be active wa
Premier's Physical Activity Taskforce

Physical Activity Levels of Western Australian Adults 2006

Findings from the Premier's Physical Activity Taskforce Adult Physical Activity Survey

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Adult Physical Activity Survey

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FOREWORD

Six years ago the Premier's Physical Activity Taskforce (the Taskforce) was given the task of developing and implementing a whole of community physical activity plan to increase physical activity levels of Western Australians by 5 per cent.

Physical inactivity is second only to tobacco as the leading contributor to the total burden of disease in Australia, and it is the leading contributor to disease in women. It is a risk factor for heart disease, high blood pressure, cholesterol, diabetes and overweight and obesity.

All Western Australians need to become involved in healthier lifestyles.

This latest research shows that we are starting to take note of the 'be active wa' message and that a number of initiatives and partnerships under the Taskforce leadership, involving government, non-government, local government and country agencies are also starting to have an impact.

Western Australia is now leading the way in terms of physical activity but there is still a long way to go to make physical activity part of everyone's daily life.

This research and its recommendations provide a clear pathway for the next few years.

John Kobelke MLA
Minister for Sport and Recreation

KEY FINDINGS

- In 2006, a total of 59% of Western Australian adults reported participating in sufficient physical activity of 150 minutes of moderate-intensity physical activity on five or more days per week. This was an increase of 4% compared to 2002.
- The trend shows that physical activity is increasing in the Perth metropolitan area, from 58% in 1999 and 55% in 2002 to 60.2% in 2006. Activity remains stable in the South West.
- In 2006, 61% of men were more likely to be sufficiently active compared to 56% of women and 12% of Western Australians did not participate in any physical activity. Since 2002, there was a 4% increase in men getting sufficient activity. Over 3% shifted from being active to more active.
- In 2006, there was a shift from individuals who were insufficiently active to become more active across the age groups. Particularly those ages 30 – 44 (14% to 11%), and those aged 45 – 59 (15% to 13%).
- The number of individuals participating in vigorous-intensity exercise has increased by 6% in men and 8% in women since 2002; however more males (43%) participated in vigorous-intensity physical activity > 60 minutes per week compared with females (34%).
- Walking for recreation (63%) and for transport (32%) were the most popular physical activities in 2006. Participation in transport-related walking increased in 2006 to 32% from 26% over the same time period. In 2006, more men and women are cycling and walking for transport.
- Local streets/paths were identified as the most frequently used facilities for physical activity (49%), followed by the home (48%). Approximately 25% of Western Australians reported using cycle or walking paths, an increase from 1999 (10%). Gym use has also increased from 1999 (11%) to 22%.
- Overall there was a dramatic increase in incidental physical activity in 2006 to 30% from 21% in 2002 during the week days. Participation in incidental physical activity was higher during weekdays (59%), compared with Saturdays (49%) and Sundays (41%) in 2006. This is a 10% increase of incidental physical activity on both days of the weekend since 2002.
- Half of insufficiently active people identified themselves as contemplating increasing their physical activity and this group would be particularly amenable to promotion activities.
- The 'Find thirty', 'be active wa' and 'TravelSmart' messages have been successful in terms of recognition. In 2006, 40% of the sample was unable to identify the recommended number of minutes of physical activity per day.

PHYSICAL ACTIVITY LEVELS OF WESTERN AUSTRALIANS 2006 EXECUTIVE SUMMARY

Introduction

Participation in sufficient levels of physical activity provides significant health benefits. The monitoring of physical activity levels in the Western Australian population is therefore necessary for developing and implementing strategies and programs for increasing participation. The Premier's Physical Activity Taskforce (PATF) conducted a survey to measure physical activity levels among Western Australian adults to follow up the 1999 and 2002 state physical activity surveys. [1, 2]

Survey method and sample

The telephone survey, conducted during November and December 2006, included 3,361 Western Australian adults (response fraction = 71%). Respondents were randomly selected from four geographical regions including metropolitan Perth, Kimberley/Pilbara, Midwest/Goldfields and the South West. The sample included 50% men and women from all age groups 18 years and over.

Participation in recommended levels of physical activity

Approximately 59% of survey respondents participated in sufficient physical activity to accrue health benefits (i.e. ≥150 minutes of moderate-intensity physical activity on five or more days per week, or undertaking 60 minutes of vigorous-intensity physical activity per week). Twelve percent of respondents were completely inactive and 29% were insufficiently active. More men than women were sufficiently active (61% vs 56%), and participation in sufficient levels of physical activity decreased with advancing age (18–29 years = 79% to 60 years and over = 49%). Participation in sufficient levels of physical activity was highest amongst 18–29 year olds (79%), those with a university education (68%), household incomes ≥$1200/wk (67%), and those not in a relationship (67%). Participation in sufficient physical activity was higher in 2006 compared with the 1999 (58%) and 2002 (55%) surveys. Inactivity increased with advancing age from 7% among those 18–29 years to 19% among those 60 years and over. Physical inactivity in 2006 was similar to levels found in 1999 (12%), and slightly lower compared with levels found in 2002 (14%).

Participation in walking, moderate-intensity, and vigorous-intensity physical activity

Seventy-six percent of men and 81% of women reported walking in the past week. More men than women participated in moderate-intensity (32% vs 25%) and vigorous-intensity (50% vs 40%) physical activity in the past week. Walking for recreation (63%) and for transport (32%) were the most popular physical activities. Participation in walking for recreation remained stable between 1999 and 2006, while participation in transport-related walking increased from 26% to 32% over the same time period.

Facilities used for physical activity

The most popular facilities used for physical activity in 2006 were streets and footpaths (49%) and respondents' home (48%). Twenty-five percent of respondents used cycle or walking paths, while 22% used a gymnasium. Between 1999 and 2006 a greater proportion of respondents reported using cycle or walking paths (10% to 25%), gyms, health clubs or recreation centres (11% to 22%), and public open space (10% to 18%).

Levels of habitual incidental physical activity

Participation in habitual incidental physical activity (i.e. activity undertaken as part of chores which took fewer than 10 minutes) was higher during weekdays (59%), compared with Saturdays (49%) and Sundays (41%). Participation in incidental physical activity on everyday increased between 2002 and 2006 (21% to 30%). Similar to the 2002 survey, 62% of respondents reported using the stairs instead of an escalator or elevator in 2006. Slightly fewer respondents in 2006 reported walking the dog (58%) and walking or cycling to destinations within a 5-minute drive from home (57%) compared with respondents in 2002 (60% and 63% respectively).

Influences on achieving sufficient physical activity for good health

Half of insufficiently active people identified themselves as contemplating increasing their physical activity and this group would be particularly amenable to promotion activities. The 'Find thirty', 'be active wa' and 'TravelSmart' messages have been successful in terms of recognition but 40% of the sample was unable to identify the recommended number of minutes of physical activity per day. General practitioners gave physical activity counselling to 16% of inactive people and 36% of obese people but to only 18% of overweight people.

Overweight and obesity

Of those surveyed, 35% were overweight and 14% were obese. Overweight and obesity has increased slightly in Western Australia over the last 4 years. Overweight and obesity was highest in males, those aged over 45 years, those living in the Kimberley and Pilbara, and those from low socioeconomic status groups such as lower education, the unemployed and retired. Obese adults were less confident of participating in physical activity and more likely to report poor health. Television watching was highest in obese and inactive people with overweight and inactivity having additive effects. Participation in incidental activities such as stair climbing, walking the dog and cycling was significantly lower among overweight and obese people than normal weight people.

Recommendations for promoting physical activity in Western Australia

Current strategies, collaborative partnerships and interventions have resulted in increasing physical activity levels of Western Australian adults over the past four years. Continuation of all these strategies and partnerships are vital for this trend to continue. The recommendations below provide guidance for promoting physical activity in Western Australia.

1. Continue to promote participation in 30 minutes of moderate physical activity on most days of the week.
2. Continue public communication to increase awareness and understanding of the national physical activity guidelines for adults.
3. Continue public communication of how individuals can meet the national physical activity guidelines for adults.
4. Develop strategies to increase self-belief and confidence of individuals in meeting the national physical activity guidelines.
5. Expand supportive environments that allow incidental and transport-related physical activity to be easily incorporated into daily life.
6. Continue to strengthen existing partnerships across all agencies involved in the promotion and support of physical activity initiatives.
7. Repeat the Physical Activity Levels of Western Australian Adults Survey (including objective measurement of physical activity using pedometers) every three years.

In addition, the following more specific recommendations will assist in the overall increase of physical activity given that the goal is to promote significant behaviour change across a whole population.

1. Continue to promote participation in vigorous physical activity for health benefits (total of 60 minutes per week).
2. Target population subgroups with particularly high levels of physical inactivity and low levels of sufficient physical activity (i.e. older adults, under resourced groups, and those overweight and obese) using specific physical activity strategies.
3. Promote opportunities for active transport within community and workplace settings.
4. Explore and develop new partnership opportunities which can impact on physical activity.
5. Continue to promote, support and develop policy that facilitates and encourages physical activity.

1 INTRODUCTION

1.1 The importance of physical activity

It is widely recognised that physical activity contributes to a healthy lifestyle and is critical in the prevention and management of many chronic diseases.[3-5] Research over the last decade shows that engaging in regular, moderate-intensity physical activity improves physical and mental well-being, quality of life, and life expectancy.[5] Sedentary lifestyles impact on mortality and disability, contributing to 5–10% of deaths and 19 million Disability Adjusted Life Years (DALY) worldwide (i.e. years of life lost plus years lived with disability)[6]. In Australia, physical inactivity contributes to 13,491 annual deaths[7] nationally and in Western Australia is responsible for approximately 9.8% of the burden of disease and disability.[7, 8]

An inactive lifestyle increases the risk of chronic diseases including cardiovascular diseases, stroke, some cancers (colorectal and breast cancer), diabetes, osteoarthritis and osteoporosis, circulatory diseases and obesity.[5,9,10] Growing scientific evidence continues to support the link between physical activity and improved mental health,[11, 12] increased social capital (i.e. the willingness of individuals to participate in collective and civic activities) [13, 14, 15] and reduced risks of falls and disability in the elderly.[16] The economic benefits of physical activity are increasingly evident as the cost of physical inactivity emerges as a major avoidable contributor to the cost of illness, responsible for approximately $370 million annually in direct health care costs in Australia. [17]

Physical activity, together with a reduction in dietary energy intake, is vital in the prevention of overweight and obesity. Participation in physical activity might positively reduce the risk of other chronic diseases directly and indirectly through its slight effect on weight and adiposity because overweight and obesity are risk factors for other chronic diseases (i.e. diabetes, hypertension, cardiovascular disease, and cancer).[10] Obesity has escalated to epidemic proportions worldwide, with three-fold increases in the prevalence of obesity in North America, the United Kingdom and Australasia since 1980. [6] In Australia, the prevalence of adult obesity increased from 8% overall in 1980 to 16% in males and 19% in females two decades later.[10] Furthermore obesity and overweight in Australia account for approximately 4.3 % of the total burden of disease. [7] In Western Australia 48% of adults are overweight or obese, [2] while nationally this figure is higher at 60%.[18] The obesity epidemic is not only an adult issue, as evidence suggests overweight and obesity is also increasing among children and adolescents.[19, 20]

1.2 Participation in physical activity

In response to the 1996 U.S. Surgeon General's report,[5] the National Physical Activity Guidelines for Australian Adults released in 1999 recommend that adults need to participate in at least 30 minutes of moderate-intensity physical activity on most, if not all, days of the week, to accrue health benefits.

The 30 minutes of activity do not need to be continuous and can be accumulated in 10-minute episodes. The guidelines note that 30 minutes of vigorous-intensity activity performed three to four times per week promote additional health benefits. [21]

The World Health Organization has reported that approximately 17% of adults worldwide are physically inactive, with an additional 41% estimated to participate in some physical activity but at insufficient levels.[6] In Australia, physical inactivity increased (13.4 to 15.3%) between 1997 and 2000 while participation in sufficient levels of physical activity decreased between 1997 and 1999, and plateaued between 1999 and 2000 (62% to 57%).[22] Recent findings from the 2004–2005 National Health Survey[23] suggest that 70% of Australians aged 15 years and over participated in no or low levels of recreational physical activity while 30% participated in moderate-intensity to high levels during a two-week period. Comparisons with previous NHS surveys indicate that sedentary behaviour has remained relatively stable since 1995.[23]

In Western Australia, participation in sufficient physical activity [A] declined from 58% (63% of men and 53% of women) in 1999 to 55% (57% of men and 52% of women) in 2002.[1,2] The same surveys indicate that approximately 12–14% of Western Australian adults did not participate in any physical activity. Similar findings have been reported for adults in other states including South Australia,[24] Queensland,[25] and New South Wales.[26] These results provide a baseline for comparison for subsequent Western Australian physical activity surveys, including the findings presented in this report.

1.3 Purpose of the survey

The Premier's Physical Activity Taskforce (PATF) undertook this survey as part of its ongoing statewide surveillance and monitoring of physical activity levels in Western Australia. The main purpose was to collect physical activity data for comparison with previous state-wide surveys conducted in 1999[1] and 2002.[2] As in the previous surveys, information about the individual, social and physical environmental determinants of physical activity and levels of overweight and obesity was also collected.

Given that physical inactivity is one of the most important and modifiable risk factors contributing to ill health in Western Australian, it is relevant to:

- monitor physical activity related knowledge of the Western Australian population over time;
- monitor the prevalence of physical activity/inactivity over time
- monitor overweight/obesity over time; and
- identify at risk segments of the population in order to develop specific strategies which target the physical activity behaviours of these groups.

The results presented in this report will be used as a guide for reviewing, planning, developing and assessing initiatives aimed at improving the levels of physical activity and health in Western Australia.

[A] Sufficient physical activity is defined as participation in 150 minutes of physical activity weekly and participation in 150 minutes over five or more sessions per week.

2 METHODOLOGY

2.1 Sample framework

The target population was Western Australian adults aged 18 years and over, residing in private dwellings with telephones. The State was divided into four geographical regions including Perth metropolitan, South West, Midwest/Goldfields and Kimberley/Pilbara.

The University of Western Australia Survey Research Centre undertook the sampling of respondents and administered the survey on behalf of the Premier's Physical Activity Taskforce. The sampling frame was stratified by geographical location and telephone numbers randomly selected from the 2006 White Pages directory. The Kimberley/Pilbara stratum was over-sampled to provide a more representative sample of the population residing in this region.

To increase the response rate and to reduce non-response bias, approach letters (Appendix 1) were sent to respondents two weeks prior to the telephone interview. Households were then called and the person with the most recent birthday who was at least 18 years of age was asked to participate in the survey. Surveys were conducted on weekdays and weekends and a maximum of 10 callbacks were made at different times and days to obtain a completed interview. Data were collected during November and December 2006, using the SurveyCraft CATI system.

A total of 4,736 eligible respondents were telephoned with 3,361 completing the interview. The response rate was 71% and was calculated by dividing completed interviews by completed interviews plus refusals plus passive refusals[β]. Overall 69.4% of the sample resided in the Perth metropolitan area, 12.6% in the South West, 9.1% in the Midwest/Goldfields and 8.9% in the Kimberley/Pilbara regions (Table 2.1). Of those respondents who completed the interview 43.1% reported receiving the approach letter, 46.9% indicated they had not received the letter, and 10.1% were unsure whether they had received the letter. Moreover, 50% of those respondents who received the approach letter indicated that it influenced their decision to participate in the survey.

TABLE 2.1: RESPONSE RATES BY REGION

Western Australian Region	Sample	Proportion of Sample (%)	Response Fraction (%)
Perth metropolitan	2333	69.4	85.7
South West	423	12.6	93.2
Kimberley/Pilbara	300	8.9	83.3
Midwest/Goldfields	305	9.1	93.0
Total	3361	100	87.0

[β] Passive refusals refer to the situation where the respondent was contacted eight or more times and each time the respondent rescheduled the interview (i.e. they did not want to say no), whereas active refusals included respondents or households who indicated to the interviewer that they did not want to participate.

2.2 Demographic profile of questionnaire respondents

The survey included 3,361 Western Australian adults. The demographic characteristics of the survey respondents are shown in Table 2.2. Population based distributions for gender and age are also shown; however, given the age of these data (i.e. collected during the 2001 Census), these estimates should only be considered a guide. The sample included approximately equal numbers of men (49.9%) and women (50.1%). The 18–29 year age group was under-represented (12%), and the other age groups over-represented.

The majority of the sample respondents were from the Perth metropolitan area (69%) and the smallest proportions from the Kimberley/Pilbara region (9%) and Midwest/Goldfields (9%) regions. Overall, more respondents were married (66%), had reached Tertiary Entrance Examination (TEE) level of education (41%), and were employed in managerial/professional occupations (30%) compared with other demographic categories. To provide adequate sample size for comparisons, weekly household income was categorized into four groups (i.e. $0–499, $500–799, $800–1199, and ≥$1200/week). It should be noted that 906 respondents refused to provide or did not know their weekly household income.

TABLE 2.2: DEMOGRAPHIC PROFILE OF RESPONDENTS

Characteristic	n	%	*Population %
Gender			
Male	1677	49.9	49.3
Female	1684	50.1	50.7
Age group			
18 to 29 years	387	11.5	22.6
30 to 44 years	884	26.3	31.0
45 to 59 years	1064	31.7	25.7
60 years or more	1017	30.3	20.7
Location			
Perth metropolitan area	2333	69.4	72.8
South West	423	12.6	13.2
Kimberley/Pilbara	300	8.9	4.5
Midwest/Goldfields	305	9.1	9.5
Marital status			
Married/de facto	2220	66.1	
Single	509	15.1	
Separated/divorced	342	10.2	
Widowed	287	8.5	
Education			
Less than TEE	1127	33.5	
TEE/diploma	1376	40.9	
University	849	25.3	
Occupation			
Manager/professional	997	29.7	
White-collar/trade	452	13.4	
Blue-collar	613	18.2	
Unemployed	60	1.8	
Home duty	317	9.4	
Student	100	3.0	
Retired	819	24.4	
Weekly household income ($)			
0-499	467	13.9	
500-799	396	11.8	
800-1199	781	23.2	
≥1200	811	24.1	

**Based on data from the Australian Bureau of Statistics 2001 Census*
Note: Frequencies may not equal n = 3361 (or 100%) due to missing data. TEE =Tertiary Entrance Examination

2.3 Survey instrument

The survey instrument consisted of 39 items. A copy of the instrument is provided in Appendix 2. Most items included in the 2006 instrument replicated those used in the 1999 and 2002 physical activity surveys. However, the 2006 instrument also included four new items which collected data on household income, residential location (i.e. suburb, town or postcode), the receipt of the introductory letter, and whether receipt of the letter influenced participation in the survey.

Eight items captured information on the frequency and duration of participation in walking, yard work or gardening, vigorous-intensity, and moderate-intensity physical activities in the past week. Two items collected data on the types of activity and facilities used. Seven items collected information about habitual incidental physical activity (i.e. habitual activity undertaken for less than 10 minutes)[27] and habitual incidental activity choices such as stair climbing. Four items captured frequency and duration of participation in transport-related cycling and walking in the past week.

Information about factors that influence physical activity including physical activity readiness (i.e. stage of change), self-efficacy, knowledge about the number of minutes of moderate-intensity physical activity required for good health, and awareness of various Western Australian physical activity campaign messages was also collected. Sedentary behaviour was captured by a single item which asked respondents to estimate time spent watching television or using a computer outside of the workplace. Height and weight data were collected for use in calculations of body mass index. Demographic data on age, gender, Aboriginality, marital status, education, occupation, people younger than 18 and children younger than five years living at home, household income, household location, and geographical region were recorded.

