PHYSICAL ACTIVITY LEVELS OF WESTERN AUSTRALIAN ADULTS 2002

RESULTS FROM THE ADULT PHYSICAL ACTIVITY SURVEY AND PEDOMETER STUDY

REPORT

premier's physical activity taskforce

PHYSICAL ACTIVITY LEVELS OF WESTERN AUSTRALIAN ADULTS 2002

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An initiative of the Premier's Physical Activity Taskforce, Western Australia

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FOREWORD

The importance of physical activity in the lives of Western Australians cannot be overstated particularly in light of the increasing evidence of the relationship between physical inactivity and poor health. Inactivity is a known risk factor for heart disease, high blood pressure, cholesterol, obesity and diabetes. Conversely, being physically active can protect against heart disease and some cancers, as well as reduce the risk of falls and injuries, particularly in the elderly.

Physical inactivity has a substantial impact on health care expenditure. Studies have estimated that for every one per cent increase in the proportion of people in Australia who are sufficiently active, the national health cost of three diseases – heart disease, diabetes and colon cancer – could be reduced by about $3.6 million per year.

In order to develop innovative strategies to support physically active lifestyles among all Western Australians, it is necessary to assess current levels of physical inactivity and understand the attitudes, beliefs and behaviours concerning physical activity.

This survey of 3,200 adults is a follow-up to the benchmarking 1999 survey of adults in Western Australia and provides valuable information that will assist government and other agencies in developing effective strategies to promote physical activity.

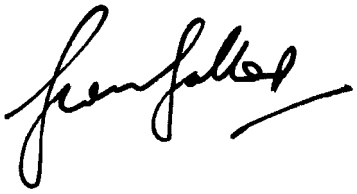
The information from this survey is relevant to the entire State, as the survey included participants from the Kimberley, Pilbara, Midwest, Goldfields and South West regions, as well as the Perth metropolitan area.

The results show that only 55 per cent of Western Australians are sufficiently active for good health which means that about one-half of adults in our State need to do more.

These results also indicate that Western Australians enjoy walking particularly in their local communities as well as in parks and at the beach. Many adults walk and cycle as a form of transport thus being both active and helping to keep our air clean and our roads less congested. Supporting active lifestyles involves encouraging a range of ways to be active and engaging agencies from all levels of government.

This survey is a collaborative effort of the Physical Activity Taskforce, established by me to oversee the development and implementation of a whole of community physical activity plan for Western Australia.

The challenge for the Taskforce and us all is to encourage more Western Australians to undertake sufficient physical activity to improve the health and well being of our community.



DR GEOFF GALLOP MLA
PREMIER

KEY FINDINGS

- A total of 55% of Western Australians reported participating in sufficient physical activity of 150 minutes of moderate-intensity physical activity on five or more days per week or 60 minutes of vigorous-intensity physical activity per week. This figure was 58% in 1999. Fifty-seven percent of men were more likely to be sufficiently active compared to 52% of women and 13% of Western Australians did not participate in any physical activity.

- Walking for recreation was the most popular activity undertaken in the past week for men (55%) and women (70%), followed by gardening (men 41%, women 37%) and walking for transport (men 27%, women 28%).

- Local streets/paths were identified as the most frequently used facilities for physical activity (57%), followed by the home (50%). Approximately 17% of Western Australians reported using public paths and ovals, 14% using cycle/walking paths and 14% using gymnasiums.

- Ten percent of Western Australians who participated in insufficient levels of physical activity reported having no intention of exercising in the next six months. However 23% indicated they were considering exercising in the next six months.

- The main barriers to being (more) active for Western Australians were lack of time (49%), already being active (15%), lack of motivation (11%), poor health (10%) and childcare commitments (6%)

- Thirty-five percent of Western Australians were overweight and 13% obese. More males than females were overweight with a greater proportion of adults aged 45 to 59 years being overweight.

- Western Australians are 25% more likely to be overweight and 20% more likely to be obese since the 1999 State physical activity survey.

PHYSICAL ACTIVITY LEVELS OF WESTERN AUSTRALIANS 2002 EXECUTIVE SUMMARY

Introduction

Physical inactivity has only recently been recognized as one of the most important risk factors for ill health in Australia, accounting for seven percent of the total burden of injury and disease. This survey was undertaken by the Premier's Physical Activity Taskforce (PATF) to provide a measure of physical activity levels among Western Australian adults to follow up the 1999 State physical activity survey (Bull, Milligan, Rosenberg, and MacGowan, 2000). The survey also provides data for planning and developing initiatives aimed at improving levels of physical activity and health in our State. In addition the survey provides information about attitudes, knowledge and behaviour from which trends between 1999 and 2002 can be monitored.

Survey method and sample

A telephone survey of Western Australian adults was conducted during November 2002. The overall response rate was 65% (n=3,200). The sample was generally representative of the Western Australian population and included males (47%) and females (53%) from all age groups 18 years and over, education levels, marital status and major employment groups across four geographic regions (metropolitan Perth, Kimberley/Pilbara, Midwest/Goldfields and South West). A unique feature of the 2002 survey was the inclusion of an objective measure of physical activity. This survey included a pedometer study undertaken on a random sub-sample of survey respondents (n=603). Approximately 71% of the pedometer sample returned data which were suitable for analysis. Demographic data for participants of the pedometer study were generally representative of both the survey respondents and of the State's population.

Level of physical activity

Just over one-half of adults (55%) reported participating in sufficient physical activity of 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. Men (57%) were more likely to be active and meet either recommendation compared with women (52%). Overall 13% of Western Australian adults did not participate in any physical activity. Higher levels of physical activity by adults were related to higher levels of education and employment in managerial positions.

Participation in different types of physical activity

Overall, walking for recreation was the most popular activity undertaken in the past week for men (55%) and women (70%), followed by gardening (men 41%, women 37%), walking for transport (men 27%, women 28%) and swimming or surfing (men 17%, women 14%). Similar proportions of adults reported running/jogging (7%) and cycling for recreation (8%) in the past week.

Facilities used for being physically active

The local streets/paths were identified as the most frequently used facilities for physical activity (57%), followed by the home (50%). Approximately 17% of adults reported using public parks and ovals for physical activity with fewer adults reporting the use of cycle/walking paths (14%) and gymnasiums (14%) for physical activity.

Motivators and intention to be more physically active

A small percentage of insufficiently active Western Australians (10%) reported no intention of exercising in the next six months. However, more adults (23%) indicated that they were considering starting exercise in the next six months. The majority of adults were exercising irregularly (31%) or had been exercising regularly for the past six months (28%). Men were less ready to be more active. Increased fitness, enjoyment and weight control were the three main reasons cited for being active. Similar proportions of men (34%) and women (33%) stated fitness as their main reason for exercising, while a greater a proportion of women (11%) compared to men (7%) indicated weight maintenance as a major reason.

Barriers to being more active

The main barriers to being (more) active for Western Australians were lack of time (49%), already being active (15%), lack of motivation (11%), poor health (10%) and childcare (6%). More women than men reported lack of time (54%), no motivation (12%) and child care (10%) as barriers to being more active.

Overweight and obesity

Of those surveyed, 35% were overweight and 13% were obese. More males (43%) than females (26%) were overweight, with a greater proportion of adults aged 45 to 59 years being overweight (41%) and obese (18%). Inactive adults were more likely to be obese (10%) compared to sufficiently active adults (23%).

Participation in incidental physical activity

This study included measures of habitual incidental physical activity. Examples include: “Do you usually climb the stairs instead of using the lift or escalator?” and “How many times a week do you walk/cycle for less than 10 minutes on trips for errands?” Habitual incidental physical activity was undertaken by 53% of adults on weekdays, 39% on Saturdays, and 30% on Sundays. Approximately 21% of Western Australians participated in habitual incidental physical activity every day. Sufficiently active adults performed more sessions of habitual incidental physical activity than inactive or insufficiently active adults. Frequency of habitual incidental activity sessions undertaken every day decreased with age (31% at 29 years to 13% at 60 years and over). Over 60% of adults reported walking the dog (63%), climbing the stairs instead of using the lift or escalator (60%), and walking or cycling instead of a 5-minute drive (60%). Compared with those inactive or insufficiently active, a higher percentage of sufficiently active adults reported walking the dog (71%), walking/cycling instead of a 5-minute drive (68%), and climbing stairs instead of using the elevator/escalator (65%).

Trends in physical activity and obesity in Western Australia 1999 to 2000

Since the 1999 physical activity survey, the proportion of adult participation in vigorous physical activity has decreased by 7%; the proportion of adults participating in 60 minutes or more per week of vigorous activity decreased by 5%. Significantly fewer (4%) Western Australian adults participated in sufficient physical activity to benefit their health when using the definition adopted by Active Australia (i.e. at least 150 minutes of total physical activity or the sum of minutes of walking/moderate activity plus minutes of vigorous activity weighted by 2). The proportion of inactive adults has increased by 2% between 1999 and 2002 (from 12% to 14%). Western Australians were 25% more likely to be overweight and 20% more likely to be obese since the 1999 State physical activity survey.

Daily steps performed by Western Australians

The pedometer study indicates that Western Australians perform on average 9,695 steps per day. Males performed more daily steps than females and adults 60 years and over performed fewer daily steps than younger adults. Forty-seven percent of the population performed 10,000 steps or more per day, while only 10% of adults, performed on average 15,000 steps or more per day. Overweight and obese adults were less likely to perform 10,000 steps or more per day compared to adults with an acceptable body mass index (BMI).

Future efforts in promoting physical activity in Western Australia

Given that there has been a decline in sufficient levels of physical activity, increased efforts are needed to raise physical activity levels among Western Australian adults. Benefits would include improved physical, mental and social health. Combined efforts across all government sectors are required. There is evidence that the most effective program will be comprehensive and include innovative programs, mass media campaigns, creating supportive environments that include access to safe, convenient facilities and promotion of existing facilities.

Recommendations for promoting physical activity in Western Australia

The following recommendations are suggested:

1. Use population-wide whole of government strategies to increase levels of physical activity.
2. Base strategies on best-practice guidelines.
3. New strategies should be evaluated comprehensively for effectiveness.
4. Promote physical activity in order to maintain healthy weight across all age groups.
5. Raise the profile of physical activity as a leading modifiable risk factor for morbidity and mortality.
6. Encourage general practitioners to prescribe physical activity as a means of (a) promoting good health generally; (b) preventing overweight and obesity; (c) keeping elderly patients active; (d) and for those with chronic health conditions.
7. Emphasise increasing physical activity levels in a number of target groups including: women, older adults, the less educated, the unemployed, the obese, and adults living in the Midwest/Goldfields.
8. Encourage participation in more incidental activity and inform the population about how physical activity can be accumulated throughout the day.
9. Create a more supportive physical activity environment.
10. Create supportive streetscapes including the creation and maintenance of footpaths and the creation of attractive public open spaces.
11. Encourage more people to make greater use of existing recreational facilities
12. Engage a wide range of sectors from government, non-government, and the community to work towards creating a more active population.
13. Continue to monitor adult's physical activity levels (including to objectively measure physical activity using pedometers) at least every three years.

1 INTRODUCTION

1.1 The importance of physical activity

Participation in sufficient levels of physical activity has been recognised as critical in the prevention of many chronic diseases including obesity, type II diabetes, circulatory diseases, depression and some cancers (U.S. Department of Health and Human Services, 1996). The World Health Organisation (WHO) estimated that physical inactivity causes 22% of cases of ischaemic heart disease and 10-16% of cases of breast, colon and rectal cancers worldwide (WHO, 2002). The Australian Institute of Health and Welfare (AIHW) has acknowledged physical inactivity as a behavioral or lifestyle factor that contributes to the development of cardiovascular diseases, stroke, colorectal cancer, diabetes, osteoarthritis and osteoporosis in Australia and has subsequently recommended that a general increase in population physical activity levels may assist in preventing these conditions (AIHW, 2002).

Physical inactivity together with consumption of excess calories in the diet contributes to overweight (>25kg/m^2) and obesity (>30kg/m^2). Excess weight increases the risk of coronary heart disease, ischaemic stroke, type II diabetes mellitus, hypertension, certain cancers and osteoarthritis and premature mortality (WHO, 2002; AIHW, 2002; WHO 2000; National Taskforce on the Prevention and Treatment of Obesity, 2000) Obesity has increased at an epidemic rate; North America, the United Kingdom and Australasia have experienced three-fold increases in the prevalence of obesity since 1980 (WHO, 2002). The AIHW reported that in Australia the prevalence of adult obesity increased from 8% overall in 1980 to 16% in males and 19% in females two decades later (AIHW, 2002).

Physical inactivity is recognised as independently contributing to mortality and disability. A World Health Organization (WHO) report estimated that physical inactivity globally causes 1.9 million deaths and 19 million Disability Adjusted Life Years or DALYs (combination of years of life lost + years lived with disability) (WHO, 2002). Hence 5-10% of deaths worldwide are due to a sedentary lifestyle, with physical inactivity being responsible for a greater proportion of global DALYs in developed countries compared to developing countries (WHO, 2002).

Nationally, research also shows that physical inactivity is responsible for 7% of the burden of disease and disability in Australia, with an estimated 13,019 deaths annually (Mathers et al., 1999). This trend is echoed at the State level, with physical inactivity and hypertension each accounting for 6.9% of the mortality burden in Western Australia, second only to tobacco smoking (11.9%) (Katzenellenbogen and Somerford, 2003). A sedentary lifestyle contributes significantly to health care costs. In Australia it is responsible for approximately $370 million annually in direct health care costs (Stephenson et al., 2000).

In response to the 1996 U.S. Surgeon General's report (U.S. Department of Health and Human Services, 1996), the National Physical Activity Guidelines, 1999 were developed. These guidelines recommended that Australian adults participate in at least 30 minutes of moderate-intensity physical activity on most, if not, all days of the week. The guidelines note that 30 minutes of vigorous activity performed three to four times per week promotes additional health benefits. Given that physical inactivity contributes significantly to the health burden and related health care costs, it is relevant to:

- monitor physical activity related knowledge of the Western Australian population over time to determine if national recommended levels of physical activity participation are being met;
- monitor the prevalence of physical activity/inactivity over time; and
- monitor overweight/obesity over time.

1.2 Participation in physical activity

The World Health Organisation has reported that the prevalence of physical inactivity in adults globally is approximately 17%, with an additional 41% estimated to participate in some physical activity but at insufficient levels (WHO, 2002). In Australia between 1997 and 2000 physical inactivity increased (13.4-15.3%) while the prevalence of participation in sufficient levels of physical activity (participation in 150 minutes of physical activity weekly and participation in 150 minutes over five or more sessions per week) decreased between 1997 and 1999, and plateaued between 1999 and 2000 (Bauman et al., 2001).

Trends in physical activity in Western Australia have not previously been documented. However, data on the levels of physical activity in the State have been collected recently (Bull et al., 2000). In 1999, the prevalence of inactivity in a cross-section of Western Australian adults was 11%. The proportion of sufficiently active (150 minutes of moderate activity over five or more sessions per week or 60 minutes of vigorous activity per week) adults in the same survey was found to be 57% (63% of men and 53% of women). BMI data were also collected and indicated that 29% of adult Western Australians were overweight and 10% were obese. These results provide a baseline for comparison for subsequent Western Australian physical activity surveys, including the survey findings presented in this report.

1.3 Differences between the 1999 and 2002 surveys

This report presents findings from the Western Australian adult physical activity survey conducted in November 2002. The objective of this survey was to replicate the survey undertaken in Western Australia in November 1999 (Bull et al., 2000) allowing comparisons and trends to be analysed. The 2002 survey followed the same procedures and replicated several questions from the 1999 survey. It provides baseline information for the Western Australian Premier's Physical Activity Taskforce (PATF) which was officially established in June 2001.

Additional items were included in the 2002 survey, such as: participation in and frequency of habitual incidental physical activity (McCormack et al., *in press*); physical activity enjoyment; recall of physical activity messages; knowledge of the minutes of physical activity required for good health; walking for transport; and cycling for transport. An item measuring 'stage of change' in exercise behaviour from the 1999 survey was re-worded to include exercise in the next six months instead of the next month. In addition to self-reported data, objective data of physical activity were collected from a sub-sample of the survey respondents using pedometers. This inclusion added a unique aspect to this study and provided comparative data between the self-report questionnaire and the pedometer data.

1.4 Pedometers

Pedometers are small motion sensor devices that count the number of steps taken during ambulatory behaviours such as walking or running. Vertical accelerations that exceed a particular threshold cause a trigger in the device to displace, registering a step or count (Welk et al., 2000). Unlike accelerometers the pedometer cannot provide information about the nature of the physical activity being performed (i.e. the intensity) nor can counted steps be stored in the device (i.e. it has no internal memory) (McCormack and Giles-Corti, 2002). For this reason step counts need to be recorded on a daily basis in a logbook or diary.

The pedometer cannot measure activity such as swimming and cycling. However, given that walking is the most popular form of physical activity in adults both overseas (Siegel et al., 1995; Tudor-Locke and Myers, 2001a; Tudor-Locke and Myers, 2001b) and in Australia

(Armstrong et al., 2000; Bull et al., 2000), the use of a pedometer appears to be an appropriate objective measure of ambulatory physical activity for the Australian adult population. Pedometers have been found to accurately measure ambulatory activity (Bassett et al., 1996) and high correlations ($r > 0.84$) have been reported between the steps recorded by the device and the number of observed steps performed (Welk et al., 2000; Hendelman et al., 2000).

Only a limited number of studies have used pedometers to quantify physical activity in population studies (Sequeira et al., 1995). However, several studies have used pedometers to quantify physical activity in free-living situations with various sub-populations (Tudor-Locke et al., 2002; Bassett et al., 2000; Ichihara et al., 1996; Hatano, 1993). Mean pedometer steps per day for adults in free-living situations range from 7,000 to 13,000 steps in healthy younger adults and 6,000 to 8,500 steps in healthy older adults (Tudor-Locke and Myers, 2001a). The population study by Sequeira et al. (1995) reported a mean daily step count of 10,400 in adults aged 25 to 74 years. The same study found that individuals in occupations involving moderate effort and heavy work performed a greater number of steps per day than those in less physically demanding occupations.

The target of 10,000 steps as a sufficient level of moderate physical activity has appeared as an arbitrary figure promoted by various international organisations and researchers (Hatano, 1993; Yamanouchi et al., 1995; Wilde et al., 2001). However, recent findings from several studies provide some support for promoting this number of steps for health benefits (Wilde et al., 2001; Welk et al., 2000; Iwane, et al., 2000). Recently, Australian projects involving the use of pedometers to promote walking and physical activity have used 10,000 steps as their target (e.g. Rockhampton 10,000 Steps Project).

2 METHODOLOGY

2.1 Questionnaire study

2.1.1 Sample framework

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

Proportional sampling, based upon population data from the 2001 Australian Census, was used to obtain a total sample of 3,200 residents. This resulted in 76% of the sample residing in the Perth metropolitan area, 11% in the South West, 9% in the Midwest/Goldfields and 4% in the Kimberley/Pilbara.

The sample was generated using a stratified random sample technique involving selection of a random sample of White Pages telephone numbers and interviewing the person in the house who had the most recent birthday and was at least 18 years of age. A maximum of six callbacks were made to obtain a completed interview.

Data were collected during November and December 2002, using the SurveyCraft CATI system. Telephone calls were made between 4:00 pm and 7:00 pm during the week and between 10:00 am and 7:00 pm on Saturdays. A total of 3,200 respondents (47% men and 53% women) provided information for the research project and the sample was made up of all age groups (18 years and over), education levels, marital status and major employment groups. Overall, the response rate for the survey amongst those contacted was 65%, with response rates per region shown in Table 2.1.

TABLE 2.1: RESPONSE RATES BY REGION			
Western Australian Region	**Sample**	**Proportion of Sample (%)**	**Response Rate (%)**
Perth metropolitan	2441	76.3	64.9
South West	338	10.6	66.7
Kimberley/Pilbara	122	3.8	66.7
Midwest/Goldfields	299	9.3	80.8
Total	**3200**	**100**	**65.4**

2.1.2 Survey instrument

The survey instrument consisted of 38 items. A copy of the questionnaire is provided at Appendix 1. The first eight items collected information on the frequency and duration of participation in various physical activities in the past week and were used with permission of the AIHW. The next set of items collected information on the types of activity and facilities used. A set of questions was directed at providing information about habitual incidental physical activity (i.e. habitual activity undertaken for less than 10 minutes) (McCormack et al., *in press*) and habitual incidental activity choices such as stair climbing. Items on perceived workplace activity levels and general practitioner advice on physical activity were also included.

Several questions were used to investigate reasons for participating in physical activity and perceived barriers to participation. The level of confidence (self-efficacy) in being able to participate in regular, moderate physical activity on five or more days per week was measured. Information was also gathered on enjoyment and the use of social support (planning to meet someone) to maintain participation in physical activity. Readiness to be more active ('stage of change') was measured in an item that was improved and hence somewhat different to the 1999 survey.

A knowledge question asked the number of minutes of moderate physical activity required for good health. Awareness of various Western Australian physical activity campaign messages was also assessed.

Demographic data on age, gender, ethnicity, marital status, education, occupation and dependents under 18 and under five living at home were collected through ten questions. Finally, two items collected self-reported height and weight.

2.1.3 Limitations

This survey was confined to Western Australians whose residence was listed in the White Pages telephone directory. Thus those people who did not have a telephone at home, had an unlisted telephone number or who were unavailable during the survey were unable to participate. In addition, seasonal variations in participation in physical activity are not accounted for in this cross-sectional study. These factors should be considered when generalising the results.

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 could be more highly motivated than the less or non-active people.

Finally, although there was provision in this survey for validating self-reported behaviour through a sub-sample using pedometers, this cannot be considered a 'gold standard' and reporting bias is a potential source of systematic error.

2.1.4 Treatment of data

The data were weighted by age, gender and the Western Australian region against the 2001 Western Australian population census data (ABS, 2002) and using age categories consistent with the 1999 Western Australian survey and previous reports from Active Australia (Armstrong et al., 2000).

The data set was cleaned and the syntax completed for coding of variables related to the level of physical activity, i.e. frequency and duration of walking, vigorous activity and moderate-intensity activity. Self-reported physical activity is subject to measurement error due to over-reporting. In this data set, values of greater than 840 minutes (14 hours) for each category of physical activity were replaced with the value of 14 hours. While 14 hours is somewhat arbitrary, this method of truncation is consistent with the 1999 Western Australian survey and Active Australia analysis (Armstrong et al., 2000) and therefore enables comparison with these studies.

2.1.5 Calculation of level of physical activity

The level of physical activity was computed using data on number of times and total time (hours and minutes) spent doing vigorous physical activity, moderate physical activity and walking (for at least 10 minutes). Total time represents the sum of time spent in each category of activity; however the time spent doing vigorous gardening or heavy work around the yard was excluded from the calculation.

2.1.6 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 exercise three times a week for the improvement of cardio-respiratory fitness and this has been well accepted for over two decades (American College of Sports Medicine, 1978). More recently, research has shown health benefits can accrue from regular participation in moderate-intensity activity and both America and Australia have adopted this focus for contemporary public health initiatives. The current national recommendation is 30 minutes of moderate activity on most, if not all, days of the week and this is frequently interpreted as 150 minutes of moderate activity over at least five sessions (National Physical Activity Guidelines, 1999).

This report has adopted a definition of sufficient physical activity that combines both the vigorous- and moderate-intensity recommendations for health and fitness benefits. Thus the following definitions are used:

Sufficient physical activity -	1) 150 minutes of moderate-intensity physical activity over five or more sessions or 60 minutes of vigorous-intensity activity in the previous week. 2) 150 minutes or more of physical activity (moderate minutes plus vigorous minutes (x2)) in the previous week.[1]
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

[1] This definition of sufficient physical activity is formulated by Active Australia and has been presented in this report for national comparison. This definition of sufficient physical activity is only presented where stated.

In addition to using the above definitions of sufficient activity for the primary analyses, this report presents the population estimates for achieving recommended levels using five different measures of recommended levels (including the Active Australia definition) and these are discussed in full in Section 4.3.

2.1.7 Predictor variables of meeting recommended levels

Logistic regression analysis was used to summarise associations between predictor variables and participation in sufficient physical activity. A force-entry model was used to calculate adjusted odds ratios and 95% confidence intervals.

2.2 Pedometer study

2.2.1 Sampling framework

Overall 603 participants agreed to participate in the pedometer component of the physical activity survey. The sample size needed to be large enough for tracking over time to allow a 10% difference in pedometer counts to be detected using a p-value of 0.05 and power of 0.80. To estimate the sample size a mean pedometer count of 10,400 steps per day and standard deviation of 4,700 steps per day were used based on previous research findings (Sequeira et al., 1995; Tudor-Locke and Myers, 2001a). Based on our sample size of 600, the number of participants required for each age and region category was determined proportionate to the Western Australian population. In addition, an equal number of participants was required for each gender.

2.2.2 Pedometer

The Yamax Digi-walker SW-700 pedometer was used to collect step data. A lever in the unit is displaced vertically each time a step is taken, registering a step. A previous report indicated that the Yamax Digi-walker pedometer is accurate and reliable for measuring steps during walking and running (Bassett et al., 1996).

The pedometer used in this study had the capacity to measure steps, distance and calories. However, given the unknown accuracy of the latter two outcomes and the fact that studies using pedometers generally report the number of steps performed, only step count was the chosen as the measured outcome.

2.2.3 Procedure

At the completion of the telephone interview, questionnaire respondents were asked if they would agree to be part of future studies. Of 1326 subjects asked, 621 (47%) agreed to participate in future studies. After explaining the nature of the pedometer study, 18 participants refused to participate, leaving a total of 603 subjects (45%) to participate in the pedometer study.

Participants (n=603) were sent a pedometer, an instruction sheet and diary (Dr. Catrine Tudor-Locke, personal communication) (Appendix 2) to record the daily number of steps they performed. Participants were asked to wear the pedometer for seven consecutive days, after which it was to be returned to the Survey Research Centre. Participant entry into a prize draw to win one of three bikes worth $1000 each was used as an incentive to encourage the return of the pedometers. The pedometer was worn on the right hip, positioned in-line with the right knee.

Participants were required to wear the pedometer during waking hours and remove it before retiring to bed, at which time steps were recorded in the diary. Included in the diary were additional questions asking participants if they had: worked; been sick or injured; or played sport or exercised that day. Participants who reported exercising were asked to record the type of activity and the time spent participating in each activity.

Apart from the initial preparation, participants were instructed not to reset the pedometer to zero following the start of the step data collection. Thus, the step counts recorded daily from the pedometer was a running count from previous day's recordings. This procedure was adopted to eliminate the effect of the participant forgetting to reset the pedometer count to zero at the beginning of each day.

2.2.4 Limitations

Several of the limitations specified for the survey as a whole (section 2.1.3) are also relevant to the design of the pedometer sub-study. However, there are several specific limitations related to the pedometer itself and the interpretation of the objective data collected. Pedometers are accurate and reliable at counting steps; however, not all physical activity involves bipedal locomotion. Hence data derived from the pedometer measures only physical activity in which steps are performed (e.g. walking, jogging or aerobics). Individuals who perform few daily steps may be very active, particularly if the majority of their physical activity is through activities such as cycling, swimming and rowing.

