# Fertility, 2012-based NPP Reference Volume 

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## 1. Introduction

For the UK as a whole the key measure used in setting the fertility assumptions in the national projections is average completed family size. This has been falling from a peak of nearly 2.5 children per woman for women born in the mid-1930s and the projections assume that this will level off at 1.89 children for women born in 2005 and later. This long-term assumption represents a rise of 0.05 from the 2010-based projections.

The assumptions made about completed family size, which underlie this projection round, are based on an analysis of recent trends in fertility and an assessment of their implications for future completed family sizes, together with other relevant information such as the views of the expert advisory panel. These assumptions about future levels of fertility are set for each of the UK's constituent countries separately, and then combined to obtain the assumption for the UK as a whole.

This chapter discusses past trends in fertility and summarises the resulting assumptions adopted for the 2012based population projections.

## 2. Recent trends in fertility

Fertility assumptions are formulated in terms of completed family size - the average number of children that women born in particular years will have. As Figure 3-1 shows, this cohort measure of fertility is more stable than the total fertility rate (TFR), the calendar year (period) measure. This is because the completed family size is affected only by changes in the total number of children women have and not by the timing of births within women' s lives. The TFR, in contrast, may rise or fall if births are brought forward or delayed for any reason ${ }^{1}$. The TFR measures the average number of children that a group of women would have if they were to experience the agespecific fertility rates of the year in question throughout their childbearing lives.

The completed family size is plotted against the year in which the women were, or will be, aged 30 (the approximate mid-point of the childbearing ages). Average completed family size reached around 2.45 children per woman among those born in the mid-1930s, who would have been in their peak childbearing ages in the early to mid-1960s. Since then the completed family size in the UK has fallen steadily, with women born in 1967 - the most recent cohort for whom there are data up to age 45 - having on average 1.90 children.

Figure 3-1: Actual and assumed total fertility rate (TFR) and average completed family size (CFS), United Kingdom, 1951-2037


Source: Office for National Statistics
Notes:

1. Completed family size relates to cohort born 30 years earlier -30 years being the approximate mid-point of the childbearing ages. Projected completed family size is given for cohorts who have not yet completed childbearing
2. Figures have not been revised to take account of the 2011 Census for Scotland. Revised population estimates for Scotland and the UK for 2002-2010 were not available at the time of projection
3. All fertility data are displayed on a calendar year basis

Fertility rates in the UK fell sharply from the 'baby boom' peak in the TFR of just under three children in 1964 to a trough of 1.69 in 1977. During the 1980s, the TFR stayed relatively stable at around 1.8 children then fell to around 1.7 in the second half of the 1990s. In recent years the UK has seen increases in the TFR, from 1.63, the lowest point ever recorded in 2001, to 1.91 in 2008. In 2009 the TFR fell slightly to 1.90 , a dip likely to be related to the economic recession. Following this the TFR increased slightly in 2010 to 1.93 and has fluctuated since. There has been some variation between UK countries since 2009 with a stabilisation then recovery in England, while in Scotland the TFR continued to fall, in Wales it fluctuated and Northern Ireland's fertility was broadly stable from 2010 onwards.

Fertility rates among women in their thirties and forties in the UK have continued to rise at a fast pace since the turn of the century, reaching levels last seen during the 1960s baby boom. This increasing fertility among older women continued despite the TFR drop in 2009 and the fluctuations since. Since 2002 there have also been smaller increases in fertility among women in their late twenties and stabilisation among women in their early twenties, following declining fertility in these age groups during the 1990s. Fertility rates for women aged under 20 have been declining since their peak in the late 1960s. The combination of trends in these age groups has led to the rise in overall fertility over the decade, as well as further small increases in the average age at childbirth.

Apart from the recuperation in fertility at older ages by women born in the late 1960s and 1970s, other factors that could be associated with recent increases in period fertility include the increasing proportion of women of childbearing age born outside the UK (who have above average fertility), and the possible role of changes relating to support for families (such as tax credits or maternity and paternity leave) - see references ${ }^{2,3,4,5,6}$ for further discussion of these factors.

