Nationwide monitoring and surveillance question development: Physical activity

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Introduction

Physical activity has long been identified as a key issue related to an individual's health and well-being. In the recent discussion paper prepared for the National Public Health Partnership on *Preventing Chronic Disease - A Strategic Framework* physical activity, along with diet, smoking, alcohol, personal control/self efficacy, social support and early life experience, was identified as a key behavioural, environmental and protective factor. The principal behavioural risk factors to be targeted in this strategic framework are smoking, diet and physical activity (49).

This discussion paper examines a number of issues related to physical activity and the instruments that have been used to measure physical activity in the population. In particular, the paper looks at health surveillance data collection.

What Should Be Measured?

The measurement of physical activity and the detail included in any data collection clearly relate to the purpose of the collection. A number of issues are related to this, including:

- Are we measuring physical activity ('health benefit' or risk reducing behaviour) or inactivity (risk increasing behaviour) or both, or should we be expanding the measure to attempt to capture something of physical fitness?
- Should we be including all physical activity in scope ('incidental activity of everyday life' as well as purposive fitness- or health-related activity) or restricting the measure to leisure-time activity only?
- Should coverage of the population be restricted to adults only (over 18 years) or expanded to cover young people, adolescents and children?
- Can point-in-time measurement be enhanced to give incidence over time, providing some data towards pictures of peoples' lifetime habitual physical activity?
- Is population physical activity per se worth measuring without conjoint information on physical inactivity or sedentariness; body composition, proportions of overweight and obese; diet and nutrition?
- What kind of comparability is required of the measuring instruments (intra-population, international, cross-cultural, over time)?
- Should environmental factors that may affect or provide barriers to peoples' ability to engage in physical activity also be collected and monitored?

Purpose of Measuring Physical Activity

A number of questions related to physical activity measurement need to be answered.

- What is the purpose of measuring physical activity in a population survey?
- What is it we want to measure?
- With what do we want to compare the answers?

The answers to these questions include the following:

- To assess population risk factor prevalence over time.
- To provide evidence for outcomes-based research into physical activity.
- Using internationally agreed questionnaires and other instruments and measures to provide international comparability.
- To document the effect of health promotion activities (and other items such as changes in the built environment) directed at changing population behaviours.
- To improve population benchmarking.
- For longitudinal tracking as the population moves through different age cohorts.
- To keep the issues in the public eye.
- To identify physical inactivity and sedentary populations to focus on as a priority, including for instance, examining barriers to activity.
- To allow targeting of sub-populations.
- To assist in tailoring intervention materials or programs aimed at behavioural change.
- To monitor specific population-wide goals.
- To provide information to professionals (eg, General Practitioners) on health promotions and/or interventions that work.
- To provide population-wide information on the most common or acceptable physical activities, as well as perceived barriers to engaging in them.
- For monitoring the relationship with other key risk factors (such as overweight, nutrition).
- To identify areas to invest in (eg, walking facilities).
- To better predict populations at high risk.
- To examine environmental factors that may enhance or impede peoples' ability or desire to engage in (more) physical activity.

Population Surveillance Concepts

Analyses and assessments of health are moving into whole-of-population models and including information on non-medical factors (ethnicity, gender) and 'health related behaviour' like physical activity (44). The concept of physical activity in population risk factor surveillance models implies that physical activity is a personal behaviour that positively influences peoples' fitness and therefore their health status. A fit population is understood to be an active population and vice versa. Physical activity *per se* is understood to have a positive effect on peoples' health status, and physical inactivity to negatively influence peoples' health status.

Physical *inactivity* is generally accepted as a behavioural risk factor contributing to poorer health, higher risk of some chronic diseases, and higher rates for all causes of mortality. There is strong evidence that physical activity can reduce disease rates for obesity and coronary artery disease. There is also good evidence that it can do the same for hypertension, cancer of the colon, non-insulin dependent diabetes, osteoporosis, emotional well-being (including anxiety and depression) and musculoskeletal disability; and some evidence for rate reductions in stroke, and cancer generally, and specifically cancers of the breast, prostate and lung (18, p121). Although there is still expert argument on these generally held agreements, the weight of the evidence, such as it is, is summarised in this overview. Conversely, to date it appears that although examined, no risk reducing relationship has been found between physical activity and peripheral vascular disease, cancer of the rectum, and osteoarthritis.

Possible negative consequences of physical activity, such as sports injuries, are treated as belonging to a different concept group (injury, accidents, protective behaviours and safety) and are not necessarily relevant to chronic disease.

Scope

There are differing views on the scope of physical activity that is 'health-related'. Some experts argue that occupational activity should be out of scope, others argue that all activity (occupational, transportation, household and gardening/yard work, as well as recreational or leisure activity and purposive exercise programs) should be in scope. From an energy expenditure point of view, Caspersen et al. gives examples of different subdivisions (portions of daily life, activities, levels of intensity, wilful or compulsory, weekday or weekend) but stresses the need for the subdivisions to be mutually exclusive and to describe total physical activity (24, p127).

A majority of studies to date have focussed on leisure-time activity based on the assumption that the 'average person' in developed countries has 3-4 hours of discretionary time available for 'leisure' per day. This in turn is based on Stundle and Hanke's work on *Freizeit in der DDR*, published in the late 1970s (18, p77 - not sighted) and raises questions of how many people have that much 'free' time, and whether those with the 'free' time have the energy. Bauman's report for Active Australia (1) noted that people with children under 5 years were *less* likely, and conversely singles were *more* likely, to be active (defined as leisure-time activity). The "element of personal choice" is said to be inherent to the definition of leisure-time physical activity (18, p77; and Australian Institute of Health and Welfare's (AIHW's) Physical Activity – Context data element (6)), implying the 'right' choice is the healthy choice.