Another limitation is that the pedometer does not differentiate between the intensity of steps taken. Hence, a step performed running is counted the same as a step performed walking. Since running strides are generally longer than walking strides, it would take fewer running steps to cover the same distance. Steps recorded may therefore underestimate physical activity levels for individuals who frequently run or jog.

The pedometer must also be assumed to have a certain degree of measurement error. For example vibrations produced other than by walking or running, such as those caused by driving over speed bumps, may also be recorded as steps.

Although there are limitations to using pedometers as a measure of physical activity, the objective data obtained can be used to complement the mainly subjective data collected from the physical activity questionnaire. In addition, the pedometer can capture habitual incidental physical activity which involves walking or running (i.e. short duration activities performed for less than 10 minutes at a time) which may be difficult to capture using self-report questions.

2.2.5 Treatment of data

The pedometer data were screened for outliers and checked for invalid entries. Invalid entry of pedometer steps included cases in which the continuous step count decreased on a consecutive day when it should have increased. In addition, cases with three or more days of diary entries missing were excluded. Following the screening process, the final sample used in the analyses was 428 (i.e. a response rate of 71% of those who agreed to participate in the pedometer study) of which 94% wore the pedometer for the entire seven days and 6% wore the pedometer on at least four to six days during the study.

2.2.6 Analysis of data

Three outcome variables were created for the pedometer data. The mean number of daily steps performed was determined for each case and used as the main outcome variable. Based on previous research, two additional outcome variables were created. The mean daily steps were dichotomously categorised into 1) < 10,000 steps/day; and 2) ≥ 10,000 steps/day and into: 1) < 15,000 steps/day; and 2) ≥ 15,000 steps/day.

Descriptive statistics were calculated including prevalence, means, standard deviations, medians and 95% confidence intervals. Inferential statistics, including analysis of variance and t-tests were also used to determine statistically significant ($p<.05$ and .01) differences between selected variables. Logistic odds ratios were calculated using force-entry method to determine predictors of performing at least 10,000 steps.

All descriptive data were weighted using 2001 Australian Census data. Unweighted data were used in analyses where statistical tests of significance were used.

3 SAMPLE POPULATION

3.1 Demographic profile of questionnaire respondents

A total of 3,200 Western Australian adults responded to the survey and a breakdown by age, gender and other demographic variables is shown in Table 3.1. The sample was made up of 47% males and 53% females, which is similar to the Western Australian population. The sample of Western Australians reflected the age profile of the general population with the exception of the 18 to 29 year age group, which was under-represented at only 15%, and the 60 years plus age group, which was over- represented at 26%. To adjust for these differences the data were weighted for age, gender and location against the 2001 Western Australian population census data.

The sampling plan was structured to obtain proportional representation according to the State's general population figures. Thus the majority of the sample population was from the Perth metropolitan area (76%) and the smallest proportion from the Kimberley/Pilbara region (4%).

Most respondents (64%) were married, while 18% described themselves as single. Approximately one quarter of the respondents reported completing a university qualification and a further 40% had reached Tertiary Entrance Examination (TEE), a Year 12 equivalent education or Diploma. Thirty-seven percent did not complete a Year 12 education.

In terms of employment, the largest proportion of respondents was employed in managerial/professional occupations (24%), with similar proportions describing themselves as white collar (17%) or blue-collar/trade (18%). Twenty percent were retired, 13% employed 'in the home', 5% students and 2% were unemployed.

TABLE 3.1: DEMOGRAPHIC PROFILE OF RESPONDENTS			
Characteristic	**n**	**%**	***Population %**
Gender			
Male	1515	47.3	49.3
Female	1685	52.7	50.7
Age Group			
18 to 29 years	491	15.3	22.6
30 to 44 years	972	30.4	31.0
45 to 59 years	901	28.2	25.7
60 years or more	825	25.8	20.7
Location			
Perth metropolitan area	2441	76.3	72.8
South West	338	10.6	13.2
Kimberley/Pilbara	122	3.8	4.5
Midwest/Goldfields	299	9.3	9.5
Marital Status			
Married/de facto	2061	64.4	
Single	587	18.3	
Separated/divorced	334	10.4	
Widowed	213	6.7	
Education			
Less than TEE	1165	36.6	
TEE/diploma	1274	40.0	
University	745	23.4	
Employment Categories			
Manager/professional	764	23.9	
White collar trade	535	16.7	
Blue collar	558	17.5	
Unemployed	74	2.3	
Home duty	424	13.3	
Student	162	5.1	
Retired	643	20.1	

* From the Australian Bureau of Statistics (ABS) 2001 Census

3.2 Demographic profile of pedometer participants

The demographic profile of the pedometer participants is presented in Table 3.2. Percentages for demographic characteristics were similar between the pedometer and questionnaire participants. For the most part the demographic profile of the pedometer participants was a reasonable approximation of the Western Australian population for gender, age and residential location. However, participants aged 18 to 29 years were under-represented (10%) in the pedometer study compared to the Western Australian population (23%).

The proportional sampling method ensured that a more representative distribution according to gender, age and residential location of the population was obtained. The majority of participants were female (52%) and sampled from the Perth metropolitan region (77%). Higher proportions of participants were married or de facto (73%), completed TEE or equivalent level of education (40%) and were in managerial or professional occupations (28%). Fewer participants were widowed (4%), university educated (27%) and unemployed (3%).

Table 3.2: Demographic profile of pedometer study participants			
Characteristic	**n**	**%**	***Population %**
Gender			
Male	205	47.9	49.3
Female	223	52.1	50.7
Age Group			
18 to 29 years	44	10.3	22.6
30 to 44 years	140	32.7	31.0
45 to 59 years	138	32.2	25.7
60 years or more	106	24.8	20.7
Location			
Perth metropolitan area	329	76.9	72.8
South West	40	9.3	13.2
Kimberley/Pilbara	16	3.7	4.5
Midwest/Goldfields	43	10.0	9.5
Marital Status			
Married/de facto	312	72.9	
Single	50	11.1	
Separated/divorced	47	11.0	
Widowed	19	4.4	
Education			
Less than TEE	141	32.9	
TEE/diploma	170	39.7	
University	117	27.3	
Employment Categories			
Manager/professional	120	28.0	
White collar trade	59	13.8	
Blue collar	75	17.5	
Unemployed	14	3.3	
Home duty	65	15.2	
Student	23	5.4	
Retired	72	16.8	

* From the ABS 2001 Census

4 LEVEL OF PHYSICAL ACTIVITY

4.1 Overview of the data presented

This chapter reports the level and pattern of participation in physical activity. Data are reported for various demographic variables, including age, gender, education, marital status and geographic region. The primary variable of interest is the proportion of Western Australians undertaking sufficient physical activity to gain a health benefit.

The recommended level of sufficient physical activity is defined by the Commonwealth Department of Health and Welfare and the Australian Sports Commission (Active Australia) as 150 minutes of moderate–intensity physical activity on most, if not all days of the week. More recently, it is acknowledged that this quantity of physical activity can be accumulated throughout the day, rather than during a single bout. Thus the accumulation of 30 minutes of physical activity through 10-minute bouts is recommended in Australia.

Current national physical activity guidelines also promote participation in vigorous physical activity for at least 30 minutes for three to four sessions per week for additional health benefits. International health bodies including the WHO and the Centers for Disease Control and Prevention have recommended participation in 20 minutes of vigorous physical activity on three or more occasions per week, in addition to or instead of 30 minutes of moderate physical activity on most days.

This report presents the prevalence of sufficient physical activity using two definitions:

1) The accumulation of 150 minutes of physical activity in at least five sessions or 60 minutes of vigorous activity per week; and
2) The accumulation of 150 minutes of total physical activity per week (vigorous activity is weighted by a factor of 2) (AIHW, 2003; Armstrong et al., 2000).

Although the national physical activity guidelines state that vigorous activity performed for 30 minutes per day, three to four times per week, should be performed to accrue additional health benefits, the use of the first definition of sufficient physical activity (which includes vigorous activity performed for *60 minutes* per week) was used in this report. This measure of sufficient physical activity was used to maintain consistency with the definitions of sufficient activity used in the 1999 report so that direct comparisons can be made between the 1999 and 2002 data. Sufficient physical activity using the second definition (the Active Australia model) is presented less often in this report but is used throughout other Australian physical activity surveys and hence is used in the present report to enable national comparisons.

The number of sessions of activity and the duration (total minutes) of activity indicate current patterns of participation and these data are presented in Section 4.5. The types of activity undertaken and the facilities used for physical activity are reported in Section 4.6 and Section 4.7 respectively. In addition habitual incidental physical activity data are presented in Section 4.8.

All measures of physical activity in this report exclude gardening, household chores and yard work. Details of the questionnaire items and treatment of the data are outlined in Chapter 2.

4.2 Western Australian adult participation in the recommended level of physical activity[2]

Table 4.1 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 (of ten minutes or more), vigorous or other moderate physical activities in the past week (sedentary).

Over one-half of all Western Australian adults (55%) reported participating in sufficient levels of physical activity. However, almost one third of adults (32%) reported doing physical activity at insufficient levels to accrue a health benefit and one in seven (13%) reported doing no physical activity (Table 4.1). While not shown in the table, the prevalence of sufficient physical activity using the Active Australia definition was 60%.

Gender

More men (57%) than women (52%) reported being sufficiently active. There was no difference between the inactive men and women (13%) but more women (34%) than men (29%) reported insufficient activity.

[2] *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).*

Age group

The proportion of Western Australians reporting sufficient levels of physical activity decreased with increasing age. This finding is consistent with other state and national surveys. Younger Western Australian adults were more active with over two thirds (68%) of those aged under 30 years meeting the recommended level but this declined to just under one-half (48%) for those aged 60 years and over. In three of the four age categories only about one-half of adults reported achieving the current recommended level.

Location

There was little difference in the proportion of the adult population achieving recommended levels of physical activity across three of the four geographical regions (range 55-57%). However, in the Midwest/Goldfields the proportion participating in sufficient physical activity was less than one-half (48%).

Marital status

Single adults were most likely to report undertaking sufficient levels of physical activity (65%) compared with just over one-half of married/de facto (52%) and separated/divorced (55%) adults and just less than one-half of adults who were widowed (46%).

Education and employment

The proportion of adults participating in recommended levels of physical activity increased with higher levels of education and differed by the type of employment. Adults with a university qualification (60%) were more likely to undertake sufficient physical activity than those with a Tertiary Entrance Exam (TEE) or Year 12 equivalent qualification (57%) and those with an education level of less than a Year 12 equivalent (48%).

Differences in meeting the recommendations across employment status were small but consistent with other state surveys in South Australia and Victoria. Professional/ management (57%) and other white-collar workers (57%) were slightly higher than blue-collar workers (53%). Retired persons (49%), the unemployed (48%) and those with home duties (51%) were least likely to be active at sufficient levels.

Body mass index

Adults with acceptable BMI were more likely to report being sufficiently active (60%) compared to Western Australians in other BMI categories. While obese adults were the least likely to report participating in sufficient physical activity (40%), underweight adults were the most likely to report being inactive (27%).

Adults with children

Adults with one or more children under five years of age were less likely to participate in sufficient physical activity (50%) and were more likely to report insufficient physical activity (37%). The proportions of adults with and without children under 18 years who were inactive, insufficiently and sufficiently active were similar.

TABLE 4.1: PREVALENCE OF INACTIVITY, INSUFFICIENT ACTIVITY AND SUFFICIENT PHYSICAL ACTIVITY[1] BY DEMOGRAPHIC CHARACTERISTICS

Characteristic	Inactive	Insufficient activity	Sufficient activity
Gender			
Male	13.4	29.4	57.2
Female	13.6	34.2	52.2
Age Group			
18 to 29 years	7.8	24.7	67.5
30 to 44 years	13.8	34.5	51.7
45 to 59 years	14.9	33.0	51.2
60 years or more	17.3	34.1	48.5
Location			
Perth metropolitan area	12.9	32.1	55.0
South West	13.1	30.4	56.5
Kimberley/Pilbara	14.7	28.0	57.3
Midwest/Goldfields	18.3	33.8	48.0
Marital Status			
Married/de facto	14.1	34.3	51.6
Single	10.1	25.0	64.9
Separated/divorced	14.2	30.7	55.1
Widowed	19.8	34.4	45.8
Education			
Less than TEE	18.7	33.0	48.3
TEE/diploma	11.5	31.4	57.0
University	9.3	31.0	59.7
Employment Categories			
Manager/professional	9.9	33.4	56.6
White collar trade	10.3	32.6	57.2
Blue collar	18.0	28.9	53.1
Unemployed	19.8	32.9	48.3
Home duty	17.9	31.0	51.1
Student	6.9	23.9	69.3
Retired	15.1	36.1	48.8
Body mass index			
Underweight	26.6	21.5	51.9
Acceptable	10.0	29.7	60.3
Overweight	13.7	34.2	52.2
Obese	22.9	36.9	40.3
Children under 5 years			
Nil	13.6	30.9	55.5
One or more	13.0	37.2	49.8
Children under 18 years			
Nil	14.1	30.5	55.4
One or more	12.7	33.9	53.5
Overall	**13.5**	**31.8**	**54.6**

[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).

4.3 Factors independently associated with meeting guidelines on sufficient levels of physical activity

Table 4.2 reports the results from a force-entry logistic regression undertaken to assess the independent factors associated with participation in sufficient levels of physical activity. For these analyses, sufficient levels were defined using the 150 minutes of moderate-intensity physical activity over five sessions or 60 minutes of vigorous-intensity physical activity per week (Column I) or the Active Australia measure of sufficient physical activity (i.e. at least 150 minutes of total physical activity where this is the sum of minutes of walking and moderate activity plus minutes of vigorous activity weighted by 2) (Column II). This second outcome measure was selected to allow for comparison with national data reported by the AIHW (Armstrong, et al., 2000; AIHW, 2003).

There was very little difference in the demographic characteristics predicting the two outcome measures. Gender, age, education and BMI were significant predictors of sufficient physical activity using both measures. Women were 25-27% less likely to reach either threshold than men. Compared to those in the youngest age category, adults in all three older age groups were significantly less likely to achieve sufficient physical activity. The significance increased with age and the likelihood was particularly low in people 60 years and over. In terms of education, adults with TEE or diploma level education and above were significantly more likely to participate in sufficient levels of physical activity compared with people who did not complete TEE level education. A university education was associated with a 54-55% higher likelihood than those who did not complete TEE-level education.

Compared with people in the healthy weight category of BMI, overweight and obese people had a significantly lower likelihood of achieving sufficient levels of physical activity. Obese adults were 48-50% less likely and overweight adults were 20-24% less likely to meet either measure of sufficient physical activity. People in the underweight category showed a significant difference by the Active Australia measure only.

Adults with children under five years or under 18 years appeared less likely to participate in sufficient physical activity under both definitions of sufficient activity.

TABLE 4.2: ADJUSTED ODDS RATIOS FOR FACTORS ASSOCIATED WITH PARTICIPATION IN SUFFICIENT PHYSICAL ACTIVITY

Characteristic	Sufficient physical activity* (Column I)		Sufficient physical activity (Active Australia)+ (Column II)	
	Odds ratio	Confidence interval	Odds ratio	Confidence interval
Gender				
Male	1.00		1.00	
Female	.75	.63-.89	.73	.61-.87
Age Group				
18 to 29 years	1.00		1.00	
30 to 44 years	.58	.44-.76	.54	.40-.72
45 to 59 years	.54	.40-.74	.52	.38-.72
60 years or more	.45	.31-.67	.42	.28-.63
Location				
Perth metropolitan area	1.00		1.00	
South West	1.25	.98-1.60	1.29	1.01-1.65
Kimberley/Pilbara	1.08	.74-1.60	1.02	.69-1.52
Midwest/Goldfields	.91	.71-1.74	.89	.69-1.15
Marital Status				
Married/de facto	1.00		1.00	
Single	.97	.75-1.26	.95	.73-1.24
Separated/divorced	1.13	.88-1.44	1.08	.84-1.41
Widowed	.94	.68-1.30	.90	.65-1.25
Education				
Less than TEE	1.00		1.00	
TEE/diploma	1.21	1.02-1.44	1.21	1.02-1.45
University	1.55	1.24-1.94	1.54	1.22-1.93
Employment Categories				
Manager/professional	1.00		1.00	
White collar trade	1.15	.89-1.48	1.16	.89-1.50
Blue collar	.94	.73-1.21	.92	.71-1.20
Unemployed	.81	.52-1.25	.76	.49-1.18
Home duty	1.21	.91-1.61	1.10	.82-1.46
Student	1.11	.73-1.70	.88	.57-1.35
Retired	1.17	.85-1.60	1.27	.92-1.76
Children under 5 years				
Nil	1.00		1.00	
One or more	.74	.57-.97	.84	.64-1.09
Children under 18 years				
Nil	1.00		1.00	
One or more	.87	.71-1.07	.89	.72-1.09
BMI Categories				
Healthy weight	1.00		1.00	
Underweight	.62	.38-1.02	.53	.33-.88
Overweight	.76	.64-.89	.80	.67-.94
Obese	.50	.40-62	.52	.41-.65

[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).
[2]Total activity is the sum of minutes of walking and moderate activity plus minutes of vigorous x 2.

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

Indicators of sufficient physical activity can vary depending on the purpose and health benefit of interest. Variations generally involve establishing cut-off 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 generally decided in accordance with scientific evidence and public health recommendations. Some examples include:

- 150 minutes of moderate-intensity physical activity per week;
- 150 minutes of moderate-intensity physical activity over five sessions per week;
- 150 minutes of moderate-intensity physical activity over five sessions or 60 minutes of vigorous activity per week;
- Energy expenditure of 800 kilocalories per week; or
- 150 minutes weighted (moderate-intensity minutes x 1 and vigorous-intensity minutes x 2) per week (i.e. Active Australia definition).

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. These measures have been used in various state surveys (New South Wales, Victoria and South Australia), the 1997 and 1999 National Active Australia surveys (Armstrong et al., 2000) and the 1999 Western Australian adult physical activity survey (Bull et al., 2000).

In addition, participation in vigorous physical activity is of interest. One of the earliest recommendations on exercise came from the American College of Sports Medicine) and emphasized the type and frequency of exercise required to develop and maintain cardio-respiratory fitness (American College of Sports Medicine, 1978). Vigorous exercise (defined as 60-90% maximal heart rate) was recommended on three to five days per week for between 15-60 minutes per session. However, the duration was later modified to 20-60 minutes. The WHO and Centers for Disease Control and Prevention recommend participation in at least 20 minutes of vigorous physical activity three times per week to achieve additional health benefits.

Figures 4.1 to 4.3 present the prevalence of sufficient physical activity as determined by several of the above-mentioned criteria, including 60 minutes of vigorous physical activity per week.

4.4.1 Proportion of Western Australians meeting various 'recommended' levels of physical activity using different criteria

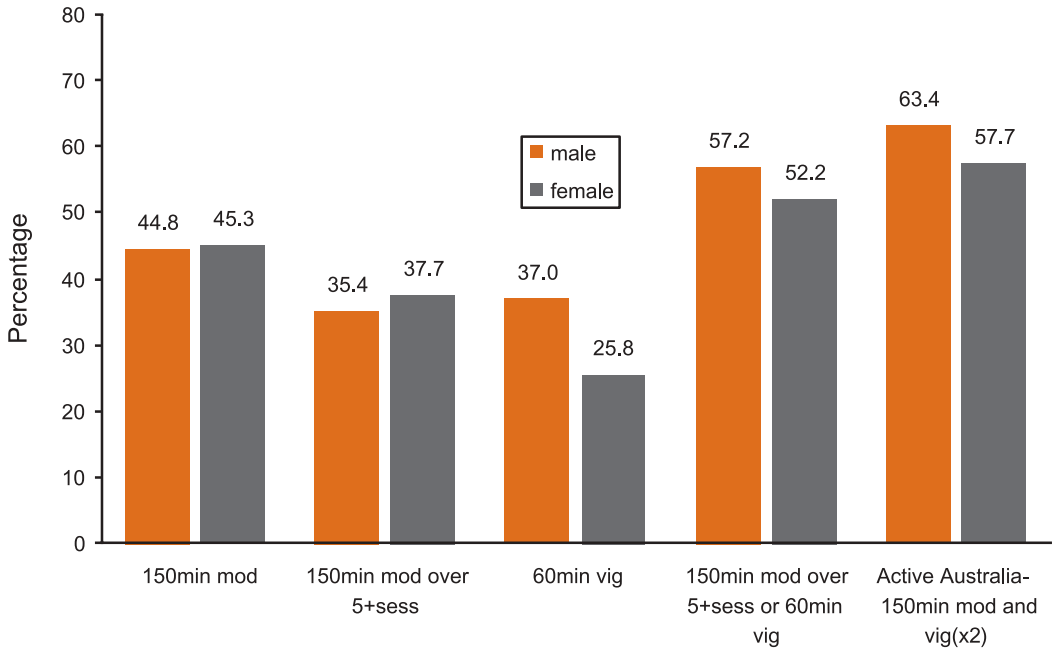
Gender

Figure 4.1 reports the prevalence of sufficient physical activity by gender using the various measures. Western Australian males were more likely than females to be sufficiently active when vigorous physical activity is incorporated into the estimates. This finding was consistent using the three measures of sufficient activity which included vigorous physical activity including:

1) 60 minutes of vigorous (37% of males versus 26% of females);
2) at least 150 minutes of moderate over at least five sessions or 60 minutes of vigorous per week (57% of males and 52% of females); and
3) the Active Australia sufficient activity model (63% in males and 58% in females).

Similar proportions of males and females participated in 150 minutes of moderate physical activity (45%). However, a slightly higher proportion of females (38%) than males (35%) reported participating in 150 minutes of moderate physical activity when the number of sessions (five or more) was taken into account.

Figure 4.1: Measures of sufficient physical activity by gender



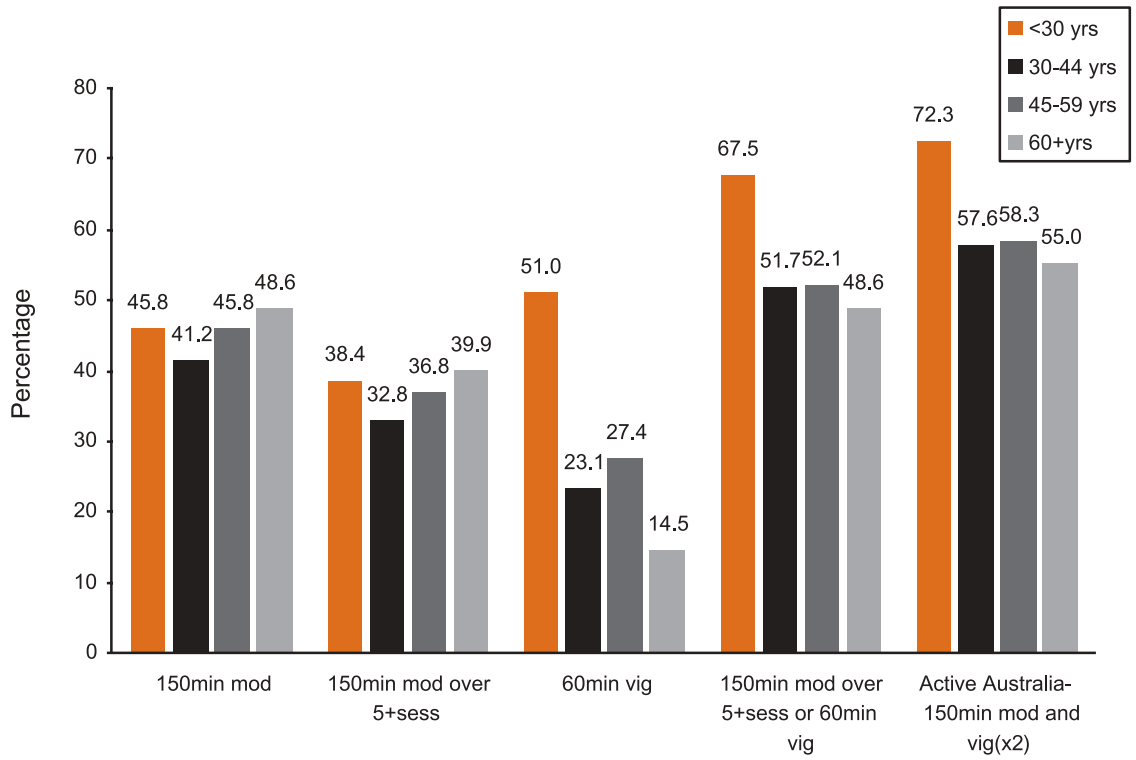
Age group

Figure 4.2 illustrates the comparison of measures of sufficient physical activity by age category.

Western Australians aged 30 years or less were more likely to be sufficiently active according to both the Active Australia sufficient activity criteria (72%) and the sufficient activity measure (at least 150 minutes of moderate activity over 5 or more sessions or 60 minutes of vigorous activity per week) compared to the other age categories. In contrast older adults (60 years or more) were less likely to be sufficiently active using both criteria (Active Australia model (55%) and sufficient activity criteria (49%)).

Fewer adults aged 30 to 44 years participated in at least 150 minutes (41%) and at least 150 minutes over five or more sessions per week (33%) compared to other age categories. A greater proportion of adults 60 years and older participated in at least 150 minutes (49%) and at least 150 minutes over five or more sessions per week (40%) compared to other age categories. Twice as many Western Australians 30 years or less participated in vigorous physical activity (51%) compared with those aged 30 to 44 years (23%) and those aged 60 years or more (14%).