The 1965, 1970 and 1975 cohorts have had steadily fewer children by the ages of 25 and 30 than earlier cohorts, and this trend continues with the data now available for the 1980, 1985 and 1990 cohorts. The exception is a rise in the average achieved family size, at the age of 30, between the 1975 and 1980 cohorts (Table 3-1). This is due to growth in the number of children achieved between the exact ages of 25 and 30 . The 1975 cohort achieved 0.47 children, whereas the 1980 cohort achieved 0.50 children. This reflects the increases in the period fertility of 25-29 year olds from 2002 to 2008.

Women born between 1960 and 1970 have been increasingly 'catching up' in their thirties. For example, women born in 1975 on average achieved 0.53 children between their 30th and 35th birthdays compared with 0.45 for women born ten years earlier.

Table 3-1: Average achieved family size by age (exact years) and year of birth of woman, United Kingdom, women born 1950-1990

|  |  |  |  |  |  | Age |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| Cohort born | 20 | 25 | 30 | 35 | 40 | 45 | Final |
| 1950 | 0.23 | 0.93 | 1.56 | 1.93 | 2.06 | 2.09 | 2.09 |
| 1955 | 0.22 | 0.78 | 1.43 | 1.84 | 2.00 | 2.03 | 2.03 |
| 1960 | 0.16 | 0.68 | 1.31 | 1.75 | 1.94 | 1.98 | 1.98 |
| 1965 | 0.13 | 0.59 | 1.18 | 1.64 | 1.85 | 1.91 | 1.91 |
| 1970 | 0.15 | 0.57 | 1.09 | 1.56 | 1.83 | $:$ | $:$ |
| 1975 | 0.15 | 0.51 | 0.98 | 1.51 | $:$ | $:$ | $:$ |
| 1980 | 0.15 | 0.50 | 1.00 | $:$ | $:$ | $:$ | $:$ |
| 1985 | 0.14 | 0.49 | $:$ | $:$ | $:$ | $:$ | $:$ |
| 1990 | 0.13 | $:$ | $:$ | $:$ | $:$ | $:$ | $:$ |

Source: Office for National Statistics
Note:

1. Figures have not been revised to take account of the 2011 Census for Scotland. Frevised population estimates for Scotland and the UK for 2002-2010 were not available at the time of projection

## 3 . Fertility assumptions for the United Kingdom

In the 2012-based projections, the long-term completed family size is assumed to be 1.89 children per woman. This is 0.05 above the level assumed in the 2008 and 2010-based projections, but is still below 'replacement level'. The 'replacement level' family size of 2.075 represents the approximate number of children per woman needed for the population to replace itself in the long-term (in the absence of migration). 7 The TFR in the UK has been below replacement level since the early 1970s and the completed family size assumed for the long-term falls around 9\% below replacement level.

Table 3-1 and Figure 3-2 show the achieved family sizes of selected cohorts at successive ages. From 1950, each subsequent cohort has had fewer children by each age (with the exception of teenagers) than earlier cohorts. For example, the 1975 cohort had averaged 0.98 children each by their 30th birthday, 0.11 children fewer on average than the 1970 cohort at the same age. However, the 1980 cohort has more children by age 30 than the 1975 cohort. The relative stabilisation of recent cohort sizes was one of the factors that supported raising the fertility assumptions of UK countries in this projection round.

Figure 3-2: Average achieved family size by age and year of birth of woman, United Kingdom, women born 1945-1990


## Source: Office for National Statistics

## Notes:

1. Figures have not been revised to take account of the 2011 Census for Scotland. Revised population estimates for Scotland and the UK for 2002-2010 were not available at the time of projection

There is also evidence of strong recuperation at older ages for women born between 1960 and 1970. These cohorts delayed their fertility at younger ages but have been experiencing relatively high rates at older ages compared with earlier cohorts. For example, Table 3-2 shows that women born in 1965 had on average 0.22 children between the ages 35-39, compared with 0.16 children for the 1955 cohort. Thus the completed family sizes of more recent cohorts will not be as low as they would have been, had their fertility at older ages stayed at levels experienced by earlier cohorts.

