

# The new Annual Survey of Hours and Earnings questionnaire

## Key points

- **ONS has introduced a new questionnaire for the 2005 Annual Survey of Hours and Earnings following testing in 2004**
- **The new questionnaire brings significant improvements to the quality of results**
- **The definition of bonus/incentive pay has been changed to give more consistent results**
- **The old questionnaire missed a significant amount of pay paid as allowances**
- **A methodology has been developed to bring 2004 results on to a comparable basis with 2005 results**
- **A set of results for 2004 that are comparable to the ASHE results for 2003 and earlier is still available.**

## Summary

A new questionnaire has been introduced for the 2005 Annual Survey of Hours and Earnings (ASHE). This article analyses the impact of the new questionnaire on ASHE results that are due to be published on the 10 November 2005.

The questionnaire was tested in 2004 and its impact on 2005 results has now been assessed. The new questionnaire has a number of changes to layout and definitions that have brought a noticeable improvement to the quality of the data collected. However, the changes have had an impact on results, particularly in the two areas of bonus/incentive pay and basic pay.

1. The definition of bonus/incentive pay has been changed to enable the estimation of more consistent results by only collecting bonus/incentive pay for the April pay period. Therefore, to compare the 2005 results with those from 2004 the method of compiling estimates of bonus/incentive pay has been changed for 2004 to exclude payments made outside the April pay period.
2. It had been suspected that the old questionnaire under estimated the amount of pay, for example by missing some paid allowances. To capture this, the new questionnaire added a new question asking for 'pay for other reasons'. The results for 2005 show that this new question collects a significant amount of pay that was being missed in 2004. In order to bring the 2004 results to a comparable basis with 2005 a methodology has been designed to estimate for the missing 'pay for other reasons' in 2004.

These changes to 2004 mean that growth between 2004 and 2005 can be calculated. It should be noted that the ASHE survey was first introduced in 2004 to replace the New Earnings Survey (NES). The two main changes introduced in ASHE were weighting and extended coverage using supplementary information. In order to construct a consistent time series weighting has been applied to the NES data sets for 2003 back to 1998, see the article [Annual Survey of Hours and Earnings: An analysis of Historical Data 1998-2003](#). To give a measure of the impact of the improved coverage a second set of 2004 results that exclude supplementary information were published in 2004. These results, which will not be changed except for revisions caused by the late return of some questionnaires, are comparable with the ASHE results for 2003 and earlier.

## 1. Background

The development of the Annual Survey of Hours and Earnings (ASHE), to replace the New Earnings Survey (NES), was the Office for National Statistics' (ONS) first major survey redesign as part of its

modernisation programme. The NES was designed to meet the policy needs of the 1970's and has changed little over the past thirty years. ASHE provides an opportunity to meet users' requirements in the 21st Century, to improve the methodology of the survey and to make use of the new statistical tools ONS will be using in its modernisation programme.

The re-engineering of NES and the subsequent ASHE methodology take forward recommendations made in the [National Statistics Quality Review of the Distribution of Earnings Statistics](#) (DOER) for improving the collection of earnings statistics. The main differences between the ASHE and NES methodologies are the estimation of missing responses, weighting of the results and better coverage. A more comprehensive description is given in the article [Methodology for the Annual Survey of Hours and Earnings](#). These methodological changes were introduced for the 2004 survey and the survey renamed ASHE. However, the questionnaire used to collect the 2004 ASHE data was still the same as had been used for NES. While the DOER recommended a review of the questionnaire for NES as well as the methodology it was not possible to introduce a new questionnaire for the full survey in 2004, since it was necessary to conduct a field test before implementing this change.

Over the life span of the NES the scope and methodology has changed little but there have been some changes to the questionnaire, in particular the addition of new questions. However, the questionnaire was changed while keeping to its original two page design and therefore has resulted in it becoming very cramped. With the user demand to add further questions, for example on pensions and concerns about the wording of some questions, it was decided to completely redesign the questionnaire using current best practice. The new questionnaire improves the layout, routing, wording and definitions used and will lead to more consistent responses improving the quality of the data collected. The questionnaire is also easier to understand and to navigate and so reduces the time taken by users to complete. ONS introduced the new questionnaire for the 2005 survey. Whilst the core data collected by the new questionnaire is essentially the same, questions have been added to collect new information in key policy areas (for example pensions). However, changes to wording and definitions mean that some of the information requested from respondents will differ from that supplied in previous surveys, which could lead to an inconsistency between the results for 2004 and 2005.

