

The Active Australia Survey

**A guide and manual for implementation,
analysis and reporting**

The Australian Institute of Health and Welfare is Australia's national health and welfare statistics and information agency. The Institute's mission is to improve the health and well-being of Australians by informing community discussion and decision making through national leadership in developing and providing health and welfare statistics and information.

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**A guide and manual for implementation,
analysis and reporting**

Australian Institute of Health and Welfare
Canberra

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1 Introduction

The Active Australia Survey is designed to measure participation in leisure-time physical activity and to assess knowledge of current public health messages about the health benefits of physical activity. It offers a short and reliable set of questions that can be easily implemented via computer-assisted telephone interviewing (CATI) techniques or in face-to-face interviews.

The Active Australia Survey was first developed and nationally implemented in 1997 to assess the effectiveness of the *Active Australia* campaign which was being run in New South Wales at the time in order to promote physical activity. Since then, the survey has been implemented nationally through the National Physical Activity Surveys in 1999 and 2000 and the Australian Diabetes, Obesity and Lifestyle Study in 1999–00. It has also been used in several state-based surveys, such as in Queensland, South Australia, and New South Wales. For more information on surveys of physical activity, see <<http://www.aihw.gov.au>>.

This manual is designed to provide an overview of the survey. It includes a copy of the survey, an implementation guide with instructions for interviewers, a guide to the measures that can be derived from the survey data, information on how these measures are calculated and examples of how they are usually reported. It also provides background information on the development of the survey and an example of CATI coding (Appendix 1).

While this manual specifically focuses on the Active Australia Survey, it is worth noting that other surveys such as the Australian Bureau of Statistics (ABS) National Health Surveys also collect and present data on participation in physical activity. However the ABS results are not directly comparable with those of the Active Australia Survey. The key differences between the two surveys are (AIHW forthcoming):

- The Active Australia questions apply to only one week preceding interview, whereas the National Health Survey questions apply to the two weeks preceding interview.
- The Active Australia Survey includes walking for transport, whereas the National Health Surveys do not.
- The Active Australia Survey and the National Health Surveys report levels of participation using different measures.

For more information on the ABS National Health Surveys see <<http://www.abs.gov.au>>.

2 The survey

This section presents the core questions in the Active Australia Survey. These consist of eight questions to assess participation in various types of activity and five statements to assess awareness of current public health messages about physical activity.

The core questions are usually supplemented by questions collecting demographic information (age, sex, and household information). See Armstrong et al. 2000 for examples of demographic information collected. Questions about other characteristics such as height and weight, or items of particular interest such as awareness of local interventions or use of facilities for physical activity may also be added to the survey. The questions were developed and intended for use with persons aged 18–75 years.

2.1 The Active Australia Survey

The next questions are about any physical activities that you may have done in the last week:

1. 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?

times

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

In hours and/or minutes

minutes

hours

3. 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?

times

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

In hours and/or minutes

--	--	--

 minutes

--	--

 hours

The next questions exclude household chores, gardening or yardwork:

5. In the last 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)

--	--

 times

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

In hours and/or minutes

--	--	--

 minutes

--	--

 hours

7. In the last 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)

--	--

 times

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

In hours and/or minutes

			minutes
--	--	--	---------

		hours
--	--	-------

To what extent do you agree or disagree with the following statements about physical activity and health?

9(a) Taking the stairs at work or generally being more active for at least 30 minutes each day is enough to improve your health.

strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
-------------------	----------	----------------------------	-------	----------------

9(b) Half an hour of brisk walking on most days is enough to improve your health.

strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
-------------------	----------	----------------------------	-------	----------------

9(c) To improve your health it is essential for you to do vigorous exercise for at least 20 minutes each time, three times a week.

strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
-------------------	----------	----------------------------	-------	----------------

9(d) Exercise doesn't have to be done all at one time – blocks of 10 minutes are okay.

strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
-------------------	----------	----------------------------	-------	----------------

9(e) Moderate exercise that increases your heart rate slightly can improve your health.

strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
-------------------	----------	----------------------------	-------	----------------

3 Interviewer training and survey implementation

This section provides a guide to implementing the Active Australia Survey in the field. First, the procedure used to implement the National Physical Activity Surveys is briefly described. Next, there are some handy hints for users, researchers, interviewers and analysts, highlighting common problems that may arise and suggesting ways to minimise reporting errors. Finally, the eight core questions for assessing physical activity participation are reproduced, along with tips for interviewers.

3.1 The National Physical Activity Survey

The National Physical Activity Survey was conducted in 1997 (often referred to as the Active Australia Baseline Survey), 1999 and 2000 (Bauman et al. 2001; Armstrong et al. 2000; ASC 1998). The three surveys were conducted at exactly the same period of the year (the last two weeks of November and first two weeks of December) to ensure that participation rates were not affected by seasonal conditions. This survey period was also before the summer holiday period, because participation rates during holiday periods may be influenced by increased leisure time. Each year, the survey consisted of the Active Australia core survey questions listed in the previous section, plus some supplementary questions covering demographics, height and weight, recognition and recall of specific physical activity promotional messages and participation in related organised activities such as Active Australia Day.

The survey method was a random sample population telephone survey (using CATI methodology) conducted by the Hunter Valley Research Foundation. The electronic white pages were used to generate a random sample of households, and an adult aged 18–75 years was then randomly selected from within each household. Participation was voluntary. Those who participated were asked a series of questions (lasting about 10 minutes) on their participation in, and knowledge and understanding of physical activity. An example of the CATI coding used in the 1999 survey is presented in Appendix 1. More detailed information regarding survey methodology can be found in Armstrong et al. 2000.

3.2 Handy hints for users, researchers, interviewers and analysts

This section presents some common problems that may arise when implementing the Active Australia Survey and some suggestions for dealing with these problems and minimising reporting errors.

Common difficulties

Difficulties may include:

- ensuring the respondent understands the meaning of the questions
- ensuring that ineligible activities are not included in the respondent's answers
- ensuring that eligible activities are correctly classified (i.e. as walking, vigorous yardwork, other vigorous or other moderate activities)
- ensuring that the answers recorded are meaningful and plausible.

Suggestions to minimise errors

- Adhere to the chosen random sampling methodology. In the National Physical Activity Surveys, the following procedure is used:
 - Randomly select households (from the white pages of the telephone directory).
 - Determine the number of eligible persons in the household.
 - Identify the desired respondent using some random choice method, e.g. next birthday.
 - **Do not** substitute if this person is not available. This may lead to substantial selection bias and invalidate the results of the survey.
 - Use callbacks to speak with the correct person. A minimum of six is suggested.
- Thorough interviewer training is essential. Incorporate examples of the types of answers which may be expected and allow for all interviewers to test the questionnaire as both interviewer and respondent. Also stress the importance of the random sampling method and the need to interview only the chosen person; substitutions will introduce selection bias and affect the extent to which estimates derived from the survey can be generalised.
- Ensure that the types of activities that are eligible are clearly understood. This relates especially to occupational activity. It may be decided that walking as an occupational activity can be included (e.g. postal delivery workers, pedestrian police); however, the need for the activity to be **continuous** in 10-minute intervals must be stressed to both the interviewer and the respondent.
- Make sure that the interviewer is aware of the difference between moderate and vigorous activities and how various activities are classified (e.g. squash would be a vigorous activity but cricket would be a moderate activity). It may be helpful to consider the effect an activity has on breathing or heart rate as a rough guide to its intensity; a moderate activity will make you breathe somewhat harder than normal and slightly increase heart rate, and a vigorous activity will make you breathe much harder than normal and have a greater effect on heart rate. Activities which cannot be classified during the interview should be noted (along with details of time and sessions) for referral to the supervisor.
- Researchers and trainers may find the *Compendium of Physical Activities* useful as a guide to intensity classification (Ainsworth et al. 2000). According to this guide, activities with an intensity of 3–6 METs* are classified as moderate, and those with intensity greater than 6 METs are classified as vigorous.
- Ensure that the hours/minutes sections are correctly recorded, e.g. to record 1 hour of activity, fill in 1 hour **or** 60 minutes but not both.
- Each interviewer should be supplied with paper and pen, and a calculator if necessary, to make notes for the supervisor or to help the respondent calculate total time spent in each activity.
- Make sure that the 'number of times' is always completed, i.e. enter zero (0) rather than leave blank for respondents who do not participate in a particular activity.

* 1 MET = the resting metabolic rate, equivalent to oxygen uptake of 3.5 mL/kg/hr.

- Be alert for logical inconsistencies in the data. For example, a person who reports five sessions of walking must have recorded a total time of at least 50 minutes to satisfy the 'continuously for at least 10 minutes' wording of the question.
- Clarify answers which may seem implausible, e.g. reporting one vigorous activity session and a total time of 4 hours.
- Where a CATI system is being used, notes on the screen relating to the current question may be helpful, e.g. types of eligible activities.
- Limiting data entry fields may be helpful, e.g. limit the hours of activity field from 0 to 14 as per the truncation rules. Answers which, after clarification from the respondent, are still outside the limits should be noted by the interviewer and assessed later by the research team.

3.3 Annotated survey questions for interviewers

In this section, the eight core questions for assessing participation in physical activity are reproduced, annotated with tips to improve data collection and to help answer respondents' queries. No specific instruction is necessary for the five 'awareness' questions except to suggest that, as in the three national surveys, the statements are presented in random order to reduce bias which may result from the order in which the statements are presented.

The next questions are about any physical activities that you may have done in the last week:

1. 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?

		times
--	--	-------

Interviewer: Stress that this must be **continuous** walking, i.e. for at least 10 minutes without stopping.