2.4 Treatment of data

The dataset was cleaned and variables recoded where necessary. Data were weighted by age, gender and geographical region against the 2001 Western Australian Census. Previous results from the 1999 and 2002 surveys presented in this report are also weighted by these same census data (i.e. by gender, age, and geographical location). However, corrections made to these weights since the 2002 report may have resulted in minor differences between the results presented in the current and previous reports. Nevertheless, these differences do not influence the inferences drawn from the 2002 or the current report.

Self-reported physical activity is subject to measurement error due to over-reporting. In this dataset, values of greater than 840 minutes (14 hours) for each category of physical activity (i.e. walking, moderate-intensity, vigorous-intensity, and gardening or yard work) were replaced with the value of 14 hours. While 14 hours is somewhat arbitrary, this method of truncation is consistent with the 1999 and 2002 Western Australian surveys and National Active Australia recommendations. [28, 29]

2.5 Calculation of physical activity levels

Frequency and duration data for vigorous-intensity physical activity, moderate-intensity physical activity, and walking (for at least 10 minutes) are presented. The total time spent participating in physical activity in the past week (i.e. sum of time spent in each category of activity) is also presented. Frequency and duration data for gardening or yard work have been presented in some sections, but are excluded from calculations of total or recommended levels of physical activity.

2.6 Calculation of recommended level of physical activity

Various measures of 'recommended level' of physical activity have been calculated based on scientific evidence on the health and fitness benefits of exercise and public health recommendations. The American College of Sports Medicine endorsed 20 minutes of vigorous-intensity exercise three times a week for the improvement of cardio-respiratory fitness and this has been well accepted for over two decades.[30] Research has shown health benefits can accrue from regular participation in moderate-intensity activity [5] and both America and Australia have adopted this focus for contemporary public health initiatives. The current national recommendation is 30 minutes of moderate-intensity activity on most, if not all, days of the week and this is frequently interpreted as 150 minutes of moderate-intensity activity over at least five sessions.[21]

The definition of sufficient physical activity used in this report combines both the vigorous-intensity and moderate-intensity recommendations for health and fitness benefits.

Sufficient physical activity - 150 minutes of moderate-intensity physical activity over five or more sessions or 60 minutes of vigorous-intensity activity in the previous week.

Insufficient activity - Some activity but not enough to reach the levels required for 'sufficient'.

Inactive - No walking, moderate-intensity or vigorous-intensity physical activity in the previous week.

In addition to using the above definition of sufficient physical activity for the primary analyses, this report presents population estimates for achieving recommended levels using three other commonly used measures of sufficient physical activity (see section 4.4).

2.7 Data analyses

For the most part descriptive statistics and results from cross-tabulations have been presented in this report. However, logistic regression analyses were undertaken to examine the associations between the correlates of physical activity and participation in sufficient activity and inactivity. For selected

binary outcomes logistic regression was also undertaken to compare 1999, 2002, and 2006 survey results. A force-entry logistic regression model (all correlates entered into the model in a single step) was used to calculate adjusted odds ratios and 95% confidence intervals. For selected continuous outcomes generalised linear models were used to compare 1999, 2002, and 2006 survey results. For statistically significant main effects pairwise post hoc comparisons were performed using Tukey's honestly significant difference test.

All results presented in this report are based on weighted data, unless otherwise stated. Unweighted data were used in tests of statistical significance. All tests of statistical significance were adjusted for gender, age, and geographical location.

2.8 Limitations

This survey included Western Australian adults whose residence was listed in the White Pages telephone directory. Thus, respondents who did not have a telephone at home, had an unlisted telephone number or were unavailable during the survey period were excluded. Participation in the survey was voluntary, resulting in self-selection by the respondents. People who choose to participate in physical activity are motivated to do so and it could be argued that those who agreed to participate in the survey were more highly motivated than those less active. Furthermore, the results in this report are based on cross-sectional data and hence relationships between variables are not necessarily causal. However, many of the associations found in this study are consistent with the findings of other published studies that have used study designs appropriate for detecting causal relationships (i.e. randomised control trials, longitudinal studies). In addition, seasonal variations in participation in physical activity are not accounted for in this cross-sectional study (i.e. only a spring pattern of physical activity was captured).

The criteria used to classify respondents as 'sufficiently active' in this survey included only leisure-time physical activity performed in bouts of at least 10 minutes. Incidental physical activity and gardening or yard work were also measured in the current survey; however, they have not been included in the calculation of sufficient physical activity as it has not been possible to measure duration of incidental physical activity reliably.[27]

Daylight Saving in WA

Daylight saving was introduced in Western Australia on December 6, 2007, coinciding with the completion of data collection. To better understand the influence of daylight saving on patterns of physical activity participation, a sub-sample of respondents (n = 1300) who participated in the survey were recalled in the week December 1 to December 6 prior to the beginning of daylight saving and asked whether the introduction of daylight saving would change their physical activity levels.

Over one-third of respondents (36%) reported that daylight saving would impact on their physical activity behaviour, although the majority of respondents (64%) indicated that it would have no impact. A high proportion of respondents indicated that they would continue to participate in physical activity in the morning before work (74%), in the afternoon after work (61%), and later in the evening (84%). While these result suggest that daylight saving may have an impact on physical activity routine, it cannot be determined whether the change would impact on frequency or duration of physical activity.

TABLE 2.3: IMPACT OF DAYLIGHT SAVING ON THE TIME OF DAY BEING PHYSICALLY ACTIVE AMONG RESPONDENTS INDICATING A CHANGE IN BEHAVIOUR ROUTINE (N = 462)

Usual time physical activity is undertaken	Change in time participating in physical activity Following implementation of daylight saving			
	In the morning before work	During the day	In the afternoon after work	Later in the evening
In the morning before work (n = 229)	73.8	12.7	24.0	45.4
During the day (n = 103)	36.9	44.7	41.7	57.3
In the afternoon after work (n = 161)	37.9	18.0	60.9	54.7
Later in the evening (n = 156)	30.8	12.2	29.5	84.0

Note: Respondents could provide more than one response and could participate in physical activity more than one time during the day, hence rows do not equal 100%

3 PHYSICAL ACTIVITY BEHAVIOUR

3.1 Overview of the data presented

This chapter reports the level and pattern of participation in physical activity in the Western Australian adult population. Data are reported for various demographic variables including age, gender, education, occupation, income, marital status and geographical location. The primary variable of interest is the proportion of Western Australians undertaking sufficient physical activity to gain a health benefit. However, data regarding physical activity frequency, duration, and type, places where people are active and habitual incidental physical activity are also presented. Selected comparisons with results from the 1999 and 2002 surveys are also shown.

3.2 Physical activity guidelines

The Commonwealth Department of Health and Welfare defines sufficient physical activity for adults as 30 minutes of moderate-intensity physical activity on most, if not all days of the week. [21] Based on scientific evidence, [5] it is recommended that physical activity can be accumulated throughout the day, and does not necessarily need to be undertaken during a single bout of exercise.

The National Physical Activity Guidelines for adults also promote participation in vigorous-intensity physical activity for at least 30 minutes for three to four sessions per week for additional health benefits.[21] International health bodies including the WHO[6] and the Centers for Disease Control and Prevention[5] recommend participation in 20 minutes of vigorous-intensity physical activity on three or more occasions per week, in addition to or instead of 30 minutes of moderate-intensity physical activity on most days. Based on the national guidelines and those recommended elsewhere, in this report achieving a sufficient level of physical activity is defined as:

- The accumulation of 150 minutes of physical activity in at least five sessions or 60 minutes of vigorous-intensity activity per week.

This definition of sufficient physical activity is consistent with definitions adopted in the 1999 and 2002 Western Australian adult physical activity surveys[12] and reflects the national recommendations.

3.3 Participation in recommended levels of physical activity

Table 3.1 presents the proportion of Western Australians participating in sufficient physical activity, those doing some activity but not enough to meet the recommendations (insufficient), and those who reported doing no walking, vigorous-intensity or other moderate-intensity physical activities for at least ten minutes in the past week (inactive). In addition Figure 3.1 shows the prevalence of sufficient physical activity, insufficient physical activity, and inactivity reported in the 1999, 2002, and 2006 surveys.

Table 3.1 highlights

- In 2006, 59% of Western Australian adults were sufficiently active, 29% were insufficiently active and 12% were inactive.

Gender and age

- Compared with women, a higher proportion of men were sufficiently active (61% vs. 56%) and fewer men were inactive (11% vs. 14%).
- Participation in sufficient physical activity decreased with advancing age from 79% among those 18–29 years to 49% among those 60 years and over.
- Inactivity increased with advancing age from 7% among those 18–29 years to 19% among those 60 years and over.

Geographical location

- Participation in sufficient physical activity was highest among respondents from the Kimberley/Pilbara region (62%) and the Perth metropolitan area (60%).
- Inactivity was lowest among respondents from the Perth metropolitan area (11%) and highest among those from the Midwest/Goldfields (16%).

Marital status and children

- Compared with all other marital status categories, a higher proportion of singles was sufficiently active (67%). Singles were also the least inactive (9%).
- Compared with all other marital status categories, a lower proportion of widowers was sufficiently active (40%) and a higher proportion was inactive (22%).
- Compared with respondents with no children, a lower proportion of those reporting at least one child under 5 was inactive (13% vs. 10%). A similar result was found when respondents with no child and those with a person under 18 years at home were compared (13% vs. 11%).

Education, employment, and income

- Participation in sufficient physical activity was higher among those with university level education (68%), those with weekly household incomes greater than $1200 (67%), students (74%) and managers and professionals (64%).
- Inactivity increased as level of education (19% to 8%) and weekly household income (19% to 7%) decreased, with this trend reversed when participation in sufficient physical activity was examined.

Figure 3.1 highlights

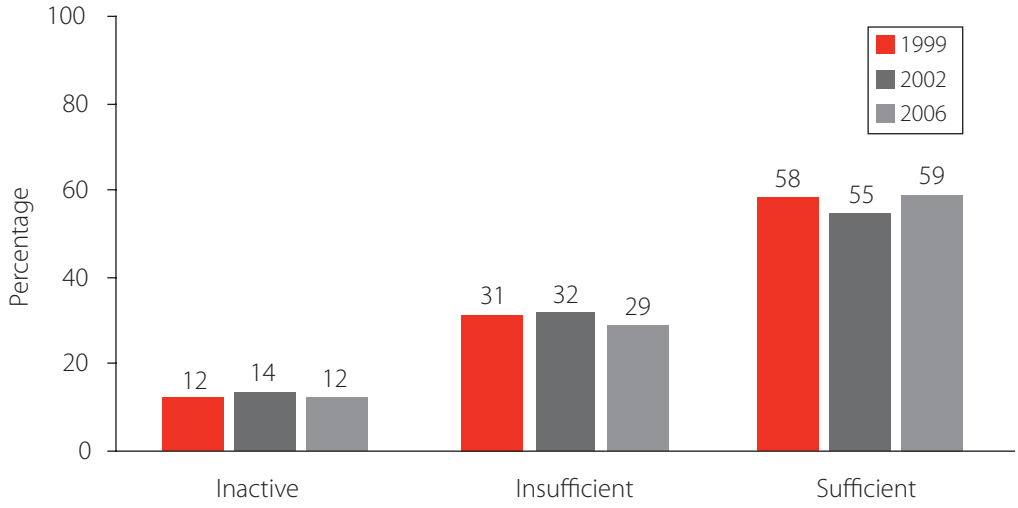
- Overall, the prevalence of inactivity and sufficient activity in 2006 appeared to have returned to the levels measured among Western Australian adults in 1999. The decrease in participation in sufficient physical activity and increase in inactivity in 2002 suggests that participation in physical activity among Western Australian adults has increased during the past four years.
- Results from a logistic regression analysis showed that after adjusting for gender, age, and geographical location, participation in sufficient levels of physical activity in 2002 (OR 0.94, 95%CI 0.85-1.03) and 2006 (OR 1.10, 95%CI 0.99-1.22) was not significantly different from levels of participation found in 1999. However, respondents in 2006 were significantly more likely to participate in sufficient levels of physical activity compared with 2002 survey respondents (OR 1.18, 95%CI 1.07-1.30, $p = 0.001$).

TABLE 3.1: PREVALENCE OF INACTIVITY, INSUFFICIENT AND SUFFICIENT PHYSICAL ACTIVITY[1] BY DEMOGRAPHIC CHARACTERISTICS

Characteristic	Inactive	Insufficient activity	Sufficient activity
Gender			
Male	10.8	28.0	61.2
Female	13.6	29.9	56.5
Age group			
18 to 29 years	7.0	23.4	69.6
30 to 44 years	11.0	28.3	60.7
45 to 59 years	12.5	32.0	55.4
60 years or more	19.1	32.3	48.6
Location			
Perth metropolitan area	11.2	28.6	60.2
South West	14.4	29.4	56.3
Kimberley/Pilbara	14.6	23.8	61.6
Midwest/Goldfields	16.4	33.4	50.1
Marital status			
Married/de facto	11.7	29.8	58.5
Single	9.3	24.0	66.7
Separated/divorced	16.8	29.0	54.3
Widowed	21.6	37.9	40.5
Education			
Less than TEE	18.9	33.7	47.3
TEE/diploma	11.1	28.2	60.7
University	6.8	24.9	68.3
Occupation			
Manager/professional	8.7	26.9	64.4
White-collar/trade	11.9	27.8	60.4
Blue-collar	13.9	28.6	57.5
Unemployed	24.7	31.5	43.8
Home duty	14.4	33.6	51.9
Student	2.9	23.2	73.9
Retired	17.6	32.9	49.4
Weekly household income ($)			
0-499	19.5	35.5	45.0
500-799	15.2	31.6	53.2
800-1199	11.9	30.0	58.1
≥1200	7.6	25.5	66.9
Children under 5 years			
Nil	12.8	28.3	58.9
One or more	9.6	32.0	58.4
People under 18 years			
Nil	13.3	29.0	57.6
One or more	10.6	28.8	60.6
Overall	**12.3**	**29.0**	**58.8**

[1] *Sufficient activity is defined as 150 minutes of moderate-intensity physical activity over five or more sessions or 60 minutes of vigorous-intensity physical activity per week (excludes gardening and household chores).*

Figure 3.1: Prevalence of inactivity, insufficient and sufficient physical activity in 1999, 2002, and 2006



3.4 Demographic factors independently associated with achieving sufficient levels of physical activity and being inactive

Table 3.2 presents the results of two forced-entry logistic regression models undertaken to assess the independent associations between demographic characteristics and participation in sufficient physical activity (model 1) and inactivity (model 2).

Table 3.2 highlights

Demographic correlates of participating in sufficient physical activity

- The likelihood of participating in sufficient physical activity decreased with advancing age. Compared with 18–29 year olds, 30–44 year olds were 35% less likely, 45–59 year olds were 50% less likely, and ≥60 year olds were 53% less likely to participate in sufficient physical activity.
- Compared with those married or in defacto relationships, widowers were 27% less likely to achieve sufficient levels of physical activity.
- The odds of participating in sufficient levels of physical activity increased with advancing education level and income.
- Although only approaching statistical significance (p=0.06), respondents with one or more child under 5 years of age were 23% less likely to be sufficiently active compared with those reporting not having a child of this age.
- No relationship between occupation and achieving sufficient levels of physical activity was observed.

Demographic correlates of being inactive

- Compared with males, females were 32% more likely to report inactivity in the past week.
- Compared with 18–29 year olds, 30–44 year olds were 61% more likely, 30–44 year olds 88% more likely, and ≥60 year olds 2.8 times more likely to be inactive.
- The odds of being inactive decreased with increasing levels of education. Compared with less educated respondents, those completing TEE/diploma and university level education were 26% and 55% less likely to be inactive, respectively.
- Although the odds of being inactive decreased as levels of income increased, only respondents with household incomes ≥$1200/week were found to be significantly less likely than those with household incomes <$499/wk to be inactive (OR 0.56, 95%CI 0.36-0.87, p = 0.01).
- While occupation was not associated with participation in sufficient physical activity, it was, however, associated with being inactive. Compared with respondents employed in professional or managerial occupations, blue collar workers were 41% more likely, and the unemployed two times more likely, to report being inactive in the past week.

TABLE 3.2: ADJUSTED ODDS RATIOS FOR FACTORS ASSOCIATED WITH PARTICIPATION IN SUFFICIENT PHYSICAL ACTIVITY AND BEING INACTIVE

Characteristic	Sufficient physical activity (n = 3340)[1] Odds ratio	95% Confidence interval	P-value	Inactivity (n = 3340)[1] Odds ratio	95% Confidence interval	P-value
Gender						
Male	1.00			1.00		
Female	0.89	0.76-1.04	0.13	1.32	1.05-1.67	0.02
Age group						
18 to 29 years	1.00			1.00		
30 to 44 years	0.65	0.48-0.88	0.00	1.61	0.98-2.64	0.06
45 to 59 years	0.50	0.37-0.68	0.00	1.88	1.13-3.11	0.01
60 years or more	0.47	0.32-0.68	0.00	2.80	1.57-4.98	0.00
Location						
Perth metropolitan area	1.00			1.00		
South West	1.07	0.86-1.33	0.55	1.00	0.73-1.36	0.99
Kimberley/Pilbara	1.11	0.86-1.44	0.43	1.21	0.83-1.75	0.33
Midwest/Goldfields	0.81	0.63-1.04	0.10	1.32	0.95-1.83	0.10
Marital status						
Married/de facto	1.00			1.00		
Single	0.90	0.70-1.17	0.43	1.24	0.85-1.80	0.26
Separated/divorced	0.96	0.76-1.23	0.77	1.23	0.89-1.71	0.21
Widowed	0.73	0.54-0.97	0.03	1.24	0.86-1.79	0.25
Education						
Less than TEE	1.00			1.00		
TEE/diploma	1.37	1.16-1.63	0.00	0.74	0.59-0.93	0.01
University	1.97	1.59-2.45	0.00	0.45	0.32-0.63	0.00
Occupation						
Manager/professional	1.00			1.00		
White-collar/trade	1.05	0.82-1.35	0.69	1.05	0.72-1.52	0.81
Blue-collar	0.88	0.70-1.12	0.30	1.41	1.00-1.99	0.05
Unemployed	0.76	0.44-1.33	0.34	2.01	1.03-3.91	0.04
Home duty	1.03	0.77-1.37	0.86	0.98	0.64-1.51	0.94
Student	1.38	0.82-2.31	0.22	0.35	0.10-1.18	0.09
Retired	1.19	0.89-1.58	0.24	0.84	0.56-1.27	0.41
Weekly household income ($)						
0-499	1.00			1.00		
500-799	1.29	0.96-1.72	0.09	0.89	0.61-1.30	0.55
800-1199	1.40	1.06-1.85	0.02	0.82	0.56-1.20	0.31
≥1200	1.75	1.30-2.37	0.00	0.56	0.36-0.87	0.01
Don't know/refused	1.49	1.14-1.93	0.00	0.81	0.57-1.15	0.24
Children under 5 years						
Nil	1.00			1.00		
One or more	0.77	0.59-1.01	0.06	0.94	0.62-1.42	0.77
People under 18 years						
Nil	1.00			1.00		
One or more	0.99	0.81-1.20	0.89	1.16	0.86-1.56	0.34

[1] *Excludes respondents with missing data*

Sufficient activity is defined as 150 minutes of moderate-intensity-intensity physical activity over five or more sessions or 60 minutes of vigorous-intensity physical activity per week (excludes gardening and household chores).