Section 2 of this article lists the main differences between the 2005 and 2004 questionnaires. Section 3 describes how the new questionnaire was tested before full implementation. Section 4 looks at the main areas that have been impacted by the changes, that is basic hours worked, bonus/incentive pay and pay for other reasons and how ONS will plan to handle the discontinuities in the results for these questions. Sections 5 and 6 describe how the results will be published and future work that will be done.

## **2. The main differences between the 2005 and 2004 questionnaires**

### **2.1 Design, layout and routing**

The new questionnaire makes use of best practice in questionnaire design. The following improvements have been made:

- The NES questionnaire was accompanied by a set of four pages of explanatory notes. Respondents found it difficult to keep referring back to these notes when answering questions, especially if they had a number of employees selected for the survey and hence had several questionnaires to complete. The new questionnaire has no separate notes. They are included instead beneath the question to which they refer.
- Questions where the respondent has to select an appropriate code from the guidance notes and enter it on the questionnaire have been changed. Such 'self-coding' questions are more complicated for respondents and more difficult for ONS to capture the data for analysis. All self-coding questions have now been redesigned as 'selection questions' where the respondent is given a list of choices and asked to put a cross against one. Hence, there are

no codes for the respondent to enter which makes it easier to complete the questionnaire and should give more consistent responses.

- The new questionnaire makes use of routing questions that guide respondents through it.
- The questions are simpler and less ambiguous. For example questions such as "If the employee's basic pay was calculated by multiplying the number of hours of work by an hourly rate of pay what was the employee's hourly rate of pay?", which asks two questions in one have been simplified and split into two questions.
- The new questionnaire uses 'white space' so that questions do not appear cluttered, making it easier to read.
- Most of the questions have been reworded to simplify or clarify definitions or to improve the consistency of returns.
- More examples of what to include and to exclude have been added to aid understanding.
- The way the job title and description is collected has been changed. While the type of information requested is the same, respondents now have to enter each character in its own box rather than writing in a single box. The job title and description are used to assign an occupation to a person, which is done by a manual inspection of the questionnaire. The capture of individual characters will allow the occupation to be assigned automatically, which will give more consistent results and is more efficient.

These changes along with a small number of new questions have caused the length of the questionnaire to increase from 2 to 4 pages. These changes affected all questions. However, it was the changes to definitions that were expected to have the biggest impact on results. The main changes to definitions were:

## **2.2 Exemptions**

The way in which exemptions from the survey are identified has been simplified. The old questionnaire had a list of eleven types of people who should be considered to be exempt from the survey, for example someone who is self-employed. These were known as exemption categories. For the new questionnaire the exemption categories were removed and replaced by the question 'was the person a paid employee working in the United Kingdom and receiving a salary or wage?'. Specific exclusions were added to an exclusion note below the question, for instance to exclude the self-employed.

## **2.3 Basic hours worked**

The basic hours question was changed from asking for average weekly hours to asking for hours worked in the pay period. This was done to get consistency between the pay and hours information and hence to give better estimates of hourly pay.

## **2.4 Bonus/incentive pay**

The question on bonus/incentive pay for the pay period was changed. NES asked for two types of incentive pay, 'where payments are made in every pay-period' and 'where payments are made less often than every pay period'. Many users found these definitions unclear. For the second type of incentive pay, 'where payments are made less often than every pay period', the definition is such that the amount entered can depend on when the respondent returns the questionnaire. The majority of NES and ASHE returns are received in the period May to August and therefore any incentive/bonus pay paid outside this period but that relates to work done in April will be missed. As most annual bonuses are paid in January to March, NES and ASHE will always miss a significant amount of this second type of bonus pay. However, information about bonuses earned in April will be available on payroll systems at varying times after April and hence a respondent is more likely to be able to supply a value the later their questionnaire is completed. That is questionnaires returned in August are more likely to have information about bonuses earned in April than ones returned in May.

The new questionnaire changes the question to only collect incentive pay paid and earned in the pay period. This makes the definition much clearer. While this will still understate the amount of incentive pay earned in the pay period the definition is precise and should give estimates of incentive pay that are more consistent between years, that is they will not depend on the return date of the questionnaire. This change brings the results more in line with short-term earnings statistics. A comprehensive estimate of incentive pay has always been obtained from the annual bonus/incentive question.