Table 3-2: Average number of children between given ages by year of birth of woman, United Kingdom, women born 1950-1990

|  | Under 20 | $20-24$ | $25-29$ | $30-34$ | $35-39$ | $40-44$ | 45 and over |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| 1950 | 0.23 | 0.70 | 0.63 | 0.36 | 0.13 | 0.03 | 0.00 |
| 1955 | 0.22 | 0.56 | 0.65 | 0.40 | 0.16 | 0.03 | 0.00 |
| 1960 | 0.16 | 0.53 | 0.63 | 0.44 | 0.19 | 0.04 | 0.00 |
| 1965 | 0.13 | 0.46 | 0.59 | 0.45 | 0.22 | 0.05 | 0.00 |
| 1970 | 0.15 | 0.42 | 0.52 | 0.47 | 0.28 | $:$ | $:$ |
| 1975 | 0.15 | 0.36 | 0.47 | 0.53 | $:$ | $:$ | $:$ |
| 1980 | 0.15 | 0.35 | 0.50 | $:$ | $:$ | $:$ | $:$ |
| 1985 | 0.14 | 0.36 | $:$ | $:$ | $:$ | $:$ | $:$ |
| 1990 | 0.13 | $:$ | $:$ | $:$ | $:$ | $:$ | $:$ |

Source: Office for National Statistics
Notes:

1. Figures have not been revised to take account of the 2011 Census for Scotland. Revised population estimates for Scotland and the UK for 2002-2010 were not available at the time of projection

Figure 3-3 shows this recuperation more clearly. The fertility of selected cohorts is shown relative to the 1965 cohort, who completed their fertility with an average of 1.91 children per woman. Although the 1970, 1975 and 1980 cohorts fell increasingly behind the 1965 cohort during their twenties, the curves for these cohorts after around age 28 rose steeply towards the 1965 level due to higher fertility at older ages, with the 1970s cohorts set to catch up with the completed family size of the 1965 cohort.

Figure 3-3: Difference between average achieved family size by age and year of birth of woman, United Kingdom, 1965 cohort compared with women born 1970-1990


## Source: Office for National Statistics

## Notes:

1. Figures have not been revised to take account of the 2011 Census for Scotland. Revised population estimates for Scotland and the UK for 2002-2010 were not available at the time of projection

Women born in 1980 have followed a very similar fertility trajectory to the 1975 cohort up to age 25, but are now showing higher fertility from age 28 onwards. This represents a marked difference from the previous pattern where successive cohorts born between the 1940s and the 1960s achieved lower fertility by each age than their predecessors, and suggests that falls in cohort fertility are bottoming out. However women born in the late 1980s have experienced slightly lower teenage fertility than those born in the 1970s and early 1980s and so they will have further to catch up at older ages if they are to match the achieved family sizes of their predecessors.

## 4 . Fertility assumptions for the constituent countries

Figure 3-4 and Figure 3-5 show the actual and assumed trends in the TFR and completed family size for the constituent countries of the UK. All four countries have seen an upturn in the TFR between 2002 and 2008, and then broadly stable rates, except for Scotland which declined (Figure 3-4). In 2012 the TFRs for England and Wales were 1.94 and 1.88 children per woman, respectively. Northern Ireland has historically had higher fertility than the rest of the UK and in 2012 its TFR was 2.03. Scotland has had lower fertility than England since the early 1980s and in 2012 its TFR was 1.67.

Recent trends do not provide any strong evidence of convergence in the overall levels of fertility between the individual countries, so current differentials are reflected in the completed family sizes assumed for the long-term (Figure 3-5).

Figure 3-4: Actual and assumed total fertility rates, constituent countries of the UK, 19732037


## Source: Office for National Statistics

## Notes:

1. Figures have not been revised to take account of the 2011 Census for Scotland. Revised population estimates for Scotland and the UK for 2002-2010 were not available at the time of projection

Figure 3-5: Actual and assumed completed family size, constituent countries of the UK, women born 1943-2007


Source: Office for National Statistics

## Notes:

1. Figures have not been revised to take account of the 2011 Census for Scotland. Revised population estimates for Scotland and the UK for 2002-2010 were not available at the time of projection
2. Figures to the right of the dotted line are partly or wholly assumed

The achieved family sizes to date for the individual countries of the UK for selected cohorts are shown in Table 33. For the 1962 and 1967 cohorts - who can now be effectively regarded as having completed their childbearing - average family sizes were lowest in Scotland and highest in Northern Ireland. In the 1962 cohort England had larger completed family size than Wales, and this was reversed for 1967, the most recent cohort to complete childbearing. While the 1962 and 1967 CFS for the UK, England and Wales are similar, there were declines for Scotland and Northern Ireland between these cohorts. These 1967 patterns persist among the 1972 and 1977 cohorts, but for younger cohorts Wales' CFS is higher than for Northern Ireland, due to the younger age pattern of childbearing in Wales.

