

Physical activity surveillance in England: what is measured and where are the gaps?

Executive Summary

This paper aims to identify and describe the main sources of national-level surveillance data on physical activity in adults and children in England, in order to identify any important gaps. This is distinct from the measurement of physical activity at a local level in order to evaluate the impact of specific interventions or for local needs assessments.

The paper focuses on data on the population prevalence of physical activity, but also includes key sources of available data on correlates of physical activity (such as characteristics of the built environment).

The prevalence of physical activity among **adults** is measured in the following surveys:

- **Health Survey for England** – reports on adults’ participation in a wide range of types of physical activity;
- **Active People survey** – focuses on activities that are done primarily for sport and active recreation;
- **National Travel Survey** – all aspects of personal travel, including walking and cycling as transport;
- **General Household Survey** – includes measures on sport and recreation including walking.
- **National Diet and Nutrition Survey (new rolling programme)** – reports on adults’ participation in a wide range of types of physical activity

Participation among **children** is measured in the following surveys:

- **Health Survey for England** – focuses on sports and exercise, active play and walking;
- **National Travel Survey** – travel, including to school;
- **General Household Survey** – sport and recreation;
- **Physical Education School Sports and Club Link Survey** – curricular and extra curricular sport and physical activity in schools.
- **National Diet and Nutrition Survey (new rolling programme)** – objectively monitors the physical activity behaviours of children under 16 using accelerometers.

The data collection systems for physical activity in England are relatively strong compared with other European countries, with a number of large-sample representative surveys that collect information on different aspects of physical activity. However, these would benefit from greater coordination, as each survey tends to focus on one type of physical activity, so it is difficult to gain an overall picture of activity levels.

The Health Survey for England (HSE) is to change format in 2011. It is hoped that the new format survey will build on the investment in physical activity measurement that has been made in 2008 and that the HSE 2008 survey theme will be repeated in the near future. In particular, it is very important that the 2008 questionnaire (which is an enhanced but directly comparable version of the 1997, 1998 and 2006 ones) remains consistent in order to measure trends in physical activity. Other enhancements include the collection of accelerometer data (as in 2008); fitness testing (as in 2008) to establish trends in cardiorespiratory fitness; ensuring sample sizes are larger to allow sub-group analysis.

There are a number of specific recommendations for other surveys, notably amending the Active People Survey to collect more reliable data on active travel.

Monitoring of the determinants of physical activity would be helped by a comprehensive audit of the environment to map green space and access to environments that promote physical activity.

1. Introduction to physical activity measurement

Surveillance of physical activity behaviour is an important component of a public health approach to promoting activity and helping to reduce obesity and cardiovascular and metabolic morbidity, and enhance the population's general wellbeing. Data on the prevalence and distribution of physical activity (and inactivity) in the population, helps us to understand how to target and design interventions appropriately, and trend data can increase our understanding of the collective impact of interventions over time. This is distinct from the measurement of physical activity at a local level in order to evaluate the impact of specific interventions or for local needs assessments.

Physical activity is a complex behaviour, and often presents significant measurement challenges. Physical activity has many health benefits, but these depend on the characteristics of the activity itself, and the manner in which the activity is carried out. The four main dimensions of physical activity are frequency, intensity, time, and type (summarised as FITT):

- Frequency of the activity. How often is the activity done per day or per week?
- Intensity: is the activity enough to get the person warm and slightly out of breath (to signify moderate intensity activity) or out of breath and sweaty (vigorous activity). A further distinction can be made between absolute intensity (the energy cost of a particular activity) and relative intensity (how an individual responds to the activity, which is determined by a range of factors including current fitness)
- Time: for how long is the individual active on each occasion?
- Type of activity: this has an influence on the relationship with health. For example, swimming and walking might both be classed as moderate intensity activity, but swimming uses more muscle groups, while walking is weight-bearing.

All these dimensions need to be measured in order to arrive at an accurate assessment of an individual's overall activity level. There are over 30 methods available for measuring physical activity and these generally have to balance feasibility against validity and accuracy¹. In

general this can either be through questionnaire-based surveys or through some objective measurement method². Appendix A summarises the strengths and limitations of the main measurement methods.

1.1. Questionnaires

The majority of measures of physical activity are based on a self-assessment of activity – with data collected through questionnaire – either self-completion or administered by an interviewer. These typically ask respondents to recall how active they have been in certain domains (or types) of activity. These might be in a diary/log format (in which the respondent notes their activity throughout the day), or through recall of activity over the last day, week, or month. The results can therefore be influenced by the respondent's ability to recall their activity. Self report measures are also subject to social desirability bias and it is not uncommon for respondents to over-report.

Most major surveys use questionnaires that have been subjected to trials of validity and reliability. Validity refers to the questionnaire's ability to measure what it sets out to measure. Validity studies usually compare the results from a questionnaire with those from an objective measure such as an accelerometer. This enables the researchers to assess whether the questionnaire over or under-estimates activity compared to the objective measure. Reliability refers to the extent to which the questionnaire is able to produce stable and repeatable results over time and/or in the same population.