## **2.5 Pay for other reasons**

The annual earnings survey collects gross pay received in the April pay period. These data are used to compile estimates of gross weekly and hourly pay for April. The gross pay is further broken down into basic pay (including allowances), overtime, shift premium and bonus/incentive pay. The NES basic pay question was a 'catch all' question intended to collect all pay that was not bonus/incentive, shift premium or overtime. However, the wording of the question was confusing and ONS suspected that some allowances were not being included by respondents with their basic pay figure. In order to gain a better understanding of the make-up of pay and to clarify what was expected for basic pay it was decided to split the NES basic pay question into two by adding a 'pay for other reasons' question to the new questionnaire. It was expected that most users would just split their old basic pay into the new basic and pay for other reasons. However, it was suspected that some respondents would include other pay that they had not included in the past but the amount of this missing pay was unknown.

## **2.6 Pensions**

The questions on pensions, which is an extremely complex and rapidly changing area, have been updated and extended. The old questionnaire had a page of notes to guide the respondent into self-coding their pension arrangements. These notes have been simplified, brought up to date and included on the questionnaire. The respondent now selects the relevant pension arrangement rather than self-coding. These changes should improve consistency of the pensions data and make it easier for the respondent to complete. New questions asking for pension contributions of both the employer and employee have been added, to address the needs for government and other users for new and better information in this key policy area.

## **2.7 Collective agreements**

The question asking if pay is set with reference to a pay agreement, known as collective agreements, has been simplified. The DOER recommended that ONS reconsider whether the question on collective agreements should remain as it found the quality of the information supplied for the question was not up to standard and that the compliance cost in collecting the information was not justified. Some reasons for the poor quality of the data are:

- There are many cases where the type of agreement does not match to other information on the questionnaire. For example where the person works for a private company but is covered by a public sector agreement.
- The old question was self-coded, with the respondent choosing from a list of 44 codes. This can result in the respondent choosing incorrect codes.
- The list of codes can become out of date.
- The number of respondents in certain collective agreements fluctuated considerably from year to year.

There is a user demand for information about collective agreements, as well as a European requirement at the national level. For these reasons ONS decided to keep the question but to considerably simplify it. The new question only allows for 5 choices, agreements can be either; national, sub-national,

organisational, workplace or a combination. These choices are part of the question and a respondent only has to put a mark against their choice. However, ONS is aware that a breakdown by some of the old collective agreement groups is important to some users. ONS has therefore developed a methodology for deriving a new code that is a good proxy to the old collective agreement code. To do this the methodology uses other information on the questionnaire as well as information available from other data sources. For example, there is a collective agreement for hospital doctors and dentists. This can be modelled using a person's occupation, the industry in which they work, the sector (public or private) in which they work and their place of work information. ONS believes these new proxy codes will meet the majority of user needs and will be more consistent than the old self assessed codes. Details of the methodology will be published in a separate article on the National Statistics web site.

### **3. Testing the new questionnaire**

After discussion with the main users of earnings statistics a draft questionnaire was created in August 2003. This was cognitively tested on 16 employers from a range of industries. This testing attempted to establish if respondents could provide the information and to identify any problems they may have with the questions. It was particularly important to establish if the information could be supplied for the new questions on pension contributions.

In 2004 the questionnaire was tested on a random sample of employers selected from the main ASHE sample. A total of 4,770 questionnaires were sent of which 4,203 were returned. The sample excluded employers who return their information electronically, as it would be impractical to ask such employers to change computer systems just for a field test. Analysis of the results from the field test showed:

- Response rates from the new questionnaire were comparable to the old, despite the increase in the number of pages and the addition of new questions.
- The compliance cost per question was reduced, but the addition of new questions caused the overall time to increase slightly.
- The estimates of gross weekly pay were not statistically different from the estimates from the old questionnaire.
- The estimates of hourly pay were statistically different from the estimates from the old questionnaire. However, by chance the sample selected for the new questionnaire had proportionally more higher earners than the old questionnaire sample, which may have impacted on the results.

The field test highlighted some issues with the new questionnaire, in particular with the basic hours question. Some respondents who were paid monthly gave weekly hours instead of monthly hours or converted weekly hours using a range of different conversion factors. Where possible these errors were corrected in the data before analysis of results. Several changes were made to the questionnaire for 2005 as a result of the field test; amendments were made to the hours questions, to the annual bonus questions, to the pension questions and to the annual leave question.