It is also thought to be more difficult to measure occupational physical activity. AIHW's Physical Activity – Context data element (6) notes that 'the majority of data collected in population surveys refer primarily to leisure-time physical activity since methods used to measure other forms of physical activity are not yet well developed'. It also notes that 'currently, there is no Australian instrument that collects occupational physical activity'. Some experts argue that the concept of leisure-time activity is irrelevant to, for instance, blue collar workers and unemployed persons, and that all physical activity should be assessed to be able to make valid population comparisons.

Focussing on 'incidental physical activity' (8, p66) of everyday life and encouraging populations to increase the activity levels in their daily lives could is an approach that is taken in current guidelines. 'Small changes in daily activity can come from small changes carried out throughout the day' (1). This, coupled with the opportunity to do even more physical activity by individual choice, could be an area of investigation to set baselines for populations. A number of instruments have attempted to capture this total activity or energy expenditure picture (52, pS15 Baecke questionnaire of habitual physical activity, pS19 Bouchard three-day physical activity record, pS25 CARDIA physical activity history).

Another area of investigation is whether or to what extent persons' physical activity levels at a point in time are reflective of lifetime activity levels, and the impact that, for instance, lifetime habitual, regular but low-intensity physical activity may have on fitness or as a health benefit (10, p118).

A further area for investigation is the conjunction of different factors, such as the influence of nutrition, and the combination of peoples' amount and levels of physical activity as compared with their sedentary inactivity. McMurray et al., analysing the activity patterns of adolescents, found that (especially for males) the lower the socioeconomic status the higher the risk of being

overweight or obese, the greater the amount of sedentary inactivity, also the higher the likelihood of participating in higher-intensity and more physical activities (43, p133). They conclude that for low SES adolescents, dietary habits were more important than activity levels. This study raises the question of how much activity at what intensity is needed to cancel out, or protect against, the risks caused by inactivity and poor nutrition (43, p138).

Population Coverage

Examination across populations, of physical activity as a health benefit, or inactivity as a risk factor, are based on beliefs that factors that influence many people are prime targets for health promotional and educational activities. These activities can potentially have a major impact on the well-being and productivity of the population and on the economics of health care provision. Most population-based instruments have focussed on adult populations *per se*, despite evidence that children and young people are at least as prone to the consequences of (some say, more effected by) modern sedentary lifestyles.

Nationally, physical activity has been measured in the Australian Bureau of Statistics (ABS) National Health Survey, the Population Survey Monitor (PSM) and the AIHW National Physical Activity Survey.

The AIHW currently reports on population surveillance of persons aged 18 years and over, (using the Standard Questions on Leisure Time Physical Activity Participation Among Adults (US Department of Health and Human Services) – designed for individuals aged 18 years and over). However, there is no US standard for collecting data from younger persons (6).

Since August 1993 the PSM has collected quarterly household survey data from approximately 3,000 households throughout Australia, including questions on sport, recreation and physical activity. In particular, in May 1996 and since August 1997, the PSM has included questions related to participation (in last 12 months) in organised sport for those aged 18 years or over. It should be noted that the PSM will not continue after 2000 and the collection of organised sport participation data are expected to be conducted by a private agency (Watkinson, J: personal communication).

The 1995 Australian National Health Survey, however, interviewed persons aged 18 years or over personally, those aged 15-17 years with the consent of a parent or guardian, and obtained information for persons aged less than 15 years from a person responsible for the child (5, p62).

The 1990-91 Pilot Survey of the Fitness of Australians was applied to persons aged 18-78 years (29, p9).

Some experts argue that it is more important to monitor children's fitness from as early an age as possible (or surrogate measures such as overweight/underweight and level of physical to sedentary activity). It is thought that early problems are exacerbated over time and be more difficult to treat or correct. It may be that different instruments, methods or ways of investigating need to be developed to do this, such as surveys implemented through schools (13) rather than general population surveillance.

Physical Activity Guidelines

Guidelines have changed over time. The initial focus was on improving cardiovascular, cardiorespiratory or endurance fitness and reducing cardiac risk factors (10, p101). They have progressed from the American College of Sports Medicine's recommended minimum 20 minute bouts of vigorous aerobic exercise at least three times a week, with an underlying assumption that a certain minimum level of exercise intensity ('the threshold') is needed to achieve a physical fitness gain.

Current guidelines are based on the US Surgeon General's 1996 recommendation of a total of 150 minutes of moderate intensity physical activity per week. The focus has swung away from the threshold concept to the idea that the positive response (fitness or health benefit) is due to the total energy expended in physical activity. It may be that individual positive response is relative and dependent on many other factors, such as individual fitness, duration of exercise, length of time over which it is maintained etc. (10, p102).

Some recent research suggests that shorter bouts of physical activity may be cumulated to daily totals of 30 minutes a day on most days of the week (adding to 150 minutes per week) and still provide a health benefit (8, p66-67). This view or 'reasonable possibility' (55, p62) is reflected in current guidelines ('Moderate-intensity activity doesn't have to be continuous' (1)). Other experts suggest that the validity of this standard is insufficiently established, failing to distinguish a threshold between 'sufficient' and 'insufficient' levels for health. In addition, they suggest that the recommendation itself is skewed as occupational activity was ignored in the formulation (total activity is therefore likely to be underestimated), and that Australian research on different population groups including children, casts doubt on the efficacy of the guidelines (55, p62).