Figure 4.2: Measures of sufficient physical activity by age

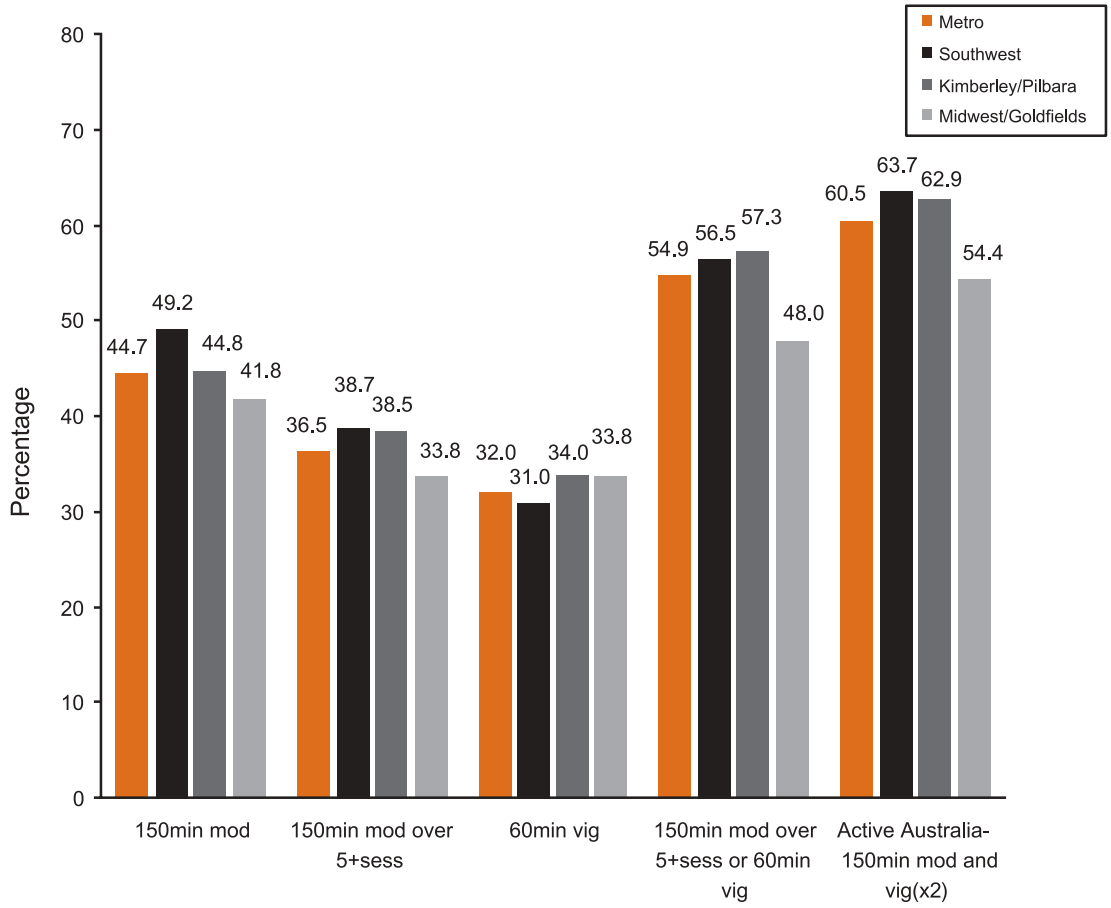


Region

Figure 4.3 illustrates the prevalence of sufficient physical activity estimates by geographical location.

Similar proportions of Western Australians from the Perth metropolitan, South West and Kimberley/Pilbara regions reported participating in sufficient physical activity using the Active Australia criteria (60% to 64%) and the sufficient activity measure (55% to 57%). Residents in Midwest/Goldfields regions showed lower levels of sufficient activity based on several criteria (Figure 4.3).

Figure 4.3: Measures of sufficient physical activity by region



4.5 Patterns of physical activity

Data on participation in different categories 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. These data present a picture of how people are active, adding more detail to the data presented previously on meeting recommended levels of activity.

The prevalence of participation in the three categories of activity, namely walking, moderate-intensity activity and vigorous activity, are shown by gender and age in Figures 4.4 and 4.5 respectively. The number of sessions of activity and mean duration (minutes) are presented in Tables 4.3 and 4.4 respectively.

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

Gender

Figure 4.4 presents the proportion of Western Australians by gender who reported participating in sessions of walking, moderate and vigorous physical activity.
A greater proportion of females (79%) reported participating in walking compared to males (72%). A greater proportion of males reported participating in moderate (32%) and vigorous (44%) physical activity compared to females (26% and 30% respectively).

Age

Figure 4.5 illustrates prevalence of walking, moderate and vigorous physical activity by age. Participation in walking deceased with age, with the highest prevalence reported for adults aged 18 to 29 years (82%) and lowest prevalence reported for adults aged 60 years and older (72.3%). A greater proportion of Western Australians aged under 30 years (34%) reported participating in moderate physical activity. Adults aged 30 to 44 and 45 to 59 years reported a similar prevalence of participation (27%) in moderate physical activity. Participation in vigorous physical activity sharply decreased with age, from 59% in the youngest age group to 18% in the oldest age group. Between the ages 18 and 44 years, participation in vigorous physical activity decreased by 20%. The prevalence of vigorous physical activity among adults aged between 44 and 60 years and over decreased by 14% compared with the youngest age group.

Figure 4.4: Sessions of walking, moderate and vigorous physical activity by gender

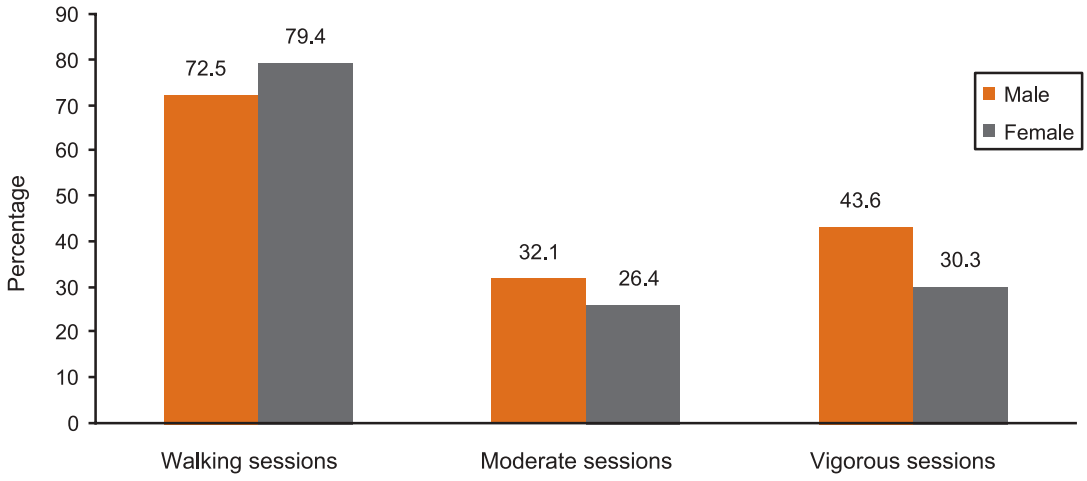
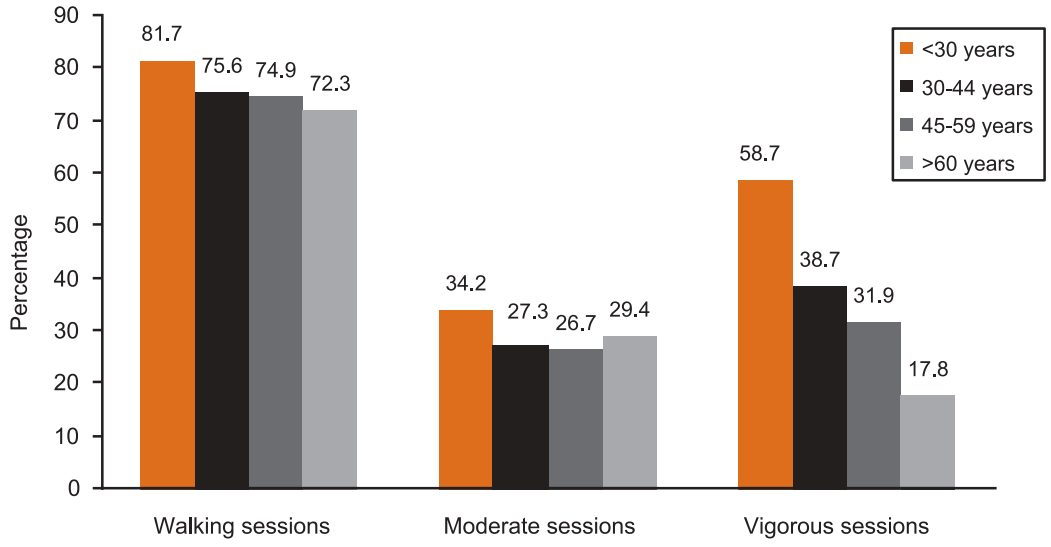


Figure 4.5: Sessions of walking, moderate and vigorous physical activity by age



4.5.2 *Number of sessions per week of physical activity*

Table 4.3 presents the number of sessions of activity per week by age category both for males and females. The majority of males (57%) and females (56%) across all age categories indicated that they participated in five or more sessions per week. Sedentary adults made up 13% of the population while the remainder was evenly distributed across one to four sessions per week. Gender differences were negligible and participation in five or more sessions per week was highest in those less than 30 years of age.

TABLE 4.3: NUMBER OF PHYSICAL ACTIVITY* SESSIONS PERFORMED PER WEEK BY GENDER AND AGE

Times/wk	Males					Females					
	<30	30-44	45-59	>60	Total	<30	30-44	45-59	>60	Total	Total
0	8.1	12.7	16.3	16.8	13.3	7.6	14.3	12.7	17.8	13.4	13.4
1	3.3	6.1	6.3	6.9	5.7	4.2	6.2	5.1	6.8	5.7	5.7
2	5.1	10.2	8.7	5.6	7.7	7.6	10.9	9.5	8.8	9.4	8.6
3	10.0	8.6	10.2	6.3	8.9	7.1	9.1	8.8	10.0	8.8	8.8
4	6.5	10.4	6.1	6.3	7.6	9.0	10.1	8.0	6.3	8.5	8.0
5+	66.9	52.0	52.4	58.2	56.8	64.4	49.3	55.9	50.2	54.3	55.6

* Physical activity includes walking, moderate and vigorous activity

4.5.3 *Time spent participating in physical activity*

The total amounts of time (mean minutes) spent walking or participating in moderate-intensity activities, vigorous physical activity and vigorous gardening are shown in Table 4.4. Those adults who reported walking did so for a mean of three hours (183 minutes) per week. Adults who undertook other moderate-intensity physical activities also participated for a mean of three hours (189 minutes), as did those who participated in vigorous activity (188 minutes per week). Those involved in vigorous gardening reported the highest amount of time – about 220 minutes per week.

For the entire sample (including those who did not report these activities), the mean times spent in different types of activity were: walking 139.2 minutes; moderate 55.1 minutes; vigorous 68.9 minutes; and vigorous gardening 108.7 minutes.

TABLE 4.4: MEAN TIME SPENT IN SELECTED PHYSICAL ACTIVITIES IN THE PAST WEEK

Activity Type	n	Mean1 (min)	SEM2 (min)	Median (min)	90th percentile (min)
Walking	2406	183.2	3.7	120.0	420.0
Moderate activity	920	189.0	6.3	120.0	480.0
Vigorous activity	1298	187.5	5.3	120.0	420.0
Vigorous gardening	1596	220.1	5.7	120.0	600.0

[1] Means are weighted
[2] Standard error of the mean
Note: Due to skewed distribution of the data, responses truncated to 840 minutes (14 hours).

4.6 Participation in different types of activity

Planning for facilities and community programs uses information on participation trends, such as the types of activity and where possible the locations and/or facilities used. Two items in the questionnaire investigated these issues. Adults who indicated they had participated in physical activity during the previous week were asked to specify what types of activity they had participated in. Respondents were also asked about the locations and/or facilities used for physical activity. Specific activities are shown in Figure 4.6 for all Western Australians and stratified by age and gender in Table 4.5.

Walking for recreation was the most popular activity, regardless of gender. However, it was more popular among females (70%) than males (55%) – a consistent finding across most national and state surveys. Among females, walking for recreation was most common in the 45 to 59 year age group (75%), whereas among males it was most common in the 60 years and over age group (65%). Males younger than 30 years of age were the least likely of all groups to walk for recreation (43%) but the most likely to walk for transport (35%). Females aged 60 years and over were least likely of all groups to walk for transport (19%).

Gardening was the second most popular activity both for males (41%) and females (37%). Adults under 30 years of age were considerably less likely to participate in gardening compared with older age groups.

Younger males (18 to 29 years) were more likely than older aged males to participate in other activities, including swimming/surfing (22%), team sports (19%) and jogging/running (16%). Younger females (18 to 29 years) were more likely to participate in aerobics (20%), and jogging/running (14%) compared to older females.

The highest prevalence of recreational cycling among males (13%) and females (8%) was in the 45 to 59 year age group. Across all age groups, cycling for recreation or transport was substantially higher among males.

Figure 4.6: Prevalence of physical activity type

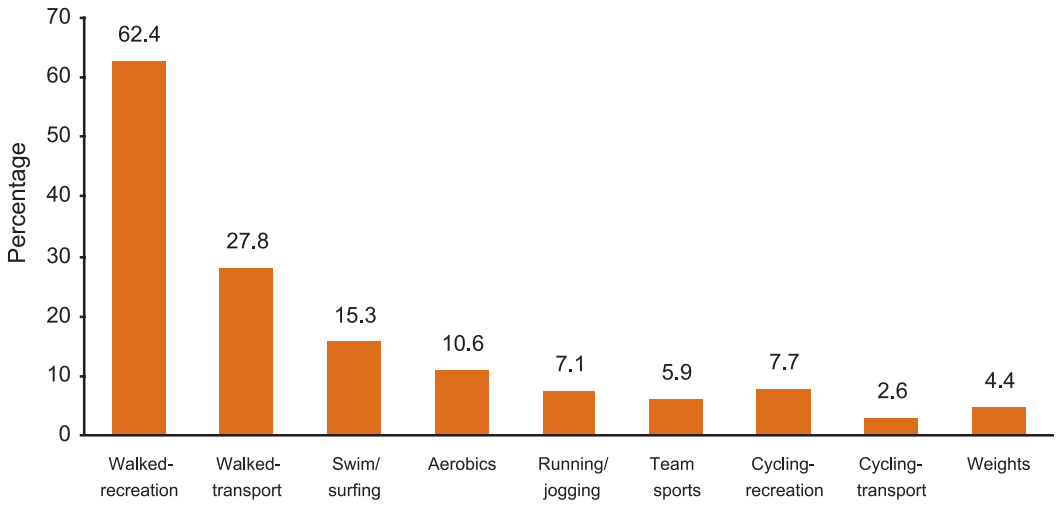


TABLE 4.5: PREVALENCE OF SPECIFIC TYPES OF PHYSICAL ACTIVITY BY AGE AND GENDER

	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	70.3	53.1	67.0	60.8	75.4	65.2	66.2	54.9	69.6
- transport	35.4	33.3	30.6	30.4	22.2	22.7	18.6	25.7	27.4	28.1
Gardening	25.4	21.4	48.0	38.5	45.2	44.5	43.9	43.9	40.9	37.4
Swimming/surfing	22.5	17.4	18.2	17.6	13.4	12.6	10.7	8.0	16.7	14.1
Aerobics	9.4	20.2	4.7	12.9	5.2	12.6	8.7	12.5	6.7	14.4
Jogging/running	15.9	13.5	11.2	5.2	5.8	2.2	1.6	0.3	9.2	5.2
Team sports	19.2	7.0	7.7	6.1	2.3	1.4	0.8	1.2	7.9	4.0
Cycling										
- recreation	9.4	4.9	10.5	4.0	13.1	7.5	9.5	2.7	10.7	4.8
- transport	5.9	2.4	3.5	1.6	4.1	1.1	1.6	0.3	3.9	1.4
Golf	7.7	2.1	6.3	0.7	9.6	2.2	10.6	4.7	8.3	2.3
Weights	11.8	5.8	4.7	2.6	4.7	2.0	3.5	0.9	6.2	2.8
Tennis	7.1	3.1	4.4	4.2	4.7	3.1	2.4	1.5	4.8	3.0

4.7 Facilities used for recreational physical activity

Respondents who undertook some form of physical activity were asked to identify the environment or facility used and these results are presented by gender in Figure 4.7 and by age in Figure 4.8. The results show the percentages of people who used the most reported facilities and more than one response was allowed.

The major settings for physical activity were streets or footpaths (53% males and 60% females) and the home (52% males and 47% females). The streetscape was particularly popular with younger adults. Younger adults were also more likely to use gymnasium/health clubs, public parks and ovals, the beach and organised sporting facilities. The only setting to increase in use with age was the home; data presented in section 4.6 indicate that this trend is primarily due to an increase in gardening with advancing age. The oldest adults in the survey were more likely to exercise in the home.

Figure 4.7: Facilities used for physical activity by gender

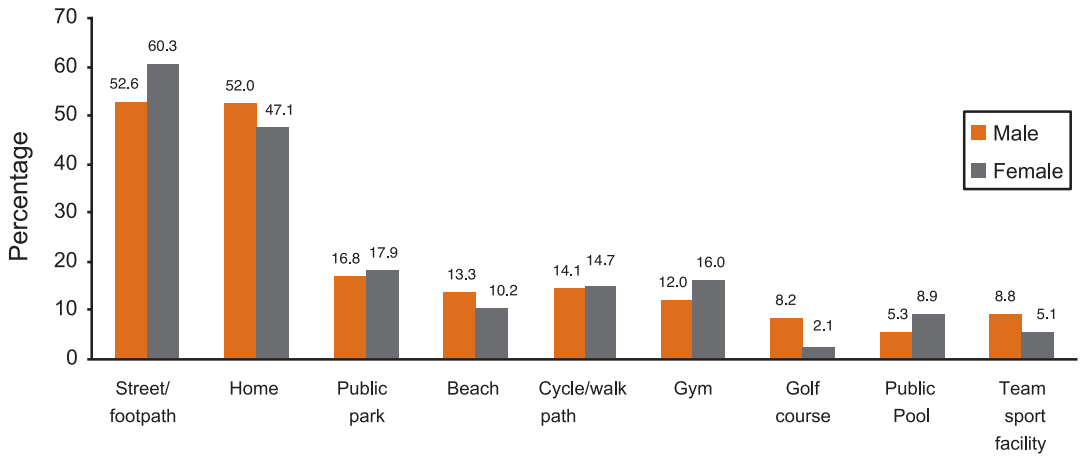
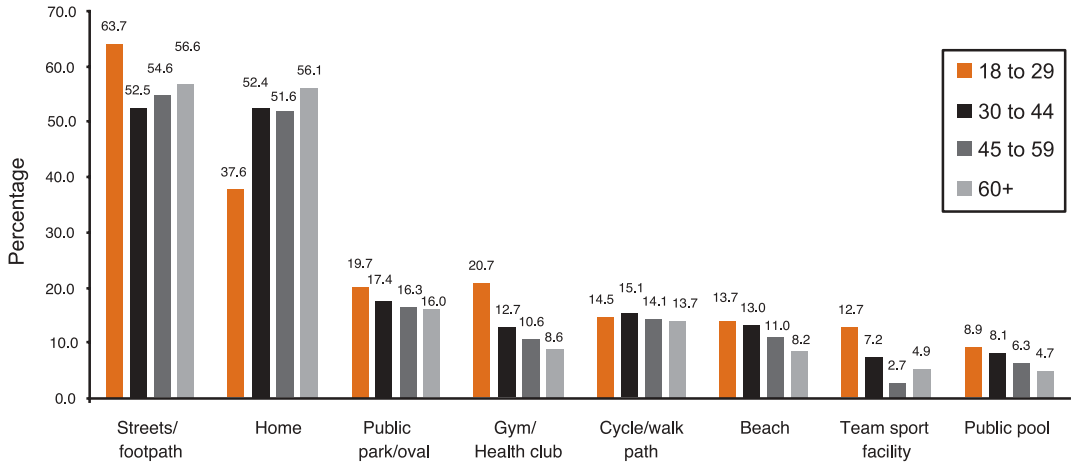


Figure 4.8: Facilities used for physical activity by age



4.8 Levels of habitual incidental physical activity

The measurement of habitual incidental physical activity was a new component added to the survey in 2002. It will be monitored by the Premier's Physical Activity Taskforce in Western Australia during the next decade. The inclusion of habitual incidental physical activity (activity undertaken as chores and measured in this survey as daily activities that are performed for fewer than 10 minutes) has become important because current physical activity guidelines indicate that all activity is beneficial to health, including exercise accumulated throughout the day. In this survey we attempted to collect habitual activities of short duration.

The 2002 survey included three items that measured the frequency of habitual incidental physical activity on weekdays, Saturdays and Sundays and four items that measured various incidental physical activities, such as using the stairs or parking farther away from your destination. These items can be reliably measured for adults (McCormack et al., *in press*).

Table 4.6 presents the prevalence of habitual incidental physical activity undertaken on weekdays, Saturdays and Sundays by demographic characteristics. Figures 4.9 to 4.12 illustrate habitual incidental physical activity performed on weekdays, Saturdays, Sundays and in total by sufficient physical activity.

4.8.1 Habitual incidental physical activity by demographics

Table 4.6 shows participation in habitual incidental physical activity on a weekday, Saturday, Sunday and every day by a number of demographic characteristics. Participation in habitual incidental physical activity was defined as short (fewer than 10 minutes) walking or cycling trips performed daily for errands, to public transport, to school, to and from work, or for recreation (excluding during work time).

Gender

More than one-half of males (51%) and females (53%) reported usually participating in some form of habitual incidental physical activity on a typical weekday. The proportion of Western Australian males and females reportedly undertaking habitual incidental activity decreased on Saturdays (40% and 38% respectively) and further decreased on Sundays (34% and 27% respectively). More males (23%) than females (19%) reported participating in habitual incidental physical activity on weekdays, Saturdays and Sundays.

Age

Participation in habitual incidental physical activity was inversely related to age. Adults aged 18 to 29 and 30 to 44 years, reported participating in habitual incidental physical activity on weekdays (68% and 52% respectively). Habitual incidental activity decreased on weekends compared to weekday activity for each age group. Eighteen to 29 years olds were more likely (31%) to participate in habitual incidental activity every day, while adults aged 60 years and older were least likely (13%) to perform habitual incidental activity every day.

Location

More than one-half (50 to 53%) of people living in the Perth metropolitan, South West and Midwest/Goldfield regions reported participating in habitual incidental activity on a weekday. No discernable patterns in habitual incidental physical activity were observed according to location, except that respondents from the Perth metropolitan region were more likely to participate in habitual incidental physical activity on weekdays (53%), Saturdays (40%) and Sundays (32%). People living in the South West were less likely (18%) than those in other geographical locations to participate in habitual incidental physical activity every day.

Marital Status

Single Western Australians were more likely to report participating in habitual incidental activity on weekdays (65%), Saturdays (48%), Sundays (38%) and every day (31%). Widowed adults were less likely to undertake incidental physical activity every day (12%).

Education and Employment

A direct relationship was observed between education level and participation in habitual incidental physical activity. This relationship held true for weekday and weekend participation. University educated adults were more likely to participate in incidental activity on weekdays (61%), Saturdays (45%), Sundays (37%) and daily (29%).

A greater proportion of students participated in habitual incidental physical activity (78%), compared with other occupations and other demographic categories. Furthermore, the proportion of students reporting participation in habitual incidental activity were higher across the entire week (weekdays, Saturday and Sunday). Retirees (14%), homemakers (16%) and blue-collar workers (17%) were least likely to participate in habitual incidental physical activity on weekdays and weekends.

TABLE 4.6: 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	51.1	40.2	33.8	23.4
Female	53.3	37.6	27.2	18.9
Age Group				
18 to 29 years	67.9	48.3	38.8	30.7
30 to 44 years	52.1	40.6	32.3	23.0
45 to 59 years	45.9	36.5	28.0	17.2
60 years or more	45.1	29.7	22.1	13.2
Location				
Perth metropolitan area	53.3	40.4	31.6	21.7
South West	51.4	34.0	26.0	17.9
Kimberley/Pilbara	46.2	38.5	27.3	20.3
Midwest/Goldfields	50.5	33.8	29.1	21.0
Marital Status				
Married/de facto	50.1	37.2	28.6	19.0
Single	64.7	47.7	38.5	30.8
Separated/divorced	43.4	36.1	29.5	17.6
Widowed	46.4	27.7	20.8	12.0
Education				
Less than TEE	47.1	33.5	25.8	16.3
TEE/diploma	52.7	39.9	30.8	21.0
University	60.6	45.3	36.8	28.6
Employment Categories				
Manager/professional	57.5	46.4	37.2	28.2
White collar trade	53.6	41.1	30.5	20.1
Blue collar	43.8	34.4	27.2	16.6
Unemployed	56.0	42.7	34.2	27.4
Home duty	48.7	33.2	24.6	15.7
Student	77.8	48.8	43.1	34.0
Retired	46.1	30.8	23.0	14.3

4.8.2 Sessions of habitual incidental physical activity by sufficient physical activity

In Figures 4.9 to 4.12 data are presented on the number of sessions of habitual incidental physical activity undertaken on weekdays, weekends and for the entire week by sufficient physical activity. This information helps to provide a better understanding of the general physical activity patterns of Western Australians. In addition, this information indicates whether there is a relationship between participation in planned physical activities such as walking, moderate and vigorous physical activity and participation in habitual incidental physical activity, which is commonly performed as part of normal daily living.

The data for weekday and weekend habitual incidental physical activity were categorised into groups based on those who participated in none, one to two sessions and three or more sessions per day. Total habitual incidental physical activity (typical weekday sessions multiplied by 5, plus Saturday and Sunday sessions) was categorised into five groups based on average number of sessions of habitual incidental activity per day:
none;

- once or twice per day;
- three or four times per day;
- five or six times per day; and
- more than six times per day.

Sufficient physical activity in Figures 4.9 to 4.12 was defined as at least 150 minutes of moderate physical activity over five or more days or 60 minutes of vigorous physical activity per week.

Incidental activities on weekdays and weekends

Participation in habitual incidental physical activity was positively related to overall physical activity level. Inactive people were more likely to report participating in no habitual incidental physical activity on a typical weekday (61%), Saturday (75%) and Sunday (80%), while sufficiently active adults were less likely to report participating in no habitual incidental physical activity (weekday-43%; Saturday-57%; Sunday-66%).

A positive trend remained between habitual incidental activity and sufficient activity levels for those participating in at least three sessions on weekdays and weekends. Sufficiently active adults were most likely to report participating in more than three sessions of habitual incidental activity on weekdays (26%), Saturdays (11%) and Sundays (7%), followed by insufficiently active adults (19%, 8% and 6%) and inactive adults (16%, 4% and 4%) across the same days (Figure 4.9 to 4.11).

Total sessions of incidental physical activity

Inactive people were more likely (52%) to report participating in no habitual incidental physical activity across an entire week, than insufficiently (37%) and sufficiently active adults (34%) (Figure 4.12). A greater proportion of insufficiently active adults (43%) participated in habitual incidental activity on average once or twice per day, while sufficiently active adults were more likely to participate in habitual incidental activity three or four times per day (16%) and five or six times per day (6%). Similar proportions of inactive (5%) and sufficiently active (5%) adults participated in habitual incidental physical activity on average more than six times per day or 43 or more times per week.

