An Analysis of Under 18 Conceptions and their Links to Measures of Deprivation, England and Wales, 2008-10

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Abstract

This article explores the most recent annual under 18 conception data using three year aggregates and averages. It highlights patterns in the data and explores possible reasons for these patterns. Under 18 conceptions are considered in context, with comparisons drawn to under 16 conceptions as well as selected population and urban aspects. Under 18 conceptions and their links to measures of deprivation at the national and regional level are made using the new Office for National Statistics (ONS) Conceptions-Deprivation Analysis Toolkit. The measures of deprivation chosen for this article are the English Indices of Multiple Deprivation, the percentage of children living in poverty and the unemployment rate.

Acknowledgements

1. The author would like to thank colleagues from the Office for National Statistics, the Department of Health, the Department for Education and the Welsh Government for their input into this article during peer review. Particular thanks go to Tom Mahoney for his work on the interactive Conceptions-Deprivation Analysis Toolkit.

Definitions

Conception statistics bring together records of birth registrations collected under the Births and Deaths Registration Act (1953) and of abortion notifications received under the Abortion Act (1967), amended by the Human Fertilisation and Embryology Act (2008). They include all pregnancies of women usually resident in England and Wales which lead to one of the following outcomes:

- a maternity at which one or more live births or stillbirths occur, which is/are registered in England and Wales;
- a termination of a pregnancy by abortion under the 1967 Act, which takes place in England and Wales.

Conception statistics do not include miscarriages or illegal abortions¹.
Under 18 conceptions are conceptions to women aged 17 or under. Under 18 conception rates are under 18 conceptions per 1,000 women aged 15 to 17.

Notes

1. For more information about conceptions issues, processing and terminology see the conceptions metadata document.

Key points

• An analytical toolkit looking at teenage conceptions and measures of deprivation has been developed by ONS and is freely available online for the first time.

• Under 18 conception rates were generally high in local authorities containing seaside towns, the Welsh Valleys, major urban centres and in bands in the north of England.

• Under 18 conception rates were strongly linked to under 16 conception rates.

• Under 18 conception rate rankings were correlated with rankings for English Indices of Multiple Deprivation at local authority level; under 18 conception rates were correlated with unemployment rates and the percentage of children in poverty.

• London was not as strongly correlated as other regions when looking at the link between under 18 conceptions and measures of deprivation.

• Under 18 conception rates were found not to be strongly correlated to the urban-rural classification of local authorities or to their population density.

Introduction

The purpose of this article is to conduct analysis into under 18 conceptions to identify patterns in the data and to demonstrate some of the analytical techniques that could be undertaken in further research. The relationship between under 18 conceptions and measures of deprivation are also examined. The measures assessed in this article are the English Indices of Multiple Deprivation, child poverty and unemployment, although it is recognised that these measures of deprivation may themselves be correlated with one another.

As part of this analysis a Conceptions-Deprivation Analysis Toolkit was developed, allowing comparisons between regions and local authorities on various datasets to be made. The toolkit contains more datasets than are explored in this article\(^1\).

This article and the Conceptions-Deprivation Analysis Toolkit are not the only way to analyse conceptions and their link to deprivation, but simply one way of analysing the data available on some datasets of interest; other deprivation measures are available. Techniques used in this article include the Pearson product-moment correlation coefficient, a measure of the strength of relationship between two variables, and quintile analysis.
This article begins by looking at the importance of teenage conceptions data and outlines some of their users and uses, including looking at the policy context of conception statistics. Analysis of under 18 conception statistics is split into seven sections:

1. Under 18 conceptions over time.
2. Regional and sub-regional analysis of under 18 conceptions.
3. Under 18 conception comparisons with under 16 conceptions.
4. Under 18 conceptions and urban aspects (looking at links with population density and the Urban-Rural Classification).
5. Under 18 conceptions and the English Indices of Multiple Deprivation.
7. Under 18 conceptions and unemployment.

Within the analysis, some possible explanations for differences in the correlations between the English regions and Wales are put forward along with suggestions for further analysis in the summary section.

Notes

1. The datasets available in the under 18 conceptions-deprivation analysis toolkit can be found in Annex 1.

The importance of the issue of teenage conceptions

It is widely understood that teenage conception and early motherhood can be associated with poor educational achievement, poor physical and mental health (for both mother and child), social isolation and poverty. There is also recognition that socio-economic disadvantage can be both a cause and a consequence of teenage motherhood (Swann et al., 2003). This led the Labour Government (1997 to 2010) to set a target to halve the under 18 conception rate in England by 2010, when compared with 1998. Local authorities set 10 year strategies in place, aiming to reduce the local rate between 40% and 60%. These local targets aimed to help underpin the national 50% reduction target. The Department for Education was charged with monitoring the overall situation and many local authorities appointed teenage pregnancy co-ordinators to focus specifically on reducing teenage conceptions in their area.

These targets were discontinued under the Coalition Government, which came to power in 2010; however, teenage pregnancy has remained an area of policy interest. The under 18 conception rate is one of the three sexual health indicators in the Public Health Outcomes Framework (2013–2016) covering English measures of progress on child poverty, continuing the focus on preventing teenage conceptions as well as the social impact on teenage mothers. In Wales teenage conceptions are used as an indicator in the Sexual Health and Well-being Action Plan for Wales, 2010–15.
It should be noted that teenage conceptions can be the result of planning within established
relationships and as such are not always cause for concern.

Notes

1. A list of the risk factors associated with teenage conception can be found in Annex 2 and Annex
3 so that some of the causes of under 18 conception and the impact it has on the child can be
better understood by people using the statistics.

Users and uses of conception statistics

The Department for Education (DfE) is a key user of conception statistics. DfE monitors the number
and rate of under 18 conceptions and provide these data to local authorities to assist them in their
wider work to reduce child poverty and narrow inequalities.

The Department of Health (DH) is also a key user of conception statistics. DH monitors the rate of
under 18 conceptions under the Public Health Outcomes Framework (2013–2016) as part of the
measures of health improvement.

In Wales, teenage conception rates are used widely as outcome indicators in the sexual health
context. For example they are used in the Sexual Health and Well-being Action Plan for Wales,
2010–15, as well as being a general indicator of health and health inequality, such as in Our Healthy
Future. The under 18 conception rate is the most commonly used and, along with the underage rate
(under 16 years), forms a key health indicator for children and young people. See, for example, the
Child Poverty targets.

English local authorities use the conceptions data, particularly the number and rate of under 18
conceptions to feed into their Joint Strategic Needs Assessments and to inform their commissioning
decisions. They also use the statistics to make comparisons with other local areas and with the
county, region and national level.

Sexual health charities that provide the public with information, advice and support services use the
statistics to promote services that contribute to the reduction in conceptions.

Academics use the data to examine the success of policy at the national and local level as well as to
inform research on various demographic topics.

The article and toolkit will be of particular interest to those in local authorities looking at under 18
conceptions and/or deprivation measures, those working with young mothers and those involved
with family planning initiatives targeted at young women. It will also be of interest to those looking to
measure the success of local policies. The toolkit allows users to look at their statistical neighbours\(^1\)
and draw comparisons, as well as looking at geographical ones.

The analyses and data may also be of interest to people who need to comprehend and evaluate
conceptions statistics and feed into under 18 conception or child poverty strategies.
Notes

1. Statistical neighbours are local authorities which are deemed to be most statistically similar across a range of socio-economic and demographic factors.

1. Under 18 conceptions over time

Key points:

• In both England and Wales under 18 conception rates fell between 1998 and 2010.
• Under 18 conception rates fell in all English regions between 1998 and 2010.
• The under 18 conception rate fell the most in Wales (31.5%) and the least in the North West (19.1%) over this period.
• The difference between the under 18 conception rates in 1998 and 2010 was highest in Wales (17.3 conceptions per thousand women aged 15 to 17) and lowest in the East of England (a rate difference of 8.1).

