MATERNITY NEEDS ASSESSMENT – COVENTRY & WARWCIKSHIRE

(UPDATE)

Warwickshire Joint Strategic Needs Assessment 2017

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2-Jun-17	N/A	Initial draft produced	N/A
23-Jun-17	0.1	Additions from Coventry City Council	0.2
31-Aug-17	0.2	Changes from Helen King incorporated	0.3
06-Nov-17	0.3	Final minor changes incorporated	1.0

APPROVALS

This document requires the following approvals.

N.B. Signed approval should be filed appropriately in the project filing system.

Name	Signature	Title	Date of Issue	Version
Helen King		Deputy Director of Public Health	2-Jun-17	0.1
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Helen King		Deputy Director of Public Health	31-Aug-17	0.3
Helen King		Deputy Director of Public Health	06-Nov-17	1.0

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Helen King	Deputy Director of Public Health	6-Nov-17	1.0

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RECOMMENDATIONS

A number of recommendations have arisen from the needs assessment update:

- A number of gaps and inconsistencies in data collection were identified as well as paucity of data in some instances. It is therefore recommended that the Trusts collect their data consistently in an electronic format efficiently and effectively working towards complete collection of data, as set out in the Maternity Services Data Set (MSDS) information Standard. Specific examples of current poor data collection or gaps in our knowledge include:
    - Recording of maternal obesity at George Eliot Hospital given the high rates of BMI of more than 35 in the North of the county.
    - Low levels of breastfeeding initiation at George Eliot and previous insufficient data (due to validation criteria for Warwickshire North CCG).
    - Collection of information on the ethnicity of mother and father to enable improved maternity services for ethnic groups – there have been gaps in data provided by George Eliot Hospital.
    - Quality of smoking in pregnancy data
    - Since the closure of the Perinatal Institute, a number of datasets are no longer recorded (as documented throughout the needs assessment).
- Increase and maintain the proportion of pregnant women having a Health and Social Care assessment of needs, risks and choices within 13 weeks.
- Risk assessment and surveillance of foetal growth restriction needs improving as recommended by the Saving Babies Lives care bundle. Early detection of growth restriction helps in planning safe deliveries.
- Reduce the proportions of women who are obese during pregnancy – interventions required before pregnancy, targeting women of child bearing age. Where identified, ensure women are referred to weight management services during pregnancy and post-natally (Fitter Futures in Warwickshire and the Be Active Be Healthy service in Coventry).
- Increase the number of pregnant women who are tested for Carbon Monoxide (CO) at time of booking and refer those women who smoke to the Smoking in Pregnancy Service. Continue to CO test all pregnant women who smoke throughout their pregnancy and refer into the Smoking in Pregnancy service at every opportunity. This in turn, will contribute to a reduction in premature births, still births and sudden infant death syndrome (SIDS).
- While the teenage pregnancy rate in Warwickshire remains lower than the national average, the 2010 key target to reduce the under 18 conception rate by 50% by 2010 was not achieved. Nuneaton & Bedworth Borough has consistently higher rates than the national average between 1998 and 2015, although the rate has fallen sharply in the latest year. North Warwickshire Borough's under 18 conception rate in 2015 was higher than the rate for Nuneaton & Bedworth Borough (25.4 births per 1,000 girls aged under 18 years) at 29.6 births per 1,000 girls aged under 18 years. Targeted work is being carried out in the North of the county to reduce these rates.
- Reducing deprivation will have a positive impact on teenage pregnancy rates, smoking, obesity, pre-term delivery and infant mortality.

- Continued investment to promote initiation of breast feeding, and more importantly, maintenance of breast feeding post-delivery is required for long term benefits for mothers and their children.
- Community action to change societal attitudes to make breastfeeding the norm, and provide breastfeeding friendly facilities in public places to help mothers to continue breast feeding for longer is still required.
- Effective service planning could help reduce health inequalities in infant mortality and thus also contribute to greater life expectancy.
- There is an urgent need to consider the development and targeting of culturally specific and sensitive maternity services to local areas to match the increasing number of BME women in Warwickshire.
- To reduce unnecessary admissions to neonatal units and keep mothers and babies together where possible, all sites with a neonatal unit should provide transitional care.
- Avoidable repeat foetal bloodspot sampling rate can be reduced with more training for staff and timely delivery of samples to the laboratories. Staff should endeavour to double check blood samples before they are sent to the laboratory. This should be the failsafe arrangements required by the National Screening Committee.

