

# Local Area Walking and Cycling Statistics

## Notes and Definitions



Department  
for Transport

This document provides information about the Department for Transport (DfT) statistical release *Local Area Walking and Cycling*, which was published for the first time in August 2012. The second release in the series was published on 16 April 2013.

The series will be updated annually each Spring, enabling longer term trends in cycling and walking prevalence to be measured.

The publication provides figures on the proportion of adults participating in walking and cycling by area of residence, with additional information on frequency, duration, and purpose.

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## 1. The Active People Survey

The statistics in the release are derived from the Active People Survey (APS). The APS is an annual household telephone survey administered by Sport England, an agency of the Department of Culture Media and Sport (DCMS).

The APS is designed to measure participation in sport and active recreation but includes some questions about all walking and cycling activity. The APS has an annual sample size of over 160,000 and at least 500 adults per local authority (with the exception of the Isles of Scilly and the City of London), which is sufficient to enable detailed analysis at local authority level.

The first APS was conducted between October 2005 and October 2006, the second between October 2007 and October 2008 and it has been run annually since then. The survey has always included questions about walking and cycling, but historically only asked about cycle rides that were at least 30 minutes in length.

Starting from the fifth Active People Survey (APS5, mid-Oct 2010 to mid-Oct 2011), the Department for Transport (DfT) has funded two additional survey questions asking about **any** cycling, irrespective of length or purpose.

Further information about the Active People Survey and published sports participation measures, can be found on Sport England's website:

[http://www.sportengland.org/research/active\\_people\\_survey.aspx](http://www.sportengland.org/research/active_people_survey.aspx)

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## Questions relevant to walking and cycling

The latest Active People Survey (APS5) included the following questions which have been used to develop the measures published in the latest Local Area Walking and Cycling Statistics:

### Walking

- Q1.** Firstly, I would like you to think about all the walking you have done. Please include any country walks, walking to and from work or the shops and any other walks you may have done. Please exclude time spent walking around shops. In the last four weeks, that is since [date four weeks ago] have you done at least one continuous walk lasting at least 10 minutes?
- Q2.** On how many days in the last four weeks have you done at least one continuous walk lasting at least 10 minutes?
- Q3a.** On the days that you walked, what was the total length of time you USUALLY spent walking during the course of the day? (Please only include walks of at least 10 minutes).
- Q3b.** You said that you had done at least one continuous walk lasting at least 10 minutes on [answer from 3a.] day(s) since [date four weeks ago]. Can I ask, on how many of those days did you walk for the purpose of health or recreation not to get from place to place again please exclude time spent walking around shops?
- Q3c.** On these days, what was the total length of time you USUALLY spent walking for the purpose of health or recreation, not to get from place to place, during the course of the day? (Please only include walks of at least 10 minutes).

### Cycling

- Q6a.<sup>1</sup>** I would now like you to think about any cycling you may have done. Please include any casual cycling in your local area, any cycling in the countryside or on cycling routes, cycling to or from work or any competitive cycling. In the last four weeks, that is since [date four weeks ago] have you done any cycling?
- Q6b.<sup>1</sup>** On how many days in the last 4 weeks have you done any cycling?
- Q6r.** On the days that you cycled, what was the total length of time you USUALLY spent cycling during the course of the day?
- Q8a.** You said that you had cycled for 30 minutes on [answer from Q3] day(s) in the last four weeks. Can I ask, on how many of those days were you cycling for the purpose of health, recreation, training or competition not to get from place to place?
- Q8ar.** Thinking only about continuous cycle rides for the purpose of health, recreation, training or competition not to get from place to place, how long do you usually cycle for?

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<sup>1</sup> Question 6a and 6b were funded by the Department for Transport for APS5.