When surveys use random probability samples, the findings can be generalised to the population. If the same methods are used in repeat surveys, trend analysis can be undertaken.

1.2. Objective measurement of physical activity

Objective measurement of activity can be carried out using devices such as motion sensors (which measure body movement in one, two, three axes or are omni-axial); pedometers (which measure number of steps taken; or combined heart rate and motion sensors. These devices can be

used to calculate movement over several days or weeks and have the advantage of being well validated and generally accurate measures, which can overcome some of the problems of recall bias found in surveys. Some of these devices have been calibrated to estimate energy expenditure but accuracy is not always acceptable.

However, objective measures can be very costly to use at a population level, and do not always provide data of the appropriate level of detail. For example motion sensors cannot provide data on the mode of activity, and the data can be difficult to interpret and analyse. However, it is of note that the Health Survey for England has recently used accelerometers in large samples (see below), the National Diet and Nutrition Survey is using accelerometers in children and young people, and the National Health and Nutrition Examination Survey has been using accelerometers in large samples in the US since 2003.

2. Data on adult participation in physical activity

This section focuses on the main surveillance data that describe physical activity participation among nationally representative samples of people. Details of each national survey with some reference to physical activity are given in appendix B. This section describes the main national surveys and the physical activity measures they use, and investigates some of the key issues for each measure.

The main measures of adult participation in physical activity come from the following national surveys:

- **Health Survey for England**

The most comprehensive physical activity data come from the Health Survey for England (HSE). The HSE reports on adults' physical activity in the four weeks prior to interview by examining overall participation in activities that lasted at least 10, 15, or 30 minutes (depending on the survey year) and by describing frequency and indicators of intensity of participation, intensity and type of activity. A very wide range of activity is considered. Physical activity is not measured every year, but is included as a

module in specific years. There are plans to incorporate the HSE into a broader Health and Social Care Survey from 2011.

- **Active People survey**
Some aspects of total physical activity are measured in Sport England's Active People survey. This survey focuses on activities that are done primarily for sport and active recreation and last at least 30 minutes per occasion.
- **National Travel Survey**
The National Travel Survey measures all aspects of personal travel, including walking and cycling as transport.
- **General Household Survey**
This survey includes measures on sport and recreation including walking.

Health Survey for England

The HSE is used as the primary source to measure progress towards achieving physical activity guidelines among adults in England³. The HSE provides a wealth of data on physical activity, and unlike the other main surveys, does not focus on one domain of activity. This makes it particularly useful for classifying people by activity level, as it can take account of all relevant types of activity.

The HSE is modular, so topics like physical activity are not included every year. This reduces the amount of trend data available. There have also been changes to the HSE questionnaire that have made it difficult to assess trends in certain domains of physical activity. One re-analysis of the 1991–2004 physical activity data of HSE concluded that 'changes in the measuring methodology over time preclude the presentation of a clear picture of the total temporal trends in physical activity in England'⁶. However, the sports and exercises questions remained unchanged so it is possible to draw time trends for most leisure-time activities.^{4 5} It is extremely important that the core measures of physical activity are retained when the HSE is developed into the Health and Social Care Survey and that the 2008 version of the questions is consistently used in the future.

Another challenge for the HSE is the validity of its questionnaire. It is important to note that the HSE questionnaire was not validated before use, although it was derived from the questions used in the English National Fitness Survey and there are signs that it may misclassify older participants⁶. Some validation has been conducted recently on the questionnaire but results have not yet been published. For the HSE 2008, the adult questionnaire was modified to obtain more detailed information on occupational activity and to reduce the minimum activity duration to 10 minutes but the modifications permit creation of the 'old' summary variable to retain trend data. It would be extremely useful to publish the results of validation studies on the existing and enhanced (2008) questionnaires among different population groups, ideally validated against objective measures. The use of accelerometers in 2008 offers the opportunity to carry out such a large validation study. Such analyses are currently in progress.

Most data analysis focuses on achievement of criterion (recommended) levels of physical activity – such as 30 minutes or more on five or more days of the week. However, for obesity prevention we also need to know as much as possible about total energy expenditure. So it will be important to see the extent to which the HSE questionnaire is well validated against 'gold standard' measures of total energy expenditure such as doubly labeled water⁷. This is a laboratory measure that estimates total carbon dioxide production, and can be used to estimate metabolic rate and total energy expenditure. Using questionnaires that accurately measure total energy expenditure is important in the context of the new physical activity action plan⁸ which sets out to 'shift the curve' of physical activity promotion (i.e. increasing activity across the board, not just increasing the proportion achieving specified levels).

The HSE 2008 questionnaire also benefits from detailed assessment of time spent in sedentary activities, time, which is an important indicator in its own right. It is important that sedentary time questions are repeated in the future.

This also raises the question of how well the HSE measures short bouts of physical activity. Public messages on physical activity tend to focus on integrating activity into daily life⁹, but, like any other questionnaire, the HSE may not be sensitive enough to be able to measure short bouts of activity, especially very short walks. This is a common problem in physical activity measurement, but is important if we are to continue to promote small bouts of activity that are integrated into daily life.