### **4. Analysis of the impact on results of the new questionnaire**

#### **4.1 Case studies**

In order to try to gain an understanding of why respondents answered the new questionnaire differently a sample of 31 employers who had responded to both the 2005 and 2004 surveys was selected and interviewed by telephone. These case studies focussed on a few particular areas of concern and asked respondents about their understanding of the questions and why their answers differed between years. The studies showed that respondents understood the basic hours question but those that were used to giving weekly hours had just continued to do so for various reasons. Respondents also said that they understood the 'pay for other reasons' question. However, whether they included other pay depended on

the type of pay and how they interpreted the question. The questionnaire for 2006 has been changed to clarify what is required for this question.

#### **4.2 Analysis of 2005 survey returns**

The final stage of the investigation and evaluation of the impact of the new questionnaire was to undertake a detailed comparison of the 2004 and 2005 returns. This identified a number of issues which needed to be studied. These included errors in completing the basic hours question and discontinuities that had been introduced by the improved questions on incentive pay and the breakdown of total pay.

#### **4.3 Basic hours worked**

Despite changes that were made to the questionnaire after the field test, a significant number of respondents still incorrectly answered the basic hours question in 2005. Most of these could be identified by comparison with last year's responses as there is around a 70 % overlap in respondents between survey years. Other checks could be made to identify new respondents who gave incorrect hours. One particular check that was done was on the hours specified for new respondents which were compared to the hours from other respondents from the same company. Another check was made on people who were paid monthly, who gave their hours as 37 or 40 and had a very high hourly rate. Such people were considered to have supplied weekly hours with monthly pay and their hours were then adjusted to a monthly equivalent. These systematic checks and edits corrected for most of the errors but a small number might remain. However, it is expected that the remaining errors have little impact on results for full time employees. This is because the errors tend to place people as part-time workers (working less than or equal to 30 hours) instead of full-time but the proportion of full-time and part-time jobs in the final data set was comparable to earlier surveys.

Further changes have been made to the 2006 questionnaire to try to address these issues. Clearer instructions have been included along with an example of how to convert weekly hours to monthly. To draw the respondents attention to these instructions they are now preceded by a 'stop marker' which consists of the word STOP in a red circle.

#### **4.4 Incentive pay**

Initial results from the 2005 survey showed that the new incentive pay was lower than the 2004 incentive pay, even allowing for the considerable variability that exists in incentive pay. This was as expected given the change in definition for the 2005 incentive pay question. The 2004 questionnaire included two incentive pay questions 'where payments are made in every pay-period' and 'where payments are made less often than every pay-period' and results were compiled by adding together data from both questions. A comparison of the returns showed that the responses in 2005 were similar to the 2004 question 'where payments are made in every pay-period'. This means that by using data from this question only, the results for 2004 could be made roughly comparable to 2005.

At an aggregate level the effect of removing the 'less often' component of bonus pay would decrease by around 1 percent the level of pay in 2004 so this change would increase the growth between 2004 and 2005 by this amount. However, bonus pay does vary by occupation and other factors and so the impact at lower levels of publication will be different. For example higher bonuses tend to be paid in the private sector and hence removing the 'less often' component of bonus pay has a bigger impact on earnings for employees in the private sector compared to those in the public sector.

#### **4.5 Pay for other reasons**

This is a new question and so has no comparable question in 2004. For the 2004 questionnaire where other pay was paid it should have been included as part of the basic pay figure. It was therefore expected that basic pay for 2004 should be comparable to basic plus other pay in 2005. To test this assumption it is

possible to look at the growth between the basic pay questions in both years. Analysis shows that this growth is lower than expected, indicating that the basic pay question for 2004 does include an element of other pay. However, when comparing basic pay plus other pay in 2005 against basic pay for 2004 the growth is higher than expected, indicating that there is other pay in 2005 that was not included in the 2004 basic pay. The case studies also support these conclusions as around half of the respondents stated that they had included other pay in with basic pay in 2004 and the rest that they had missed it out altogether. There was no indication from the case studies of any particular type of other pay that was being missed. Some of the types of other pay mentioned were; car allowances, stand-by allowances, clothing allowances. However, an analysis of the types of employees who receive other pay has showed that 27 per cent of employees in the public sector receive some form of other pay compared to 17 per cent in the private sector.