3.5 A comparison of different measures of recommended levels of physical activity

Definitions of sufficient physical activity can vary depending on the purpose and health benefit of interest. Variations generally involve establishing cut-points for the desired type, intensity and/or duration of activity. The content of the indicator and the location of the cut-off point are decided in accordance with scientific evidence and public health recommendations. In particular, different measures of sufficient physical activity have been used in various state surveys (New South Wales, Victoria and South Australia), the 1997 and 1999 National Active Australia surveys[28] and the 1999 Western Australian adult physical activity survey.[1, 2] The following indicators of sufficient physical activity are compared:

- 150 minutes of moderate-intensity physical activity over five sessions per week;
- 60 minutes of vigorous-intensity physical activity per week;
- 150 minutes of moderate-intensity physical activity over five sessions or 60 minutes of vigorous-intensity activity per week; and
- 150 minutes weighted per week (i.e. moderate-intensity minutes plus vigorous-intensity minutes x 2).

Each of the above measures will produce slightly different estimates of the proportion of the Australian population achieving sufficient levels of physical activity to obtain a health benefit. Figures 3.2 to 3.4 present the prevalence of sufficient physical activity as determined by the above-mentioned definitions stratified by gender and age. Based on these definitions of sufficient physical activity, comparisons are also made between the 1999, 2002, and 2006 survey results (Figure 3.4).

Figure 3.2 highlights

- Participation in moderate-intensity physical activity ≥150 minutes over ≥5 sessions per week was slightly higher among females (40%) compared with males (38%).
- Compared with females, more males participated in vigorous-intensity physical activity ≥60 minutes per week (43% vs. 34%).
- Because of their higher rates of participation in vigorous-intensity activity, men were more likely than women to participate in sufficient physical activity where the definition included both vigorous-intensity and moderate-intensity physical activity.

Figure 3.2: Measures of sufficient physical activity by gender

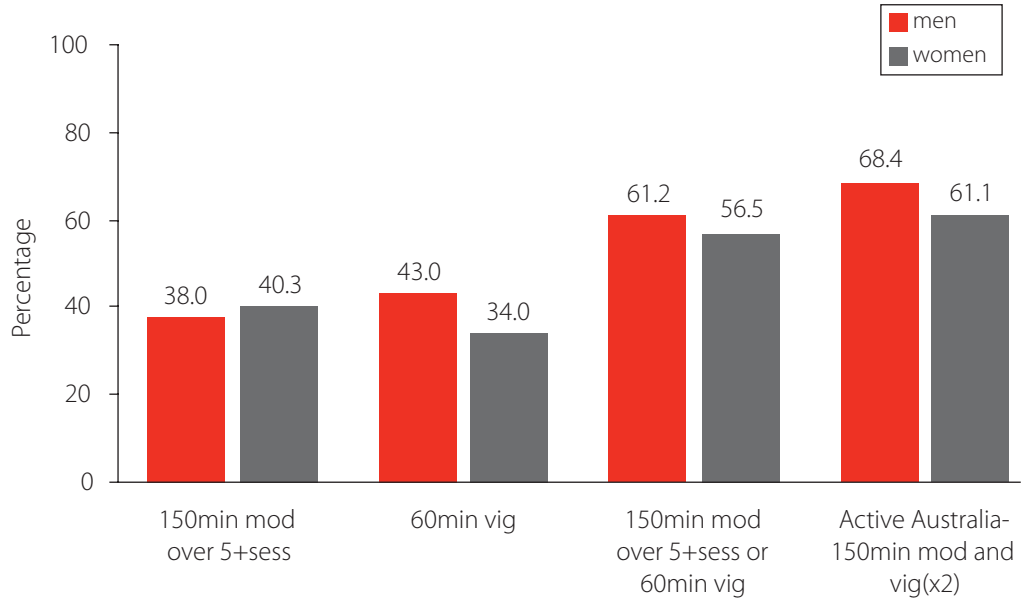


Figure 3.3 highlights

- Participation in moderate-intensity physical activity ≥150 minutes over ≥5 sessions per week decreased between the 18–29 and 30–44 year groups (42% to 38%), then remained relatively stable across the older age groups.
- Participation in sufficient vigorous-intensity physical activity decreased sharply with advancing age, with 58% of 18–20 year olds and 20% of those 60 years or older participating in this level of activity.
- Mainly due to their higher rates of participation in sufficient vigorous-intensity physical activity, 18–29 year olds were more likely than other age groups to participate in sufficient physical activity, where the definition included both vigorous-intensity and moderate-intensity physical activity.

Figure 3.3: Measures of sufficient physical activity by age

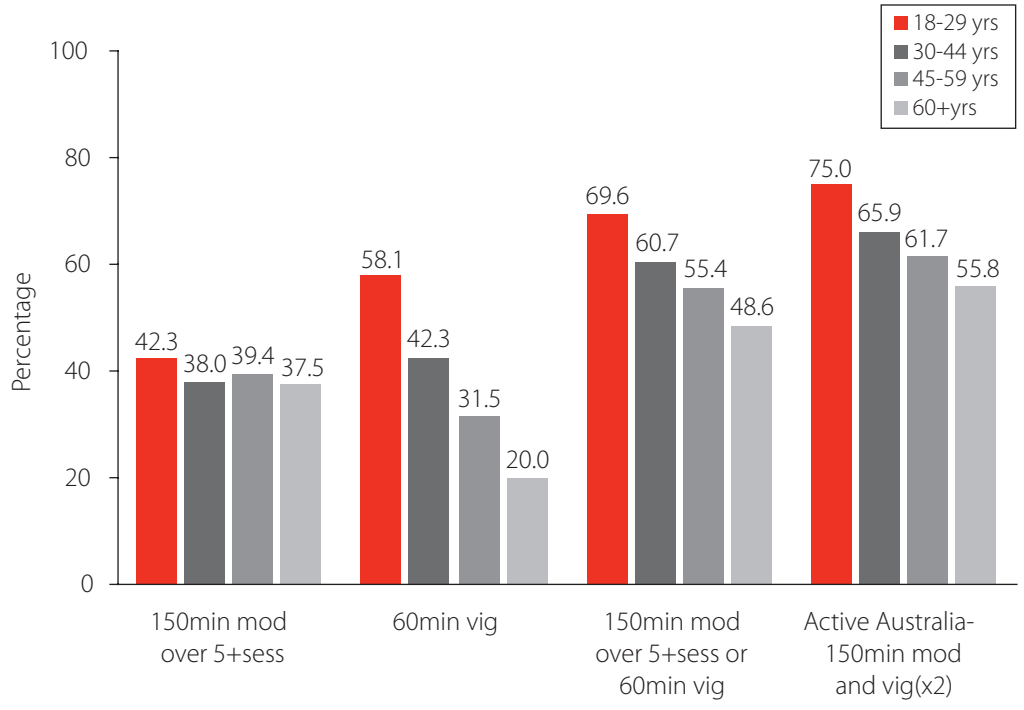
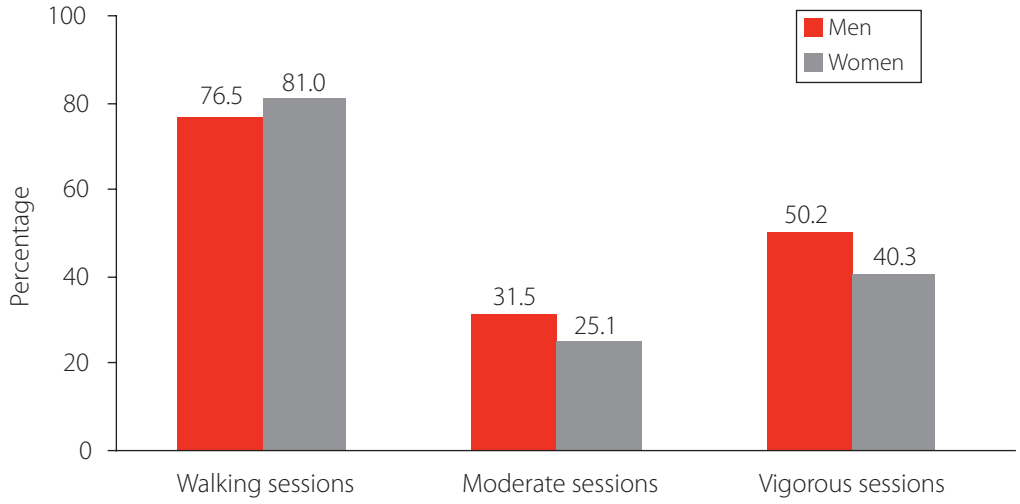


Figure 3.4 highlights

- Participation in sufficient physical activity increased between the 1999 and 2006 surveys, regardless of which definition was used.
- Adjusting for gender, age, and geographical location, 2006 survey respondents were significantly more likely to participate in sufficient vigorous-intensity physical activity (≥60 minutes/week) compared with respondents in 1999 (OR 1.20, 95%CI 1.08-1.34, p=0.001) and 2002 (OR 1.41, 95%CI 1.26-1.57, p < 0.001).
- Adjusting for gender, age, and geographical location, 2006 survey respondents were significantly more likely to participate in sufficient moderate-intensity physical activity (≥150 minutes and ≥5 sessions per week) compared with 1999 (OR 1.17, 95%CI 1.06-1.30, p = 0.002), but not significantly more likely than 2002 respondents (OR 1.10, 95%CI 0.99-1.22, p = 0.061).

Figure 3.4: Measures of sufficient physical activity by survey



3.6 Patterns of physical activity participation

Data on participation in different types of physical activity, the number of sessions of activity and the amount of time spent doing different types of activity are often of interest to those designing programs and planning communication messages on physical activity.

Figures 3.5 and 3.6 present the prevalence of participation in walking, moderate-intensity and vigorous-intensity activities by gender and age respectively. Figure 3.7 shows participation for the 1999, 2002, and 2006 surveys. Table 3.3 presents the mean weekly sessions and minutes of physical activity. Figure 3.8 shows the mean weekly minutes spent in physical activity from the 1999, 2002, and 2006 surveys.

3.6.1 Participation in walking, moderate-intensity, and vigorous-intensity physical activity

Figure 3.5 highlights

- More women than men walked in the past week (81% vs. 76%).
- More men than women participated in vigorous-intensity (50% vs. 40%) and moderate-intensity (32% vs. 25%) physical activity in the past week.

Figure 3.5: Prevalence of walking, moderate-intensity and vigorous-intensity physical activity by gender

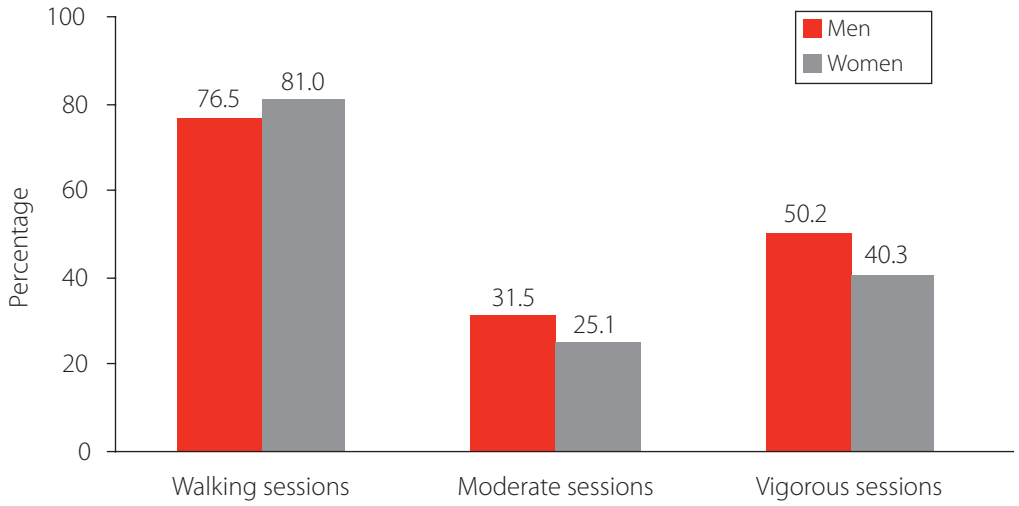


Figure 3.6 highlights

- Compared with all other age groups, a higher proportion of adults <30 years participated in walking (84%), moderate-intensity (35%) and vigorous-intensity activities (66%).
- While participation in the three types of physical activity declined with age, the steepest decline was observed for vigorous-intensity physical activity.

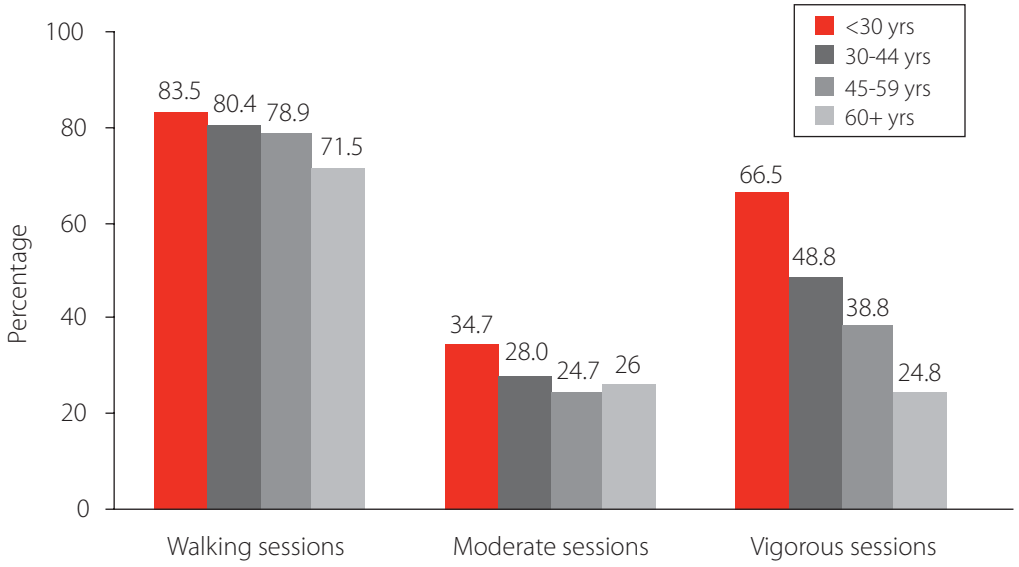
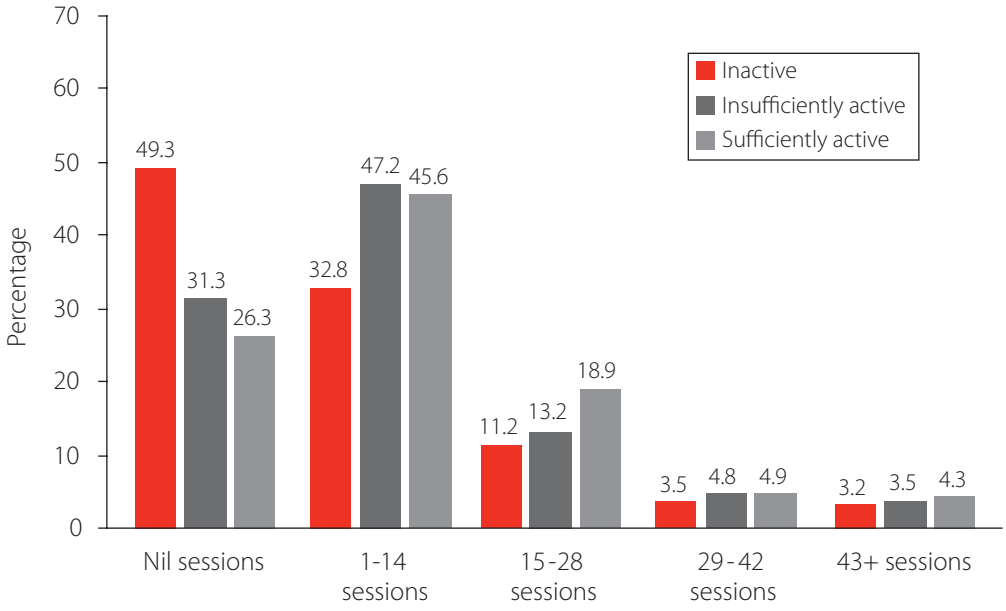


Figure 3.6: Prevalence of walking, moderate-intensity and vigorous-intensity physical activity by age

Figure 3.7 highlights

- Participation in walking and vigorous-intensity activity increased between the 1999 and 2006 surveys, while participation in moderate-intensity physical activity remained relatively stable.
- After adjusting for gender, age, and geographical location, respondents in 2006 were more likely to report walking in the past week compared with 1999 (OR 1.13, 95%CI 1.00-1.27, p = 0.046) and 2002 respondents (OR 1.19, 95%CI 1.06-1.33, p = 0.004). Furthermore, 2006 respondents were more likely to report participating in vigorous-intensity activities in the past week compared with 1999 (OR 1.19, 95%CI 1.07-1.32, p < 0.001) and 2002 survey respondents (OR 1.45 95%CI 1.31-1.62, p < 0.001).

Figure 3.7: Prevalence of walking, moderate-intensity and vigorous-intensity physical activity by survey



3.6.2 Average frequency and time spent participating in physical activity

Table 3.3 highlights

- Walking was undertaken more frequently in the past week (6.2 times) than moderate-intensity (2.6 times), vigorous-intensity physical activity (3.5 times) or gardening activity (2.4 times).
- More time was spent in the past week participating in gardening (228 minutes) and walking (199 minutes) compared with other activities.

TABLE 3.3: MEAN FREQUENCY AND TIME SPENT IN SELECTED PHYSICAL ACTIVITIES IN THE PAST WEEK

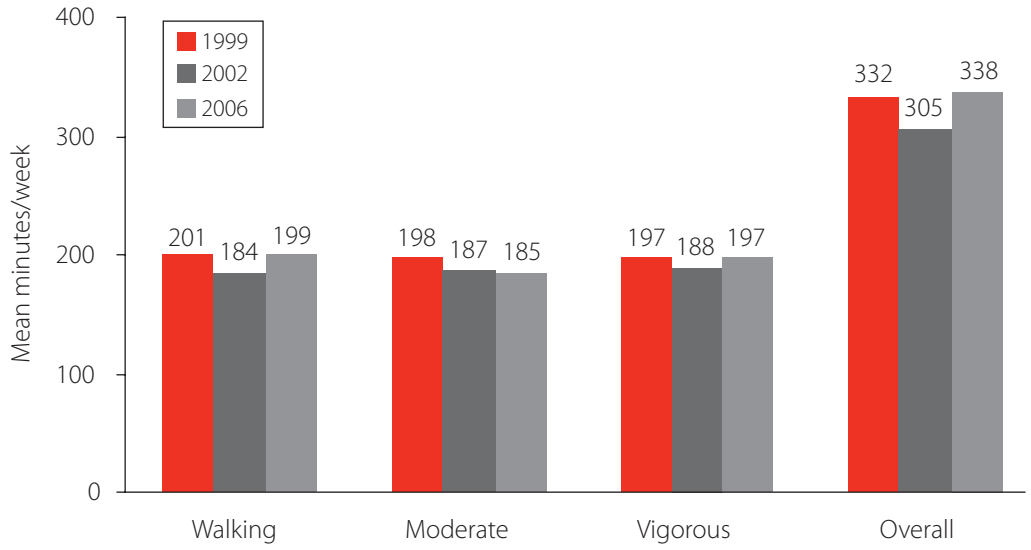
Activity Type	n	Mean	SD[1]	Median
Frequency				
Walking	2586	6.2	5.8	5.0
Moderate activity	936	2.6	2.1	2.0
Vigorous activity	1363	3.5	3.1	3.0
Vigorous gardening	1712	2.4	2.2	2.0
All physical activity[2]	2913	8.3	7.3	7.0
Duration				
Walking	2579	199.3	194.6	130.0
Moderate activity	931	184.9	185.5	120.0
Vigorous activity	1354	197.2	182.8	140.3
Vigorous gardening	1707	228.3	230.6	120.0
All physical activity[2]	2911	337.7	301.4	240

[1]Standard deviation. [2]Excludes gardening and vigorous-intensity yard work
Note: Due to skewed distribution of the data, minutes of walking, moderate-intensity and vigorous-intensity gardening are truncated to 840 minutes (14 hours). Includes only those respondents who reported participating in activity in past week. Means, standard deviations, and medians are weighted.