In 2008 the HSE focused on physical activity and health, and included accelerometer data on a sample of approx 3,600 adults together with a step test to measure cardiovascular fitness. This is an extremely encouraging development as it will provide:

- Detailed accelerometer data which will provide a more accurate assessment of total energy expenditure
- Accelerometer data to enable a validation of the questionnaire
- Fitness data that can a) potentially be compared with the 1992 National Fitness Survey and b) provide a baseline for measuring trends in fitness

It will be very important to build on this investment in physical activity and fitness data, by continuing some or all of these measures in the new survey.

Active People Survey

Some aspects of total physical activity are measured in Sport England's Active People survey. This survey is designed primarily to measure progress towards National Indicator 8 (NI8) – adult participation in sport and active recreation. This means that it focuses on activities that are done primarily for sport and active recreation. The survey has an impressive sample size and provides data that can provide a picture of participation at local authority level. If the survey continues to be conducted annually, it will provide a valuable picture of trends at national, regional and local level.

The main drawback of the survey is that its focus on sport and active recreation means that it does not provide an accurate measure of total physical activity. Active transport in particular is not well covered: detailed data on cycling and walking are only collected for walks or rides of 30 minutes or more. This might then lead to an underestimation of total walking or cycling, especially among people who do lots of short walks.

The other issue with walking and cycling is that they are only included in the NI8 indicator set if the purpose of the journey was for sport or recreation and not for transport. This means that all 'active commuting' journeys are excluded (although the data are available for analysis), along with activity at work. This is likely to reduce the estimates of total activity. The other omissions are dance and active conservation/ gardening, although these are likely to be included in the future⁸.

National Travel Survey

The National Travel Survey (NTS) is a continuous survey of personal travel. It uses an interview and week-long travel diary to measure all aspects of personal travel, including walking and cycling. The NTS provides the most comprehensive data on walking and cycling for transport. The issue here is that until recently, in contrast to the Active People Survey, the NTS focused on only journeys from one place to another, and did not include any walks or bike rides with the same origin and destination (such as typical walks done for leisure or exercise). In recent years they have begun collecting data on walks for recreation, but not cycle rides.

The General Household Survey

This survey collects annual data on participation in sports and recreation (including walking) but the measures are limited: for example the survey focuses on whether the respondent has done an activity in the last week or month.

Trend data on aspects of physical activity are available from most of the major surveys, but all have been compromised to some extent by

changes to the questionnaires. The General Household Survey and the Health Survey for England provide trend data on specific sport and activities, while the National Travel Survey provides some trend data on measures of walking and cycling, although this does not include trips taken on traffic-free routes (which appear to be increasing).

Time Use Survey

This survey collects detailed information on the way that people spend their time. Its level of detail may make it particularly useful as a measure of sedentary behaviour, although this potential has perhaps not been fully exploited to date.

National Diet and Nutrition Survey

A new rolling National Diet and Nutrition Survey commenced data collection in April 2008. An extensive questionnaire assessed in the preceding comparison study was validated against doubly-labelled water and Actigraph data. It was unable to specify energy expenditure accurately enough for individual-level data. From Year 2 of the NDNS (April 2009), the RPAQ (Recent Physical Activity Questionnaire, MRC Epidemiology Unit, Cambridge) is being used instead to categorise participants' physical activity levels.

3. Data on Children's participation in physical activity

The main measures of child participation in physical activity come from the following surveys:

- **Health Survey for England.** Like the adult version, this is based on a comprehensive questionnaire that assesses participation in sports and exercise, active play and walking through parental interview. The parents of children 2–12 are asked about their children's activity while children are usually present. Children aged 13–15 were asked the questions directly. Children aged eight and over are also asked questions about their participation in housework and gardening. Prior to 2008, activity which was part of the school

curriculum was excluded as this information is collected elsewhere^a
³. The survey is carried out on a large sample and it has been repeated, allowing some comparison of trends.

- Other measures. These have either been superseded by other surveys (**Taking Part**) or provide only a partial picture of total activity (**National Travel Survey; General Household Survey**).
- **Physical Education School Sports and Club Link Survey**
This survey collects data on curricular and extra curricular sport and physical activity in schools.

Health Survey for England (HSE)

The HSE provides the most comprehensive data on children's participation in physical activity. The survey does face some challenges however. The most important is the questionnaire used to assess activity levels. A recent study highlighted that the questionnaire was not validated before it was used in the survey, and that the survey overestimates moderate intensity physical activity by an average of 122 minutes per day. The authors concluded that 'Levels of habitual physical activity in children are likely to be substantially lower than those reported in UK health surveys'¹⁰. However it is important to put this into context as the motion sensors used in this validation study may underestimate moderate intensity activity.

There is no simple solution to this issue. The measurement of children's physical activity is highly problematic. While there has been significant progress in recent years in the use of objective measures (such as accelerometers), the cost and complexity of analysis make these problematic for population-level surveillance¹¹. Self-assessment (or parent-assessment) questionnaires are seen as the most practical (and affordable) option for large samples such as the HSE. However, the low validity of the questionnaire may make its utility for population level surveillance questionable.