Prior to 1969, the first year for which abortions data are available, conception figures would have simply referred to the number of maternities\(^1\).

Figure 1 shows the under 18 conception rates\(^2\) for England, Wales, and England and Wales back to 1998\(^3\).

Figure 1 - Under 18 conception rates, England and Wales, 1998–2010

[Graph showing under 18 conception rates from 1998 to 2010 for England, Wales, and England and Wales, with a clear downward trend.]
Figure 1 shows that the under 18 conception rate for Wales was higher than that for England and for England and Wales throughout the period; the rate for England and Wales almost exactly matched the rate for England due to the vast majority of under 18 conceptions in England and Wales taking place in England.

It can be seen that the rate for under 18 conceptions has been generally falling and that the under 18 conception rate for Wales has fallen more than for England or for England and Wales. Between 1998 and 2010, the under 18 conception rate for Wales fell by 17.3 conceptions per 1,000 women aged 15 to 17 (from 55.0 to 37.7), while the rate for England and Wales fell by 11.6 (from 47.1 to 35.5) and the rate for England fell by 11.2 (from 46.6 to 35.4).

While the reduction in the under 18 conception rate for England over the period 1998 to 2010 was considerable (24%), it did not meet the target level of reduction (50%). The responsibility for meeting the target was taken by local authorities who themselves had individual targets. The regional variation of under 18 conception rates can be seen in Figure 2.

Figure 2 - Under 18 conception rates, by region, 1998–2010
Figure 2 shows that all of the English regions and Wales experienced considerable declines in under 18 conception rates. The regional trends in the data are not as smooth as at the national level, seen in Figure 1, because smaller geographic areas are more prone to yearly fluctuations. The under 18 conception rates for all regions except London fell considerably between 1998 and 2001 and then rose in a number of regions in 2002. A larger increase in under 18 conception rates can be seen between 2006 and 2007, most notably in the North East and South West.

The East of England, the South East and South West all had relatively low rates of under 18 conception throughout the period, while the East Midlands had the fourth lowest under 18 conception rate each year. The North East generally had the highest under 18 conception rate, although for a brief period it had the second highest rate in the early 00s, when London became the region with the highest under 18 conception rate.
Table 1 - Under 18 conception rates by region/country, England and Wales, 1998–2010

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>North East (12)</td>
<td>56.5</td>
<td>44.3</td>
<td>12.2</td>
<td>-21.6</td>
</tr>
<tr>
<td>North West (39)</td>
<td>50.3</td>
<td>40.7</td>
<td>9.6</td>
<td>-19.1</td>
</tr>
<tr>
<td>Yorkshire and The Humber (21)</td>
<td>53.1</td>
<td>40.5</td>
<td>12.6</td>
<td>-23.7</td>
</tr>
<tr>
<td>East Midlands (40)</td>
<td>48.8</td>
<td>34.5</td>
<td>14.3</td>
<td>-29.3</td>
</tr>
<tr>
<td>West Midlands (30)</td>
<td>51.7</td>
<td>40.5</td>
<td>11.2</td>
<td>-21.7</td>
</tr>
<tr>
<td>East (47)</td>
<td>37.9</td>
<td>29.8</td>
<td>8.1</td>
<td>-21.4</td>
</tr>
<tr>
<td>London (32)</td>
<td>51.1</td>
<td>37.1</td>
<td>14.0</td>
<td>-27.4</td>
</tr>
<tr>
<td>South East (67)</td>
<td>37.8</td>
<td>28.3</td>
<td>9.5</td>
<td>-25.1</td>
</tr>
<tr>
<td>South West (36)</td>
<td>39.4</td>
<td>29.9</td>
<td>9.5</td>
<td>-24.1</td>
</tr>
<tr>
<td>Wales (22)</td>
<td>55.0</td>
<td>37.7</td>
<td>17.3</td>
<td>-31.5</td>
</tr>
</tbody>
</table>

Table source: Office for National Statistics

Table notes:
1. City of London has been combined with Hackney and the Isles of Scilly have been combined with Cornwall throughout this article. As such, separate statistics are not available for these local authorities, meaning that there are 346 local authorities in the table but 348 local authorities exist for England and Wales.

Download table

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Table 1 shows that there was a great deal of variation in the regional reduction in under 18 conception rates between 1998 and 2010. It can be seen that under 18 conception rates fell the most in Wales, by 17.3 conceptions per 1,000 women aged 15 to 17, while they fell the least in the East of England, by 8.1 conceptions per 1,000 women aged 15 to 17 in the region. In percentage terms, under 18 conception rates in Wales fell the most (by 31.5%), while they fell the least in the North West (19.1%). The discrepancy between the East of England having the smallest fall in under 18 conception rates and the North West having the smallest fall in percentage terms can be explained by the East of England having a much lower under 18 conception rate in 1998 than the North West (37.9 compared with 50.3). This means that the same decrease in the under 18 conception rate will have a bigger percentage decrease in the East of England than in the North West.
Having looked at the correlation between under 18 and under 16 conceptions it is natural to consider whether under 18 conceptions were simply a reflection of the general level of fertility. Figure 3 shows the under 18 conception rate and the total conception rate over time.

**Figure 3 - Under 18 and total conception rates, England and Wales, 1998–2010**

![Conception rate graph](image)

Source: Office for National Statistics

Download chart
- PNG (22.8 Kb)
- XLS format (28.5 Kb)

Figure 3 shows that there is a large gap between the conception rates for under 18s and all women. Interestingly, the trend in the under 18 conception rate mirrors the trend in the total conception rate from 1998 to 2001. There are a number of factors which could explain the recent reduction in teenage conceptions, including the following:

- The programs invested in by successive governments (for example sex and relationships education, improved access to contraceptives and contraceptive publicity).
- A shift in aspirations of young women towards education (Broecke and Hamed, 2008).
- The increased media awareness of young people and the perception of stigma associated with being a teenage mother (McDermott et al, 2004).
Notes

1. At that point there was a lack of specific interest in the under 18 age group, with conceptions to women aged under 16 or under 20 taking more prominence, although figures for individual year of age at the national level were reported.

2. The under 18 conception rate is the number of conceptions to women aged under 18 per thousand women aged 15 to 17. It should be noted that population figures are subject to revision and are normally revised after a Census for inter-census years; as a result conception rates are subject to change.

3. Data are available back to 1975 for England and Wales, however they are not directly comparable as ONS changed the methodology for estimating age at conception in 1999 and applied to 1997 conception statistics. Whilst a time series was created back to 1986, these data are for England and Wales only. The data are available in the [statistical bulletin for conceptions 2010](https://www.ons.gov.uk).  

4. The total conception rate is all conceptions per thousand members of the female population aged 15 to 44 in the relevant area.

2. Regional and sub-regional analysis of under 18 conceptions

Key points:
- The North East had the highest under 18 conception rate and the smallest range of any English region or Wales.
- High rates of under 18 conception were generally found in local authorities containing cities or seaside towns, in the Welsh Valleys and in two belts in the North of England.
- Low rates of under 18 conception were generally found in the London commuter belt, mid Wales, local authorities not containing cities or seaside towns south of Yorkshire and The Humber and the North West, and in a band between the two belts of high under 18 conception rates in the North of England.
- More than half of the local authorities in the North East had under 18 conception rates in the highest 20% of local authority under 18 conception rates, but none in the lowest 40%.

When looking at under 18 conception data three year aggregates are often used due to the smoothing effect it has on the annual data by reducing the effect of anomalous years on the overall trend in conception rates. In any year anomalies can occur and these can distort the data, so by taking a three year aggregate any anomalies have a lesser impact on the statistics. This smoothing effect means that we can be more confident that any rise or fall in the three year aggregate is likely to be genuine as it is evened out by two other years. Furthermore, conception statistics are routinely subjected to disclosure control, by adopting three year aggregates disclosure control needs to be applied less frequently so more data are available for people to use, this is particularly true for under 16 conceptions where county district data might otherwise be unavailable.
Table 2 shows under 18 conception rates for the English regions and Wales, along with the local authorities with the highest and lowest under 18 conception rates in region, using three year aggregated data for 2008 to 2010.