Figure 3.8 highlights

- Minutes of walking, vigorous-intensity physical activity and overall physical activity (excluding gardening and vigorous-intensity yard work) increased slightly between the 2002 and 2006 surveys. Time spent participating in total physical activity was also slightly higher in 2006 compared with 1999.
- After adjusting for gender, age, and geographical location, minutes of walking, vigorous-intensity activity and overall (walking plus moderate-intensity plus vigorous-intensity minutes) were significantly higher in 2006 compared with 2002 (all statistically significant with $p < 0.001$).

Figure 3.8: Mean minutes of walking, moderate-intensity and vigorous-intensity physical activity 1999, 2002, and 2006



3.7 Participation in different types of activity and use of facilities

Planning for facilities and community programs requires information on the specific types of physical activity that individuals undertake, as well as the places or facilities they use to be active. Figure 3.9 presents the prevalence of the most reported types of physical activity that respondents undertook. Table 3.4 presents the prevalence of the most reported types of physical activity stratified by age and gender. The results presented include only those who reported being active in the past week (i.e. those completely inactive were excluded). Figure 3.10 shows the most reported physical activities undertaken in the 1999, 2002, and 2006 surveys.

3.7.1 Participation in different physical activities

Figure 3.9 highlights

- Walking for recreation (63%) followed by walking for transport (31.6%) were the most reported physical activities.
- Fourteen percent of respondents reported swimming or surfing, 13% reported participating in aerobics, and 11% reported participating in running or jogging in the past week.

Figure 3.9: Prevalence of physical activity type

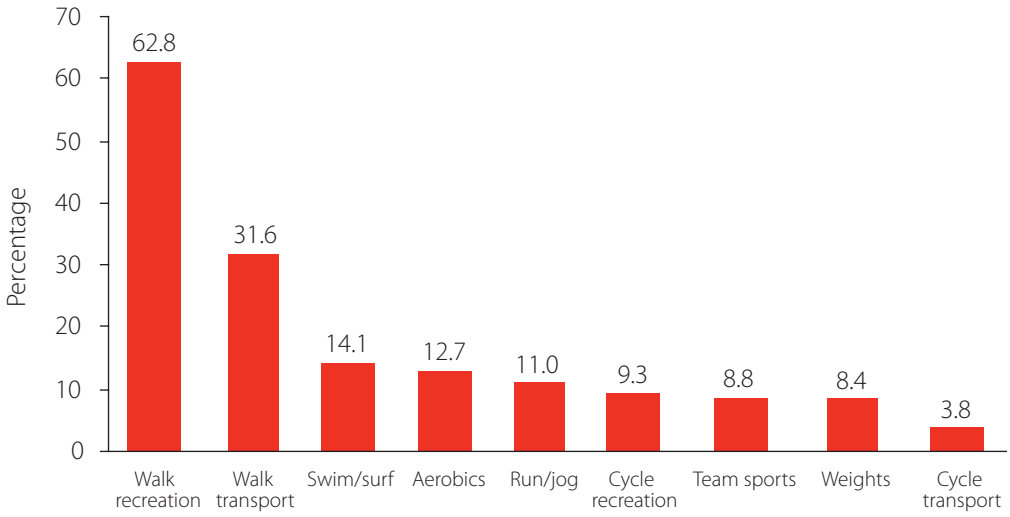


Table 3.4 highlights

- Men's participation in walking for recreation and exercise increased with advancing age (18–29 years = 43% to 60 years and over = 63%).
- For men and women, participation in running/jogging, team sports and cycling for recreation or exercise decreased steeply with advancing age.
- Compared with men, a higher proportion of women walked for recreation (70% vs. 56%) and participated in aerobics (18% vs. 8%).

TABLE 3.4: PREVALENCE OF SPECIFIC TYPES OF PHYSICAL ACTIVITY BY AGE AND GENDER

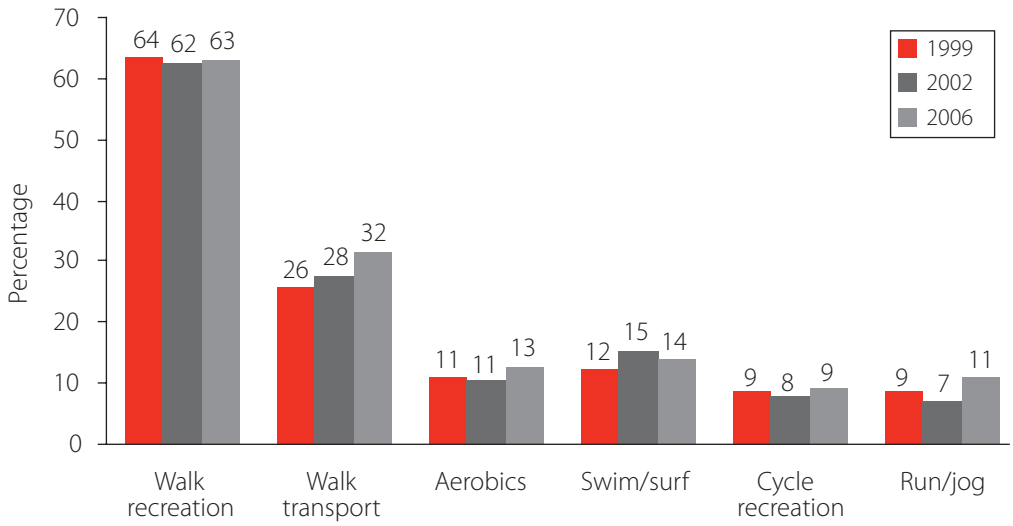
	Gender by age groups									
	<30 yrs		30-44		45-59		≥60 yrs		Total	
Activity Type	M	F	M	F	M	F	M	F	M	F
Walking										
-recreation	43.4	66.3	56.9	70.7	62.3	74.5	62.7	65.2	55.9	69.6
-transport	35.7	36.7	33.0	33.2	28.0	28.3	24.7	32.2	30.8	32.4
Swimming/surfing	15.9	22.3	15.6	16.3	11.2	11.2	8.1	8.7	13.2	14.9
Aerobics	12.8	25.3	7.0	17.4	6.1	14.1	4.9	13.3	7.8	17.6
Jogging/running	23.3	21.5	11.5	9.3	10.5	5.9	2.2	1.0	12.5	9.5
Team sports	24.3	11.8	13.3	9.1	3.5	2.0	0.9	1.0	11.3	6.3
Cycling										
-recreation	17.3	8.4	8.3	8.8	11.1	7.4	7.8	4.7	11.2	7.5
-transport	7.8	0.9	5.0	3.7	5.6	2.4	2.6	1.1	5.4	2.2
Golf	8.3	1.4	7.6	1.3	10.1	3.9	13.0	4.3	9.4	2.6
Weights	20.7	5.6	11.1	5.2	7.9	5.1	6.1	3.4	11.8	4.9
Tennis	3.5	2.6	4.2	2.9	4.8	2.9	2.6	4.5	3.9	3.1

Note: Percentages exclude inactive respondents (i.e. no walking, moderate-intensity or vigorous activity)

Figure 3.10 highlights

- Participation in most physical activities between the 1999, 2002, and 2006 surveys either remained relatively constant or showed only minor differences.
- Noteworthy is the 6% increase in participation in walking for transport between 1999 and 2006 among active respondents.

Figure 3.10: Prevalence of the most reported physical activities in the 1999, 2002 and 2006 surveys



3.7.2 Facilities used for physical activity

Respondents who undertook physical activity in the past week were asked to identify the place or facility used. Figures 3.11, 3.12, and 3.13 present the reported places used to undertake physical activity by gender, age, and survey year.

Figure 3.11 highlights

- Streets/footpaths and the home were the most popular places for both men (48% and 41%, respectively) and women (49% and 50%, respectively) to be physically active.
- Compared with men, a higher proportion of women used cycle/walking paths (27% vs. 23%) and gyms (25% vs. 19%). Compared with women, a higher proportion of men were physically active at the beach (13% vs. 10%) and at the workplace (6.8% vs. 2.2%).

Figure 3.11: Most reported facilities used for physical activity by gender

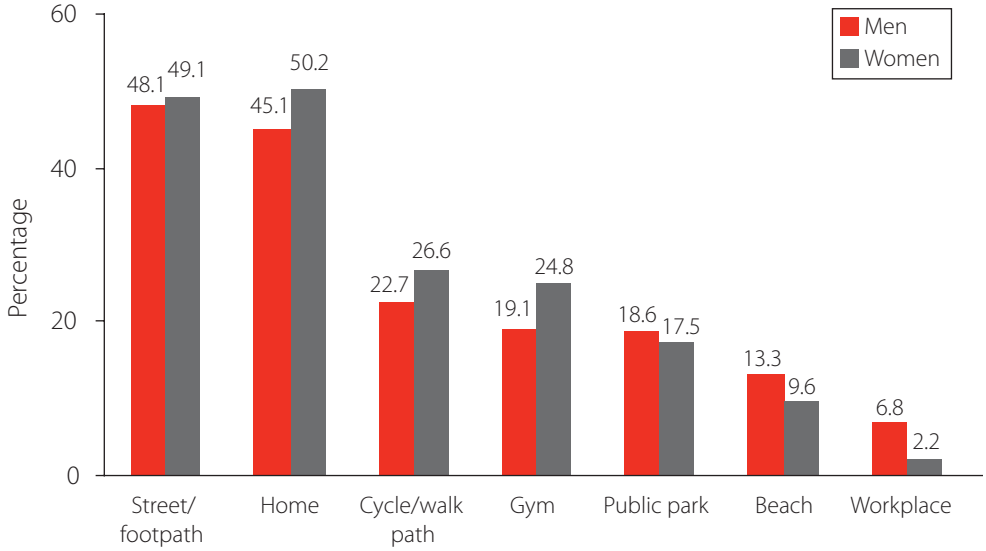


Figure 3.12 highlights

- The proportion of adults being physical activity at home increased with advancing age (18–29 years = 36% to 60 years and over = 61%).
- The use of public open space (22% to 13%) and gymnasia, health clubs and recreation centres (31% to 15%) for physical activity declined with advancing age.

Figure 3.12: Most reported facilities used for physical activity by age

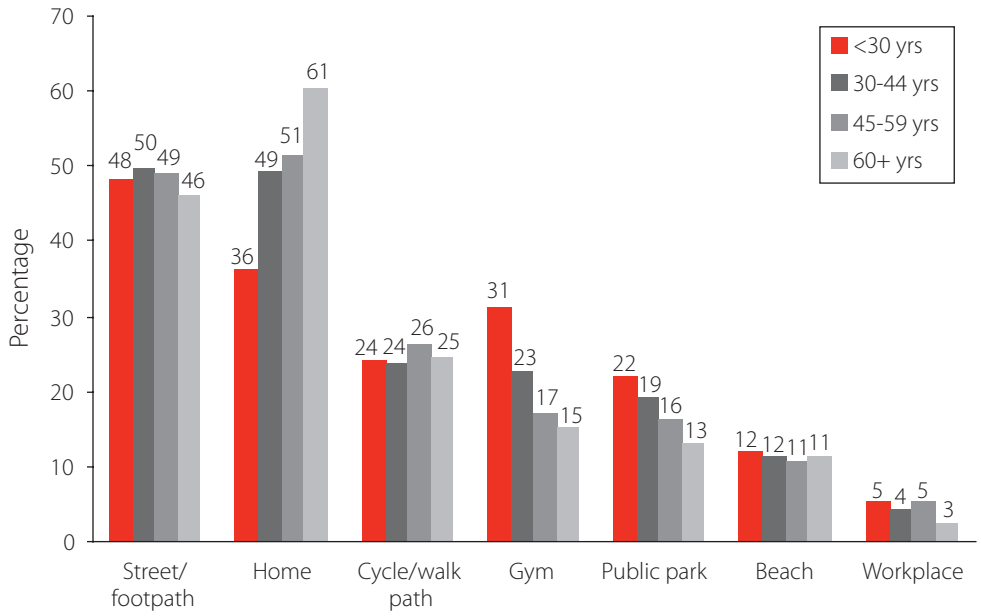
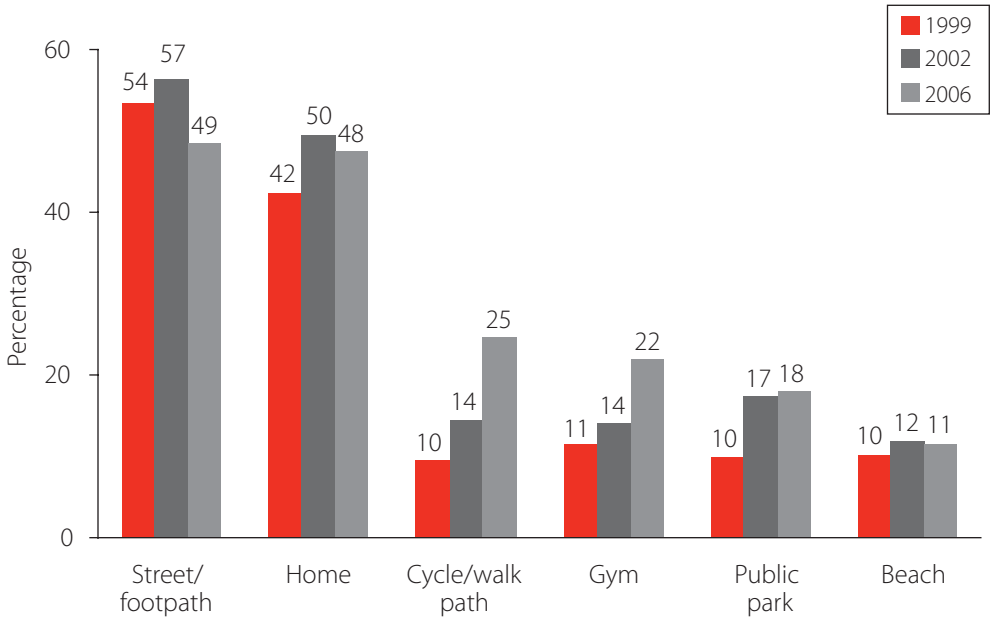


Figure 3.13 highlights

- The use of the streets and footpaths for physical activity was lower in the 2006 (49%) survey compared with the 1999 (54%) and 2002 (57%) surveys. However, since the 1999 survey the proportion of adults using cycle and walking paths has increased by 15%. This may reflect the increase in transport-related walking and jogging and running reported previously.
- The use of gymnasia, health clubs, and recreation centres doubled between the 1999 and 2006 surveys (11% to 22%).
- The proportion of adults using public open space for physical activity was similar between 2002 (17%) and 2006 (18%), but higher than that measured in 1999 (10%).

Figure 3.13: Most reported facilities used for physical activity in 1999, 2002, and 2006



3.8 Levels of habitual incidental physical activity

The measurement of habitual incidental physical activity introduced in the 2002 survey was included again in the 2006 survey. Habitual incidental physical activity is activity performed while undertaking other activities or chores (i.e. undertaken incidentally) and has become important because current physical activity guidelines indicate that all activity is beneficial to health, including exercise accumulated throughout the day.[21] The level of habitual incidental physical activity was captured by asking respondents to report daily activities including walking and cycling they had performed for fewer than 10 minutes.

The 2002 and 2006 surveys included three items that measured the frequency of habitual incidental physical activity on weekdays, Saturdays and Sundays, and four items that measured specific incidental physical activity behaviours. The four items asked respondents to indicate whether they use the stairs instead of the lift or escalator, park further away from their destination so that they have to walk further, walk or cycle to destinations that are within a 5-minute drive from home, and walk the dog. The seven items can be reliably measured for adults.[27]

Table 3.5 presents the prevalence of habitual incidental physical activity undertaken on weekdays, Saturdays and Sundays by demographic characteristics. Figure 3.14 presents the prevalence of incidental physical activity for the 2002 and 2006 surveys. Figures 3.15 to 3.18 illustrate habitual incidental physical activity performed on weekdays, Saturdays, Sundays and in total by sufficient physical activity. Figure 3.19 presents the four habitual incidental physical activity behaviours undertaken in 2002 and 2006 and Table 3.6 shows the prevalence of participation in the four habitual incidental physical activities by demographic characteristics and sufficient physical activity.

3.8.1 Prevalence of habitual incidental physical activity

Table 3.5 highlights

- Participation in incidental physical activity was highest on weekdays (58%), followed by Saturdays (49%) then Sundays (41%).
- More women than men participated in incidental physical activity on all days of the week.
- The proportion of respondents participating in incidental physical activity on all days decreased with advancing age and increased with higher levels of education.
- Compared with other occupation categories, a higher proportion of students (43%) and a lower proportion of retirees (24%) participated in incidental physical activity every day.