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

In hours and/or minutes

			minutes
--	--	--	---------

		hours
--	--	-------

Interviewer: If the respondent appears to be having difficulty in totalling the time over the entire week, you could assist by prompting for a time each day and adding them yourself, e.g. 'Did you walk on Monday? How long did you spend walking on Monday? And did you walk on Tuesday? For how long?'

3. 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?

<input type="text"/>	<input type="text"/>
----------------------	----------------------

 times

Interviewer: The types of activities which may be included in this section could include heavy digging, tree lopping, landscaping (e.g. pushing a wheelbarrow or moving large rocks), pushing a lawn mower and using a hand saw.

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

In hours and/or minutes

<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------

 minutes

<input type="text"/>	<input type="text"/>
----------------------	----------------------

 hours

Interviewer: As for the walking question, if the respondent is having trouble providing a total time, assist them by prompting for a time each day.

The next questions exclude household chores, gardening or yardwork:

5. In the last 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)

<input type="text"/>	<input type="text"/>
----------------------	----------------------

 times

Interviewer: The types of activities which might be reported here, in addition to the above examples, include football (of all types), hockey, squash, cross-country skiing, cross-country hiking (i.e. rough or steep terrain), weight lifting, boxing, rock climbing, basketball, netball, gymnastics, using a rowing machine, martial arts, high-impact and step aerobics.

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

In hours and/or minutes

--	--	--

 minutes

--	--

 hours

Interviewer: Again, prompt the respondent for daily times if they are having difficulty calculating a weekly total.

7. In the last 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)

--	--

 times

Interviewer: The types of activities which might be expected, in addition to the above examples, include dancing, badminton, table tennis, horseback riding, canoeing, kayaking, volleyball, cricket, baseball or softball, downhill skiing, cross-training, surfing and windsurfing.

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

In hours and/or minutes

--	--	--

 minutes

--	--

 hours

Interviewer: Again, assist the respondent with adding daily times if necessary.

4 Analysis and reporting of the survey data

This section describes the types of measures that can be constructed from the survey data and provides instructions on how each of these measures is derived. Details and examples of the usual method of reporting each measure are also provided. Although the examples of usual reporting method present the data in table form, it is also possible, and can be more informative, to present these data graphically. An example of a graphical presentation is provided. These methods and measures were used in reporting the results of the three National Physical Activity Surveys and other national and state surveys that used the Active Australia questions. With appropriate adjustments for sample demographics, use of these same measures allows comparisons to be made between new and previously published results.

For more examples of survey data presentation see Armstrong et al. 2000.

4.1 Measures derived from the Active Australia Survey

A number of different measures of participation in physical activity during the previous week can be derived from the survey data. These include:

- number of sessions of physical activity
- total time spent in each activity
- average time spent in each activity
- proportion of people who were doing a sufficient amount of activity to gain health benefits
- proportion of people who were sedentary.

The methods of constructing and reporting on each of these measures will be described in turn.

The other measures that can be derived from the survey data relate to awareness of the current public health messages about physical activity and health. The awareness section of the survey consists of five statements about physical activity and health. Survey respondents are asked to indicate to what extent they agree with each of the statements. The methods of analysing and reporting these data are also described below.

4.2 Data structure

This section describes the structure of the survey data and defines the variables used in this document.

Participation in physical activity

For each activity type there are two questions – number of sessions and time per week. Usually the time is recorded in hours and/or minutes, so for each activity type there will be two time variables – hours and minutes.

For example, a data set would have 12 variables as follows:

walksess	number of sessions walking
walkhrs	number of hours walking
walkmins	number of minutes walking
gardsess	number of sessions of vigorous gardening/yardwork
gardhrs	number of hours of vigorous gardening/yardwork
gardmins	number of minutes of vigorous gardening/yardwork
vigsess	number of sessions of other vigorous activities
vighrs	number of hours of other vigorous activities
vigmins	number of minutes of other vigorous activities
modsess	number of sessions of other moderate activities
modhrs	number of hours of other moderate activities
modmins	number of minutes of other moderate activities

These variable names will be used in this document to illustrate formulas for constructing measures to assess participation in physical activity.

Awareness of physical activity messages

For the awareness section of the survey there will be five variables, corresponding to the five statements on physical activity and health. In this document, the following variables will be used to refer to the five statements:

pamess1	Taking the stairs at work or generally being more active for at least 30 minutes each day is enough to improve your health.
pamess2	Half an hour of brisk walking on most days is enough to improve your health.
pamess3	To improve your health, it is essential for you to do vigorous exercise for at least 20 minutes each time, three times a week.
pamess4	Exercise doesn't have to be done all at one time – blocks of 10 minutes are okay.
pamess5	Moderate exercise that increases your heart rate slightly can improve your health.

Respondents are asked to indicate to what extent they agree with each of these statements, and the answers are usually coded numerically in the following manner:

1	=	Strongly agree
2	=	Agree
3	=	Neither agree nor disagree
4	=	Disagree
5	=	Strongly disagree

4.3 Number of sessions of each activity

This measure describes the number of sessions of physical activity people participated in during the previous week. Because this relates to a single question for each activity type (walking, other moderate activities, vigorous gardening/yardwork, other vigorous activities), the variables *walksess*, *gardsess*, *vigsess* and *modsess* defined in the previous section may be used without modification.

Usual reporting method

Usually, data on number of activity sessions are presented separately for each activity type, as the proportion of people participating in various numbers of activity sessions. For example, the variable 'walksess' may be split into four categories: 0, 1-2, 3-4 and 5 or more. Then the data presented would be the proportion of the population falling into each of those categories. It may also be useful to separate the data into subgroups, for example by age group or sex, as shown in Table 3.1.

Table 3.1: Sessions of physical activity in the previous week, by sex (per cent)

Physical activity	Men	Women	Persons
Walking			
Nil	25.4	20.2	22.8
1-2	18.3	19.4	18.8
3-4	12.6	23.5	18.1
5 or more	43.7	36.9	40.3
Total	100.0	100.0	100.0

4.4 Total time spent in each activity

This is a measure of the total amount of time spent in physical activity during the previous week. This is useful for describing population patterns of the time spent in different types of activities.

Total time in minutes for each activity is calculated by multiplying the hours by 60 and adding the minutes:

$\begin{aligned}\text{walktime} &= (\text{walkhrs} \times 60) + \text{walkmins} \\ \text{gardtime} &= (\text{gardhrs} \times 60) + \text{gardmins} \\ \text{vigtime} &= (\text{vighrs} \times 60) + \text{vigmins} \\ \text{modtime} &= (\text{modhrs} \times 60) + \text{modmins}\end{aligned}$
--

Total time in hours would be calculated by dividing the minutes variable by 60 and adding the hours variable, or by dividing the total time in the minutes variable derived above by 60.

To avoid errors due to over-reporting, any times greater than 840 minutes (14 hours) for a single activity type are recoded to 840 minutes. Missing values are not imputed.

Usual reporting method

Total time spent in activity is usually reported by presenting the average of total time over a population or subgroup. Instructions on how to derive and report the average time are shown below.

4.5 Average time spent in each activity

This measure is used to illustrate the population distribution of the total time spent in activity. Note that the question assessing moderate activity other than walking has been found to have low validity (Brown et al. 2002) and therefore should not be reported on its own, although it is still used when calculating 'sufficient' activity and can be combined with the walking question as a measure of total moderate activity.

The average time per week spent in each of the activity types (walking, other moderate activities, vigorous gardening/yardwork, other vigorous activities) can be calculated as the sum of total times reported divided by the relevant number in the sample. This number can be calculated in two ways, depending on the desired measure: as the average for the overall population, or as the average for people participating in a particular activity type.

Note that vigorous activity time is **not** doubled when calculating these measures; this is only undertaken when calculating time for deriving 'sufficient' activity (see section 4.6).

Overall population average

The average time spent by the overall population in a particular activity is calculated by taking the sum of the total time spent in the activity and dividing it by the number of people reporting valid answers to the questions for that activity type. This includes all people reporting activity times of up to 840 minutes (after times greater than 840 minutes have been recoded, as specified previously) as well as those reporting no participation in the activity (i.e. number of sessions = 0).

People who did not answer the questions relating to a particular activity type are excluded from the calculations for that activity, as are those who reported at least one session of the activity but have no time recorded for it.

For example, the population average time spent walking would be calculated as follows:

$$\text{avgwalk1} = \text{sum}(\text{walktime}) / (\text{number}\{0 < \text{walktime} \leq 840\} + \text{number}\{\text{walksess}=0\})$$

where number{criteria} indicates number of people satisfying the criteria.

Average for people reporting participation

The average time for those people who participated in a particular activity type is calculated by taking the sum of the total time spent in activity and dividing it by the number of people reporting a total activity time of up to 840 minutes (after times greater than 840 minutes have been recoded).

People who did not answer the questions relating to a particular activity type are excluded from the calculations for that activity. People who did not participate in the activity (number of sessions = 0) are also excluded, as are those who reported at least one session of the activity but have no time recorded for it.

For example, the average time spent walking among those people who walked would be calculated as follows:

$$\text{avgwalk2} = \text{sum}(\text{walktime}) / \text{number}\{0 < \text{walktime} \leq 840\}$$

where $\text{number}\{\text{criteria}\}$ indicates number of people satisfying the criteria.

Usual reporting method

The distribution of activity times is generally highly skewed, so it is usual to report the 75th and 95th percentiles in addition to the mean. The 25th percentile, median and the minimum and maximum values may also be of interest. For the total sample, the median value may be zero because of the inclusion of non-participating people in the calculations. The data may be analysed and presented separately by age, sex, or other characteristics of interest, as shown in Table 3.2.

