Trends in population levels of reported physical activity in Australia, 1997, 1999 and 2000

Adrian Bauman
School of Population Health and Community Medicine
University of New South Wales

Ian Ford
Australian Sports Commission
Canberra

Tim Armstrong
Australian Institute of Health and Welfare
Canberra

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List of Abbreviations

AA	Active Australia
PA	Physical activity

Summary

Increasing levels of participation in physical activity is an important issue for all Australians, from the sport and recreation sector's perspective as well as being an important and under-recognised issue from the health perspective. Direct health care costs attributable to physical inactivity in Australia have been estimated at upwards of $370 million per annum. However, despite the health, social and economic burden associated with a relatively inactive lifestyle this report ? a summary of adult physical activity participation data collected in 1997, 1999 and 2000 ? indicates physical activity participation by Australians has decreased in recent years and remains relatively low.

Major findings from the report suggest:

- The percentage of adult Australians achieving sufficient time being physically active for health benefits (at least 150 minutes of walking, moderate and/or vigorous activity per week) declined from 62.2% in 1997 to 56.6% in 1999 and remained stable at 56.8% in 2000.

- Similarly, the percentage of adults achieving sufficient time and frequency of activity (at least 150 minutes of walking, moderate and/or vigorous activity *and* 5 sessions per week) declined from 50.9% in 1997 to 45.2% in 1999 and remained stable at 46.1% in 2000.

- Levels of physical inactivity (i.e. sedentary behaviour) increased from 13.4% in 1997 to 14.6% in 1999, with an additional slight increase again in 2000 to 15.3%.

- Of the adults surveyed in 2000, almost 50% are doing no more, or no less physical activity than 1 year previously. And, although about 28% of adults indicated they were more active that 1 year previously, this is countered by the 23% of adults who indicated they were less active than a year before.

- Findings from the 2000 survey indicated that 4% of adults reported that they had increased their level of activity in response to Australia hosting the Olympic games earlier that year.

- The proportion of adults intending to be more active "in the next month" (short term intention) increased from 31.5% in 1997 to 34.4% in 1999 and 36.9% in 2000. However, the proportion of adults intending to be more active "in the next 6 months" remained at 28.5% from 1997 to 1999 before decreasing to 25.8% in 2000.

This report also details information regarding the physical activity promotional campaigns and the Active Australia initiative. Findings from the surveys indicate that:

- Understanding and awareness of physical activity messages were generally high suggesting knowledge about appropriate activity type and level was good and that most adults recognise the importance of being more active. Awareness of any generic physical activity message was consistent between 1997 and 1999, at 63.7% and 63.9% respectively, before increasing to 66.4% in 2000.

- The proportion of adults who had heard specifically of Active Australia increased from 17.8% in 1999 to 23.3% in 2000. Recall of the specific Active Australia health-related tagline "Exercise, you only have to take it regularly, not seriously" jumped markedly from 14.4% in 1997 to 41.8% in 1999 before dropping slightly to 38.5% in 2000.

- Findings from the 2000 survey suggested that 2.8% of adults (about 383,000) participated in Active Australia Day (October 29). However, when household residency estimates were applied, the proportion of Active Australia Day participants is likely to have ranged ranged from 3.5% (651,000) to 5.8% (1,078,000) of the population.

Introduction

This report summarises trends in physical activity among adults in Australia. Monitoring physical activity is an important component of tracking trends in risk factors of public health interest, as well as of substantial interest to other sectors such as sport and recreation (AIHW 1999, SIGPAH 2001). Monitoring trends in physical activity can allow the impact of specific interventions, as well as strategic and national initiatives to be assessed.

This report describes serial National Physical Activity prevalence estimates collected in November 1997, and again at the same time of the year in 1999 and in 2000. The main purpose of this report is to extend the analysis conducted by the Australian Institute of Health and Welfare (Armstrong, Bauman & Davies 2000) which described trends in the surveys between 1997 and 1999. Full details of the methods of those two surveys and of the trends in physical activity between those two points are described in that document. This brief report summarises the additional information collected in November 2000, which was about six weeks following the end of the Sydney Olympic and Paralympic Games. The main objectives of this report are to describe any trends that occurred following the initial two surveys in 1997 and 1999, and to assess responses to some specific questions of relevance to Active Australia added into the 2000 questions.

Methods

The methods used in the 2000 physical activity survey are the same as those in the earlier surveys in 1997 and 1999 (Armstrong et al., 2000). The primary questions asked related to self reported participation in physical activity, and used questions which have been shown to be appropriate and reliable for population surveys.

The three surveys were conducted at exactly the same period of the year, namely the last two weeks of November. The survey method was a random sample population telephone survey, carried out by the Hunter Valley Research Foundation. All three surveys used National samples, and the data in this report are presented at the national level. Subsequent analyses may report on state specific estimates, but these are reliable only for States with larger sample sizes. The method of sampling was to use a random sample from the electronic white pages, and to sample adults aged 18–75 years. A random adult within each household was selected, and asked to participate in the study, which was explained to them. Participation was voluntary, and those who participated were asked a series of questions about their physical activity participation, knowledge and understanding, which lasted for about 10 minutes.

The major research questions in this study were to determine:

- Were there any changes in physical activity participation levels among adult Australians across these surveys?
- Were there any changes in understanding and awareness of the moderate physical activity message?
- Were there any changes in intention to be more physically active?
- Were there any changes in awareness of the mass media campaigns conducted by various state and federal organisations, usually through the umbrella of Active Australia?
- Additional specific research questions asked in November 2000 were in relation to the Olympics, and whether any recent changes in physical activity had occurred?

The survey questions are reproduced in Appendix 1 at the end of this report, and were usually close coded questions. Where open ended questions were asked, they were content analysed and reduced into closed coded categories. The methods for analysing these data particularly for the construction of summary physical activity measures are described in the earlier publication (Armstrong et al., 2000). In particular, physical activity was expressed as total minutes of moderate activity, vigorous activity, or walking and also expressed as a summary index where people had achieved sufficient physical activity for health benefit, described by the US Surgeon-General's Report as at least 150 minutes accumulated in the previous week. As an alternative measure, also consistent with the US Surgeon-General's report, we also use the threshold of both 150 minutes and five sessions per week. Note that for vigorous activities minutes were weighted by a factor of 2 which accounted for their increased energy expenditure, which is also described in the earlier monograph (Armstrong et al., 2000).

Analyses in this report are generally descriptive in nature. The primary focus of the comparison is at the national level. For the specific comparisons between November 1999 and November 2000 data, bivariate comparisons and tests of statistical significance are estimated for the observed trends. These tests of significance are not reported for the 1997 to 1999 trends, as these have been reported earlier (Armstrong et al., 2000). Two-way and multi-way contingency tables are compared, and continuous or ranked data assessed using parametric or non-parametric statistical methods, as required. Data are reported as p-values, indicating where significant trends occurred at the national level between 1999 and 2000.

Results

1. Demographic data

The data for each of these three surveys were based on a random sample of adults across Australia. The survey response rates were 61%, 65% and 76% across the three time periods of 1997, 1999 and 2000. These were household level response rates, with the individual level response rates within households being 81%, 89% and 84%. (Bauman et al 2001, Armstrong et al 2000) The data in table 1 show the demographic characteristics of each of the three samples. These use unweighted data, to demonstrate that the samples were similar. It can be seen from table 1 that around 44% of each sample were male, with reasonably similar proportions across age groups. The 2000 sample was slightly more likely to have a tertiary education, but showed very similar employment status categories. In summary, the three samples were similar to each other on demographic characteristics, and were very similar to samples obtained in other population survey data (Bauman 1996, Smith 1999).[1]

Table 1: Demographic characteristics of samples (unweighted data)

	1997 (%) N=4824	1999 (%) N=3842	2000 (%) N=3590
Sex			
Male	44.3	44.1	43.6
Female	55.7	55.8	56.4
Age group (years)			
18-29	19.3	17.2	18.2
30-44	35.2	32.8	33.6
45-59	25.2	27.3	27.4
60-75	20.3	22.5	20.7
Marital status			
Married/partner	63.7	68.2	67.1
Single	30.6	25.2	27.0
Widowed	5.6	6.6	5.9
Education level			
Less than 12 years schooling	41.5	41.4	36.0
Completed 12 years schooling	35.1	34.6	36.5
Tertiary qualifications	23.4	24.0	27.5
Employment Status			
Professional, Manager	29.1	30.2	30.7
White collar, trade	24.5	23.5	24.6
Blue collar	8.3	7.6	8.3
Unemployed	3.1	3.0	2.5
Home duties	18.2	16.6	14.4
Student	4.1	3.4	3.5
Retired	12.7	15.8	16.0
Language Spoken at home			
English	95.7	95.0	93.8

For analysis the data were weighted to be nationally representative. The weights used were based on the potential number of interviews per household, and age and gender. The age groups used in weighting were the ABS populations for adults aged 18-75. The weighted data were then reduced to an effective sample size for analysis that comprised 2500 effective responders in 1997, and 3,000 in each of the surveys in 1999 and 2000. This down-weighted national sample estimates were suitable

[1] Note that this report, due to differences in statistical software, may produce some prevalence estimates which differ by up to 0.1% from the 1997 to 1999 estimates described by Armstrong et al 2000. This is within the rounding error methods used by different statistical packages, and is not corrected. It makes no difference for trend comparisons.

for statistical analysis. Where simple prevalence rates are reported, nationally weighted data are reported.

2. Physical activity participation

This section describes trends in physical activity (PA) participation across the three surveys. These are nationally weighted data. Tables 2 and 3 show different classifications of the proportion of the population who are sufficiently active for health, defined as the proportion achieving "150 minutes per week" (table 2), and the more conservative definition, those reaching the "150 minutes per week and also reporting five or more sessions of activity in the week" (table 3).

The first definition of 'sufficient activity for health' (achieving 150 minutes per week) shows that in 1997 62.2% of all adults were sufficiently active, which reduced to 56.6% in 1999, and remained stable at 56.8% in 2000 (table 2). These declines were noted for men and for women, although there was a continued decline between 1999 and 2000 for men, compared to a slight increase among women. The decline between 1997 and 1999 was maintained across all age-groups in the year 2000, except those aged 60-75 years. None of the differences between 1999 and 2000 were statistically significant.

Table 2: Percentage of people achieving sufficient activity time*

	1997	1999	2000
Sex			
Men	63.4	59.6	57.6
Women	61.1	53.8	56.0
Total sample	*62.2*	*56.6*	*56.8*
Age group (years)			
18–29	74.0	68.7	68.5
30–44	63.6	53.5	54.2
45–59	53.8	50.0	49.7
60–75	53.4	54.1	54.4
Education level			
Less than 12 years schooling	55.1	49.6	50.6
Completed 12 years schooling	63.0	59.7	58.8
Tertiary qualifications	71.9	62.3	62.3

* 'Sufficient' activity time is defined as 150 minutes total activity including all walking and moderate minutes, and vigorous minutes of activity weighted by two (refer pages 16-18 of Armstrong et al., 2000)

Data for the second definition of 'sufficient activity for health' (achieving both 150 minutes and five sessions per week) indicates that in 1997 50.9% of all adults were sufficiently active, which declined to 45.2% in 1999, and remained stable at 46.1% in 2000 (table 3). These trends were similar by gender, although the initial decline was greater for women between 1997 and 1999 from 50% to 43%. By age group, the declines were most marked in young and middle aged adults, with much less decline among those aged 45-59 years (43% in 1997 to 41% by 2000), and no decline amongst those aged over 60 years. According to level of education, the greatest decline was among those with tertiary education, who declined from 61% in 1997 to 52% in 1999 and in 2000. Although there were some

significant differences between 1997 and 1999 (Armstrong et al, 2000), no differences between 1999 and 2000 were significant.

Table 3: Percentage of people achieving sufficient activity time and sessions

	1997	1999	2000
Sex			
Men	51.7	47.1	46.7
Women	50.1	43.4	45.5
Total sample	*50.9*	*45.2*	*46.1*
Age group (years)			
18–29	62.9	56.3	57.8
30–44	51.6	41.2	42.0
45–59	43.1	40.2	41.3
60–75	42.7	43.6	43.6
Education level			
Less than 12 years schooling	43.9	38.6	38.9
Completed 12 years schooling	51.4	47.0	48.5
Tertiary qualifications	61.2	52.3	52.5

* 'Sufficient' activity time and sessions is defined as 150 minutes total activity and at least five sessions per week (refer pages 16-18 of Armstrong et al., 2000)

The data in table 4 show people reporting no physical activity at all across the three surveys. There was an increase from 1997 where 13% reported that they were sedentary to almost 15% in 1999, and 15% in the year 2000. The difference between 1999 and 2000 was significant for males overall, and for persons aged 18-29, who showed statistically significant ($p<0.05$) increases in the reported sedentary rate.

Tables 5 and 6 illustrate the mean and median minutes of physical activity, by general activity type, in the previous week. Table 5 shows mean minutes and their standard errors. Table 6 shows the median minutes of activity by type. For example, it can be seen in table 5 that over the three years of survey, the mean number of minutes walked declined from 137 minutes in 1997 to 114 minutes in 1999, to123 minutes in 2000. Between 1999 and 2000, there was a significant increase in walking minutes ($p=0.02$), but changes were not significant for other measures in Table 5, including total minutes of activity.