A methodology has been developed to adjust the 2004 data so that the results are on a comparable basis with 2005. This focused on 'correcting' records and estimating for missing other pay in 2004. Details of the methodology will be made available on the National Statistics web site at the time of the release of the new 2005 results. In summary, the methodology splits the data into two subsets with different approaches for each.

The first subset consisted of those respondents that had reported basic pay in both 2004 and 2005 but also reported other pay in 2005. If the growth between basic pay 2004 and basic pay plus other pay 2005 was greater than 5% then it was assumed that other pay was missing for these records in 2004. A value for other pay 2004 was estimated using the ratio of other pay to basic pay in 2005.

The second subset consisted of those records that only responded in 2004. Some of these records will have missing other pay while others will either have no other pay or will have already included it in the basic pay figure. To correct these, a probabilistic model was developed that had two stages. The first stage was to estimate the probability that a record has missing other pay. A generalised linear model was used with variables occupation, hourly rate excluding overtime and age to assess the probability of a record being incorrect and hence needing a value for other pay to be estimated. Using the responses to these variables each record could then be assessed as to whether it should be estimated or not according to these probabilities.

The second stage was to estimate the size of the missing pay. Again the generalised linear model was used to assess which variables should be used to generate the correction factor. Occupation, sex, age and hourly rate excluding overtime were included in the model and all were statistically significant. A new other pay variable was created for 2004. Correction factors were then calculated and applied to the basic pay for those records that had been selected from stage one as possibly reporting incorrectly in 2004 and a value generated for the missing other pay.

At an aggregate level estimating for missing other pay will increase the level of pay in 2004 by 1 percent and hence remove around 1 percent from the growth between 2004 and 2005. However, other pay does vary by occupation and other factors and so the impact at lower levels of publication will be different. For example, the average size of other pay paid in the public sector is lower than in the private sector but there are sufficiently more public employees that receive other pay that the net effect is to increase private sector pay more than for the public sector.

At the aggregate level the impact of the incentive/bonus pay and the pay for other reasons approximately cancel each other out. However, this is not the case when analysing the results for more detailed breakdowns of the population. Hence there is a need to adjust the 2004 results to bring them on to a comparable 2005 basis. For example, the effect of the change in definition of incentive/bonus pay decreases private sector earnings more than for the public sector, while the change in other pay increases public sector earnings more than for the private sector. The two changes therefore do not cancel each other when looking at a private/public sector comparison.

## **5. Publication and micro data**

ONS currently publishes a consistent time series from 1998 to 2004 and a second dataset for 2004 which includes information from the supplementary surveys which were designed to improve the coverage of ASHE. The latter was previously thought to give the best estimate of the level of pay in 2004. It was not feasible to provide a back series on this basis since there was only one year of this supplementary information available which might not have been representative of other periods. ONS will not at present revise the currently published 2004 results and micro data sets that exclude supplementary information to take account of the findings on incentive and other basic pay since the aim of these results is to provide a consistent time series between 1997 and 2004. However, as is our usual practice these results will be revised to incorporate late returns.

The changes introduced by the new questionnaire have improved the quality of the 2005 data. Therefore, the new results for 2005 are considered to be our best estimates of the pay level and can be published without adjustment.

The currently available 2004 results that include supplementary information will be revised. These will include estimated missing other pay and will be compiled to exclude pay 'where payments are made less often than every pay-period'. These results will therefore be comparable to the 2005 results and will allow growth rates between 2004 and 2005 to be published.

By creating a new variable 'other pay' on the 2004 data set the adjustments described above will be available to users of the ASHE micro data. The adjustments can also be made to any tables generated from the 2004 data set. This allows ONS to answer ad-hoc queries and produce 2004 results that are comparable to 2005. However, the imputation of missing other pay for 2004 is done using a probabilistic method that was designed to give plausible results at high levels of aggregation. Using the estimated other pay at the micro data level may give some unexpected results.

## **6. Future work**

ONS already has a long term programme of work that is looking at the feasibility of constructing consistent time series back to 1992. This programme includes looking at the impact of the supplementary surveys and the impact of the Labour Force Survey on the calculation of ASHE weights. The possibility of making adjustments to the results for 2003 and earlier for the incentive and other pay changes that have been described in this article will be included as part of this programme of work.

A copy of the NES questionnaire used in 2004 can be found at:  
<http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=13101>

A copy of the ASHE questionnaire used in 2005 can be found at:  
<http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=13101>