For the 2012-based projections, the long-term fertility assumptions for England, Wales, Northern Ireland and Scotland have been slightly raised when compared to the 2010 and 2008 based; the assumed long-term completed family size is 1.90 children per woman for England and for Wales, 2.00 for Northern Ireland and 1.75 in Scotland. Table 3-4 illustrates, for each constituent country of the UK, the assumed progression in completed family size from cohorts who have recently finished childbearing to those who have not yet started. The CFS is assumed to rise slightly for the cohorts between 1975 and 1990, before declining back down to the long term trend.

Table 3-3: Achieved family size attained by 2012, constituent countries of the UK, women born 1952-1992

| Cohort born | Achieved to age | United Kingdom | England | Wales | Scotland | Northern Ireland |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| 1952 | Complete | 2.07 | 2.05 | 2.06 | 2.02 | 2.73 |
| 1957 | Complete | 2.02 | 2.01 | 2.06 | 1.94 | 2.50 |
| 1962 | Complete | 1.94 | 1.94 | 1.92 | 1.87 | 2.36 |
| 1967 | Complete | 1.90 | 1.90 | 1.97 | 1.78 | 2.18 |
| 1972 | Age 40 | 1.83 | 1.84 | 1.87 | 1.69 | 1.99 |
| 1977 | Age 35 | 1.62 | 1.63 | 1.70 | 1.50 | 1.71 |
| 1982 | Age 30 | 1.13 | 1.13 | 1.24 | 1.05 | 1.17 |
| 1987 | Age 25 | 0.60 | 0.60 | 0.68 | 0.52 | 0.53 |
| 1992 | Age 20 | 0.16 | 0.16 | 0.18 | 0.16 | 0.15 |

Source: Office for National Statistics
Note:

1. Figures have not been revised to take account of the 2011 Census for Scotland. Revised population estimates for Scotland and the UK for 2002-2010 were not available at the time of projection

Table 3-4: Actual and assumed average completed family size for the constituent countries of the UK, women born 1950-2010

| Cohort born | United Kingdom | England | Wales | Scotland | Northern Ireland |
| :--- | ---: | ---: | ---: | ---: | ---: |
| 1950 | 2.09 | 2.06 | 2.10 | 2.08 | 2.87 |
| 1955 | 2.03 | 2.02 | 2.05 | 1.95 | 2.65 |
| 1960 | 1.98 | 1.98 | 1.99 | 1.87 | 2.42 |
| 1965 | 1.91 | 1.91 | 1.96 | 1.80 | 2.22 |
| 1970 | 1.90 | 1.91 | 1.94 | 1.74 | 2.11 |
| 1975 | 1.90 | 1.91 | 1.92 | 1.73 | 2.00 |
| 1980 | 1.96 | 1.97 | 1.94 | 1.75 | 2.12 |
| 1985 | 1.98 | 2.00 | 1.98 | 1.77 | 2.08 |
| 1990 | 1.98 | 2.00 | 2.00 | 1.77 | 2.07 |
| 1995 | 1.92 | 1.93 | 1.92 | 1.75 | 2.03 |
| 2000 | 1.90 | 1.91 | 1.91 | 1.76 | 2.01 |
| 2005 | 1.89 | 1.90 | 1.90 | 1.75 | 2.00 |
| 2010 and later | 1.89 | 1.90 | 1.90 | 1.75 | 2.00 |

Source: Office for National Statistics
Note:

1. Figures in bold are partly or wholly projected
2. Figures have not been revised to take account of the 2011 Census for Scotland. Revised population estimates for Scotland and the UK for 2002-2010 were not available at the time of projection

Between 2002 and 2008, total fertility rates increased in all constituent countries of the UK, followed by a dip in 2009. All countries except Scotland then showed a recovery from 2010 onwards. For the latest projections, the total fertility rate for the UK has been assumed to slightly decrease from 2012 before fluctuating in the short term and levelling off at 1.89 by 2029.