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## Sport and active recreation

As part of the APS, respondents are asked to list any sports or physical recreational activity they have done in last four weeks, the number of days that they did this on and how long they normally did it for. Where respondents mention recreational walking (including hill walking, backpacking, hill trekking, rambling, cliff walking and gorge walking) or cycling (including BMX, cyclo-cross, mountain biking, downhill / gravity riding and stunt riding) in answer to these questions, they are asked whether this is in addition to any recreational walking and cycling mentioned in the questions above. Where this is the case, we have combined the answers with those given above.

### Changes to the questions for APS6 onwards

A number of changes to the cycling and walking questions were made from the second quarter of APS6 and thereafter. These changes included:

- Questions ask about walks of at least ten minutes, rather than five minutes
- Respondents are now asked about the frequency and purpose of all walks longer than ten minutes, rather than just those of at least 30 minutes
- Respondents are now asked about the purpose of all cycle rides, rather than just those of at least 30 minutes

The questions about cycling frequency (Q6a and b above, funded by DfT) were unchanged.

Because the changes above came into effect partway through the October to October survey year, we did not have a full year of data for the new questions. Therefore, the measures relating to walking and to cycling purpose were not updated in the April 2013 release.

New data tables to reflect these new questions have been introduced as part of the Spring 2014 release.

### Active People Survey data collection

The APS is a telephone survey, covering adults aged 16 and over in England. The survey year runs from mid-October to mid-October – thus APS5 ran from mid-Oct 2010 to mid-Oct 2011; APS6 ran from mid-Oct 2011 to mid-Oct 2012. Interviews in each local authority are spread over the 12 month period to avoid seasonal bias. Data collection for APS5 and 6 was carried out by TNS-BMRB.

The standard sample size is around 500 interviews in each county district, metropolitan borough or unitary authority. A small number of local authorities each year fund a “boost” to give a larger sample size in their area. The Isles of Scilly and the City of London are the two smallest local authorities by population, with around 1,000 and 4,000 households respectively. For these authorities, the target is to achieve as many interviews as possible. In both cases, the eventual number of respondents for APS5 and APS6 was around 100 people.

Households are selected using random digit dialling. An eligible individual (i.e. aged 16 or over) from the household is randomly selected to complete the survey. As the sampling frame only

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includes landline telephone numbers, the 15% of households in England that are mobile-only<sup>2</sup> are excluded from the survey, which may introduce bias into the sample.

More detailed information about the data collection methodology can be found in the technical note for Active People Survey (APS1), which is available on this page:

[http://www.sportengland.org/research/active\\_people\\_survey/active\\_people\\_survey\\_1.aspx](http://www.sportengland.org/research/active_people_survey/active_people_survey_1.aspx)

### **Availability of underlying data**

Following the completion each survey wave, APS microdata is placed in the UK Data Archive<sup>3</sup>.

## **2. Definitions**

For the purposes of the Local Area Walking and Cycling Statistics, the following definitions are used:

### **Survey years**

The survey year runs from mid-October to mid-October – thus APS5 ran from mid-Oct 2010 to mid-Oct 2011; APS6 ran from mid-Oct 2011 to mid-Oct 2012; and APS7 from mid-Oct 2012 to mid-Oct 2013.

### **Walking**

In the tables, “walking” refers to any continuous walk of at least ten minutes and covers all types, including a number of specific recreational types: hill walking, backpacking, hill trekking, rambling, cliff walking and gorge walking. However, “walking around shops” is excluded.

### **Cycling**

In the tables, “cycling” refers to cycle rides of any length and includes a number of specific recreational types: BMX, cyclo-cross, mountain biking, downhill / gravity riding and stunt riding.

### **Time “usually” spent walking and cycling**

In the tables, the time “usually” spent walking and cycling is the total time they most regularly or frequently walked or cycled on each day. It is not necessarily the *average* time they spent walking or cycling on those days.

### **Utility purposes**

"Recreational" refers to walking or cycling that is for purposes of recreation, health, competition or training purposes, i.e. not just for getting from place to place. "Utility" means getting from place to place, for example commuting or going to the shops.

Estimates of utility walking are made by comparing the answers to questions 2 and 3b (number of days walked for at least 10 minutes and number of days on which this was for recreational purposes). i.e.