Effect of Guidelines

The effect of the earlier guidelines and public health promotion and prevention activities based on them is fairly well agreed to have had a disappointing lack of impact on changing population behaviour. Some specifically relate this to the difficulty of the behaviour required (for example frequent bouts of vigorous aerobic activity).

Blair et al presents the results of five prospective studies that indicate a gradient of health risk across activity or fitness levels, with moderate levels associated with clinically significant risk reductions (10, p115). Two of these studies show all cause death rates increasing with the highest levels of physical activity plotted. They state that the public health message 'should be "Doing some physical activity is better than doing none at all"… and to a degree, more is better' (10, p115) but they put forward that the prevailing opinion is that you have to do quite a lot to get any benefit. The Active Australia survey tested this presumption and found that 62% of respondents agreed with it, but that higher percentages agreed with the more moderate view given by Blair above (2).

Some argue that the current guidelines are inadequate or actively misleading because they are absolute rather than relative to individuals or population subgroups, and are not sufficiently tailored to make them attractive to people whose circumstances may be different (21, 55).

Population Survey Instruments

The variety of survey instruments designed to assess some measure of physical activity (and in some cases, inactivity as well) is overwhelming. Most have been designed at least initially, for interviewer- or self-administration, although some have since been adapted for telephone interviewing. Many have had their reliability and validity tested over time, others not (3, 14, 15, 37, 52, 55, 56).

A search of the Australian National University's Social Science Data Archives for studies including items on physical activity, provided 72 references, most of which were to Australian surveys. These ranged from local area surveys such as the Canberra and Queanbeyan Survey of Health and Well-Being, to Australia-wide studies such as the National Heart Foundation's Risk Factor Prevalence Studies, 1980, 1983, 1989 (http://ssda.anu.edu.au).

The AIHW is promoting the US Dept of Health & Human Services Standard Questions on Leisure Time Physical Activity Participation Among Adults in lieu of an accepted international

instrument (6, see below). A copy of the AIHW questionnaire is available on at http://www.aihw.gov.au/inet/publications/health/papaa/index.html.

The ABS is proposing to re-use the questions developed for the 1995 National Health Survey in the 2001 National Health Survey, primarily for reasons of comparability and trend comparison (Langon, M: personal communication) (see 4 for copy of the 1995 questionnaire).

International Consensus and Comparability

1. The International Physical Activity Questionnaire

There is a current push amongst researchers to achieve international consensus on an interview instrument, and a thorough program of design and testing, including cross-cultural validation in around 12 countries, has been drawn up and is currently being executed. Results of the first pilot testing, including those from Australian test centres, have been being presented to the American College of Sports Medicine's June 2000 conference. The first round focusses on differences (if any) between long and short forms of an International Physical Activity Questionnaire (IPAQ), between the period examined (last seven days compared to usual week), and between telephone and self-administration methods (Bull, F: personal communication). Attachments A presents the IPAQ short form examining the last seven days for telephone interviews. Attachment B presents the IPAQ long form examining the usual week for telephone interviews.

The IPAQ in its current state of development addresses a number of problems identified in other instruments. Briefly, the long and the short versions use the different approaches of setting (occupational, transportational, leisure-time and household/yard) versus intensity (across all the same, specified settings) dealing with the persistent problem of examining physical activity in only one area (which is usually leisure-time, as noted above). Both the long and the short forms incorporate a measure of inactivity (sitting, rather than, say watching TV - as the Canadian Community Health Survey optional sedentary section does); thus both physical activity *and* inactivity are examined at the same time in one instrument. The intensity (as well as frequency and duration) of walking is also captured, which is an improvement on instruments which did not collect the intensity of this activity, especially as it is the primary physical activity that Australians engage in (29, p2). Having parallel instruments providing the options of using either telephone surveying or self-completion modes is also a plus (36). The next, possibly final version of the IPAQ will also identify a standard time period for examination.

As the European Union has adopted (and a host of other countries are likely to) the IPAQ for reasons of international comparability, this instrumentation deserves serious consideration. It has been suggested that the ABS could enhance the forthcoming National Health Survey by the addition of IPAQ questions.

2. The Behavioral Risk Factor Surveillance System

The Behavioral Risk Factor Surveillance System (BRFSS) run in each State of the United States and coordinated by the Center for Disease Control and Prevention (CDC), has been investigating a revision of the current physical activity questions. Attachments C presents the revised BRFSS questions. This incorporates a question on the predominant nature of occupational activity (question 1), namely: mostly sitting or standing; mostly walking; mostly heavy labor or physically demanding work; questions related to walking (questions 2, 3 and 4); questions related to strength (questions 5 and 6); and questions related to moderate and vigorous activity (questions 7 to 12). The revised instrument was subjected to extensive reliability and validity testing earlier this year. Although the results of validation and reliability testing are not at hand, these BRFSS revisions provide an opportunity to identify and monitor individuals with differing types of activity that incorporate both of occupational and leisure-time activity.

Relationship to Other Factors

To some extent physical activity is being used as surrogate measurement for fitness. The model advanced at the Consensus Symposium on Physical Activity, Fitness and Health assumes that "habitual physical activity" has a positive effect on fitness (18, p77). However, this symposium noted that there is no universally agreed definition of fitness or its components (18, p81: quotes WHO definition as "the ability to perform muscular work satisfactorily"). Caspersen et al define physical activity as "Any bodily movement produced by skeletal muscles that results in energy expenditure" (24, p100).