## 5. Fertility assumptions age and sex distribution

## Assumed age pattern of fertility

Table 3-5 summarises assumed fertility rates for the UK by five-year age groups. The age pattern is projected to change slightly over the projection period, with fertility rates for women aged 40 and over increasing, and rates for women aged under 20 decreasing slightly. Fertility rates for women in their 20s are also assumed to decrease slightly, and this is offset by slight increases for women in their 30s.

The mean age at motherhood for the UK is assumed to rise gradually from 28.4 years for the 1965 cohort to its long-term level of 30.2 years for those born from 2005 onwards. Among the constituent countries of the UK, the mean age at motherhood assumed for the long-term varies from 29.5 years in Wales, to 30.1 in Scotland, 30.2 in England and 30.4 years in Northern Ireland.

Table 3-5: Actual and assumed births per 1,000 women by age and year of birth of woman, United Kingdom, women born 1950-2010

| Cohort born | Under 20 | $20-24$ | $25-29$ | $30-34$ | $35-39$ | 40 and over | Mean age at motherhood (years) |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| 1950 | 231 | 699 | 634 | 365 | 132 | 28 | 26.4 |
| 1955 | 221 | 561 | 650 | 403 | 163 | 36 | 27.1 |
| 1960 | 156 | 527 | 630 | 438 | 190 | 43 | 27.8 |
| 1965 | 133 | 457 | 594 | 454 | 216 | 57 | 28.4 |
| 1970 | 152 | 418 | 522 | 466 | 276 | 70 | 28.8 |
| 1975 | 147 | 361 | 469 | 534 | 314 | 73 | 29.4 |
| 1980 | 154 | 346 | 499 | 561 | 322 | 75 | 29.5 |
| 1985 | 135 | 357 | 517 | 566 | 328 | 76 | 29.6 |
| 1990 | 128 | 350 | 519 | 574 | 332 | 77 | 29.7 |
| 1995 | 96 | 321 | 509 | 579 | 335 | 77 | 30.0 |
| 2000 | 87 | 318 | 506 | 580 | 335 | 77 | 30.1 |
| 2005 | 81 | 316 | 504 | 580 | 335 | 77 | 30.2 |
| 2010 and later | 80 | 315 | 504 | 580 | 336 | 77 | 30.2 |

Source: Office for National Statistics
Note:

1. Figures have not been revised to take account of the 2011 Census for Scotland. Revised population estimates for Scotland and the UK for 2002-2010 were not available at the time of projection
2. Figures in bold are partly or wholly projected

## Assumed sex ratio at birth

It is assumed that there will be 105 boys born for every 100 girls. This is in line with the actual sex ratios recorded in the UK over the period 1999 to 2012, which averaged 105.2. The average levels in each constituent country of the UK are similar, although there is substantial year-on-year fluctuation, particularly in Scotland, Wales and Northern Ireland. Varying the sex ratio to reflect small changes over time or any differences between countries would have a very small effect on the resultant UK population projections. Thus the ratio of 105 assumed since the 2006-based projections has been maintained in all individual countries of the UK.

## 6 . Distribution of completed family size

The assumptions for these projections have been informed by the use of a birth order probability model for England \& Wales maintained by the Office for National Statistics (ONS) 8, 9,10. This model also provides details of a distribution of women by number of children that is consistent with the fertility assumptions used for the 2012based projections.

Table 3-6 shows that the proportion of women who remain childless by age 45 in England \& Wales has been increasing in recent years, from an estimated $14 \%$ of the 1950 cohort to $20 \%$ of women born in 1965. The rise in childlessness was the main factor in the reduction in completed family size for cohorts born in the 1950s through to the early 1960s, since the average number of children for women who were not childless remained fairly stable for these cohorts at around 2.4.

In the long-term, for cohorts born from the mid-1990s, it is assumed that $18 \%$ of women will remain childless. The drop in completed family size, from 1.98 for the 1960 cohort to the 1.90 assumed for those born from the mid2000s onwards, is consistent with a decrease in the average completed family size of women who have children from 2.45 to 2.33 . The family size distribution consistent with the 2012-based projections is similar to the distribution produced alongside the 2010-based projections, though the 2012-based projections assume a slightly lower level of childlessness, and slightly more children for women who have children.