*Number of days of utility walking = Total number of days walking – Number of days recreational walking*

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<sup>2</sup> See paper commissioned from the Office for National Statistics Methodology Advisory Service available on this page: [http://www.sportengland.org/research/active\\_people\\_survey/consultation.aspx](http://www.sportengland.org/research/active_people_survey/consultation.aspx)

<sup>3</sup> <http://www.data-archive.ac.uk/>

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Questions 6b and 8a are used in the same way to derive estimates of utility cycling.

### **Frequency of cycling and walking**

In questions 1, 2, 6a and 6b, survey respondents are asked whether they have done a particular walking or cycling activity in the past four weeks (28 days). These answers are used to derive the “at least once per month” measures presented in the tables.

In other questions, respondents are asked to state the number of days in the past 4 weeks (28 days) that they did that activity for. These answers are used to derive the other frequency measures in the tables. We assume that the number of days relates to frequency as follows –

- At least once per month = at least one day in 28
- At least once per week = at least four days in 28
- At least 3 times per week = at least 12 days in 28
- At least 5 times per week = at least 20 days in 28

### **Area of residence**

Estimates are grouped according to the region / county / local authority where respondents live, which may not be the same as the area where they walk or cycle. Therefore, caution is needed when interpreting the figures, particularly in large urban areas where there are multiple local authorities in a relatively small area.

### **Local authorities**

The local authorities shown in tables are the administrative districts, counties, metropolitan boroughs and unitary authorities following re-organization in April 2009. The unitary authorities of County Durham, Northumberland, Shropshire, Cornwall, Wiltshire, Bedford, Central Bedfordshire, Cheshire East and Cheshire West and Chester were created in April 2009 and their constituent districts were abolished. Results are also presented for former metropolitan counties.

## **3. Data processing, statistical reliability and hypothesis tests to identify changes**

### **Data weighting**

The APS data is weighted to ensure the results are representative of the population. For local authorities (districts, unitary authorities and metropolitan boroughs) data is weighted by socio-demographic factors - age, gender, ethnicity, household size, working status and socio-economic group. For larger geographies (counties, regions and England), weights are applied by applying the individual local authority weights and then weighting the local authorities within the larger geography by their population. More detailed information about the weighting methodology can be found in the technical report for APS<sup>14</sup>.

### **Sample sizes**

The sample sizes quoted in the tables are unweighted sample sizes. Respondents who answered

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<sup>4</sup> APS1 technical report is available from this page:

[http://www.sportengland.org/research/active\\_people\\_survey/active\\_people\\_survey\\_1.aspx](http://www.sportengland.org/research/active_people_survey/active_people_survey_1.aspx)

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“don’t know” to the relevant question(s) are excluded from the sample for each measure, but those who stated that they are unable to walk are included.

## The Isles of Scilly and City of London

The achieved sample sizes for the Isles and Scilly and the City of London are around 100. These are far smaller than for other areas and therefore results for these areas may not be statistically robust, which is reflected in the wide confidence intervals given. The unusually small populations of Isles of Scilly and City of London<sup>5</sup> also mean that they are not directly comparable with other authorities. Therefore, although results for the Isles of Scilly and City of London are presented in the tables, caution is needed when interpreting these.

## Statistical reliability and confidence intervals

The proportions for walking and cycling participation are estimated from finite samples of people and as such, they may not be exactly the same as the true proportion existing in the population. If a different sample were drawn from the population, the result obtained would differ slightly, due to sampling variability.

Confidence intervals are presented in the tables to demonstrate the statistical reliability of the results. They are 95 per cent confidence intervals – that is, if the sample were to be drawn repeatedly from the population, we would expect the result to lie within the confidence interval 95 per cent of the time, or 19 times out of every 20.