As a concept, physical activity is often related to body mass, and the increasing proportion of the population which is assessed as overweight or obese. The Netherlands with its tradition of, and facilities for cycling for transportation, is often sited as a developed country with a population whose relative weight (body mass index) has not increased as much as the Australian or US populations (7, p33). However, at least one Dutch study finds that there is an alarming trend and notes that it is 'mainly youngsters and subjects with low education [who have] an increased risk of

[being] overweight' (42). Other studies have found the same thing, and identified diet as being the possible variable making such a large difference between individuals in different SES groups (43).

The variables of age, weight and height are necessary to calculate body mass index. Details on foods eaten are necessary to investigate diet as a potential difference.

Growth in sedentary activities may be independent of physical activity and this may be another factor that requires independent investigation.

Australian Population Weight Structure

Data from the ABS' National Health Survey, 1995, as reported by the AIHW (39, pp 149-150), shows that the weight structure for the Australian population of the time was as follows:

Weight category (Body Mass Index)		**Persons aged 15-24 years**	**Persons aged 25+ years**
Underweight	(BMI less than 20)	22%	5%
Acceptable weight	(BMI 20 to less than 25)	54%	35%
Overweight	(BMI 25 to less than 30)	16%	39%
Obese	(BMI 30 or more)	6%	20%

BMI = weight (kg) / {height (m)}^{2}

There is no comparable data for children or people younger than 15 years as there is still argument as to the appropriate standard (such as the Body Mass Index (BMI) for adults) which would allow similar categorisation.

ABS reported that more males (40%) than females (28%) were calculated to be overweight or obese (5, p10). It has been reported that 'the Australian diet has seen a reduction in total fats consumed per person per day' (27, p60) and that our increasing overweight is mostly explained by our failure to increase physical activity or to have sufficient physical activity to cancel our increasing sedentariness.

There do not appear to be any Australian analyses comparing people's reported level of physical activity with their weight category, so we do not know whether overweight and obese people are more likely to report lower activity levels than, say people of an 'acceptable weight'. Studies from other areas show both and are inconsistent. Nevertheless, whether people are overweight or of a healthy weight, when they improve their fitness they decrease their risk factor exposure to a growing list of health conditions (11, 49).

Accuracy of Weight Structure

Body mass is calculated on the self-reported weight and height of persons answering these questions (5, p76; p10 notes that BMI could not be calculated for 7% of males and 12% of females). The divergence between peoples' self-assessed weight category and their calculated BMI graphically illustrates (5, p10) the discrepancy between these measures, however as discrepancy measures potentially group dissimilar individuals together, their usefulness is questioned (49, p377). Other researchers report 'substantial correlations' between peoples' weight estimates and their actual weights' (49, p375); another study found that 'self-reported BMI averaged 0.77 lower than a comparable BMI based on physical measurements' (49, p376). Because BMI reports body mass per metre, and 'essentially standardizes weights for individuals of different heights' (49, p375) it appears to be the preferred measure for adults at least.

Surveillance

The Americans have been undertaking surveillance of various risk factors and monitoring health behaviours in their population for around 16 years through the BRFSS. They have been able to track the insidious creep of obesity showing that in 1998, with the exception of three states, more than 15% of their population were obese (BMI of 30 or more), (47, p1). Overall, more than 60% of adults 'do not achieve the recommended amount of regular physical activity' (46, p1).

Surveillance has been able to document the negative changes that have been occurring in the United States and bring the issues to public attention.

Environment as a Factor

Some promoters of physical activity feel that despite numerous approaches inciting or encouraging the general population to increase their levels of physical exercise, using various means such as mass media campaigns, educating general practitioners, promoting the Olympics, nothing has

worked. The only good news is that population physical activity levels are static (rather than going backwards, which is the perception regarding the proportion of the population that is overweight or obese) (Booth, M; Bauman, A: personal communication). At least one study has found there was a difference in peoples' physical activity levels depending on whether they lived near the coast or not (9, p324).

Researchers are now looking to the built environment as an overwhelming factor. Contrary messages are being sent out, such as having to take the lift rather than being able to use the stairs in multi-floor buildings; new housing developments that do not have pavement for pedestrians to walk on safely; absence of, or lack of safety in green areas like parks that people can walk in.

It may be that these issues are worthy of exploration in any population surveillance re physical activity, and that we need to examine whether people can, safely, undertake physical activity, near to their home or work environments, as well as whether they do.

Conclusion

A wide body of literature identifies that physical activity needs to encompass broad health measures. The ABS National Health Survey and the AIHW National Physical Activity Survey questionnaires have provided an important base in the collection primarily of leisure-time physical activity. However, the IPAQ should be considered in Australian collections of physical activity as it provides

- measures that are broader than leisure-time activity,
- the potential for international comparisons, and
- capacity for more than one data collection method.

Collections that have a surveillance focus should consider incorporation of the BRFSS developments that are currently being tested by CDC.

The incorporation of either the IPAQ or BRFSS questions does however, require validation and reliability testing within the Australian setting. This would include comparison with the National Health Survey and National Physical Activity Survey questions. In addition, it will be important for physical activity questions to cover young people, adolescents and children.

It can be concluded from this review that, along with the collection of leisure-time physical activity, there should also be collection of occupational physical activity, incidental physical activity, inactivity, diet/nutrition factors, the BMI and relevant environmental factors.

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Attachment A

International Physical Activity Questionnaire

[Young and Middle-Aged Adults]

Short Form, Last Seven Days Activity, Telephone Interview

[Note: Examples of activities may be replaced by culturally relevant examples with the same mets values. (see Ainsworth et al)]

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. This is part of a large study being conducted in many countries around the world. Your answers will help us to understand how active we are compared with people in other countries.