Table 4: Percentage of people reporting no PA (i.e. sedentary)

	1997	1999	2000
Sex			
Men	13.7	14.6	17.5
Women	13.1	14.7	13.1
Persons	*13.4*	*14.6*	*15.3*
Age group			
18–29	7.3	6.3	10.1
30–44	11.7	16.9	15.6
45–59	18.1	18.2	18.2
60–75	19.2	17.9	18.3
Education level			
Less than 12 years schooling	18.2	19.5	20.1
Completed 12 years schooling	13.1	12.5	13.8
Tertiary qualifications	6.2	10.9	10.8

Table 5: Mean minutes (and SE*) for activity type in the previous week

	1997		1999		2000	
Activity Type	**Mean**	**SE**	**Mean**	**SE**	**Mean**	**SE**
Walking (w)	137.1	3.5	114.2	2.6	123.5	3.0
Moderate (m)	62.3	3.0	54.2	2.5	48.4	2.3
Vigorous (v)	91.2	3.4	65.0	2.5	67.9	2.6
Gardening (g)	86.6	3.4	76.9	2.9	76.2	2.8
Total w + m + v**	291.2	6.2	233.2	4.5	239.6	4.8
Total w + m + v + g***	377.6	7.2	310.3	5.5	315.8	5.8

* SE = standard error of the mean
** Total minutes in walking + moderate and vigorous activities
*** Total minutes in walking + moderate, vigorous and gardening activities
Note: There are missing data for 12 people for all four components in 1997 (compared to the N=2499 for w, m and v separately in 1997) and for 2 people in 1999 (n=2992) and 2000 (n=2985).

The data in table 6 showed similar results to table 5. For example, the median walking minutes were 80 minutes, 60 minutes and 65 minutes, and the total leisure time physical activity (walking + moderate + vigorous) declined from 190 minutes to a median of 160 minutes in 1999 and 2000. These differences were not significant. As the data for minutes of activity were skewed, the median values were often zero, for example, for moderate and vigorous activity. To illustrate this further, table 6 provides interquartile ranges for these median values. These show the values at the 25th and 75th percentiles of the distribution, as well as 50th percentiles (median values).

Table 6: Median minutes for activity type in the previous week (with interquartile range ? 25th and 75th percentiles of the distribution ? shown in parentheses)

Activity type	1997	1999	2000
Walking (w)	80 (0 –180)	60 (0 – 170)	65 (0 – 180)
Moderate (m)	0 (0 – 30)	0 (0 – 30)	0 (0 – 20)
Vigorous (v)	0 (0 –90	0 (0 – 60)	0 (0 – 70)
Gardening (g)	0 (0 – 90)	0 (0 – 90)	0 (0 – 90)
Total w + m + v	190 (60 – 420)	160 (46 – 330)	160 (50 – 330)
Total w + m + v + g	270 (120 – 540)	220 (90 – 435)	225 (90 – 430)

In summary, physical activity rates declined between 1997 and 1999 and were generally stable between 1999 and 2000. This is true of the categorical measures or of the continuous measures expressed as mean or average minutes of activity. There were no particular differences by activity type in discerning these trends, and a non parametric method (using median minutes) produced similar trends. These data suggest that there was a decline in physical activity between 1997 and 1999 in the Australian adult population across most age groups and for both genders, with no change in the 2000 survey.

3. Intention to be more active

The data in table 7 show reported intention to be more active. This was divided into those that had no intention to be more active, and those that had a short-term intention (within the next month) and longer-term intention to be more active (within six months). Overall, rates of no intention to be more physically active were similar in 1999 and 2000. The most important component of intention (for strategic planning) is the short-term intention to be active, shown in the middle column of table 7, as this is most closely related to the adoption of physical activity. Here is can be seen there were increases in short-term intention between 1997 and 1999, and a further significant increase between 1999 and 2000 ($p<0.05$). There was also a decline in longer-term intention between 1999 and 2000.

Table 7: Percentage of (total) people intending to be more active

	Do not intend	Intend next month	Intend next 6 month
Persons 1997	39.9	31.5	28.5
Persons 1999	37.1	34.4	28.5
Persons 2000	37.3	36.9	25.8

These data are shown in the figures below, stratified by gender and age group. For males short term intention increased between 1997 and 1999, but increased further to 37.4% in the year 2000 ($p<0.01$), whereas longer-term intention declined. For females there was an increase in short term intention between 1997 and 1999, but no change between 1999 and 2000 in the proportion of women who intended to be active in the next month. The figures below also show intention by age group, with little impact on short-term intention among adults aged less than 30 years shown in figure 3; for this younger age group, there was an increase in 'no intention' which was significant ($P<0.05$). Figure 4 shows in the middle aged adults groups that there was a slight but non-significant increase in intention across all three time periods, but figure 5 shows that the most substantial increase in short term intention occurred in the adults aged 45-59 years between 1999 and 2000. This change was from 31% to 38%, and was highly significant ($p<0.001$). For the oldest adults, those aged over 60 (shown in figure 6) there were no significant changes in intention to be physically active.