Table 3.2: Total time (minutes) in physical activity during the previous week, by sex

	Walking		Vigorous intensity	
	Males	Females	Males	Females
Mean	125	143	70	54
75th percentile	160	165	85	68
95th percentile	583	604	126	74

4.6 Proportion of people doing ‘sufficient’ activity for health

This is a measure of the proportion of the population who reported participating in physical activity at levels sufficient to confer a health benefit. It provides an indication of the number of people obtaining the health benefits of physical activity, and conversely an indication of the number of people not obtaining these benefits and hence at increased risk of poor health outcomes.

For the purposes of calculating ‘sufficient’ activity for health, we are interested in participation in walking, moderate activity, and vigorous activity. Gardening is not included in the calculation of sufficient activity, as there is limited research on the validity of the self-reported intensity of these activities (Armstrong et al. 2000).

There are two different ways of calculating ‘sufficient’ activity for health. These are:

- (a) the accumulation of a sufficient **amount** of activity over a week
- (b) the accumulation of a sufficient **amount** of activity by participation in a sufficient **number of sessions** over a week.

The *National Physical Activity Guidelines for Australians* (DHAC 1999) recommend that, to achieve health benefits, a person should participate in 30 minutes of at least moderate-intensity physical activity on most days of the week. For the purposes of calculating ‘sufficient’ activity, this is interpreted as 30 minutes on at least 5 days of the week; a total of at least 150 minutes of activity per week. Therefore the two definitions of ‘sufficient’ above become:

- (a) the accumulation of at least **150 minutes** of activity over 1 week
- (b) the accumulation of at least **150 minutes** of activity and at least **5 sessions** of activity over 1 week.

Calculating total activity time

Total time in activity overall is calculated, as shown below, by adding the time spent in walking and moderate activity and twice the time spent in vigorous activity (not including gardening and yardwork). The time spent in vigorous activity is doubled because vigorous activity is more intense and so confers greater health benefits than moderate activity (Armstrong et al. 2000).

$\text{sufftime} = \text{walktime} + \text{modtime} + (2 \times \text{vigtime})$
--

To avoid errors due to over-reporting, total times in all activities that are greater than 1680 minutes (28 hours) are recoded to 1680 mins.

Calculating total activity sessions

Total sessions are calculated by adding the number of sessions of walking, moderate activity and vigorous activity (not including gardening, as before), as shown below:

$\text{suffsess} = \text{walksess} + \text{modsess} + \text{vigsess}$

Identifying people participating in ‘sufficient’ activity

(a) Sufficient time

For calculation of sufficient activity using time only, the data are grouped into three categories based on total activity time. Participation in at least 150 minutes per week is classified as ‘sufficient’. People who are doing no activity at all are classed as sedentary. The remainder are classed as ‘insufficient’ – that is, they are participating in some activity but not enough to obtain a health benefit. This results in the following classification:

sufftime = 0	sedentary
1 <= sufftime <= 149	insufficiently active
sufftime >= 150	sufficiently active for health.

(b) Sufficient time and sessions

The second definition of ‘sufficient’ activity for health includes both the time and number of sessions of activity. As before, people doing no activity at all are classed as sedentary. People doing at least 150 minutes of activity over at least five sessions are classed as ‘sufficient’. The remainder are classed as ‘insufficient’ – that is, participating in some activity but either not enough in total or **not regularly enough** to obtain a health benefit.

The data are grouped into three categories as follows:

sufftime = 0	sedentary
1 <= sufftime <= 149	} insufficiently active
OR	
sufftime >= 150 and suffsess < 5	} sufficiently active for health
sufftime >= 150 and suffsess >= 5	

There are some problems with this measure in that it assumes each session is undertaken on a different day. Further, the length of time spent in each session is unknown. Therefore the activity may not equate to 30 minutes per day over 5 days. However, it is the best approximation to the guidelines available using the current survey questions.

Usual reporting method

These data are usually reported by presenting the proportion of people in each of the three categories defined above. Alternatively, the proportions of people who are sedentary and insufficiently active can be combined and presented to show the total number of people who are not sufficiently active for health. As for the other measures described in this document, the data can be analysed and presented separately by age group, sex, or any other characteristics of interest. Tables 3.3 and 3.4 and Figure 3.1 provide examples.

Table 3.3: Percentage of people achieving 'sufficient' time during the previous week, by sex

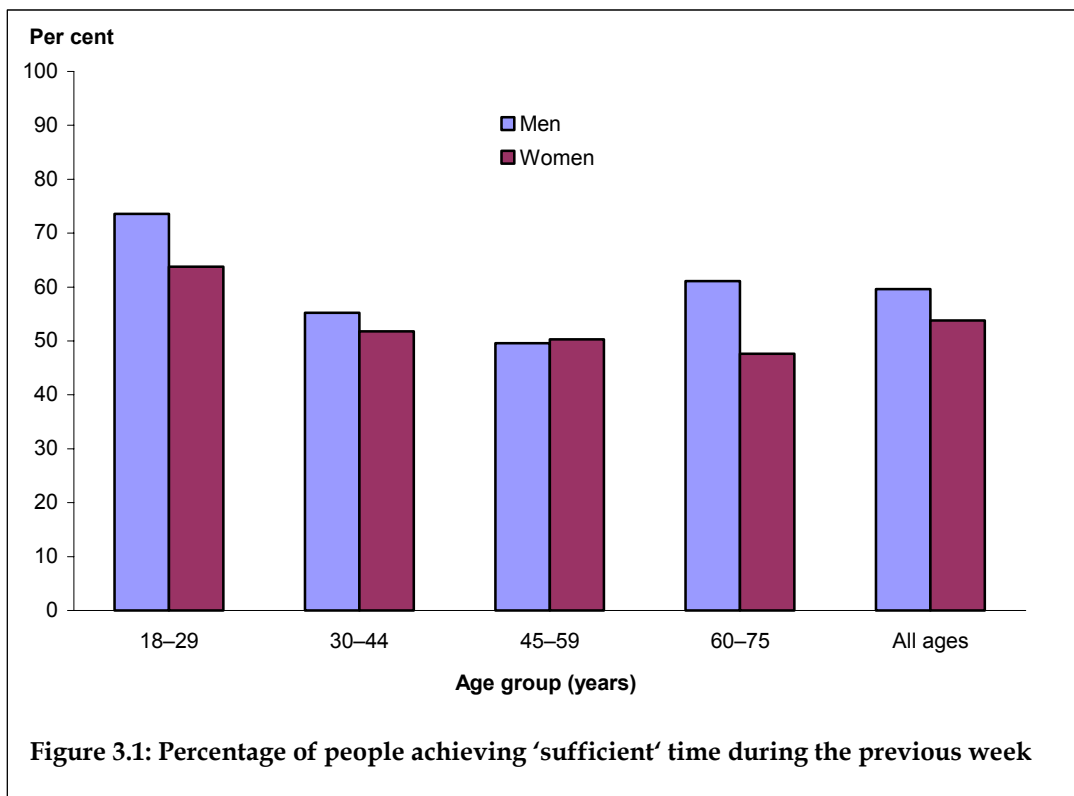
	Sedentary	Insufficient	'Sufficient'*
Sex			
Men	15.1	24.8	60.1
Women	15.9	31.6	52.5
<i>Persons</i>	15.4	27.4	57.2

* 'Sufficient' time is defined as 150 minutes per week, using the sum of walking, moderate activity and vigorous activity (weighted by two).

Table 3.4: Percentage of people achieving 'sufficient' time and sessions during the previous week, by age group

	Sedentary	Insufficient	'Sufficient'*
Age group (years)			
18–29	8.7	39.6	51.7
30–44	13.6	42.4	44.0
45–59	19.4	40.2	40.4
60–75	22.1	38.3	39.6
<i>All ages</i>	16.1	40.3	43.6

* 'Sufficient' time and sessions is defined as 150 minutes (using the sum of walking, moderate activity and vigorous activity (weighted by two)) and five sessions of activity per week.



4.7 Proportion of people who were sedentary

This is a measure of the proportion of the population who reported no leisure-time physical activity or walking during the previous week. This gives an indication of the number of people who are at increased risk of poor health because of inactivity.

The proportion of people who were sedentary can be obtained from the calculations for sufficient activity described previously. Alternatively, people who were sedentary can be identified by adding the time spent in walking, moderate and vigorous activities (not including gardening and yardwork) as follows:

$$\text{tottime} = \text{walktime} + \text{modtime} + \text{vigtime}$$

Any person who has tottime = 0 is classified as sedentary.

Usual reporting method

The proportion of people sedentary is usually presented in a table or graph, grouped by age, sex or other characteristics of interest, similar to the method for reporting proportion undertaking 'sufficient' activity.

4.8 Awareness of physical activity messages

This is a measure of the extent to which people recognise and acknowledge the current public health messages concerning physical activity and health. It indicates the success (or otherwise) of the promotion of physical activity messages in the community.

For each statement, the response variable provides five categories of agreement, and these can be considered as they are without modification as numbers or proportions of people strongly agreeing, agreeing, disagreeing, strongly disagreeing, or having no opinion about the statements. However, if a message has been very successful in its uptake by the community, the number of people in the 'disagree' and 'strongly disagree' categories may be extremely small. Therefore it is usual to group the five agreement categories into two: one for those who agree or strongly agree with the statement, and the other for those who do not agree or have no opinion. This indicates the number of people who are aware of and accept the relevant public health message, which is commonly the most desired information for assessing the impact of promotional efforts. Alternatively, examination of the characteristics of the group that do not agree with the messages may indicate possible target groups for different or more focused interventions.

