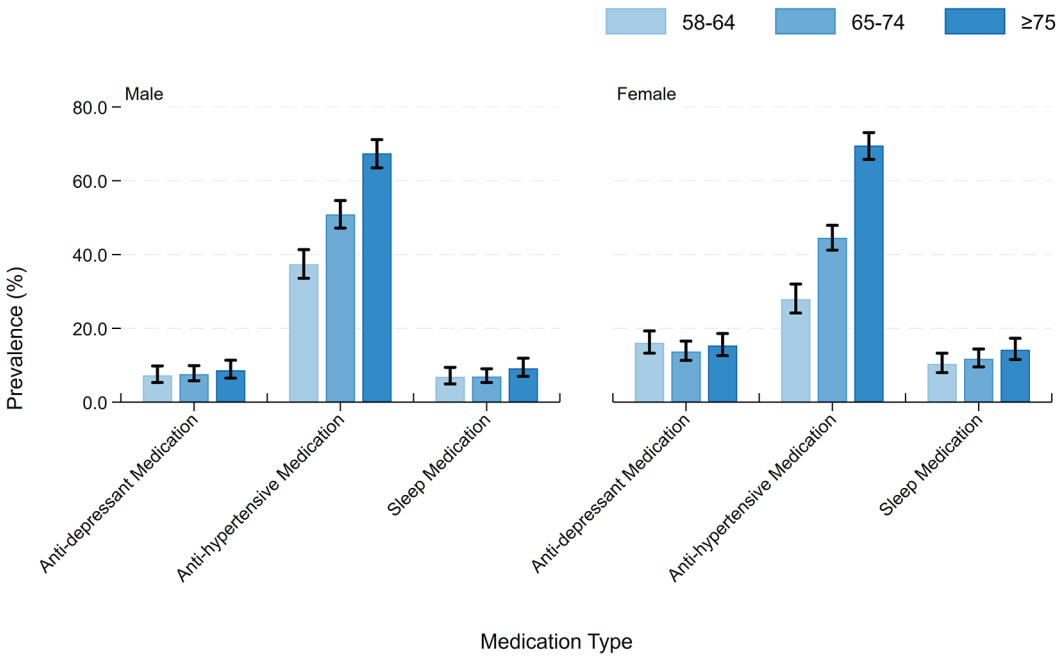


4.10 Medication Types

Prevalence of type of medication use by age group and sex are presented in figure 4.22. Use of anti-hypertensive medication is most prevalent, with almost half of adults (49%) reporting use. Prevalence is similar between men and women, but an age gradient is apparent, with prevalence increasing from 33% in adults aged 58-64 years to 69% in adults aged 75 years and older.

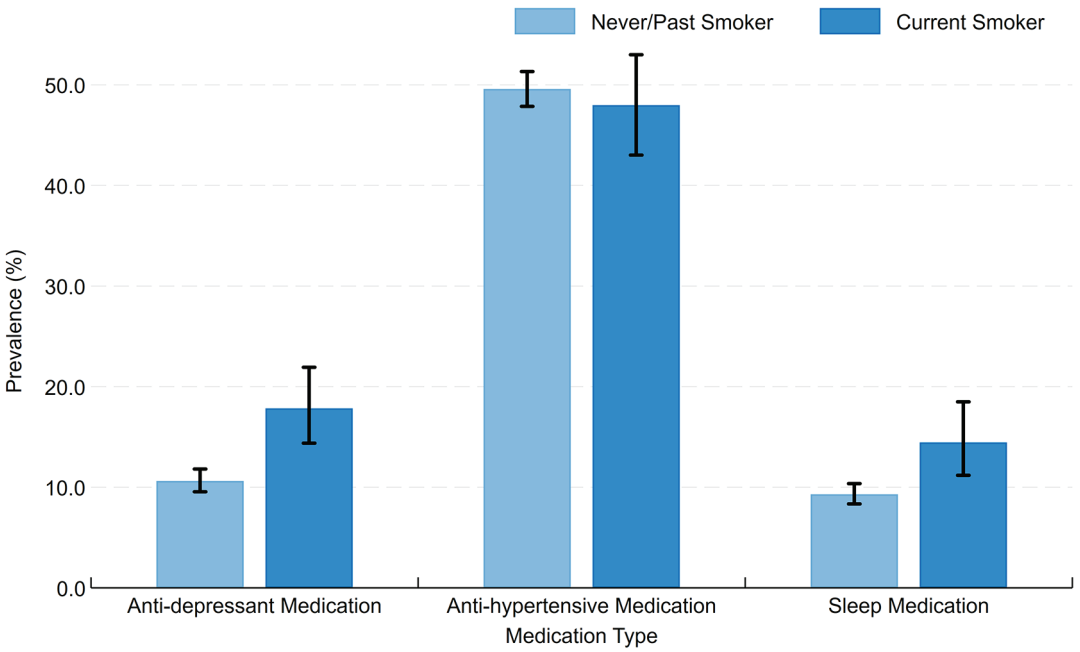
Prevalence of anti-depressant (11%) and sleep medication use (10%) is similar. Sex differences are present with a higher prevalence reported by women for both anti-depressant medication (15%) and sleep medication (12%) compared to men for both types (8%).