The confidence intervals are presented in the tables as the difference between the estimated value and the upper and lower bounds of the confidence interval:

$$p_{Lower} - p, p_{Upper} - p$$

where  $p$  is the proportion estimated from the survey  
the range  $p_{Lower}$  to  $p_{Upper}$  is the 95 per cent confidence interval.

Confidence intervals for proportions can be calculated using the binomial distribution. The standard approach is to approximate the binomial distribution to a normal distribution, but this approach is not appropriate for small sample sizes or extreme proportions. The Association of Public Health Observatories (APHO) recommends the Wilson Score method as an alternative<sup>6</sup> and this has been used here.

For a simple random sample, the Wilson Score interval is given by:

$$p_{Lower} = \frac{2O + z^2 - z\sqrt{z^2 + 4Oq}}{2(n + z^2)}$$

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<sup>5</sup> According to the 2011 Census, the populations are 2,200 persons (IoS) and 7,400 persons (CoL), compared to 37,400 persons for the next smallest authority (West Somerset).

<sup>6</sup> See APHO report on Commonly used public health statistics and their confidence intervals:  
<http://www.apho.org.uk/resource/view.aspx?RID=48457>

$$pUpper = \frac{2O + z^2 + z\sqrt{z^2 + 4Oq}}{2(n + z^2)}$$

where  $O$  is the number of individuals observed in the sample with the characteristic of interest  
 $n$  is the sample size  
 $q$  is the proportion without the characteristic of interest ( $q = 1-p$ )  
 $z$  is the relevant percentile value from a standard normal distribution (1.96 for a 95 per cent confidence interval).

The APS does not have a simple random sample and a design effect was applied to the calculation above to account for the effects of weighting and stratification of the sample. In practice, this was achieved by replacing  $z^2$  by  $dz^2$  in the equations above to give<sup>7</sup>:

$$pLower = \frac{2O + dz^2 - z\sqrt{d}\sqrt{dz^2 + 4Oq}}{2(n + dz^2)}$$

$$pUpper = \frac{2O + dz^2 + z\sqrt{d}\sqrt{dz^2 + 4Oq}}{2(n + dz^2)}$$

where  $d$  is the design effect.

The design effects published in the APS1 technical report<sup>8</sup> have been used here.

As part of the preparation for the April 2013 release, an error in the calculation of the confidence intervals used for the August 2012 release was detected. We have now corrected this error and revised the confidence intervals published previously. The effect of the error was small and generally resulted in a slight narrowing of the confidence intervals.

### **Hypothesis tests to identify statistically significant differences and changes**

In tables CW0111 and CW0112, we have compared the cycling prevalence for 2010/11 (APS5) and 2011/12 (APS6), to identify whether there has been a statistically significant change in the underlying cycling rate. Where a statistically significant change has not been identified, this suggests that it is more likely that the difference in the observed cycling rate is simply due to random variation in the samples, rather than a genuine change in the underlying cycling rate.

To determine whether the two years of data are significantly different, we have used the “overlapping confidence intervals” approach – where the confidence intervals for the two measures overlap, no statistically significant change has occurred; where they do not overlap, a statistically significant increase or decrease has occurred.

Looking for overlap between the 95% confidence intervals would lead to a comparison which is

<sup>7</sup> We are grateful for advice from the Survey Methodology & Statistical Computing Division on the use of design effects with the Wilson Score interval and constructing hypothesis tests.

<sup>8</sup> APS1 technical report is available from this page:

[http://www.sportengland.org/research/active\\_people\\_survey/active\\_people\\_survey\\_1.aspx](http://www.sportengland.org/research/active_people_survey/active_people_survey_1.aspx)

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more conservative than a 95% test. Therefore, **to test for statistically significant differences at 95 per cent confidence, we have used the 83% confidence interval** for each sample (equivalent to reducing  $z(95\%)$  by a factor of  $\sqrt{2}$ )<sup>9</sup>.