Usual reporting method

The data on awareness of physical activity messages is usually presented in a table, showing the percentage of people who agree or strongly agree with each statement. As with each of the other measures described, the data can be presented by age group, sex or other characteristics of interest. Table 3.5 gives an example.

Table 3.5: Percentage of people agreeing (combined 'strongly agree' and 'agree') with knowledge statements, by sex

	Message 1	Message 2	Message 3	Message 4	Message 5
Sex					
Men	84.6	87.7	70.1	71.6	94.6
Women	91.3	93.8	63.8	75.1	96.3
<i>Persons</i>	<i>87.4</i>	<i>89.9</i>	<i>66.4</i>	<i>73.2</i>	<i>95.1</i>

- Message 1: Taking the stairs at work or generally being more active for at least 30 minutes each day is enough to improve your health.
 Message 2: Half an hour of brisk walking on most days is enough to improve your health.
 Message 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.
 Message 4: Exercise doesn't have to be done all at one time—blocks of 10 minutes are okay.
 Message 5: Moderate exercise that increases your heart rate slightly can improve your health.

5 Background to the survey

This section provides an overview of the development of the Active Australia Survey. The material is sourced from a document written to chart the progress of the development of data standards for physical activity measurement (AIHW: Dixon T unpublished). This provides some background information about the importance of physical activity, the framework for national data standards, and ways in which physical activity is measured. It also describes the means by which the questions in the Active Australia Survey were developed.

In 1997, the Commonwealth Department of Health and Family Services (now Department of Health and Ageing) commissioned the Australian Institute of Health and Welfare (AIHW) to develop national data standards, methods and definitions for the measurement of physical activity and health, with a view to including these in the *National Health Data Dictionary* (NHDD) and the National Health Information Knowledgebase (now known as the Knowledgebase). This would assist in the collection of uniform, standardised data for physical activity among Australian adults.

To facilitate this project, the Expert Working Group on Physical Activity Measurement (the Expert Group) was established by the AIHW. During the following 2 years, the Expert Group reviewed existing physical activity measures, examined the issues surrounding measurement of physical activity, undertook related research and consulted widely with various interested bodies and experts, both in Australia and overseas, before identifying a number of data elements (discrete items of information or variables) necessary for physical activity measurement. These were:

- Physical activity (data concept)
- Physical activity – context
- Physical activity – duration
- Physical activity – frequency
- Physical activity – intensity
- Physical activity – type
- Physical activity – health benefit.

The Expert Group considered these elements to be the best available given the evidence and funding available at the time. In September 1999, the elements were entered with draft status into the Knowledgebase, but not into the NHDD. This was because of concerns raised by the National Health Data Committee that the elements did not capture all the desirable aspects of physical activity, that the questions related to measurement of these elements had not been validated, and that some members had not had sufficient time and information to consider them. There was also a concern that once the data elements were included in the dictionary it could be difficult to alter them should better measures become available.

Concurrently, the Expert Group developed the Active Australia Survey as a means of collecting data consistent with these elements and evaluating the *Active Australia* initiative. The Expert Group drew from questions used in the National Heart Foundation Risk Factor Prevalence Survey, the ABS National Health Surveys, and the New South Wales State Health Surveys to develop a series of questions, six of which are used to derive a measure of physical activity that can be assessed for health benefit. The survey has been used nationally

in 1997, 1999 and 2000, and in several state-based surveys. It exhibits good reliability, face validity, criterion validity and acceptability.

5.1 Basis for data development

This section provides an overview of the importance of physical activity with regard to health, describes government initiatives promoting physical activity between 1996 and 2001, and outlines the framework for developing national data standards for measuring physical activity.

Why is physical activity important?

Physical inactivity is a modifiable behavioural risk factor for coronary heart disease, ischaemic stroke, type 2 diabetes mellitus, colon cancer and breast cancer. Being physically active not only reduces the risk of developing these chronic diseases, but also increases musculoskeletal strength, thus decreasing the risk of falls, improves general wellbeing, and reduces symptoms of depression, anxiety and stress (Armstrong et al. 2000). Physical activity therefore has a beneficial association with six of the seven National Health Priority Areas (cardiovascular disease, diabetes, cancer, mental health, arthritis and musculoskeletal health, and injury).

Physical inactivity accounts for 7% of the total burden of disease in Australia, second only to tobacco smoking as a risk factor for ill health (Mathers et al. 1999). It accounts for the highest burden among females. It is estimated that the direct health-care cost attributable to physical inactivity is around \$377 million per year, with \$262 million of this due to cardiovascular diseases (Stephenson et al. 2000). There is also evidence that physical inactivity is associated with other risk factors such as overweight and obesity, high blood pressure, and high blood cholesterol.

Physical activity has therefore become an important public health issue, and there has been substantial investment in its promotion by the Commonwealth, state and territory governments, reflected in the establishment of the *Active Australia* campaign in 1996 and the *National Physical Activity Guidelines for Australians* in 1999.

Active Australia

Launched in December 1996 and formally functioning until 2001, *Active Australia* was a national public health initiative that aimed to promote regular moderate-intensity physical activity and to increase participation in sports. It involved a partnership between the Department of Health and Family Services, the Australian Sports Commission, state and territory sport and recreation departments and the National Office of Local Government. *Active Australia* had three main goals:

- to realise and enhance lifelong participation in physical activity
- to realise the social, health and economic benefits of participation in physical activity
- to develop quality infrastructure, opportunities and services to support participation in physical activity.

A number of media campaigns were produced under the *Active Australia* brand, including the 'Regularly, not seriously' tagline in New South Wales, the 'Rusty' campaign and other similar campaigns targeting older Australians in various states.

The National Physical Activity Guidelines

The *National Physical Activity Guidelines for Australians* were established in 1999. These guidelines outline the level of physical activity considered necessary to achieve a health benefit (DHAC 1999). They state that adults should accumulate at least 30 minutes of moderate-intensity physical activity on most, preferably all, days of the week. This corresponds to current research, where 'adequate' physical activity for health benefit is defined as the accrual of 150 minutes of moderate-intensity physical activity over 1 week. Research, and the guidelines, also suggest that benefit can result from activity undertaken in a number of short sessions of 10 minutes rather than a single longer session.

National data standards

In Australia some systems have been developed to facilitate collection of data in a standard and consistent manner. These include the NHDD and the Knowledgebase, maintained under the umbrella of the National Health Information Agreement. These, and their relationship to the development of data standards for measuring physical activity, are described below. More detailed information can be found on the AIHW web site <<http://www.aihw.gov.au>>.

The National Health Data Dictionary

Published annually (10th edition in 2001), the NHDD contains definitions of the data elements (discrete items of information or variables) currently formally approved by the National Health Information Management Group (NHIMG). Under the National Health Information Agreement, the NHDD is the authoritative source of health data definitions used in Australia where national consistency is required. It is designed to improve the comparability of data across the health arena. It is also designed to make data collection activities more efficient by reducing the duplication of effort in the field and more effective by ensuring information to be collected is appropriate to its purpose. Data elements in the NHDD can be revised as new evidence becomes available. This encourages users to reach consensus around common concepts while further research is undertaken. While adherence to the NHDD standard data element definitions is not mandatory, it is highly recommended to ensure consistent and comparable data collection.

The Knowledgebase

The Knowledgebase (formerly known as the National Health Information Knowledgebase) is an electronically accessible health, community services and housing metadata registry designed and created by the AIHW on behalf of the NHIMG. The core of the health section of the Knowledgebase is an electronic version of the NHDD. However, the Knowledgebase also holds information on superseded, retired, abandoned, and draft data elements, which are not published in the printed NHDD. Details of National Minimum Data Sets, National Health Performance Indicators and the National Health Information Model are also available in the Knowledgebase.

The National Health Information Agreement

The National Health Information Agreement, in effect from June 1993 between the Commonwealth, state and territory health authorities, the ABS and the AIHW, aims to ensure that the collection, analysis and dissemination of national health information is undertaken appropriately and efficiently. A project focusing on cardiovascular disease risk

factors was established under the National Health Information Work Program, with the AIHW's National Centre for Monitoring Cardiovascular Disease as the responsible agency. The aim of this project was the development of standard definitions and a minimum data set on the basis of nationally agreed definitions and standards for all agencies collecting and reporting data on cardiovascular disease risk factors. Subprojects were to be set up for each specific risk factor, with those for overweight/obesity, smoking and physical activity to be established first. The expected outputs of these subprojects were data item definitions (data elements) for each of these risk factors. The processes involved were:

- a literature search and review of means of assessment of the risk factors, measurement strategies, definitions, standards and measurement issues
- a review of national and international survey techniques and questionnaires
- the establishment of expert working groups to assist with the development of definitions.

To facilitate the physical activity project, the Expert Working Group on Physical Activity Measurement (the Expert Group) was established by the AIHW. Members of the Expert Group included representatives from universities, research centres, government and non-government organisations, some of whom were concurrently involved in the World Health Organization project to develop an international physical activity questionnaire (Appendix 2).

Terms of reference of the Expert Working Group on Physical Activity Measurement

Under the terms of the National Health Information Project, the focus of the Expert Group was on physical activity as a risk factor for cardiovascular disease. Their terms of reference were as follows:

- The Expert Group is required to develop standard methods and definitions for measuring and reporting on the prevalence of physical activity in adults for use in Australian population surveys and data collections.
- The data elements to be addressed by the Expert Group are adult leisure-time physical activity. The Expert Group may be required to develop other data elements for adult leisure-time and adult non-leisure-time physical activity.
- The proposal developed by the Expert Group should conform to the criteria and recommended formats for input into the NHDD.
- The Expert Group should use a national consultation process to demonstrate consensus.
- The proposal should be submitted to the National Health Data Committee by November 1997 for inclusion in the NHDD by July 1998.