Figure 1: Percentage of males intending to be more active

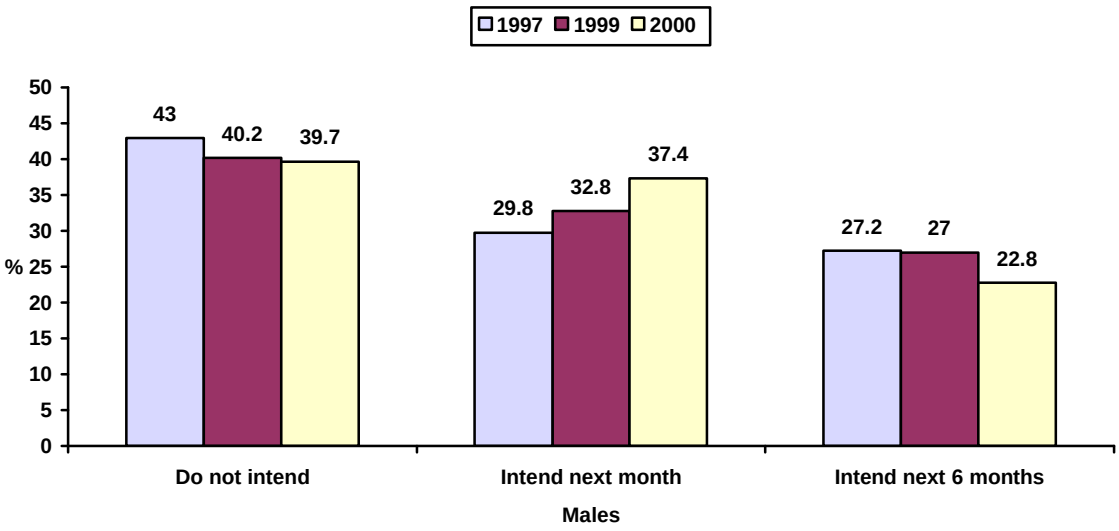


Figure 2: Percentage of females intending to be more active

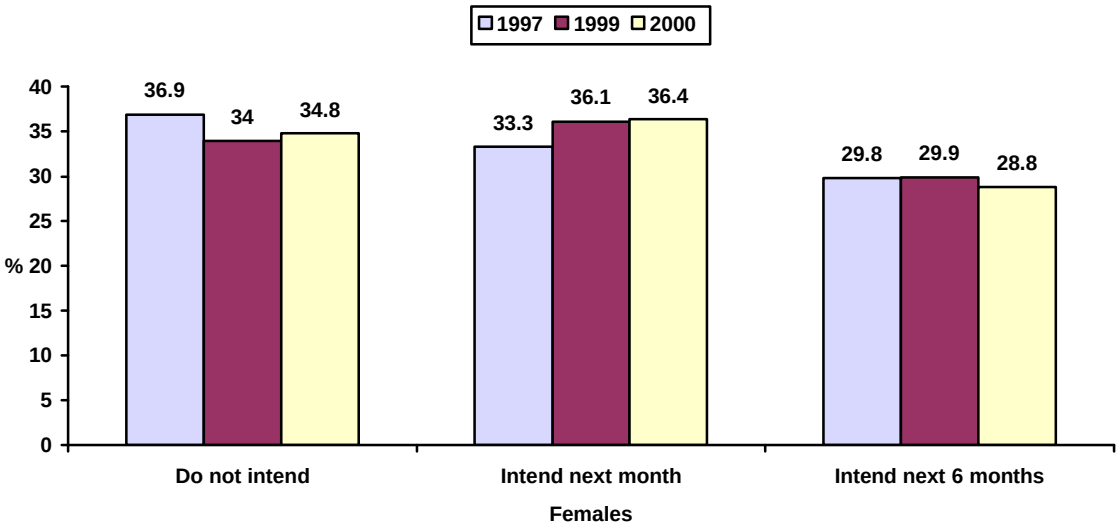


Figure 3: Percentage of people aged 18-29 years intending to be more active

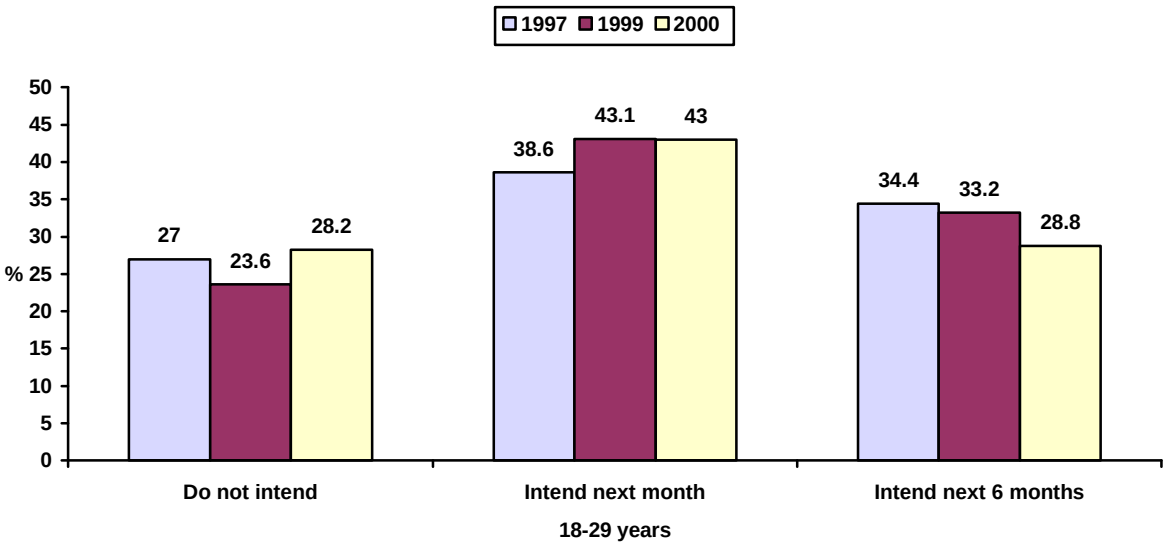


Figure 4: Percentage of people aged 30-44 years intending to be more active

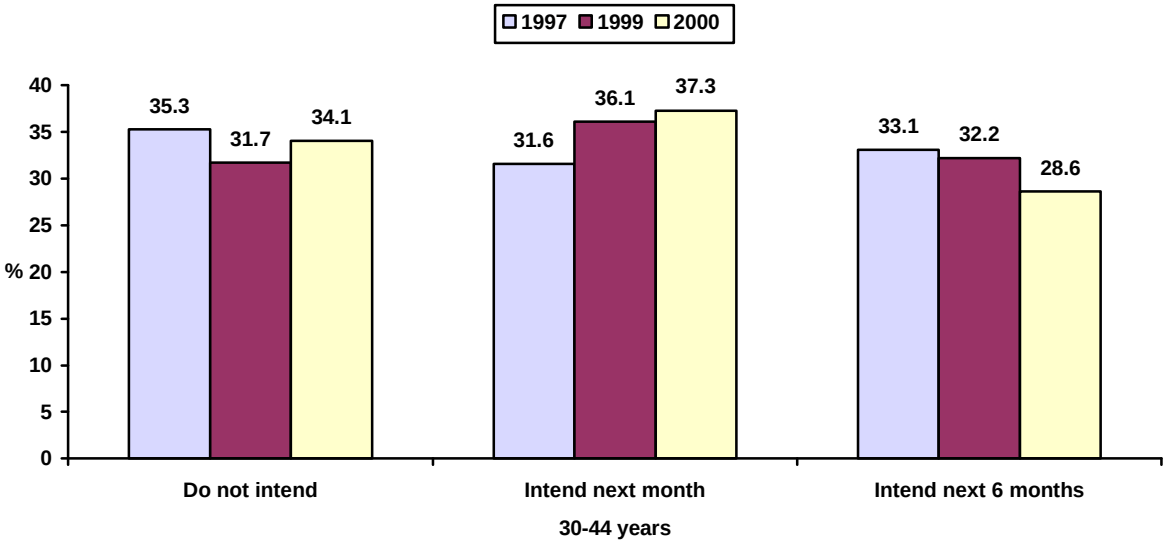


Figure 5: Percentage of people aged 45-59 years intending to be more active

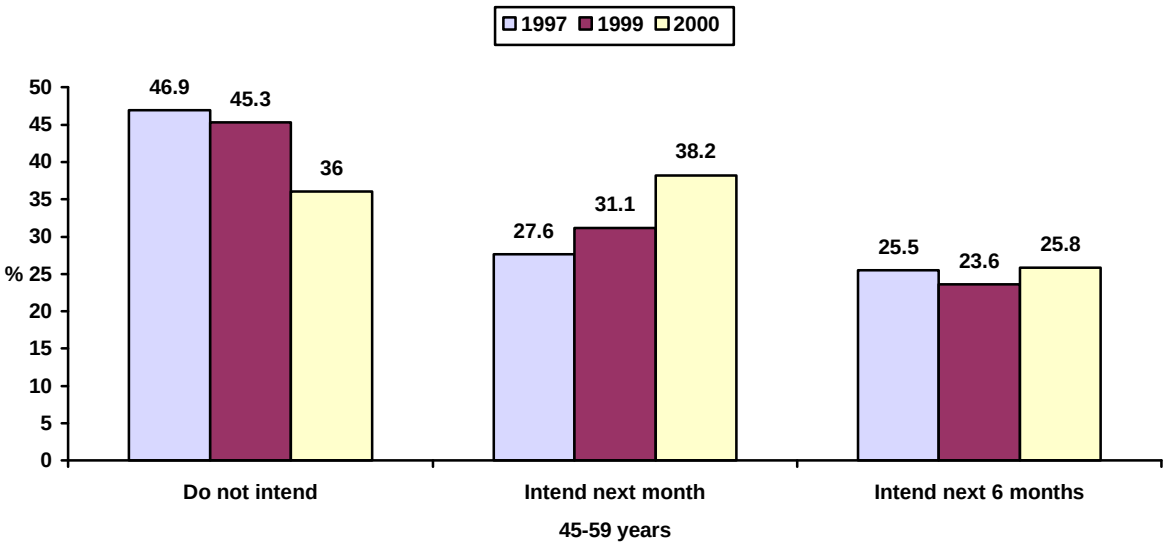
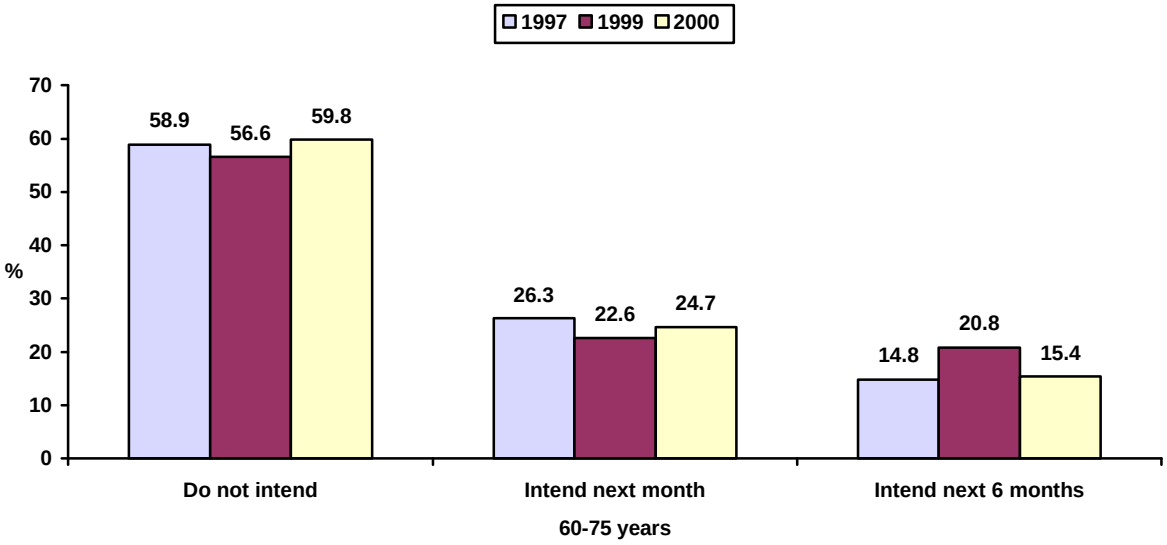


Figure 6: Percentage of people aged 60-75 years intending to be more active



4. Understanding and awareness of the moderate physical activity message

The data in table 8 show responses to a series of knowledge statements about physical activity. Four statements were asked, and survey responders were asked to rate their agreement with each statement on a five point scale from strongly agree to strongly disagree. The data in the table below show the proportion who agree with each statement across each of the three surveys. For each of the knowledge items there were generally high levels of agreement in 1997, for example 84.6% agreeing that generally being more active was enough to improve health. This increased to 88.1% in 1999, and 87.7% in 2000. Similarly rates of agreement with the half an hour of brisk walking item were high across all three surveys. There was a slight decrease from 62.2% to 59.6% in the proportion that agreed it was necessary to do vigorous exercise at least 20 minutes three times per week to improve health. This decrease in agreement is a move in the correct direction. There was also an improvement in the concept of accumulation, with more people agreeing that blocks of 10 minutes were sufficient for health benefit, with most of this improvement occurring between the 1997 and 1999 surveys. None of these changes were significant between 1999 and 2000.

The figures below show each of these items and their agreement stratified by gender and age group. Figures 7 and 8 show that for knowledge about generally being more active, more women than men reported agreement with this item, but the trends were similar across surveys. By age group this item showed increased agreement across surveys for the two younger age groups, but a mixed pattern for those aged 45 and older.

Figures 9 and 10 describe agreement with the item asking about brisk walking on most days. Again females showed high rates of agreement that males, but for both genders, agreement was higher in 1999 than in 1997. By age group agreement continued to increase across surveys for the youngest age group, with some effect in the 45-59 year old age group in the year 2000.

The next question asked about the need for vigorous activity. This showed little variation across surveys for males, but a decline in agreement with this statement for females between 1997 and 1999. Rates of agreement with the need for vigorous activity were highest amongst young adults, but declined between 1997 and 1999.

Figures 13 and 14 showed the concept of accumulation, looking at the proportion that agreed with the statement that blocks of 10 minutes were useful for health. This showed increases between 1997 and 1999 for both males and females, and also across all age groups.

Table 8: Percentage of people agreeing (combined 'strongly agree' and 'agree') with PA knowledge statements

Statement	1997	1999	2000
1. Taking the stairs at work or generally being more active for at least 30 minutes each day is enough to improve your health.	84.6	88.1	87.7
2. Half an hour of brisk walking on most days is enough to improve your health.	90.3	92.1	91.2
3. To improve your health it is essential for you to do vigorous exercise for at least 20 minutes each time, three times a week.	62.2	60.8	59.6
4. Exercise doesn't have to be done all at one time—blocks of 10 minutes are okay.	74.1	79.2	78.2

Figure 7: Percentage of people agreeing with knowledge about PA statement 1 ("Generally more active") by sex and year

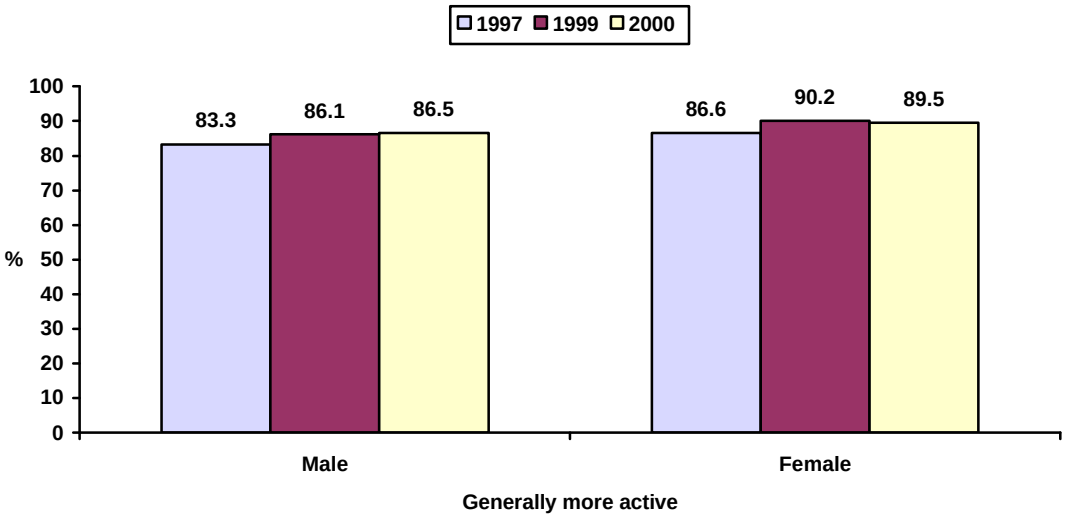


Figure 8: Percentage of people agreeing with knowledge about PA statement 1 ("Generally more active") by age group and year

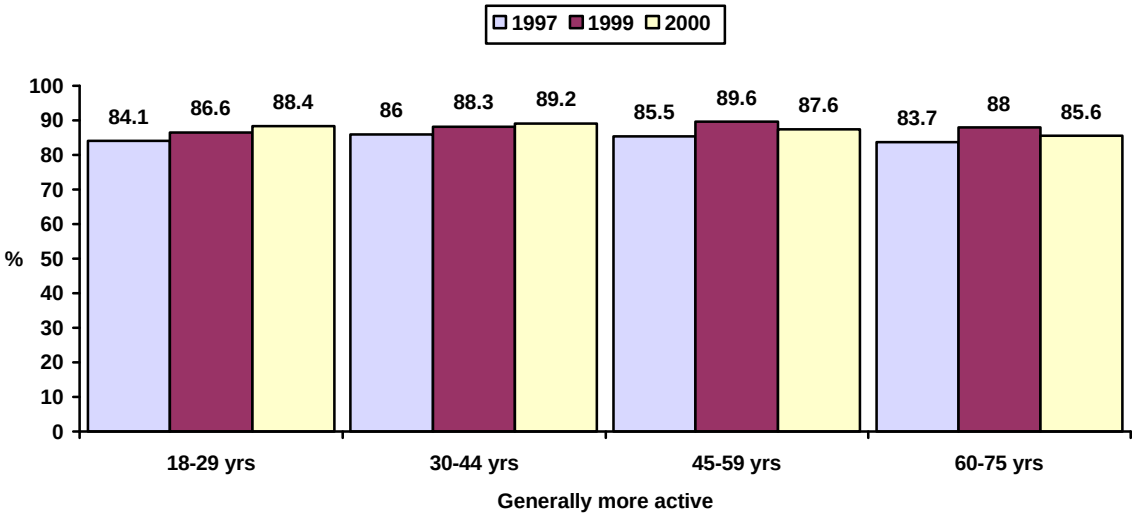


Figure 9: Percentage of people agreeing with knowledge about PA statement 2 ("Brisk walk most days enough") by sex and year

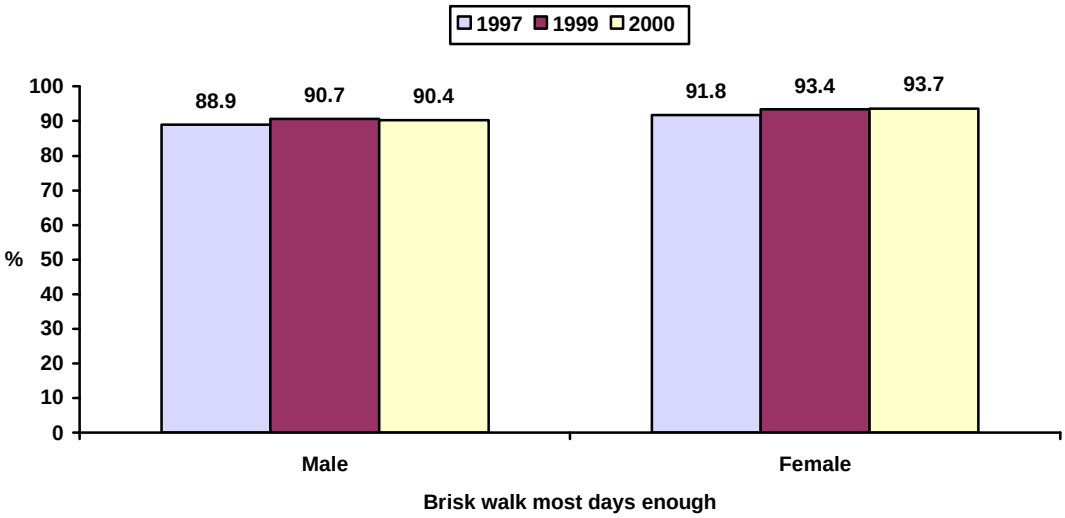


Figure 10: Percentage of people agreeing with knowledge about PA statement 2 ("Brisk walk most days enough") by age group and year

