

1. Physical inactivity

Physical inactivity is associated with an increased risk of morbidity and mortality from cardiovascular and other diseases. It can contribute to increases in blood pressure, blood cholesterol levels and overweight and obesity. Increased physical activity is beneficial to improvements in various aspects of health including cardiovascular disease, musculoskeletal health and diabetes. Physical activity may also assist in the reduction in symptoms of depression and reduce the risks of developing some cancers (AIHW 2002a).

Physical activity for health benefit comprises many components, for example intensity, frequency, duration. Its measurement is complicated because there are various dimensions of physical activity (energy expenditure, aerobic intensity, strength and flexibility) that may relate to different health conditions. For example, physical activity for the prevention of heart disease may be different from that required for musculoskeletal problems.

To incur a health benefit from physical activity, the National Physical Activity Guidelines for Australians (DHAC 1999), recommend to 'put together at least 30 minutes of moderate-intensity physical activity on most, preferably all, days' in a week. Moderate intensity activity is activity that will cause a slight (but noticeable) increase in breathing and heart rate, for example brisk walking, digging in the garden or medium paced cycling.

In general, surveys collect and define people's physical activity levels as sedentary (or physically inactive, see glossary), moderate and of vigorous intensity. These definitions can differ in the way they are derived between surveys. These differences are discussed below. Other differences between surveys lie in the definitions of what constitutes physical activity. Again these differences are discussed further in this chapter.

The two national surveys that have recently addressed this risk factor are compared below: the ABS National Health Survey (NHS) and the Active Australia Survey (AAS). A table showing other recent surveys which collect data on physical activity is shown in Appendix 1.

The different methodologies used to collect information about physical activity (discussed further in this chapter) make it difficult to compare results for most activity levels with the exception of sedentary activity which is discussed below.

Sedentary activity

Physical activity data, as measured by the Active Australia Surveys, showed that for the years 1997, 1999 and 2000, the proportion of people whose physical activity levels were considered sedentary increased over the collection periods (Bauman 2001). In contrast, latest results from the 2001 NHS have shown the proportion of people whose exercise levels are considered sedentary have decreased since 1989-90 (Table 1.1). Results from the 2000 Active Australia National Physical Activity Survey were included in Australia's Health 2002.

Table 1.1: Proportion of people aged 18 years and over who reported sedentary activity: comparison of the Active Australia Surveys and the National Health Surveys

Survey and year	Men	Women	Persons
Active Australia Survey^{(a)(b)}			
1997	13.7	13.1	13.4
1999	14.6	14.7	14.6
2000	17.3	12.9	15.3
National Health Survey^(c)			
1989–90	37.2	37.5	37.5
1995	35.0	35.2	35.2
2001	30.9	32.0	31.2

(a) Age-standardised to the 1991 Australian population.

(b) Aged 18–75 years only.

(c) Age-standardised to the 2001 Australian population adjusted to exclude sparsely settled areas.

Comparison of surveys

The surveys are not directly comparable as they measure different aspects of physical inactivity. There are differences in the concepts and methodologies used in the two surveys. The following sections of this chapter describe differences between the Active Australia and National Health Surveys and highlight some of the major reasons which may contribute to variation between their results. The most important differences between the surveys are the definitions of what comprise physical activity, the measures used to define levels of physical activity and the methodologies used to collect the information, such as recall periods.

Definition of physical activity/exercise in surveys

Physical activity is any bodily movement produced by skeletal muscles that results in energy expenditure. **Exercise** is a subset of physical activity and is defined as planned, structured and repetitive bodily movement done to improve or maintain one or more components of physical fitness.

For the NHS, exercise was asked about only in relation to sport, recreation or fitness. This excluded any other incidental activity (see Glossary), such as physical activity undertaken in the course of work or physical activity taken for transport (getting to and from places).

The Active Australia Survey asked about participation in predominantly leisure-time physical activities. It also excluded activity undertaken in the course of work, but included walking which enabled the respondent to get to and from places.