5.2 Development of the data standards for physical activity, 1997–1999

This section provides a brief overview of the various means of measuring physical activity, outlines the rationale behind the Expert Group's chosen measure (self-report survey) and describes the two measures initially developed by the Expert Group. The remainder of the section follows the continuing development of the preferred measure, including a discussion of the assessment of 'sufficient' activity for health, and describes the process of national consultation and submission of the data standards to the National Health Data Committee.

Measurement of physical activity

A measure of physical activity is needed to determine the prevalence of physical activity in the population, to monitor changes over time, and to assess the effect of any interventions. At the time the Expert Group began their work, there were no nationally accepted uniform procedures for collecting or analysing data on physical activity. Methodologies used were uncoordinated and incomplete. Standards for data and methodology, and a recognised measurement instrument, were needed to ensure that results from different studies were comparable, and that trend data were meaningful. The Expert Group believed that, if possible, the measurement instrument should:

- provide information on how many Australians attain the recommended 'adequate' level of physical activity for health
- be suited to both self-administration and telephone interview
- be accurate, valid and reproducible
- preferably, be short.

A number of methods are available to measure physical activity levels (Montoye et al. 1996). These include:

- self-report measures
- direct behavioural observation
- physiological testing
- indirect estimates of maximal or submaximal cardiorespiratory oxygen uptake (e.g. via treadmill or cycle ergometer tests)
- mechanical/electronic devices such as pedometers and motion sensors
- activity diaries.

There are issues regarding the use of each of these methods in population surveys. Direct observation, physiological testing, treadmill/ergometer tests and the use of electronic devices have high-cost, time and acceptability implications in wide-scale application. However they are useful for validating self-report measures. Activity diaries involve a large amount of time and effort on the part of participants, and there are concerns that the act of filling out such diaries may influence behaviour, therefore providing inaccurate results. Self-report measures, while less accurate than other methods and subject to recall bias, are relatively inexpensive, acceptable to survey participants, and can be adapted to suit CATI techniques. After considering the issues surrounding each of the above methods, the Expert Group decided that self-report measures were the most appropriate for population surveys.

Self-report measures

The Expert Group considered it important that:

- the questions be constructed so that they could include further investigation on matters such as activity setting, whether activities were organised and whether they involved individual or team sports (This was believed to be essential to sport and recreation and associated sectors.)
- the use of the information for measuring/monitoring indicators for health outcomes, such as in the National Health Priority Areas, be considered
- a core set of questions be developed which had the potential to be linked to a set of more detailed questions
- any self-report measures developed be cross-validated (against other self-report measures and, if possible, against more objective measures of activity).

Two of the main factors to be considered during the development of self-report measures are the timeframe of recall and the activity types or categories of interest.

Commonly in self-report surveys, the recall period is short term, from 1 to 4 weeks. Sometimes the previous year or, less often, lifetime activity levels are captured. Historically in Australia a 2-week recall has been used; however, the Expert Group decided that this should be changed to 1 week to be comparable with the latest international developments (e.g. the International Physical Activity Questionnaire (IPAQ)).

Types of activity to be included in a self-report measure can range from a complete listing, with up to 100 activities, to subsets of these, to broad categorisation (e.g. walking, moderate or vigorous activities).

Measures developed by the Expert Group

Initially two measures for assessing population levels of participation in physical activity were developed by the Expert Group: an activity-specific questionnaire and a generic questionnaire. These referred specifically to leisure-time physical activity and did not include occupational activity (i.e. any activity undertaken during the course of paid or unpaid employment) or incidental activity (i.e. the activities of daily living, such as those relating to personal hygiene, or walking from one room to another). The Expert Group, while acknowledging the probable importance of occupational and incidental activity to overall energy expenditure, was unable to endorse their inclusion. Although there is some evidence relating these activities to health benefit, the measures used to assess these activities in epidemiological studies are not generally appropriate for use in population surveys as they are typically long and time-consuming. Further, current national and international physical activity guidelines and thresholds for health benefit are based on leisure-time physical activity only. Many published studies also follow this reasoning, stating, for example, that 'Particular attention has been paid to leisure time activity because few middle-aged men do physically demanding work and because, in public health terms, occupational activity is not amenable to change' (Shaper & Wannamethee 1991). The same is true of women and other age groups.

While the Active Australia Survey does not include occupational physical activity its walking question captures walking to get to and from places (i.e. for transport) as well as walking as a leisure activity. These forms of walking are most likely to be associated with

health benefits, while walking at work in most cases is unlikely to be of sufficient intensity or duration to influence health.

Activity-specific questionnaire

The activity-specific questionnaire captured (during the previous week):

- frequency, duration and self-rated intensity of walking
- type, frequency and duration of three most common vigorous activities
- type, frequency and duration of three most common moderate activities
- frequency, duration and self-rated intensity of household chores
- frequency, duration and self-rated intensity of gardening or yardwork.

For each activity type, it was decided to measure total time spent over the week rather than time per session of activity. The Expert Group felt that this had the advantages of decreasing recall bias, reducing arithmetical errors and increasing international comparability of the data. Household chores and gardening/yardwork were included as separate questions because their contribution to physical activity for health benefit is unclear and it was therefore thought better to separate them from other activities.

The questionnaire was similar to that used in the 1990–91 Pilot Survey of the Fitness of Australians (PSFA). Part of that survey captured frequency, duration and intensity of all sport and recreational activities performed over the previous 2 weeks. Re-analysis of these data by members of the Expert Group showed that there was little difference in prevalence rates across numbers of activities when counting three activities or more, but a significant drop in prevalence occurred when only two activities were counted. Therefore, the Expert Group's questionnaire was designed to capture a person's three 'most common' activities.

Generic short-form questionnaire

The generic questionnaire recorded the frequency and duration over the previous week of:

- walking
- vigorous exercise
- household chores
- gardening or yardwork
- moderate activities.

Similarly to the activity-specific questionnaire, duration was recorded as total time in the previous week, and gardening and household-chore activities were captured separately. The generic questionnaire was very similar to tools being refined at the time in the United States and Canada, and in fact the walking component of the questionnaire was later appropriated for use in the US Behavioural Risk Factor Surveillance Study (BRFSS). The short form of the IPAQ, which was circulated some months after the Expert Group's generic questionnaire was developed, proved to be much like the Australian survey.

As it is worded, the walking question captures walking as a leisure activity as well as walking for transport. In this way moderate or brisk-paced walking, which is most likely to be associated with health benefit, is captured rather than walking at work which in most cases is unlikely to be of sufficient intensity or duration to influence health, and would be subject to recall bias. Current opinion, along with evidence from two Australian studies (A

Hills personal communication; Gunn et al. 2002), suggest that this self-reported walking is sufficiently intense to confer health benefit.

Pilot testing

Both questionnaires were tested in a pilot study run through the ABS Population Survey Monitor in June–July 1997. The generic questionnaire was well received and understood, though there was some confusion about what constituted ‘moderate’ activity. The ABS reported that the questionnaire was easy to administer and elicited meaningful responses from participants. The activity-specific questionnaire was also well received; however, respondents seemed to have some difficulty estimating the intensity of their activities, especially those around the house and yard. Some changes to the ordering of the questions and the inclusion of examples of activity types in both questionnaires were suggested.

Because of the length of the activity-specific questionnaire and the need to produce an instrument which could be used as a short telephone survey, the Expert Group decided to discontinue its development and focus only on the generic questionnaire as a population measure for developing data standards.

Validity and reliability

An early version of the generic questionnaire (where the same questions were asked but applied to a 2-week recall period) was used as part of the 1994 and 1996 New South Wales Health Promotion Surveys. The results were cross-validated against responses to specific-activity questions (from the PSFA) which were asked in the same survey. Reports of the number of sessions of moderate and vigorous activity correlated highly with those reported in the activity-specific questions ($r = 0.86$ and 0.95 , respectively), as did reported total time spent in these activities ($r = 0.97$ and 0.89 , respectively).

A reliability study conducted on the final version of the generic questionnaire (the National Physical Activity Questions) found all items had good to excellent reliability, with intraclass correlation coefficients from 0.71 to 0.86 and Spearman’s Rho from 0.54 to 0.77 (Bull 2000).

In 2001 the Department of Health and Aged Care (now Department of Health and Ageing) funded further research into the psychometric properties of this and other physical activity instruments. This found that the Active Australia questions exhibited good reliability and acceptable validity (Brown et al. 2002).

Assessment of ‘adequate’ (or ‘sufficient’) activity

It was initially intended that the duration of each activity be multiplied by its MET value* and individual body mass to produce estimates of weekly energy expenditure (kcal/wk) over and above the energy expended through ‘normal’ living activities. These energy expenditure estimates would then be used to determine if a person was ‘adequately’ active for health using a threshold value of 800 kcal/wk, in line with the recommendation of the US Surgeon General. However, it was noted that this method biases against those of lighter weight; five 30-minute sessions of moderate exercise for a 65 kg person equates to 569 kcal, whereas the same amount of activity for a person weighing 95 kg equates to 831 kcal. In this case, the heavier person would be classed as undertaking ‘adequate’ activity, but the lighter

* 1 MET = the resting metabolic rate, equivalent to oxygen uptake of 3.5 mL/kg/hr. For the purposes of this assessment, walking and moderate activities were defined as having an energy expenditure rate equivalent to 3.5 METs and vigorous activities as 9.0 METs.

person would not. Therefore, the Expert Group explored the concept of METmins – an estimate of energy expenditure independent of body weight. Calculation of METmins involves multiplying the MET value of a particular activity by its duration in minutes over the week. This means that in the above example both people would have undertaken 525 METmins of activity, regardless of their different weights.