^a Principally through the Physical Education School Sports and Club Link survey.

A new questionnaire was developed and piloted for HSE 2008. It differs considerably from the earlier questionnaires, so trend data will not be available. It includes information on travel to and from school and on activity at school. The validity study, which was very encouraging, has not yet been published. The HSE team also used accelerometers among a sub-sample of children in the 2008 survey, which is a very positive development. Like in adults, the HSE 2008 dataset will offer the opportunity for a large-scale validation of this new children's questionnaire.

Physical Education School Sports and Club Link Survey

This survey is used to assess sport and PE in schools. Schools' Partnership Development Managers are asked to estimate how many of their pupils participate in "at least two hours of high-quality PE and out-of-hours school sport in a typical week". Despite the broad coverage of this survey there are limitations to the data. There has been some criticism that the data from this survey may not be reliable¹², and the data collection approach appears to have only been subjected to very rudimentary validation¹³. More importantly, the data only represent the time that teachers say that pupils spend in PE and school sport lessons (or sessions), which is unlikely to equate to time spent in physical activity. One study showed that pupils were only active for around one third of the PE lesson¹⁴.

National Diet and Nutrition Survey

The UK National Diet and Nutrition Survey measures physical activity as a proxy for energy expenditure. In Year 1 (April 2008–March 2009), children aged four to ten years wore an accelerometer for a week. From Year 2 (April 2009) onwards, all participants aged four to 15 years are being asked to wear an accelerometer.

4. Data on physical activity correlates

Environmental correlates

In recent years there has been increasing focus on the importance of aspects of the built and natural environment that may have an influence on physical activity. These include:

- Access to green space;
- Quality of green space;
- Access to physical activity facilities
- Quality of physical activity facilities
- Walkability of urban areas;
- Patterns of land use
- Perceptions of the built environment ;
- Perceptions of personal safety.

There is a lack of data in this area. As with total physical activity, measures are included in some surveys (such as perceptions of safety in Home Office crime surveys) but it is difficult to gain an overall picture. Natural England has made a strong contribution to the development of this area with their new database of green space. This has started with the mapping of the green space for which they have responsibility^b (for example sites of special scientific interest) and is being extended to include a wider variety of green spaces. Data come from a number of sources: local authorities keep geographical information systems (GIS) databases of their managed land (including 'mowing databases' of land they need to maintain); other data come from English Nature and the Nature Conservancy Council. The picture is generally patchy and is not currently in a form that can be used in national studies of physical activity.

Data on 'walkability' are also rare. Living Streets have conducted community street audits but these are at a very local scale, and are designed to develop action plans not to generate data. Individual local authorities are likely to have some data on local facilities and

^b See <http://www.natureonthemap.org.uk/>

environments for walking but again this has not been collated at national level.

Leisure facilities

All local authorities keep databases of their leisure facilities (such as gyms, pools or leisure centres) and this information is being pulled together into websites^c to help the public find facilities. The Leisure Database Company also conducts an annual survey of facilities and keeps the most comprehensive database. These could be used by researchers to look into correlations between facilities and activity levels.

Psycho-social correlates

A number of psycho-social factors have been found to correlate with physical activity, such as self-esteem or attitude to sport and exercise. Again there is little systematic work done in this area. HSE 2007 has just reported data on knowledge and attitudes to physical activity, which provides an important contribution to the area. This needs to be enhanced in the future and conducted at the same time as measures of behaviour so that the two can be correlated.

5. Discussion on possible gaps in the data

The data collection systems for physical activity are relatively strong, however understanding and analysis could be enhanced through a number of actions. Overall, our understanding of physical activity would be enhanced by greater coordination of the existing surveys, as they all tend to measure slightly different aspects of total activity, making it difficult to gain an overall picture of total activity. Other potential enhancements are outlined below.

Physical activity

- There has been a great deal of investment in physical activity measures in the HSE in 2008. Accelerometer data should be

^c See for example <http://www.activeplaces.com> and <http://www.promotingactivitytoolkit.com>

- collected again in the HSE's replacement (alongside questionnaire data), to establish valid and reliable trend data in physical activity,
- There are few data available on trends in fitness. These trends could be described by developing the HSE fitness test so that it can be compared to the National Fitness Survey data from 1992 (see appendix) and establishing a measure that can be regularly incorporated into the HSE's replacement survey.
 - Ideally, physical activity would be included more often than at present in the HSE's replacement survey among adults and children, to enable a stronger estimation of trends. This is extremely important; i), in the context of the rise in obesity, ii), with recent indications that, at least, recreational physical activity may be increasing. As there is always a possibility of this upward trend been affected by social desirability and the huge amounts of media attention that issues around obesity have attracted ¹⁵, it is important that accelerometry is also included in future HSEs
 - It is most important that from now on, no changes are made to the core measures from the HSE, to enable measurement of trends since 1997.
 - The HSE's replacement should also ideally have a larger sample each year so that we have the ability to do more sub-group analysis on total physical activity and look at smaller geographical areas.
 - It would be helpful if the HSE data on attitudes and knowledge (2007) were collected again in future years to monitor change. Ideally, both the behaviour and the attitudes should be measured concurrently, unlike 2007 (attitudes only) and 2008 (behaviour only).
-
- The Active People Survey should be amended so that data are also collected on walks and bike rides of less than 30 minutes, and data are presented on walks and rides regardless of purpose This should not, however, be at the expense of trend data using existing measures.
 - The measure of participation in PE and school sport should be re-thought to reduce the likelihood of positive response bias.