I am going to ask you about the time you spend being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. I will be asking you about activities you do at work, to get from place to place, as part of your house and yard work, and in your spare time for recreation, exercise or sport.

1a Now, think about all the vigorous activities which take **hard physical effort** that you did in the last 7 days. Vigorous activities make you breathe much harder than normal and may include heavy lifting, digging, aerobics, or fast bicycling. Think about *only* those physical activities that you did for at least 10 minutes at a time.

During the last 7 days, on how many days did you do vigorous physical activities?

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

[Interviewer: Include all jobs.]

____ days per week

Refused [Interviewer: Do not read]

Don't know [Interviewer: Do not read]

[Interviewer: If respondent answers zero, refuses or does not know, skip to *Question 2a*]

1b How much time in total did you usually spend on one of those days doing **vigorous** physical activities?

____ hours ____ minutes

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: "How much time in total would you spend in a **usual week** doing vigorous physical activities?"
____ hours ____ minutes per week]

2a Now think about activities which take **moderate physical effort** that you did *in the last 7 days*? Moderate physical activities make you breathe somewhat harder than normal and may include carrying light loads, bicycling at a regular pace, or doubles tennis. Do not include walking. Again, think about *only* those physical activities that you did for at least 10 minutes at a time.

During the last 7 days, on how many days did you do **moderate** physical activities?

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

[Interviewer: Include all jobs.]

____ days per week

Refused [Interviewer: Do not read]

Don't know [Interviewer: Do not read]

[Interviewer: If respondent answers zero, refuses or does not know, skip to *Question 3a*]

2b How much time in total did you usually spend on one of those days doing **moderate** physical activities?

____ hours ____ minutes

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, or includes time spent in multiple jobs, ask: "How much time in total would you spend in a **usual week** doing moderate physical activities *during a usual week*?"
____ hours ____ minutes per week]

3a Now think about the time you spent walking *in the last 7 days*. This includes walking at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise or leisure.

During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

[Interviewer clarification: Think about only the walking that you do for at least 10 minutes at a time.]

[Interviewer: Include all jobs.]

____ days per week

Refused [Interviewer: Do not read]

Don't know [Interviewer: Do not read]

[Interviewer: If respondent answers zero, refuses or does not know, skip to *Question 4a*]

3b How much time in total did you usually spend walking on one of those days?

____ hours ____ minutes

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: "How much time in total would you spend walking in a **usual week**?"
____ hours ____ minutes per week

3c At what pace did you **usually** walk? Did you walk at:

____ a **Vigorous** pace, that makes you breathe much harder than normal;
____ a **Moderate** pace that makes you breathe somewhat harder than normal; or
____ a **Slower** pace where there is no change in your breathing.

[Interviewer probe: A usual pace is being sought. If the respondent can't answer because the pace varies widely from day to day, or from across job, transportation and leisure categories, ask: "How much time would you spend in a **usual week** walking at a **slow** pace?"
____ hours ____ minutes per week]

The last questions are about the time you spend sitting each day while at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading or sitting or lying down to watch television.

4a During the last 7 days, how much time in total did you usually spend *sitting* on a **week day?**

____ hours ____ minutes

[Interviewer clarification: Include time spent lying down (awake) as well as sitting]

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: "How much time **in total** would you spend sitting in a **usual week**?"
____ hours ____ minutes per week [skip to end]

4b During the last 7 days, how much time in total did you usually spend *sitting* on a **weekend day**?

____ hours ____ minutes

Attachment B

International Physical Activity Questionnaire

[Young and Middle-Aged Adults]

Long Form, Usual Week Activity, Telephone Interview

[Note: Examples of activities may be replaced by culturally relevant examples with the same mets values. (see Ainsworth et al)]

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. This is part of a large study being conducted in many countries around the world. Your answers will help us to understand how active we are compared with people in other countries.

I am going to ask you about the time you spend being physically active in a usual week. Please answer each question even if you do not consider yourself to be an active person. I will be asking you about activities you do at work, to get from place to place, as part of your house and yard work, and in your spare time for recreation, exercise or sport.

PART 1: JOB-RELATED PHYSICAL ACTIVITY

The first questions are about your work. This includes paid jobs, farming, volunteer work, course work and other unpaid work that you do outside your home. Do not include unpaid work you might do *around your home*, like housework, yard work, general maintenance, or caring for your family. I will ask you about these later.

1a Do you currently have a job or do any unpaid work outside your home?

[Interviewer clarification: This also includes credit and non-credit classes or course work. It also includes volunteer work and time spent looking for work. It does **not** include unpaid house or yard work, nor caring for dependents. This will be asked in a later section]

Yes ____ (go to *Question 1b*)

No ____ (skip to *Question 2a*)

Refused [Interviewer: Do not read]

Don't know [Interviewer: Do not read]

The following questions are about all the physical activity you do in a usual week as part of your paid or unpaid work. This does *not* include travelling to and from work.

1b First, think about all the vigorous activities which take **hard physical effort** that you might do *as part of your work*. Vigorous activities make you breathe much harder than normal and may include things like heavy lifting, digging, heavy construction work, or climbing up stairs. Think about *only* those vigorous physical activities that you do for at least 10 minutes at a time.

On how many days in a usual week do you do vigorous physical activities *as part of your work*?

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

[Interviewer: Work includes paid and unpaid work as well as course work. Include all jobs and volunteer work.]

____ days per week

Refused [Interviewer: Do not read]

Don't know [Interviewer: Do not read]

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

1c How much time in total would you usually spend on one of those days doing **vigorous** physical activities *as part of your work*?