However, the use of energy expenditure estimates of any form has problems, as they ideally need to be adjusted not only for body weight but also for age. This is because an older person generally cannot perform activities at the same intensity as a younger person. METs are a function of oxygen uptake and therefore reflect maximal uptake (VO_{2max}). For a 25-year-old, the PSFA estimated VO_{2max} at 43 mL/kg/min. Thus a vigorous activity, estimated at 9.0 METs, is performed at 73% of VO_{2max} . Compare this with a person aged 70 whose estimated VO_{2max} is 30 mL/kg/min. To perform a 9.0 MET activity this person would need to sustain an oxygen uptake of 105% of their VO_{2max} – an impossible task. Hence, using a value of 9.0 METs for vigorous activity for all ages would result in an over-estimate of energy expenditure in older people.

The Expert Group therefore decided not to rely on estimates of energy expenditure to assess whether adequate activity was being undertaken, but instead chose to compare the duration of activity to the amount recommended in national and international guidelines. The evidence-based National Physical Activity Guidelines for Australians (DHAC 1999) suggest that, to obtain a health benefit, 30 minutes of moderate activity should be undertaken on most days of the week, and that more vigorous activity will result in greater benefits. The criteria for 'adequate' physical activity were therefore redefined as accumulating 150 minutes (5 x 30 minutes) of moderate activity or 90 minutes of vigorous activity per week. These levels approximate the 800 kcal/wk energy expenditure suggested previously. Further, 90 minutes (or 3 x 30 minutes) of vigorous activity reflected the earlier physical activity and health message of the American College of Sports Medicine (ACSM 1975). Because the relationship between physical activity and health appears to be a dose-response gradient, any particular level of activity is better than a lower level in terms of health benefit. However, these thresholds for 'adequate' activity were chosen, based on epidemiological evidence, as representing a level associated with a significant reduction in both all-cause mortality and the development of and mortality due to diseases such as coronary heart disease, colon and breast cancers, and type 2 diabetes mellitus.

The data standards—submission to the National Health Data Committee

The Expert Group identified a set of data elements relating to physical activity and developed an entry (or definition) for each one for inclusion in the NHDD. These elements represent discrete components which, when combined, completely describe participation in physical activity. Four draft elements (frequency; duration; intensity; and adequate frequency, duration and intensity) were first submitted to the National Health Data Committee (NHDC) in May 1999. The NHDC were generally pleased with the elements and suggested some revisions, including the addition of an 'activity type' element. The revised five elements were resubmitted to the NHDC and circulated for national consultation (see below) in July 1999. Some further revisions were made, notably the removal of household chores as an activity type of interest. This was due to a lack of evidence showing that this type of activity provides a health benefit, and the fact that household chores are not commonly reported as physical activities in surveys. In addition, the 'adequate' element was renamed to 'Physical activity – health benefit'. In September–October 1999 further

consideration by the NHDC resulted in the addition of one further element, namely the context of activity, and the recommendation that the elements be included as draft data elements in the National Health Information Knowledgebase. The NHDC were, however, not in agreement that the elements in their current form should be included in the NHDD.

The consultation process

In July 1999, the draft data standards (the elements and proposed questionnaire) were circulated for comment and endorsement to 172 individuals. They included representatives of the Commonwealth, state and territory governments, non-government organisations, professional bodies and consumer groups, as well as public health researchers, epidemiologists and other relevant individuals (Appendix 3). Forty-one replies were received; 21 endorsed the standards, 4 did not, and the remainder did not specifically make a statement regarding endorsement. The concerns of the four respondents who did not endorse the standards were related to:

- the apparent lack of evidence for the impact of physical activity on health
- the non-inclusion of occupational activity
- concerns that endorsement at the time would slow the impetus of further work.

In response to the comments received, the Expert Group made a number of changes to the data elements and survey instrument. These included:

- stressing that the data elements and survey questions relate primarily to leisure-time physical activity
- changing the criterion for 'adequate' activity for health benefit (now generally referred to as 'sufficient activity') so that it was defined as accumulating a total of 150 minutes of activity per week, with the duration calculated by summing the time spent in walking and moderate and vigorous activities, where vigorous activity is weighted by a factor of two to account for its higher intensity
- removing all reference to housework as a type of physical activity to be measured.

5.3 Current status of the proposed data standards

The physical activity questions

The current version of the Active Australia Survey (see Section 2), proposed in late 1999, incorporates changes made in response to comments from the national consultation process. The survey consists of five statements about physical activity to assess knowledge of public health messages, and eight questions capturing the frequency and duration over the previous week of:

- walking, for at least 10 minutes continuously, for recreation, exercise, or transport
- vigorous gardening or heavy work around the yard
- vigorous physical activities (excluding gardening, yardwork and household chores)
- moderate physical activities (excluding walking, gardening, yardwork and household chores).

The questions in this format (with or without additional questions assessing household activities) have so far been used in three national surveys (1997, 1999 and 2000) and several

state surveys, including Queensland (2001), New South Wales (1996–2001), Victoria (1997), Western Australia (1999) and South Australia (1998, 2001).

In 2001, two projects assessing the validity and reliability of the Active Australia questions and other international measurement instruments were funded by the Department of Health and Aged Care. The key recommendation of these projects was:

The measurement properties (test-retest reliability, convergent validity and criterion validity) of the Active Australia survey are as good as those of any of the surveys assessed in this series of studies. For this reason, and because this survey has been used in three consecutive population surveys in Australia, it is recommended that this survey be adopted for continuing population monitoring of physical activity (PA) in Australia. (Brown et al. 2002)

The data elements

The data elements proposed for physical activity are the data concept of Physical Activity, the five related data elements of context, duration, frequency, intensity and type of physical activity, and a derived data element of physical activity – health benefit. These standards are defined as follows:

- **Physical activity (data concept):** Physical activity may be defined as ‘any bodily movement produced by skeletal muscles that results in energy expenditure’ (Caspersen et al. 1985). This includes exercise, sport, active recreation, fitness, incidental activity, and active living. The majority of data collected in population surveys refers to leisure-time physical activity since methods to measure other forms of activity are not yet well developed.
- **Physical activity – context:** The context in which a person participates in physical activity (i.e. leisure time or other).
- **Physical activity – duration:** The length of time spent participating in physical activity as self-reported by an adult person (measured in minutes over a period of 1 week).
- **Physical activity – frequency:** The number of times an adult person self-reported participating in physical activity (over a period of 1 week).
- **Physical activity – intensity:** The self-perceived and self-reported intensity at which an adult person participated in physical activity (i.e. moderate or vigorous). Moderate physical activity increases heart rate but does not necessarily make a person puff or pant. Moderate-intensity activities include walking, golf, gentle swimming and social tennis. Information on walking is included as a moderate activity. Vigorous physical activities generally make a person breathe harder or puff and pant and include activities such as jogging, cycling, aerobics, competitive tennis and hockey.
- **Physical activity – type:** The specific physical activities self-reported by adults (i.e. walking, gardening and yardwork, or other).
- **Physical activity – health benefit:** Participation in walking and leisure-time physical activity of sufficient intensity and duration to confer a health benefit.

The derived data element pertaining to health benefit is denoted as adequate or inadequate (in practice, generally referred to as ‘sufficient’ and ‘insufficient’) after calculating a person’s total activity level from the duration and intensity definitions. The number of minutes spent in walking, moderate and vigorous leisure-time activities (not including gardening and

yardwork) are summed, with vigorous activity being weighted by a factor of two to account for its greater intensity. Total leisure-time activity of 150 minutes per week or more is considered to be sufficient to obtain health benefit. The extra element measuring frequency can be used to assess a person's activity level against the National Physical Activity Guidelines which recommend activity be undertaken on most days of the week.

The data elements are still classified as 'draft' in the Knowledgebase. They have not been entered into the NHDD, because of concerns raised by the NHDC that the elements do not capture all the desirable aspects of physical activity and that some members had not had sufficient time and information to consider the proposed elements. They were also concerned that once the data elements were included in the dictionary it could be difficult to alter them should better measures become available. It is, however, possible to make alterations to data elements in the NHDD.

These data elements are generic and applicable not just to the Active Australia Survey but to most of the instruments currently used to measure physical activity both in Australia and around the world. They would require little or no modification should, for example, the IPAQ or the US BRFSS questions be used to measure population activity levels. During 2001-02, the Department of Health and Ageing worked with other interested parties, including the Computer Assisted Telephone Interview Health Surveys Technical Reference Group (CATI-TRG), to revise and eventually resubmit the physical activity data elements for inclusion in the NHDD.

Appendix 1: Example of CATI survey coding

An extract from the methods and coding manual used in the 1999 National Physical Activity Survey is included in this section as an example of the implementation of the Active Australia Survey in a CATI setting.



An extract from:

1999 Physical Activity Survey

National Physical Activity Survey

Methods, Coding Manual and Questionnaire

Prepared for the
Australian Institute of Health and Welfare

By
The Hunter Valley Research Foundation

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Downie Street, Maryville, NSW 2293

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December 1999

The information herein is believed to be reliable and accurate. However, no responsibility or liability for the contents, or any consequence of its use, will be accepted by The Hunter Valley Research Foundation or the Foundation staff involved in its preparation

Completed interview databases

Notes: A field containing -1 indicates that the question was not asked. This occurred whenever a question(s) was (were) skipped as part of the questioning process.