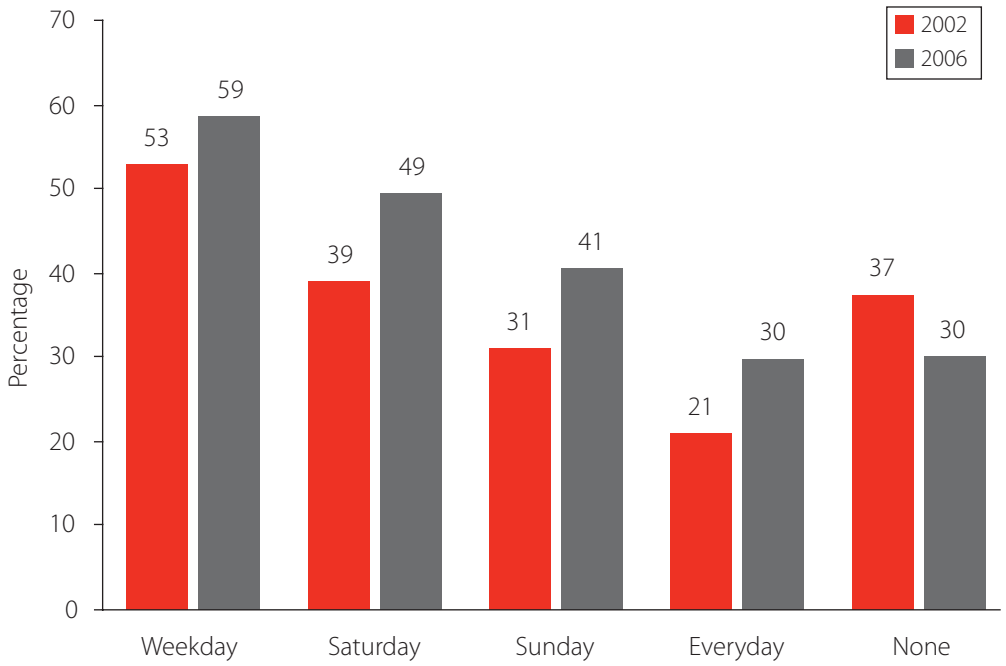
TABLE 3.5: PREVALENCE OF HABITUAL INCIDENTAL PHYSICAL ACTIVITY ON WEEKDAYS, SATURDAYS AND SUNDAYS BY DEMOGRAPHIC FACTORS AND OTHER CHARACTERISTICS

Characteristic	Weekday	Saturday	Sunday	Every day
Gender				
Male	54.6	48.7	40.0	28.7
Female	62.3	49.9	41.5	31.1
Age group				
18 to 29 years	67.8	54.1	45.7	34.8
30 to 44 years	61.9	55.1	45.5	34.1
45 to 59 years	52.7	46.5	38.2	26.1
60 years or more	50.5	39.3	31.7	23.4
Location				
Perth metropolitan area	59.7	50.9	42.0	30.7
South West	53.2	46.8	37.5	28.0
Kimberley/Pilbara	60.5	48.7	38.7	31.6
Midwest/Goldfields	55.5	41.2	36.3	25.7
Education				
Less than TEE	52.0	40.8	34.5	24.4
TEE/diploma	59.4	50.0	40.2	29.5
University	64.4	57.7	48.6	37.0
Occupation				
Manager/professional	60.7	54.3	45.0	32.9
White-collar/trade	62.8	52.6	44.3	32.4
Blue-collar	49.7	46.2	36.3	26.3
Unemployed	53.4	45.9	39.5	36.9
Home duty	63.6	45.6	37.4	26.6
Student	78.0	59.9	55.9	42.6
Retired	51.8	40.3	32.2	23.7
Weekly household income ($)				
0-499	55.3	40.3	33.7	25.0
500-799	59.7	45.9	37.4	28.0
800-1199	60.6	52.0	43.2	29.7
≥1200	59.0	53.2	44.5	33.0
Don't know/refused	56.9	48.5	39.3	30.1
Overall	**58.5**	**49.3**	**40.7**	**29.9**

Figure 3.14 highlights

- The prevalence of habitual incidental physical activity was higher in the 2006 survey compared with the 2002 survey for weekdays, Saturdays, and Sundays.
- After adjusting for gender, age, and geographical location, 2006 survey respondents were significantly more likely to participate in incidental physical activity on weekdays (OR 1.30, 95%CI 1.18-1.44, $p < 0.001$), Saturdays (OR 1.53, 95%CI 1.38-1.70, $p < 0.001$), and Sundays (OR 1.60, 95%CI 1.44-1.78, $p < 0.001$) compared with 2002 respondents.
- After adjusting for gender, age, and geographical location, 2006 respondents were significantly more likely to participate in incidental physical activity every day (OR 1.67, 95%CI 1.49-1.88, $p < 0.001$), and less likely to report no incidental physical activity (OR 0.72, 95%CI 0.65-0.80, $p < 0.001$) compared with 2002 respondents.

Figure 3.14: Prevalence of habitual incidental physical activity in the 2002 and 2006 surveys



3.8.2 Sessions of habitual incidental physical activity

Figure 3.15, 3.16, 3.17 and 3.18 highlights

- Generally, there was a positive relationship between sufficient physical activity levels and sessions of habitual incidental physical activity.
- Participation in sessions decreased with age, with fewer older adults (41%) and younger adults (22%) reporting no participation in incidental physical activity.
- Compared with males (33%), fewer females reported participating in no habitual incidental physical activity (28%).
- Compared with other locations, fewer metropolitan Perth area respondents reported no participation in sessions of habitual incidental physical activity (28%).

Figure 3.15: Total weekly sessions of habitual incidental physical activity by gender

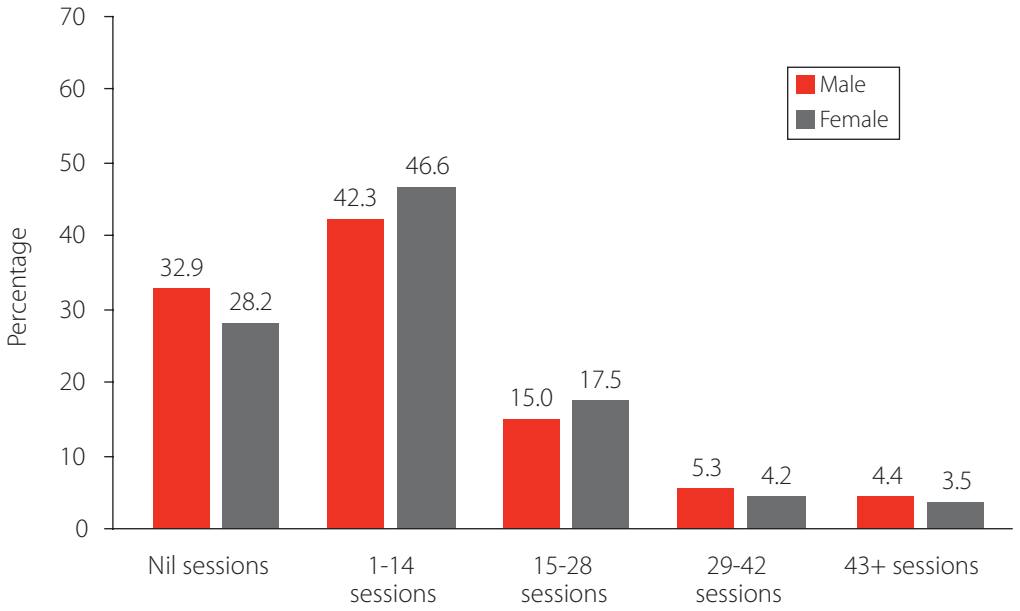


Figure 3.16: Total weekly sessions of habitual incidental physical activity by age

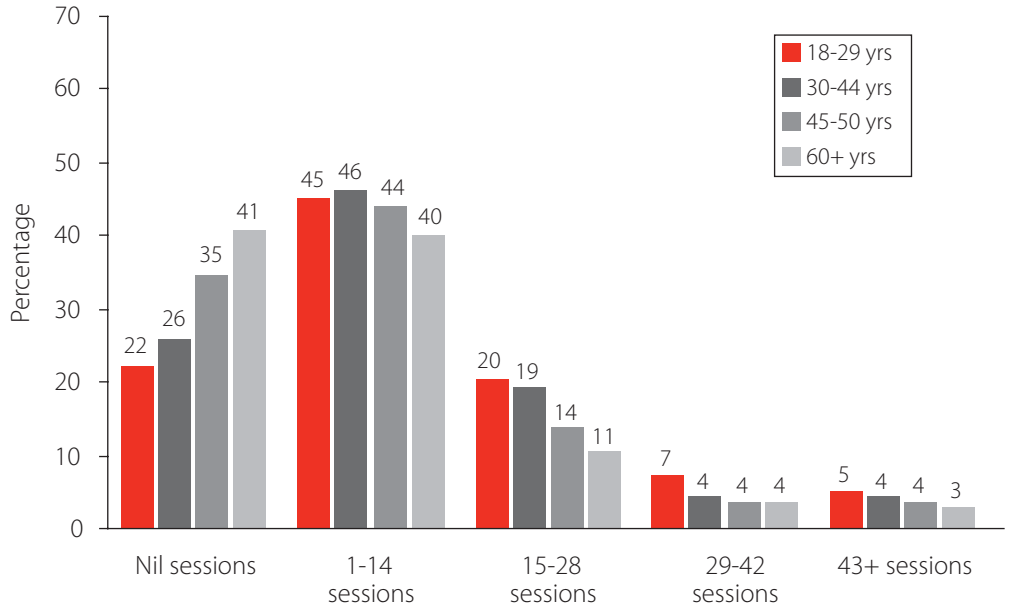


Figure 3.17: Total weekly sessions of habitual incidental physical activity by location

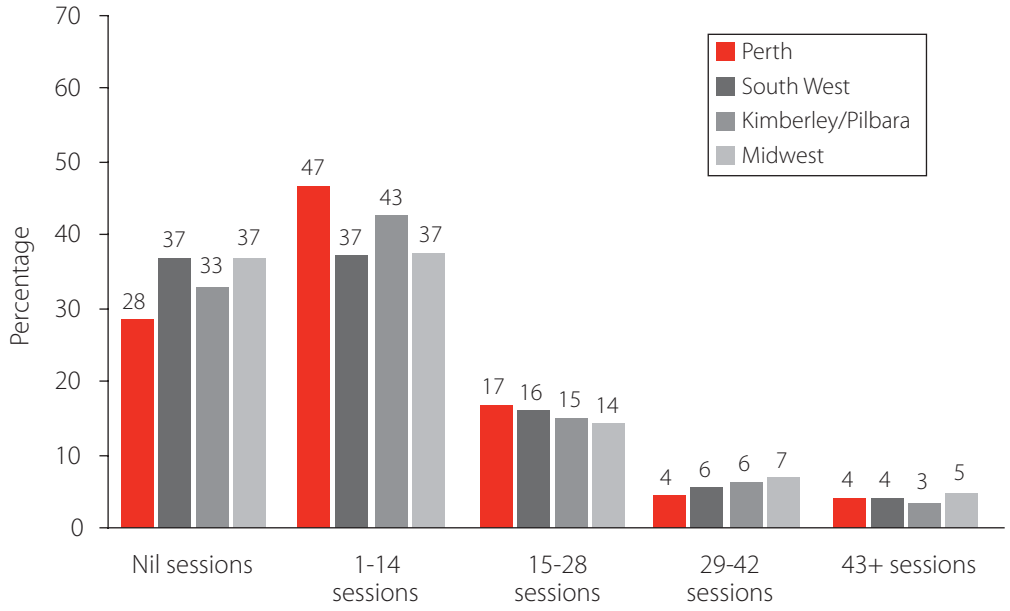


Figure 3.18: Total weekly sessions of habitual incidental physical activity by sufficient physical activity

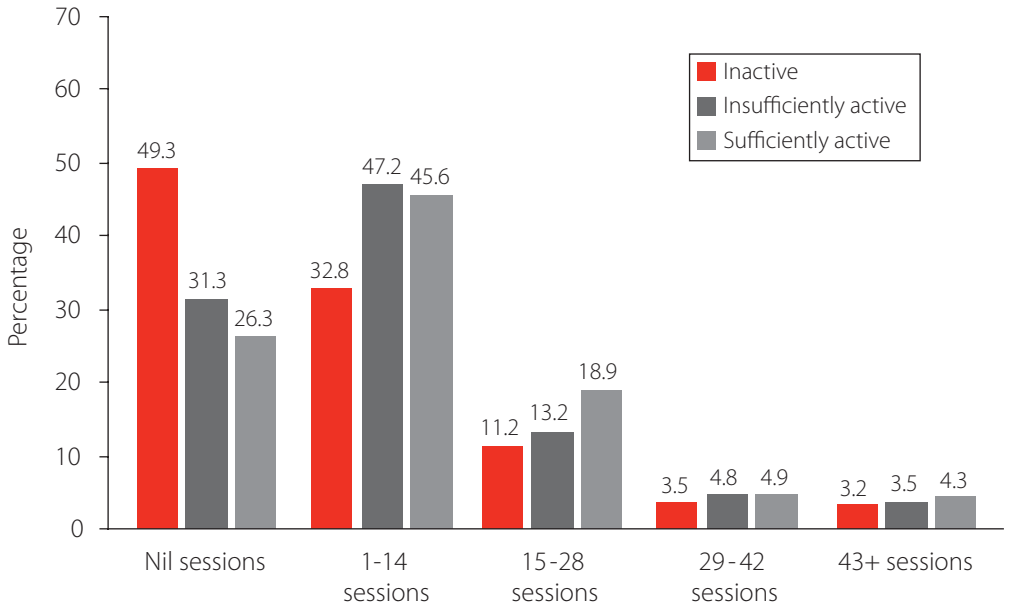


Table 3.6 highlights

- Participation in all four incidental physical activity behaviours was higher among women compared with men.
- Participation in the four incidental physical activity behaviours increased with increasing sufficient physical activity levels.
- Participation in climbing the stairs, walk/cycling instead of a 5-minute drive to reach a destination, and taking the dog for a walk all increased with higher education levels.
- Compared to other age groups, fewer respondents 60 years and older climbed the stairs (48%), walk/cycled instead of a 5-minute drive (53%), and took the dog for a walk (49%).

TABLE 3.6: PREVALENCE OF INCIDENTAL PHYSICAL ACTIVITIES BY GENDER, AGE, GEOGRAPHICAL LOCATION, INCOME, EDUCATION, AND ACTIVITY LEVEL

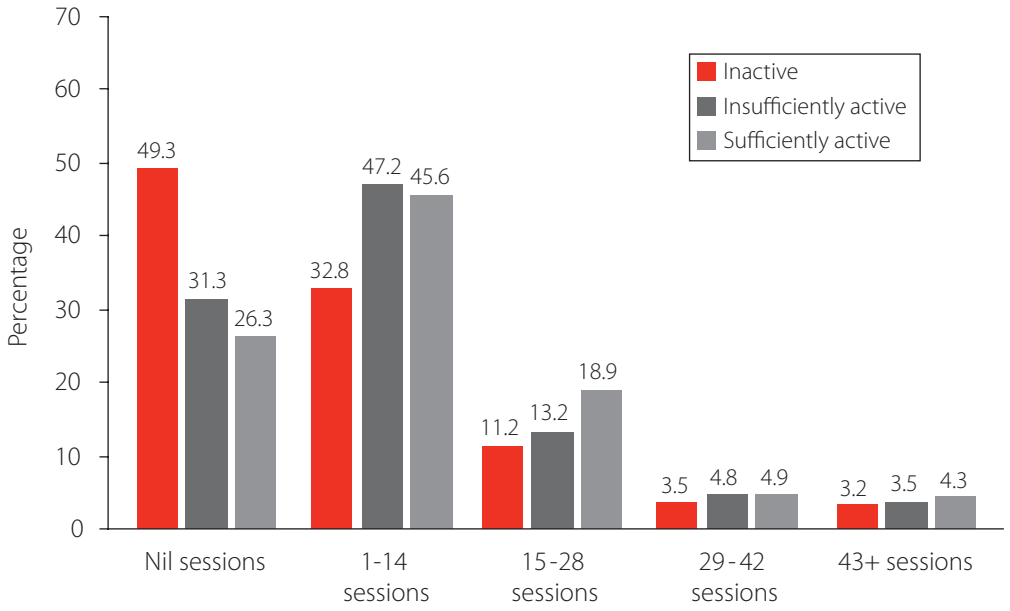
Characteristic	Climb stairs	Park vehicle further away	Walk/cycle instead of 5min drive	Take dog for a walk
Gender				
Male	59.5	30.0	53.8	52.3
Female	63.8	46.1	61.0	63.9
Age group				
18 to 29 years	62.7	34.6	62.5	56.0
30 to 44 years	66.3	38.1	59.0	60.4
45 to 59 years	66.4	40.5	54.7	63.2
60 years or more	47.8	38.8	52.8	48.8
Location				
Perth metropolitan area	62.7	38.3	58.1	56.9
South West	58.7	38.2	55.9	62.6
Kimberley/Pilbara	50.7	34.0	51.4	60.8
Midwest/Goldfields	57.0	39.0	56.8	59.6
Education				
Less than TEE	51.9	40.5	51.0	54.3
TEE/diploma	63.4	38.3	58.4	57.8
University	69.5	35.2	63.0	62.8
Weekly household income ($)				
0-499	46.1	37.7	56.8	51.6
500-799	54.3	44.4	58.1	50.5
800-1199	64.5	35.5	55.1	53.1
≥1200	69.2	32.7	58.6	62.5
Activity level[1]				
Inactive	40.0	30.7	30.8	25.1
Insufficient	56.6	38.6	54.9	53.1
Sufficient	68.1	39.4	64.0	66.4
Overall	**61.7**	**38.1**	**57.4**	**58.2**

[1]*Sufficient activity is defined as 150 minutes of moderate-intensity physical activity over five or more sessions or 60 minutes of vigorous-intensity physical activity per week (excludes gardening and household chores).*

Figure 3.19 highlights

- Compared with 2002 survey respondents, a higher proportion of 2006 respondents reported using the stairs instead of a lift or escalator (62% vs. 60%), and parking their vehicle further from a destination, so they would have to walk further (38% vs. 34%). For dog walking and walking or cycling to destinations that are within a 5-minute drive, the opposite was found.
- After adjusting for gender, age, and geographical location, 2006 survey respondents were significantly more likely to park their vehicle further from a destination to walk further (OR 1.21, 95%CI 1.08-1.34, p = 0.001), and significantly less likely to walk their dog (OR 0.84, 95%CI 0.73-0.97, p = 0.017).

Figure 3.19: Prevalence of specific habitual incidental physical activity in the 2002 and 2006 surveys



4 INFLUENCES ON PHYSICAL ACTIVITY IN WESTERN AUSTRALIA

This chapter presents data on factors important for influencing levels of physical activity in the population. Contemporary approaches to increasing physical activity are guided by theories from psychology, sociology and social marketing, and use planning frameworks such as the precede/proceed model, to guide their development and implementation. This survey included items to assess key aspects of these theories and approaches.

The survey sought information on readiness to be physically active according to Prochaska's 'stage of change' model.[31] The results are presented in Section 4.1. Section 4.2 provides information on comprehension of major physical activity campaign messages that have been promoted in Western Australia during the past few years. Section 4.3 shows awareness of particular marketing messages,

which indicates reach to the target audience. Social marketing has formed a key component of creating socio-cultural and behavioural change and understanding message awareness is important in designing and promoting effective messages.

One survey item assessed respondents' confidence to participate in moderate-intensity physical activity on five or more days in a typical week, which is a strong predictor of participation in physical activity (Section 4.4).

Sedentary behaviour was investigated via measurement of television watching and computer use (Table 4.5). The interactions between these sedentary activities, body weight and physical activity participation were also investigated (Figure 4.1).

One survey question asked if respondents had received advice on physical activity participation during their last visit to a physician (Table 4.6).

4.1 Readiness to be more physically active

Readiness to increase physical activity was measured as described in the 'stage of change' model.[31] Respondents were classified using the categories of Pre-contemplation (not intending to change), Contemplation (intending to be active in the next six months), Preparation (intending to be active in the next week), Action (becoming more active at the present time) and Maintenance (maintaining their raised level of activity).

Table 4.1 highlights

- Amongst those who were inactive, 15.9% classified themselves as pre- contemplaters, compared with 4.9% amongst insufficiently active and 0.7% of sufficiently active adults.
- There were 55% of inactive people and 57% of insufficiently active people who described themselves as either contemplating or preparing to become physically active in the next few weeks, compared with 16.2% of adults who were sufficiently active.
- While 69.4% of sufficiently active adults considered themselves in the maintenance stage, 32.0% of insufficiently active and 26.7% of inactive adults considered themselves in this stage.
- A greater proportion of males were in the maintenance stage of physical activity, with a greater proportion of females in each of the preceding stages of change.
- People aged 60 years and over had the highest proportion that had no intention of increasing their physical activity level (11%) and the lowest proportion who were taking action to be more active (4%).