### Table 2 - Under 18 conception rates by region/country, England and Wales, 2008–10

<table>
<thead>
<tr>
<th>Region/Country</th>
<th>Lowest under 18 conception rate in region</th>
<th>Highest under 18 conception rate in region</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rate</td>
<td>Local authority</td>
</tr>
<tr>
<td>North East (12)</td>
<td>46.8</td>
<td>Northumberland</td>
</tr>
<tr>
<td>North West (39)</td>
<td>43.5</td>
<td>Ribble Valley</td>
</tr>
<tr>
<td>Yorkshire and The Humber (21)</td>
<td>44.1</td>
<td>Harrogate</td>
</tr>
<tr>
<td>East Midlands (40)</td>
<td>37.3</td>
<td>Rutland</td>
</tr>
<tr>
<td>West Midlands (30)</td>
<td>43.1</td>
<td>Malvern Hills</td>
</tr>
<tr>
<td>East (47)</td>
<td>30.8</td>
<td>Brentwood</td>
</tr>
<tr>
<td>London (32)</td>
<td>40.9</td>
<td>Richmond upon Thames</td>
</tr>
<tr>
<td>South East (67)</td>
<td>30.5</td>
<td>Windsor and Maidenhead</td>
</tr>
<tr>
<td>South West (36)</td>
<td>32.4</td>
<td>East Dorset</td>
</tr>
<tr>
<td>Wales (22)</td>
<td>40.8</td>
<td>Monmouthshire</td>
</tr>
</tbody>
</table>

**Table source:** Office for National Statistics
Table 2 shows that the North East had the highest overall under 18 conception rate. However, it also had the smallest range in under 18 conception rates from 34.4 per 1,000 in Northumberland to 59.7 in Hartlepool, giving an overall range between the local authorities with the highest and lowest under 18 conception rates in the region of 25.3. The local authority in the North East with the lowest under 18 conception rate was higher than the local authority with the lowest under 18 conception rate in any other English region or Wales.

The South East had the lowest under 18 conception rate at 30.5 conceptions per 1,000 women aged 15 to 17. The local authority in the South East with the highest rate of under 18 conception (Thanet with a rate of 53.8) was lower than the highest under 18 conception rate in any other English region or Wales.

The East Midlands had the greatest range with a difference between the highest and lowest under 18 conception rates in region of 48.3 conceptions per 1,000 women aged 15 to 17. This ranged from Rutland (11.1) to Nottingham (59.4). However, Rutland has a relatively small population of teenage women and as such should be treated with some caution. Rushcliffe was the local authority with the next lowest under 18 conception rate in the East Midlands at 17.3. Were this used instead, then the East Midlands would have had a range of 42.1 and consequently had the fourth largest range, with Yorkshire and the Humber then having the largest.

Of the ten local authorities with the highest under 18 conception rate in region/country, four contained seaside towns (Hartlepool, Great Yarmouth, Thanet and Torbay) and five were cities (Manchester, Kingston upon Hull, Nottingham, Stoke-on-Trent and Lambeth). The remaining local authority (Merthyr Tydfil) was in the Welsh Valleys.

The overall five highest and lowest local authority under 18 conception rates in England and Wales can be seen in Table 3.
**Table 3 - Under 18 conception rates by local authority, England and Wales, 2008–10**

<table>
<thead>
<tr>
<th>Local authorities with the lowest under 18 conception rates</th>
<th>Local authorities with the highest under 18 conception rates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Local authority (Region)</strong></td>
<td><strong>Rate</strong></td>
</tr>
<tr>
<td>1. Rutland (East Midlands)</td>
<td>11.1</td>
</tr>
<tr>
<td>2. Windsor and Maidenhead (South East)</td>
<td>14.5</td>
</tr>
<tr>
<td>3. Waverley (South East)</td>
<td>14.6</td>
</tr>
<tr>
<td>4. Tandridge (South East)</td>
<td>15.1</td>
</tr>
<tr>
<td>5. Brentwood (East)</td>
<td>15.7</td>
</tr>
</tbody>
</table>

*Table source:* Office for National Statistics

Download table

[XLS](#) XLS format (25.5 Kb)

It is apparent that the local authorities with the highest under 18 conception rates are all city based (with Lambeth, Southwark and Greenwich all being in London). The local authorities with the lowest under 18 conception rates are more rurally located, with only Rutland not being located in the Home Counties. This suggests that there may be a link between under 18 conceptions and population size or density, these relationships will be explored later in the article.

By mapping the data it can be determined whether there were any patterns in under 18 conception rates which might hold true for England and Wales as a whole. This can be seen in Map 1.
Map 1 - Under 18 conceptions by local authority, England and Wales, 2008–10
Source: Office for National Statistics

Map 1 shows that there were distinct areas of high and low rates of under 18 conception in England and Wales. Areas where there were high rates of under 18 conception tend to include:

- Local authorities containing seaside towns.
- Two belts across the North of England, one at the top of the Midlands and another across the very North of England.
- The Welsh Valleys.
- Cities.

Areas where there were low rates of under 18 conceptions tend to include:

- Mid Wales.
- Local authorities which do not contain cities or seaside towns below the North West and Yorkshire and The Humber.
- A band of local authorities between the two belts across the North of England.
- London commuter belt.

Another way to assess the distribution of under 18 conception rates is to look at the quintile distribution of each English region and Wales. This will help to highlight regional disparities. The distribution of under 18 conception rates by region/country can be seen in Table 4, which details the percentage of local authorities in each English region and Wales within each quintile.¹
Table 4 - Quintile distribution of under 18 conception rate by region/country, England and Wales, 2008–10

<table>
<thead>
<tr>
<th>Region/Country</th>
<th>Percentage of Local Authorities in Quintile&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Low&lt;sup&gt;2&lt;/sup&gt;</th>
<th>High&lt;sup&gt;3&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quintile 1</td>
<td>Quintile 2</td>
<td>Quintile 3</td>
</tr>
<tr>
<td>North East (12)</td>
<td>0.0</td>
<td>0.0</td>
<td>8.3</td>
</tr>
<tr>
<td>North West (39)</td>
<td>5.1</td>
<td>10.3</td>
<td>20.5</td>
</tr>
<tr>
<td>Yorkshire and The Humber (21)</td>
<td>14.3</td>
<td>19.0</td>
<td>4.8</td>
</tr>
<tr>
<td>East Midlands (40)</td>
<td>12.5</td>
<td>30.0</td>
<td>25.0</td>
</tr>
<tr>
<td>West Midlands (30)</td>
<td>10.0</td>
<td>23.3</td>
<td>16.7</td>
</tr>
<tr>
<td>East (47)</td>
<td>34.0</td>
<td>27.7</td>
<td>17.0</td>
</tr>
<tr>
<td>London (32)</td>
<td>12.5</td>
<td>9.4</td>
<td>31.3</td>
</tr>
<tr>
<td>South East (67)</td>
<td>37.3</td>
<td>19.4</td>
<td>22.4</td>
</tr>
<tr>
<td>South West (36)</td>
<td>27.8</td>
<td>30.6</td>
<td>22.2</td>
</tr>
<tr>
<td>Wales (22)</td>
<td>4.5</td>
<td>9.1</td>
<td>18.2</td>
</tr>
</tbody>
</table>

Table source: Office for National Statistics

Table notes:
1. Quintile 1 contains those local authorities with the lowest under 18 conception rates, whereas Quintile 5 contains those local authorities with the highest under 18 conception rates. The quintile the local authority is placed in is based on the ordering of conception rate in England and Wales.
2. Low denotes the percentage of local authorities within region/country contained within quintiles 1 and 2.
3. High denotes the percentage of local authorities within region/country contained within quintiles 4 and 5.