Field name: ID

Field type: Numeric

Content: The ID number given to each randomly chosen telephone number. The ID for each number did not change during the interview process. Therefore, the ID field can be used to link the response rate database (AUS99RR.DBF) with the completed interview databases (AUS99.DBF and NSW99AGE.DBF).

PHONE NO. IS {instruction to interviewer}

Hello, is this 'phone number'?

Hello, my name is ..., I'm calling on behalf of ... We are conducting a national study on physical activity.

[READ FOLLOWING PARAGRAPH IF HELPFUL.]

The research results will be important for the planning of future health and exercise programs in your local area. Your telephone number has been selected randomly from the White Pages. A member of your household will be asked to answer a few questions over the phone.

{Selection of required household member}

WHEN REQUIRED PERSON IS ON PHONE ASK:

Hello, are you (RESPONDENT'S NAME)? My name is ... I'm calling on behalf of ... We are conducting a national study on physical activity.

The research results will be important for the planning of future health and exercise programs. All that is involved is answering a few questions over the phone. Your answers will be kept confidential. We don't need to know your name and no individuals will be identified or described in any reports. [If there are any questions you prefer not to answer just say so.]

The survey should take NO MORE THAN 15 minutes. Can you help us with this study?

[IF YES] Is it OK to talk to you now?

When would be the best time to call back to speak to you?

RECORD ON THE LOG SHEET.

{Additional questions – omitted here}

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

Question: Q8. 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

Field type: Numeric

Content: # number of times

99 = Don't know – use only as an absolute last resort

If: Q8 = 0, skip to Q12

Question: Q9. 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 names:	Q9M	Q9H
Field type:	Numeric	Numeric
Content:	Minutes	Hours
	77 = Don't know	777 = Don't know

If: Q9M < 1 AND Q9H < 1, skip to Q9m
Program check – interview could not proceed without an answer

Question: Q12. 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
Field type: Numeric
Content: # number of times
99 = Don't know – use only as an absolute last resort

If: Q12 = 0, skip to Q14

Question: Q13. 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:	Q13M	Q13H
Field type:	Numeric	Numeric
Content:	Minutes	Hours
	77 = Don't know	777 = Don't know

If: Q13M < 1 AND Q13H < 1, skip to Q13m
Program check – interview could not proceed without an answer

The next question excludes household chores or gardening or yardwork:

Question: Q14. IN THE LAST 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)

Field name: Q14

Field type: Numeric

Content: # number of times
99 = Don't know – use only as an absolute last resort

If: Q14 = 0, skip to Q16

Question: Q15. What do you estimate was the total time that you spent doing this vigorous physical activity IN THE LAST WEEK?

Field name: Q15M Q15H

Field type: Numeric Numeric

Content: Minutes Hours
77 = Don't know 777 = Don't know

If: Q15M < 1 AND Q15H < 1, skip to Q15m
Program check – interview could not proceed without an answer

The next question excludes household chores or gardening or yardwork:

Question: Q16. IN THE LAST WEEK how many times did you do any other more moderate physical activity that you have not already mentioned? (e.g. gentle swimming, social tennis, golf)

Field name: Q16

Field type: Numeric

Content: # number of times
99 = Don't know – use only as an absolute last resort

If: Q16 = 0, skip to Q9m

Question: Q17. What do you estimate was the total time that you spent doing these activities IN THE LAST WEEK?

Field name: Q17M Q17H

Field type: Numeric Numeric

Content: # minutes # hours
77 = Don't know 777 = Don't know

If: Q17M < 1 AND Q17H < 1, skip to Q17m
Program check – interview could not proceed without an answer

{The following statements were presented in RANDOM order:}

Question: Q19. To what extent do you agree or disagree with the following statements about physical activity and health? [READ 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, three times a week.

Q19P4 = Exercise doesn't have to be done all at one time – blocks of 10 minutes are okay.

Q19P5 = Moderate exercise that increases your heart rate slightly can improve your health.

Field type: Numeric

Content: 1 = Strongly agree

2 = Agree

3 = Neither agree nor disagree

4 = Disagree

5 = Strongly disagree

6 = Don't know [Do not read]

9 = Refused [Do not read]

{Additional questions and demographic data collection}

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

Question: [INTERVIEWER: USE THE FOLLOWING FIELD TO DESCRIBE ANY UNUSUAL ASPECTS OF THIS RESPONDENT OR HIS/HER ACTIVITIES.]

Field name: QCOM

Field type: Character

Content: Used when the respondent noted issues/characteristics which might have influenced the survey answers. For example 'respondent is a farmer – walks 5 kilometres every day'.

Field name: COMMENTS

Field type: Character

Content: Interviewer comments about the interview

Appendix 2: Membership of the Expert Working Group

Membership of the Expert Working Group, as at last meeting, August 1999:

Professor Adrian Bauman (Chair)	Epidemiology Unit, University of New South Wales
Dr Tim Armstrong	National Centre for Monitoring Cardiovascular Disease, Australian Institute of Health and Welfare
Dr Michael Booth	Centre for Advancement of Adolescent Health, New Children's Hospital
Dr Wendy Brown	Research Institute for Gender and Health, University of Newcastle
Dr Billie Corti	Department of Public Health, University of Western Australia
Mr Peter Crowe	Health Section, Australian Bureau of Statistics
Professor Terence Dwyer AM	Menzies Centre for Population Health Research, University of Tasmania
Dr Ian Ford	Research and Evaluation Coordinator, Australian Sports Commission
Dr Chris Gore	Laboratory Standards Assistance Scheme, Australian Institute of Sport
Ms Penny Graham	Primary Prevention Unit, Commonwealth Department of Health and Aged Care
Professor Andrew Hills	Department of Human Movement Studies, Queensland University of Technology
Professor Neville Owen	School of Nutrition and Public Health, Deakin University

Appendix 3: Parties invited to be part of the national consultation process

Input was received from those parties in **bold** type.

Dr Peter Abernethy	Department of Human Movement Studies, University of Queensland
Dr Michael Ackland	Epidemiology Unit, Public Health Branch (Vic.)
Dr Michael Ackland	Chair, National CATI-TRG
Ms Sue Baker-Finch	Chief Executive Officer, Australian Division of General Practice (ACT)
Ms Jeanette Baldwin	Manager National Diabetes Strategies, Diabetes Australia
Mr Bill Bellew	Director, Health Promotion, NSW Department of Health
Dr David Ben-Tovin	Clinical Epidemiology and Health Outcomes Unit, Flinders Medical Centre
Ms Colleen Bichel	Centre for General Practice Integration Studies, School of Community Medicine, University of New South Wales
Professor Colin Binns	School of Public Health, Curtin University of Technology
Ms Jo Blunt	Education Support Evaluation (Qld)
Dr Ron Borland	Anti-Cancer Council of Victoria
Ms Kelli Brown	Top End Division of General Practice
Dr Mark Brown	Department of Biomedical Science, University of Wollongong
Mr Doug Browning	Weight Management Code Administration Council of Australia
Dr Fiona Bull	Department of Public Health, University of Western Australia
Mr Ron Burns	Confederation of Australian Sport
Professor Ian Caterson	Human Nutrition Unit, Department of Biochemistry, University of Sydney
Professor John Catford	Director of Public Health, Department of Human Services (Vic.)
Ms Michelle Charlton	General Practice Branch, Department of Health and Aged Care
Mr Joe Christensen	Data Management Unit, Australian Institute of Health and Welfare
Dr Glenn Close	Western Sydney Area Division of Health
A/Professor Stephen Colagiuri	Australian Diabetes Society, Department of Endocrinology, Prince of Wales Hospital
Dr John Condon	Epidemiology and Statistics Branch, Territory Health Services
Dr Bill Coote	Australian Medical Association

Ms Sue Cornes	Epidemiology & Health Information Branch, Queensland Department of Health
Dr David Crawford	Faculty of Health and Behavioural Sciences, Deakin University
Mr Owen Curtis	Department of Biomedical Science, University of Wollongong
Mr Edouard d'Espaignet	Epidemiology Branch, Territory Health Services
Mr Jim Daly	Manager, Economic and Industry, Recreation Sport and Racing (SA)
Ms Alison Daly	Performance Measurement and Health Outcomes, Health Department of Western Australia
Mr Robert de Castella	SmartStart
Ms Deirdre Degeling	Director, Health Promotion, Heart Foundation of Australia (NSW Division)
Professor Annette Dobson	Centre for Clinical Epidemiology and Biostatistics, University of Newcastle
Ms Vanessa Doherty	Health Promotion Coordinator, Southern Division of General Practice (SA)
Mr Jim Dolman	Office for Recreation, Sport and Racing (SA)
Ms Carmel Donnelly	Manager, Information Development, NSW Department of Health
Professor Robert Douglas	Director, National Centre for Epidemiology and Population Health, Australian National University
Ms Ann Dragon	WA Ministry of Sport and Recreation
Ms Gillian Duncan	Sport, Recreation and Racing (Vic.)
Dr David Dunstan	International Diabetes Institute
Dr Garry Egger	Centre for Health Promotion and Research
Mr Jeffrey Emmel	National Executive Director, Australian Council for Health, Physical Education and Recreation
Ms Lyn Fleming	Executive Director, Public Health Association
Mr Simon Forest	Executive Director, Office for Recreation, Sport and Racing (SA)
Mr John Fuhmann	Acting Executive Director, WA Ministry of Sport and Recreation
Mr Richard Galton	NT Department of Sport and Recreation
Mr Bill Gillooly	Director General, NSW Department of Sport and Recreation
Ms Kathleen Graham	Primary Prevention Unit, Department of Health and Aged Care
Dr Phil Hamdorf	Centre for Physical Activity in Ageing, Hampstead Rehabilitation Centre (SA)
Mr Glenn Hamlyn	National Culture/Leisure Statistics Unit, Australian Bureau of Statistics