TABLE 4.1: PHYSICAL ACTIVITY STAGE OF BEHAVIOUR CHANGE BY GENDER, AGE, LOCATION AND ACTIVITY LEVEL

	Stage of Change				
Variable	PC	C	P	A	M
Gender					
Male	3.1	8.6	22.6	8.8	57.0
Female	4.0	11.6	22.9	11.6	48.9
Age group					
18 to 29 years	0.6	10.2	20.8	17.8	50.6
30 to 44 years	1.7	11.0	24.4	11.9	50.9
45 to 59 years	2.5	9.9	24.7	6.6	56.0
60 years or more	10.6	8.9	20.0	3.9	56.6
Location					
Perth metropolitan area	3.8	10.3	22.4	10.2	53.3
South West	2.3	8.4	24.6	7.6	57.2
Kimberley/Pilbara	4.0	9.3	23.3	12.7	50.7
Midwest/Goldfields	3.4	11.0	22.6	13.3	49.7
Activity level					
Inactive	15.9	28.6	26.4	2.4	26.7
Insufficient	4.1	16.1	41.3	6.5	32.0
Sufficient	0.7	3.3	12.9	13.7	69.4
Overall	**3.6**	**10.1**	**22.8**	**10.2**	**53.4**

Stages: PC) Pre-contemplation; C) Contemplation; P) Preparation; A) Action; M) Maintenance
[1] Participating in less than 150 minutes of moderate over five or more sessions and 60 minutes of vigorous physical activity per week.

4.2 Comprehension of physical activity messages

Comprehension of physical activity messages was assessed using two questions. The first asked for the correct number of minutes of activity recommended 'each day for good health'. The second question asked about recall of specific campaign messages, in particular the Department of Health's 'Find thirty, it's not a big exercise' message (Table 4.3 to 4.6).

Table 4.2 highlights

- Most incorrect responses over-estimated rather than under-estimated the correct number of minutes of recommended physical activity.
- Overall, 60% of adults were aware that 30 minutes of moderate physical activity is required on most days for good health. This was an increase of 4% from the 2002 survey.
- The proportion giving the correct response was higher among women and those aged 18–44 years.
- Sufficiently active respondents and those within a normal weight range were less likely to correctly identify the recommended amount of physical activity, although they were likely to over-estimate the correct amount of recommended time.

TABLE 4.2: PROPORTION OF SUBJECTS CORRECTLY ANSWERING '30 MINUTES' OF MODERATE PHYSICAL ACTIVITY IS REQUIRED ON MOST DAYS FOR GOOD HEALTH

Variable	(%)
Gender	
Male	58.4
Female	61.8
Age group	
18 to 29 years	62.6
30 to 44 years	66.9
45 to 59 years	56.4
60 years or more	50.5
Location	
Perth metropolitan area	60.2
South West	59.5
Kimberley/Pilbara	60.9
Midwest/Goldfields	59.8
Activity level[1]	
Inactive	64.7
Insufficient	64.3
Sufficient	57.3
BMI category	
Normal weight	52.9
Underweight	59.9
Overweight	59.9
Obese	63.1
Overall	**60.1**

[1]*Sufficient activity is defined as 150 minutes of moderate physical activity over five or more sessions or 60 minutes of vigorous physical activity per week (excludes gardening and household chores).*

4.3 Awareness of physical activity campaigns

Awareness of physical activity campaigns was assessed from two questions. The first asked for unprompted awareness of any physical activity messages. The second question prompted specific campaign messages, in particular the Department of Health's 'Find thirty, it's not a big exercise' message (Table 4.3).

Table 4.3 highlights

- People who were sufficiently active were more aware of all community physical activity messages compared with the inactive and insufficiently active groups.
- 'Find thirty, it's not a big exercise' was the most well known message, with 78.6% of people aware of the Find thirty message.
- 'walk there today to find thirty' was the least recalled physical activity related message.

TABLE 4.3: AWARENESS OF PHYSICAL ACTIVITY MESSAGES BY SUFFICIENT PHYSICAL ACTIVITY[1]

Variable	Inactive	Insufficiently active	Sufficiently active	Overall
Find thirty, it's not a big exercise.	68.7	77.3	81.2	78.6
be active wa	43.0	49.8	51.4	49.9
TravelSmart	37.1	41.5	48.0	44.8
Walk there today to Find thirty	19.2	22.0	22.2	21.8
Cycle instead	45.5	55.6	58.5	56.1

[1]*Sufficient activity is defined as 150 minutes of moderate physical activity over five or more sessions or 60 minutes of vigorous physical activity per week (excludes gardening and household chores).*

4.4 Confidence in participating in physical activity

One survey item assessed confidence towards participating in 30 minutes of moderate physical activity on five or more days per week. These data are presented in Table 6.4.

Table 4.4 highlights

- The majority of people (80%) reported that they were 'very' or 'moderately confident' that they could participate in moderate physical activity for 30 minutes on five or more days per week. About 11% of adults were 'not at all confident' in their ability to undertake activity at this frequency. This was an increase of 5% from 2002.
- More men (66%) than women (55%) were 'very confident' that they could participate in physical activity on 5–7 days per week.
- Across all age categories, most adults reported being 'very confident' of achieving 30 minutes of moderate physical activity on 5–7 days per week. Almost one in five (19%) adults aged over 60 years said they were 'not at all confident' to exercise at this frequency.
- Sufficiently active people were likely (76%) to be 'very confident' and less likely to be 'moderately', 'somewhat' or 'not at all confident' of participating in five or more days of physical activity each week. Conversely, one in three inactive adults were 'not at all confident' (34%) of participating in five or more days of physical activity each week.

TABLE 4.4: CONFIDENCE OF PARTICIPATING IN FIVE OR MORE DAYS PER WEEK OF PHYSICAL ACTIVITY BY GENDER, AGE, LOCATION AND ACTIVITY LEVEL

Variable	Confidence			
	Very confident	Moderately confident	Somewhat confident	Not at all confident
Gender				
Male	65.9	18.6	6.9	8.2
Female	55.2	21.4	10.3	13.0
Age group				
18 to 29 years	67.4	19.5	7.7	5.4
30 to 44 years	58.0	21.8	10.2	9.8
45 to 59 years	64.1	18.1	8.5	8.9
60 years or more	52.7	20.3	7.1	19.4
Location				
Perth metropolitan area	60.4	19.4	8.6	11.3
South West	58.7	25.1	7.0	9.2
Kimberley/Pilbara	66.9	17.2	7.9	7.9
Midwest/Goldfields	60.7	18.9	11.6	8.2
Activity level[1]				
Inactive	35.3	17.4	13.0	33.6
Insufficient	40.2	29.0	14.5	16.1
Sufficient	75.7	16.1	4.8	3.1
Overall	**60.5**	**20.0**	**8.6**	**10.6**

[1] *Sufficient activity is defined as 150 minutes of moderate physical activity over five or more sessions or 60 minutes of vigorous physical activity per week (excludes gardening and household chores).*

4.5 Television viewing and computer use

Participation in sedentary activities as well as physical activities can provide important information for the planning and implementation of programs aimed at different populations. The number of hours spent watching television or non-work use of a computer is one indicator of sedentary activity.

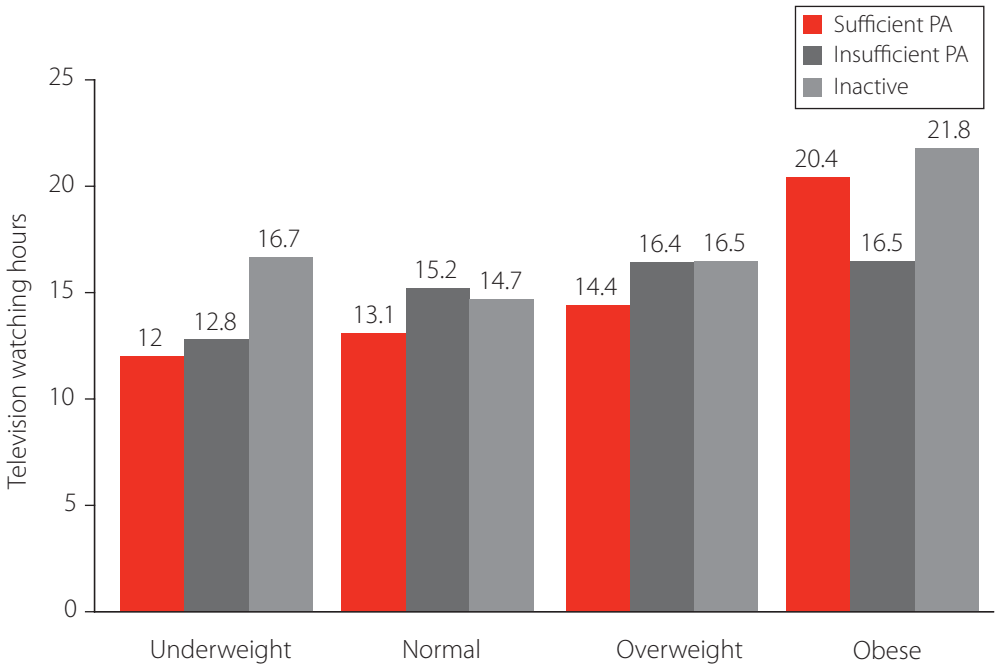
Table 4.5 shows the hours of television watching and recreational computer use by gender, age, location and activity level.

Table 4.5 highlights

- The average amount of time spent watching television and on recreational computer use per week was 15.2 hours. There was a large range of time engaged in these activities between individuals in the number of hours reported, although there was no gender difference observed.
- Television watching was similar in the first two age groups, increased in the 45–60 year age group and increased again to be highest in the 60 years and over group (20 hours/week).
- There were only minor non-significant differences between locations and no indication of a metropolitan/country differentiation in television watching.
- Watching television was significantly less amongst those sufficiently active adults compared with insufficiently active adults.

TABLE 4.5: TELEVISION AND COMPUTER USE PER WEEK BY GENDER, AGE, LOCATION AND ACTIVITY LEVEL			
Variable	**Hours per Week (mean)**	**95% CI lower bound**	**95% CI upper bound**
Gender			
Male	15.2	14.7	15.8
Female	15.2	14.6	15.8
Age group			
18 to 29 years	13.6	12.8	14.4
30 to 44 years	13.1	12.6	13.7
45 to 59 years	15.2	14.4	16.0
60 years or more	19.9	18.9	20.9
Location			
Perth metropolitan area	15.3	14.8	15.8
South West	14.7	13.8	15.6
Kimberley/Pilbara	15.3	13.3	17.3
Midwest/Goldfields	14.9	13.9	16.0
Activity level			
Inactive	17.7	16.2	19.2
Insufficient	16.3	15.5	17.0
Sufficient	14.1	13.7	14.6
Overall	**15.2**	**14.8**	**15.6**

Figure 4.1: Television watching by body weight and level of physical activity



4.6 Physician advice about physical activity

Respondents were asked about advice they may have received on physical activity during their last visit to their doctor or general practitioner. Table 4.6 shows the proportion of adults by gender, age, location, current level of physical activity and BMI who reported receiving physical activity advice from their general practitioner.

Table 4.6 highlights

- Overall, 15% of respondents reported receiving advice about physical activity during their last visit to their general practitioner, similar to the 14% found in 2002.
- A slightly higher proportion of men (16%) than women (14%) reported having received advice. Adults aged 30 through to 59 years (17%) were most likely to have received advice and young adults 18–30 years old (8%) were least likely to have received advice about physical activity.
- There was little difference in the proportion of people given advice across the state.
- There was also little difference according to activity level, with insufficiently active adults (17%) the most likely to receive physical activity advice from their doctor, followed by inactive (16%) adults and sufficiently active adults the least likely (13%).
- Obese adults were the most likely (36%) to report receiving advice about physical activity from their general practitioner, with 18% of overweight respondents having received advice.

TABLE 4.6: GP ADVICE ON PHYSICAL ACTIVITY

Times	Proportion (%)
Gender	
Male	15.5
Female	13.8
Age group	
18 to 29 years	8.3
30 to 44 years	17.2
45 to 59 years	17.0
60 years or more	14.7
Location	
Perth metropolitan area	14.9
South West	14.1
Kimberley/Pilbara	15.9
Midwest/Goldfields	12.7
Activity level[1]	
Inactive	15.5
Insufficient	17.3
Sufficient	13.2
BMI category	
Underweight	8.8
Acceptable	6.6
Overweight	17.6
Obese	36.2
Overall	**14.6**

[1]*Sufficient activity is defined as 150 minutes of moderate physical activity over five or more sessions or 60 minutes of vigorous physical activity per week (excludes gardening and household chores).*

5 BODY MASS INDEX AND PHYSICAL ACTIVITY

Obesity is defined as a disease where excess body fat has accumulated to an extent that health may be adversely affected.[32] Measurement of obesity uses body mass index (BMI), defined as the weight in kilograms divided by the square of the height in metres (kg/m^2). A BMI over 25 kg/m^2 is defined as overweight, and a BMI of over 30 kg/m^2 as obese. Well established negative health consequences such as diabetes, hypertension, cardiovascular disease, certain cancers, sleep apnoea, osteoarthritis and premature death occur and the risk increases as body mass index increases from the healthy weight range through overweight into obesity.[10] Obesity has also been associated with increased likelihood of injury, including car crashes, workplace injuries and absenteeism.[10] Obesity is considered by the World Health Organization to be a worldwide epidemic, with the global prevalence of both overweight and obesity rapidly increasing.[9]

Obesity and overweight in Australia account for approximately 4.3% of the total burden of disease.[7] It is estimated that in 2005 there were 3.24 million obese Australians, made up of 1.52 million males (15.1% of all males) and 1.72 females (16.8% of all females). The total financial cost to Australia of obesity in 2005 was estimated at $3.767 billion.[33]

There are several known causes of overweight and obesity, of which energy imbalance is the most common. This imbalance is the consequence of a higher consumption of energy from food than that being expended and may be the product of over-consumption, lack of physical activity or both.[34] Both excessive energy consumption and physical inactivity are partly the result of an increasingly 'obesogenic' environment.[35, 36, 37] Environmental factors such as increases in the availability of fast foods, increased portion size, increased energy content of foods, increased automation in the workplace and in everyday living, and increased participation in inactive pastimes (e.g. watching television) appear to be contributing to the obesity epidemic.

Methodology

Self-reported body weight and height were collected in either metric (metres and kilograms) or imperial (feet and inches, stones and pounds) units and converted to common metric measures to compute body mass index (BMI). The following standard formula was used: BMI = weight in kg/height in metres squared. The following definitions of BMI were used to categorise individuals in this report [11].

- Underweight (< 18.50)
- Healthy (18.50 to 24.99)
- Overweight (25.00 to 29.99)
- Obese (>30.00)

5.1 Proportion of Western Australians in each category of body mass index

Table 5.1 shows the proportion of adult respondents in each category of body mass index. The level of overweight and obesity in the population was approximately one in every two people. Analysis by demographic factors shows that there were particular subgroups where the proportion who were overweight or obese was much higher than one in two.

Table 5.1 highlights

- Approximately one-half of all adults were categorised as either overweight (35%) or obese (14%), with the same proportion (49%) in the healthy BMI range. These figures have remained unchanged from 2002.
- Although a significantly higher proportion of males (43%) than females (26%) were overweight, the proportion of obese adults for each gender was similar (14% males and 15% females). More females (4%) than males (1%) were underweight.
- The prevalence of overweight and obesity increased with increasing age up to the 45–59 year age group. It ranged from 31% in the 18–29 year age group to 57% in the 45–59 and 60 years and over age groups.
- People living in the Perth metropolitan area and South West region were less likely to be overweight (34% and 33%) or obese (13% and 12%) compared with those in other regions. High proportions of obese adults were observed in the Kimberley/Pilbara (21%), with 37% in the healthy BMI range.
- The majority (53%) of Western Australian adults either married or in de facto relationships were overweight or obese. Widows accounted for the greatest proportion of obese individuals (18%), while single adults had the highest proportion in the healthy BMI range (59%).
- The higher the level of education, the lower the level of overweight and obesity. For those with a university level education, the proportion who were overweight or obese was 43%. Those people with an education less than TEE had a combined overweight and obesity percentage of 57%.
- While almost three quarters (72%) of students had healthy BMI levels, 60% of unemployed people had BMI's indicating overweight and obesity. Blue-collar occupations had higher proportions of overweight and obesity (57%) than white-collar (49%) or people in the manager/ professional category (48%).

TABLE 5.1: BODY MASS INDEX BY DEMOGRAPHIC VARIABLES

Characteristic	BMI Category			
	Underweight	Healthy	Overweight	Obese
Gender				
Male	1.0	42.1	43.2	13.7
Female	4.1	55.5	25.9	14.6
Age group				
18 to 29 years	4.9	64.2	25.5	5.4
30 to 44 years	2.5	46.7	35.9	15.0
45 to 59 years	1.2	42.6	38.6	17.7
60 years or more	1.6	43.4	37.1	17.8
Location				
Perth metropolitan area	2.4	47.7	33.6	13.3
South West	2.1	50.8	32.6	12.1
Kimberley/Pilbara	2.0	37.4	35.4	20.6
Midwest/Goldfields	2.0	44.7	31.2	16.8
Marital status				
Married/de facto	1.5	45.3	37.8	15.3
Single	5.2	59.4	26.5	8.9
Separated/divorced	2.5	46.7	34.3	16.5
Widowed	3.3	48.8	30.2	17.7
Education				
Less than TEE	2.1	40.7	37.4	19.8
TEE/diploma	3.0	50.5	33.4	13.0
University	2.2	54.7	33.4	9.8
Occupation				
Manager/professional	1.8	50.5	35.1	12.6
White-collar/trade	3.3	47.8	32.3	16.5
Blue-collar	1.1	41.5	44.3	13.1
Unemployed	1.5	38.8	37.3	22.4
Home duty	5.3	54.1	23.4	17.3
Retired	1.8	44.6	37.1	16.5
Student	7.9	72.4	14.8	4.9
Overall	**2.5**	**48.8**	**34.6**	**14.1**

5.2 Level of physical activity and body mass index

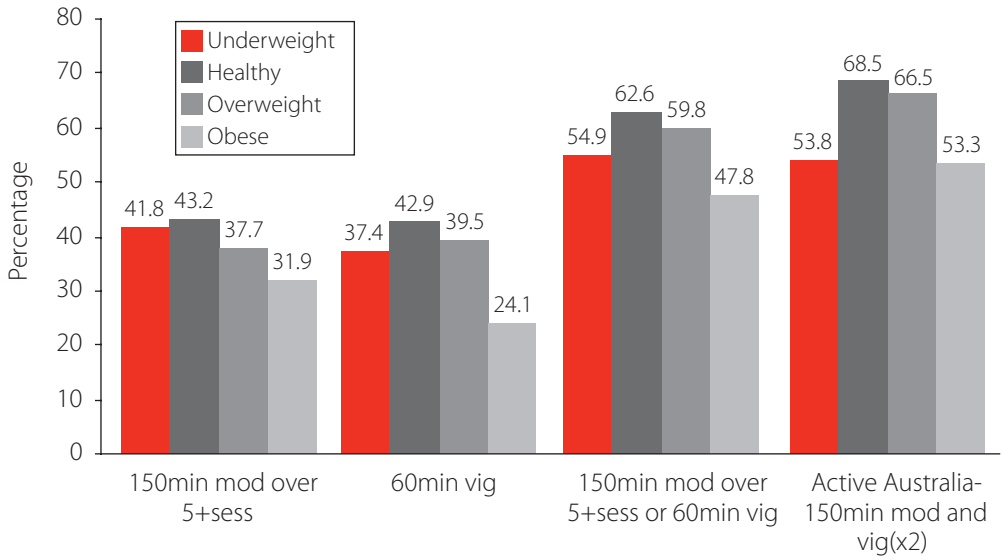
The National Physical Activity Guidelines for Australians[21] recommend 30 minutes of moderate-intensity activity on most, preferably all, days of the week. However, several definitions of sufficient physical activity exist, all of which have strengths and limitations. Hence, as presented in earlier chapters of this report, the following section presents BMI related to attainment of sufficient physical activity based on several definitions often used in other surveys and reports nationally.[2, 22, 29]

The proportion of adults undertaking sufficient physical activity in each BMI category is presented in Figure 5.1 and Table 5.2. Note that the definitions of sufficient physical activity include only walking, vigorous-intensity and other moderate-intensity physical activities. Gardening, household chores and occupation are not included.