Environment

- Understanding of the determinants of physical activity would be enhanced by a comprehensive audit of the environment to map green space and access to environments for physical activity (building on Natural England's work).
- Perceptions of the environment should be studied (possibly by using questions being developed by existing research projects such as the EU-funded 'ALPHA 'project.)

Development of Tools

- All research tools should be validated against objective measures and results published. This should include validation against measures of total energy expenditure such as doubly labelled water.
- The purpose of walk/cycle bouts should be included in the HSE to better estimate the contribution of active travel (alongside existing measures so as not to threaten the trend data). Any newly-developed tools should follow a pre-determined method for development, including initiation, cognitive testing; reliability testing; validity testing.
- The HSE should continue to include the measure of sedentary behaviour collected in 2008.

6. Conclusions

The data collection systems for physical activity in England are relatively strong. We have a number of large-sample representative surveys that collect information on different aspects of physical activity. One challenge is co-ordination: all surveys seems to specialise in one particular domain or type of activity, and no single survey pulls this together. Each survey collects data in a slightly different way, which makes analysis complex. This is best illustrated by walking: Active People focuses on walking for leisure and recreation (and excludes walking for transport); NTS collects data on walking for transport (and until recently excluded leisure and while the HSE does collect information on total walking, it does not ask about the purpose of walks, so we do not know about the contribution of active transport to total walks. While this specialisation is to some extent inevitable (and a function of the separate funding streams for each survey) it means that it is very hard to get an overview. There is therefore a need for some specific amendments to individual surveys (highlighted above) and overall a greater degree of collaboration across government to co-ordinate data collection on physical activity.

Nick Cavill
Specialist Advisor
National Obesity Observatory

July 2009

The author of this paper is grateful for comments received from the following expert reviewers:

Dr Melvyn Hillsdon, University of Bristol
Dr Emmanuel Stamatakis, University College London
Dr Jenny Mindell, University College London

Appendix A – strengths and weaknesses of physical activity assessment methods

Physical activity measure	Examples of instruments available	Strengths	Limitations
Self-report (recall)	IPAQ GPAQ Health survey for England	Capture qualitative and quantitative information Inexpensive Low participant burden	Over-reporting due to potential social desirability bias Reliability and validity Misinterpretation of questions Problems for children under 10 Potential recall bias
Self-report (diaries or logs)	National Diet and Nutrition Survey 1997	Not subject to recall bias Capture qualitative and quantitative information Relatively inexpensive	Very high participant burden and subsequent low compliance Data entry and analysis can be very time consuming
Accelerometer	Actigraph RT3 Triaxial	Objective monitoring of body movement Measure of frequency, intensity, duration Non-invasive Measures frequency in seconds Easy data manipulation	Expensive Less useful for detecting upper body movement or for cycling and rowing if uni-axial Some issues with placement of monitor
Heart Rate monitoring	Polar	Indirect physiologic measure of activity Measure of frequency, intensity, duration Non-invasive Measures frequency in seconds Easy data manipulation Useful for analyzing activity in structured sessions	Expensive Some monitor discomfort Heart rate affected by arousal; gender; fitness; temperature

Combined sensors (geart rate plus acceleromter)	Actiheart	All strengths of acceleromters and heart rate monitors combined	Prohibitively expensive for large population surveys
Pedometers	Yamax	Inexpensive Non-invasive Can be used for large groups Good measure of walking	Problems with between-instrument variation Can be tampered with Lose accuracy during running and intermittent activity
Systematic direct observation	SOPLAY SOPARK CARS	Qualitative and quantitative information Specific physical activity behaviours	Training needed Time intensive Possible bias due to observers
Geographic Positioning Systems	Garmin	Detects movement, speed, and distance travelled while outdoors Can download data and map activity patterns	Does not work indoors Can provide incorrect results (e.g. in car) Some participant burden Signals can be poor e.g. built up areas.

Source: adapted from Dugdill et al¹

Appendix B – details of surveys^d

Health Survey for England (HSE) – adults

The Health Survey for England is an annual survey designed to measure health and health related behaviours in adults and children living in private households in England. It has been undertaken since 1991. This is currently the most robust data source to monitor trends in physical activity.