____ hours ____ minutes

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, or includes time spent doing a variety of paid and unpaid work, ask: "How much time in total would you spend in a **usual week** doing vigorous physical activities *as part of your work*?"
____ hours ____ minutes per week]

1d Now think about activities which take **moderate physical effort** that you might do *as part of your work?* Moderate physical activities make you breathe somewhat harder than normal and may include activities like carrying light loads. Do not include walking. Again, think about *only* those moderate physical activities that you do for at least 10 minutes at a time.

On how many days in a usual week do you do moderate physical activities *as part of your work*?

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

[Interviewer: Work includes paid and unpaid work as well as course work. Include all jobs.]

____ days per week

Refused [Interviewer: Do not read]

Don't know [Interviewer: Do not read]

[Interviewer: If respondent answers zero, refuses or does not know, skip to *Question 1f*]

le How much time in total would you usually spend on one of those days doing **moderate** physical activities *as part of your work*?

____ hours ____ minutes

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, or includes time spent doing a variety of paid and unpaid work, ask: "How much time in total would you spend in a **usual week** doing moderate physical activities *as part of your work*?"
____ hours ____ minutes per week]

1f Now think about the time you spend walking for at least 10 minutes at a time *as part of your work*. Please do **not** count any walking you do to **travel** to or from work.

On how many days in a usual week do you walk *as part of your work*?

[Interviewer clarification: Think about only the walking that you do for at least 10 minutes at a time.]

[Interviewer: Include all jobs.]

____ days per week

Refused [Interviewer: Do not read]

Don't know [Interviewer: Do not read]

[Interviewer: If respondent answers zero, refuses or does not know, skip to *Question 2a*]

1g How much time in total would you usually spend on one of those days **walking** *as part your work*?

____ hours ____ minutes

[Interviewer clarification: Think about only the walking that you do for at least 10 minutes at a time.]

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, or includes time spent in multiple jobs, ask: "How much time in total would you spend in a **usual week** walking *as part of your paid work*?"
____ hours ____ minutes per week]

1h When walking *as part of your work*, at what pace do you usually walk? Do you walk at:

____ a **Vigorous** pace;
____ a **Moderate** pace or
____ a **Slower** pace.

[Interviewer clarification: Do you walk at
____ a **Vigorous** pace, that makes you breathe much harder than normal;
____ a **Moderate** pace that makes you breathe somewhat harder than normal; or
____ a **Slower** pace where there is no change in your breathing]

[Interviewer probe: A usual pace is being sought. If the respondent can't answer because the pace varies widely from day to day, or from job to job, ask: "How much time would you spend in a **usual week** walking at a slow pace *as part of your paid work*?"
____ hours ____ minutes per week]

PART 2: TRANSPORTATION PHYSICAL ACTIVITY

2a Now, I am going to ask you about how you typically travel to go from place to place in a usual week, including to places like work, stores, movies and so on.

On how many days in a usual week do you travel in a motor vehicle like a train, bus, car or tram?

____ days per week

Refused [Interviewer: Do not read]

Don't know [Interviewer: Do not read]

[Interviewer: If respondent answers zero, refuses or does not know, skip to *Question 2c*]

2b How much time in total did you usually spend on one of those days *travelling in a car, bus, train or other kind of motor vehicle*?

____ hours ____ minutes

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: "Can you tell me the total amount of time you spend in a **usual week** *travelling in a motor vehicle*?"
____ hours ____ minutes per week

2c Now think **only** about the *bicycling* you might do to travel to and from work, to do errands, or to go from place to place. *Only* include bicycling that you do for at least 10 minutes at a time.

On how many days in a usual week do you bicycle *to go from place to place*?

[Interviewer clarification: Think about only the bicycling that you do for at least 10 minutes at a time.]

____ days per week

Refused [Interviewer: Do not read]

Don't know [Interviewer: Do not read]

[Interviewer: If respondent answers zero, refuses or does not know, skip to *Question 2f*]

2d How much time in total would you usually spend on one of those days *to bicycle from place to place?*

____ hours ____ minutes

[Interviewer clarification: Think about only the bicycling that you do for at least 10 minutes at a time.]

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: "How much time in total would you spend bicycling in a **usual week** *to travel from place to place*?"
____ hours ____ minutes per week

2e When *travelling by bicycle*, at what pace do you usually bike? Do you bike at:

____ a **Vigorous** pace, that makes you breathe much harder than normal;
____ a **Moderate** pace that makes you breathe somewhat harder than normal; or
____ a **Slower** pace where there is no change in your breathing.

2£ Now think **only** about the *walking* you might do *to travel* to and from work, to do errands or to go from place to place. *Only* include walking that you do for at least 10 minutes at a time.

On how many days in a usual week do you walk *to go from place to place*?

[Interviewer clarification: Think about only the walking that you do for at least 10 minutes at a time.]

____ days per week

Refused [Interviewer: Do not read]

Don't know [Interviewer: Do not read]

[Interviewer: If respondent answers zero, refuses or does not know, skip to *Question 3a*]

2g How much time in total would you usually spend on one of those days walking *from place to place?*

____ hours ____ minutes

[Interviewer clarification: Think about only the walking that you do for at least 10 minutes at a time.]