Figure 4.22. Prevalence of medication types by age group and sex



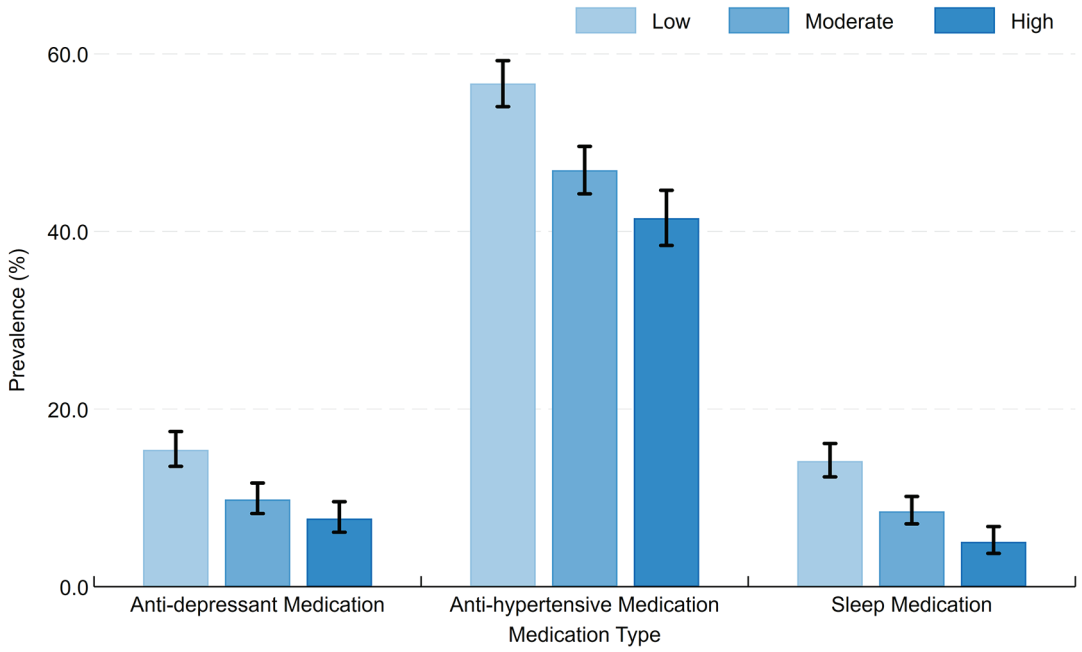
There are no differences in use of anti-hypertensive medication between never or past smokers and current smokers (Figure 4.23). Current smokers are however more likely to report use of either anti-depressant (18% vs 11%) or sleep medication (15% vs 9%) than never or past smokers.

Figure 4.23. Prevalence of use of anti-depressant, anti-hypertensive or sleep medication by smoker status



Reporting use of anti-depressant, anti-hypertensive and sleep medication are all lowest in those reporting high physical activity compared to low physical activity (Figure 4.24). 57% of adults reporting low physical activity reported use of anti-hypertensive medication, compared to 42% of those reporting high physical activity. The prevalence of use of anti-depressant medication is almost twice that in those reporting low physical activity (15%) compared to high physical activity (8%), while 14% reporting low physical activity report use of sleep medication compared to 5% of those reporting high physical activity.

Figure 4.24. Prevalence of use of anti-depressant, anti-hypertensive and sleep medication by exercise category



4.11 Conclusion

Multimorbidity becomes increasingly prevalent in community-dwelling older adults as they age. Less than ten percent of adults aged 58 years and older report no conditions, with almost three quarters reporting the presence of two or more conditions. A similar age gradient is seen in use of medication, with close to half of adults aged 75 years and older reporting use of five or more medications regularly.

Hypertension (52%), high cholesterol (59%) and arthritis (46%) are the most commonly reported conditions, with both hypertension and arthritis becoming increasingly prevalent in older age groups. Differences in prevalence among men and women are notable in some conditions. Thyroid problems and osteoporosis, for example, are more commonly reported by women, while the proportions of heart attacks and diabetes are higher in men.

Adults reporting high levels of physical activity have a lower prevalence of hypertension, angina, diabetes, high cholesterol, asthma, lung disease, arthritis, stroke and mini-stroke / TIA. It cannot be ascertained however whether this results from engaging in physical activity, or if the experience of these conditions has negatively impacted involvement in physical activity. However, results from other international studies have shown similar patterns. (11-13) Evidence from randomised intervention trials supports the association of physical activity and the potential causal mechanism for reversing some chronic conditions such as diabetes, hypertension, high cholesterol and associated cardiovascular conditions. (14)

Use of anti-hypertensive medication was reported by almost half of adults, and became increasingly prevalent in older age groups, with similar reported use in both men and women. Use of anti-depressant and sleep medication was more commonly reported by women, with little difference in use across age groups. As with a number of chronic conditions, adults who engaged in high levels of physical activity were less likely to report use of multiple medications, or use of anti-depressant, sleep or anti-hypertensive medication, while those who reported being current smokers were more likely to report use of either anti-depressant or sleep medication.

Cumulative presence of health conditions and use of medications can pose serious risks for the healthy life years of the ageing population. Increasing prevalence of these conditions may also result in an increased burden on healthcare systems. Mapping the breakdown and projected rise in chronic conditions in older people will help with planning and targeting of healthcare service provision. A better understanding of the modifiable

risk factors for these conditions will improve outcomes through more targeted prevention and intervention strategies. Furthermore, gaining a better understanding of how men and women at different age groups may be impacted will assist in building awareness of the importance of demographics to risk of these conditions. In particular, this report has highlighted the importance of physical exercise as a potential protective measure for protecting against multimorbidity in older ages. This supports the importance for public health campaigns around maintaining physical activity during the COVID-19 pandemic amongst the older population. Multimorbidity and use of certain medications are identified as risk factors for the severity of COVID-19 infection, and so understanding their prevalence in the older population is a crucial aspect of planning for the managing the long-term response to and consequences of the pandemic and protecting the health of the older population.

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