Measures of exercise

The NHS calculates the proportions of people undertaking various levels of activity as sedentary, low, moderate and high. The total time spent in each of walking, moderate and vigorous activity are multiplied by the activity's intensity value (MET value, see Glossary) and summed to give a total exercise score for that respondent. These scores are then grouped for output purposes (Table 1.2).

Table 1.2: NHS categories for scores of exercise level

Category	Score
Sedentary	Less than 100 (includes no exercise)
Low	100 to less than 1,600
Moderate	1,600–3,200, more than 3,200 but less than 2 hours in 2 weeks of vigorous exercise
High	More than 3,200 and 2 hours or more in 2 weeks of vigorous exercise

The Active Australia Surveys calculate the proportion of the population who reported participating in physical activity at levels sufficient to confer a health benefit. For the purposes of calculating ‘sufficient’ activity for health, participation in walking, moderate activity and vigorous activity is included but activities such as gardening is not. Gardening and yardwork are not included in the calculation of ‘sufficient’ activity because there is limited research regarding the actual energy expenditure of these activities (AIHW 2000).

The survey uses two different measures of ‘sufficient’ activity for health, based on the National Physical Activity Guidelines for Australians (DHAC 1999) that, to achieve health benefit, **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 five days of the week; a total of at least 150 minutes of activity per week. The two ‘sufficient’ activity measures used in the Active Australia Survey are ‘*sufficient time*’ (i.e. at least 150 minutes of physical activity) and a further refined definition of ‘*sufficient time and sessions*’. To achieve *sufficient time and sessions*, a person must accrue at least 150 minutes of physical activity over at least five sessions in the week. The measure *sufficient time and sessions* is the preferred indicator for measuring ‘sufficient’ activity for health.

Table 1.3: Active Australia Survey categories for activity time and activity time and sessions

Measure and time	Category
Activity time to gain health benefit	
0 minutes	Sedentary
Less than 150 minutes	Insufficient
150 minutes or more	Sufficient
Activity time and sessions to obtain a health benefit	
0 minutes	Sedentary
Less than 150 minutes ^(a)	} Insufficient
OR	
150 minutes or more and less than 5 sessions ^(a)	} Sufficient
150 minutes or more and 5 or more sessions	

(a) Participating in some physical activity but either not enough in total or not regularly enough to obtain a health benefit.

Sedentary category

The category ‘sedentary’ is defined differently in each survey. NHS respondents are given an exercise score (calculated from duration, frequency and intensity) which is grouped to represent the intensity of the exercise. The sedentary classification is given to respondents

who scored less than 100 (Table 1.2) and includes those who did no exercise at all; data may be broken down further to produce two sub-categories of 'did not exercise' and 'other'.

In the Active Australia Survey, only respondents who report no participation in physical activity are classified as sedentary (Table 1.3).

NHS data for 2001 (Table 1.1) can also be calculated using only those respondents who did no exercise, therefore bringing the NHS definition of 'sedentary' a little closer to the definition of sedentary used in the Active Australia survey. The proportions who did no exercise were 29.6%, 31.2% and 30.4% for males, females and all people respectively for the year 2001.

Sample and other methodology

The NHS was a face to face interview, whereby respondents were asked questions by a trained ABS interviewer and responses coded onto a paper questionnaire. The Active Australia interviews were undertaken by interviewers especially trained in the CATI (Computer Assisted Telephone Interviewing) system. Answers to questions were entered into the system during interview allowing for automatic validation and checking by the system.

Both surveys are national surveys which use random sampling methodologies to select respondents. One adult from each selected household is chosen as the respondent. The NHS surveys people in all age groups; however only persons aged 18 years and over are asked about exercise (17,918 persons). In comparison, the Active Australia survey questioned 3,590 persons aged 18–75 years.

