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written to chart the progress of the development of data standards for physical activity measurement (AIHW: Dixon T unpublished).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 ergonometer 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/ergonometer 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.