Table 3-6: Actual and assumed distribution of women by number of children and year of birth of woman, consistent with 2012-based projections, England and Wales women born 1950-2010


Source: Office for National Statistics
Notes:

1. Figures for 1950 to 1965 (inc) are actual, 2000 onwards are wholly assumed, and between 1970 and 1995 (inc) are based on partly actual and partly assumed data
2. Comparable figures for Scotland and Northern Ireland are not available

## 7 . Future fertility levels

For the 2006-based projections, the fertility assumptions were raised for the first time since the 1960s, with the long-term level of completed family size for the UK increasing from 1.74 to 1.84 children per woman. For the 2008-based projections, the long-term assumptions remained unchanged following a review of the available evidence, except in Scotland where the assumption was raised slightly. In 2010 the assumptions were maintained at the 2008-based levels. The review by ONS prior to the 2012-based projections proposed raising the assumptions slightly to reflect continued high level of period fertility and the impact of this on the achieved fertility of women born in the 1970s and 1980s, suggesting that falls in completed family size are slowing. This recommendation was accepted in line with the following arguments:

The NPP advisory panel was asked their views on the likely level of fertility in 2036. Six out of seven experts thought that the UK TFR would be between 1.80 and 2.00 in 2036 , with four of the experts feeling it would be between 1.90 and 2.00. This suggests that experts believe fertility is likely to maintain its current period level in the long-term.

When considering likely factors affecting future fertility for the 2012-based projections, some could put downward pressure on fertility levels, for example continued increases in female employment and higher education that raise the opportunity costs of childbearing, and changes in socio-economic conditions such as housing cost and availability. Others factors could put upward pressure on fertility in the long-term; these include the continuing inmigration of women from countries with higher fertility than the UK and perhaps the increased ability of women to realise their fertility intentions, for example by more flexible working patterns for parents. The uncertainty inherent in future trends in these factors, particularly in the prevailing economic and social climate, makes it difficult to judge whether those having an upward or downward influence will have the stronger influence on fertility in the long-term.

In order to decide on plausible assumptions for long-term fertility, the completed family sizes resulting from different scenarios for possible trends in fertility at different ages were examined. As agreed in consultation with key users, the final projection for the UK is broadly based on a long-term scenario with a fairly flat profile, with only minimal variation over time before reaching the end TFR. This scenario projects small declines for women aged under 20 and in their early 20s. Women aged 25-34 are projected to have stable fertility at a similar level to 2012. Women aged 35-39 and women aged over 40 are projected to experience small increases in their fertility.

For the short-term, fertility projections have been based around the latest trends in age-specific fertility. This means that the fertility rates of all countries are projected to decline slightly in the first year of the projection, on the basis of published births numbers for the first quarter of 2013 being lower than for previous years. Following this decline the fertility rates gradually climb towards the longer term projected levels, and due to the long term assumptions being close to current levels, these are reached quite quickly.

## 8. References

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8. Smallwood S (2002). New estimates of trends in births by birth order in England and Wales. Population Trends 108: http://www.ons.gov.uk/ons/rel/population-trends-rd/population-trends/no--108--summer-2002 /new-estimates-in-trends-of-birth-by-birth-order-in-england-and-wales.pdf
9. For application in population projections, see also Smallwood $S$ (2003). Fertility assumptions for the 2002based national population projections. Population Trends 114: http://www.ons.gov.uk/ons/rel/population-trends-rd/population-trends/no--114--winter-2003/fertility-assumptions-for-the-2002-based-national-population-projections.pdf
10. Since May 2012, information on previous children has been collected from all women at birth registration, so from 2013 onwards, birth order will no longer be estimated from the General Lifestyle Survey for births outside marriage.

## 9. Background notes

1. The 2012-based Population Projections for United Kingdom and constituent countries were published on $\underline{6}$ November 2013 (main release) and 10 December 2013 (extra variants).
2. Details of the policy governing the release of new data are available by visiting www.statisticsauthority.gov. uk/assessment/code-of-practice/index.html or from the Media Relations Office email: media.relations@ons. gsi.gov.uk

These National Statistics are produced to high professional standards and released according to the arrangements approved by the UK Statistics Authority.