Figure 4.9: Habitual incidental physical activity (weekday) by sufficient physical activity

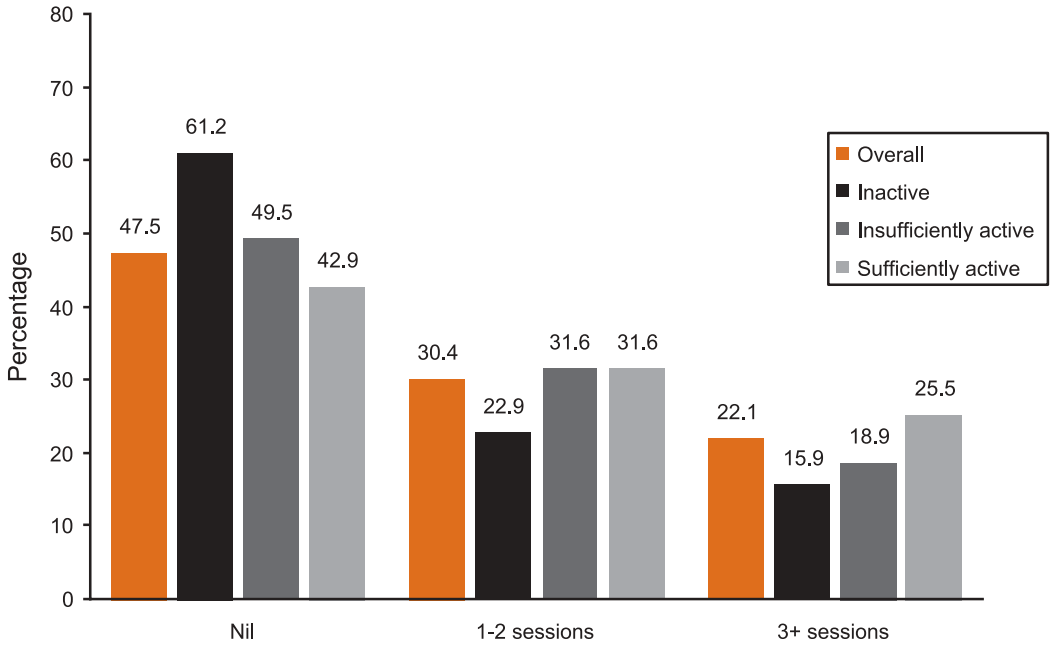


Figure 4.10: Habitual incidental physical activity (Saturday) by sufficient physical activity

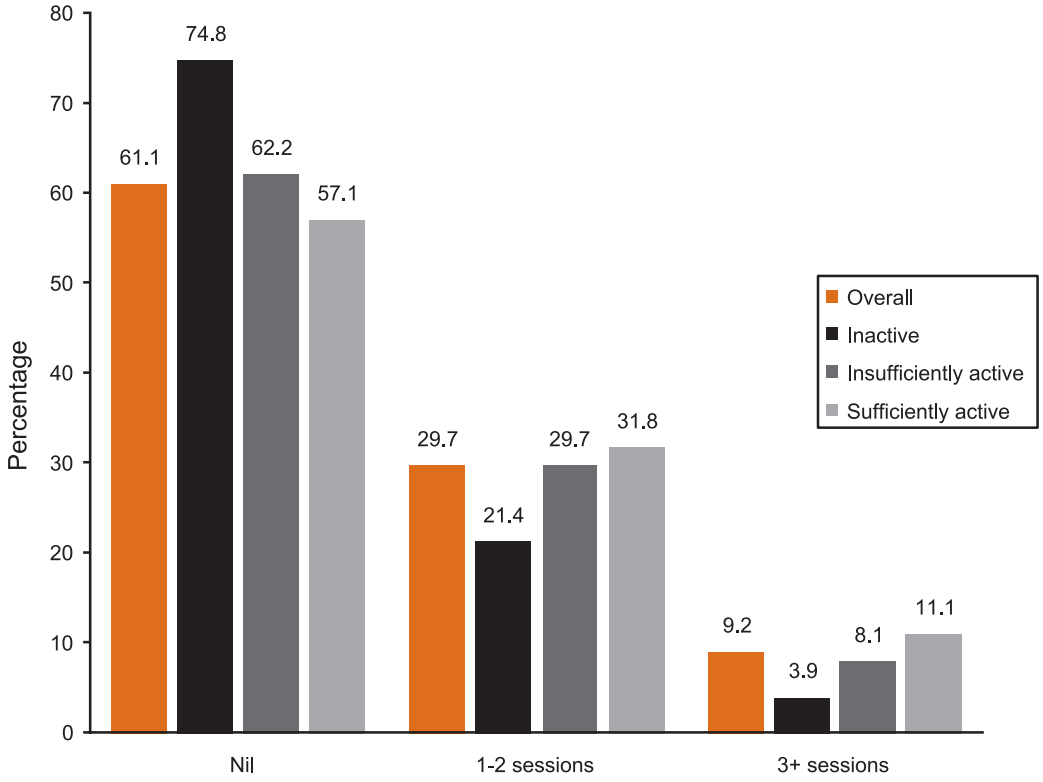


Figure 4.11: Habitual incidental physical activity (Sunday) by sufficient physical activity

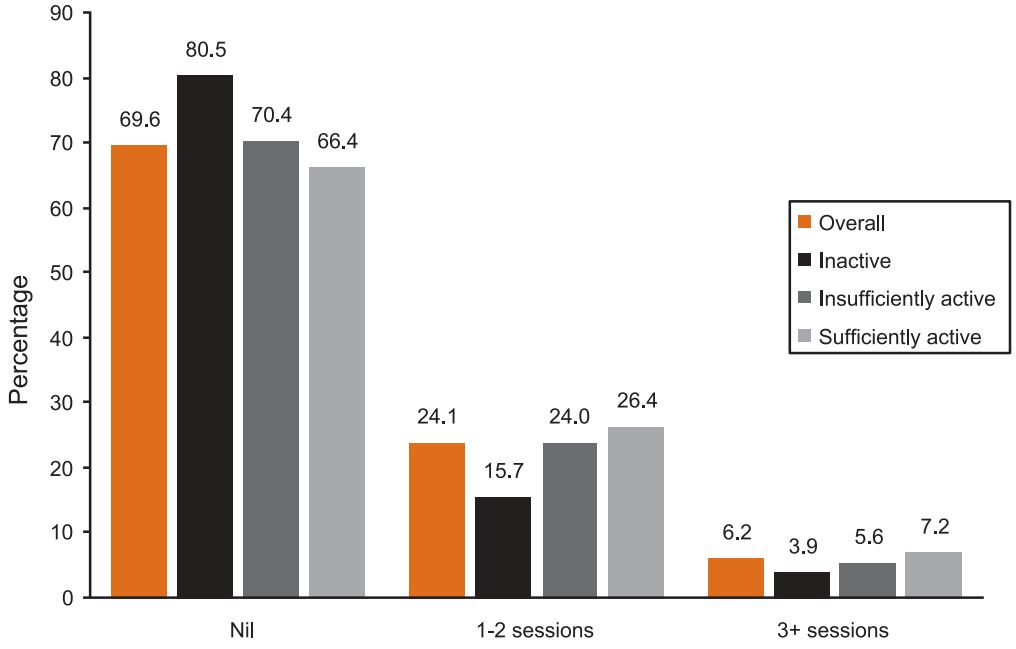
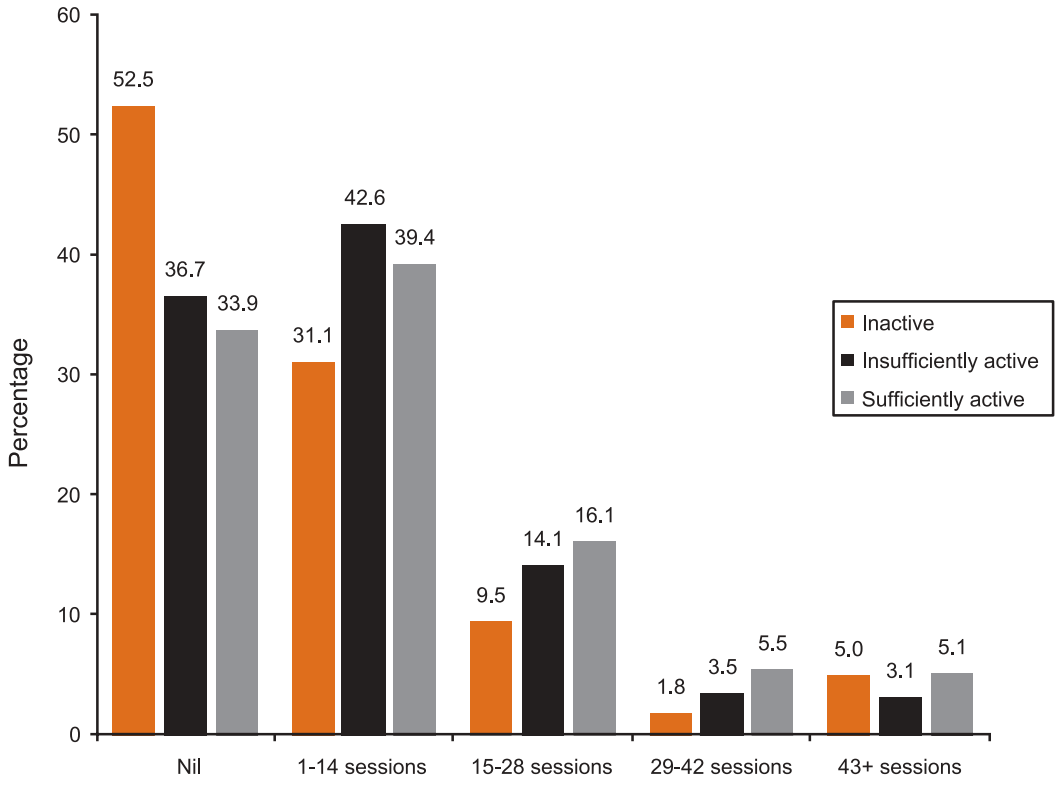


Figure 4.12: Total weekly habitual incidental physical activity by sufficient physical activity



5 PHYSICAL ACTIVITY BEHAVIOUR — PEDOMETER STUDY

5.1 Overview of data presented

This chapter presents the pedometer data collected in 2002. As noted earlier, pedometers provide an objective assessment of physical activity, particularly for activities involving walking or running. The pedometer cannot be assumed to measure all types of physical activity because activities such as swimming and cycling cannot be measured using this instrument. However, given that walking is the most commonly performed physical activity by adults nationally and in Western Australia (Armstrong et al., 2000; Bull et al., 2000) and that many other types of physical activity involve some form of walking or running (e.g. most team sports, golf, tennis, aerobics, etc.), the counting of steps should provide an approximation of the general physical activity levels of adults. In addition to walking and jogging/running for recreation and transport, the pedometer will also capture any changes in habitual incidental physical activity.

Table 5.1 presents descriptive data including mean steps per day, medians, standard deviations and confidence intervals for level of physical activity and major demographic characteristics.

Presently the optimum number of daily steps required to confer a health benefit is not known. However, recent studies have reported that performing 10,000 steps or more per day may result in health benefits (Wilde, Sidman and Corbin, 2001; Iwane et al., 2000; Yamanouchi et al., 1995). Furthermore, various physical activity campaigns and interventions both overseas (e.g. Shape up America; Health Partners; North Ottawa Community Health System) and in Australia (e.g. Rockhampton 10,000 Steps Project) are promoting the target of 10,000 steps per day.

Therefore the proportion[2] of participants undertaking below or above 10,000 steps per day by demographic variables and physical activity level are presented in Table 5.2.
To provide additional information about the distribution of daily steps performed, the proportion of participants performing more or less than 15,000 steps per day is also presented.

5.2 Pedometer steps accumulated by Western Australians

On average, Western Australian adults in the present study took 9,695 steps per day (Table 5.1). Under one-half (47%) of respondents performed 10,000 or more steps per day and considerably fewer people (10%) took more than 15,000 steps per day (Table 5.2).

Gender

On average, men performed more steps per day (10,221 steps) than women (9,178 steps) (Table 5.1). A greater proportion of men (52%) than women (42%) performed 10,000 steps or more per day, with more than twice as many men as women (13% versus 6%) performing 15,000 steps or more per day (Table 5.2).

Age group

Older adults, aged 60 years and over, took fewer mean daily steps (8,122 steps) than other age groups (Table 5.1). Over one-half of Western Australians aged 18 to 29 years (53%) and 30 to 44 years (57%) performed 10,000 steps or more per day (Table 5.2). A considerably lower proportion (29%) of adults aged 60 years and over performed 10,000 steps or more per day. A higher proportion of adults aged 30 to 44 years (13%) and 45 to 59 years (12%) took more than 15,000 steps per day compared to the other age categories.

Location

Adults living in the South West performed the fewest mean daily steps (9,402 steps) while the Midwest/Goldfields performed the highest (10,360 steps) (Table 5.1). Less than one-half of adults residing in the Perth metropolitan (47%) and South West (40%) regions performed 10,000 steps or more per day (Table 5.2). No adults from the Kimberley/Pilbara region reported taking 15,000 steps or more per day.

Education and employment

Retired adults performed the fewest daily steps (8,054 steps); adults in blue-collar occupations performed the most (11,565 steps) (Table 5.1). In Table 5.2, the proportions of students, manager/professionals and white-collar workers taking 10,000 steps or more per day were similar (45% to 46%). A higher proportion (75%) of adults from blue-collar occupations took 10,000 steps or more per day. Furthermore, a higher proportion of blue-collar workers (19%) performed 15,000 steps or more per day, with equal proportions of adults reaching this target among managerial/professional (10%) and white-collar occupations (10%).

Few differences in mean daily steps were observed between the three education categories (Table 5.1). Almost one-half (49%) of TEE/diploma-educated adults took 10,000 steps or more per day, with this group more likely (13%) to take 15,000 steps or more per day compared with adults at other levels of education.

Marital status

Widowed adults performed fewer steps per day (7,050 steps/day) than those who reported being married/de facto (9,762 steps/day), single (9,750 steps/day), or separated/divorced (10,183 steps/day) (Table 5.1). The proportion of adults in different marital status categories performing at least 10,000 steps per day was similar (47% to 52%) except for those who reported being widowed (24%) (Table 5.2).

Children under five and under 18 years of age

Western Australian adults with at least one child aged either under five years or under 18 years performed more daily steps than those without children under 18 years (Table 5.1). Of those adults with at least one child aged 18 years or younger at home, 57% performed 10,000 steps or more per day (Table 5.2). In contrast only 40% of adults who reported not having a child under 18 years performed 10,000 steps or more per day.

Current level of physical activity

Western Australians undertaking sufficient physical activity performed on average 10,227 steps per day, compared with only 8,995 steps and 9,250 steps among insufficiently active and inactive people respectively (Table 5.1). However, a little over one-half of inactive adults (54%) and sufficiently active adults (52%) performed 10,000 steps or more per day. Twice as many sufficiently active adults performed 15,000 steps or more per day compared with insufficiently active and inactive people (13%, 6% and 5% respectively, see Table 5.2).

TABLE 5.1: MEAN STEPS PER DAY BY DEMOGRAPHIC CHARACTERISTICS AND PHYSICAL ACTIVITY LEVEL

Variable	Descriptive				
	Mean	Standard Deviation	Median	95% CI lower	95% CI upper
Gender					
Male	10221	3798	10205	9670	10742
Female	9178	3797	9137	8691	9705
Age Group					
18 to 29 years	9890	3191	10381	9096	10684
30 to 44 years	10565	3772	11018	9940	11191
45 to 59 years	9749	3959	9487	9054	10444
60 years or more	8122	3715	7844	7347	8896
Location					
Perth metropolitan	9627	3819	9574	9205	10048
South West	9402	4320	8655	8107	10697
Kimberley/Pilbara	10045	2887	9604	8631	11458
Midwest/Goldfields	10360	3738	10384	9209	11511
Occupation					
Manager/Professional	9863	3600	9641	9204	10521
White collar	10000	3638	9280	9036	10963
Blue collar	11565	3950	11515	10682	12447
Unemployed	8774	3671	8276	6599	10949
Home duty	9012	3793	9032	8078	9947
Student	8747	3276	9538	7558	9937
Retired	8054	3651	7525	7110	8998
Education					
Less than TEE	9624	3955	9501	8952	10295
TEE/diploma	9932	4000	9789	9332	10530
University	9423	3394	9244	8796	10050
Marital status					
Married/de facto	9762	3806	9502	9331	10193
Single	9750	3581	10517	8823	10676
Separated/divorced	10183	3817	10276	9043	11322
Widowed	7050	4370	5915	4819	9282
Children under 5 years					
nil	9558	3967	9296	9147	9967
One or more	10387	3154	10356	9637	11138
Children under 18 years					
nil	9192	3886	8945	8709	9675
One or more	10422	3631	10670	9879	10967
Activity level[1]					
Inactive	9250	3852	10170	7964	10536
Insufficiently active	8995	3650	8405	8291	9500
Sufficiently active	10227	3850	10248	9743	10711
Overall	9695	3827	9530	9239	9970

[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).

TABLE 5.2: PERFORMANCE OF MORE OR LESS THAN 10,000 STEPS OR 15,000 STEPS PER DAY BY DEMOGRAPHIC CHARACTERISTICS AND PHYSICAL ACTIVITY LEVEL

Variable	Pedometer Category			
	< 10 000 steps/day	10 000+ steps/day	<15 000 steps/day	15 000+ steps/day
Gender				
Male	47.6	52.4	86.9	13.1
Female	58.4	41.6	93.6	6.4
Age Group				
18 to 29 years	46.9	53.1	95.4	4.6
30 to 44 years	43.0	57.0	87.3	12.7
45 to 59 years	55.1	44.9	88.2	11.8
60 years or more	71.4	28.6	93.4	6.6
Location				
Perth metropolitan	53.3	46.7	89.9	10.1
South West	60.0	40.0	91.1	8.9
Kimberley/Pilbara	50.0	50.0	100.0	0.0
Midwest/Goldfields	46.5	53.5	88.4	11.6
Activity level				
Inactive	45.9	54.1	94.6	5.4
Insufficiently active	63.4	36.6	94.4	5.6
Sufficiently active	48.2	51.8	87.3	12.7
Occupation				
Manager/ Professional	54.7	45.3	89.7	10.3
White collar	54.4	45.6	89.7	10.3
Blue collar	25.3	74.7	81.0	19.0
Unemployed	69.2	30.8	92.3	7.7
Home duty	60.6	39.4	93.9	6.1
Student	54.8	45.2	100	0.0
Retired	73.3	26.7	93.3	6.7
Education				
Less than TEE	52.2	47.8	90.4	9.6
TEE/diploma	50.6	49.4	86.8	13.2
University	58.3	41.7	94.8	5.2
Marital status				
Married/de facto	53.3	46.7	89.4	10.6
Single	48.3	51.7	93.3	6.7
Separated/divorced	50.0	50.0	91.3	8.7
Widowed	76.5	23.5	88.9	11.1
Children under 5 years				
nil	54.8	45.2	89.5	10.5
One or more	44.3	55.7	93.0	7.0
Children under 18 years				
nil	60.2	39.8	91.6	8.4
One or more	43.1	56.9	87.9	12.1
Overall	**53.2**	**46.8**	**90.2**	**9.8**

[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).

5.3 Factors associated with performing at least 10,000 steps per day

Adjusted odds ratios for performing 10,000 steps or more per day were calculated using a force-entry logistic regression. All variables were entered into the regression model simultaneously. Table 5.3 presents the odds ratios and the 95% confidence intervals. It should also be noted that the statistical significance of the odds ratios are affected by sample size. Therefore statistically significant differences that may be expected may not be found given the small sample size in some of the groups for the pedometer study.

TABLE 5.3: ADJUSTED ODDS RATIOS FOR FACTORS ASSOCIATED WITH PERFORMING 10,000 STEPS OR MORE PER DAY

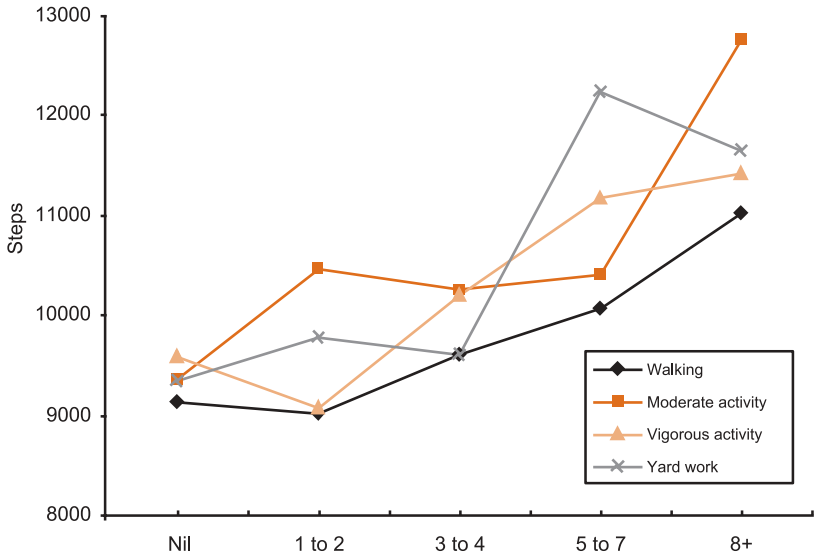
Characteristic	Odds ratio	Confidence interval
Gender		
Male	1.00	
Female	.66	.40-1.09
Age Group		
18 to 29 years	1.00	
30 to 44 years	1.12	.43-2.92
45 to 59 years	.90	.33-2.45
60 years or more	.56	.17-1.83
Location		
Perth metropolitan area	1.00	
South West	.73	.34-1.56
Kimberley/Pilbara	.70	.22-2.21
Midwest/Goldfields	.96	.47-1.97
Marital Status		
Married/de facto	1.00	
Single	1.58	.65-3.86
Separated/divorced	1.60	.79-3.24
Widowed	1.33	.42-4.22
Education		
Less than TEE	1.00	
TEE/diploma	.68	.40-1.16
University	.55	.29-1.03
Employment categories		
Manager/professional	1.00	
White collar trade	1.11	.54-2.30
Blue collar	2.83	1.36-5.86
Unemployed	.36	.09-1.40
Home duty	.73	.31-1.71
Student	.48	.14-1.64
Retired	.72	.28-1.87
Children under 5 years		
Nil	1.00	
One or more	1.10	.50-2.44
Children under 18 years		
Nil	1.00	
One or more	1.64	.90-2.99
BMI categories		
Acceptable	1.00	
Underweight	1.22	.26-5.59
Overweight	.51	.31-.84
Obese	.45	.22-.91
Activity level		
Sufficient	1.00	
Insufficient	.45	.28-.73
Inactive	.87	.39-1.91

After adjusting for other demographic variables, the only variables significantly and independently associated with achieving 10,000 steps or more per day were weight status and levels of physical activity. There was a general trend associated with BMI, with both overweight and obese adults less likely (OR = .51 and OR = .45, respectively) to perform at least 10,000 steps per day compared to adults in the acceptable-weight range. Adults who were insufficiently active were significantly less likely (OR = .45) than sufficiently active adults to perform 10,000 steps or more per day.

5.4 The relationship between weekly activity sessions and daily steps

Figure 5.1 presents the mean daily step count by the number of reported sessions of walking, moderate-intensity activity, vigorous-intensity activity and yard work performed in the past week. There is a linear trend for each activity, with an increase in the number of daily steps as the number of sessions increases. Adults participating in five to seven or more sessions per week of walking, moderate activity, vigorous activity or yard work, performed on average more than 10,000 steps per day. Current physical activity guidelines, although not including a recommendation for the number of steps to be undertaken, recommend that physical activity should be undertaken on most days of the week, preferably all days.

Figure 5.1: Physical activity sessions by mean daily steps



6 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 models.

The survey sought information on readiness to be physically active according to the 'stage of change' model and the results are presented in Section 6.1. Section 6.2 provides information about knowledge of major physical activity campaign messages that have been promoted in Western Australia during the past few years. Motivators for participation amongst the physically active (Section 6.3) and barriers to increasing physical activity (Section 6.4) provide useful information for planning programs addressing physical activity promotion.

A strong predictor of participation in physical activity is the confidence to complete a specific task in a variety of different situations, otherwise known as self-efficacy. One item assessed the level of self-efficacy towards participation in regular physical activity (Section 6.5).

While knowledge about physical activity and self-efficacy are important predictors of physical activity participation, on their own they are usually considered to be insufficient for maintaining regular participation. Developing skills to overcome barriers to being active is also important. Social support has been found to be associated with long-term physical activity participation and the results are shown in Section 6.6.

In the survey respondents were also asked:

- if they had arranged to meet someone for physical activity (Section 6.7);
- whether they enjoy participating in physical activity (Section 6.8);
- the nature of physical activity in their workplace (Section 6.9);
- about participation in habitual incidental physical activity (Section 6.10); and
- if they received advice from their general practitioner during their last visit (Section 6.11).

Where appropriate pedometer data are included to supplement each section.

6.1 Readiness to be more physically active

Readiness to increase physical activity was measured as described in the 'stage of change' model by Prochaska and Marcus (Prochaska, 1996; Marcus et al., 1994). Respondents were classified using the categories of Precontemplation (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).

Among those who were insufficiently active, 65% placed themselves in the precontemplation, contemplation or preparation stages, compared to only 38% of sufficiently active adults. Of the insufficiently active, only 10% were precontemplators, while 28% considered themselves to be in the 'maintenance' stage. Five percent of those who were sufficiently active were in the 'precontemplation' stage.

Demographic factors associated with stages of behaviour change are reported separately for those who were insufficiently active (Table 6.1) and those sufficiently active (Table 6.2). Pedometer data are reported in Table 6.3.

Gender

Gender differences were small. However, among both the insufficiently and sufficiently active groups, the proportion who considered themselves to be in the 'maintenance' stage was slightly higher for males than females (Tables 6.1 and 6.2).

Age group

Older people were much more likely to see themselves in the 'maintenance' stage and much less likely to see themselves in the 'action' stage, irrespective of current physical activity status. In the insufficiently active group, the proportion reporting precontemplation increased with age, while the adults in the contemplation and action stages deceased with age (Table 6.1).

Location

There were few clear regional differences. However, adults in the Kimberley/Pilbara region had higher proportions of adults in the 'action' stage and lower proportions in the 'maintenance' stage, perhaps reflecting the younger age distribution in that area (Table 6.1 and 6.2).

Pedometer steps and 'stage of change'

Adults in the 'maintenance' stage of physical activity adoption performed the highest number of daily steps (10,412 steps/day) compared to those in other stages. However, statistically significant differences were only found between those in the 'maintenance' stage and those in the 'contemplation' (8,373 steps/day) and 'preparation' stages (8,851 steps/day). Among subjects included in the pedometer study, 14% reported being in the 'action' stage and 54% reported being in the 'maintenance' stage (Table 6.3).

TABLE 6.1: PHYSICAL ACTIVITY STAGE OF BEHAVIOUR AMOUNG INSUFFICIENTLY[1] ACTIVE ADULTS

Variable	'Stage of Change'				
	PC	C	P	A	M
Gender					
Male	12.3	21.2	30.7	5.6	30.2
Female	8.7	25.3	30.9	9.9	25.2
Age group					
18 to 29 years	4.7	29.4	30.6	11.1	24.3
30 to 44 years	7.7	28.1	33.3	10.0	20.8
45 to 59 years	11.6	19.2	32.4	7.8	28.9
60 years or more	16.0	17.9	25.8	3.3	37.0
Location					
Perth metropolitan	10.8	24.1	31.4	7.9	25.8
South West	6.0	22.0	29.1	7.1	35.7
Kimberley/Pilbara	14.8	19.7	31.1	14.8	19.7
Midwest/Goldfields	10.8	21.5	29.1	5.7	32.9
Total	**10.4**	**23.4**	**30.8**	**7.9**	**27.5**

Stages: PC) Precontemplation; 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.