Download table

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Table 4 shows that in five English regions and Wales at least half of the local authorities had high rates of under 18 conceptions, compared with three regions where at least half of the local authorities within the region had low rates of under 18 conceptions.

The North East had no local authorities with low under 18 conception rates. It also had the highest percentage of local authorities with high under 18 conception rates at 91.7%; 58.3% of local authorities in the North East were in Quintile 5. This is unsurprising given the narrow range in under 18 conception rates for the North East. Wales had the highest percentage of local authorities in Quintile 4 at 54.5%.

The East of England had the highest percentage of local authorities with low rates of under 18 conception at 61.7%. The South West had the lowest percentage of local authorities with high rates of under 18 conception at 19.4%. The South East had the highest percentage of local authorities in Quintile 1 at 37.3%, whilst the South West had the highest percentage of local authorities in Quintile 2 at 30.6%.

So, overall the North East had high quintile distribution, meaning that high under 18 conception rates were prominent in the region, while the East, South East and South West had low quintile distribution, meaning that low rates of under 18 conception rates were prominent in the regions.

Notes

1. Quintiles are derived by ordering the local authorities in England and Wales by under 18 conception rate and splitting them up into five groupings of similar size based on the ordering. There are 348 local authorities in England and Wales, of which 346 are recorded in under 18 conceptions: City of London and Isles of Scilly are combined with Hackney and Cornwall respectively. Due to the number of local authorities not being divisible by five and the fact that rates are taken to one decimal place, meaning that there may be several local authorities with the same rate on a quintile boundary, boundary groupings may differ in size.

3. Under 18 conception comparisons with under 16 conceptions

Key points:
• When mapped using quintiles, under 16 conception rates in England and Wales looked similar to under 18 conception rates.
• Three of the local authorities with the five highest under 18 conception rates also appeared in the local authorities with the five highest under 16 conception rates.
• Under 18 conception rates are very strongly correlated with under 16 conception rates, with the English regions and Wales being more strongly correlated than England and Wales as a whole.
• The rankings for under 18 conception rate rankings were more strongly correlated with under 16 conception rate rankings than under 18 conception rates were with under 16 conception rates at the England and Wales level.
One area which has not been greatly examined has been the strength of the links between under 18 conceptions and under 16 conceptions. Under 16 conceptions are an area of interest due to the legal age of consent being 16; a firm downward trend in conception rates was also part of the Labour Government’s teenage conceptions target. Figure 4 shows the under 18 and under 16 conception rates \(^1\) over time.

**Figure 4 - Under 18 and under 16 conception rates, England and Wales, 1998–2010**

![Graph showing the under 18 and under 16 conception rates from 1998 to 2010](chart.png)

Source: Office for National Statistics

**Download chart**

- **PNG** (22.1 Kb)
- **XLS format** (28.5 Kb)

Figure 4 shows that there is a large difference between the rates for under 18 and under 16 conceptions and both have fallen since 1998. The low under 16 rate is reflective of the small number of under 16 conceptions included within under 18 conceptions, as the base populations used to calculate the rates are broadly similar.

To help determine whether under 16 conceptions are a strong predictor of under 18 conceptions the distribution of under 16 conception rates can be seen in Map 2.
Map 2 - Under 16 conceptions by local authority, England and Wales, 2008–10

1 To preserve confidentiality, counts for City of London and Isles of Scilly have been combined with those for Hackney and Cornwall respectively.

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Comparing Map 2 with Map 1, we can see that the distribution of conceptions across England and Wales did not differ greatly, with local authorities which had high rates of under 18 conceptions having high rates of under 16 conceptions and those local authorities with low rates generally having low rates for under 18 conceptions.

The local authorities with the highest and lowest rates of under 16 conceptions can be seen in Table 5.

Table 5 - Under 16 conception rates by local authority, England and Wales, 2008–10

<table>
<thead>
<tr>
<th>Local authorities with the lowest under 16 conception rates</th>
<th>Rate</th>
<th>Local authorities with the highest under 16 conception rates</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. St Albans (East)</td>
<td>2.0</td>
<td>1. Middlesbrough (North East)</td>
<td>15.0</td>
</tr>
<tr>
<td>2. Uttlesford (East)</td>
<td>2.1</td>
<td>2. Southwark (London)</td>
<td>14.9</td>
</tr>
<tr>
<td>3. Elmbridge (South East)</td>
<td>2.3</td>
<td>3. Halton (North West)</td>
<td>14.7</td>
</tr>
<tr>
<td>4. Rutland (East Midlands)</td>
<td>2.5</td>
<td>4. Merthyr Tydfil (Wales)</td>
<td>13.7</td>
</tr>
<tr>
<td>5. Wokingham (South East)</td>
<td>2.5</td>
<td>5= Manchester (North West)</td>
<td>13.6</td>
</tr>
<tr>
<td>6. Harrogate (Yorkshire and The Humber)</td>
<td>2.5</td>
<td>5= Greenwich (London)</td>
<td>13.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5= Tameside (North West)</td>
<td>13.6</td>
</tr>
</tbody>
</table>

Table source: Office for National Statistics

Download table

[ XLS format](XLS) (26 Kb)
Table 5 reveals that three of the local authorities with the five highest under 18 conception rates also appeared in the local authorities with the five highest under 16 conception rates (Southwark, Manchester and Greenwich). Furthermore four of the seven local authorities were cities, the remaining three comprised of large towns (Halton, which contains Runcorn and Widnes; Tameside, which is part of Greater Manchester; and Merthyr Tydfil).

Rutland appeared in the local authorities with the five lowest conception rates at both the under 16 and under 18 levels. Of the local authorities with the lowest under 16 conception rates in Table 5, only Rutland (East Midlands) and Harrogate (Yorkshire and The Humber) were outside of the Home Counties.

Table 6 shows the level of correlation between under 16 conceptions and under 18 conceptions in terms of numbers, rates and the rate ranking for the local authority for 2008 to 2010.

Table 6 - Correlation of under 18 conceptions with under 16 conceptions, England and Wales, 2008–10

<table>
<thead>
<tr>
<th>Region/Country (number of local authorities)¹</th>
<th>Rates R²</th>
<th>Regional Rank R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>England and Wales (346)</td>
<td>0.8735</td>
<td>0.8739</td>
</tr>
<tr>
<td>North East (12)</td>
<td>0.6832</td>
<td>0.5343</td>
</tr>
<tr>
<td>North West (39)</td>
<td>0.8279</td>
<td>0.8702</td>
</tr>
<tr>
<td>Yorkshire and The Humber (21)</td>
<td>0.9331</td>
<td>0.9757</td>
</tr>
<tr>
<td>East Midlands (40)</td>
<td>0.9064</td>
<td>0.8331</td>
</tr>
<tr>
<td>West Midlands (30)</td>
<td>0.8021</td>
<td>0.7947</td>
</tr>
<tr>
<td>East (47)</td>
<td>0.8323</td>
<td>0.8219</td>
</tr>
<tr>
<td>London (32)</td>
<td>0.8881</td>
<td>0.8914</td>
</tr>
<tr>
<td>South East (67)</td>
<td>0.8698</td>
<td>0.8702</td>
</tr>
<tr>
<td>South West (36)</td>
<td>0.8001</td>
<td>0.7392</td>
</tr>
<tr>
<td>Wales (22)</td>
<td>0.8450</td>
<td>0.6728</td>
</tr>
</tbody>
</table>

Table source: Office for National Statistics

Table notes:

¹. When looking at correlation statistics, such as the coefficient R², the number of data points (in this case local authorities) helps determine how robust the statistic is. As such statistics for the English regions and Wales with fewer local authorities are not as robust as English regions with more local authorities.
Table 6 shows that under 16 conception rates accounted for 87.4%\(^2\) of the variation in under 18 conception rates across England and Wales and for at least 68.3% of variation in each of the English regions or Wales.