Figure 5.1 highlights

- For each definition of sufficient physical activity, a similar BMI category trend was observed. There was an inverse relationship between sufficient physical activity and BMI (excluding the underweight category). Adults with healthy BMI levels were more likely than overweight or obese people to undertake sufficient physical activity for all definitions.
- The strongest trend was found in the measurement of vigorous physical activity. Sixty minutes or more of vigorous physical activity was reported by 43% of healthy BMI adults. This dropped to 39% of overweight adults and even further to 24% of obese adults.
- With all measures of physical activity, the differential between healthy and overweight adults was not as marked as the differential between overweight and obese adults. For example, according to the Active Australia definition, there was a 2% difference in proportions between healthy BMI and overweight adults, but a 13% difference in the proportion of overweight and obese adults.

Figure 5.1 Sufficient physical activity by BMI



5.3 Prevalence of inactive, insufficiently active and sufficiently active by BMI category

Table 5.2 presents the proportion of adults undertaking sufficient physical activity (at least 150 minutes of moderate-intensity activity over at least five sessions or 60 minutes of vigorous exercise), insufficient activity and those who were inactive by level of BMI.

Table 5.2 highlights

- The proportion of people who were inactive or participating in insufficient physical activity increased with BMI.

TABLE 5.2: PREVALENCE OF INACTIVITY, INSUFFICIENT ACTIVITY AND SUFFICIENT PHYSICAL ACTIVITY* BY BODY MASS INDEX

Body mass index category	Inactive	Insufficiently active	Sufficiently active
Underweight	15.4	29.7	54.9
Healthy	10.0	27.3	62.7
Overweight	11.7	28.6	59.8
Obese	19.2	33.0	47.8
Overall	12.3	29.0	58.8

**Participation in 150 minutes of moderate over five or more sessions or 60 minutes of vigorous physical activity per week.*

5.4 Television watching and computer use by level of physical activity and BMI category

Participation in sedentary activities such as television watching and recreational computer use has been linked with overweight and obesity as a risk factor independent of physical activity. Table 5.3 presents the mean hours of sedentary behaviours by level of physical activity (at least 150 minutes of moderate-intensity activity over at least five sessions or 60 minutes of vigorous exercise) and BMI.

Table 5.3 highlights

- Television watching and computer use were associated with overweight and obesity independent of physical activity levels, which were also independently associated with hours of television and computer use.
- The highest hours of television watching and computer use were found in inactive obese adults (21.8 hrs/wk). This effect was statistically significant.

TABLE 5.3: MEAN HOURS PER WEEK TELEVISION VIEWING AND RECREATIONAL COMPUTER USE BY PHYSICAL ACTIVITY AND BODY MASS INDEX

Body mass index category	Inactive	Insufficient activity	Sufficient activity	Total
Underweight	16.7	12.7	12.0	12.9
Healthy	14.7	15.2	13.1	13.8
Overweight	16.5	16.4	14.4	15.2
Obese	21.8	19.0	17.8	19.0
Overall	**17.0**	**16.2**	**14.0**	**15.0**

**Participation in 150 minutes of moderate over five or more sessions or 60 minutes of vigorous physical activity per week.*

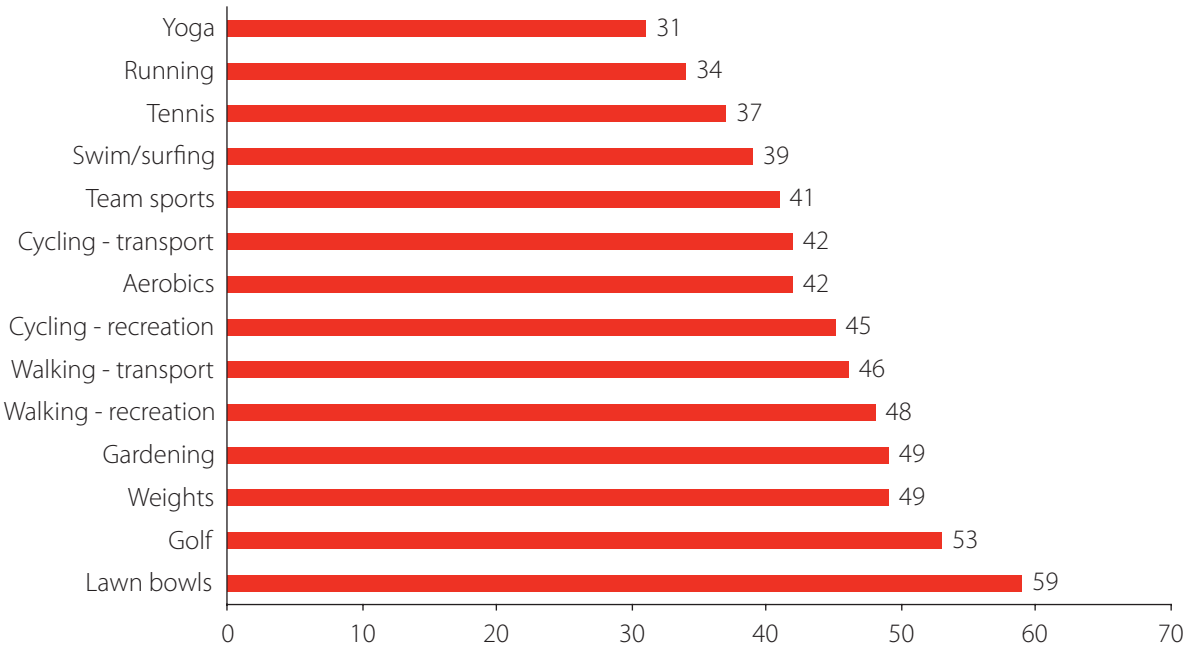
5.5 Prevalence of different types of physical activity by BMI categories

The proportion of people who were overweight or obese varies according to participation in different types of physical activity. The results of this section are descriptive and have not been adjusted for age and gender. Caution should be taken when interpreting these results.

Figure 5.2 highlights

- Percentages of overweight or obesity were highest for lawn bowls (59%) and golf (53%). This result likely reflects the higher proportion of middle aged and older adults participating in these activities and because approximately half of middle aged and older adults are overweight (i.e., >50%)
- Sports that are usually more vigorous, such as running, tennis, swim/surfing and aerobics, had lower proportions of adults who were overweight or obese.
- Adults who reported participating in yoga had the lowest proportion of people who were overweight or obese (31%).

Figure 5.2 Prevalence of overweight and obese people by participation in different physical activities



5.6 Confidence in participating in physical activity by level of BMI

Survey participants were asked how confident they were to participate in at least 30 minutes of moderate level physical activity on five or more days per week.

Table 5.4 highlights

- Being 'very confident' of achieving five or more days of moderate physical activity per week was highest among adults in the healthy BMI category (66%) and lowest in the obese (46%) category.
- Obese adults were most likely to be either 'somewhat confident' or 'not at all confident' (28%) of exercising on five or more days each week.

TABLE 5.4: CONFIDENCE OF PARTICIPATING IN FIVE OR MORE DAYS PER WEEK OF PHYSICAL ACTIVITY BY BODY MASS INDEX

	Confidence			
Body mass index category	Very confident	Moderately confident	Somewhat confident	Not at all confident
Underweight	48.4	31.9	7.7	12.1
Healthy	65.9	17.5	8.2	8.3
Overweight	61.1	20.4	7.6	10.5
Obese	46.5	25.5	12.1	15.4
Overall	61.0	20.0	8.5	10.2

5.7 Prevalence of incidental physical activity and BMI

Tables 5.5 and 5.6 report the proportion of people who participated in habitual incidental physical activity by their BMI category. Table 5.5 shows the frequency of habitual incidental physical activity performed on weekdays, Saturdays, Sundays, every day of a typical week and any day of a typical week by BMI category. Table 5.6 shows the frequency of four examples of incidental physical activity in a typical week by BMI category.

Table 5.5 highlights

- Participation in habitual incidental physical activity was highest on weekdays and declined from weekday to Saturday, then further from Saturday to Sunday regardless of BMI.
- In general, the proportion of people who engaged in incidental activity was lower in the overweight and obese than those within the healthy BMI range. This was consistent across weekdays, Saturdays and Sundays.
- Thirty-four percent of people participated in habitual incidental activity every day, which was 6% higher than overweight people and 8% higher than those classified as obese.
- Underweight people represented the highest proportion of incidental activity on weekdays, Saturdays and Sundays.

TABLE 5.5: FREQUENCY OF INCIDENTAL PHYSICAL ACTIVITY ON WEEKDAYS, SATURDAY, SUNDAY, EVERY DAY AND ANY DAY OF THE WEEK BY BODY MASS INDEX

Sessions	Underweight %	Healthy %	Overweight %	Obese %
Weekday	73.6	62.3	57.0	51.5
Saturday	57.1	52.8	49.4	42.4
Sunday	56.0	44.7	38.3	38.4
Every Day (in typical week)	44.0	34.1	27.8	25.7
Any Day (in typical week)	81.3	73.1	69.3	62.6

Table 5.6 highlights

- In general, participation in short walking or cycling trips to increase participation in physical activity was highest in healthy weight and underweight people, and lowest in overweight and obese people. The exception was the percentage of obese people prepared to park further away from their final destination.
- Using the stairs (62%) was the most popular of these activities, closely followed by walking the dog (59%), cycling or walking rather than driving (58%) and then parking the car further away (38%).

TABLE 5.6: SHORT (< 10MIN.) WALKING TRIPS TO INCREASE PHYSICAL ACTIVITY ON ANY DAY OF THE WEEK BY BODY MASS INDEX

Sessions	Underweight %	Healthy %	Overweight %	Obese %
Walk or cycle rather than drive	67.4	63.6	51.8	50.5
Climb the stairs instead of using the lift	65.8	66.1	61.2	50.3
Walk the dog	58.0	62.3	57.9	48.3
Park the car further away	41.2	38.2	36.1	43.7

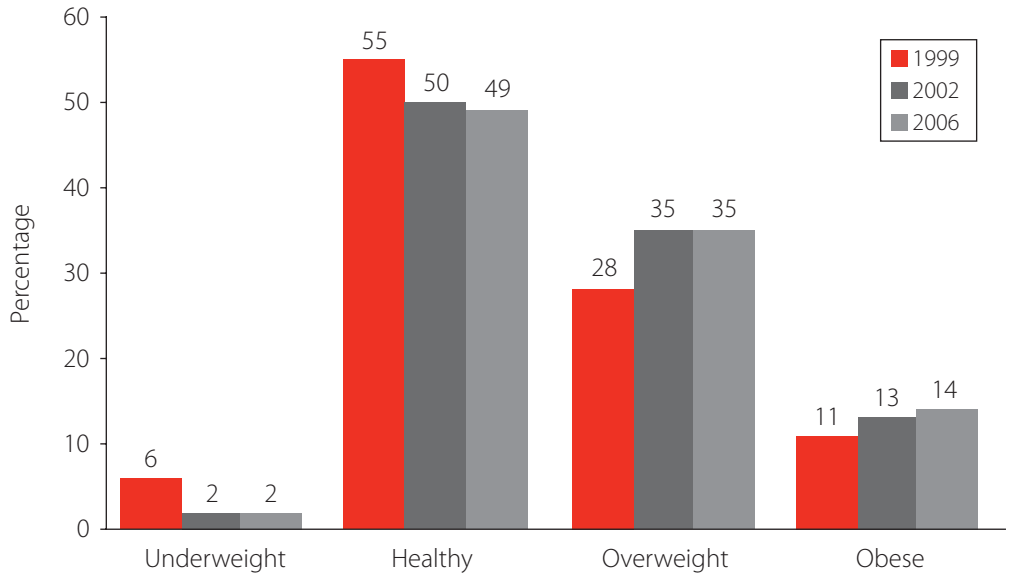
5.8 Overweight and obesity trends between 1999, 2002 and 2006.

Trend data should be treated with caution due to some methodological variations in sampling between the three surveys. However, it may give a general indication concerning whether overweight is increasing, decreasing or is stable in the adult community.

Figure 5.3 highlights

- The proportion of people in the healthy BMI range decreased by 5% from 1999 to 2002 but by only 1% from 2002 to 2005.
- Similarly, overweight increased by 6% from 1999 to 2002, but stabilised between 2002 and 2005.
- Obesity has shown a more consistent rise of 2% from 1999 to 2002 and 1% between 2002 and 2005.
- Statistically significant increases in overweight and obesity were found from 1999 to 2002 but not from 2002 to 2006.

Figure 5.3 Trends in body mass index between 1999, 2002 and 2006



6 DISCUSSION

This report presents findings on current levels of physical activity participation, and, factors related to physical activity and BMI of Western Australian adults in 2006. The results presented in this report replicate those of previous surveys undertaken by the Department of Health in 1999[1] and the Premier's Physical Activity Taskforce in 2002.[2] Unlike the 2002 survey, the 2006 survey did not include a pedometer study and several questions considered redundant were removed.

6.1 Physical activity levels of respondents

Survey results

In 2006, over one-half of all men (61%) and women (56%) participated in sufficient levels of physical activity to accrue health benefits. Eleven percent of men and 14% of women reported participating in no walking, moderate-intensity or vigorous-intensity physical activity for 10 minutes or more in the week leading up to the survey. The survey findings indicated several groups could be the target of future campaigns and programs designed to increase participation in sufficient levels of physical activity including people:

- aged 60 years and older;
- of low socioeconomic status (i.e. low education, low income, and the unemployed);
- who were overweight and obese; and
- residing in the Midwest/Goldfields region.

There are important health and economic benefits associated with increasing the proportion of the population who are active at levels sufficient to benefit their health. Furthermore, there are even more significant health benefits for the community as a whole if the proportion of people who are entirely sedentary can be reduced.[17]

6.2 Participation in different types of physical activity and use of facilities

This study confirmed previous surveys showing that walking for recreation and for transport are the most popular forms of physical activity for both men and women.[38] Gardening was the second most popular physical activity; however, limited published research to establish the health benefits associated with gardening exists[39] and some caution should be made regarding the interpretation of these findings. Given that gardening is popular, particularly among older adults, research on the physical and mental health benefits associated with gardening and yard work should be encouraged.

As walking is the most popular physical activity, it is not surprising that streets/ footpaths were the most frequently reported facilities used for undertaking physical activity (49%). Noteworthy was the increase in the use of cycle or walking paths since the 1999 survey (10 to 25%). This increase may correspond with the increase in transport-related walking since 1999 (26 to 32% in 2006), or improvements in walking and cycling paths during the same period. Importantly, four out of the five (streets/footpaths, home, cycle/walking paths, public parks, and the beach) most used facilities for physical activity can be accessed without incurring a direct fee for their use. This suggests that public infrastructure is important for providing opportunities to facilitate regular physical activity participation.

The Department for Planning and Infrastructure has developed guidelines to create more 'Liveable Neighbourhoods' that encourage walking and cycling.[40] The results of this survey support this type of initiative: walking is popular and most people undertake this activity in streets and parks. Given the importance of streets for walking and for other activities including cycling and running, efforts to increase the supportiveness of the streetscapes for these activities is to be encouraged. Promoting walking and cycling as forms of (environmentally friendly) sustainable transport, as well as a healthy activity, is consistent with the State Sustainability Strategy.[46]

6.3 Incidental physical activity

The National Physical Activity Guidelines promote the accumulation of physical activity through the day and encourage adults to be active in as many ways as possible. Hence, these recommendations reflect a change from promoting *structured* exercise to promoting *unstructured* physical activity that can be incorporated into one's lifestyle. For some individuals, participating in incidental physical activity may be a way in which sufficient daily physical activity can be accumulated. The majority of adults reported daily stair climbing instead of using an elevator/escalator (62%), daily walking or cycling instead of driving short distances (62%) and taking the dog for a daily walk (64%). The least popular type of incidental physical activity was parking farther away from a destination in order to walk further (38%). Moreover, respondents who were classified as 'sufficiently active' were more likely than those less active to climb the stairs instead of using the elevator or escalator (68%), walk or cycle to a destination located 5 minutes away instead of drive (64%) and walk the dog (66%).

While not all dog owners walk their dogs, owners who do walk their dogs spend more time in walking and moderate-intensity activities compared with non-dog owners.[41-43] Of concern is the reduction in adults reporting that they walk their dogs (2002:63% vs. 2006:58%). Nearly one-third (30%) of respondents performed incidental physical activity every day, which was a significant increase from the 2002 survey levels (21%). Similarly 30% of respondents reported performing no incidental physical activity (30%) in 2006. Previous surveys have revealed that when asked, Western Australian adults most commonly cite a 'lack of time' as a barrier to being more active.[1, 2]
Given that the time demands of work and family life are reducing leisure time, making adults more aware that accumulating physical activity in shorter bouts throughout the day should be considered a strategy for encouraging achievement of sufficient physical activity. Moreover, creating supportive environments has the potential to influence large segments of the population, and can act passively on a person's behaviour, as the individual is unaware that the built environment is causing them to be more active (e.g. providing stairwells that are more accessible and lifts or escalators that are less accessible).

6.4 Factors influencing physical activity in Western Australia

Physical activity level is influenced by every component of human life, from genetics to individual characteristics such as gender, age and education to environmental aspects such as socioeconomic status, ethnic background and geographic location. This survey attempted to measure those characteristics known to be important influences, triggers and mediators of physical activity in the Western Australian population.

Determining the 'stage of change' profile[31] of the community with respect to physical activity can be useful in guiding campaigns aiming to increase participation. It can also be used to monitor changes in the preparedness of the community to respond to physical activity messages. For example, more

than half of inactive people identified themselves as contemplating increasing their physical activity and this group would be particularly amenable to a certain style of physical activity promotion.

However, one in four inactive people and one in three insufficiently active people considered themselves in the maintenance phase of physical activity. This may be related to the finding that 40% of the sample were unable to identify the number of minutes of physical activity recommended for good health. It suggests that more public education is needed to alert people to the appropriate level of physical activity needed for health benefits, including the benefits of participating in vigorous physical activity in accordance with the Active Australia guidelines.

The 'Find thirty' campaign message would appear to be a relevant message to convey for this purpose, but as 79% of respondents were aware of this message, there is obviously a gap between awareness of healthy behaviour messages and knowledge of the actual behaviour required to attain good health. This survey indicated that the 'Find thirty' in particular, 'be active wa' and 'TravelSmart' messages have been very successful in terms of message awareness. Although there appears to be an increase in physical activity behaviours in the community in this survey and others taken over the last 12 months around Australia, the challenge is still there to turn the high message recognition into substantial lifestyle behaviour change.

It has been noted that confidence in completing a task is essential to the achievement of that task[44] and this was reflected in the finding that one in three inactive people felt 'not at all confident' in participating in the recommended five or more days of physical activity, irrespective of the type or intensity of that activity. Promoters of healthy ageing should note that lack of confidence was highest in the 60 years and over age group.