Similarly, the map showing areas which are significantly different from the England average was constructed by looking at overlapping confidence intervals at varying levels of confidence:

- For comparing at 90 per cent confidence, we use  $z(90\%)/\sqrt{2} = 1.16$
- For comparing at 99 per cent confidence, we use  $z(99\%)/\sqrt{2} = 1.82$
- For comparing at 99.9 per cent confidence, we use  $z(99.9\%)/\sqrt{2} = 2.33$

### Further information

1. For an introduction to the concept and use of confidence intervals, see:

<http://www.scotland.gov.uk/Topics/Statistics/Browse/Health/scottish-health-survey/ConfidenceIntervals>

2. A discussion of various methods for calculating confidence intervals, including the Wilson Score interval, can be found in the following paper: Newcombe RG, Two-sided confidence intervals for the single proportion: comparison of seven methods. *Statistics in Medicine*, 1998; 17:857-72.

3. For an explanation of the use of overlapping confidence intervals for comparing proportions, see this paper: ME Payton, MH Greenstone, N Schenker: Overlapping confidence intervals or standard error intervals: What do they mean in terms of statistical significance? *The Journal of Insect Science*, 2003; 3:34.

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## 4. Comparison with other data sources

### The National Travel Survey

The National Travel Survey (NTS) is the DfT's primary source of data on personal travel patterns in Great Britain. The NTS is an annual household survey of around 8,100 households, covering over 19,000 individuals. Although this sample size is insufficient for analysis at local level, NTS provides a useful comparison with the England-level APS results.

NTS consists of face-to-face interviews with respondents and a diary that they keep for a week to record their travel. The interview includes questions about how often respondents cycle and walk:

**How frequently do you walk anywhere for 20 minutes or more without stopping? Please count each single trip as one journey and each return trip as two.**

INCLUDE ALL WALKS, WHETHER FOR PLEASURE OR WITH A PURPOSE. IF ROUND TRIP, COUNT AS ONE JOURNEY

1. 3 or more times a week
2. Once or twice a week
3. Less than that but more than twice a month
4. Once or twice a month
5. Less than that but more than twice a year
6. Once or twice a year
7. Less than that or never

**How frequently do you use a bicycle? Please count each single trip as one journey and each return trip as two.**

1. 3 or more times a week
2. Once or twice a week
3. Less than that but more than twice a month
4. Once or twice a month
5. Less than that but more than twice a year
6. Once or twice a year
7. Less than that or never

An analysis of the 2010 NTS data from the above questions on walking and cycling data (for those aged at least 16 in England) has been performed for comparison with the 2010/11 APS results.

Table 1 compares results from the 2010 NTS for "how frequently do you use a bicycle?" and APS5 for "on how many days in the last 4 weeks have you done any cycling?". The NTS and APS results in Table 1 are broadly in agreement, although the NTS results are higher than APS for the once per month and 3 times per week.

**Table 1: Comparison of APS and NTS results for cycling frequency**

Cycle at least	APS5	NTS*
Once per month	15%	18%
Once per week	10%	10%
3 times per week	4%	6%

\* Note: The "at least once per month / once per week / 3 times per week" measures for the NTS are derived by aggregating the relevant frequency categories in the interview questions (i.e. "at least once per week" = "3 or more times per week" plus "once or twice per week").

Sources: APS – Local Area Walking and Cycling: England 2010/11 (cycle rides of at least 30 minutes)  
NTS – National Travel Survey 2010 (cycle rides of at least 20 minutes)

Table 2 presents a similar comparison, but for walking frequencies. The NTS frequencies are for walks of at least 20 minutes, but as there is no equivalent question in the APS, the frequencies are for walks of at least 30 minutes. The results are broadly consistent for the once per month and once per week measures, but there is a greater discrepancy for the 3 times per week measure.

**Table 2: Comparison of APS and NTS results for walking frequency**

Walk at least	APS	NTS*
Once per month	71%	73%
Once per week	55%	61%
3 times per week	29%	39%

\* Note: The “at least once per month / once per week / 3 times per week” measures for the NTS are derived by aggregating the relevant frequency categories in the interview questions (i.e. “at least once per week” = “3 or more times per week” plus “once or twice per week”).