INTRODUCTION

In February 2016, the National Maternity Review published *Better Births*, a Five Year Forward View for maternity care which set out a vision for maternity services across England to become safer, more personalised, kinder, more professional and more family friendly. Recommendations were made to ensure that every woman has access to information to enable her to make decisions about her care, and support that is centred on her individual needs and those of her baby. *Better Births* also called for staff to be supported in delivering woman-centred care, emphasising the importance of strong leadership, promoting innovation and continuous learning, and breaking down organisational and professional boundaries.

This followed on from the Safer Births programme, which enabled frontline professionals working in maternity units to improve the safety of the services delivered to women and their babies. The Safer Births initiative was a partnership between The King's Fund, Royal College of Midwives, Royal College of Obstetricians and Gynaecologists, Centre for Maternal and Child Enquiries, NHS Litigation Authority and the National Patient Safety Agency.[1]

The Maternity Transformation Programme was launched in July 2016 to implement the vision set out in *Better Births*, supporting the Secretary of State's ambition to halve the number of stillbirths, neonatal and maternal deaths and brain injuries by 2030.

The CCG Improvement and Safety Framework 2016/17 baseline maternity assessment rates CCGs in England on improvement indicators for patient choice, experience, maternal smoking, and neonatal mortality rates, aligning with key themes from *Better Births*. There was considerable variation between CCGs, with almost 75% needing at least "some improvement" to maternity services - and 11 of these having "greatest need for improvement", including South Warwickshire CCG. Only one, West Kent CCG, was rated as "top performing" with another 53 rated as "performing well".[2]

The focus of this needs assessment is:

a) To provide an updated picture on maternity need and services across Coventry & Warwickshire to inform the upcoming service re-commissioning under the banner of the Sustainability & Transformation Partnership (STP).
b) Provide insight into routine maternity, excluding those groups which require additional interventions/services, for example, neonatal services at this stage, complications in pregnancy, pre-natal and perinatal mental health, pre-conceptual services and in vitro fertilisation.
c) The definition of maternity is from conception to eight weeks postnatal.

[1] King's Fund. About Safer Births. https://www.kingsfund.org.uk/projects/safer-births/about-safer-births (accessed 10 Apr 2017)
[2] Gammie J (2016). New ratings show 75% of CCGs failing on maternity care. Nursing Times https://www.nursingtimes.net/news/reviews-and-reports/new-ratings-show-75-of-ccgs-failing-on-maternity-care/7012873.article

LOCAL DEMOGRAPHICS

CURRENT & FUTURE POPULATION

The total population of Warwickshire was 554,000 according to the latest mid-2015 population estimates. Of which, 98,500 are women aged 15 to 44 years old. Figure 1 shows the numbers of women aged 15 to 44 years in each of the local authority areas in Warwickshire. Stratford-on-Avon District has the lowest proportions of 15-44 year old women (15.3%), while Warwick District has the highest (19.5%). Warwickshire's proportion of females aged 15-44 years (17.8%) is slightly lower than the national average (19.4%) while Coventry has a higher proportion of 15-44 year old women at 22.3%.

Figure 1: Mid-2015 population estimates

	Total	Female *(15-44 years)*	
	Count	Count	% of total population
North Warwickshire	62,800	10,600	16.9%
Nuneaton & Bedworth	126,300	23,400	18.5%
Rugby	103,400	18,700	18.1%
Stratford-on-Avon	121,500	18,500	15.3%
Warwick	139,900	27,300	19.5%
Warwickshire	**554,000**	**98,500**	**17.8%**
Coventry	345,400	77,000	22.3%
England	54,786,300	10,634,900	19.4%

Source: Office for National Statistics, 2015

ETHNICITY

The 'White British' group accounted for 88.5% of the overall population in 2011, a fall from 92.7% in 2001. Warwickshire's next largest ethnic group is the 'Other White' category at 3.1% of the population followed by the Indian community who make up 3% of the population. Both of these groups have experienced increases in numbers over the last 10 years. People identifying as 'Other White' more than doubled since 2001 and includes people with Poland as a country of birth while those identifying themselves as 'Indian' increased by a third (33%). Correspondingly Indian and Polish were the two largest groups of non-UK born residents in 2011 in the county.