TABLE 6.2: PHYSICAL ACTIVITY STAGE OF BEHAVIOUR AMOUNG SUFFICIENTLY[1] ACTIVE ADULTS					
Variable	**'Stage of Change'**				
	PC	**C**	**P**	**A**	**M**
Gender					
Male	6.2	10.3	20.9	9.0	53.6
Female	4.5	13.7	19.7	14.1	47.9
Age group					
18 to 29 years	1.5	11.1	20.5	19.1	47.8
30 to 44 years	4.8	15.6	23.7	12.2	43.7
45 to 59 years	6.3	10.6	20.1	10.4	52.5
60 years or more	8.8	9.8	15.8	4.8	60.8
Location					
Perth metropolitan	5.5	13.3	19.9	12.0	50.3
South West	3.6	10.9	21.1	11.4	53.0
Kimberley/Pilbara	7.0	9.8	21.7	14.7	46.9
Midwest/Goldfields	5.6	12.7	21.9	7.8	52.0
Total	**5.3**	**12.1**	**20.3**	**11.7**	**50.6**

Stages: PC) Precontemplation; C) Contemplation; P) Preparation; A) Action; M) Maintenance
[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).

TABLE 6.3: STAGE OF BEHAVIOUR CHANGE BY MEAN DAILY STEPS					
Stage of physical activity behaviour	**N steps/day**	**Mean**	**SD lower bound**	**95% CI upper bound**	**95% CI**
I do not exercise and do not intend to	2.5	**9444**	4293	6334	12554
I currently do not exercise but I am thinking about it	10.4	**8373** [a]	3298	7341	9405
I currently exercise but not regularly	19.1	**8851** [b]	3970	7948	9754
I currently exercise but have only done so in the past 6 months	13.7	**9232**	3565	8272	10191
I currently exercise regularly and have done so for more than 6 months	54.2	**10412** [a b]	3816	9903	10922

[a b] Statistically significant difference ($p < .05$)

6.2 Knowledge of physical activity messages

Knowledge of physical activity messages was assessed using two questions. The first asked the number of minutes of activity recommended 'each day for good health'. The second question asked about memory of specific campaign messages, in particular the Department of Health's 'Find thirty, *it's not a big exercise*' message (Table 6.4 to 6.7).

Overall, 54% of adults were aware that 30 minutes of daily physical activity were required (Table 6.4). The proportion giving the correct response was substantially higher among females and those aged 18 to 44 years. There were no other significant trends according to location, activity level, education or body mass index (BMI) (Table 6.4).

Table 6.5 presents the perceived number of minutes of daily physical activity required as reported by participants in the pedometer study. To assist in the interpretation of the results, responses were categorised into four groups: those who didn't know; those reporting less than 30 minutes; those reporting exactly 30 minutes; and those reporting more than 30 minutes. The majority (57%) of participants reported that exactly '30 minutes' of moderate physical activity on most days were required for good health.

Participants (28%) who reported that 'more than 30 minutes' of physical activity were required on most days performed significantly more steps per day (10,844 steps) than those who reported that 'less than 30 minutes' (8,988 steps/day) were required and those who reported that 'exactly 30 minutes' (9,325 steps/day) were required (Table 6.5).

Table 6.6 shows the proportions of people aware of the three major physical activity promotional messages delivered in Western Australia in recent years. This was asked through a prompted awareness question about recently heard messages. The table also shows the mean minutes of physical activity (moderate minutes plus vigorous weighted by 2), along with confidence intervals, for those who did and did not report the messages.

The majority of respondents reported recalling the 'Find thirty' (71%) and 'Be active' (74%) messages. Overall, 74% of respondents were aware of three or more messages. In general, those aware of physical activity messages undertook more minutes of physical activity on average per week. However, those aware of the well-established messages such as 'Be active' (74%), 'Be active every day' (50%), 'TravelSmart' (32%) and 'Walk there today' (21%) participated in significantly more minutes of physical activity per week than those who did not report these messages.

Table 6.7 reports the proportion of pedometer study participants who recalled recent physical activity messages. The mean daily steps and the proportion performing more than 10,000 steps per day are included.

Generally, proportions of respondents in the pedometer study who recalled the physical activity messages were similar to those in the questionnaire survey. Participants in the pedometer study who recalled 'Find thirty' (75%), or three or more messages (77%) undertook significantly more steps on average than those who did not recall these messages.

TABLE 6.4: PROPORTION OF SUBJECTS STATING 'EXACTLY 30 MINUTES' OF MODERATE PHYSICAL ACTIVITY IS REQUIRED ONMOST DAYS FOR GOOD HEALTH

Variable	(%)
Gender	
Male	49.5
Female	59.5
Age Group	
18 to 29 years	59.1
30 to 44 years	59.7
45 to 59 years	52.2
60 years or more	41.3
Location	
Perth metropolitan	54.0
South West	51.5
Kimberley/Pilbara	56.6
Midwest/Goldfields	52.6
Activity level[1]	
Inactive	47.7
Insufficiently active	57.2
Sufficiently active	53.0
BMI category	
Normal weight	54.2
Underweight	51.3
Overweight	53.8
Obese	55.5
Total	53.6
Total	**53.6**

[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).

TABLE 6.5: KNOWLEDGE OF RECOMMENDED MINUTES OF DAILY PHYSICAL ACTIVITY REQUIRED FOR HEALTH BY MEAN DAILY STEPS

Participant response[1]	Proportion (%)	Mean steps	SD	95% CI lower bound	95% CI upper bound
< 30 minutes	10.6	8988 [b]	3327	7991	9986
Exactly 30 minutes	57.4	9325 [a]	3651	8864	9796
More than 30 minutes	28.0	10844 [a b]	4073	10105	11584
Don't know	4.0	8842	4356	6594	11091

[1] Participants reported the minutes of daily physical activity required and these were categorized accordingly
[a b] Statistically significant difference ($p < .05$)

TABLE 6.6: KNOWLEDGE OF PHYSICAL ACTIVITY MESSAGES BY PHYSICAL ACTIVITY MINUTES[1]

Variable	Recalled message %	Mean	95% CI lower bound	95% CI upper bound
Find thirty				
Yes	70.9	334.1	318.8	349.3
No	29.1	325.5	300.5	350.6
It's not a big exercise				
Yes	37.7	345.0	323.2	366.8
No	62.3	323.5	307.2	339.8
Find thirty, it's not a big exercise				
Yes	55.0	331.4	314.2	348.6
No	45.0	331.9	311.8	351.9
Be active				
Yes	74.0	349.2[a]	333.4	365.0
No	26.0	281.3	259.2	303.4
Be active every day				
Yes	49.9	355.3 [a]	336.2	374.5
No	50.1	307.9	290.2	325.6
TravelSmart				
Yes	32.0	359.4 [a]	333.7	385.1
No	68.0	318.5	303.6	333.4
Walk there today				
Yes	20.9	366.5[b]	335.2	397.8
No	79.1	322.4	308.4	336.7
Knowledge of any three messages[2]				
Yes	74.3	336.0	321.0	351.0
No	-25.7	319.0	292.5	345.5

[1] The sum of minutes of walking and moderate activity plus minutes of vigorous x 2.
[2] Knowledge of either 'Find thirty', 'It's not a big exercise', or 'Find thirty, it's not a big exercise'
[a] $p < .01$; [b] $p < .05$

Table 6.7: Knowledge of physical activity messages by Daily Steps			
Variable	**Recalled message %**	**Mean Steps per day**	**10 000+ steps**
Find thirty			
Yes	75.1	9965 [a]	49.1
No	24.9	8977	40.0
It's not a big exercise			
Yes	38.9	9605	46.7
No	61.1	9782	46.9
Find thirty, it's not a big exercise			
Yes	61.8	9815	47.7
No	38.2	9559	45.7
Be active			
Yes	76.7	9788	46.6
No	23.3	9477	47.5
Be active every day			
Yes	54.1	9803	47.2
No	45.9	9608	46.7
TravelSmart			
Yes	33.7	9681	44.8
No	66.3	9733	47.9
Walk there today			
Yes	21.4	9498	47.3
No	78.6	9775	46.8
Knowledge of any three messages[1]			
Yes	76.6	9904 [b]	48.3
No	23.4	9114	41.4

[1] Knowledge of either 'Find thirty', 'It's not a big exercise', or 'Find thirty, it's not a big exercise'

[a] $p < .01$; [b] $p < .05$

6.3 Motivators to being active

Western Australians who reported that they had participated in at least some physical activity in the past week were asked their main reasons for being active (Table 6.8). The most frequently reported reasons for being active were to improve fitness (34%), enjoyment (20%) and weight control (9%). These reasons were independent of gender, age and location. Only 1% to 2% of Western Australian adults gave 'reduction in the risk of heart disease' as their major reason for participation in regular physical activity.

Gender

Male (34%) and female (33%) respondents reported 'to improve fitness' as their major reason for participating in physical activity. Males (22%) were more likely than females (17%) to report participation in physical activity for enjoyment, while females (11%) were more likely than males (7%) to report weight control as their main reason for participating in physical activity (Table 6.8).

Age group

Older adults were more likely to report 'reducing the risk of disease' as the main reason for being active (4%) compared with younger adults. Conversely younger adults (under 60 years of age) were more likely to report fitness as a motivating factor compared with adults over 60 years of age.

Weight control was more important for those aged between 30 and 59 years and was less relevant for those aged over 60 years and under 30 years (Table 6.8).

TABLE 6.8: MAIN REASONS FOR DOING PHYSICAL ACTIVITY BY VARIOUS CHARACTERISTICS

Variable	Reason					
	Improve fitness	Enjoy activity	Weight control	Feel better about self	Improve appearance	Reduce risk of disease
Gender						
Male	34.1	22.3	7.1	2.2	0.1	1.3
Female	33.2	17.0	11.2	4.2	0.7	1.6
Age Group						
18 to 29 years	39.2	21.8	7.2	3.4	1.4	0.2
30 to 44 years	33.1	18.2	11.5	3.9	0.2	1.2
45 to 59 years	32.3	19.5	10.7	2.5	0.1	1.0
60 years or more	29.9	19.3	6.6	3.0	0.2	3.8
Location						
Perth metropolitan	33.3	17.7	9.3	3.3	0.5	1.5
South West	38.3	27.5	7.2	2.8	0.0	0.6
Kimberley/Pilbara	34.2	17.1	16.2	4.3	0.0	0.9
Midwest/Goldfields	29.8	24.5	8.2	2.0	0.8	2.4
Activity level[1,2]						
Insufficient	29.8	16.8	8.7	3.5	0.1	1.8
Sufficient	35.9	21.1	9.6	3.1	0.6	1.2
Total	**33.7**	**19.6**	**9.3**	**3.2**	**0.4**	**1.4**

[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).
[2] Subjects participating in no activity (walking, moderate, or vigorous) are excluded.

6.4 Barriers to participation in physical activity

Reasons for not being (more) active were obtained via one multiple response item. The results for the most frequently reported barriers are shown in Table 6.9.

A lack of time was the most frequently reported barrier to being (more) active (49%). Fifteen percent of adults indicated that they considered they were already active enough. Other constraints to being (more) active included a lack of motivation (11%), poor health (10%), child responsibilities (6%) and being too old (3%).

Gender

Slightly more women (54%) than men (49%) stated that lack of time was a barrier to being (more) active. Women (10%) were also more likely to report childcare as a barrier to participation compared with men (3%).

Age group

Lack of time was the most frequently reported barrier to participation for all adults aged under 60 years. Poor health was the most frequently reported reason for not being more active by older adults (60 years and over). Childcare was a more significant barrier for adults aged 30 to 44 years (14%) compared with all other age categories.

Location

Adults living in the Kimberly/Pilbara were less likely (35%) compared to adults living in other regions to report 'lack of time' as a barrier. The proportion of Midwest/Goldfields adults reporting 'poor health' was higher than other regions (14%) (Table 6.9).

Current level of physical activity

'Lack of time' was the major constraint for participation in physical activity for all adults, regardless of their current activity level (Table 6.9). Inactive adults reported 'poor health' (19%), 'lack of motivation' (15%) and already being 'active enough' (8%) as major barriers to being (more) active. Adults participating in some but not sufficient levels of activity, reported a 'lack of motivation' (16%), 'poor health' (13%), followed by already 'being active enough' (9%), as major barriers to physical activity.

Adults who were undertaking sufficient levels of physical activity reported a 'lack of time' as the most common barrier to being active (51%). Twenty-one percent of this group stated they were already 'active enough' as the reason for not being more active. Adults participating in sufficient levels of physical activity were less likely to indicate 'poor health' (6%), 'lack of motivation' (11%) and 'childcare' (5%) as barriers to participation compared to inactive and insufficiently active adults.

TABLE 6.9: MAIN BARRIERS TO BEING MORE ACTIVE BY AGE, GENDER, LOCATION AND ACTIVITY LEVEL

	Reason					
Variable	**Lack of time**	**No motivation**	**Poor health**	**Too old**	**Active enough**	**Children to look after**
Gender						
Male	48.8	11.8	9.8	3.4	18.6	3.3
Female	54.1	14.4	10.5	3.5	11.9	9.5
Age Group						
18 to 29 years	59.9	15.6	2.2	0.0	11.6	8.7
30 to 44 years	59.3	12.4	5.3	0.7	11.7	13.5
45 to 59 years	51.5	13.4	10.6	1.6	15.4	1.3
60 years or more	18.9	11.3	24.4	13.0	23.4	0.3
Location						
Perth metropolitan	49.6	13.3	9.9	3.2	14.8	6.0
South West	47.7	10.7	9.3	4.3	18.8	8.6
Kimberley/Pilbara	35.0	15.3	9.1	4.2	11.9	9.1
Midwest/Goldfields	48.4	13.4	13.7	3.9	14.7	6.2
Activity level[1]						
Inactive	41.1	14.8	19.3	3.9	8.2	6.8
Insufficiently active	47.5	16.1	12.7	3.8	8.7	8.9
Sufficiently active	51.0	10.9	6.4	3.2	20.7	5.0
Total	**48.6**	**10.9**	**10.1**	**3.4**	**15.2**	**6.5**

[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).

6.5 Confidence in participating in physical activity

A single item was used to assess self-efficacy towards participating in 30 minutes of moderate physical activity on five or more days per week. These data are presented in Table 6.10. Average daily steps performed by respondents with different levels of self-efficacy are presented in Table 6.11.

The majority of people (81%) 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. Approximately 10% of adults were 'not at all confident' in their ability to undertake activity at this level.

Gender

The majority of men (64%) and women (53%) were 'very confident' that they could participate in physical activity on 5-7 days per week. More women (12%) than men (9%) reported 'not being confident' in participating in physical activity on most days of the week (Table 6.10).

Age group

Across all age categories, most adults reported being 'very confident' of achieving 30 minutes of moderate physical activity on 5-7 days per week. Adults aged over 60 years were less confident (Table 6.10).

Location

Adults living in the Kimberley/Pilbara region were most likely to report being very confident (65%) and least likely to report being only 'somewhat confident' (15%) of being active at recommended levels. Respondents from the same region were most likely to report being 'not at all confident' (13%) compared to Western Australians living in other regions (Table 6.10).

TABLE 6.10: 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	63.6	20.7	6.7	8.8
Female	53.2	24.8	10.0	11.9
Age Group				
18 to 29 years	60.5	25.2	6.8	7.5
30 to 44 years	58.6	21.8	10.6	9.1
45 to 59 years	62.5	20.8	7.9	8.5
60 years or more	50.4	24.2	7.5	17.3
Location				
Perth metropolitan	57.6	23.2	8.4	10.7
South West	58.7	23.3	9.0	8.8
Kimberley/Pilbara	65.0	15.4	7.0	12.6
Midwest/Goldfields	59.2	22.9	8.5	9.2
Activity level[1]				
Inactive	34.5	24.3	11.8	29.1
Insufficiently active	41.6	30.6	13.0	14.5
Sufficiently active	73.8	17.9	4.8	3.3
Total	**58.3**	**22.8**	**8.4**	**10.4**

[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).

TABLE 6.11: CONFIDENCE OF PARTICIPATING IN FIVE OR MORE DAYS PER WEEK OF PHYSICAL ACTIVITY BY DAILY STEPS

Confidence level	Proportion (%)	Mean steps	SD	95% CI lower bound	95% CI upper bound
Not at all confident	6.0	7880	3279	6498	9263
Somewhat confident	8.2	8414	2900	7380	9448
Moderately confident	23.4	8794	3618	8052	9535
Very confident	62.4	10406a	3917	9919	10893

[a] Significantly different from all other categories ($p < .05$)

Current levels of physical activity

Sufficiently active people were more likely (74%) to be 'very confident' and less likely to be 'somewhat confident' (5%) and 'not at all confident' (3%) of achieving 30 minutes of moderate physical activity on at least five days per week. Conversely, inactive adults were more likely to be 'not at all confident' (29%) and less likely to be 'very confident' (34%) of achieving this level of physical activity (Table 6.10).

Average daily steps

Table 6.11 presents the mean number of steps per day by level of self-efficacy. Generally, participants in the pedometer study were more likely to be 'very confident' of achieving recommended levels (62%) and less likely to be 'not at all confident' (6%) compared with the entire survey sample. The mean number of daily steps increased as confidence in participating in moderate physical activity on five or more days per week increased. The mean number of steps recorded for respondents who reported being 'very confident' (10,406 steps/day) was significantly greater than those recorded for all other levels of confidence. Those who were 'not at all confident' undertook nearly 2,500 fewer steps per day (i.e. 7,880 steps/day) than those who were 'very confident'.

6.6 Social support for physical activity

Social support from family, friends or colleagues is a significant factor in both initiating and maintaining participation in physical activity. Support can be obtained in different ways such as exercising in a group or with a partner. One item asked respondents to indicate who normally did physical activity with them. More than one response could be given and these results are shown in Table 6.12.

Western Australian adults reported that they participated in physical activity alone (36%), with a spouse (23%) with a friend (20%) or with a family member (19%). The majority of respondents were less likely to report participating in physical activity with a neighbour (1%).

Gender

A spouse or partner was the major social support for exercise among males (27%), whereas a family member was the major social support for females (24%). Males (4%) were more likely than females (1%) to exercise with a workmate.

Age group

Older adults (60 years and over) were more likely to report no social support for physical activity (44%) and were least likely to exercise with a family member (7%) compared to other age categories. Exercising with a friend was the most popular social support for people aged 18 to 29 years (34%), while this group was less likely to report exercising with a spouse or partner (15%) compared to other age categories.

Location

There was little difference in the pattern of support across the four geographical regions of Western Australia. However, adults from the Midwest/Goldfields were less likely to report exercising with a family member (14%) compared to other regions.

Current level of physical activity

Sufficiently active Western Australian adults (34%) were less likely than insufficiently active adults (39%) to report exercising with no one. Sufficiently active adults were more likely to participate in physical activity with a friend (24%) and with a health or sport club member (10%) compared with insufficiently active adults (15% and 4% respectively).

TABLE 6.12: USE OF SOCIAL SUPPORT IN PHYSICAL ACTIVITY PARTICIPATION BY GENDER, AGE, LOCATION, ACTIVITY LEVEL

	Support Group						
Variable	No support	Spouse/ partner	Family member	Friend	Workmate	Neighbour	Club member
Gender							
Male	36.4	26.7	13.5	19.9	4.4	0.1	7.9
Female	35.0	19.0	23.5	20.8	1.2	1.4	7.2
Age Group							
18 to 29 years	28.8	14.0	19.2	33.7	5.3	0.0	8.6
30 to 44 years	34.4	21.3	30.2	19.1	3.5	1.1	7.2
45 to 59 years	36.5	30.0	13.7	13.9	1.6	0.9	6.7
60 years or more	44.3	25.9	6.9	14.9	0.3	1.2	8.0
Location							
Perth metropolitan	36.5	22.6	18.3	21.3	2.5	0.9	7.1
South West	31.4	23.8	22.1	16.9	4.4	0.3	9.3
Kimberley/Pilbara	38.2	21.3	20.5	21.3	3.3	0.0	8.1
Midwest/Goldfields	33.6	21.4	15.2	17.2	2.4	0.8	8.4
Activity level[1]							
Insufficiently active[2]	39.1	24.4	20.7	14.7	1.7	1.1	4.2
Sufficiently active	33.7	21.7	17.4	23.7	3.3	0.6	9.5
Total	**35.7**	**22.7**	**18.6**	**20.3**	**2.7**	**0.7**	**7.6**

[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).
[2] Subjects participating in no physical activity (walking, moderate, or vigorous) were removed

6.7 Arrangement to meet for exercise

One item asked whether the respondent had arranged to meet someone in the past month to do physical activity. Although respondents may have arranged to meet someone for exercise, they may not necessarily have exercised with the person they had intended to meet.

Table 6.13 presents frequency of arranging to meet someone for physical activity by gender, age, location and current level of physical activity. Table 6.14 reports the average daily steps by arrangement to meet someone for physical activity.

Gender

Nearly one-half of males (45%) and females (47%) reported arranging to meet someone for physical activity at least once in the previous month (Table 6.13).

Age

Arranging to meet someone for physical activity declined with advancing age. Adults 18 to 29 years were generally more likely (66%) to arrange to exercise with someone compared with older people. Adults aged 60 years and over were less likely (32%) to arrange to meet someone to participate in physical activity.

Location

Respondents from the Kimberley/Pilbara and Midwest/Goldfields were less likely than others to arrange to meet someone to exercise in the past month (both 58%). A greater proportion of adults living in the Perth metropolitan region (20%) arranged to meet someone for exercise more than once per week compared to adults living in other regions.

Current level of physical activity

Sufficiently active adults were more likely to arrange to meet someone for physical activity (58%) compared with insufficiently active (40%) and inactive (17%) adults. Sufficiently active adults were also more likely to report arranging to meet someone for exercise weekly (14%) and more than once per week (27%) in the past month in comparison to adults who were less active. Overall, 83% of respondents who were inactive and 60% of respondents who were insufficiently active did not arrange to meet someone to participate in physical activity.

Average daily steps

Table 6.14 reports the data results for those who participated in the pedometer study. Those who never arranged to meet someone in the past for physical activity did fewer steps than those who had arranged to meet someone. Compared with those who never met anyone (9,171 steps/day) the mean steps per day were significantly higher in those who reported arranging to meet someone more than once in the past month (10,436 steps/day).

TABLE 6.13: PAST MONTH ARRANGEMENTS TO MEET SOMEONE FOR PHYSICAL ACTIVITY BY VARIOUS CHARACTERISTICS

	Occasions			
Variable	**No times**	**1-3 times**	**Weekly**	**> Once/wk**
Gender				
Male	54.9	16.0	11.1	18.0
Female	53.0	16.8	10.7	19.5
Age Group				
18 to 29 years	33.9	26.8	15.2	24.0
30 to 44 years	53.5	17.6	10.8	18.0
45 to 59 years	59.7	13.1	9.7	17.5
60 years or more	68.1	8.0	8.1	15.8
Location				
Perth metropolitan	52.7	16.7	11.0	19.6
South West	56.3	17.1	9.5	17.1
Kimberley/Pilbara	58.3	13.9	10.4	17.4
Midwest/Goldfields	58.4	14.1	12.5	15.1
Activity level[1]				
Inactive	83.4	11.7	1.9	3.0
Insufficiently active	60.2	19.7	9.0	11.1
Sufficiently active	41.6	17.0	14.3	27.2
Total	**54.9**	**16.4**	**10.9**	**18.7**

[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).

TABLE 6.14: TIMES IN THE PAST MONTH ARRANGED TO MEET SOMEONE FOR PHYSICAL ACTIVITY BY MEAN DAILY STEPS

Times	Proportion (%)	Mean steps	SD	95% CI lower bound	95% CI upper bound
Never	24.1	9171 [a]	3939	8653	9795
Once or twice	18.2	9757	3754	8644	10870
2 to 3 times	2.3	10400	4240	9036	11764
Weekly	6.6	9758	3835	8637	10878
More than once per week	30.4	10436 [a]	3354	9705	11166

[a] Significantly different ($p < .05$)

6.8 Physical activity enjoyment

Three statements were included in the 2002 survey to measure enjoyment of participating in physical activity. The items focused on three factors: enjoyment, boredom and feeling good. These statements provide an idea of how adults perceive their experience of physical activity and provide additional information about what factors may motivate individuals to start or maintain a physical activity routine.

Tables 6.15A to 6.15C show the level of agreement with the three statements: "When I am active I enjoy it", "When I am active I feel bored" and "When I am active it makes me feel good" according to gender, age, location and current level of physical activity. Table 6.16 reports the average number of steps performed each day for those who disagreed, had no opinion and agreed with these three statements.

Gender, age and location

More than 90% of the people agreed that when they were active they enjoyed it (93%) and it made them feel good (95%). Furthermore 94% of adults stated that they disagreed with the statement "When I am active I feel bored". Agreement and disagreement with each statement was similar among males and females. However, a higher proportion of females (57%) than males (48%) strongly agreed that they 'felt good' when active. There was no significant relationship with age or location for any of the statements (Table 6.15A to 6.15C).

Current level of physical activity

Compared with others, sufficiently active adults were more likely to agree strongly that "When I am active I enjoy it" (56%) and to disagree strongly with the statement "When I am active I feel bored" (52%) (Table 6.15A to 6.15B).

Average daily steps

In the pedometer study the vast majority of participants responded positively to the three statements (range 94% to 98%). Although small proportions were observed for negative responses, making inferences from the pedometer data difficult, in general individuals who responded positively to participating in physical activity perform on average more steps per day (Table 6.16).

TABLE 6.15A: WHEN I AM ACTIVE I ENJOY IT					
Variable	**Strongly disagree**	**Disagree**	**Neither agree or disagree**	**Agree**	**Strongly agree**
Gender					
Male	0.3	2.2	4.6	45.4	47.5
Female	0.3	2.4	4.1	42.4	50.7
Age Group					
18 to 29 years	0.0	1.7	5.1	46.3	46.9
30 to 44 years	0.4	2.5	5.0	43.4	48.6
45 to 59 years	0.4	3.0	3.6	41.8	51.1
60 years or more	0.3	1.8	3.5	44.4	50.0
Location					
Perth metropolitan	0.3	2.6	4.6	43.6	49.0
South West	0.2	1.2	3.6	44.7	50.4
Kimberley/Pilbara	0.7	2.8	6.3	47.2	43.1
Midwest/Goldfields	0.0	2.0	3.0	43.2	51.8
Activity level[1]					
Inactive	0.7	5.5	6.2	53.4	34.2
Insufficient	0.3	2.9	5.3	48.5	43.0
Sufficiently	0.2	1.2	3.4	38.8	56.5
Overall	**0.3**	**2.3**	**4.4**	**43.9**	**49.2**

[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).