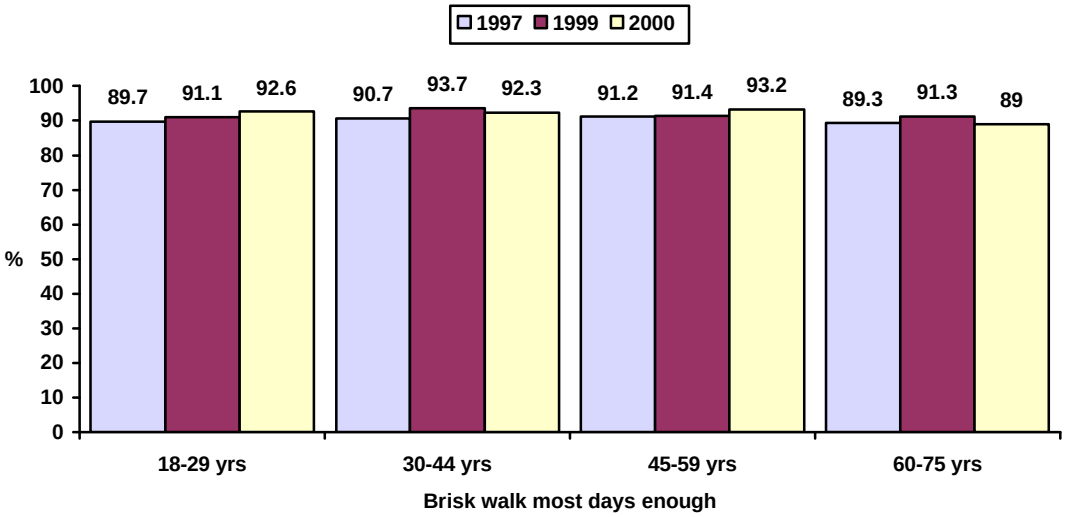


Figure 11: Percentage of people agreeing with knowledge about PA statement 3 ("Need vigorous 20 min") by sex and year

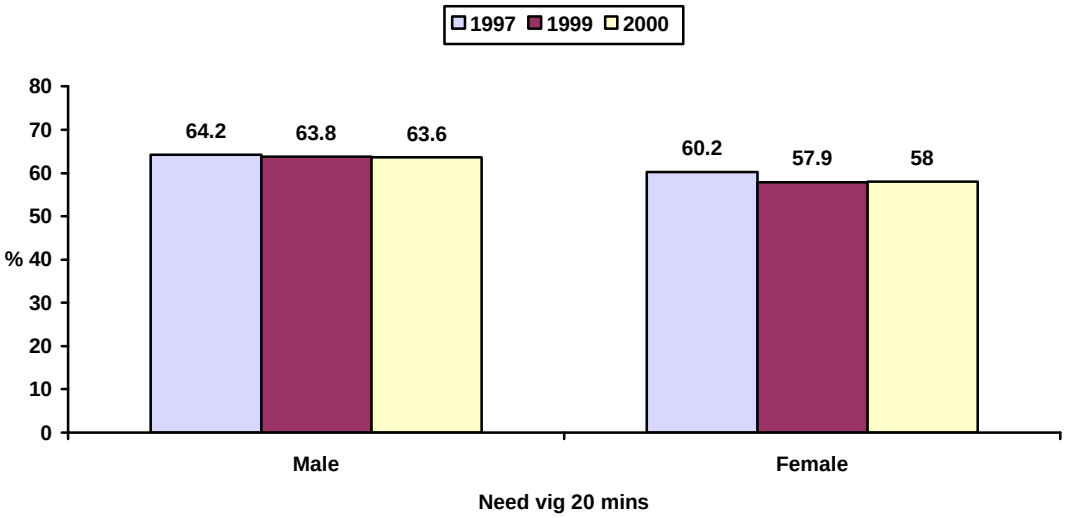


Figure 12: Percentage of people agreeing with knowledge about PA statement 3 ("Need vigorous 20 min") by age group and year

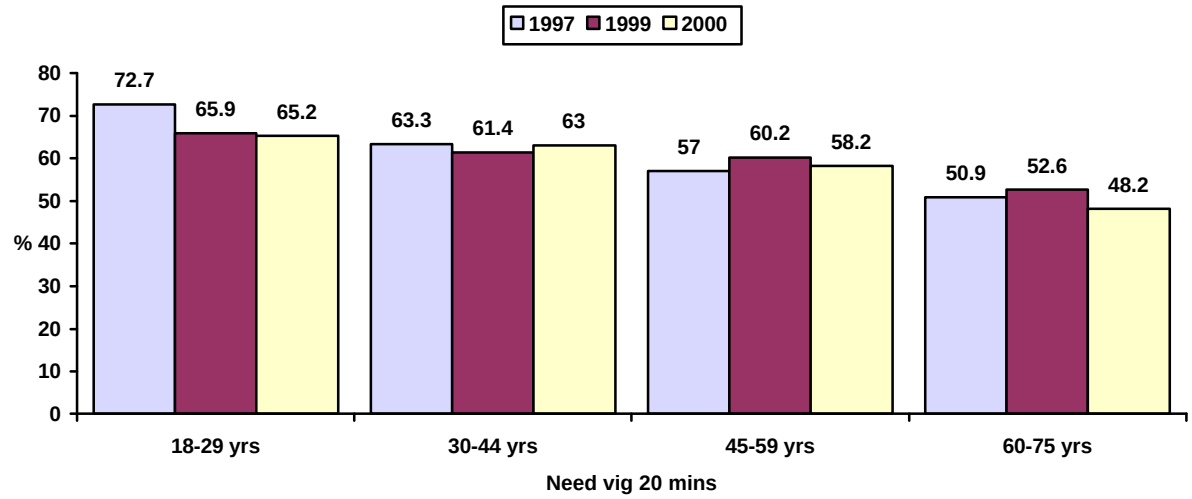


Figure 13: Percentage of people agreeing with knowledge about PA statement 4 ("Blocks of 10 mins okay") by sex and year

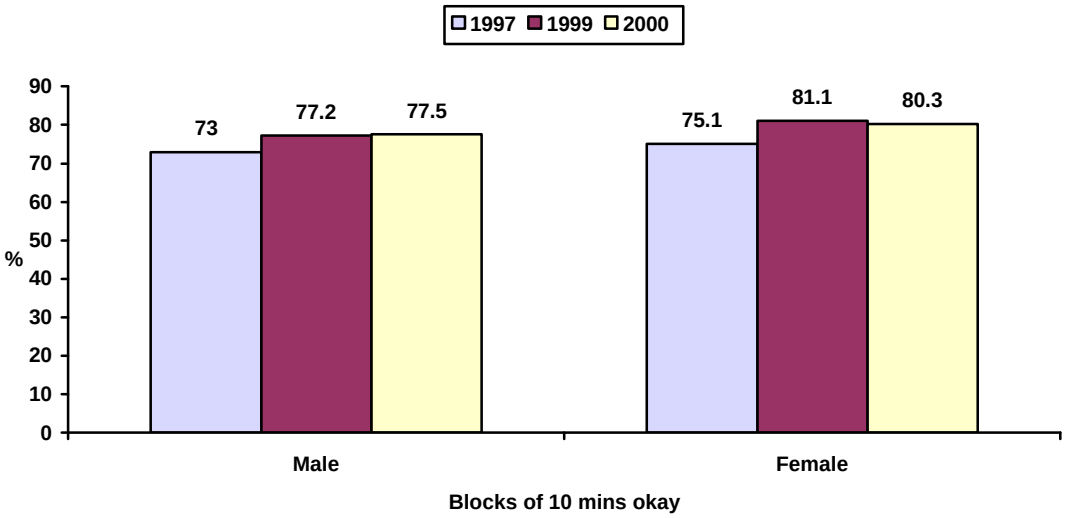
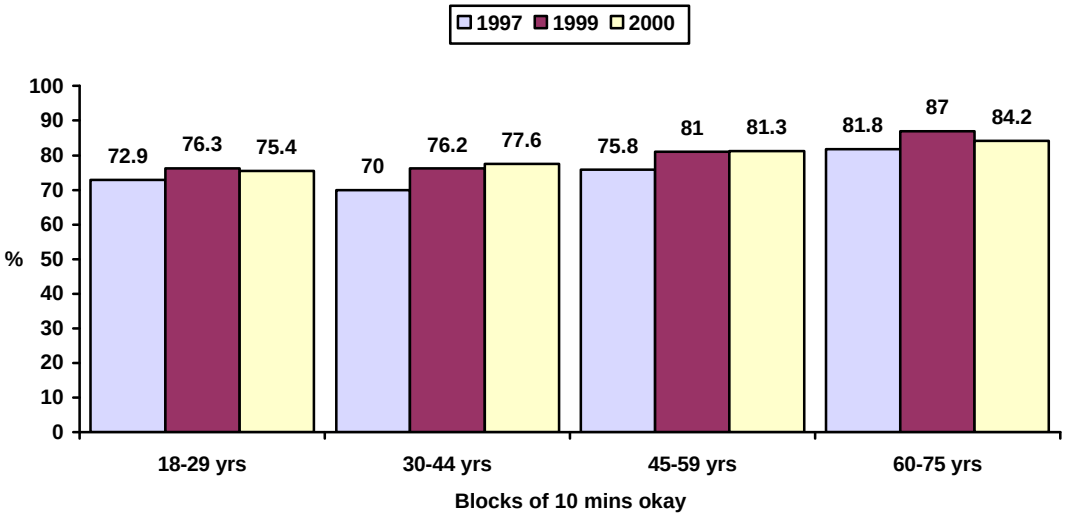


Figure 14: Percentage of people agreeing with knowledge about PA statement 4 ("Blocks of 10 mins okay") by age group and year



5. Awareness of media campaigns or messages

The data in table 9 show awareness of any message about physical activity, and specific recall of the Active Australia (AA) media campaign tagline, “Exercise you only have to take it regularly not seriously”. The generic recall of any message about physical activity was reported fairly consistently by around two thirds of the population. Recall of the specific AA tagline increased from 14% in 1997 to 41.8% in 1999 and remained high at 38.6% in the year 2000. Note that there were substantial AA campaigns, in some states, during 1998 and 1999, which contributed to this increase in recall of AA, and of the specific mass media campaign tagline, ‘Exercise, you only have to take it regularly, not seriously’.

Recall of this campaign tagline is shown in figure 15, with increases in males mostly maintained to the year 2000, and similar results with even higher levels of recall maintained by the year 2000 among females. The same data are shown by age group, and figure 17 shows that the increase in recall to 1999 dropped back to 38.6% in the year 2000 among adults 18-29 years ($p<0.01$). Similar observation was noted for the 30-44 age group ($p<0.05$), but better maintenance of awareness of the tagline amongst the 45-59 year old age group and a slight, but not significant increase across all years in those aged 60 and above.

Table 9: Percentage of people recalling any messages about PA and the AA tagline

	1997	1999	2000
Recall of generic message about exercise or physical activity	63.7	63.9	66.4
Recall AA tagline ‘exercise you only have to take it regularly not seriously'	14.4	41.8	38.6