When looking specifically at the ethnic group of women aged 15 to 44 years, 84.1% of females aged 15 to 44 years in Warwickshire are 'White British,' slightly lower than the proportion of the overall population but still higher than the equivalent national figure (73.2%). The proportion of non-'White British' or Black & Minority Ethnic (BME) groups is highest in Warwick District (22.1%) for women aged 15 to 44 years and lowest in North Warwickshire, representing 5.4% of women aged 15 to 44 years old. The 'Asian/Asian British' group is estimated to be the largest BME group in Nuneaton &

Bedworth, Warwick, and Warwickshire as a whole for this population of women, reflecting the national trend. In North Warwickshire, Rugby and Stratford-on-Avon the largest BME group is 'White: Other'. This group is likely to reflect those from Eastern European countries.

Coventry's population is much more diverse. Two in five of Coventry's population are from Black & Minority Ethnic (BME) Groups, with Asian/Asian British accounting for nearly one in five residents.

Figure 2: Proportion of women aged 15-44 years, by ethnic group

	North Warwickshire	Nuneaton & Bedworth	Rugby	Stratford -on-Avon	Warwick	Warwickshire	Coventry	England
White British	94.6%	85.8%	79.0%	89.7%	77.9%	**84.1%**	61.0%	73.2%
Black & Minority Ethnic (BME) **Of which:**	**5.4%**	**14.2%**	**21.0%**	**10.3%**	**22.1%**	**15.9%**	**39.0%**	**26.8%**
White: Irish	0.5%	0.2%	0.6%	0.5%	0.9%	**0.6%**	0.9%	0.8%
White: Gypsy or Irish Traveller	0.1%	0.1%	0.3%	0.2%	0.0%	**0.1%**	0.1%	0.1%
White: Other White	2.1%	2.8%	8.8%	5.5%	7.1%	**5.5%**	7.4%	7.5%
Mixed/multiple ethnic group	0.9%	1.2%	2.0%	1.1%	2.2%	**1.5%**	2.7%	2.5%
Asian/Asian British	1.5%	8.3%	6.7%	2.5%	9.8%	**6.6%**	19.1%	10.3%
Black/African/ Caribbean/Black British	0.3%	1.1%	2.3%	0.4%	1.0%	**1.0%**	7.2%	4.4%
Other ethnic group	0.1%	0.5%	0.4%	0.2%	1.1%	**0.5%**	1.6%	1.2%

Source: 2011 Census, Office for National Statistics

DEPRIVATION

The Indices of Multiple Deprivation 2015 (IMD 2015) is the official measure of deprivation in England. The Indices provide a set of relative measures of deprivation for small areas, known as Lower Layer Super-Output Area (LSOAs), across England based on seven domains of deprivation. Further to the IMD and the domain indices, there are also two supplementary indices one of which is the Income Deprivation Affecting Children Index (IDACI).