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: "How much time in total would you spend in a **usual week** *walking to commute*?"
____ hours ____ minutes per week

2h When walking from place to place, at what pace do you usually walk? Do you walk at:

____ a **Vigorous** pace;
____ a **Moderate** pace or
____ a **Slower** pace.

[Interviewer clarification: Do you walk at
____ a **Vigorous** pace, that makes you breathe much harder than normal;
____ a **Moderate** pace that makes you breathe somewhat harder than normal; or
____ a **Slower** pace where there is no change in your breathing]

PART 3. HOUSEWORK, HOUSE MAINTENANCE, AND CARING FOR FAMILY

3a Now I will ask you about some of the physical activities you might do in a usual week *in and around your home*, for example, your housework, gardening, yard work, general maintenance work, or caring for your family.

First, think about **vigorous** activities which take **hard physical effort** that you do *in the garden or yard*. Vigorous activities make you breathe much harder than normal and may include heavy lifting, chopping wood, shovelling snow, or digging. Again, think about *only* those vigorous physical activities that you do for at least 10 minutes at a time.

On how many days in a usual week do you do **vigorous** physical activities *in the garden or yard*?

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

____ days per week

Refused [Interviewer: Do not read]

Don't know [Interviewer: Do not read]

[Interviewer: If respondent answers zero, refuses or does not know, skip to *Question 3c*]

3b How much time in total would you usually spend on one of those days doing **vigorous** physical activities *in the garden or yard*?

____ hours ____ minutes

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: "What is the total amount of time you would spend in a **usual week** doing vigorous physical activities *in the garden or yard*?"
____ hours ____ minutes per week]

3c Now think about activities which take **moderate physical effort** that you do *in the garden or yard*. Moderate activities make you breathe somewhat harder than normal and may include carrying light loads, sweeping, washing windows, and raking. Again, include *only* those moderate physical activities that you do for at least 10 minutes at a time.

On how many days in a usual week do you do **moderate** activities *in the garden or yard?*

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

____ days per week

Refused [Interviewer: Do not read]

Don't know [Interviewer: Do not read]

[Interviewer: If respondent answers zero, refuses or does not know, skip to *Question 3e*]

3d How much time in total would you usually spend on one of those days doing **moderate** physical activities *in the garden or yard*?

____ hours ____ minutes

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: "What is the total amount of time you would spend in a **usual week** doing moderate physical activities *in the garden or yard*?"
____ hours ____ minutes per week]

3e Now think about activities which take at least **moderate physical effort** that you do *inside your home*. Examples include carrying light loads, washing windows, scrubbing floors and sweeping. Include *only* those moderate physical activities that you do for at least 10 minutes at a time.

[Interviewer clarification: Moderate activities make you breathe somewhat harder than normal]

On how many days in a usual week do you do **moderate** activities *inside your home*?

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

[Interviewer clarification: On how many days in a usual week do you do activities that take **at least moderate effort** *inside your home*]

____ days per week

Refused [Interviewer: Do not read]

Don't know [Interviewer: Do not read]

[Interviewer: If respondent answers zero, refuses or does not know, skip to *Question 4a*]

3f How much time in total would you usually spend on one of those days doing **moderate** physical activities *inside your home*?

____ hours ____ minutes

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: "What is the total amount of time you would spend in a **usual week** doing moderate physical activities *inside your home*?"
____ hours ____ minutes per week]

PART 4: RECREATION, SPORT, AND LEISURE-TIME PHYSICAL ACTIVITY

4a Now, I am going to ask you about all the physical activities that you do in a usual week solely for recreation, sport, exercise or leisure. Please do NOT include any activities you have already mentioned.

Not counting any walking you have already mentioned, on how many days in a usual week do you walk for at least 10 minutes at a time *in your leisure time*?

[Interviewer clarification: Think about only the walking that you do for at least 10 minutes at a time.]

____ days per week

Refused [Interviewer: Do not read]

Don't know [Interviewer: Do not read]

[Interviewer: If respondent answers zero, refuses or does not know, skip to *Question 4d*]

4b How much time in total would you usually spend on one of those days *walking in your leisure time*?

____ hours ____ minutes

[Interviewer clarification: Think about only the walking that you do for at least 10 minutes at a time.]

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: "How much time in total would you spend in a **usual week** *walking in your leisure time*?"
____ hours ____ minutes per week

4c When walking in your leisure time, at what pace do you usually walk? Do you walk at:

____ a **Vigorous** pace;
____ a **Moderate** pace or
____ a **Slower** pace.

[Interviewer clarification: Do you walk at
____ a **Vigorous** pace, that makes you breathe much harder than normal;
____ a **Moderate** pace that makes you breathe somewhat harder than normal; or
____ a **Slower** pace where there is no change in your breathing]

4d Now think about other physical activities you do in your leisure time for at least 10 minutes at a time.

First, think about vigorous activities which take **hard physical effort** that you do *in your leisure time*. Examples include aerobics, running, fast bicycling, or fast swimming.

[Interviewer clarification: Vigorous activities make you breathe much harder than normal]

On how many days in a usual week do you do **vigorous** physical activities *in your leisure time?*

[Interviewer clarification: Think about only those vigorous physical activities that you do for at least 10 minutes at a time.]

____ days per week

Refused [Interviewer: Do not read]

Don't know [Interviewer: Do not read]

[Interviewer: If respondent answers zero, refuses or does not know, skip to *Question 4f*]

4e How much time in total would you usually spend on one of those days doing **vigorous** physical activities *in your leisure time*?

____ hours ____ minutes

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: "How much time in total would you spend in a **usual week** *doing vigorous physical activities in your leisure time*?"
____ hours ____ minutes per week

4f Now think about activities which take **moderate physical effort** that you do *in your leisure time*. Examples include bicycling at a regular pace, swimming at a regular pace, and doubles tennis. Again, include only those moderate activities that you do for at least 10 minutes at a time.