- Methodology: self-assessment questionnaire measuring physical activity participation. Includes information on frequency, intensity, and duration of physical activity in all main domains
- Start date: 1991 (adults); Physical activity data included: 2008 (including accelerometers); 2007 (perceptions and attitudes not behaviour); 2008; 2006; 2004; 2003; 2002; 1999; 1998, 1997; 1994; 1993; 1992; 1991. There were three versions in the questionnaire: the 1991–1994; the 1997–1998 that was re-introduced in 2006 and enhanced for 2008; and the 1999–2004.
- Frequency of survey: Annual (though physical activity not always included)
- 2004 survey included a boost sample of people from ethnic minorities
- Most recent return: 2007
- 2008 module focused on physical activity and health, and included accelerometer and fitness data on approx 3,600 adults
- Commissioned by: Department of Health 1991 – 2005, post 2005 the Information Centre
- Coverage: England, SHA, Lower level synthetically estimated data is also available for adults
- Caveats: Data not sufficiently robust to measure geographical boundaries smaller than SHA
- Link to data source: [Information Centre](#), [Archived data sources](#)

^d Based on http://www.noo.org.uk/data_sources

- Link to associated reports: [Health Survey for England 2007 Latest Trends, Statistics on Obesity, Physical, Activity and Diet: England, January 2009](#)

Health Survey for England (HSE) – children

Since 1995 the HSE has also included children aged 2–15 years, and since 2002 infants under 2 have been included.

- Methodology: questionnaire on participation in out-of-school physical activity achieved by children aged 2 to 15. Children aged under 13 are interviewed with their parents.
- Start date: 1995 (children 2–15); 2002 (infants under 2)
- Physical activity included in: 1997, 1998, 1999, 2002, 2003, 2004, 2006, 2007, 2008
- 2008 physical activity module was developed from scratch, the 2008 survey focused on physical activity and health, and included accelerometer and fitness data on approx 1,400 children

Active People

The Active People Survey is a large telephone survey of sport and active recreation, commissioned by Sport England. The survey measures participation in sport and active recreation, and provides details of how participation varies from place to place and between different groups in the population. The survey also measures other sport-related issues such as volunteering; club membership; tuition or coaching; and overall satisfaction with levels of sporting provision in the local community. The survey began in October 2005, and is planned to run continuously until 2010. In the first year the sample was 363,724 adults in England (aged 16 plus), with a minimum of 1,000 interviews completed in every one of the 354 Local Authority in England. The survey provides the measurement for National Indicator 8 (NI8) – adult participation in sport and active recreation.

- Methodology: Bespoke telephone questionnaire collected data on frequency of participation in sport and active recreation during the previous 4 weeks

- Start date: 2005
- Frequency of survey: Survey 1: 2005–6; Survey 2: 2007–8; Survey 3: 2008–
- Most recent return: October 2008
- Commissioned by: Sport England
- Coverage: Adult 16+yrs
- Caveats: Physical activity data focus on sport, with only limited coverage of active travel
- Link to data source:
http://www.sportengland.org/index/get_resources/research/active_people.htm

General Household Survey

The General Household Survey (GHS) is a multi-purpose continuous survey carried out by the Social Survey Division of the Office for National Statistics (ONS) which collects information on a range of topics from people living in private households in Great Britain. The survey started in 1971 and has been carried out continuously since then, except for breaks in 1997/98 (when the survey was reviewed) and 1999/2000 when the survey was re-developed.

- Methodology: Interviewer led questions on physical activity cover participation in sport, leisure, employment and vehicle ownership
- Start date: 1971 redeveloped in 1999
- Frequency of survey: annual
- Most recent return: 2006
- Commissioned by: multiple Government departments
- Coverage: UK and England
- Caveats:
- Link to data source:
http://www.statistics.gov.uk/ssd/surveys/general_household_survey.asp

Labour Force Survey

The Labour Force Survey (LFS) is a quarterly sample survey of households living at private addresses in Great Britain. Its purpose is to provide information on the UK labour market that can then be used to develop, manage, evaluate and report on labour market policies. The questionnaire design, sample selection, and interviewing are carried out by the Social and Vital Statistics Division of the Office for National Statistics (ONS) on behalf of the Statistical Outputs Group of the ONS.

- Methodology: Interviewer led questions about mode of transport to work – methodology complies with EU agreed concepts and definitions
- Start date: 1979
- Frequency of survey: Quarterly
- Most recent return: 2004
- Commissioned by: ONS
- Coverage: UK and GOR
- Caveats: Only limited application to physical activity
- Link to data source:
<http://www.statistics.gov.uk/statbase/Source.asp?vlnk=358>

Physical Education School Sports and Club Link survey

The 2007/08 survey aimed to collect information from all partnership schools in the maintained sector in England (21,727 schools). In addition, it collected information from a small number of independent schools, but this information is not included in this report.