Rankings of rates were marginally better correlated than rates at the England and Wales level, with under 16 conception rate rankings again accounting for 87.4% of the variation in under 18 conception rate rankings (a difference between rates and ranks of 0.04%). However, the majority of the English regions and Wales were more strongly correlated when looking at rates rather than ranks.

Rates were least strongly correlated in the North East (0.6832), which was also the region with the lowest correlation for ranks (0.5343). Yorkshire and The Humber was the region with the strongest correlation for both rates (0.9331) and regional ranks (0.9757).

Notes

1. The under 18 conception rate is the number of under 18 conceptions per 1,000 women aged 15 to 17. The under 16 conception rate is the number of under 16 conceptions per 1,000 women aged 13 to 15.

2. This is the R\(^2\) value multiplied by 100.

4. Under 18 conceptions and urban aspects

Key points:

- There was weak correlation between under 18 conception rates and population density.
- There was also weak correlation between under 18 conception rates and the Urban-Rural Classification.

It has previously been put forward that under 18 conceptions are more likely to take place in urban than rural areas. Under 18 conception rates for local authorities can be plotted against their population density values to see how linked they were. This can be seen in figure 5.
Figure 5 - Under 18 conception rates and population densities, England and Wales, 2008–10

Figure 5 shows that for 2008 to 2010 population density accounted for 10.2% of the variation in under 18 conception rates. As such, population density did not provide a good explanation of variation in under 18 conception rates, particularly with the clustering of data points close to the Under 18 conception rate axis.

Urban-Rural Classification for England as updated in 2009 also did not provide a good explanation of under 18 conception rates for 2008 to 2010, yielding an R² value of 0.2364. This means that less than a quarter of the variation in local authority under 18 conception rates is explained by the classification.

Given the weak correlation values for under 18 conception rates with population density and with the Urban-Rural Classification, further analysis for the English regions and Wales was not undertaken. This weak correlation is surprising given that cities appeared to have higher rates of under 18 conception than rural areas.
Notes

1. Correlation, denoted by the $R^2$ value, is a measure of how well one variable describes a change in another over a dataset. The more closely associated the two variables are the closer the value will be to one. If the two variables have an $R^2$ value of one, then if we plot the two variables against one another on a scatter plot they will all fall on the trend line for the data. The further away the $R^2$ value is from one the more spread out the data will appear on the scatter plot.

2. This is the $R^2$ value multiplied by 100.

3. The data used are for England only as data for Wales are not produced on a consistent basis. There is an alternative Welsh dataset but this has a different number of categories so is not directly comparable. There are consistent datasets available for a lower level of geography but conceptions data are not available at this level. Given that Wales comprises 22 local authorities out of 348 for England and Wales, it is not likely to have a significant impact upon the overall correlation given that conceptions data for Wales are not extreme.

5. Under 18 conceptions and the English Indices of Multiple Deprivation

Key points:
• There was strong correlation between under 18 conception rates in England and the English Indices of Multiple Deprivation. This correlation was stronger for the English Indices of Multiple Deprivation with under 18 conception rate rankings than with under 18 conception rates.

• London and the South West did not have strong correlation between the English Indices of Multiple Deprivation and under 18 conceptions.

• Just over two-thirds of the most deprived local authorities had high incidents of under 18 conception in England, while just under two-thirds of the least deprived local authorities had low incidents of under 18 conception in England.

• The North West had the highest number of local authorities in quintile 5 for IMD rankings, under 18 conception rate rankings and both in conjunction with one another. London had the second highest in all three categories.

• Half of the local authorities in quintile 1 for the IMD rankings were in the South East, while just over a third of the local authorities in quintile 1 for under 18 conception rate rankings were in the same region.

The English Indices of Multiple Deprivation$^1$ (IMD) were chosen for analysis as under 18 conception are often associated with deprived areas.

When comparing under 18 conceptions with IMD it is important to note that ideal data for comparison are not available$^2$. Furthermore, the IMD data are for one in every three years, rather
than a three year aggregate measure. As such we are using the latest IMD rankings data available (that for 2010) in combination with the latest under 18 annual conception data (2008 to 2010).

The picture for England can be seen in Figure 6. Due to IMD giving the most deprived area a rank of one and the least deprived area with the highest value, as such the under 18 conception rate rankings have been inverted for consistency so that the local authority with the highest under 18 conception rate has a rank of one.

Figure 6 - Inverted under 18 conception rate ranking 2008–10 and IMD 2010, England

Figure 6 shows that the IMD rank accounted for 76.2% of the variation in local authority rankings of under 18 conception rates in England. Rankings have been used rather than rates as IMD is provided in ranks and this provides the most consistent comparison. Were we to switch to using local authority under 18 conception rates (rather than their ranks) then the R2 value would fall to 0.7409 which, reduces the explanation in variation of under 18 conceptions (by 2.1 percentage points).
Having identified that the IMD rank and the under 18 conception rate rank were strongly correlated, the regional picture can now be looked at to see how much variation there was in the English regions. This can be seen in Table 7.

Table 7 - Regional under 18 conception rate ranking and IMD, England, 2008–10

<table>
<thead>
<tr>
<th>Region</th>
<th>Local authority under 18 conception rate rankings within region and Regional IMD rankings (R²)</th>
<th>Local authority under 18 conception rates within region and Regional rankings (R²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North East (12)</td>
<td>0.7641</td>
<td>0.7604</td>
</tr>
<tr>
<td>North West (39)</td>
<td>0.6448</td>
<td>0.6299</td>
</tr>
<tr>
<td>Yorkshire and The Humber (21)</td>
<td>0.7316</td>
<td>0.8068</td>
</tr>
<tr>
<td>East Midlands (40)</td>
<td>0.7908</td>
<td>0.7512</td>
</tr>
<tr>
<td>West Midlands (30)</td>
<td>0.6855</td>
<td>0.6892</td>
</tr>
<tr>
<td>East (47)</td>
<td>0.7265</td>
<td>0.7296</td>
</tr>
<tr>
<td>London (32)</td>
<td>0.4676</td>
<td>0.4325</td>
</tr>
<tr>
<td>South East (67)</td>
<td>0.7468</td>
<td>0.7444</td>
</tr>
<tr>
<td>South West (36)</td>
<td>0.4248</td>
<td>0.4695</td>
</tr>
</tbody>
</table>

Table source: Office for National Statistics

Table notes:
1. When looking at correlation statistics, such as the coefficient R², the number of data points (in this case local authorities) helps determine how robust the statistic is; as such statistics for the English regions and Wales with fewer local authorities are not as robust as English regions with more local authorities.

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Table 7 shows that there was large variation, regionally, in the correlation that IMD rankings had with under 18 conception rates and with under 18 conception rate rankings. Four of the English regions were more strongly correlated with under 18 conception rates than with the rankings of those rates, while the other five regions were more strongly correlated with the rate rankings. This is consistent with the 2.1 percentage point difference between the R² values for IMD ranks with under 18 conception rates and with under 18 conception rate rankings.

Yorkshire and The Humber had the highest R² value for correlation between regional IMD rankings and local authority under 18 conception rates within region (80.7%). The East Midlands had the highest R² value for correlation between regional IMD rankings and local authority under 18 conception rate rankings within region (79.1%). The South West had the lowest R² value for...
correlation between regional IMD rankings and both local authority under 18 conception rates within region (42.5%). London had the lowest $R^2$ value for correlation between regional IMD rankings and local authority under 18 conception rate rankings within region (43.3%).

Looking at the rankings data, London tended to have relatively low rankings for IMD but tended to have relatively high levels of under 18 conceptions. Conversely, the South West tended to have relatively high rankings for IMD but had relatively low levels of under 18 conception.