Figure 15: Percentage of males recalling the AA tagline by year

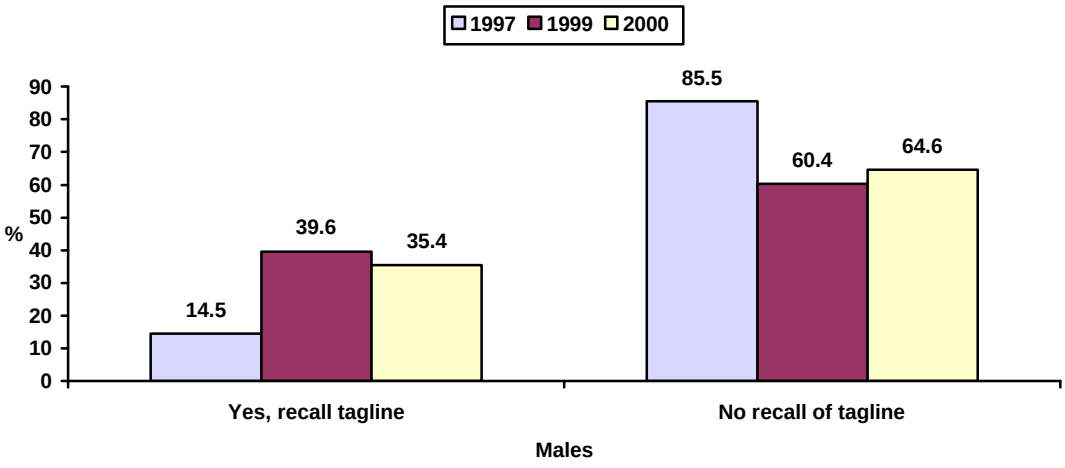


Figure 16: Percentage of females recalling the AA tagline by year

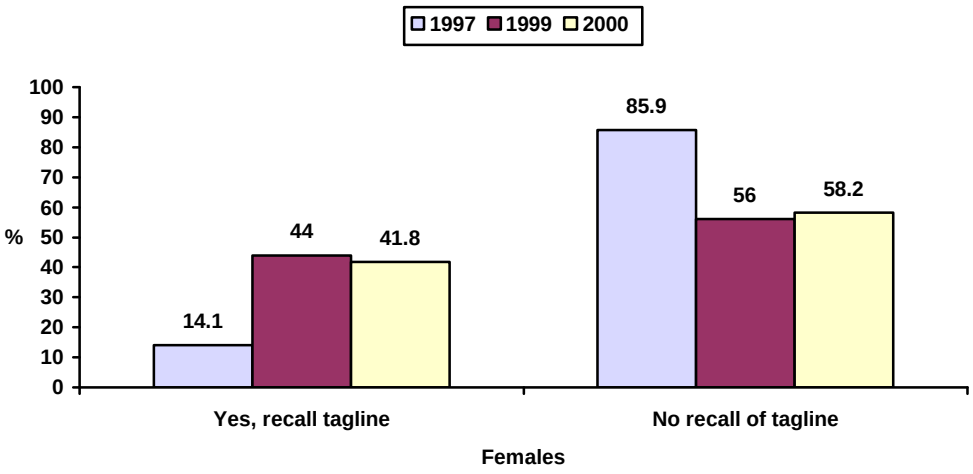


Figure 17: Percentage of 18-29 year olds recalling the AA tagline by year

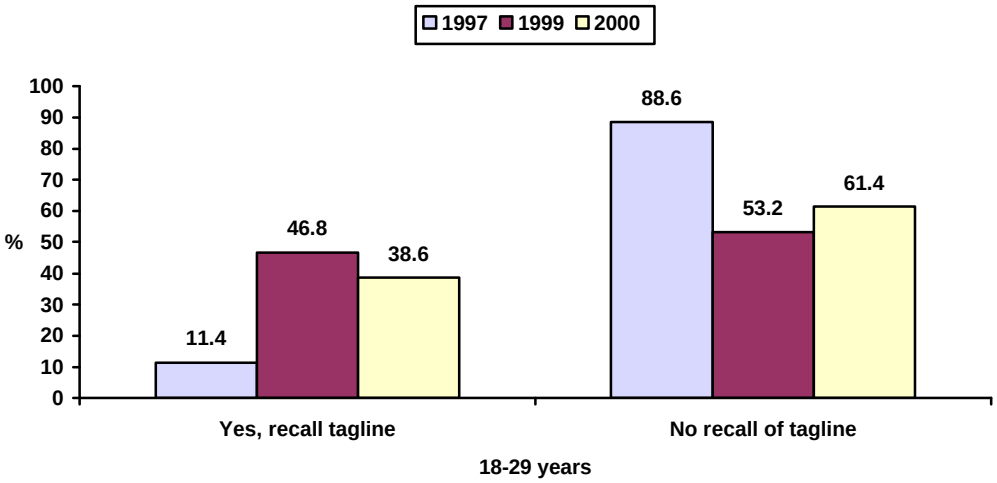


Figure 18: Percentage of 30-44 year olds recalling the AA tagline by year

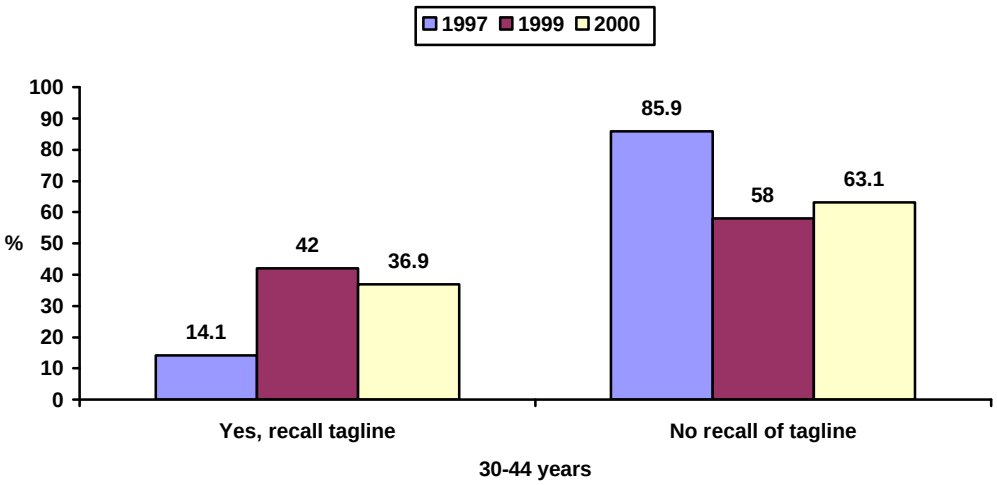


Figure 19: Percentage of 45-59 year olds recalling the AA tagline by year

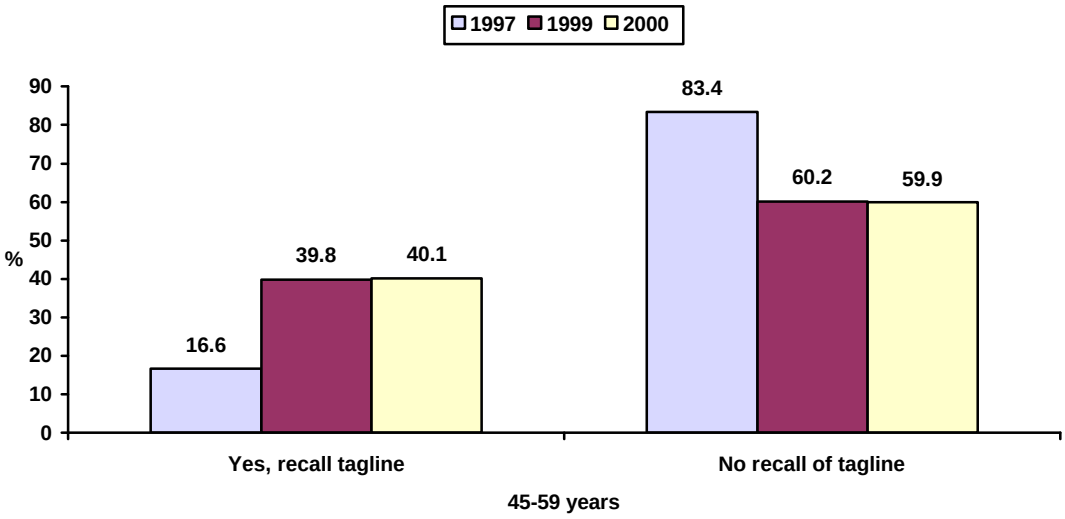
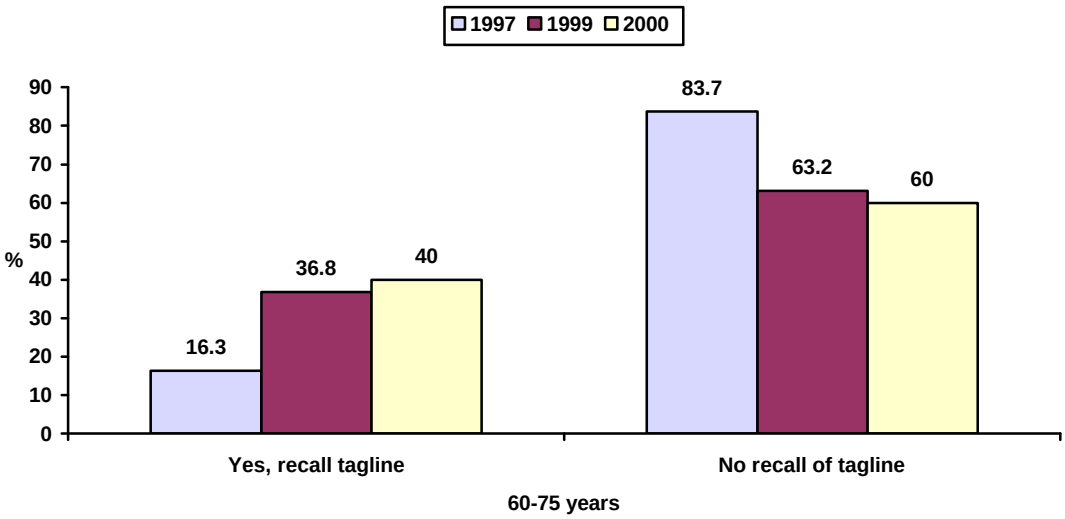


Figure 20: Percentage of 60-75 year olds recalling the AA tagline by year



6. Other analyses specific to the 2000 survey

The next set of questions were only asked in the November 2000 survey. They relate to recall of AA, and descriptions of the AA initiative. Included in this was recognition and participation in AA Day, which was held on October 29. In addition, questions were asked about their physical activity compared to one year previously, and whether there was any change in physical activity that they were aware of since the Olympics.

The data in figure 21 show the proportion of the adult population that recalled AA. This was reported by 23.3% of the adult population (up from 17.8% in 1999), slightly more often by women than men, and also more often by younger adults than older adults. Only the educational gradient was significant ($p<0.05$) as those who were more educated were more likely to have heard of AA. Figure 22 shows the recall of AA by region, which are weighted data, weighted to the State populations. For states with small populations these estimates are less reliable, but do indicate substantial variation in AA recall across Australia. The highest rates were in ACT and Tasmania, with the lowest rates in South Australia and Queensland. If these data are extrapolated to represent individuals in Australia, then a total of 3.14 million adult Australians recalled AA. This is of the total of 13.5 million people aged 18-75 across the country. These numbers are shown in figure 23. These reflect the proportion of people who recalled AA multiplied by the denominator populations of the appropriate age range in each State or Territory.