TABLE 6.15B: WHEN I AM ACTIVE I FEEL BORED					
Variable	**Strongly disagree**	**Disagree**	**Neither agree or disagree**	**Agree**	**Strongly agree**
Gender					
Male	46.6	47.5	2.5	3.0	0.4
Female	45.7	48.5	2.0	3.3	0.4
Age Group					
18 to 29 years	41.4	50.0	3.3	4.7	0.6
30 to 44 years	48.4	45.9	2.1	3.2	0.3
45 to 59 years	47.9	47.1	1.9	2.6	0.5
60 years or more	45.9	49.9	1.7	2.4	0.1
Location					
Perth metropolitan	46.1	47.4	2.7	3.2	0.5
South West	43.2	52.3	1.0	3.6	0.0
Kimberley/Pilbara	49.0	45.5	2.8	2.8	0.0
Midwest/Goldfields	49.7	48.0	0.0	2.3	0.0
Activity level[1]					
Inactive	34.7	57.7	1.8	4.8	0.9
Insufficient	41.6	52.6	1.6	4.0	0.2
Sufficiently	51.6	43.0	2.6	2.4	0.3
Overall	**46.2**	**48.0**	**2.2**	**3.2**	**0.4**

[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).

Table 6.15c: When I am active it makes me feel good					
Variable	**Strongly disagree**	**Disagree**	**Neither agree or disagree**	**Agree**	**Strongly agree**
Gender					
Male	0.1	2.0	3.4	46.0	48.4
Female	0.2	1.9	2.3	38.8	56.9
Age Group					
18 to 29 years	0.0	1.4	2.5	41.8	54.3
30 to 44 years	0.3	1.9	3.6	42.4	51.7
45 to 59 years	0.4	2.6	2.3	39.9	54.9
60 years or more	0.0	1.7	2.7	45.1	50.5
Location					
Perth metropolitan	0.2	2.2	2.8	41.6	53.2
South West	0.0	1.4	2.6	44.4	51.1
Kimberley/Pilbara	0.0	2.8	1.4	38.2	57.6
Midwest/Goldfields	0.3	0.3	3.9	46.6	48.9
Activity level[1]					
Inactive	0.9	5.0	2.7	52.7	38.6
Insufficient	0.0	2.6	4.2	45.8	47.4
Sufficiently	0.1	0.8	2.1	37.6	59.4
Overall	**0.2**	**1.9**	**2.8**	**42.3**	**52.8**

[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).

Table 6.16: Physical activity enjoyment items by mean daily steps			
Statement	**Disagree or strongly disagree**	**Neither agree or disagree**	**Agree or strongly agree**
When I am active I enjoy it			
- Proportion (%)	2.9	2.7	94.3
- Steps	8123.0	7363.0	9813.0
When I am active I feel bored			
- Proportion (%)	96.0	1.8	2.2
- Steps	9779.0	8706.0	6866.0
When I am active it makes me feel good			
- Proportion (%)	1.6	0.9	97.5
- Steps	7326.0	9934.0	9732.0

6.9 Workplace physical activity

Respondents were asked to describe their workplace activity. One item asked if while at work, respondents:

- were physical inactive;
- walked regularly for blocks of at least 10 minutes;
- were moderately active for a total of 30 minutes every day; or
- were vigorously active for a total of at least 20 minutes on three or more days.

Table 6.17 reports physical activity at work by gender, age, location, current level of physical activity and occupation. Due to a low number of participants responding for some categories of workplace activity, retirees, students, the unemployed and homemakers were removed from the analysis. Table 6.18 presents the average daily steps performed by participants for each category of workplace physical activity.

Gender

Fewer females (10%) compared with males (22%) reported being vigorously active in the workplace; however, females were more likely to report performing regular walking in the workplace (23%) compared to males (15%) (Table 6.17).

Age group

Older adults (60 years and over) were less likely to report being physically inactive (26%) and more likely to be moderately active (40%) in the workplace compared with younger Western Australians. A greater proportion of adults, aged 18 to 29 years were vigorously active in the workplace (20%), compared with other age groups (Table 6.17).

Location

Adults living in the Perth metropolitan area were more likely to report being physically inactive in the workplace (39%) compared with adults living in other regions. People living in the Midwest/Goldfields (25%) were more likely than others to be vigorously active in the workplace (Table 6.17).

Occupation

One-half of people in managerial or professional occupations reported being physically inactive in the workplace (51%). Adults in blue-collar occupations were most active overall with approximately three-quarters reporting that they were moderately active (36%) or vigorously active (39%) in the workplace. This may explain why blue-collar workers achieved such high levels of steps per day compared to other groups.

Current level of physical activity

People who were classified as inactive in terms of their leisure-time physical activity were the most active in the workplace, with 36% and 23% respectively being moderately and vigorously active at work. Insufficiently active adults were more likely to be physically inactive (39%) and less likely to be vigorously active (13%) in the workplace (Table 6.17).

Average daily steps

The proportion of respondents participating in workplace activity was similar for those participating in the pedometer study compared with the entire survey sample. Adults who reported being vigorously active in the workplace performed the greatest number of average daily steps (11,501 steps/day). Statistically significant differences were found between the mean daily steps of those who reported being inactive (9,132 steps/day) and moderately active (10,868 steps/day) in the workplace and between those who were inactive and vigorously active (11,501 steps/day) in the workplace (Table 6.18).

TABLE 6.17: LEVEL OF WORKPLACE ACTIVITY BY GENDER, AGE, LOCATION, ACTIVITY LEVEL AND BMI CATEGORY

Variable	Workplace activity			
	Inactive	Regular walking	Moderately active	Vigorously active
Gender				
Male	34.1	14.9	29.5	21.5
Female	36.8	22.7	30.4	10.1
Age Group				
18 to 29 years	32.0	17.0	30.7	20.2
30 to 44 years	37.0	19.2	28.1	15.7
45 to 59 years	38.3	18.3	29.1	14.3
60 years or more	26.3	18.9	39.9	14.9
Location				
Perth metropolitan	38.8	18.0	28.5	14.7
South West	28.2	21.3	31.8	18.8
Kimberley/Pilbara	31.8	15.0	35.5	17.8
Midwest/Goldfields	21.4	18.8	34.5	25.3
Occupation				
Manager/Professional	50.7	17.4	24.8	7.2
White collar	39.4	22.7	29.8	8.1
Blue collar	11.3	14.2	35.9	38.6
Activity level[1]				
Inactive	26.7	14.5	35.8	23.0
Insufficient	39.1	19.3	28.9	12.6
Sufficient	34.5	18.7	29.2	17.0
Total	**35.3**	**18.4**	**29.9**	**16.4**

[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).

TABLE 6.18: LEVEL OF WORKPLACE PHYSICAL ACTIVITY BY MEAN DAILY STEPS

Activity at work	Proportion (%)	Mean daily steps	Standard deviation	95% CI lower bound	95% CI upper bound
Physically inactive	36.8	9132 [a b]	3726	8421	9842
Regular walking	20.5	10480	3718	9523	11438
Moderately active	27.0	10868 a	3614	10061	11674
Vigorously active	15.6	11501 b	3788	10375	12627

[a, b] Significantly different ($p < .01$)

6.10 Incidental physical activity behaviour

Respondents were asked whether or not they had participated in four specific types of habitual incidental activity. Habitual incidental activity behaviours are often undertaken during normal daily living (e.g. as part of performing chores). Respondents were asked if they undertook the following activities daily:

- climbed the stairs instead of using an elevator or escalator;
- parked their vehicle farther away from their destination so as to walk farther;
- walked or cycled to destinations that were within a 5-minute drive of where they lived instead of driving; and
- took the dog for a walk.

Table 6.19 reports the prevalence of habitual incidental behaviours by gender, age, location, current level of physical activity and 'stage of change'. Figure 6.1 shows the average daily steps performed by respondents in the pedometer study who did and did not report participating in these activities. A similar prevalence (60 to 63%) was reported for all except parking farther away where a little over one third reported performing the behaviour (34%). Sixty-three percent of people reported taking their dog for walks.

Gender

Females were more likely to report performing each of the habitual incidental behaviours than males. This difference was especially evident for parking away from a destination in order to walk farther (females 42% and males 27%) (Table 6.19).

Age

Compared to all other ages, adults aged 60 years and over were less likely to climb stairs instead of using an elevator or escalator (49%) and to take the dog for a walk (58%). Adults aged 18 to 29 years were less likely (31%) to park farther away from a destination to walk farther but were more likely (67%) to walk or cycle to destinations within a 5-minute drive of home (Table 6.19).

Location

People living in the Kimberley/Pilbara region were more likely to take their dog for walks (66%) and less likely to park the car away from a destination to walk farther (29%) compared to adults living in other regions (Table 6.19).

Current level of physical activity

Inactive adults were less likely to report undertaking all four types of habitual incidental physical activity behaviour compared to more active adults. Sufficiently active adults were more likely to undertake all four types of habitual incidental activity than less active adults. Sufficiently active adults were twice as likely (71%) to report walking the dog compared to those who were inactive (34%) (Table 6.19).

'Stage of change'

The prevalence of walking or cycling instead of a 5-minute drive and walking the dog increased as the stage of behaviour progressed from precontemplation to maintenance. Adults in precontemplation and contemplation stages of exercise behaviour were less likely to report participating in all types of habitual incidental physical activity compared to adults in other stages (Table 6.19).

Average daily steps

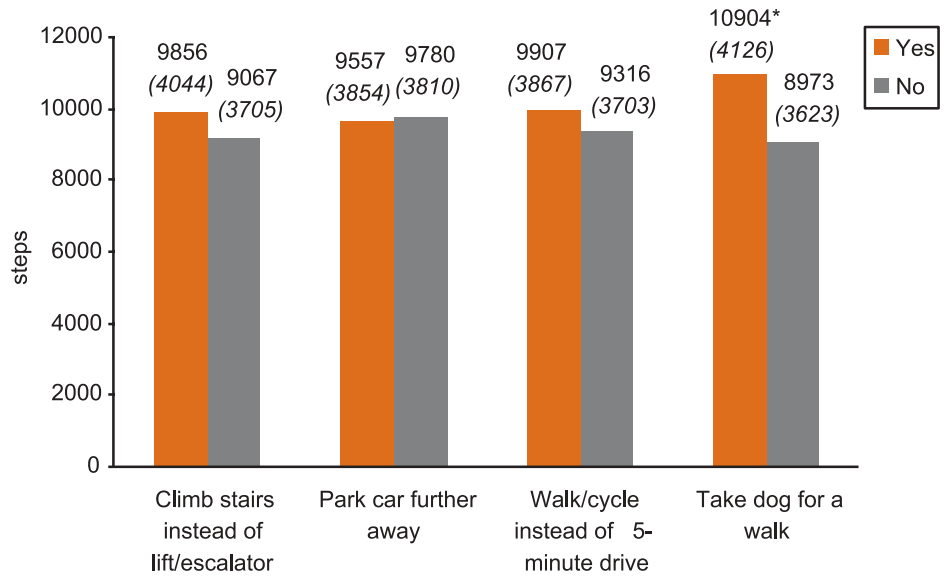
Figure 6.1 shows the mean daily steps performed by pedometer study participants who did and did not report undertaking the four types of habitual incidental activity. The mean daily steps performed by adults who walked the dog (10,904 steps/day) were significantly greater than those who owned a dog but did not walk it (8,973 steps/day). No other statistically significant differences were found.

TABLE 6.19: PREVALENCE OF INCIDENTAL PHYSICAL ACTIVITIES BY AGE, GENDER, LOCATION, ACTIVITY LEVEL AND STAGE OF BEHAVIOUR CHANGE

Characteristic	Climb stairs	Park vehicle farther away	Walk/cycle instead of 5min drive	Take dog for a walk
Gender				
Male	58.3	26.6	57.4	62.6
Female	62.3	41.9	62.8	64.0
Age Group				
18 to 29 years	64.8	31.2	66.7	65.7
30 to 44 years	62.3	33.9	60.4	65.5
45 to 59 years	63.6	35.7	57.0	62.0
60 years or more	48.9	36.7	56.4	57.9
Location				
Perth metropolitan	61.0	33.5	60.4	63.9
South West	55.7	37.3	62.2	64.0
Kimberley/Pilbara	59.3	28.9	55.7	66.2
Midwest/Goldfields	60.0	39.0	57.1	58.3
Activity level[1]				
Inactive	47.3	31.1	35.8	33.7
Insufficient	57.8	34.5	57.3	61.8
Sufficient	65.1	35.0	67.7	70.7
'Stage of Change'				
Pre-contemplation	29.1	17.3	25.8	33.3
Contemplation	53.5	31.9	40.5	43.2
Preparation	63.1	36.1	61.8	54.5
Action	59.2	35.9	63.5	65.3
Maintenance	64.4	35.5	67.0	73.6
Overall	**60.4**	**34.3**	**60.1**	**63.3**

[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).

Figure 6.1: Average daily steps and incidental physical activity behaviours



6.11 Physician advice about physical activity

A single item was included in the 2002 survey asking respondents about advice on physical activity during their last visit to their doctor or general practitioner. Table 6.20 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.

Gender, age and location

Overall, only 13% of respondents reported receiving advice about physical activity during their last visit to their general practitioner. The proportion of males and females reporting having received advice was similar. Younger adults 18 to 44 years were slightly less likely to receive advice about physical activity compared to adults aged 45 and over. More respondents living in the Kimberley/Pilbara (18%) reported receiving advice about physical activity from their doctor, while adults living in the Midwest/Goldfields region were the least likely (8%) to receive similar advice (Table 6.20).

Current level of physical activity and BMI

Sufficiently active adults were less likely (10%) to receive physical activity advice from their doctor compared to insufficiently active (16%) and inactive (18%) adults. This may be partly due to sufficiently active adults being younger and hence making fewer visits to their doctor. Furthermore, participation in sufficient levels of physical activity is likely to be related to lower incidences of chronic conditions and health problems, again resulting in fewer visits to the doctor. Obese adults were the most likely (30%) to report receiving advice about physical activity from their general practitioner, compared with other BMI categories; however, only 14% of overweight respondents claimed to receive this advice (Table 6.20).

Table 6.20: GP advice on physical activity	
Times	**Proportion (%)**
Gender	
Male	13.3
Female	12.8
Age Group	
18 to 29 years	9.0
30 to 44 years	12.5
45 to 59 years	15.8
60 years or more	14.5
Location	
Perth metropolitan	13.3
South West	13.5
Kimberley/Pilbara	17.5
Midwest/Goldfields	7.8
Activity Level[1]	
Inactive	18.0
Insufficient	16.1
Sufficient	10.0
BMI Category	
Acceptable	7.8
Underweight	14.1
Overweight	14.1
Obese	30.0
Overall	**13.0**

[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).

7 BODY MASS INDEX AND PHYSICAL ACTIVITY

Overview

Obesity is defined as a disease where excess body fat has accumulated to an extent that health may be adversely affected (WHO, 2000). The likelihood of individuals experiencing negative health consequences such as diabetes, hypertension, cardiovascular disease, osteoarthritis and premature death is increased as body mass index increases from overweight into obesity (National Taskforce on the Prevention and Treatment of Obesity, 2000). The WHO has acknowledged obesity as an epidemic, with the global prevalence of both overweight and obesity rapidly increasing (WHO, 2000).

In Australia during 2000, the prevalence of overweight and obesity was estimated to be 39.0% and 20.8% respectively (Cameron et al., 2003). By comparison in the same period the prevalence of obesity in the United States was 30.5% (Flegal et al., 2002). Obesity and overweight in Australia account for approximately 4.3% of the total burden of disease (Mathers et al., 1999).

There are several known causes of overweight and obesity, of which energy or caloric imbalance is the most common. This imbalance is the consequence of a higher consumption of calories than that being expended and may be the product of over-consumption, lack of physical activity or both (Hill and Melanson, 1999). Both excessive caloric consumption and physical inactivity are partly the result of an increasingly 'obesogenic' environment (French et al., 2001; Swinburn et al., 1999; Hill and Peters, 1998). 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 (WHO, 2000):

- Underweight (< 18.50)
- Acceptable (18.50 to 24.99)
- Overweight (25.00 to 29.99)
- Obese (30 or more)

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

The proportion of Western Australians in each category of BMI is shown in Table 7.1. Approximately one-half of all adults (50%) were categorised as having acceptable BMI, while 48% were either overweight (35%) or obese (13%).

Gender

A greater proportion of males (43%) than females (26%) were overweight, while the proportion of obese adults for each gender was similar (13%). More females (4%) than males (1%) were underweight (Table 7.1).

Age group

The prevalence of overweight Western Australians generally increased with advancing age, although there was a small decrease in the proportion of overweight and obese adults from 45 to 59 years (41% and 18%, respectively) to 60 years or older (40% and 14%, respectively). A greater proportion of adults aged 18 to 29 years (70%) had acceptable BMI levels compared to all other age categories. The lowest proportion of people with acceptable BMI levels was among adults aged 45 to 59 years (39%) (Table 7.1).

Location

People living in the metropolitan area were less likely to be overweight (33%) and obese (12%) compared to those in other regions. Higher proportions of obese adults were observed in the South West (16%), Kimberley/Pilbara (16%) and Midwest/ Goldfields (15%). More people in the Kimberley/Pilbara region were overweight, with the combined prevalence of obesity and overweight at approximately 60% (Table 7.1).

Marital status

Over one-half (52%) of Western Australian adults either married or in de facto relationships were overweight (38%) or obese (14%). Widows represented the greatest proportion of obese individuals (18%), while single adults were the least likely to be overweight (23%) or obese (9%) (Table 7.1).

Education

Adults reporting less than a TEE education were less likely to have acceptable BMI levels (43%) compared to those with TEE/diploma (53%) or university (54%) level education. Both overweight and obesity was inversely related to educational level with the highest proportions of obesity observed among the least educated group (18%) and lowest among the most educated group (9%) (Table 7.1).

Employment

Eighty percent of students had acceptable BMI levels, considerably higher than all other occupation categories. Blue-collar occupations and the unemployed were less likely to have acceptable BMI levels (40% and 39%, respectively) compared to the other occupation categories. Students (10%), followed by homemakers (25%) were less likely to be overweight than other occupations, while obesity was highest in the unemployed (20%) and lowest in students (5%) (Table 7.1).

Table 7.1: Body mass index by demographic variables

	BMI Category			
Characteristic	**Underweight**	**Acceptable**	**Overweight**	**Obese**
Gender				
Male	1.0	42.5	43.2	13.3
Female	3.9	57.0	26.5	12.7
Age Group				
18 to 29 years	5.2	69.7	19.7	5.5
30 to 44 years	1.9	48.5	36.5	13.1
45 to 59 years	1.4	39.2	41.4	18.0
60 years or more	1.8	44.1	39.6	14.5
Location				
Perth metropolitan area	2.7	52.8	32.6	11.9
South West	2.4	41.3	40.1	16.1
Kimberley/Pilbara	0.0	39.6	44.8	15.7
Midwest/Goldfields	2.3	43.3	39.0	15.3
Marital status				
Married/de facto	1.8	45.8	38.3	14.1
Single	4.2	64.3	22.9	8.6
Separated/divorced	2.6	43.9	40.7	12.8
Widowed	3.4	47.5	31.1	18.1
Education				
Less than TEE	2.1	43.1	37.0	17.8
TEE/diploma	2.3	53.0	33.6	11.1
University	3.4	54.0	32.9	9.1
Occupation				
Manager/professional	1.7	48.8	38.0	11.4
White collar trade	2.8	53.0	30.8	13.4
Blue collar	1.8	39.9	44.5	13.8
Unemployed	0.9	39.1	40.0	20.0
Home duty	3.8	57.4	25.3	13.5
Student	5.2	80.0	9.5	5.2
Retired	2.3	43.8	38.7	15.2
Total	**2.5**	**49.8**	**34.7**	**13.0**

7.2 Level of physical activity and body mass index

The National Physical Activity Guidelines for Australians (1999) 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 (Bauman et al., 2001; Bull et al., 2000; Armstrong et al., 2000).

The proportion of adults undertaking sufficient physical activity in each BMI category is presented in Figure 7.1 and Table 7.2. Note that the definitions of sufficient physical activity include only walking, vigorous and other moderate physical activities. Gardening has not been included.

Proportion of Western Australians meeting sufficient level of physical activity by BMI

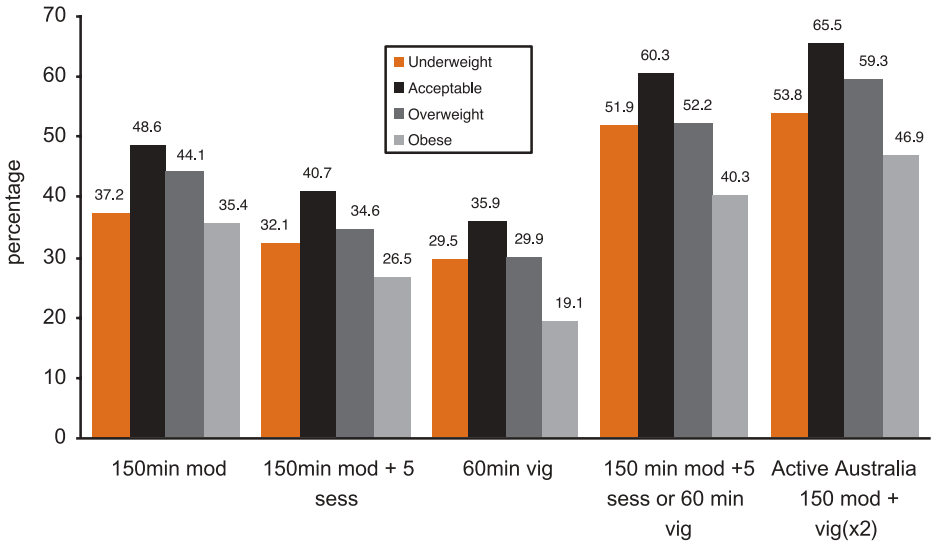
Figure 7.1 shows that for each definition of sufficient physical activity, a similar trend is observed, showing an inverse relationship between sufficient physical activity and BMI (excluding the underweight category). Adults with acceptable BMI levels were the most likely to undertake sufficient physical activity for all definitions (range 36% to 66%). In comparison obese adults were the least likely to participate in sufficient physical activity (range 19% to 47%).

Among overweight adults the prevalence of participation in 150 minutes of moderate physical activity per week was 44%; 150 minutes of moderate physical activity over five or more sessions was 35%; and 60 minutes of vigorous activity was 30%. The prevalence among obese adults was consistently lower for 150 minutes of moderate physical activity per week (35%); 150 minutes of moderate physical activity over five or more sessions (26%); and 60 minutes of vigorous activity (19%).

Sixty-percent of acceptable-weight, 52% of overweight and 40% of obese adults participated in sufficient levels of physical activity (150 minutes of moderate activity over five or more sessions or 60 minutes of vigorous activity (Figure 7.1).

The AIHW and Active Australia definition of sufficient physical activity is based on total weekly time spent (at least 150 minutes per week) in moderate and vigorous physical activity. Time spent participating in vigorous physical activity is weighted by two because it has a higher intensity. Under this definition 66% of acceptable-weight, 54% of underweight, 59% of overweight and 47% of obese adults participated in sufficient physical activity. Those who were underweight were also less likely than acceptable-weight subjects to achieve recommended levels of physical activity, regardless of the definition used. This group is likely to include those who are ill.

Figure 7.1: Sufficient physical activity by BMI



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

Table 7.2 presents the proportions 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 classified as inactive by level of BMI.

The proportion of people who were inactive or participating in insufficient physical activity increased as the level of BMI increased from acceptable to obese.

Ten percent of acceptable and 14% of overweight adults reported participating in no leisure-time physical activity. In comparison to those with acceptable BMI levels, twice as many underweight (27%) and obese (23%) Western Australians reported participating in no physical activity (Table 7.2).

TABLE 7.2: PREVALENCE OF INACTIVITY, INSUFFICIENT ACTIVITY AND SUFFICIENT PHYSICAL ACTIVITY* BY BODY MASS INDEX

Body mass index category	Inactive	Insufficient activity	Sufficient activity
Underweight	26.6	21.5	51.9
Acceptable	10.0	29.7	60.3
Overweight	13.7	34.2	52.2
Obese	22.9	36.9	40.3
Overall	**13.5**	**31.8**	**54.6**

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

7.3 Prevalence of different types of physical activity by BMI categories

Table 7.3 shows the pattern of participation across different types of physical activity by BMI category for each gender.

The most reported physical activity undertaken by people in each BMI category was walking for recreation. The prevalence of walking was higher among females (range 46% to 65%) than males (range 33% to 49%) across all levels of BMI. Walking for transport was undertaken less by underweight males (13%) and females (18%). Similar percentages of walking for transport were observed in acceptable-weight males and females (25% and 25%, respectively), overweight males (26%) and obese females (25%).

Gardening was the second most reported activity. Underweight males (31%) were least likely to participate in gardening, while overweight females (43%) were most likely to report gardening. Some gender differences were observed with females being more likely to report participation in aerobics and males more likely to report participation in team sports, cycling for transport and recreation, and weight training across all BMI levels.

Swimming/surfing was the fourth most frequently reported type of physical activity among obese males (10%) and females (11%). Running/jogging was most prevalent among underweight females (13%) and acceptable-weight males (12%). Males of acceptable-weight were more likely to report participation in team sports (10%). Underweight males were also more likely to participate in weights (12%) and cycling for transport (12%) compared to other BMI and gender categories (Table 7.3).

TABLE 7.3: PREVALENCE OF TYPES OF PHYSICAL ACTIVITY BY GENDER AND BODY MASS INDEX

Type of activity	BMI							
	Underweight		Acceptable		Overweight		Obese	
	M	F	M	F	M	F	M	F
Walking:								
- recreation	33.0	60.3	48.0	64.8	48.9	60.4	41.5	46.3
- transport	13.3	17.7	24.6	25.4	25.1	20.9	19.9	24.8
Gardening	31.3	33.3	40.4	35.8	42.3	42.7	41.7	32.7
Aerobics	0.0	19.0	6.9	14.5	5.8	11.4	2.9	5.5
Swimming/surfing	12.5	14.5	17.5	12.3	13.1	10.9	9.7	11.4
Running/jogging	0.0	12.9	12.0	5.7	6.0	2.1	3.4	0.5
Team sports	6.7	0.0	9.6	4.7	5.5	2.8	2.9	1.5
Cycling:								
- recreation	6.3	0.0	10.8	5.1	8.7	3.1	6.8	3.0
- transport	12.5	0.0	4.1	1.9	3.0	0.2	2.4	0.5
Golf	0.0	3.2	7.9	1.9	7.4	3.1	5.4	0.0
Tennis	0.0	3.2	5.9	2.6	3.4	2.6	1.9	2.5
Weights	12.5	3.2	6.5	2.9	5.7	2.1	1.5	1.0

7.4 Confidence in participating in physical activity and BMI

Self-efficacy – the belief in one's ability to complete a specific task – has been shown to be a strong predictor of participation in physical activity. 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. The results are shown in Table 7.4.

Being 'very confident' of achieving in five or more days of moderate physical activity per week was highest among adults in the acceptable BMI category (63%) and lowest in the obese (42%) and underweight (41%) categories. Underweight and obese adults were more likely to be 'not at all confident' (20%). A similar prevalence was observed for the acceptable and overweight categories across most levels of confidence (Table 7.4).