General practitioners are an important source of health information for many people.[45] While information on the primary reason for their last visit to their general practitioner was not collected, 15% of respondents reported receiving information about physical activity. This was a slight increase (2%) from the 2002 report. Obese adults (36%) appeared to have been the group most likely to receive physical activity advice from their general practitioner, irrespective of their primary reason for visiting their general practitioner, with 18% of overweight adults reporting that they had received physical activity advice during their last visit. Opportunities for general practitioner consultations to promote physical activity appear to occur, and an understanding of the situations when general practitioners are able to engage patients in these type of discussions might lead to better targeting of at risk individuals.

6.5 Physical activity and body weight

'There is probably no better – certainly there is no simpler – sign of the condition of an ordinary individual's health up to middle life than his weight'.[46]

Overweight and obesity, as measured by self reported height and weight and converted into body mass index, was similar to the 2004-05 Australian Bureau of Statistics findings of 18% of adults obese and 35% overweight. Results from the 1999 and 2002 surveys show significant increases in the proportion of overweight and obese adults in Western Australia, a result that is consistent with national[38, 47] and international[9] trends. Results from the 2006 survey however, have shown that this rate of increase in Western Australia has slowed markedly.

Overweight and obesity was highest among males, those aged 45 years and over, those living in the Kimberley and Pilbara, and those having lower education levels and lower incomes (the unemployed, blue collar workers and the retired). Self-perception may be a problem for some of these groups with the latest ABS survey showing that only 32% of males considered themselves to be overweight compared to 62% classified as overweight or obese based on BMI calculations.[38]

Obese adults were much more likely to be inactive or insufficiently active compared to overweight adults who in turn were more likely to be inactive or insufficiently active than healthy weight adults. This is consistent with numerous other studies, including the 2004–05 National Health Survey,[38] and while it is logical to infer that when observing an association between a health behaviour and a health condition, it is the behaviour that is likely to be causative of the condition, there is inconsistent evidence to support this causative link.[48] This may be at least partly due to the difficulty in accurately measuring physical activity levels across the population. However, there is also evidence in this survey that being overweight or obese can negatively impact on confidence in achieving even moderate amounts of physical activity. Obese adults were less confident about participating in five or more days of physical activity per week, compared with healthy weight people. In the 2002 survey, they were also more likely to report poor health as a major barrier to physical activity.[2] This may cause those people to less regularly attempt to incorporate sufficient physical activity into their lifestyle.

This survey also showed a clear and consistent inverse relationship between habitual incidental physical activity and overweight and obesity. Although this is an area that can be hard to measure accurately, it would appear to be an important piece in the jigsaw puzzle and give insights into more effective strategies to promote physical activity and reduce negative outcomes such as obesity.

Overweight and obesity were clearly associated with higher rates of television watching, with inactivity having an additive effect on the relationship. This survey can only highlight the association between these three variables and is not able to tease out the causative links. However, evidence is accumulating that sedentary activities such as television watching increase the risk of obesity, independent of physical activity levels.[1, 49, 50] An investigation of 'sitting time', of which television watching was a major component, found a strong positive association with obesity independent of physical activity.[51] People of low socioeconomic status and people who studied or worked long

hours were particularly at risk. These studies and the results of this survey indicate that sedentary time needs to be included as a separate measure in future surveys and examined more closely for its impact on the health of the community.

Some research has hypothesised that there exists a 'sedentary syndrome' that includes unhealthy eating habits and leads to negative health consequences that include overweight and obesity. Strategies to reduce obesity may have to think more holistically at converting an 'obesogenic' environment[34, 36] that discourages physical activity and encourages over-consumption of food into one that encourages a healthy lifestyle.[52]

6.6 Recommendations from the report for promoting physical activity in Western Australia

Promoting physical activity levels of Western Australian adults requires a multi-faceted approach. The following recommendations are suggested:

1. Continue to promote participation in 30 minutes of moderate physical activity on most days of the week.
2. Continue public communication to increase awareness and understanding of the national physical activity guidelines for adults.
3. Continue public communication of how individuals can meet the national physical activity guidelines for adults.
4. Develop strategies to increase self-belief and confidence of individuals in meeting the national physical activity guidelines.
5. Expand supportive environments that allow incidental and transport-related physical activity to be easily incorporated into daily life.
6. Continue to strengthen existing partnerships across all agencies involved in the promotion and support of physical activity initiatives.
7. Repeat the Physical Activity Levels of Western Australian Adults Survey (including objective measurement of physical activity using pedometers) every three years.

In addition, the following more specific recommendations will assist in the overall increase of physical activity given that the goal is to promote significant behaviour change across a whole population.

1. Continue to promote participation in vigorous physical activity for health benefits (total of 60 minutes per week).
2. Target population subgroups with particularly high levels of physical inactivity and low levels of sufficient physical activity (i.e. older adults, under resourced groups, and those overweight and obese) using specific physical activity strategies.
3. Promote opportunities for active transport within community and workplace settings.
4. Explore and develop new partnership opportunities which can impact on physical activity.
5. Continue to promote, support and develop policy that facilitates and encourages physical activity.

GLOSSARY

Body mass index (BMI) is a measure of a person's weight in relation to their height, calculated as weight in kilograms divided by height in metres squared. A BMI of 20-25kg/m^2 is considered ideal.

Duration is the length of time (hours/minutes) spent participating in physical activity.

Exercise is a subset of physical activity and is defined as planned, structured and repetitive bodily movement done to improve or maintain one or more components of fitness.

Fitness is a set of attributes that people have or achieve that relates to their ability to perform physical activity. It is most often used to refer to the cardio-respiratory capacity of an individual to perform physical activity.

Frequency is the number of times a person participates in physical activity within a given period.

Health The World Health Organization defines health as 'a state of complete physical, mental and social well being and not merely the absence of disease.'

Inactive is used to describe individuals who reported no participation in any walking, moderate-intensity, or vigorous-intensity physical activity in the past week.

Habitual incidental physical activity in this report is defined as physical activity, which is performed for less than 10 minutes and is undertaken as part of carrying out normal daily chores. Examples include walking/cycling to the shop for a newspaper, or walking to a bus stop.

Habitual incidental activity behaviour in this report is defined as specific physical activities that are carried out either as deliberate or non-deliberate acts and often can be performed as part of undertaking normal daily chores. Examples include climbing stairs instead of using an elevator/escalator; parking the car further away from the shop in order to walk further; or taking the dog for a walk.

Intensity is the perceived or self-reported intensity at which an activity is performed, e.g. vigorous-intensity, moderate-intensity, or light.

Moderate-intensity physical activity is physical activity requiring 3-4 METS (i.e. 3-4 times as much energy as at rest). In questionnaires, this is often described as activity that causes some increase in breathing and heart rate.

National Physical Activity Guidelines released in May 2000 recommend 30 minutes of moderate-intensity physical activity on most, preferably all, days of the week.

Participation is taking part in a sport or activity.

Pedometers are small motion sensor devices, which count the number of steps performed during upright ambulatory behaviours such as walking or running.

Physical activity is any bodily movement produced by skeletal muscle that results in energy expenditure.

Risk factor is a characteristic or an exposure that increases the rate of disease relative to those unexposed or without the characteristic.

Sport is a human activity capable of achieving a result requiring exertion and/or physical skill that, by its nature and organisation, is competitive and is generally accepted as being a sport and/or physical involvement within an accepted set of rules.

Sufficient level of physical activity is presented in two ways in this report:

1) undertaking 150 minutes of moderate-intensity physical activity on five or more days per week or undertaking 60 minutes of vigorous-intensity physical activity per week; and
2) undertaking 150 minutes of total physical activity where moderate-intensity and vigorous-intensity activity (weighted by two) are summated.

Vigorous activity is physical activity requiring 7+ METS (i.e. over 7 times as much energy as at rest). In questionnaires this is often described as activity that causes some 'huffing and puffing.'

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APPENDIX 1: SURVEY APPROACH LETTER

Dear Householder

I am writing to ask you to take part in an important initiative of the Premier's Physical Activity Taskforce. The University of Western Australia's Survey Research Centre will be conducting a survey on our behalf.

We have randomly selected households to be part of the survey by using the most recent electronic version of the telephone book. Your household has been selected to take part.

In the next few weeks, an interviewer from the UWA Survey Research Centre may telephone your house. The interviewer will ask to speak with a person in the household who is 18 years of age or older.

The interviewer will ask the chosen person to take part in an interview over the telephone that will last ten to fifteen minutes. All information collected will be strictly confidential.

We want to be more responsive to local needs and it is your response that will help us form a picture about the current needs of the community.

If you have any queries about the survey, please call Vicki Graham or the supervisor on duty on (08) 9347 4054, or on 1800 799100 if you are calling from outside Perth. Staff at the Survey Research Centre will be happy to answer your questions.

I would like to thank you in advance for your support and participation in this important initiative.

Yours sincerely

Ron Alexander
Director General
Department of Sport and Recreation

APPENDIX 2: QUESTIONNAIRE

WESTERN AUSTRALIAN PHYSICAL ACTIVITY SURVEY

November 2006

INTRODUCTION

Good afternoon/evening, I am calling on behalf of the University of Western Australia Survey Research Centre and my name is (name). We are conducting a statewide survey, which is a follow-up to similar surveys completed in 1999 and 2002. We are tracking changes in the physical activity levels of Western Australian adults. Your telephone number has been selected randomly from the White Pages.

Could I speak to the person AGED 18 years or older and who had the last birthday?

Would that be yourself?

(IF NOT – when required person is on the phone repeat introduction)

Q1. We recently sent you a letter telling you about the survey .Did you receive the letter we sent you ?

[1 yes 2 no 8 Don't know]

We would like to ask you about the physical activity you did last week.

Q2. In the past week how many times have you walked continuously, for at least 10 minutes, for recreation/exercise, or to get to and from places?

*[**98= don't know** – use as an absolute last resort]*
[Skip Q3 to Q4 if no walking]

Times:	

Q3. What do you estimate was the total time that you spent walking in this way in the past week?

[Interviewer: this is continuous walking (walking for 10 minutes or more)]

Hours:	
Minutes:	

Q4. In the past week how many times did you do any vigorous gardening or heavy work around the yard, which made you breathe harder or puff and pant?

*[**98= don't know** – use as an absolute last resort]*
[Skip Q5 to Q6 if no vigorous gardening or heavy work around the yard]

Times:	

Q5. What do you estimate was the total time you spent doing vigorous gardening or heavy work around the yard in the past week?

Hours of vigorous gardening:	
Minutes of vigorous gardening:	

The next question excludes household chores, gardening or yard work.

Q6. In the past week, how many times did you do any vigorous physical activity, which made you breathe harder or puff and pant? (e.g. jogging, cycling, aerobics, competitive tennis)

*[**98= don't know** – use as an absolute last resort]*
[Skip Q7 to Q8 if no vigorous physical activity]

Times:	

Q7. What do you estimate was the total time that you spent doing this vigorous physical activity in the past week?

Hours of vigorous physical activity:	
Minutes of vigorous physical activity:	

This question excludes household chores or gardening.

Q8. In the past week how many times did you do any other more moderate-intensity physical activities that you have not already mentioned? (e.g. gentle swimming, social tennis, golf, etc.)

*[**98= don't know** – use as an absolute last resort]*
[Skip Q9 to Q10 if no moderate-intensity physical activity]

Times:	

Q9. What do you estimate was the total time that you spent doing these activities in the past week?

Hours of moderate-intensity physical activity:	
Minutes of moderate-intensity physical activity:	

Q10. If you have been physically active in the past week, can you list those activities that you have done continuously for ten minutes or more? (do not read out)

1. Aerobics/step/dancing/circuit class	
2. Cycling for recreation or exercise	
3. Cycling for transport	
4. Gardening	
5. Golf	
6. Jogging/running	
7. Walked for recreation or exercise	
8. Lawn bowls	
9. Sailing	
10. Swimming/surfing	
11. Squash	
12. Table tennis	
13. Team sports	
14. Tennis	
15. Walked for transport, i.e. to get to and from places	
16. Weights	
17. Other 1 [specify]	
18. Other 2 [specify]	
19. Other 3 [specify]	
97. Haven't been active in the past week	
98. Don't know	

Skip to Q12 if 97/98 at Q10

Q11. What facilities or areas did you use for these activities? (do not read out)

1. Beach	
2. Cycle or walking paths, not a beach, river or park	
3. Golf course	
4. Gymnasium, health club or recreation centre	
5. Home	
6. Natural bushland	
7. Public park or oval	
8. Public swimming pool	
9. River	
10. Sailing or boat club	
11. Squash courts	
12. Streets/footpath	
13. Team sport facilities, e.g. basketball, netball, indoor cricket	
14. Tennis courts	
15. Signed trail and/or track e.g. Bibbulmun track	
16. Other [specify]	
98. Don't know	

The following questions (12 to 14) are about short walking or cycling trips that you do daily. By short, I mean 10 minutes or less of continuous duration:

Q12. Excluding what you do as part of your work, on a typical weekday how many times per day do you usually walk or cycle for less than 10 minutes on trips for errands (for example to the shops, to buy your lunch) to public transport, to school, to and from work or for recreation? *Prompt: Think about trips you do every day in the morning, in the middle of the day and in the afternoon and evening.*

Times:	

Q13. Excluding what you do as part of your work, on a typical Saturday how many times do you usually walk or cycle for less than 10 minutes on trips for errands (for example to the shops to buy a paper), to public transport, to and from work, or for recreation?

Times:	

Q14. Excluding what you do as part of your work, on a typical Sunday how many times do you usually walk or cycle for less than 10 minutes on trips for errands (for example to the shops to buy a paper), to public transport, to and from work or for recreation?

Times:	

Now I want to ask about things you might do daily to be more active generally. Do you usually participate in the following activities?:

Q15a. Climb the stairs instead of using the lift or escalator?

1. Yes	
2. No	
3. Not applicable	

Q15b. Park your vehicle away from your destination so you have to walk further?

1. Yes	
2. No	
3. Not applicable	

Q15c. Walk or bicycle to destinations that are within a 5-minute drive from where you live, rather than drive?

1. Yes	
2. No	
3. Not applicable	

Q15d. Take your dog for a walk?

1. Yes	
2. No	
3. Not applicable	

The following question is about bicycling you did to travel to and from work, to do errands, or to go from place to place. Only think about cycling that you did for at least 10 minutes.

Q16a. During the past 7 days, on how many days did you bicycle to go from place to place?

8. Refused
9. Don't know

Days in past week:	

[Interviewer clarification: Think about only the bicycling that you did for at least 10 minutes at a time.]

[Interviewer: If respondent answers zero, refuses or does not know, skip to Question 16]

Q16b. How much time in total did you usually spend on one of those days to bicycle from place to place?

Hours:	
Minutes:	

Don't know = 998 in BOTH

[Interviewer clarification: Think about only the bicycling that you did for at least 10 minutes at a time.]

Skip to Q17a if Q16b was not answered "Don't know"

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask

Q16c. What is the total amount of time you spent bicycling over the past seven days to travel from place to place?

Hours:	
Minutes:	

Don't know = 998 in BOTH

Now think only about the walking you did to travel to and from work, to do errands or to go from place to place. Only include walking that you did for at least 10 minutes at a time.

Q17a. During the past seven days, on how many days did you walk to go from place to place? (Do not read out)

[Interviewer clarification: Think about only the walking that you did for at least 10 minutes at a time.]

8. Refused
9. Don't know

Times per week:	

[Interviewer: If respondent answers zero, refuses or does not know, skip to Question 17]

Q17b. How much time in total did you usually spend on one of those days walking from place to place?

Hours:	
Minutes:	

Don't know = 998 in BOTH

[Interviewer clarification: Think about only the walking that you did for at least 10 minutes at a time.]

Skip to Q18 if Q17b was not answered "Don't know"

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask

Q17c. What is the total amount of time you spent walking over the past seven days to travel from place to place?

Hours:	
Minutes:	

Don't know = 998 in BOTH

Q18. How many minutes of physical activity or exercise do you think you need to do each day for good health?

Minutes:	

Q19a. When you think of physical activity, do any messages come to mind?

1. Yes	
2 . No	

Q19b. IF YES, What messages come to mind? Anything else? Anything else?

Q20. I am going to read you a short list of messages. Just tell me which of these, if any, you recall hearing recently. [Rotate order of messages]

1. Find thirty, it's not a big exercise	
2. be active	
3. be active wa	
4. TravelSmart	
5. Walk There Today	
6. Cycle Instead	

Q21. How confident are you that you can participate in at least 30 minutes of moderate-intensity level physical activity, such as walking on five or more days per week? [Read out Responses]

1. Not at all confident	
2. Somewhat confident	
3. Moderately confident	
4. Very confident	
5. Don't know – [do not read out (last resort)]	
6. Refused – [do not read out]	

The following statement is about the amount of exercise you intend to do in the near future.

Q22. Which of these categories best describes you?:

1. I am not physically active and I do not intend to become physically active in the next 6 months?	
2. I am not physically active but I am thinking about starting to become physically active in the next 6 months [Pause]	
3. I currently do some physical activity but not regularly.	
4. I am physically active regularly but I have only become so within the past 6 months.	
5. I am physically active regularly and have been so for longer than 6 months	

Q24. On average how many hours per week do you spend watching television or using a computer (outside of your workplace)?

Number of hours:	

Q25. Last time you saw your doctor or GP, did he or she give you any advice about doing more physical activity or exercise?

1. Yes	
2 . No	

Finally a few questions to help classify your answers.

Q26. Autocode respondent's sex

Male	
Female	

Q27. Could I ask your age please?

0-99 *[99 = refusal]*

Q28. What is your marital status?

1. Married	
2. De facto	
3. Never married	
4. Separated	
5. Divorced	
6. Widowed	
7. Refused	

Q29. What is your approximate weight in pounds, stones or kilograms?

1. Weight in stone	
2. Weight in pounds	
3. Weight in kilograms	

Q30. What is your approximate height in feet and inches or centimetres?

1. Height in feet	
2. Height in inches	
3. Height in centimetres	

Q31. Are you of Aboriginal or Torres Strait Islander origin?

Interviewer note – if "BOTH" ask "Which do you most strongly identify with?"

1. Aboriginal	
2. Torres Strait Islander	
3. No	

Q32. How many people under 18 reside at your home?

Q33. How many children aged five and under reside at your home?

Q34. What is the highest level of education you have completed?

1. Never attended school, some primary school	
2. Completed primary school	
3. Some high school	
4. School certificate/intermediate/ year 10/4th form	
5. TEE/TAE.HC/Leaving/Year 12/6th Form	
6. TAFE certificate/diploma	
7. University, CAE or other tertiary institution degree	
8. Other [specify]	
9. Refused	

Q35. What is your current occupation?

1. Manager/administrator	
2. Professional/para-professional	
3. Tradesperson	
4. Clerk	
5. Salesperson and personal service worker	
6. Plant and machine operator driver	
7. Labourer	
8. Unemployed	
9. Home duties	
10. Retired	
11. Student	
12. Other [specify]	
99. Refused	

Q36. What is your suburb/town and your postcode?

Suburb/Town	
Postcode	

Q37. What is your weekly net household income?

$0-$199	
$200 - $299	
$300 - $399	
$400 - $499	
$500 - $599	
$600 - $699	
$700 - $799	
$800 - $999	
$1000 - $1199	
$1200 - $1499	
$1500 - $1999	
$2000 or more	
Don't know	
Refused	

Q38. What are the names of the streets or roads that form the closest intersection to your home?

Q39. Did receiving the introductory letter make the difference in your decision to participate in this survey?

1. Yes	
2. Would have participated anyway	

be active wa
Premier's Physical Activity Taskforce

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