Sources: APS – Local Area Walking and Cycling: England 2010/11 (walks of at least 30 minutes)  
NTS – National Travel Survey 2010 (walks of at least 20 minutes)

Differences in the results for cycling and walking may arise for a number of reasons:

- 1. Treatment of return trips** – The NTS asks respondents to treat return trips as two journeys, whereas APS simply asks for the number of days on which the respondent did any walking or cycling. Therefore, NTS is likely to report higher frequencies, as observed, particularly for the higher frequency “at least 3 times per week” measure.
- 2. Question time frame** – The NTS question asks respondents to describe their typical behaviour over approximately one year, whereas APS constrains the question to the previous four weeks. There may be some mismatch between respondents’ perceptions of their typical frequency over a year and the actual number of days they cycle in a single month.
- 3. Mode effect** – The NTS interview is conducted face-to-face, whereas APS is a telephone interview. A comparison of sports participation measures derived from a telephone survey and a face-to-face survey revealed some small but systematic differences between the reporting of walking and cycling for the two modes and a similar effect is likely to occur between the NTS and APS.
- 4. Walk length** – NTS asks about walks of at least 20 minutes, whereas APS asks about walks of at least 30 minutes, making an exact comparison impossible.

## The 2011 Census

In February 2013, the Office for National Statistics (ONS) released data from the 2011 Census, relating to people’s mode of travel to work, including the proportion that usually get to work by cycling. The Census data are available at local authority level and thus offer a useful comparison with the APS data. We have assumed that the “% **who cycle at least five times per week**” measure offers a reasonable proxy for comparison with the ONS data.

According to the 2011 Census, around 2 per cent of adults aged 16 to 74 in England travelled to work by bicycle, broadly consistent with the finding in APS5 (covering the 2010/11 period), that 2 per cent of adults cycled at least five times per week.

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The results are also broadly consistent at local authority level – a comparison of the two measures for county districts, metropolitan boroughs and unitary authorities gave an R-squared value of around 0.7. Any discrepancies are likely to be due to:

**1. Exclusion of those not in employment** – The Census figure for cycling to work only includes those aged 16 to 74 who were in employment in the week before the Census (in March 2011), thus excluding students and others who are not in employment. No such distinction is drawn in the APS.

**2. Differences in cycling purpose** – The Census only asks about the mode of travel to work. APS simply asks respondents how often they have cycled, irrespective of where or why they were cycling.

### **Further information**

1. The latest results from the National Travel Survey, along with a detailed technical note, can be found here:

[www.gov.uk/government/organisations/department-for-transport/series/national-travel-survey-statistics](http://www.gov.uk/government/organisations/department-for-transport/series/national-travel-survey-statistics)

2. Data on travel to work from the 2011 Census are available from the [Office for National Statistics \(ONS\) website](http://www.ons.gov.uk).

## **5. Uses of Local Area Walking and Cycling Statistics**

Uses for these statistics within the Department for Transport include:

- evaluation of local area interventions to encourage sustainable travel
- background information in the development and targeting of walking and cycling policies
- ministerial briefing and to answer public enquiries

Outside the Department, users include local authorities, who may be interested in studying the prevalence of walking and cycling in their area and comparator areas and for evaluating interventions. Other users are likely to include Parliamentary Groups, organizations, researchers and individuals with an interest in walking and cycling.

## **6. Other statistics on walking and cycling**

Information about walking and cycling also appears in several other statistical releases produced by the Department for Transport:

Public attitudes to walking and cycling

- Road accidents involving cyclists and pedestrians
- Travel to work by walking and cycling
- Traffic counts of pedal cycles
- Access to services by cycling

These statistics can be accessed from the DfT's Statistics Website -

[www.gov.uk/government/organisations/department-for-transport/about/statistics#statistical-series](http://www.gov.uk/government/organisations/department-for-transport/about/statistics#statistical-series)