TABLE 7.4: CONFIDENCE OF PARTICIPATING IN FIVE OR MORE DAYS PER WEEK OF PHYSICAL ACTIVITY BY BODY MASS INDEX

Variable	Confidence			
	Very confident	Moderately confident	Somewhat confident	Not at all confident
BMI category				
Underweight	41.0	29.5	7.7	20.5
Acceptable	63.0	21.6	7.1	8.2
Overweight	59.3	23.2	9.1	8.5
Obese	42.2	26.0	10.8	20.3
Total	**58.3**	**22.8**	**8.4**	**10.4**

7.5 Main barriers to being more active and BMI

Segmenting the data by BMI allows specific barriers to physical activity to be identified. Thus it may be possible to target specific barriers known to be associated with different levels of BMI. For example, while 'lack of time' is a barrier to participating in more physical activity at all levels of BMI, 'poor health' is more likely to be a barrier among obese individuals (Table 7.5). Hence, strategies which accommodate or target this barrier may be adopted when trying to increase the physical activity levels of obese adults.
'Lack of time' was the most frequently reported barrier to being more active regardless of BMI. However, it was least likely to be reported by obese adults (42%) compared to overweight adults (47%), adults with acceptable body weight (51%) and underweight adults (51%).

For acceptable and overweight people being 'active enough' (18% and 14%) was the second most reported reason for not participating in more physical activity. For the same BMI categories, 'no motivation' was the third most reported barrier (13% for acceptable and 11% for overweight). A higher proportion of obese adults reported 'poor health' (22%) and 'no motivation' (13%) as reasons for not being more active (Table 7.5).

TABLE 7.5: MAIN BARRIERS TO BEING MORE ACTIVE BY BODY MASS INDEX

Variable	Reason					
	Lack of time	No motivation	Poor health	Too old	Active enough	Children to look after
BMI category						
Acceptable	51.4	12.8	7.8	3.3	18.2	7.9
Underweight	51.3	9.8	9.0	2.6	5.1	11.5
Overweight	47.1	10.9	9.2	3.9	14.3	4.6
Obese	42.2	13.3	21.6	2.9	8.4	5.4
Total	**48.6**	**10.9**	**10.1**	**3.4**	**15.2**	**6.5**

7.6 Prevalence of incidental physical activity and BMI

Table 7.6 reports the prevalence of BMI categories by the frequency of habitual incidental physical activity performed on weekdays, Saturdays, Sundays and the entire week. Frequency for weekdays, Saturdays and Sundays were categorised into three groups: 1) no incidental physical activity; 2) one or two occasions of incidental physical activity; and 3) three of more occasions of incidental physical activity per day.

Habitual incidental physical activity for an entire week was estimated by multiplying typical weekday incidental activity by five and adding the total habitual incidental activity performed on Saturday and Sunday. The total habitual incidental activity for a week was categorised into five groups:

1) nil (0 times/day);
2) 1-14 times/wk (0< and = 2 times/day);
3) 15-28 times/wk (2< and = 4 times/day);
4) 29-42 times/wk (4< and = 6 times/day); and
5) 43+ times/wk (6< times/day).

Generally, participation in habitual incidental physical activity declined from weekday to Saturday, then further from Saturday to Sunday. A positive direct relationship was observed between BMI (i.e. underweight to obese) and the proportion of adults reporting no habitual incidental physical activity on a typical weekday (38% to 54%) and Saturday (51% to 66%). Obese adults were more likely to report performing no habitual incidental activity on a typical weekday (54%), Saturday (66%), Sunday (73%) and for the entire week (43%).

Similar proportions of acceptable-weight (40%), overweight (40%) and obese (38%) adults reported participating in habitual incidental physical activity on average one to 14 times per week (Table 7.6).

TABLE 7.6: FREQUENCY OF INCIDENTAL PHYSICAL ACTIVITY ON WEEKDAYS, SATURDAY, SUNDAY AND TOTAL WEEK BY BODY MASS INDEX				
Sessions	**Underweight**	**Normal**	**Overweight**	**Obese**
Typical Weekday				
Nil	38.5	43.9	50.0	53.9
1-2 times	21.8	31.5	30.9	28.3
3 or more times	39.7	24.6	19.1	17.7
Saturday				
Nil	51.3	58.8	63.2	65.8
1-2 times	34.6	30.8	28.7	27.0
3 or more times	14.1	10.4	8.1	7.1
Sunday				
Nil	70.5	67.8	70.3	72.9
1-2 times	20.5	25.3	23.6	22.7
3 or more times	9.0	6.9	6.1	4.4
Total week[1]				
Nil	33.3	34.2	39.7	42.9
1-14 times	24.2	39.9	40.0	38.2
15-28 times	28.2	16.3	12.0	13.3
29-42 times	2.6	4.7	4.5	3.4
43+ times	11.5	5.1	3.8	2.2

[1]5 x weekday + Saturday + Sunday incidental physical activity sessions

8 TRENDS IN PHYSICAL ACTIVITY 1999 TO 2002

Overview

The following chapter reports on trends and changes that have occurred in the Western Australian adult population between 1999 and 2002. The monitoring of physical activity over time provides insight into the lifestyle choices of the Western Australian population and compliance with physical activity recommendations. The monitoring of physical activity over time can also be used to measure the effectiveness of campaigns or strategies designed to increase mediators of behaviour change, including attitudinal and motivational factors, which may lead to the adoption of physical activity.

Methodology

For comparative purposes, both the 1999 and 2002 descriptive data have been weighted using proportions for age, gender and location derived from the Australian Bureau of Statistics 2001 Census data (ABS, 2002). The descriptive data was handled in this way to remove differences brought about by changes in the demographic distributions (i.e. age, gender, location) between 1999 and 2002. Hence, percentages in the report of the 1999 survey (Bull et al., 2000) may be slightly different from the 1999 percentages presented in this report.

Adjusted odds ratios using logistic regression analysis were performed on unweighted dichotomous data (i.e. yes or no) to determine if changes in achieving sufficient physical activity and BMI between 1999 and 2002 were statistically significant (Tables 8.1, 8.3 to 8.5). Odds ratios were adjusted for age, gender and region. The independent variables (i.e. year) and potential confounding variables were entered into the model using a force-entry method.

Comparison of unweighted continuous variable data between 1999 and 2002 (e.g. minutes of physical activity) were analysed using analysis of covariance (ANCOVA), controlling for age, gender and region (Table 8.2). The data failed the Levene's homogeneity of variance test (an assumption needed to be met for use of the ANCOVA); hence transformed data (natural log) were used in the analysis.

8.1 Physical activity

Table 8.1 presents the prevalence, percentage change, adjusted odds ratio and 95% confidence intervals for comparisons between 1999 and 2002. Comparisons were made between 1999 and 2002 participation in recommended levels of physical activity; participation in walking, gardening, vigorous and moderate activity; and level of physical activity.

Definitions of recommended physical activity

The results in Table 8.1 suggest that the Western Australian adult population has become more sedentary and less active since 1999. The proportion of people who reported being inactive increased from 12% in 1999 to 14% in 2002 and the proportion of people who were sufficiently active (participating in at least 150 minutes of moderate activity over at least five sessions or 60 minutes of vigorous activity per week) decreased from 57% in 1999 to 55% in 2002. However, the increase of 1.8% in inactivity and the 2.7% decrease in sufficient physical activity (at least 150 minutes of moderate activity over at least five sessions or 60 minutes of vigorous physical activity per week) were not statistically significant at the $p < .05$ level.

Table 8.1 includes the Active Australia definition of sufficient physical activity (at least 150 minutes of physical activity where moderate activity and vigorous activity weighted by two are summated). The proportion of adults participating from 1999 to 2002 has significantly ($p < .01$) decreased by 4.0%, from 65% to 61% under this definition of sufficient physical activity.

Table 8.1 also includes results related to vigorous and moderate activities. The proportion of adults participating in at least 150 minutes of moderate physical activity and at least 150 minutes of moderate activity over five or more sessions did not change significantly between 1999 and 2002. However, the proportion of adults participating in vigorous physical activity for at least 60 minutes per week decreased significantly from 37% in 1999 to 31% in 2002.

Participation in walking, gardening, moderate and vigorous activity

Minor, non-significant changes in the prevalence of walking (-1.3%), gardening (0.4%) and moderate activity (1.4%) occurred between 1999 and 2002. However, significantly fewer Western Australian adults participated in vigorous physical activity in 2002 (37%) compared with 1999 (44%).

TABLE 8.1: COMPARISONS AND ADJUSTED ODDS RATIOS FOR PHYSICAL ACTIVITY AND BODY MASS INDEX BETWEEN 1999 AND 2002 PHYSICAL ACTIVITY SURVEYS

Variable	1999 (%)	2002 (%)	Change (+/-%)	Odds ratio[1]	95% CI lower bound	95% CI upper bound
Level of Physical Activity						
Inactive	11.7	13.5	+1.8	1.14c	0.98	1.32
Insufficiently active	31.0	31.8	+1.3	1.04	0.92	1.13
Sufficiently active[2]	57.3	54.6	-2.7	0.93	0.84	1.03
Sufficiently active (Active Australia)[3]	64.5	60.5	-4.0	0.86 a	0.78	0.95
Recommended Level of Physical Activity						
At least 60 minutes of vigorous per week	36.6	31.2	-5.4	0.84a	0.76	0.95
At least 150 minutes of walk/moderate per week	46.5	45.0	-1.5	0.94	0.85	1.04
At least 150 minutes walk/moderate and 5+ sessions per week	34.9	36.6	+1.7	1.05	0.95	1.17
Participation in physical activity						
Walking	77.4	76.1	-1.3	0.96	0.84	1.06
Gardening	49.1	49.5	+0.4	0.96	0.85	1.04
Vigorous	43.5	36.8	-6.7	0.80 a	0.73	0.91
Moderate	27.8	29.2	+1.4	1.08	0.95	1.19

[1]Odds ratios are adjusted for age, gender and location

[2]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).

[3]Total activity is the sum of minutes of walking and moderate activity plus minutes of vigorous x 2.

[a] $p < 0.01$; [b] $p < 0.05$; [c] $p < 0.10$

8.2 Minutes of physical activity

Table 8.2 reports the mean minutes of physical activity undertaken in 1999 and 2002. Survey respondents who did not report participating in the physical activities were excluded from the analysis.

Changes in time spent participating in specific activities, including walking, moderate and vigorous physical activity, did not reach statistical significance between 1999 and 2002, although there was a 12-minute decrease in walking and a 10-minute decrease in vigorous activity per week. However, Western Australians spent significantly less time gardening (26.8 minutes; $p < .001$) in 2002.

Western Australian adults participating in walking, moderate and vigorous physical activity together (minutes summated) reported on average spending 24.2 minutes less per week in 2002 compared to 1999. Using the Active Australia calculation, which involves weighting time spent on vigorous physical activity by a factor of two because of its higher level of intensity, the average time spent on walking and in moderate and vigorous physical activity in total decreased significantly by 41.3 minutes per week between 1999 and 2002.

Table 8.2: Comparisons between 1999 and 2002 of mean minutes spent in different types of physical activity[1]						
Variable	**1999[2] minutes**	**1999[2] SD)**	**2002 minutes**	**2002 (SD)**	**Change (+/-min)**	**Sig. (p<.05)**
Walking	195.6	202.6	183.2	183.6	-12.4	.122
Gardening	246.6	241.3	220.1	228.0	-26.8	.001
Vigorous	196.7	191.9	187.5	182.3	-9.4	.441
Moderate	190.2	190.4	189.0	193.1	-1.2	.092
Walk+mod	247.7	250.2	237.1	228.4	-9.7	.199
Walk+mod+vig	328.1	307.1	303.9	277.2	-24.2	.004
Walk+mod+vig*[2]	425.0	426.6	383.7	383.2	-41.3	.001

[1]Subjects who did not report performing the activity were excluded for each analysis.
[2]Values are slightly different from the 1999 survey (Bull et al., 2000) due to weighting under 2001 ABS data.

8.3 Body mass index

Table 8.3 presents the change in BMI between 1999 and 2002. The proportion of people at each level of BMI changed significantly between 1999 and 2002. The largest increase was observed for overweight adults with the prevalence increasing by 6% from 1999 to 2002 while the proportion of acceptable-weight Western Australians decreased by 5%. In Western Australia the prevalence of obesity increased significantly by 2% in the past three years (Table 8.3).

Table 8.3: Comparisons and adjusted odds ratios for body mass index between 1999 and 2002 physical activity surveys						
Variable	**19991 (%)**	**2002 (%)**	**Change (+/-%)**	**Odds ratio2**	**95% CI lower bound**	**95% CI upper bound**
Body mass index						
Underweight	6.1	2.5	-3.6	0.36 [a]	0.27	0.47
Acceptable	55.0	49.8	-5.2	0.89 [b]	0.80	0.99
Overweight	28.3	34.7	+6.4	1.25 [a]	1.12	1.39
Obese	10.6	13.0	+2.4	1.20 [b]	1.03	1.40

[1]Values are slightly different from the 1999 survey (Bull et al., 2000) due to weighting under 2001 ABS data.
[2]Odds ratios are adjusted for age, gender and location
[a] $p < 0.01$; [b] $p < 0.05$; [c] $p < 0.10$

8.4 Specific types of physical activity and facility use

Overview

It is important to determine what specific types of physical activity the Western Australian population is undertaking and how preferences for these activities change over time. As activities become less or more popular it may be appropriate to adjust the amount of resources allocated to encouraging or facilitating the activity. For instance, walking is the most popular physical activity undertaken by Western Australians. Therefore, it may be more beneficial to invest additional resources to facilitate participation in walking (i.e. footpaths, walking trails, parks, etc.) as compared to less popular activities.

Moreover, monitoring trends in participation in different types of physical activity is useful for planning future resource allocation, potentially alleviating issues such as lack of facilities. The monitoring of participation in different activities assists in predicting future demands on infrastructure and services. For example, a trend toward increasing team sport participation may require new facilities to be built to accommodate this increase.

Furthermore, the monitoring of facility use is also beneficial for the same purpose. The same types of physical activity can be performed in various contexts (e.g. jogging in a park, jogging on a footpath, jogging on a bush trail, etc.). Therefore monitoring the prevalence of facility use and the prevalence of different types of physical activity undertaken together provides a better indication of current and future trends.

Participation in specific activities

Generally adult participation in many traditional physical activities has decreased between 1999 and 2002 (Table 8.4). In 2002, significantly fewer adults participated in weight training (3%), team sports (3%), cycling for transport (1%) and golf (1%) compared to 1999. Participation in both gardening and swimming/surfing increased (4% and 2% respectively), however only the latter was found to be statistically significant ($p<.01$). While participation in jogging/running and walking for recreation decreased in 2002 (2% respectively), compared with 1999, these changes were not statistically significant (Table 8.4).

Facilities used for physical activity

Compared with 1999, in 2002 Western Australian adults were significantly more likely to use public parks or ovals (6%), the home (5%), cycle/walking paths (2%), public swimming pools (2% increase) and street/footpaths (2% increase) for physical activity. In 2002, compared with 1999 fewer adults reported using golf courses (1% decrease) and team sport facilities (2% decrease) for physical activity (Table 8.4).

TABLE 8.4: CHANGE IN PREVALENCE BETWEEN 1999 AND 2002 OF DIFFERENT TYPES OF PHYSICAL ACTIVITY AND FACILITIES USED

Variable	1999[1] (%)	2002 (%)	Change (+/-%)	Odds ratio[2]	95% CI lower bound	95% CI upper bound
Activity						
Walking						
- for recreation	63.9	62.4	-1.5	0.94 [c]	0.84	1.05
- for transport	26.1	27.8	+1.7	1.12	0.99	1.26
Gardening	35.5	39.1	+3.6	1.08	0.97	1.21
Swimming/surfing	12.9	15.3	+2.4	1.30[a]	1.11	1.52
Aerobics	11.9	10.6	-1.3	0.96	0.81	1.14
Jogging/running	9.3	7.1	-2.2	0.82[c]	0.66	1.01
Team sports	9.3	5.9	-3.4	0.67[a]	0.54	0.84
Cycling						
- for recreation	9.0	7.7	-1.3	0.91	0.75	1.10
- for transport	3.8	2.6	-1.2	0.69[b]	0.50	0.94
Golf	6.2	5.2	-1.0	0.71[a]	0.61	0.89
Weights	7.4	4.4	-3.0	0.61[a]	0.48	0.78
Tennis	4.6	3.9	-.0.7	0.83	0.63	1.08
Facility						
Beach	11.0	11.7	+0.7	1.10	0.93	1.31
Cycle/walking path	10.2	14.4	+2.2	1.54[a]	1.31	1.81
Golf course	6.0	5.1	-0.9	0.70[a]	0.55	0.88
Gymnasium	15.5	14.1	-1.4	0.99	0.85	1.16
Home	44.9	49.5	+5.4	1.14[b]	1.02	1.27
Bushland	5.4	5.7	+0.3	1.07	0.84	1.35
Public park or oval	11.2	17.3	+6.1	1.74[a]	1.49	2.04
Public swimming pool	4.9	7.1	+2.2	1.57[a]	1.25	1.97
Street/footpath	54.5	56.5	+2.0	1.13[b]	1.01	1.26
Team sport facility	9.1	6.9	-2.2	0.81[b]	0.66	1.00
Tennis courts	4.0	3.6	-0.4	0.86	0.65	1.14

[1] Values are slightly different from the 1999 survey (Bull et al., 2000) due to weighting under 2001 ABS data.

[2] Odds ratios are adjusted for age, gender and location

[a] $p < 0.01$; [b] $p < 0.05$; [c] $p < 0.10$

8.5 Major reason for being more and less active

Overview

Knowledge about the reasons why people are active or inactive is important for health practitioners and researchers as it allows strategies to be developed to overcome such barriers. For example, strategies may incorporate time management for those individuals who state 'lack of time' as a reason for being inactive. Moreover it is important that exercise interventions are made as enjoyable as possible in order to improve participation, as 'enjoyment' is generally ranked highly as a reason for participating in physical activity. Table 8.5 reports the percentage change from 1999 to 2002, odds ratios and 95% confidence intervals for a variety of reasons for being active and inactive.

Barriers to being more active

The six most common reasons for being inactive reported in this survey were used for comparison with the 1999 survey. For the most part, reasons for inactivity remained consistent between 1999 and 2002. Adults reported 'lack of time' (52% and 49%), followed by 'being active enough' (27% and 15%) as the main reasons for inactivity in 1999 and 2002 respectively.

Notably in 2002, significantly fewer (12%) adults reported being 'active enough' as a reason for inactivity compared with 1999. While 'no motivation' was ranked the third highest in both years, significantly fewer (2%) adults reported this reason in 2002 (Table 8.5).

Reason for participating in physical activity

Of the six highest ranked reasons for participating in physical activity, the proportion of adults reporting four of them (i.e. enjoyment, improve appearance, improve fitness, and reduce risk of heart disease) as major reasons significantly decreased in 2002.

The percentage of people reporting 'improve appearance' and 'reduce risk of heart disease' as major reasons for participating in physical activity decreased significantly from 1999 (2% and 1% respectively) (Table 8.5).

Table 8.5: Changes in major reasons for inactivity and activity participation between 1999 and 2002

Variable	1999[1] (%)	2002 (%)	Change (+/-%)	Odds ratio[2]	95% CI lower bound	95% CI upper bound
Reason for inactivity						
Lack of time	52.2	48.6	-3.6	0.96	0.86	1.06
Active enough	26.9	15.2	-11.7	0.43 [a]	0.38	0.49
No motivation	13.0	10.9	-2.1	0.85 [b]	0.73	0.99
Poor health	10.0	10.2	+0.2	0.88	0.75	1.03
Child care	7.2	6.5	-0.7	1.00	0.81	1.23
Too old	2.7	3.4	+0.7	1.01	0.76	1.33
Reason for activity						
Improve fitness	37.3	33.7	-3.6	0.84 [a]	0.75	0.94
Enjoyment	22.2	19.6	-2.6	0.83 [a]	0.73	0.95
Weight control	9.7	9.3	-0.4	0.93	0.83	1.19
Feel better about self	3.3	3.2	-0.1	1.03	0.76	1.39
Improve appearance	2.3	0.4	-1.9	0.19 [a]	0.10	0.37
Reduce risk of heart disease	2.0	1.4	-0.6	0.63 [b]	0.43	0.92

[1]Values are slightly different from the 1999 survey (Bull et al., 2000) due to weighting under 2001 ABS data.
[2]Odds ratios are adjusted for age, gender and location
Note: Subjects participating in no activity (walking, moderate, or vigorous) were excluded
[a] $p < 0.01$; [b] $p < 0.05$; [c] $p < 0.10$

8.6 Associated factors of participation in physical activity

Overview

Several factors in addition to self-motivation may influence an individual's success in undertaking regular physical activity. These factors include social support (e.g. spouse, friend or neighbour) and self-efficacy (e.g. confidence in own ability to successfully complete or undertake a behaviour). Several behaviour adoption models include social support and self-efficacy as integral parts of initiating and maintaining the behaviour (e.g. transtheoretical model, theory of reasoned action, theory of planned behaviour, etc.). In addition, arranging to meet someone to exercise, which involves commitment to the behaviour, may be an effective strategy in maintaining a regular physical activity routine.

The monitoring of these factors over time provides useful information, particularly for health practitioners, health promotion researchers and planners of physical activity programs. For example, declines in self-efficacy may lead to physical activity campaigns and practitioners incorporating strategies for improving confidence such as rewarding or praising individuals/communities for meeting health goals or recommendations.

Changes between 1999 and 2002 in the prevalence of self-efficacy and arranging to meet someone for exercise are presented in Table 8.6.

Arrangement in the past month to meet someone for exercise

Between 1999 and 2002 there was a significant decrease (5%) in the proportion of people arranging in the past month to meet someone for physical activity. In 2002, respondents were significantly less likely to arrange to meet someone for physical activity on a weekly basis (2% decrease) compared to 1999 (Table 8.6).

Confidence of participating in physical activity five or more days

In 1999 and 2002 the survey respondents were asked how confident they were of participating in 30 minutes of moderate physical activity on five or more days per week. Generally, adults reported being 'more confident' of participating in physical activity on five or more days per week in 2002, with significantly fewer respondents reporting being 'not at all confident' between 1999 (15%) and 2002 (10%). In addition, more people reported being 'moderately confident' in 2002 (9% increase) compared to 1999, although significantly fewer reported being 'very confident' in 2002 (4% decrease).

Table 8.6: Comparisons of past month arrangements, social support and physical activity confidence between 1999 and 2002

Variable	1999[1] (%)	2002 (%)	Change (+/-%)	Odds ratio[2]	95% CI lower bound	95% CI upper bound
Arranged to meet for physical activity						
Never	49.0	54.0	+5.0	1.16 [a]	1.05	1.29
1 to 3 times	17.2	16.4	-0.8	1.01	0.88	1.16
Weekly	13.2	10.9	-2.3	0.79 [a]	0.68	0.93
More than once per week	20.6	18.7	-1.9	0.92	0.81	1.04
Confidence of participating in physical activity 5-7 days per week						
Very confident	62.2	58.3	-3.9	0.84 [a]	0.76	0.93
Moderately confident	14.2	22.8	+8.6	1.83 [a]	1.61	2.09
Somewhat confident	8.3	8.4	+0.1	1.10	0.92	1.32
Not all confident	15.1	10.4	-4.7	0.61 [a]	0.53	0.71

[1]Values are slightly different from the 1999 survey (Bull et al., 2000) due to weighting under 2001 ABS data.

[2]Odds ratios are adjusted for age, gender and location

Note: Subjects participating in no activity (walking, moderate, or vigorous) were excluded

[a] $p < 0.01$; [b] $p < 0.05$; [c] $p < 0.10$

9 DISCUSSION

This report provides baseline data for the Premier's Physical Activity Taskforce (PATF) and will assist in planning future strategies designed to increase physical activity levels in Western Australian adults. It presents the findings on physical activity levels, factors related to physical activity and BMI of Western Australian adults and compares the 2002 findings with those from a similar survey conducted in 1999 (Bull et al., 2000).

The 2002 survey of adult physical activity is unique for several reasons. In addition to repeating the 1999 survey of physical activity, it includes measures of habitual incidental physical activity and an objective measurement of physical activity. During 2002, one of the Premier's Physical Activity Taskforce communication campaigns conducted by the WA Department of Health (the 'Find thirty' campaign) focused on increasing physical activities of daily living (e.g. parking farther away, gardening, dancing while watching television and walking the dog). This approach is consistent with the Australian physical activity guidelines to 'be active every day in as many ways you can'. Thus, it was important that the 2002 survey included several items measuring incidental physical activity (McCormack et al., *in press*), in addition to measuring physical activity generally.

The other unique aspect of the 2002 study was the collection of objectively-measured physical activity data using pedometers. The use of motion sensors to collect data in population surveys is limited (Sequeira et al., 1995). Nevertheless, including an objective measure of physical activity is an important addition to the self-reported behaviour because it provides an objective measure that can be monitored over time and allows incidental physical activity to be captured in addition to other physical activities more easily recalled by respondents (e.g. walking for recreation, vigorous activity, etc.).

9.1 Physical activity levels of Western Australians

Survey Results

Over one-half of all Western Australian men (57%) and women (52%) participated in sufficient levels of physical activity (i.e. participation in at least 150 minutes of moderate activity over five or more sessions per week or 60 minutes of vigorous physical activity per week). Nevertheless, between 1999 and 2002, the proportion of Western Australians who were sufficiently active using this definition declined from 57% to 55%. Although not a statistically significant decrease, the result suggests an important trend is taking place and is consistent with national data showing a decline in physical activity from 1997 to 1999 (Armstrong et al., 2000).

Overall 14% of respondents were sedentary, participating in no walking, moderate or vigorous physical activity in the previous week. Although once again not statistically significant, the proportion of people who reported being inactive increased between 1999 (12%) and 2002 (14%) indicating an important trend that is reflected in national data.

The findings of this report provide insights into a number of groups who are insufficiently active to benefit their health and who represent possible target groups for future campaigns and programs:

- women;
- those aged 30 years or over;
- those with less education;
- adults with children under five years at home; and
- those who are either overweight or obese.

While there are important health and economic benefits associated with increasing the percentage of people who are active at levels sufficient to benefit their health, reducing the percentage who are entirely sedentary could produce even more significant health benefits for the community as a whole (Stephenson et al., 2000). This is highly relevant because the proportion of inactive adults in Western Australia increased by 2% between 1999 and 2002. The national study of Australian physical activity levels (Armstrong et al., 2000) also found a small increase in inactivity between 1997 and 1999 (13.7% to 14.6% respectively). These changes, while modest, appear to be consistent and suggest a disturbing trend towards increasingly sedentary lifestyles and associated health problems if it continues. Inducing those who are currently sedentary to take-up some physical activity – even walking to the local shop or parking farther away from a destination and walking a little farther – could be a critical first step in curbing this worrying trend (Sheth and Frazier, 1982).