Enumeration periods for both surveys differ. The 2001 NHS was enumerated over a 10 month period from February to November 2001 and the Active Australia Survey was enumerated over a two week period in November of 2000. The NHS was not enumerated during a six-week period around the national Census of 7 August 2001.

Recall periods for the surveys also differ. The NHS asks respondents about activity undertaken in the last two weeks. In contrast, Active Australia Survey asks respondents about physical activity undertaken in the last week.

Conclusion

The surveys are not directly comparable as they measure different aspects of physical activity (including sedentary).

Results from the NHS and the Active Australia Survey both provide useful measures but in different contexts.

- The definition of sedentary is very different between NHS and the Active Australia Survey. This difference has contributed significantly to the apparently conflicting results of the two surveys.
- NHS looks at structured exercise only, and therefore is not indicative of total physical activity. Those respondents who may not participate in exercise but undertake large amounts of physical activity in the course of work are likely to be recorded having exercise levels of sedentary or low.
- The Active Australia methodology provides more comprehensive measurement of physical activity because of the inclusion of walking for transport. The questionnaire also

caters for respondents to report other types of physical activity they have undertaken through gardening or yardwork.

Of note is the time series available from both the National Health and Active Australia Surveys. The NHS has collected data about exercise for the years 1989–90, 1995 and 2001, the Active Australia Surveys for 1997, 1999 and 2000.

Recommendations

The AIHW recommends that data from surveys using the Active Australia Survey instrument be used to derive indicators of levels of physical activity, including physical inactivity. AIHW intends to base its reporting in *Australia's Health* and other publications on the Active Australia Surveys. The National Health Performance Committee (NHPC) indicator 2.08 is 'the proportion of adults insufficiently physically active to obtain a health benefit' (NHPC 2003, forthcoming). The National Health Priority Action Council (NHPAC) has included 'the proportion of adults not engaged in regular physical activity, aged 18–75 years' (AIHW 2002a, Table S59) as one of its indicators for health risk factors. Both these indicators can be measured by the Active Australia Surveys. The Institute recommends that the definition of sufficiently active be based on the measure sufficient time and sessions. Therefore the definition of insufficiently active would be, or imply, not undertaking sufficient time and sessions of activity to confer a health benefit.

The extensive development of the standards, methods and definitions for the collection of physical activity data was undertaken by the Expert Working Group on Physical Activity Measurement which concluded its work in 1999. The Active Australia Survey was developed by this group to produce an instrument that provides an accurate picture of physical activity patterns in the Australian population as they relate to health (AIHW 2003a). In 2001, research and testing of instruments that measure physical activity in population groups found that the questions used in the Active Australia Survey exhibited good reliability and acceptable validity. The report in which these findings were presented included a recommendation that the Active Australia Survey be adopted for continuing population monitoring of physical activity in Australia (Brown et. al 2002). In addition, the ability to measure amounts of physical activity, as specified in the National Physical Activity Guidelines for Australians, adds further value to using this instrument.

With the exception of walking for transport, the Active Australia Survey only collects information about leisure time physical activity. However, non-leisure time physical activity such as work, domestic or transport-related also contributes to overall physical activity. Further there is evidence of some relationship between non-leisure time physical activity and health. However, non-leisure time physical activity is difficult to measure accurately and the instruments 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. Work is currently underway internationally to develop simpler population survey instruments to measure non-leisure time physical activity. The Institute recommends that appropriate, valid and reliable methods of measuring non-leisure time physical activity in Australian population surveys be developed that take account of international developments.

The Institute acknowledges the immense value that NHS data contribute to information on physical activity, largely due to the ability to analyse exercise data with all other risk factor variables collected by the survey, including smoking, alcohol consumption and other health related and demographic data items.

The Institute recommends that the ABS and the members of the Expert Working Group on Physical Activity Measurement consult together to harmonise a definition of sedentary activity. This definition should then be put to the Health Data Standards Committee (HDSC) for endorsement.