London is characterised as a region for high income (in part due to well paying industries and the prevalence of the London Weighting Allowance), a young, mobile, highly-educated population (due to a regular influx of graduates), a generally buoyant housing market with access to transport and other services. As such, it is likely to score well in the income, barriers to housing and services, health deprivation and disability, and education, skills and training domains. Given this, it can be seen as unsurprising that London did not have a strong correlation between under 18 conceptions and the local authority rankings for the IMD in region.

The South West is characterised by more rural attributes, with relatively few cities or large towns, meaning that it is likely to have a large proportion of local authorities with barriers to housing and services (such as nearby post offices and food shops). It is a region with a relatively old population (and associated health issues), with 26.2% of its population in 2008 to 2010 being 60 or older, 2.6% or more than any other region, meaning that it is more likely to have health related deprivation and disability than London (which also has the lowest proportion of people aged 60 or over of any region at 15.7%). With the older population and rural community aspects of the South West it is not particularly surprising that the region did not have a strong correlation between under 18 conceptions and the local authority rankings for IMD in region.

The number of local authorities which appeared in the highest and lowest quintiles for IMD rankings, under 18 conception rate rankings and both in conjunction with one another can be seen in Table 8. This shows the degree of connectedness and levels of disparity in the English regions.
### Table 8 - Quintile distribution of IMD and under 18 conceptions by region/country, England, 2008–10

<table>
<thead>
<tr>
<th>Region/Country¹ (number of local authorities)</th>
<th>Number of Local Authorities</th>
<th>Quintile 1 IMD</th>
<th>Quintile 5 IMD</th>
<th>Quintile 1 U18CRR²</th>
<th>Quintile 5 U18CRR²</th>
<th>Quintile 1 Both</th>
<th>Quintile 5 Both</th>
</tr>
</thead>
<tbody>
<tr>
<td>England (324)</td>
<td></td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>41</td>
<td>47</td>
</tr>
<tr>
<td>North East (12)</td>
<td></td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>North West (39)</td>
<td></td>
<td>1</td>
<td>19</td>
<td>2</td>
<td>14</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Yorkshire and The Humber (21)</td>
<td></td>
<td>3</td>
<td>7</td>
<td>3</td>
<td>6</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>East Midlands (40)</td>
<td></td>
<td>7</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>West Midlands (30)</td>
<td></td>
<td>2</td>
<td>6</td>
<td>2</td>
<td>11</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>East (47)</td>
<td></td>
<td>15</td>
<td>1</td>
<td>16</td>
<td>3</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>London (32)</td>
<td></td>
<td>1</td>
<td>14</td>
<td>4</td>
<td>11</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>South East (67)</td>
<td></td>
<td>32</td>
<td>2</td>
<td>23</td>
<td>5</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>South West (36)</td>
<td></td>
<td>4</td>
<td>1</td>
<td>10</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

**Table source:** Office for National Statistics

**Table notes:**
1. Quintile 1 represents those local authorities with the lowest deprivation scores for IMD and the lowest under 18 conception rate rankings. Conversely, Quintile 5 represents those local authorities with the highest deprivation scores for IMD and highest under 18 conception rate rankings.
2. U18CRR is Under 18 conception rate ranking.

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From Table 8 it can be seen that just over two-thirds of the most deprived local authorities had high incidents of under 18 conception in England. Just under two-thirds of the least deprived local authorities had low incidents of under 18 conception in England.

The North West had the highest number of local authorities in quintile 5 for IMD rankings, under 18 conception rate rankings and both in conjunction with one another. London had the second highest in all three categories. When combined, London and the North West had just over half of all local authorities in quintile 5 for the IMD rankings and just under half of all local authorities appearing in quintile 5 for both IMD rankings and under 18 conception rate rankings.

Half of the local authorities in quintile 1 for the IMD rankings were in the South East, while just over a third of the local authorities in quintile 1 for under 18 conception rate rankings were in the same region. Half of the local authorities in quintile one for the IMD rankings in conjunction with quintile one for the under 18 conception rate rankings were in the South East. All of the local authorities which appeared in quintile 5 for IMD ranking in the West Midlands appeared in quintile 5 for under 18 conception rate rankings.

The local authority in the North West (Ribble Valley) and the local authority in London (Richmond upon Thames) which appeared in quintile 1 in the IMD rankings also appeared in quintile 1 in the under 18 conception rate rankings. The North East had no local authorities in quintile 1 for either IMD rankings or under 18 conception rate rankings.

Overall, under 18 conceptions and IMD were reasonably well correlated in England, with large variation at regional level. This means that there were likely to be higher rates of under 18 pregnancy in areas of high deprivation. Two regions, London and the South West, had very different correlation values from the other regions but this could be explained by looking at the IMD domains and characteristics of those regions. As the IMD is skewed, due to regional characteristics of the component domains, the correlation with under 18 conceptions is also skewed resulting in a lower \( R^2 \) value. As such, IMD is not always a good predictor of under 18 conceptions due to regionally specific characteristics.

Notes

1. IMD is measure of relative deprivation. It uses several domains to produce a series of rankings, informing which local authorities are more deprived than others. The rankings do not reveal the extent to which one area may be more or less deprived than another. The domains used for IMD are:

- Income
- Employment
- Health deprivation and disability
- Education, skills and training
- Barriers to housing and services
- Crime
• Living environment

2. Directly comparable data for England and Wales are not available (the composition of the English IMD and the Welsh IMD are different), as such the measure for England has been used for the national picture. Data for Wales are available at LSOA level for 2008 and 2011 and at local authority level for 2011.

3. This is the R2 value multiplied by 100.

4. That said London still has large pockets of deprivation with areas of low income. London also has a high crime rate so will score poorly in the crime domain. However, this is unlikely to offset the scores from the other domains.

6. Under 18 conceptions and child poverty

Key points:
• Under 18 conception rates in England were well correlated with the percentage of children living in poverty.
• London was not as strongly correlated as other English regions for under 18 conceptions with the percentage of children living in poverty.

Child poverty\(^1\) was chosen for analysis as living in poverty is another factor that is often associated with under 18 conceptions. When comparing under 18 conceptions with child poverty data it is important to note that ideal data for comparison are not available\(^2\). Child poverty percentages have been averaged over three years.
As can be seen in Figure 7, the percentage of children living in poverty explained 59.0% of the variation in under 18 conception rates between 2008 and 2010. There appears to be a stronger correlation than is indicated by the $R^2$ value in Figure 8 as there are a few outliers to the right of the graph, which are influencing the trend line. This could imply that the relationship between under 18 conception rates and the percentage of children living in poverty is non-linear, which would mean that additional factors need to be examined as part of a regression model and an appropriate correlation method adopted.

Having identified that the percentage of children living in poverty and the under 18 conception rate had a moderate correlation, the regional picture can now be looked at to see how much variation there was sub-nationally. This can be seen in Table 9.
Table 9 - Under 18 conception rate and percentage of children living in poverty, by region, England, 2008–10

<table>
<thead>
<tr>
<th>Region (number of local authorities)</th>
<th>Local authority under 18 conception rates and percentage of children living in poverty, by region ($R^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North East (12)</td>
<td>0.7431</td>
</tr>
<tr>
<td>North West (37)</td>
<td>0.6043</td>
</tr>
<tr>
<td>Yorkshire and The Humber (21)</td>
<td>0.8524</td>
</tr>
<tr>
<td>East Midlands (40)</td>
<td>0.7301</td>
</tr>
<tr>
<td>West Midlands (30)</td>
<td>0.6654</td>
</tr>
<tr>
<td>East (45)</td>
<td>0.7885</td>
</tr>
<tr>
<td>London (32)</td>
<td>0.2210</td>
</tr>
<tr>
<td>South East (67)</td>
<td>0.7970</td>
</tr>
<tr>
<td>South West (36)</td>
<td>0.6102</td>
</tr>
</tbody>
</table>

Table source: Office for National Statistics

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Table 9 shows that there was large variation, regionally, in the correlation of the percentage of children living in poverty with under 18 conception rates. Under 18 conceptions for London were again not as strongly correlated as the other English regions with the percentage of children living in poverty. London had the lowest $R^2$ value at 0.2210 while Yorkshire and the Humber had the highest at 0.8524. Interestingly, the other four eastern regions (the North East, the East Midlands, the East of England and the South East) had similar $R^2$ values, all falling between 0.7301 and 0.7970, meaning that there were strong correlations between under 18 conception rates and the percentage of children living in poverty in those regions. The North West (0.6043), the West Midlands (0.6654) and the South West (0.6102) had more moderate correlation values.