Figure 21: Percentage of people recalling AA

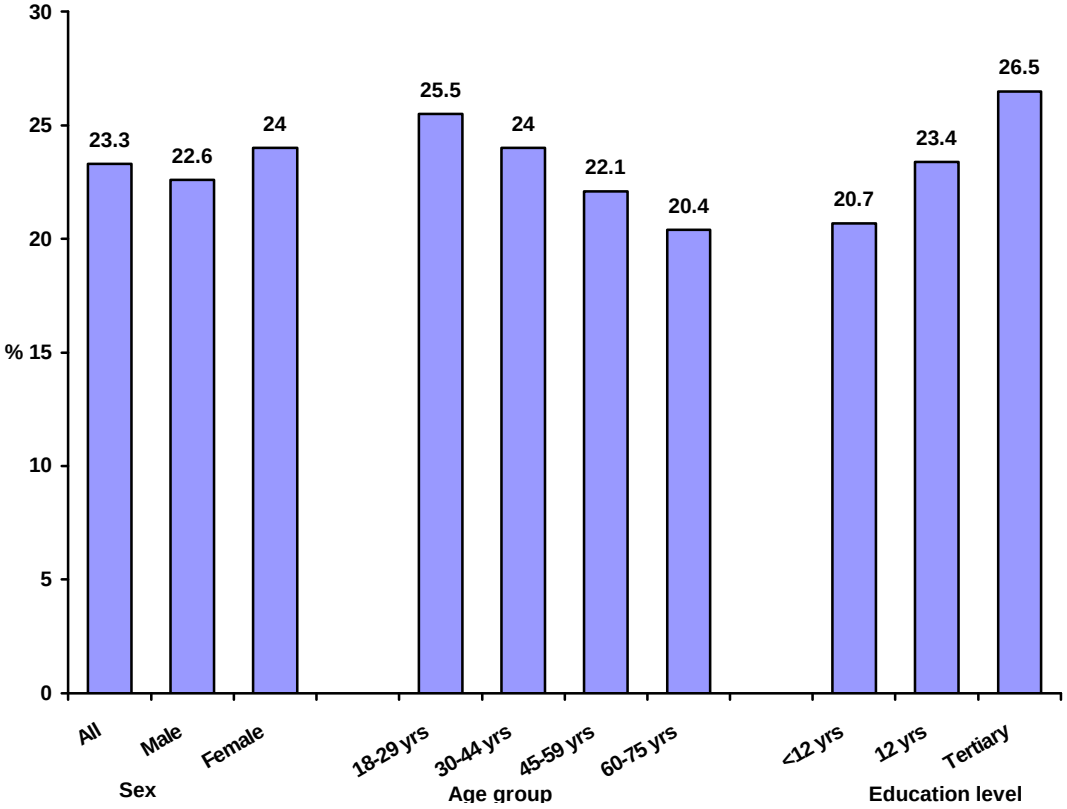


Figure 22: Percentage of people recalling AA by region

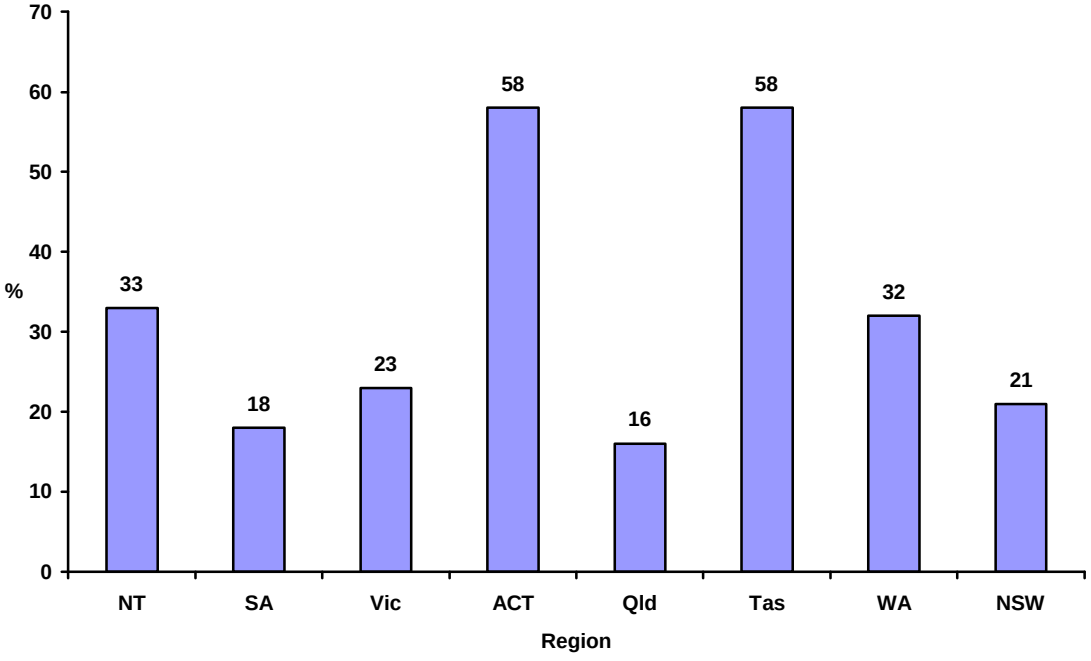
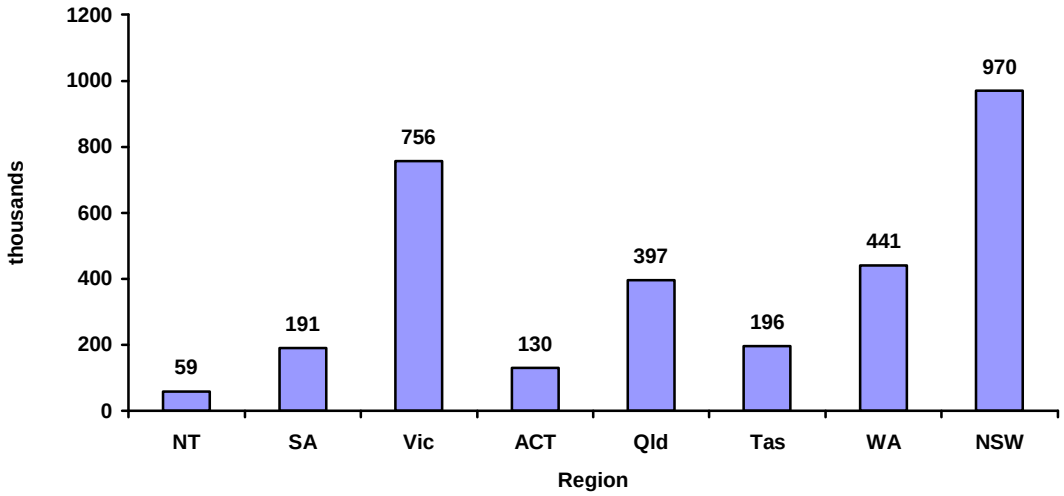


Figure 23: Number of people (in thousands) recalling AA by region



Those that recognised AA were asked 'what it was'. These open ended responses were then content analysed and closed coded[2] and then the data were descriptively analysed. The main messages perceived by the quarter of the sample that recognized AA are shown in the table 10.

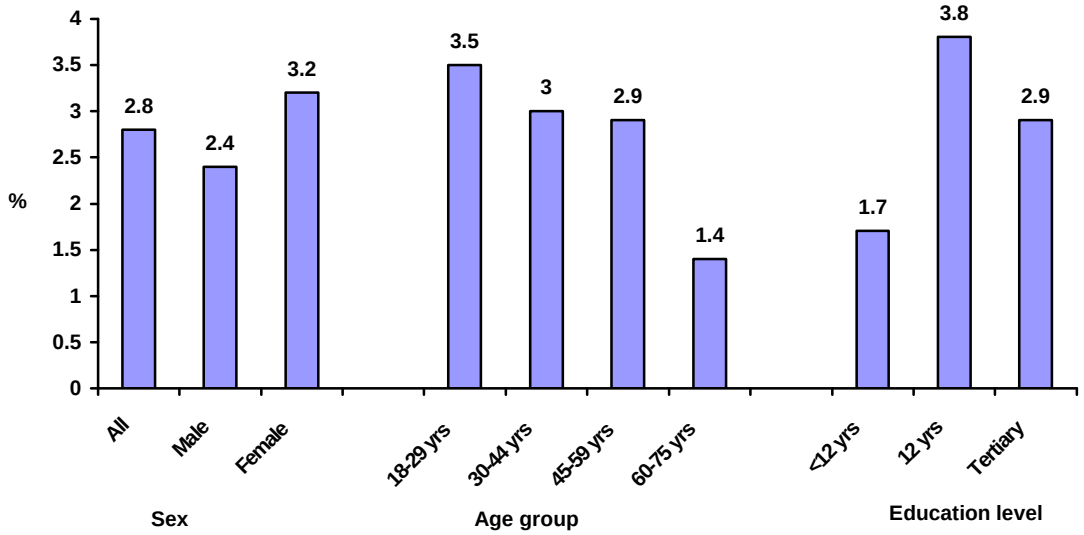
Table 10: Main messages perceived and percentage reported by people who recognised AA

Message	% those who recognized AA
To encourage Australians to be active, more active	33.4
A specific day or weekend	6.8
Get Australia fit	3.6
Activity specific message	2.8
Exercise for health	3.8
Healthy lifestyles	2.5
Event related activity	1.0
Promotes organised sport	2.5
Media campaign	6.1
Fun, enjoyment, social activity	1.8
Children more active	0.7
Older people more active	2.1
Celebrity TV advertisement	2.2
Rehabilitation, handicapped	0.3
Other	1.6
Cannot tell	29.8
Don't know	1.7

The data in figure 24 show the proportion of the adult population that participated in AA Day (on October 29). Overall 2.8% of adults participated, which also showed a gender difference, with more women than men participating, and an age effect with fewer older adults participating. Figure 26 estimates the proportion of adults in each state who participated, with the highest proportion occurring in the ACT, and the lowest proportions in South Australia and Tasmania.

[2] Work carried out by Dafna Merom, Physical Activity Research Group, Liverpool Hospital, Sydney using standardised coding frames developed through content analyses of the Active Australia questions in the Exercise, Recreation and Sport Survey (ERASS) national data sets in 2001.

Figure 24: Percentage of people who participated in AA Day (2000) by sex, age group and education level



Those that reported participating in AA Day were asked what they had done on that day. The main categories of responses are shown in figure 25, with walking being reported by nearly half, followed by other vigorous or moderate activity. This was derived from content analyses of open ended responses to this question. Note that as a proportion of the whole population, these data in figure 25 have 2.8% as the denominator, and of these, almost half reported walking, followed by other activities, event attendance and cycling. Walking and cycling were common events or activities organised through AA Day. However, as population rates, only 1.4% of adults walked on AA Day, 0.8% did other activities such as golf or tennis, 0.4% attended an AA Day event, and 0.3 % went cycling.

Figure 25: Main activities (and percentage) undertaken by people who participated in AA Day

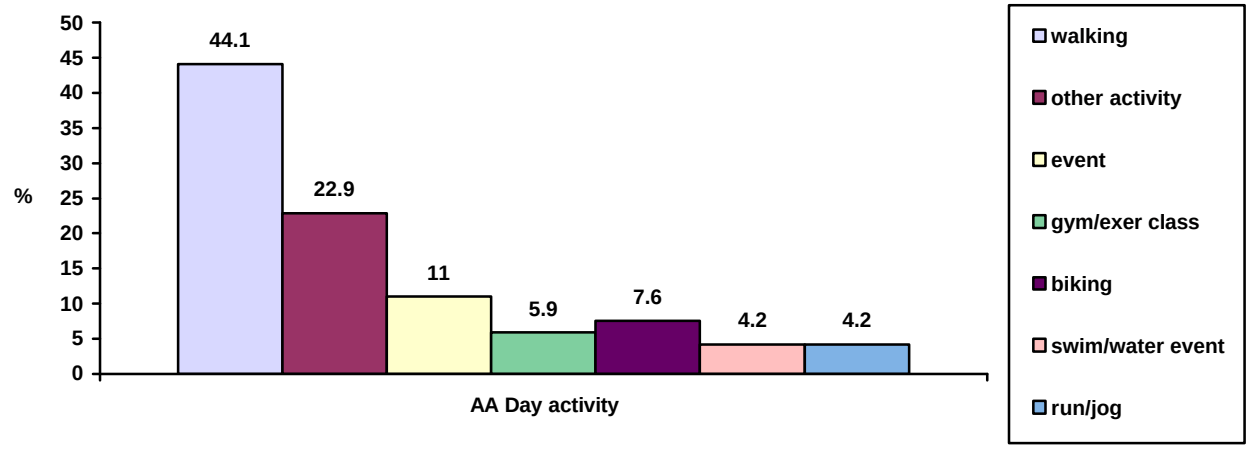


Figure 26: Percentage of people (total survey respondents) who participated in AA Day by region

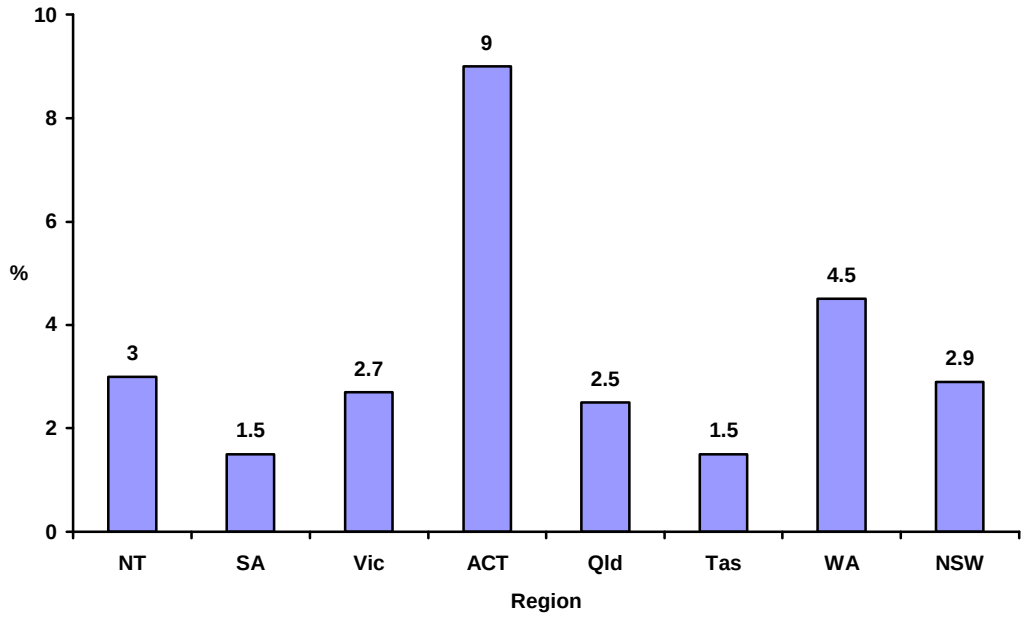


Table 11 below shows the total participants in Active Australia Day using a range of different estimates. The table shows that the 2.8% of the adult population represents participation numbers of around 383,000 Australia adults[3]. If we weight these data by the number of household residents, this totals just over 1 million people, or 5.8% of the population aged 5 to 75. If we take the more conservative assumption that only half the household members participated (where a survey responder had indicated that they had participated) then this estimate suggests that around 651,000 people participated in Active Australia Day on October 29, 2000. Figure 27 shows participants by state, using the minimum and maximum estimates. These are weighted by the population size of each state or territory, and indicate the approximate number of people (extrapolated from this population survey) that were likely to participate in Active Australia Day in each region.

Table 11: Estimated numbers (and percentages) of participants in AA Day

Estimate	# (thousands)	% (of eligible population)
Responders only (min. estimates)	383	2.8
Half of eligible household members 5-75 years participated	651	3.5
All eligible household members 5-75 years participated (max. estimates)	1078	5.8

[3] Given the sampling error in surveys, this number could have been as low as 300,000 or as high as 478,000 [expressed as the 95% confidence interval around the estimate of 383,000]

Figure 27: Minimum and maximum estimated numbers of participants in AA Day by region

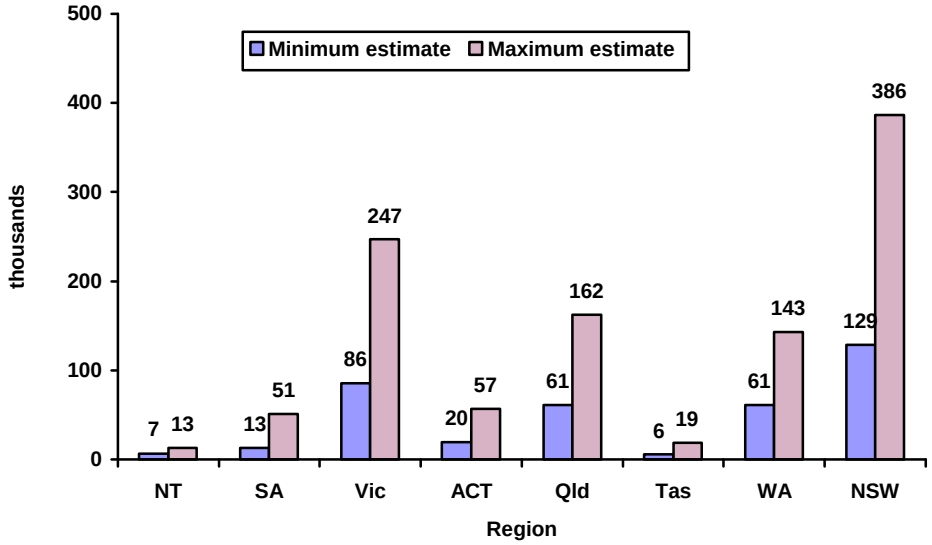


Figure 28 shows responses to the questions about how active people were compared to one year previously. Roughly similar proportions indicated they were more active or less active compared to a year before, with about half the population indicating they were about the same. This is an indirect validation of the physical activity questions which also show very little difference in physical activity participation rates between 1999 and 2000. Responses to this question exactly parallel those trends in physical activity.