- Methodology: Bespoke questionnaire to collect data on type of school sports, time spent in high quality curricular and extra curricular sport and physical activity
- Start date: 2002
- Frequency of survey: Annual
- Most recent return: 2006/7
- Commissioned by: Department for Children, Schools and Families

- Coverage: England
- Caveats: relies on teachers' assessments; covers only provision of PE and school sport and not actual physical activity levels
- Link to data source:
<http://www.dcsf.gov.uk/rsgateway/DB/RRP/u014102/index.shtml>
- Link to associated reports:
http://www.teachernet.gov.uk/_doc/13010/DCSF-RW063.pdf

Taking Part: adults

The Taking Part Survey gives detail on adult (16 plus) participation and attendance covering all DCMS sectors that will provide the ability to carry out statistically robust analysis at cross-sectoral, socio-demographic sub-group and regional levels. The survey was used to monitor the Department for Culture, Media and Sport, Public Service Agreement 3 (PSA3) from the 2004 Spending Review. Part of this PSA was by 2008, to increase the number who participate in active sport at least twelve times a year by 3% among those in priority groups (black and minority ethnic group, limiting disability, lower socio-economic groups and women).

- Methodology: Bespoke interviewer led face-to-face questionnaire covering engagement in culture, leisure and sport
- Start date: 2005
- Frequency of survey: Annual for three years; new survey in 2009
- Most recent return: 2007
- Commissioned by: Department for Culture Media and Sport
- Coverage: England, GOR
- Caveats: most of the physical activity data will be superseded by the Active People survey
- Link to data source:
http://www.sportengland.org/index/get_resources/research/tracking/taking_part_2007.htm

- Link to associated reports:
http://www.culture.gov.uk/images/research/TPMay2007_8_ActiveSport.pdf

Taking Part: children

In 2006 and 2007, the Taking Part Survey included a child interview for those households containing at least one child aged 11 to 15. In 2007, 2,454 interviews were conducted with children in this age group.

- Methodology: Bespoke interviewer led face-to-face questionnaire covering engagement in culture, leisure and sport
- Start date: 2006
- Frequency of survey: Annual until 2008; new survey in 2009
- Most recent return: 2007
- Commissioned by: Department for Culture Media and Sport
- Coverage: England, GOR
- Caveats: most of the physical activity data will be superseded by the Active People survey; 11–15 only
- Link to data source:
http://www.sportengland.org/index/get_resources/research/tracking/taking_part_2007.htm
- Link to associated reports:
http://www.culture.gov.uk/images/research/TPMay2007_8_ActiveSport.pdf

Time Use Survey

The UK 2000 Time Use Survey was conducted on behalf of a funding consortium consisting of: the Economic and Social Research Council; the Department of Culture, Media and Sport; the Department for Education and Skills; the Department of Health; the Department of Transport, Local Government and the Regions; and the Office for National Statistics.

- Methodology: Individual questionnaires, two one-day diaries and a one week work and education time sheet – harmonised with the European survey

- Start date: 2000,
- Frequency of survey: Every 5 yrs
- Most recent return: 2005
- Commissioned by: Economic and Social Research Council; the Department of Culture, Media and Sport; the Department for Education and Skills; the Department of Health; the Department of Transport, Local Government and the Regions; and the Office for National Statistics
- Coverage: UK & GOR
- Caveats:
- Link to data source:
<http://www.statistics.gov.uk/cci/article.asp?id=1600>
- Link to associated reports:
<http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=12962&Pos=&ColRank=1&Rank=422>

National Travel Survey

The National Travel Survey (NTS) is a continuous survey on personal travel. It provides the Department for Transport with data to answer a variety of policy and transport research questions. The survey has been running on an ad hoc basis since 1965 and continuously since 1988.

- Methodology: Bespoke interview and week long travel diary
- Start date: 1988
- Frequency of survey: Annual
- Most recent return: 2007
- Commissioned by: Department for Transport
- Coverage: UK & GOR
- Caveats: until recently, covered only journeys i.e. does not include any walks or bike rides with the same origin and destination; and excludes travel on traffic-free routes (an increasing number of trips)

- Link to data source:
http://www.statistics.gov.uk/ssd/surveys/national_travel_survey.asp

National Diet and Nutrition Survey

The National Diet and Nutrition Survey (NDNS) provides the Food Standards Agency (FSA) with data to monitor individual's diet and nutritional status across the UK. This survey was conducted initially to assess nutritional intake, and included some physical activity questions in later years. Previously, individual surveys were undertaken for different age-groups as a one-off survey. There are published reports to 2004.. The new rolling NDNS has been a continuous survey since April 2008.

- Method: Bespoke interviews, four-day food and drink diary; self-completion physical activity questionnaire (16+) or accelerometer (4-15yrs); physical measurements; biological samples
- Start date: 2008 (previous surveys also available, different method)
- Frequency of survey: Continuous from 2008
- Most recent return: The Year 1 report is due to be published on the FSA website December 2009.
- Commissioned by: Food Standards Agency
- Coverage: UK & constituent countries
- Caveats: physical activity not its prime focus; questionnaire data from Year 1 not useful
- Link to data source: Data will be archived on the UK Data Archive in 2010.

Older surveys providing historical data

Health and Lifestyles Survey

Originally conducted by the Department of Community Medicine (now Department of Public Health and Primary Care), at the University of Cambridge, with fieldwork carried out by Social and Community Planning Research (now National Centre for Social Research).

First conducted in 1984/5, then repeated in 1991 (with the same sample) to provide the basis for a long-term epidemiological investigation. Thus the survey cannot provide current prevalence data.