[Interviewer clarification: Moderate activities make you breathe somewhat harder than normal]

On how many days in a usual week do you do **moderate** physical activities *in your leisure time*?

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

____ days per week

Refused [Interviewer: Do not read]

Don't know [Interviewer: Do not read]

[Interviewer: If respondent answers zero, refuses or does not know, skip to *Question 5a*]

4g How much time in total would you usually spend on one of those days doing **moderate** physical activities *in your leisure time*?

____ hours ____ minutes

[Interviewer clarification: Think about only those physical activities that you do for at least 10 minutes at a time.]

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: "How much time in total would you spend in a **usual week** *doing moderate physical activities in your leisure time*?"
____ hours ____ minutes per week]

PART 5: TIME SPENT SITTING

5a The last questions are about the time you spend sitting each day while at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading or sitting or lying down to watch television. Do not include any time spent sitting in a motor vehicle that you have already told me about.

How much time in total did you usually spend *sitting* on a **week day**?

____ hours ____ minutes

[Interviewer clarification: Include time spent lying down (awake) as well as sitting]

[Interviewer probe: An average time per day is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: "How much time **in total** would you spend *sitting* in a **usual week**?"
____ hours ____ minutes per week [skip to end]

5b How much time in total did you usually spend *sitting* on a **weekend day**?

____ hours ____ minutes

Attachment C

BRFSS Physical Activity Questions

Physical Activity and Health Branch
Centers for Disease Control and Prevention
July 2000

<Ask only of those who are employed; if not employed, skip to *Question 2*>

1. When you are at work, which of the following best describes what you do?

[Interviewer clarification: If respondent has multiple jobs, include all jobs]

Would you say:

Mostly sitting or standing		1
Mostly walking		2
Or		
Mostly heavy labor or physically demanding work		3
Don't know/Not sure	[Interviewer clarification: Do not read]	7
Refused	[Interviewer clarification: Do not read]	9

2. In a usual week, do you walk for at least 10 minutes at a time [Interviewer clarification: If employed, insert: "while at work,"] for recreation, exercise, to get to and from places, or for any other reason?

Yes		1
No		2
Don't know/Not sure	[Interviewer clarification: Do not read]	7
Refused	[Interviewer clarification: Do not read]	9

[Interviewer clarification: If respondent answers no, don't know, not sure or refuses, skip to *Question 5*]

3. How many days per week do you walk for at least 10 minutes at a time?

____ days per week

Don't know/Not sure	[Interviewer clarification: Do not read]	77
Refused	[Interviewer clarification: Do not read]	99

4. On days when you walk for at least 10 minutes at a time, how much total time per day do you spend walking?

____: ____ ____ hours and minutes per day

Don't know/Not sure	[Interviewer clarification: Do not read]	777
Refused	[Interviewer clarification: Do not read]	999

5. In a usual week, do you do any activities designed to increase muscle strength or tone, such as lifting weights, pull-ups, push-ups, or sit-ups?

Yes		1
No		2
Don't know/Not sure	[Interviewer clarification: Do not read]	7
Refused	[Interviewer clarification: Do not read]	9
	[Interviewer clarification: If respondent answers no, don't know, not sure or refuses, skip to *Question 7*]	

6. How many days per week do you do these activities?

____ days per week

Don't know/Not sure	[Interviewer clarification: Do not read]	77
Refused	[Interviewer clarification: Do not read]	99

We are interested in two types of physical activity – vigorous and moderate. Please answer even if you have included these activities in previous questions. Vigorous activities cause large increases in breathing or heart rate while moderate activities cause small increases in breathing or heart rate. Now, thinking about the moderate activities you do [Interviewer clarification: If employed, insert: "while <u>not</u> at work,"]

7. In a usual week, do you do moderate activities for at least 10 minutes at a time, such as brisk walking, bicycling, vacuuming, gardening, or anything else that causes some increase in breathing or heart rate?

Yes		1
No		2
Don't know/Not sure	[Interviewer clarification: Do not read]	7
Refused	[Interviewer clarification: Do not read]	9
	[Interviewer clarification: If respondent answers no, don't know, not sure or refuses, skip to *Question 10*]	

8. How many days per week do you do moderate activities for at least 10 minutes at a time?

____ days per week

Don't know/Not sure	[Interviewer clarification: Do not read]	77
Refused	[Interviewer clarification: Do not read]	99

9. On days when you do moderate activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities?

____: ____ ____ hours and minutes per day

Don't know/Not sure	[Interviewer clarification: Do not read]	777
Refused	[Interviewer clarification: Do not read]	999

Now, thinking about the vigorous activities you do [Interviewer clarification: If employed, insert: "while not at work,"]

10. In a usual week, do you do vigorous activities for at least 10 minutes at a time, such as running, aerobics, heavy yard work, or anything else that causes large increases in breathing or heart rate?

Yes		1
No		2
Don't know/Not sure	[Interviewer clarification: Do not read]	7
Refused	[Interviewer clarification: Do not read]	9

[Interviewer clarification: If respondent answers no, don't know, not sure or refuses, skip to end]

11. How many days per week do you do these vigorous activities for at least 10 minutes at a time?

____ days per week

Don't know/Not sure	[Interviewer clarification: Do not read]	77
Refused	[Interviewer clarification: Do not read]	99

12. On days when you do vigorous activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities?

____: ____ ____ hours and minutes per day

Don't know/Not sure	[Interviewer clarification: Do not read]	777
Refused	[Interviewer clarification: Do not read]	999