Given that the present survey also found a decrease in the prevalence of sufficient physical activity over the past three years, a *reinforcement strategy* designed to support those already active enough to remain so, would also appear to be important in preventing a further decrease in the proportion of people who are sufficiently active (Sheth and Frazier, 1982).

Pedometer results

Pedometers do not measure total physical activity because they cannot be worn when undertaking certain activities (e.g. swimming). In addition, pedometers simply measure movement and do not measure the intensity with which an activity is undertaken. Nevertheless, they provide an objective measure of behaviour including total walking and jogging/running behaviours. In addition, they can be used to measure walking undertaken for shorter periods including incidental physical activity. Importantly, the pedometer data reported in the present study can be used as a baseline to monitor any changes in objectively measured physical activity levels over the next 10 years.

The pedometer data collected in the present study were analysed according to findings from the current literature with 10,000 steps used as a cut-off point for categorising participants (Wilde et al., 2001; Welk et al., 2000; Iwane, et al., 2000). The average number of steps measured was 9,695 steps/day. Consistent with the self-reported results on physical activity, women (42%) and older adults (29%) were less likely to perform 10,000 steps or more per day.

The use of pedometers in this study highlighted some of the limitations of measuring only self-reported leisure-time physical activity. For example, one-half of adults classified as 'inactive' performed at least 10,000 steps/day. It is likely that these people may be active in other types of physical activity in short bouts such as incidental activities or are physically active at work. For example, compared to all other occupational categories, 75% of blue-collar workers performed at least 10,000 steps/day, despite a higher proportion of blue-collar workers being classified as inactive (18%). Hence, the pedometers detected activities not measured by the self-report questionnaire which in this survey focused on leisure-time and transport related physical activity.

9.2 Participation in different types of physical activity and facilities used

This study confirmed many previous studies showing that walking is the most popular form of physical activity. Three-quarters of respondents reported walking of some type in the previous week and this was consistent both for males and females. Gardening was the second most popular physical activity, although it was less popular among younger adults

(under 30 years). Little research is published on the benefits associated with gardening and given that this activity is so popular (particularly among older adults), research on the physical and mental health benefits associated with gardening would be helpful and timely.

As walking is the most popular physical activity, it is not surprising that streets/ footpaths were the most frequently reported facility used for undertaking physical activity (57%). In addition, the proportion of people who reported using public parks or ovals increased by 6% between 1999 and 2002 (from 11% to 17%).

The home was the second most frequently reported place for performing physical activity (50%). Between 1999 and 2002, use of this setting for physical activity increased by 6%. Participation in physical activity at home was highest among older adults (60 years and over) and lowest among those under 30 years of age. This possibly reflects the popularity of gardening among older adults but may also be influenced by factors such as safety, convenience and cost.

The facilities most frequently used for physical activity varied according to different age groups. For example, younger adults were more likely than older people to report using the streets/footpaths (64%), the gym/health club (21%), and team sport facilities (13%) for physical activity.

The Department of Planning and Infrastructure has developed guidelines to create more 'Liveable Neighbourhoods' that encourage walking and cycling. The results of this study 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, efforts to increase the 'walkability' of streetscapes is to be encouraged. This may require strategies to improve existing facilities such as footpaths and public parks (Giles-Corti and Donovan *in press*).

Encouraging walking and cycling as forms of (environmentally friendly) sustainable transport as well as healthy activity is consistent with the State Sustainability Strategy (Government of Western Australia, 2002). This strategy describes a whole-of-government approach in which the health, education, environmental protection, transport and planning sectors as well as local government can work together to advance this important health and environmental agenda (Giles-Corti and Donovan *in press*).

9.3 Incidental physical activity

In the present study, two types of question were used to measure incidental physical activity. One asked respondents whether they had participated in four specific activities defined in this report as 'incidental physical activity behaviours' (e.g. climbing the stairs instead of using an elevator/escalator). The second question required respondents to recall the frequency of participation in activities of less than 10 minutes duration which were performed as part of carrying out chores of daily living (e.g. walking to the shop to buy lunch, etc.). No attempt was made to measure the duration of these activities because a recent study indicates that time spent in short duration activities cannot be measured/recalled reliably (McCormack et al., *in press*). Increasing the time spent in incidental physical activity could be an important way of incorporating more physical activity into the day and meeting the national physical activity guideline of 'being active in as many ways as possible'.

The majority of respondents reported doing one or more of these incidental physical activity behaviours. Over 60% of adults reported daily stair climbing instead of using an elevator/escalator (60%), daily walking or cycling instead of driving short distances (60%) and taking the dog for a daily walk (63%). Respondents were less likely to park their

vehicles farther away from their destination in order to walk farther each day (34%). It is noteworthy that adults who were classified as 'sufficiently active' were more likely to participate in all incidental physical activity behaviours compared to those who were inactive or insufficiently active. Furthermore, adults who reported taking their dog for walks performed 2000 more steps on average than those who did not walk their dogs (10,904 versus 8,973 steps/day). James Hill (Hill et al., 2003) has recommended that everyone should take an additional 2000 steps per day as a means of curbing the disturbing rising levels of obesity and overweight in developed countries.

While our measures of incidental physical activity behaviours were limited, they provide information about the propensity to choose sedentary behaviours (e.g. using the car) over more active behaviours (walking instead). Monitoring these behaviours over time will provide some insight into changing levels of inactivity in the community.

Another measure of incidental physical activity used in the present study was the frequency of habitual short-bout physical activities during weekdays and on weekend days. The results show a decrease in reported habitual short-bout physical activity from weekdays to weekend days. Twenty-three percent of men and 19% of women participated in incidental physical activity every day. Negative relationships were found between the frequency of habitual incidental physical activity and (increasing) age and between incidental physical activity and BMI, whereas a positive relationship was found between incidental activity and education. Adults under 30 years of age (31%), single (31%), university educated (29%) and students (34%) were the most likely to participate in daily incidental physical activity.

The results indicate a need to increase community awareness of the benefits of incorporating incidental physical activity into the day. In addition, it is important to continue promoting the message that activity accumulated throughout the day can also contribute to health benefits.
Greater efforts are required to encourage incidental physical activity throughout the day through the design of the physical environment. This may include:

- the introduction of building codes that make staircases more accessible in public places and workplaces;
- the beautification and maintenance of existing staircases that might make them more desirable to use (Kerr et al., in press; Kerr et al., 2001; Brownell et al., 1980);
- the provision of more exercise areas for dogs and encouragement of dog owners to walk their dogs (Bauman et al., 2001); and
- incorporating local shops and other community facilities into the design of neighbourhoods.

9.4 Factors influencing physical activity in Western Australia

Determining the 'stage of change' profile of the community with respect to physical activity is important in guiding campaigns aiming to increase participation. It can also be used to monitor changes in the preparedness of the community to adopt physical activity messages.

In 2002, 23% of inactive and insufficiently active adults were contemplating exercising. In addition, 31% of insufficiently active adults were exercising but not regularly. People who are contemplating change and those already active who are not doing enough, represent important target groups for future campaigns. These groups appear to have a positive attitude towards being active but may simply need to be encouraged or supported to do more. An inducement strategy to encourage people to become active or to be more active should be developed (Sheth and Frazier, 1982).

In particular, there is a need to increase levels of confidence that physical activity can be readily incorporated into the day. This will make it easier for these groups to become more active (Bandura, 1997). Twenty-nine percent of inactive adults reported that they were not at all confident of their ability to achieve five or more days of physical activity and this was considerably higher than among insufficiently active (14%) and sufficiently active adults (3%). Seventeen percent of adults aged 60 years and over reported that they were not at all confident, approximately two times more than younger adults (7 to 9%).

Access to social support consistently emerges in the literature as a factor influencing participation in physical activity (Stahl et al., 2001). Over one-half of respondents in the present study participated in physical activity with another person, providing further evidence that social support is an important factor in decisions about being physically active. Finding support such as a 'walking buddy' for those who are inactive or insufficiently active would appear to be an important strategy for increasing activity levels.

Approximately three-quarters (74%) of respondents were aware of messages which have been promoted as part of the Department of Health's 'Find thirty' campaign and a similar proportion (74%) were aware of the 'Be Active' message promoted by the National Heart Foundation and Healthway. Nevertheless, only 54% of people correctly reported that '30 minutes' of moderate physical activity on most days of the week was required for good health. Knowledge of the correct amount and intensity of activity for health is a necessary first step, although on its own it may be insufficient to achieve behaviour change. However, promoting the 'good news' message that only 30 minutes of daily moderate-intensity activity will benefit health, along with the message that it can be accumulated throughout the day, may increase people's confidence that such a goal is both realistic and achievable.

General practitioners are an important source of health information for many people. However, only 13% of respondents reported that they had received information about physical activity during their last visit to their general practitioner. Inactive adults (18%), and obese adults (30%) were the most likely to report receiving information on physical activity from their general practitioner although only 14% of overweight adults reported to have done so. Notably fewer people living in the Midwest/ Goldfields reported receiving physical activity advice from their doctor (8%), compared to adults living in other regions (13-18%). Given that moderate physical activity can help prevent a wide range of chronic diseases as well as reducing the impact of other risk factors, there is considerable potential for general practitioners to play a greater role in encouraging more people to be active by prescribing the 'Find thirty' message wherever possible.

The present study found that the major reasons for participation in physical activity included 'to improve fitness' (34%), 'enjoyment' (20%) and 'weight control' (9%). However, consistent with previous findings, the most important reason reported for not being more active was 'lack of time' (49%). Given that people increasingly feel under time pressure, helping them to 'Find thirty' is important. However, future campaigns targeting specific groups should also consider age and gender differences in reasons for being active and barriers to participation.

9.5 Physical activity and body mass index

Between 1999 and 2002 the proportion of overweight and obese adults in Western Australia increased by 6% and 2% respectively. In 2002, 13% of adults were obese and 35% were overweight. This trend is disturbing and is consistent with national (AIHW, 2002) and international trends (WHO, 2000).

Obesity was highest among the following groups: Those aged 45 to 59 years (18%); widowers (18%); people with lower education levels (18%); and the unemployed (20%). Obese adults were more likely to be inactive (23%) compared to overweight (10%) and acceptable-weight (14%) adults.

Obese adults were less confident about participating in five or more days of physical activity per week, compared to overweight and acceptable-weight people. They were also more likely to report poor health as a major barrier to physical activity (22%).

Obesity is an independent risk factor for a range of chronic conditions and is a major contributor to the burden of disease in Australia (Mathers et al., 1999) and in Western Australia (Katzenellenbogen and Somerford, 2003)**.** The trend towards increasing levels of overweight and obesity in the population coupled with deceasing participation in physical activity is highly disturbing and requires immediate action.

Physical activity is advocated as one of the 'best buys' for fighting the global obesity epidemic (WHO, 2000). There is growing concern that a major factor in this epidemic is the emergence of 'obesogenic' environments that discourage physical activity while at the same time encouraging over-consumption of food (Swinburn et al., 1999**;** Hill and Peters, 1998). Strategies are required to create an environment that is more conducive to being active and consistent with the national guideline of being 'active in as many ways as possible'. The environment should encourage people to take less sedentary options throughout the course of the day. Examples include making stairwells accessible, attractive and easier to use than lifts, or making a walk to the shop easier and more attractive than driving, through the provision of safe, accessible walking routes and restrictions on car access or parking.

9.6 Limitations of monitoring

It should be recognised that this study is based on cross-sectional data and hence relationships between variables are not necessarily causal. However, many of the associations found in this study, such as that between physical activity and BMI, are consistent with the findings of other published studies that have used study designs appropriate to detecting causal relationships (i.e. randomised control trials, longitudinal studies, etc.).

In this survey the measures used to classify people as 'sufficiently active' include only leisure-time physical activity performed in bouts of at least 10 minutes. Although incidental physical activity was measured in the present survey, it has not been included in calculating sufficient physical activity because it has not been possible to measure duration of physical activity reliably (McCormack et al., *in press*). In addition, our measures of sufficient physical activity did not include occupational activity. This should be taken into account when interpreting the physical activity data in this study.

The trends in this study showing a decline in physical activity and increase in obesity are consistent with recent national trends comparing data from 1997 and 1999. However, the percentage changes measured were small and, although unlikely, the possibility cannot be ruled out that these findings were chance observations. Hence, further surveys of the Western Australian adult population need to be undertaken in the future to monitor and confirm these trends. Physical activity surveys should be undertaken regularly, at least every three years, to measure the effectiveness of the methods and strategies implemented by the Premier's Physical Activity Taskforce for encouraging and facilitating physical activity in Western Australia.

9.7 Recommendations for promoting physical activity in Western Australia

The following recommendations are suggested:

1. Use population-wide whole of government strategies to increase levels of physical activity.
2. Base strategies on best-practice guidelines.
3. New strategies should be evaluated comprehensively for effectiveness.
4. Promote physical activity in order to maintain healthy weight across all age groups.
5. Raise the profile of physical activity as a leading modifiable risk factor for morbidity and mortality.
6. Encourage general practitioners to prescribe physical activity as a means of (a) promoting good health generally; (b) preventing overweight and obesity; (c) keeping elderly patients active; (d) and for those with chronic health conditions.
7. Emphasise increasing physical activity levels in a number of target groups including: women, older adults, the less educated, the unemployed, the obese, and adults living in the Midwest/Goldfields.
8. Encourage participation in more incidental activity and inform the population about how physical activity can be accumulated throughout the day.
9. Create a more supportive physical activity environment.
10. Create supportive streetscapes including the creation and maintenance of footpaths and the creation of attractive public open spaces.
11. Encourage more people to make greater use of existing recreational facilities.
12. Engage a wide range of sectors from government, non-government, and the community to work towards creating a more active population.
13. Continue to monitor adult's physical activity levels (including to objectively measure physical activity using pedometers) at least every three years.

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.

Energy expenditure is an estimate of the energy costs of physical activity and is derived from observation, indirect or direct assessment or reports of people's activity level.

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 Organisation 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, or vigorous 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 farther away from the shop in order to walk farther; or taking the dog for a walk.

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

METs (metabolic equivalent) One MET is defined as the energy expenditure for sitting quietly which for the average adult is one kilocalorie per kilogram of body weight (kg^{-1} hr^{-1}) or 3.5ml of oxygen per kilogram of body weight ($kg^{-1}min^{-1}$). METS are used as an index of the intensity of activities.

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 muscles that results in energy expenditure.

Physical education is part of the education curriculum that uses physical activity as the medium and is concerned with the development of knowledge, skills and attitudes needed to understand, accept and lead a healthy lifestyle.

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 and vigorous 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 A: QUESTIONNAIRE

WESTERN AUSTRALIAN PHYSICAL ACTIVITY SURVEY
NOVEMBER 2002

INTRODUCTION

Good afternoon/evening, my name is (name) I am calling on behalf of [name of research company] We are conducting a statewide survey to help with planning a new physical activity initiative recently launched by the Premier. 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)

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

Q1. 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?

[99= don't know – use as an absolute last resort]
[Skip Q2 to Q3 if no walking]

Times:	

Q2. What do you estimate was the total time that you spent walking in this way in the past week?
[Interviewer: this is continuous walking]

Hours:	
Minutes:	

Q3. 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?

[99= don't know – use as an absolute last resort]
[Skip Q4 to Q5 if no walking]

Times:	

Q4. 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.

Q5. ***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)

[99= don't know – use as an absolute last resort]
[Skip Q6 to Q7 if no walking]

Times:	

Q6. 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.

Q7. In the past week how many times did you do any other more moderate physical activities that you have not already mentioned? (e.g. gentle swimming, social tennis, golf, etc.)

[99= don't know – use as an absolute last resort]
[Skip Q8 to Q9 if no walking]

Times:	

Q8. What do you estimate was the total time that you spent doing these activities in the past week?

Hours of moderate physical activity:	
Minutes of moderate physical activity:	

Q9. 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]	

Q10. What facilities or areas did you use for Q9?
(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]	

Q11a. What is your MAIN reason for doing physical activity?
(do not read out but mark response in table below)

Q11b. Are there any other reasons?
(do not read out but mark response in table below)

Reason	Main Reason	Other 1	Other 2
1. Improve appearance			
2. Enjoy doing the activity			
3. Maintain or lose weight			
4. Social interaction and friendships			
5. Reduce your risk of heart disease			
6. Feel more relaxed			
7. Tone your muscles			
8. Improve your fitness			
9. Feel better about yourself			
10. Have more energy			

Reason	Main Reason	Other 1	Other 2
11. Sleep better			
12. Prevent joint stiffness			
13. Other			
14. No Reason			

The following questions (12 to 15) 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:

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:

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 farther?

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 or walking 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? (Do not read out)

Times per week:	

1. Refused
2. Don't know

[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 17]

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

Hours:	
Minutes:	

[Interviewer clarification: Think about only the bicycling that you did for at least 10 minutes at a time.]
[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: What is the total amount of time you spent bicycling over the past seven days to travel from place to place?

Hours:	
Minutes:	

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.]

Times per week:	

1. Refused
2. Don't know

[Interviewer: If respondent answers zero, refuses or does not know, skip to Question 18]

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

Hours:	
Minutes:	

[Interviewer clarification: Think about only the walking that you did for at least 10 minutes at a time.] [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: What is the total amount of time you spent over the past seven days walking from place to place?]

Hours:	
Minutes:	

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?

Yes:	
No:	

Q19b. IF YES, What? 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	
2. It's not a big exercise	
3. Find thirty, it's not a big exercise	
4. Be active	
5. Be active every day	
6. Travelsmart	
7. Walk There Today	

Q21. To what extent do you agree or disagree with each of the following:
[Read out each of the following categories except 6 and 7]

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly Disagree.
6. Don't know - [don't read]
7. Refused - [don't read].

When I am active:

I enjoy it:	1	2	3	4	5	6	7
I feel bored:	1	2	3	4	5	6	7
It makes me feel good:	1	2	3	4	5	6	7

Q22. How confident are you that you can participate in at least 30 minutes of moderate 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]	

Q23. Who normally does physical activity with you?

1. Spouse/partner	
2. Family member	
3. Friend	
4. Workmate	
5. Neighbour	
6. Sports or health club member	
7. None	

Q24. In the past month, how often did you arrange to meet with someone to do physical activity?

1. Never	
2. Once or twice	
3. 2 -3 times	
4. Weekly	
5. More than once a week	

The following statements are about the amount of exercise you intend to do in the near future.

Q25. Which of these categories best describes you?:

1. I currently do not exercise and I do not intend to start exercising in the next 6 months?	
2. I currently do not exercise but I am thinking about starting to exercise in the next 6 months [Pause]	
3. I currently exercise some but not regularly.	
4. I currently exercise regularly but I have only begun to do so within the past 6 months.	
5. I currently exercise regularly and have done so for longer than 6 months	

Q26. What reasons would you give for not being more physically active?
[Multiple answers allowed]
(do not read out)

1. I don't have time	
2. My health is not good enough	
3. There is no-one to do it with	
4. I've lost contact with friends/family	
5. I can't afford it	
6. I'm too old	
7. There are no suitable facilities	
8. Traffic is too heavy	
9. I'm not the sporty type	
10. No motivation	
11. Can't be bothered	
12. Too fat – overweight	
13. I need to rest and relax in my spare time	
14. I don't put priority on physical activity	
15. I've got young children to look after	
16. I might get injured or damage my health	
17. I don't enjoy physical activity	
18. I'm active enough	
19. Other [specify]	
20. None	

Q27. How would you describe your workplace activity?

1. Physically inactive	
2. Regular walking in blocks of at least ten minutes	
3. Moderately active (raised heart rate) for a total of 30 minutes every day	
4. Vigorously active (breathing hard) for a total of at least 20 minutes on three or more days	
5. Not applicable	

Q28. Last time you saw your doctor or GP, did he or she give you any advice about doing more physical activity or exercise?

Yes:	
No:	

Finally a few questions to help classify your answers.

Q29. What is your sex?

Male:	
Female:	

Q30. Could I ask your age please?

0-999 *[99 = refusal]*

Q31. What is your marital status?

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

Q32. What is your approximate weight in pounds, stones or kilograms?

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

Q33. What is your approximate height in feet and inches or centimetres?

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

Q34. What you consider yourself to be:

1. Aboriginal	
2. Torres Straight Islander	
3. Neither	

Q35. How many people under 18 reside at your home?

Q36. How many children aged five and under reside at your home?

Q37. 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]	

Q38. 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]	

Script for recruitment of pedometer participants

That completes the survey except to ask if you would be willing to take part in further studies about physical activity?

Yes _____ 1

No _____ 2 – Skip to (R21)

Thank you very much. May I please have your name and daytime phone number?

Name: _____

Daytime phone: _____

Actually, we are currently conducting a study of physical activity using pedometers. A pedometer is a small mechanical device (about the size of a matchbox) that clips to your clothing and counts the number of steps you take each day.

If you were willing to be involved we would mail you a pedometer, instructions on use and a simple activity diary. You would need to wear the pedometer for one week, during your waking hours. As a small token of appreciation, once you returned the pedometer, your name would go into a draw to win a bicycle of your choice.

May I tell you a little more?

Yes _____ 1

No _____ 2 – Skip to (R21)

Each day you need to write in your diary whether you wore the pedometer, and the number of steps you took that day. Wearing the pedometer will not cause any discomfort or inconvenience. You would simply do your typical daily activities. After we receive all the pedometers and diaries back, we will send you a report of the results so you can compare your results with people your own age.

When the week is finished, you will need to return the pedometer and diary in the pre-paid return envelope. It's important that we get your pedometer back because it will be sent to other people in the study and will be used for a children's study next year.

You may refuse to participate, refuse to answer any question, or withdraw from the study at any time. We just need you to return the pedometer.

May we send you the pedometer kit?

Yes _____ 1

No _____ 2 – Skip to (R21)

To show you are giving Informed Consent and to allow us to send you a pedometer and materials, please give me your full name and day telephone number so that we can contact you if we haven't heard from you.

Full name: _____

Daytime phone (confirm): _____

Evening phone: _____

House no. and street: _____

Suburb/town: _____

Postcode: _____

R21. That is the end of the interview. Thank you for your time. Just to remind you my name is (interviewer's name). I am from the Survey Research Centre in the University of Western Australia. If you have any questions about this research you can telephone our office on 08 9347 4054.

APPENDIX 2: PEDOMETER INSTRUCTIONS AND DIARY

PEDOMETER INSTRUCTIONS

(keep this on the fridge or somewhere similar)

Pedometer: The pedometer counts your steps taken.

If the pedometer is not at 0, reset before you put on in the morning of the first day.

Wear your pedometer during your waking hours. Do **not** wear it in the shower or bath, or while swimming.

Each night, put it with your shoes or keys to remind you to wear it.

Each morning, in the diary, write down the date, put your pedometer on and then circle YES to indicate you are wearing it.

Wear the pedometer as shown above.

Clip the pedometer to your waistband on the front of your body, placing it on your hipbone or as close to as possible. You can wear the pedometer under your clothes or on the outside of your waistband if you wish.

Every night, take the pedometer off and open it. In your diary, write down the number of steps shown on the screen.

Circle **YES**, or **NO** in answer to each of the questions in your diary.
For example, Were you injured or sick today?
Did you go to work today?
Did you do any sports today?
Did you exercise today?

If you did sports or exercise, write down the type of activity you did and how much time you were active. For example,
Walk 30 minutes
Swim 15 minutes

Some people may do more than 99,999 steps over the seven days. If you do more than 99,999 steps, the pedometer will reset to 0 and you should continue to record the number on the pedometer. If necessary, we will add the other 99,999 steps to your total.

If you forget to wear the pedometer one day, just circle NO and leave the day blank.

We will send you the overall results of the study so you can compare your results. Keep a record of your total number of steps somewhere safe (e.g. calendar, diary).

Thank you for helping us with our physical activity study!

If you have any questions, please call Janelle during work hours on (08) 9382 5980.

ID # _____ **FULL NAME** _____ **EMAIL** _____

(So we can send results to you please provide your email address above)
DON'T HAVE AN EMAIL ❑ **(place tick in box)**

WHEN FINISHED, MAIL THIS SHEET BACK WITH THE PEDOMETER IN THE PRE-STAMPED ENVELOPED. THANK YOU

EXAMPLE						
Date (12/11/02)	**Date (/ /)**	**Date (/ /)**	**Date (/ /)**	**Date (/ /)**	**Date (/ /)**	**Date (/ /)**
PEDOMETER WORN: 1. YES 2. NO	PEDOMETER WORN: 1. YES 2. NO	PEDOMETER WORN: 1. YES 2. NO	PEDOMETER WORN: 1. YES 2. NO	PEDOMETER WORN: 1. YES 2. NO	PEDOMETER WORN: 1. YES 2. NO	PEDOMETER WORN: 1. YES 2. NO
TOTAL STEPS: **4683**	TOTAL STEPS:	TOTAL STEPS:	TOTAL STEPS:	TOTAL STEPS:	TOTAL STEPS:	TOTAL STEPS:
SICK/INJURED 1. YES 2. NO	SICK/INJURED 1. YES 2. NO	SICK/INJURED 1. YES 2. NO	SICK/INJURED 1. YES 2. NO	SICK/INJURED 1. YES 2. NO	SICK/INJURED 1. YES 2. NO	SICK/INJURED 1. YES 2. NO
WORK 1. YES 2. NO	WORK 1. YES 2. NO	WORK 1. YES 2. NO	WORK 1. YES 2. NO	WORK 1. YES 2. NO	WORK 1. YES 2. NO	WORK 1. YES 2. NO
SPORT 1. YES 2. NO	SPORT 1. YES 2. NO	SPORT 1. YES 2. NO	SPORT 1. YES 2. NO	SPORT 1. YES 2. NO	SPORT 1. YES 2. NO	SPORT 1. YES 2. NO
EXERCISE 1. YES 2. NO	EXERCISE 1. YES 2. NO	EXERCISE 1. YES 2. NO	EXERCISE 1. YES 2. NO	EXERCISE 1. YES 2. NO	EXERCISE 1. YES 2. NO	EXERCISE 1. YES 2. NO
TYPE AND TIME: **Walk 30 mins** **Swim 15 mins**	TYPE AND TIME:	TYPE AND TIME:	TYPE AND TIME:	TYPE AND TIME:	TYPE AND TIME:	TYPE AND TIME:

School of Population Health
Survey Research Centre
1st Floor 45 Stirling Highway
Nedlands WA 6009
Telephone: +61 8 9347 4055
Facsimile: +61 8 9380 1743
Email:
anton@dph.uwa.edu.au

Dear:

Re: Participation in the Pedometer Study

Thank you for agreeing to participate in the pedometer study. Your participation in this study is very important to us.

Enclosed is a pedometer to wear on your waist or hip, instructions on how to use the pedometer and a diary to record when you wear it.

As a token of our appreciation, after you return the pedometer and diary you will be entered into a prize for a brand new bicycle (up to the value of $1000). There will be three prizes drawn at the end of the survey. Please call Janelle on (08) 9382 5980 if you have any questions about the survey. We need the pedometers to be returned because they will be used for a survey of children which will be conducted next year.

Thank you again.

Yours sincerely

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