English National Fitness Survey and Survey of Activity and Health

These surveys were conducted in 1990 and 1991 by the former Health Education Authority and Sports Council. The fieldwork for the 1991 survey was carried out by the National Centre for Social Research (formerly Social and Community Planning Research) and fieldwork for the 1990 survey was carried out by Office of National Statistics (formerly Office of Populations, Census and Surveys).

The Survey of Activity and Health compliments an earlier survey carried out in the same series, the Allied Dunbar National Fitness Survey (ADNFS), 1990. The unique aspect of the ADNFS was that it measured physical fitness levels of a random sample of the adult English population.

The surveys provide extremely important data for long term monitoring of physical activity and fitness, but they cannot provide current prevalence data. The cohort from this study are now flagged for mortality and cancer incidence and so may be part of an important study in the future.

Youth Lifestyles Survey

This survey was conducted in 1998 and managed by the Home Office, Research Development and Statistics Directorate. The fieldwork was carried out by the National Centre for Social Research Data and further documentation can be found in the UK Data Archive. The survey did contain some questions on use of leisure time. As the survey was not repeated it cannot provide current prevalence data.

Health Survey for England: outline of the contents of the physical activity questionnaires

Reproduced with permission from Stamatakis et al, 2007; *Prev Med* 45(6):416–23.

Outline of the three versions of the Health Survey for England physical activity questionnaire			
Physical activity Domain	1991- '94	1997- '98	1999- '04
<i>Heavy Domestic (Heavy Housework and Heavy Gardening/manual/building/DIY)</i>			
<i>Frequency*</i>	√	√	√
<i>Duration</i>		√	
<i>Intensity</i>			
<i>Lower limit for duration (minutes)</i>	None	15	30
<i>Perceived level</i>			
<i>Walking</i>			
<i>Frequency*</i>	√	√ [†]	√
<i>Duration</i>		√	
<i>Intensity</i>	√	√	√
<i>Lower limit for duration (minutes)</i>	20	15	30
<i>Perceived level</i>			
<i>Sports and exercise</i>			
<i>Frequency*</i>	√	√	√
<i>Duration</i>	√	√	√
<i>Intensity</i>	√	√	√
<i>Lower limit for duration (minutes)</i>	None	15	15
<i>Perceived level</i>			
<i>Occupational activity[†]</i>			
<i>Frequency*</i>			
<i>Duration</i>			
<i>Intensity</i>			
<i>Lower limit for duration (minutes)</i>			
<i>Perceived level</i>	√	√	√
[†] A single question on overall activity levels at work			
*1991-94: occasions of participation; 1997-04: days of participation			
[‡] A question probing on second walking session on the same day was included			

References

1. Dugdill L, Stratton G, Watson P. Developing the evidenc base for physical activity interventions. In: Dugdill L, Crone D, Murphy R, editors. *Physical activity and health promotion: evidence-based approaches to practice*. Oxford: Blackwell, 2009:60–84.
2. Cavill N, Rolfe L. Choosing health in the South East: Physical activity. Oxford, 2006.
3. NHS Information Centre. Statistics on obesity, physical activity and diet: England, February 2009. London, 2009.
4. Stamatakis E, Ekelund U, Wareham N. Temporal trends in physical activity in England: the Health Survey for England 1991 to 2004. *Prev Med* 2007;45(6):416–23.
5. Stamatakis E, Chaudhury M. Temporal trends in adults' sports participation patterns in England between 1997 and 2006: the Health Survey for England. *British Journal of Sports Medicine*. 2008; 42: 601–608.
6. Orrella A, Doherty P, Coulton S, Miles J, Stamataki E, Lewin R. Failure to validate the Health Survey for England physical activity module in a cardiac population. *Health Policy* 2007;84(2–3):262–68.
7. Ainslie P, Reilly T, Westerterp K. Estimating human energy expenditure: a review of techniques with particular reference to doubly labelled water. *Sports Med* 2003;33(9):683–98.
8. Department of Health. Be Active Be Healthy. London, 2009.
9. Department of Health. At least five a week: evidence on the impact of physical activity and its relationship to health. London, 2004.
10. Basterfield L, Adamson A, Parkinson K, Maute U, Li P, Reilly J.

Surveillance of physical activity in the UK is flawed: validation of the Health Survey for England Physical Activity Questionnaire. *Arch Dis Child* 2008;93(12):1054–8.

11. Sirard J, Pate R. Physical activity assessment in children and adolescents. *Sports Med* 2001;31(6):439–54.

12. David Marley. Figures 'fudged' over two hours of PE,. *Times Education Supplement* 2008.

13. TNS. 2005/06 School Sport Survey. London, 2006.

14. Fairclough S, Stratton G. 'Physical education makes you fit and healthy'. Physical education's contribution to young people's physical activity levels. *Health Educ Res* 2005;20(1):14–23.

15. International Food Information Council Foundation. Trends in Obesity-related media coverage. Available online: <http://www.ific.org/research/obesitytrends.cfm> (accessed 27th February 2009)