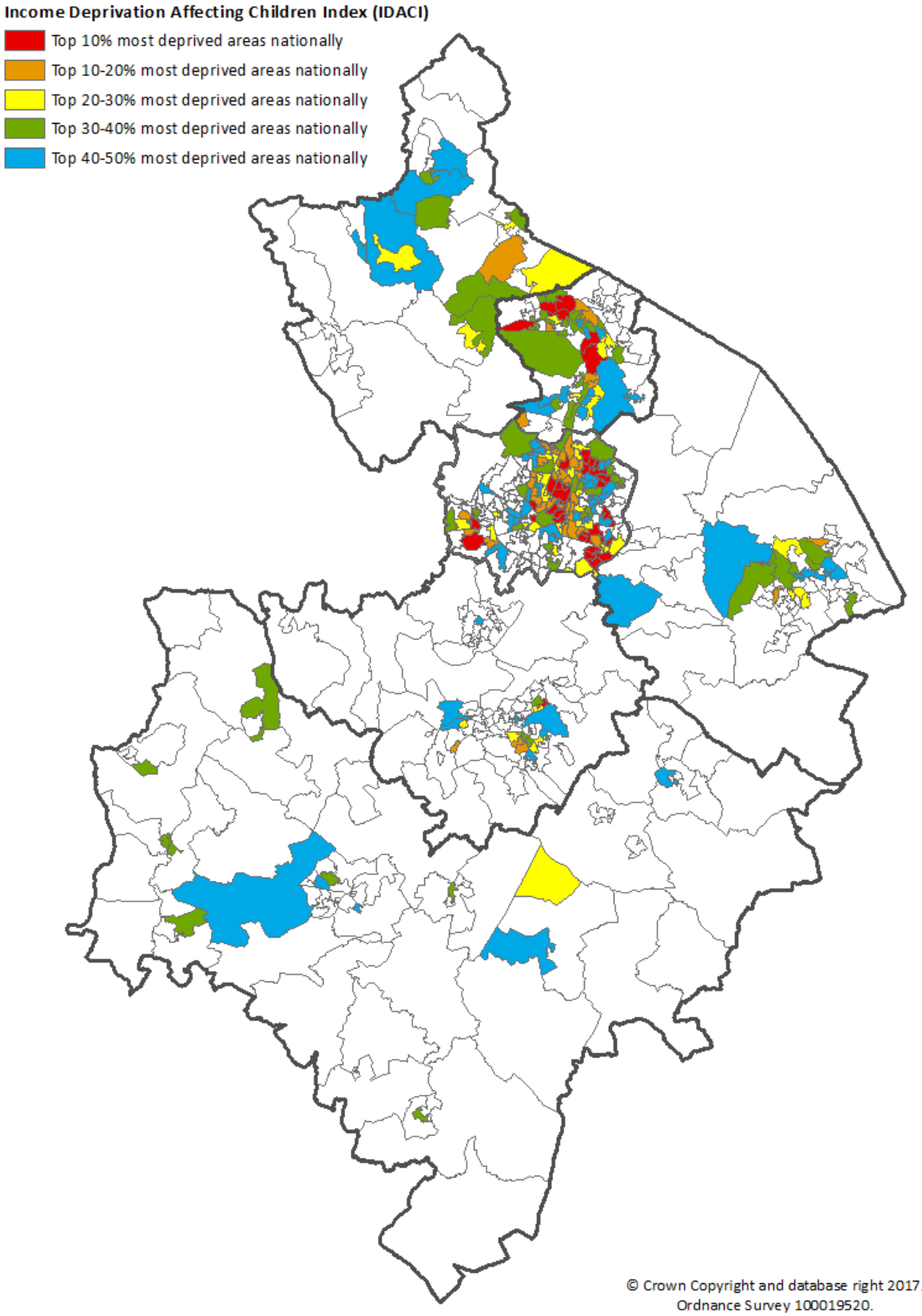
Figure 3 below highlights the key areas based on this index which measures the proportion of all children aged 0 to 15 years living in income deprived families. There are 39 areas in Warwickshire in 2015 ranked within the 30% most deprived LSOAs nationally experiencing income deprivation affecting children, compared to 44 in the 2010 index.

Of the 39 areas in the 2015 index, 18 are in Nuneaton & Bedworth Borough, nine in Warwick District, six in Rugby Borough, five in North Warwickshire Borough and one are in Stratford on Avon. Two areas in Nuneaton & Bedworth Borough feature within the top 1% most deprived LSOAs nationally. These are Bar Pool North & Crescents and Camp Hill Village & West.

In Coventry, there are 81 areas ranked within the 30% most deprived LSOAs nationally out of 195 areas constituting 42% of the areas in the city. There are 29 areas in the 10% most deprived LSOAs nationally and five areas in the 1% most deprived. These are:

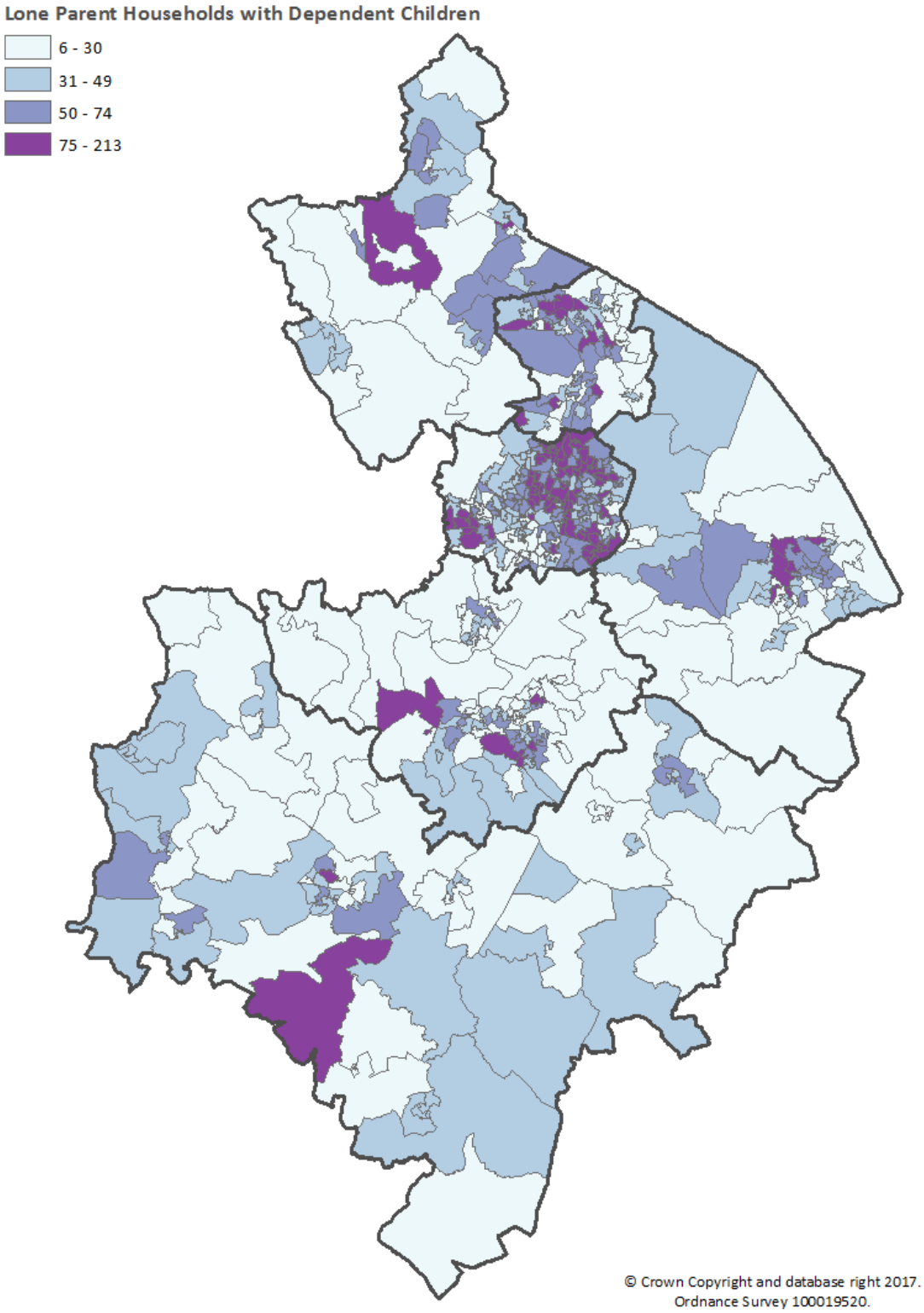
- Wood End – Hillmorton Road
- Aldermans Green - Deedmore Road
- Bell Green - Roseberry Ave
- Manor Farm
- Hillfields - Coronation Road, Swanswell Basin.

Figure 3: Income Deprivation Affecting Children, Coventry & Warwickshire



LONE PARENT HOUSEHOLDS

Figure 4: All Lone Parent Households with Dependent Children



MATERNITY NEED

NUMBER OF BIRTHS

The total number of live births to Warwickshire residents has fallen by 3% from 6,273 live births in 2011 to 6,086 live births in 2015. Figure 5 shows the number of live births for this period. Nuneaton & Bedworth Borough and Warwick District account for one in two (50%) live births in Warwickshire. All areas have seen a fall in births in the five year period, 2011 to 2015, except North Warwickshire, 2011 to 2015. Coventry and Warwick District have seen the largest percentage falls, both falling by around 6% between 2011 and 2015, compared to a national average of 3.4%. Rugby Borough has stayed relatively constant in that period, falling by only seven births between 2011 and 2015.

Figure 5: Number of live births, 2011-2015

	2011	2012	2013	2014	2015	% change *(2011-2015)*
North Warwickshire	651	688	676	568	664	2.0%
Nuneaton & Bedworth	1,639	1,598	1,582	1,528	1,589	-3.1%
Rugby	1,273	1,261	1,243	1,246	1,266	-0.5%
Stratford-on-Avon	1,153	1,139	1,068	1,037	1,103	-4.3%
Warwick	1,557	1,619	1,521	1,506	1,464	-6.0%
Warwickshire	**6,273**	**6,305**	**6,090**	**5,885**	**6,086**	**-3.0%**
Coventry	4,801	4,731	4,495	4,572	4,517	-5.9%
England	688,120	694,241	664,517	661,496	664,399	-3.4%

Source: Office for National Statistics

In 2015, there were 667,351 births in England, of which, 2,952 (0.4%) were stillbirths.[3] Figure 6 shows the proportions of still births across Coventry & Warwickshire which are largely in line with the national average. The stillbirth rate for the three-year period 2013 to 2015 was 4.6 per 1,000 births in England.[4] The equivalent stillbirth rate was lower in Warwickshire (3.1 per 1,000 births) and the Coventry rate was 5.0 per 1,000 births, which was not significantly different to the England rate.[4]

Nationally in 2015, 2.3% of women gave birth at home, with those aged 35 to 39 most likely to do so.[5] More than half of all live births were to mothers aged 30 and over; falling birth rates among the under-30s and rising birth rates at older ages reflect trends to delay childbearing to later ages.