Nonetheless an examination of those who are more active than a year before is shown in figure 29. This is confined to the people who reported being 'more active' or 'much more active'. There is a tendency for women compared to men and younger adults compared to older adults to report greater participation in physical activity than the year before.

Figure 30 shows the perceived changes in physical activity over the past year according to their current level of activity. The histograms indicate those who are already sufficiently active, and the cross-hatched histograms show those who are not currently meeting sufficient activity for health. There is a clear relationship between already being sufficiently active and increasing activity levels in the past year. The reverse trend is shown for those who are not currently active, with 64.5% of those who were much less active than they were a year ago also being not currently sufficiently active for health benefit. The same relationship was seen for the threshold of both 150 minutes and five sessions [data not shown].

Figure 28: Percentage of peoples' PA levels compared to 1 year previously

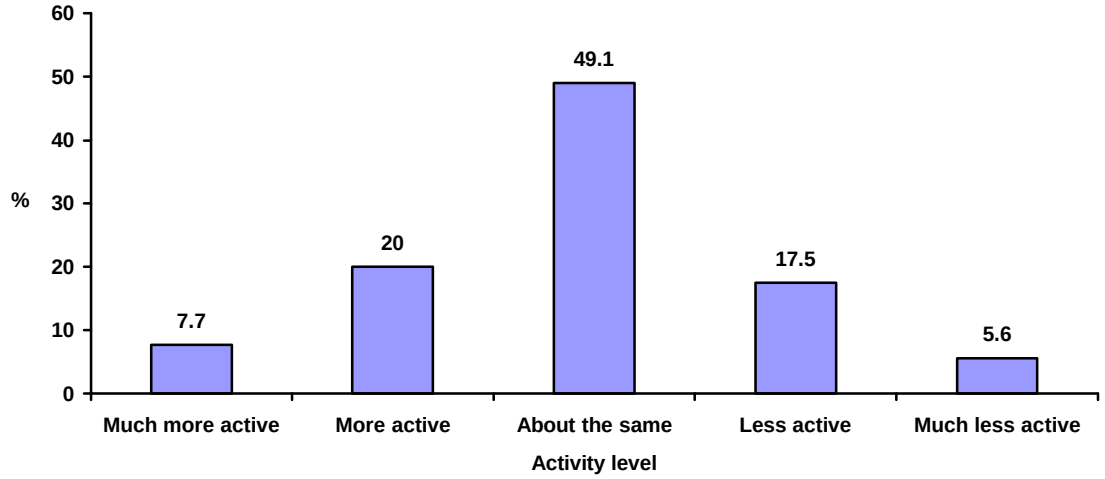


Figure 29: Percentage of people who reported being "more active" than a year previously by sex, age group and education level

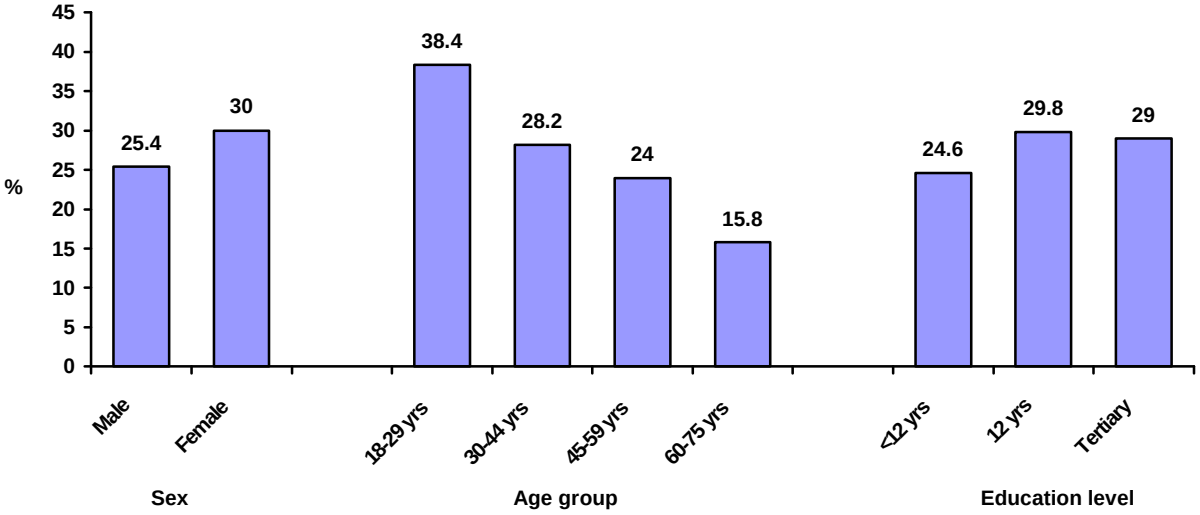
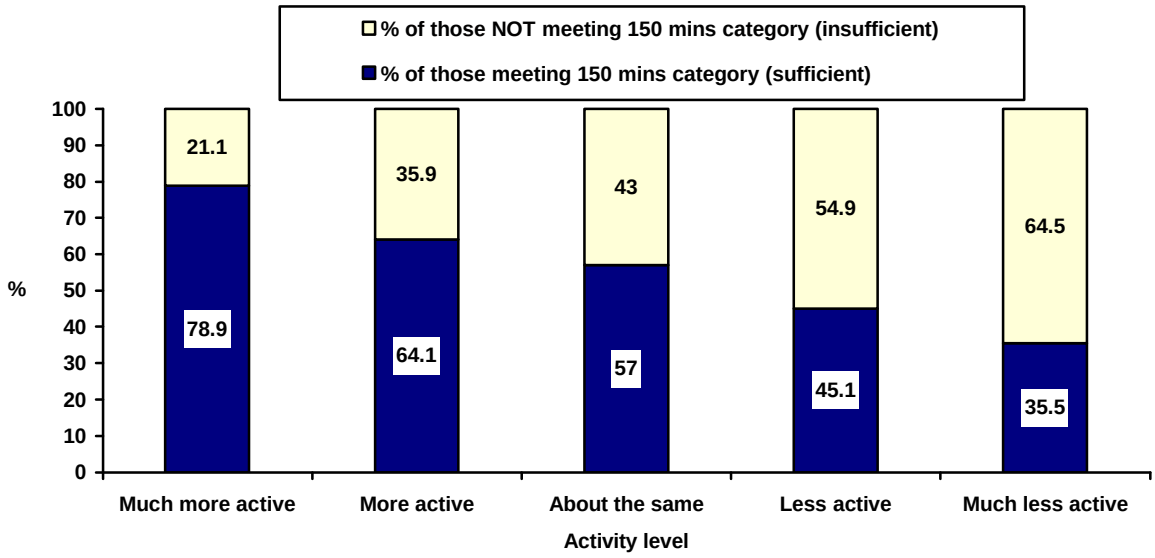


Figure 30: Percentage of perceived change in PA over the past year by current level of activity



The data in figure 31 show the proportion of people who responded to the question that they had increased their physical activity participation since the Olympics. Since the Olympics were between 6 and 9 weeks prior to the survey this provided an opportunity for people to react to the Olympics and trial physical activity in response to it. Overall 4% of Australian adults increased their activity since the Olympics which was more common amongst younger adults than older adults. Of the 4% who had changed their participation, around 23% had increased their activity by doing some moderate physical activity or walking, around 21% reported vigorous sports or other vigorous activity, 17% reported more physical activity or attending gyms, and 1/5 reported that they were just encouraged in other ways or motivated by the Olympics. A further 12% reported that they specifically tried swimming, and 5% reported other incidental physical activity. These data are shown in figure 32.

Figure 31: Percentage of people who reported they had increased participation in PA since the Olympics

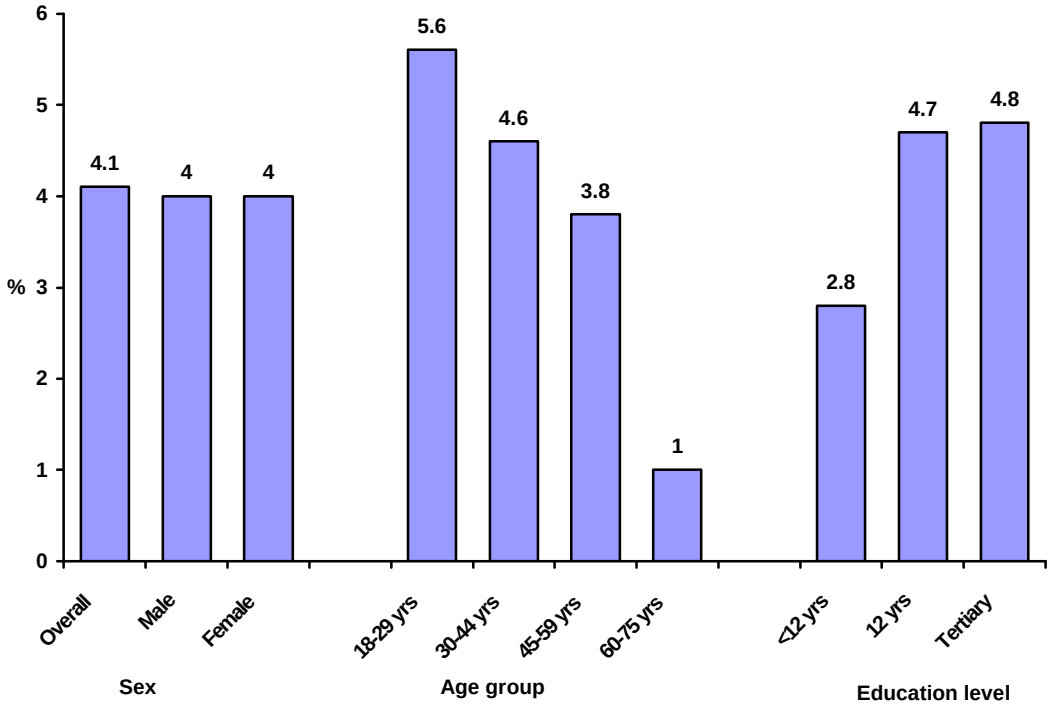
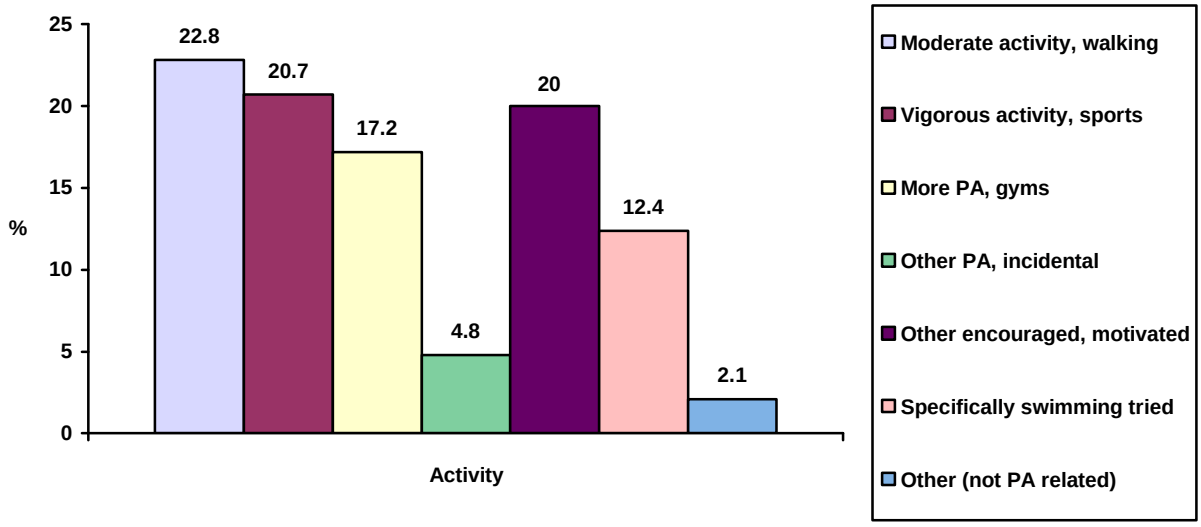


Figure 32: Type of activity participated in (and percentage) for those people who had increased PA since the Olympics



Conclusions

This report indicates that there were declines in physical activity between 1997 and 1999 for adult Australians and no change in physical activity participation between 1999 and November 2000. This suggests that the Olympics had little impact upon physical activity participation overall across the adult population, although 4% of adults reported that they had done some physical activity which they attributed to the Olympics. This proportion was not large enough to influence physical activity participation overall, and indicates that the Olympics was not likely to have specifically resulted in increases in physical activity participation in the whole community.