In order to establish the patterns in the data for child poverty and under 18 conceptions, they have been plotted in figures 8 and 9, with local authorities in London highlighted to show their position relative to other local authorities in England.
From Figure 8 it can be seen that London had some high rates of child poverty. The cluster of light blue on the left side of the chart reveals that it was experiencing the majority of the worst local authority percentages of children in poverty (more than 30%). Figure 8 can be compared with the under 18 conception rate pattern for England as seen in Figure 9.
Figure 9 shows that under 18 conception rates for local authorities in London were more evenly distributed, with many more appearing on the right side of Figure 9 than on Figure 8. The worst under 18 conception rates, those above 50, contain a far lower concentration of London local authorities than those local authorities with the worst child poverty levels.

London had under 18 conception rates that were generally lower than might be expected given the levels of child poverty. One possible explanation for the low level of correlation in London is the difference in culture within the London region. London tends to attract a lot of international migrants and migrants have higher levels of fertility, (Tromans et al 2009). This means that if migrant families are deemed to be living in poverty then this is likely to affect a larger number of children and increasing the percentage of children living in poverty.
Overall, under 18 conceptions and child poverty were reasonably well correlated in England, with large variation at regional level. This means that in areas of high child poverty there are likely to be high under 18 conception rates. London had a very different correlation value from the other regions; this is believed to be due to the fertility of London’s migrant population.

Notes

1. Child poverty is deemed to occur when children are living in families in receipt of out of work benefits or tax credits where their reported income is less than 60% median income.

2. Child poverty data for Wales are unavailable for 2008; as such they have not been included in this comparison. Child poverty values for those unitary authorities which comprise the former counties of Cheshire and Bedfordshire are also unavailable and as such have been excluded from this analysis. This means that the North West and East of England have two local authorities each which are not accounted for.

7. Under 18 conceptions and unemployment

Key points:

• Under 18 conception rates were well correlated with unemployment rates.

• There was an east-west divide in how well the rates were correlated with one another, with rates in the east (except London) being strongly correlated, with rates in the west (and London) being moderately correlated.

Unemployment has been chosen for analysis as it can be seen as an indicator for deprivation and poverty. Employment is a domain in the English Indices of Multiple Deprivation and is naturally linked to income. Children growing up in areas with high unemployment were likely to experience deprivation and these areas were likely to have high under 18 conception rates.
Figure 10 - Under 18 conception rate and unemployment rate, England and Wales, 2008–10

Source: Office for National Statistics

Download chart

PNG
(27.9 Kb)

Download chart

XLS
(117.5 Kb)

Figure 10 shows that the unemployment rate was well correlated with the under 18 conception rate across England and Wales. The unemployment rate accounted for 65.4% of the variation in the under 18 conception rate. Table 10 shows the regional $R^2$ values for correlation between under 18 conception rates and unemployment rates for local authorities.
Table 10 - Under 18 conception rate and unemployment rate, by region/country, England and Wales, 2008–10

<table>
<thead>
<tr>
<th>Region (number of local authorities)</th>
<th>Local authority under 18 conception rate and unemployment rate, by region, $R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>England and Wales (346)</td>
<td>0.6535</td>
</tr>
<tr>
<td>North East (12)</td>
<td>0.7885</td>
</tr>
<tr>
<td>North West (39)</td>
<td>0.5441</td>
</tr>
<tr>
<td>Yorkshire and The Humber (21)</td>
<td>0.8807</td>
</tr>
<tr>
<td>East Midlands (40)</td>
<td>0.7016</td>
</tr>
<tr>
<td>West Midlands (30)</td>
<td>0.5844</td>
</tr>
<tr>
<td>East (47)</td>
<td>0.7646</td>
</tr>
<tr>
<td>London (32)</td>
<td>0.3433</td>
</tr>
<tr>
<td>South East (67)</td>
<td>0.7352</td>
</tr>
<tr>
<td>South West (36)</td>
<td>0.4880</td>
</tr>
<tr>
<td>Wales (22)</td>
<td>0.4648</td>
</tr>
</tbody>
</table>

Table source: Office for National Statistics

Download table

XLS format (25 Kb)

Table 10 shows wide variation in regional correlation for under 18 conception rates and unemployment rates, with $R^2$ values ranging from 0.8807 in Yorkshire and the Humber to 0.3433 in London. Alongside London, the South West and Wales had $R^2$ values below 0.5, whilst the North West and the West Midlands had $R^2$ values between 0.5 and 0.6.

Surprisingly, the disparate $R^2$ values reveal an east-west divide: the eastern coastal regions were strongly correlated, while other English regions and Wales had moderate correlations. This can be seen in Map 3.
Map 3 - Under 18 conception rate and unemployment rate correlation values by region/country, England and Wales, 2008–10

Source: Office for National Statistics

Contains National Statistics data © Crown copyright and database right 2013
Contains Ordnance Survey data © Crown copyright and database right 2013
To help assess what might have been contributing to the particularly low correlations for the under 18 conception rate and the unemployment rate, the correlation chart was adapted to reflect the different regions. This means that it could be seen whether the areas of poor correlation had higher under 18 conception rates than would be expected given the correlation coefficient for England and Wales or lower under 18 conception rates.

Figure 11 shows the correlation for the unemployment rate with the under 18 conception rate for 2008 to 2010, for England and Wales, highlighting London boroughs and South West local authorities in the national picture.

**Figure 11 - Under 18 conception rate and unemployment rate, London, South West, Wales and England and Wales, 2008–10**

Source: Office for National Statistics

Download chart

![PNG](26.3 Kb)

Download chart

![XLS format](58.5 Kb)

Figure 11 shows that London had more points below the trend line than above it, meaning that for the level of unemployment the under 18 conception rates were lower than expected. This may be a reflection of redundancies during the recession of white collar workers which are highly concentrated in London. This is supported by the rising unemployment rates across the London boroughs between 2008 and 2010. The weak correlation for London could also be a reflection of the ease of access to out of area family planning, which may mean that family planning services are
more likely to be used, or the cultural differences in London due to greater ethnic diversity from first, second and third generation migrants.

Figure 11 shows that the South West had more points above the trend line than below it, meaning that the under 18 conception rates were higher than would have been expected for the levels of employment. Looking at the full-time and part-time employment splits, it is apparent that in 2010 the South West had the highest proportion of part-time workers across the English regions. This means that just because someone was employed they were not necessarily as employed as much as they wanted to be, so they could still have faced poverty despite being employed. It is important to note that seasonal working is an important factor for the South West, with agriculture and seasonal tourism comprising a large part of the economy.

Wales had the majority of its data points above the England and Wales trend line, meaning that under 18 conception rates were higher than would have been expected given the rates of unemployment. That said, one local authority, Blaenau Gwent, had a particularly high unemployment rate without a particularly high under 18 conception rate. Looking at the full-time and part-time employment splits for 2010, Wales had the same proportion of full-time and part-time workers as the South West and would expect to have a similar pattern in under 18 conceptions to the South West. That said, the Welsh data points are closer to the trend line than those of the South West, suggesting that employment in Wales is, perhaps, less seasonal due to economic composition.