Dr Graeme Hankey	Department of Neurology, Royal Perth Hospital
Professor Mark Harris	Director, General Practice Unit, Fairfield Hospital (NSW)
Dr Noel Hayman	Inala Community Centre (Qld)
Professor Richard Heller	Professor of Community Medicine and Clinical Epidemiology, University of Newcastle
Ms Michele Herriot	Manager Health Promotion Unit, SA Department of Human Services
Dr David Hill	Director Centre for Behavioural Research in Cancer, Anti-cancer Council of Victoria
A/Professor Michael Hobbs	Department of Public Health, University of Western Australia
Ms Vivienne Hobson	Manager Food and Nutrition Unit, Territory Health Services
Mr Arnold Puggy Hunter	Chairperson, National Aboriginal Community Controlled Health Organisation
Dr Konrad Jamrozik	Department of Public Health, University of Western Australia
Ms Jenny Jeffreson	Director, General Practice Branch, Department of Health and Aged Care
Dr Louisa Jorm	NSW Department of Health
Ms Wilawan Kanjanapan	Commonwealth Department of Health and Aged Care
Mr Terry Kearney	Chairman, Recreation Council of Australia
Mr Ross Kennedy	Executive Director, Sport, Recreation and Racing (Vic.)
Mr Ian Kett	Executive Director, VICFIT
Mr Arthur Konstad	Office for Recreation, Sport and Racing (SA)
Dr Steve Larkin	Chief Executive Officer, National Aboriginal Community Controlled Health Organisation
A/Professor Christina Lee	Women's Health Australia, University of Newcastle
Professor Stephen Leeder	Department of Community Medicine, Westmead Hospital
Ms Eva Leslie	Research Coordinator, Physical and Health Program, School of Health Sciences, Deakin University
Ms Jeanette Lewis	Manager, Information and Statistics, Department of Community and Health Services
Ms Ceciclia Lim	Bikesouth, SA Department of Transport
Dr John Litt	Department of Evidence Based Care, Noarlunga Hospital
Ms Melanie Little	NT Department of Sport and Recreation
A/Professor Doune Macdonald	Department of Human Movement Studies, University of Queensland

Dr Geoff Marks	Director, Nutrition Program, University of Queensland
Ms Cristy Massingham	NSW Department of Sport and Recreation
Mr Colin McDougal	Course Coordinator, Master of Primary Health Care, Flinders University
Ms Robyn Miller	Manager Nutrition Program, Health Department (WA)
Ms Kate Moore	Executive Director, Consumers' Health Forum of Australia
Ms Elizabeth Moss	Information Development, Territory Health Services
Mr Lucio Nacarrella	Coordinator, Public Health and Health Innovation SEPU
Mr Theo Neumann	Ass. Dir. Population Survey Monitor, Australian Bureau of Statistics
Ms Kim Nichols	ACT Government Bureau of Sport and Recreation
A/Professor Kevin Norton	School of Physical Education, Exercise and Sports Studies, University of South Australia
Professor Don Nutbeam	Professor of Public Health, University of Sydney
Mr John O'Brien	Director, Information Management, South Australian Health Commission
Dr Brian Oldenburg	School of Public Health, Queensland University of Technology
Ms Henny Oldenhove	Director, Participation Division, Australian Sports Commission
Dr Timothy Olds	Human Bioenergetics Laboratory, University of New South Wales
Mr Mark Owens	General Manager, ACT Government Bureau of Sport and Recreation
Mr Robbie Parker	Chairperson, Fitness Australia
Prof Hedley Peach	Department of Health and Community Medicine, The University of Melbourne
Ms Michelle Peuch	Public Health Officer, NSW Health Department
Dr Louis Pilotto	Clinical Epidemiology and Health Outcomes Unit, The Queen Elizabeth Hospital
Dr Gayle Pollard	Senior Analyst, Epidemiology Services, Queensland Health (CATI representative)
Ms Jenny Purtell	Heart Foundation of Australia, Kings Meadow Community Health Centre (Tas.)
Mrs Yvonne Rate	Australian Sports Commission
Ms Marelle Rawson	Director, Health Statistics Section, Australian Bureau of Statistics
Ms Myree Rawsthorne	ACT Department of Health and Community Care

Ms Angela Reddy	Head, Health Priorities and Outcomes Section, Department of Health and Family Services
Mr Matthew Reid	Chief Executive Officer, Sports Medicine Australia
Dr Ian Ring	Epidemiology and Prevention Unit, Queensland Department of Health
Dr Lyn Roberts	Health Development and Delivery, Heart Foundation of Australia
Dr David Roder	Director Epidemiology Branch, South Australian Health Commission
Ms Fidelma Rogers	Director, Primary Prevention Section, Department of Health and Aged Care
Professor Ari Rotem	Director, Centre for Public Health, University of New South Wales
Dr Lori Rubenstein	Department of Human Services (Tas.)
Ms Trish Ryan	Data Management Unit, Australian Institute of Health and Welfare
Dr David Scrimgeour	Menzies Centre for Health Research (NT)
Ms Jane Seberry	Physical Activity Coordinator, Heart Foundation of Australia (NSW Division)
Mr Tony Sedgewick	Head, Institute for Fitness Research and Training (SA)
Dr Bruce Shadbolt	Director Epidemiology and Population Health, Department of Health and Community Care (ACT)
Ms Noella Sheerin	GP Support Officer, Heart Foundation of Australia (NSW Division)
Mr Tony Sheppard	NSW Police Service
Mr Mike Shetter	Office for Recreation, Sport and Racing (SA)
Mr Trevor Shilton	Heart Foundation of Australia, Western Australia Division
Mr Colin Sindall	Population Health Division, Department of Health and Aged Care
Dr Ben Smith	Manager, Active Practice Project, Epidemiology Unit, Liverpool Hospital
Dr Merran Smith	General Manager, Epidemiology Unit, Health Department (WA)
Mr Fred Smith	Executive Director, Office of Sport and Recreation (Qld)
Dr Simon Spedding	Royal Australian College of General Practitioners
Mr Paul Sproule	Director, Office of Sport and Recreation (Tas.)
Dr Don Staines	Manager, Southern Public Health Unit Network (Qld)
Ms Alison Standen	Menzies Centre for Population Health Research, University of Tasmania

Mr Gary Starr	Centre for Population Studies and Epidemiology, C/- Department of Human Services (SA)
Ms Kate Steinbeck	Metabolism and Obesity Clinic (NSW)
Prof Len Storlien	Dean of Faculty of Health and Behavioural Science, University of Wollongong
Mr Alan Sutherland	Health Promotion Policy Officer, Department of Health and Human Services (Tas.)
Mr Martin Sweeney	Medical Education Coordinator, RACGP
Mr Martin Sweeney	VICFIT
Ms Susan Tabak	Physical Activity Manager, Department of Human Services (Vic.)
Ms Anne Taylor	Manager, SERCIS, Epidemiology Branch, Department of Human Services (SA)
Ms Jenny Thomas	Assistant Secretary, Health Service Outcomes Branch, Department of Health and Family Services (ACT)
Dr Neil Thompson	Director Epidemiology Branch, Health Department (WA)
Professor Andrew Tonkin	Director Health, Medical and Scientific Affairs, National Heart Foundation
Mr Martin Turnbull	Manager Health Enhancement, Department of Human Services (Vic.)
Ms Loretta Vaughan	Epidemiology Section, Department of Human Services (Vic.)
Mr Phillip Vita	A/Manager Sun Exposure, Nutrition and Physical Activity, NSW Department of Health
Professor Mark Wahlqvist	Monash Medical Centre
Dr Melanie Wakefield	Epidemiology Branch, South Australian Health Commission
Mr Peter Wallace	Chief Executive Officer, National Heart Foundation
Dr Peter Wan	Head, Epidemiology Unit, Department of Health and Human Services (Tas.)
Ms Nicole Watson	Epidemiology Section, Department of Human Services (Vic.)
Dr Karen Webb	Senior Lecturer in Public Health Nutrition, Department of Public Health and Community Medicine, Westmead Hospital
Ms Char Weeks	Office of the Secretary-General, Royal Australian College of General Practitioners
Mr Mark Williams	Senior Project Officer, SA Department of Human Services
Ms Margaret Williamson	Manager, Health Survey Program, NSW Department of Health
Ms Shirley Willis	Australian Sports Commission

Dr David Wilson	Head of Centre for Population Studies and Epidemiology, C/- Department of Human Services (SA)
Dr Robert Withers	Reader in Exercise Physiology, School of Education, Flinders University
Ms Elizabeth Woods	Office of Sport and Recreation (Qld)
Dr Tony Worsley	Professor of Community Medicine, University of Adelaide
Ms Sue Wragge	Office of Sport and Recreation (Tas.)
Ms Cheryl Wright	National Physical Activity Program Director, Heart Foundation
Professor Paul Zimmet	International Diabetes Institute
Health Promotion Foundation of Western Australia	
Health Promotion Foundation of the Australian Capital Territory	
Health Promotion Foundation of South Australia	
Health Promotion Foundation of Victoria	

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