There was one apparent impact of the Olympics, which was upon intention to be more active, where across age and gender groups, short-term intention to be active increased, particularly between 1999 and 2000. This could be attributed to the Olympics, as it might have been an encouraging event that got people to think about being physically active.

There was no noticeable impact of the Olympics on knowledge or awareness of the moderate activity message, but rates of correct responses to these questions were already high or continued to improve. There was also high levels of awareness and recognition of the AA media tagline, which indicates continued awareness of this campaign in the general population. In 2000, over a third remembered the tagline, even though there was little formal media campaign from AA during 2000, as most media were focused on the Olympics, and no specific paid media campaigns were carried out around the moderate physical activity message.

Other analyses were specific to the 2000 Survey and indicated around a quarter of Australian adults could recall 'Active Australia'. This is very similar to recent estimates derived in February and May 2001 from the Exercise, Recreation and Sport participation surveys (ERASS) conducted by the Australian Sports Commission. Active Australia recall appeared particularly high in the ACT and Tasmania compared to other states and territories. Further analyses of open-ended questions on 'what was Active Australia' were content analysed and coding frames are provided in Appendix 2.

The proportion who self-rated their activity levels as higher than a year previously was similar to the proportion who indicated less activity – with this question corroborating the flat trends in the physical activity questions. This provides further evidence that activity levels remained static following the Olympics.

Overall, at least 383,000 Australians participated in AA Day, on October 29, which was an initiative with community based participation events held locally across Australia. If we include household members as well as respondents, a more realistic estimate here is that around 650,000 adults and children might have participated. This is similar to estimates derived by indirect counts at the AA Day events or venues, compiled for the Australian Sports Commission.

Around 4% of adults reported they did some activity in response to the Olympics, but this was not large enough to result in any observable upward shifts in population prevalence of those 'sufficiently active for health'. Young adults were most likely to respond affirmatively to this question. The activities that were reported by this group included moderate and vigorous activity, but a fifth of them just indicated they were encouraged or motivated, without specifying any actual activity.

In conclusion, these data are from representative samples of the adult population, so results are considered scientifically reasonable, and generalisable to the adult Australian population. New approaches and innovative strategies are required to contribute to increased activity among Australians, which remains of concern to health and other sectors of government (SIGPAH 2001).

The commitment to specific approaches targeting the moderate message have shown promise, and organised and well resourced campaigns, supported by community-wide programs can increase activity levels in the population. Supportive physical environments, and policies that adequately resource physical activity interventions and program strategies are required for sustainable improvements in the current levels of participation.

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(for the Active Australia strategy see also "*Developing an Active Australia: A framework for action for physical activity and health*." www.health.gov.au/pubhlth/publicat/document/active.pdf)

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APPENDIX 1

November 2000
Physical Activity Survey Questions

Question: Have you heard or seen any messages about exercise or physical activity IN THE PAST MONTH?
Field name: Q2
Content:
1 = Yes
2 = No
8 = Don't know
9 = Refused

if q2 = 1, ask q3a

Question: What is one message that you remember?
Field name: Q3a
Content: Typed answer, however, the following code was used if applicable:
88 = Don't remember/can't recall

Question: Have you heard of the Active Australia campaign?
Field name: Q3B
Content:
1 = Yes
2 = No
8 = Don't know
9 = Refused

if q3B= 1, ask q3B1

Question: What is it?
Field name: Q3B1
Content: Typed answer, however, the following code was used if applicable:
88 = Don't remember/can't recall

Question: Did you participate in Active Australia day on October 29?
Field name: Q4
Content:
1 = Yes
2 = No
8 = Don't know
9 = Refused

if q4 equal to 1, ask q4a

Question: What did you do?
Field name: Q4a
Content: Typed answer, however, the following code was used if applicable:
88 = Don't remember/recall

Question: Have you heard of the exercise and physical activity campaign, 'Exercise - you only have to take it regularly not seriously'?
Field name: Q5
Content:
1 = Yes
2 = No
8 = Don't know
9 = Refused

if q5 equal to 1, ask Q5a

Question: What messages do you remember?
Field name: Q5a
Content: Typed answer, however, the following code was used if applicable:
88 = Don't remember

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

Question: IN THE LAST WEEK how many times have you walked continuously, for at least 10 minutes, for recreation/exercise or to get to or from places?
Field name: Q8
Content: Typed answer, however, the following code was used when applicable
88 = Don't know

if q8 equal to 0, ask q12

Question: What do you estimate was the total time that you spent walking in this way IN THE LAST WEEK? [INTERVIEWER: THIS IS `CONTINUOUS' WALKING]
Field name: Q9
Content: Typed numerical answer regarding amount of time in last week, however, the following codes were used when applicable:
88 = Don't know
888 = Don't know

Question: IN THE LAST 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?
Field name: Q12
Content: Typed numerical response regarding how many times per month, however, the following code was used if applicable
88 = Don't know

if q12 equal to 0, ask q14

Question: What do you estimate was the total time that you spent doing vigorous gardening or heavy work around the yard IN THE LAST WEEK?
Field name: Q13

Content: Typed numerical response regarding how much time per week, however, the following codes were used if applicable
88 = Don't know
888 = Don't know

The next question excludes household chores or gardening or yardwork.

Question: IN THE LAST WEEK, how many times did you do any vigorous physical activity which made you breathe harder or puff and pant? (eg. jogging, cycling, aerobics, competitive tennis, etc)
Field name: Q14
Content: Typed numerical response regarding the number of times per week, however, the following code was used if applicable
88 = Don't know

if q14=0, ask q16

Question: What do you estimate was the total time that you spent doing this vigorous physical activity IN THE LAST WEEK?
Field name: Q15
Content: Typed numerical response regarding the number of times per week, however, the following codes were used if applicable
88 = Don't know
888 = Don't know

The next question excludes household chores or gardening or yardwork.

Question: IN THE LAST WEEK how many times did you do any other more moderate physical activity that you haven't already mentioned? (eg. gentle swimming, social tennis, golf etc)
Field name: Q16
Content: Typed numerical response regarding how many times per week, however, the following code was used when applicable
88 = Don't know

if q16=0, ask q18

Question: What do you estimate was the total time that you spent doing these activities IN THE LAST WEEK?
Field name: Q17
Content: Typed numerical response regarding how many times per week, however, the following codes were used when applicable
88 = Don't know
888 = Don't know

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

Question: Which one best describes how you feel at present? [READ STATEMENTS] [Enter 1 only for the statement chosen by respondent]

Field name: Q18p1 You do NOT intend to be more active than you have been over the last week.
Q18p2 You intend to be more active over the NEXT MONTH than you have been over the last week.
Q18p3 You intend to become more active sometime over the NEXT SIX MONTHS than you have been over the last week.

Content:
1 = Chosen statement
8 = Don't know

Question: To what extent do you agree or disagree with the following statements about physical activity and health? (Interviewer reads out scale)

Field name: Q19p1 Taking the stairs at work or generally being more active for at least 30 minutes each day is enough to improve your health
Q19p2 Half an hour of brisk walking on most days is enough to improve your health
Q19p3 To improve your health it is essential for you to do vigorous exercise for at least 20 minutes each time, 3 times a week
Q19p4 Exercise doesn't have to be done all at one time - blocks of 10 minutes are okay

Content:
1 = Strongly agree
2 = Agree
3 = Neither agree nor disagree
4 = Disagree
5 = Strongly disagree
(Interviewer does not read out the following)
8 = Don't know
9 = Refused

Question: Compared to one year ago, are you ....

Field name: Q20

Content:
1 = Much more physically active
2 = More physically active
3 = About the same
4 = Less physically active
5 = Much less physically active
(Interviewer does not read the following)
8 = Don't know
9 = Refused

Question: Have you changed your own participation in physical activity or sport in response to the Olympics?

Field name: Q21

Content:
1 = Yes
2 = No
8 = Don't know
9 = Refused

if q21=1, ask 21a

Question: What have you done?

Field name: Q21a

Content: Typed answer, however, the following code was used when applicable
88 = Don't know

Finally a few questions to make sure we've spoken to a wide range of people.

Question: What is your sex? (Interviewer observes or asks)
Field name: Q25
Content:
1 = Male
2 = Female
9 = Refused

Question: Could I ask your age please?
Field name: Q26
Content: Age
0 = Respondent did not provide specific age, however, see age ranges - Q26r
99 = Respondent refused to give specific age, however, see age ranges - Q26r

Field name: Q26r
Content: If exact age refused, interviewer prompted with the following ranges
101 = 18-19
102 = 20-24
103 = 25-39
104 = 40-44
105 = 45-49
106 = 50-54
107 = 55-59
108 = 60-64
109 = 65-69
110 = 70-75
999 = refused

Question: What is your MARITAL STATUS?
Field name: Q27
Content:
1 = Married/De Facto
2 = Single
3 = Widowed
4 = Divorced
9 = Refused

Question: What is your approximate weight in pounds, stones, or kilograms?
Field name: Q28
Content: Typed numerical response, however, the following codes were used if applicable
88 = Don't know
888 = Don't know

Question: What is your approximate height in feet & inches or cms?
Field name: Q29

Content: Typed numerical response, however, the following codes were used if applicable
88 = Don't know
888 = Don't know

Question: How MANY people UNDER 18 reside at your home?
Field name: Q30
Content: Typed numerical response, however, the following code was used if applicable
99 = Refused

Question: How many children AGED 5 AND UNDER reside at your home?
Field name: Q30a
Content: Typed numerical response, however, the following code was used if applicable
99 = Refused

Question: How many adults aged between 18 & 75 years, including yourself, live in your household?
Field name: Q31
Content: Typed numerical response, however, the following codes were used if applicable
99 = Refused
8 = 8 or more

Question: What is the highest level of education you have COMPLETED?
Field name: Q32
Content:
1 = Never attended school, some primary school
2 = Completed Primary school
3 = Some High school
4 = School certificate/Intermediate/Year 10/4th form
5 = HSC/Leaving/Year 12/6th form
6 = TAFE certificate/diploma
7 = University, CAE or other tertiary institution degree
Typed response if respondent does not fit any codes

Question: What is your current occupation?
Field name: Q33
Content:
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
99 = Refused
Typed response if respondent does not fit any codes

Question: What language do you USUALLY speak at home?
Field name: Q34

Content: 1 = English
2 = Other language
9 = Refused

Question: What is your postcode?
Field name: Q35
Content: Typed in suburb if postcode unknown

Field name: Qcom
Field type: Character
Content: Interviewer comments about the interview

That ends our survey. Thank you very much for your help.

Field name: **Age**
Field type: Numeric
Content: Age groups used for weighting
1 = 18 to 19
2 = 20 to 24
3 = 25 to 29
4 = 30 to 34
5 = 35 to 39
6 = 40 to 44
7 = 45 to 49
8 = 50 to 54
9 = 55 to 59
10 = 60 to 64
11 = 65 to 69
12 = 70 to 75

Field name: **Sex**
Field type: Numeric
Content: Sex of respondent - used for weighting
1 = Male
2 = Female

APPENDIX 2

Content analyses [coding frames] for open ended questions

Closed codes for the question "What is Active Australia?"

Code	Content
1	Message on the purpose of AA - to encourage people or Australians to be active or more active, keep us active, promoting exercise, involved in more exercise, not being lazy, to get out and do activities, including 'active for life' and 'get out and about' or 'get out and do it'.
2	A day or a weekend where everyone should or get to be active
3	To get us fit, Australians more fit.
4	The same as in code 1 but the activity was an activity specific messages-on walking, walking instead of driving, or taking moderate activities or exercise regularly, or every day 30 min, activity into daily life
5	Promoting exercise or physical activity for health reasons, for its benefits including fit and healthy.
6	Promoting healthy lifestyles.
7	An event that relates to activity: fun run, On a Sunday, bike ride, exercise on the lake.
8	Promoting sport, join sport participate in sport.
9	'Life be in it / Norm' including one person who mentioned Rusty campaign [IYOP Active Australia campaign 1999) and one who mentioned 'wind-up man' [ASC campaign 2000].
10	When the message of being active was associated with fun, enjoyment, social activity or family being active together.
11	Getting kids more active.
12	Getting old people more active.
13	Generic – exercise or just repeated AA.
14	It is a TV advertisement on activity, exercise including celebrities (Rob De Costella) saying something about being more active / a poster with AA/ a program about healthy eating & exercising.
15	Deals with handicapped people/ rehabilitation.
77	Not relevant, can not be coded to any of those (personal statements).
88	Can't tell.
99	Don't know.

Closed codes for the question, "What did you do on Active Australia day?"

Code	
1	Any sort of moderate or vigorous activity other than walking taken individually
2	Walk - alone or with family or social club.
3	Exercised with other people/family.
4	Event with physical activity (BQQ run, bike ride, soft ball carnival etc.).
5	Class in gym, coaching in the gym.
6	No different than other day.
7	Light and recreational activity (fishing, golf, gardening, sailing).
8	Sport game footy/cricket/bowls/netball/soccer.
9	Picnic with no PA, just socializing.

Codes developed and qualitative analysis conducted by: Dafna Merom, Physical Activity Epidemiologist, Physical Activity Research Group, Liverpool, Sydney.