Overall, under 18 conception rates and unemployment rates were well correlated, meaning that areas with high levels of unemployment were likely to have high under 18 conception rates. There is tremendous variation in the regional correlation coefficients with an almost east-west split for 2008 to 2010. The English regions with the worst correlation and Wales have been looked at more closely to identify reasons for their differences. The natural extension of this is to look at workless households, economic inactivity rates and economic composition for the regions/country.

Notes

1. Adding this to the 60.6% of the variation in under 18 conception rates shows there must be overlap. The strength of the correlation of the percentage of children living in poverty and the unemployment rate could be examined and built into a model for under 18 conception rate analysis.

Summary

An analytical toolkit looking at under 18 conceptions and measures of deprivation has been developed by ONS and is freely available online for the first time.

In this article under 18 conceptions have been analysed in order to identify to what extent under 18 conceptions may be correlated with other datasets which could be built into a forecasting model in further research. This may be of benefit to those working with young mothers or those involved with family planning initiatives targeted at young women. There may be more recent data available for some of the data series used in the article and/or toolkit, but these are not for the same time period as available conceptions data so have not been used.
Looking at conception data for 2008 to 2010, it has been determined that under 18 conceptions are strongly correlated with under 16 conceptions and the English Indices of Multiple Deprivation.

There was moderate correlation between under 18 conceptions and the percentage of children living in poverty in England and the unemployment rate for England and Wales for 2008 to 2010. There is variation in the strength of the relationship between these datasets at regional level and the reasons for this variation have been analysed. In England, London had much lower levels of correlation than other regions. The North West, the West Midlands and the South West also had more moderate R² values when compared with the eastern regions, suggesting that there is something different in the social make up of eastern and western regions within England.

It has been determined that under 18 conceptions were not reflective of population density or the urban-rural classification due to weak correlations.

Ideas for further work looking at under 18 conceptions and measures of deprivation include, but are not limited to:

- Looking at other datasets associated with deprivation.
- Undertaking multivariate analysis: looking at the interconnectedness of relationships of deprivation factors and under 18 conceptions through statistical modelling.
- Establish why the east-west divide exists.
- Establishing why London is not as strongly correlated as other regions when looking at under 18 conceptions and the percentage of children living in poverty or unemployment rates, to see if lessons can be learnt both for London and other regions.
- Examine how workless households, economic inactivity and economy composition impact on under 18 conception rates.
- Undertaking local authority analysis using sub-local authority data.
## Annex 1

### Annex 1 - Measures of deprivation included in the Conceptions-Deprivation Analysis Toolkit

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Time Period</th>
<th>Geography</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 18 conceptions</td>
<td>1998-2010 single year data, 2008-10 three year aggregated data</td>
<td>Country (England and Wales), Region, Local Authority, County District</td>
<td>ONS</td>
</tr>
<tr>
<td>Under 16 conceptions</td>
<td>2008-2010 three year aggregated data</td>
<td>Country (England and Wales), Region, Local Authority, County District</td>
<td>ONS</td>
</tr>
<tr>
<td>Urban-Rural Classification</td>
<td>Based on Census 2001 population estimates</td>
<td>Country (England), Region, Local Authority, County District</td>
<td>ONS</td>
</tr>
<tr>
<td>Population density</td>
<td>2008-2010 single year data, 2008-10 three year averaged data</td>
<td>Country (England and Wales), Region, Local Authority, County District</td>
<td>ONS</td>
</tr>
<tr>
<td>Indices of Multiple Deprivation (Overall)</td>
<td>2010</td>
<td>Local Authority, County District</td>
<td>ONS</td>
</tr>
<tr>
<td>Indices of Multiple Deprivation (Income)</td>
<td>2010</td>
<td>Local Authority, County District</td>
<td>ONS</td>
</tr>
<tr>
<td>Indices of Multiple Deprivation (Employment)</td>
<td>2010</td>
<td>Local Authority, County District</td>
<td>ONS</td>
</tr>
<tr>
<td>Percentage of children living in poverty</td>
<td>2008-2010 single year data, 2008-10 three year averaged data</td>
<td>Country (England), Region, Local Authority, County District, new unitary authorities</td>
<td>HM Revenue &amp; Customs (HMRC)</td>
</tr>
<tr>
<td>Dataset</td>
<td>Time Period</td>
<td>Geography</td>
<td>Source</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Unemployment</td>
<td>2007/2008-2009/2010 averaged data</td>
<td>County District, new unitary authorities</td>
<td>ONS</td>
</tr>
<tr>
<td>Economic Inactivity</td>
<td>2008-2010 single year data, 2008-10 three year averaged data</td>
<td>Country (England and Wales), Region, Local Authority, County District</td>
<td>ONS</td>
</tr>
<tr>
<td>Housing all tax bands</td>
<td>2008-2010 single year data, 2008-10 three year averaged data</td>
<td>Country (England and Wales), Region, Local Authority, County District</td>
<td>Valuation Office Agency, HMRC</td>
</tr>
<tr>
<td>Housing tax band A</td>
<td>2008-2010 single year data, 2008-10 three year aggregated data</td>
<td>Country (England and Wales), Region, Local Authority, County District</td>
<td>Valuation Office Agency, HMRC</td>
</tr>
<tr>
<td>Percentage of dwellings in tax band A</td>
<td>2008-2010 three year aggregated data</td>
<td>Country (England and Wales), Region, Local Authority, County District</td>
<td>ONS calculations on data from Valuation Office Agency, HMRC</td>
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<tr>
<td>Lone parent benefits</td>
<td>November 2008, November 2009, November 2010 single year data, 2008-2010 three year averaged data</td>
<td>Country (England and Wales), Region, Local Authority, County District, new unitary authorities</td>
<td>Department for Work and Pensions</td>
</tr>
<tr>
<td>Crime (total and by category)</td>
<td>2008-2010 single year data, 2008-10 three year aggregated data</td>
<td>Local Authority, County District, new unitary authorities</td>
<td>Home Office</td>
</tr>
</tbody>
</table>
Annex 2

**Risk factors associated with becoming a teenage parent**

The following is a list of potential risk factors, these indicate an increased risk of becoming a teenage parent, they do not mean that you will necessarily become a teenage parent if you experience one or more of these factors. These include:

- Being a child of a teenage parent.
- Being a teenage parent already.
- Being a young women who accesses termination services.
- Living in poverty/areas of high deprivation.
- Having low educational attainment and/or disengagement from school.
- Being in or leaving care.
- Having a history of running away from home.
- Being exposed to inappropriate sexual activities.
- Being sexually abused or exploited.
- Having low self-esteem, poor emotional health and/or self harm.
- Having low aspirations and expectations.
- Having inadequate family support including domestic abuse.
- Misusing alcohol and/or drugs.
- Having multiple sexual partners.
- Having early onset of sexual activity (under 16 years old).
- Being involved in youth offending.
• Engaging in risky sexual behaviour.
• Being sexually active but not accessing contraception.
• Being vulnerable to sexual exploitation.
• Demonstrating inappropriate sexual behaviour.
• Being the victim of a sexual assault.
• Having child-protection concerns and multi agency involvement with the young person/family.

Young people with multiple risk factors and/or chaotic lifestyles are those deemed to be most at risk.

Notes


Annex 3

Risk factors for those born to teenage mothers

The following are a list of possible outcomes. Being born to a teenage mother does not necessarily mean that any of these outcomes will be experienced. These include:

• Having a low birth weight.
• Having congenital anomalies.
• Having low life expectancy.
• Having low life expectations.
• Having lower educational achievement.
• Growing up in poverty.
• Having an increased likelihood of infant mortality.
• Having an increased likelihood of behavioural problems.
• Not having their father involved in their life due to relationship breakdown.

Notes

    Population Trends 93, pp 19 –28

4. Hofferth SL and Reid L Early, 2002, ‘Childbearing and Children's Achievement and Behaviour 
    over Time’, Perspectives on Sexual and Reproductive Health 34, No1, pp 41–9

Background notes

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

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