Over a quarter (28.4%) of live births in England in 2015 were to mothers born outside the UK. In Coventry this was over a third (39.2%), reflecting the diversity of the city's population, whereas Warwickshire was under a fifth (17.6), ranging from 5.6% in North Warwickshire to 26.9% in Rugby.[6]

[3] ONS (2015). Birth Summary Tables
[4] PHE Pregnancy and birth indicators: https://fingertips.phe.org.uk/profile-group/child-health/profile/child-health-pregnancy
[5] ONS (2016). Birth characteristics in England and wales: 2015. https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/birthcharacteristicsinenglandandwales/2015
[6] ONS (2016). Parents' country of Birth, England and wales: 2015. https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/parentscountryofbirthenglandandwales/2015

Figure 6: Live and still births, 2015

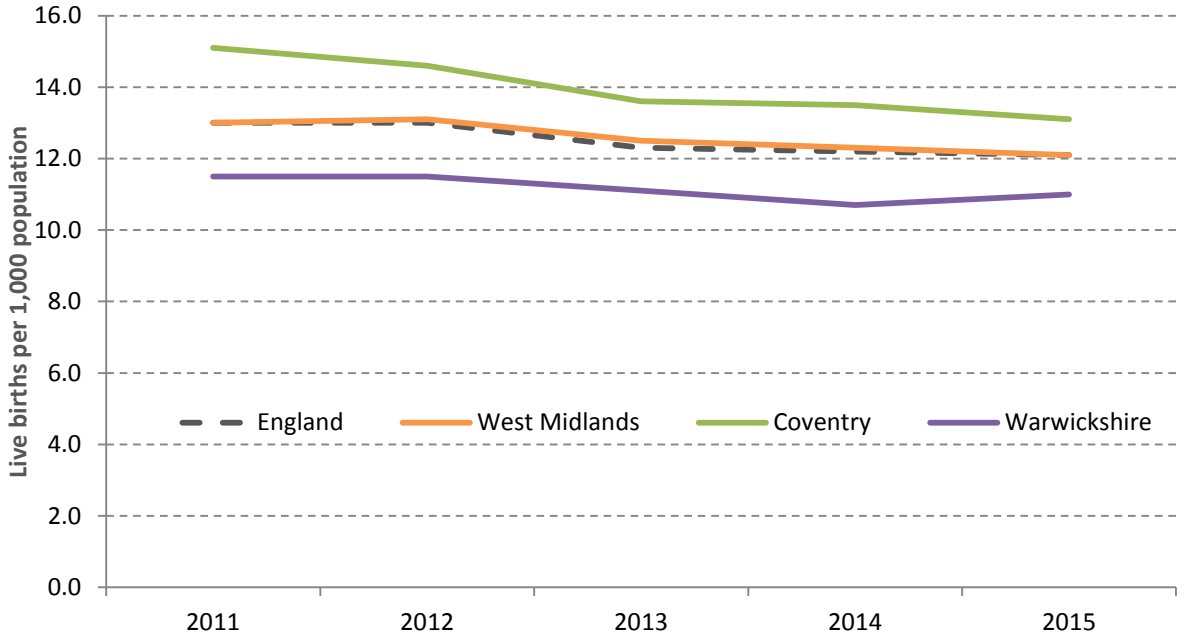
	Total Births	Live Births	Still births	
			Number	%
North Warwickshire	667	664	3	0.4%
Nuneaton & Bedworth	1,594	1,589	5	0.3%
Rugby	1,268	1,266	2	0.2%
Stratford-on-Avon	1,107	1,103	4	0.4%
Warwick	1,467	1,464	3	0.2%
Warwickshire	**6,103**	**6,086**	**17**	**0.3%**
Coventry	4,538	4,517	21	0.5%
West Midlands	70,136	69,806	330	0.5%
England	667,351	664,399	2,952	0.4%

Source: Office for National Statistics

CRUDE BIRTH RATES

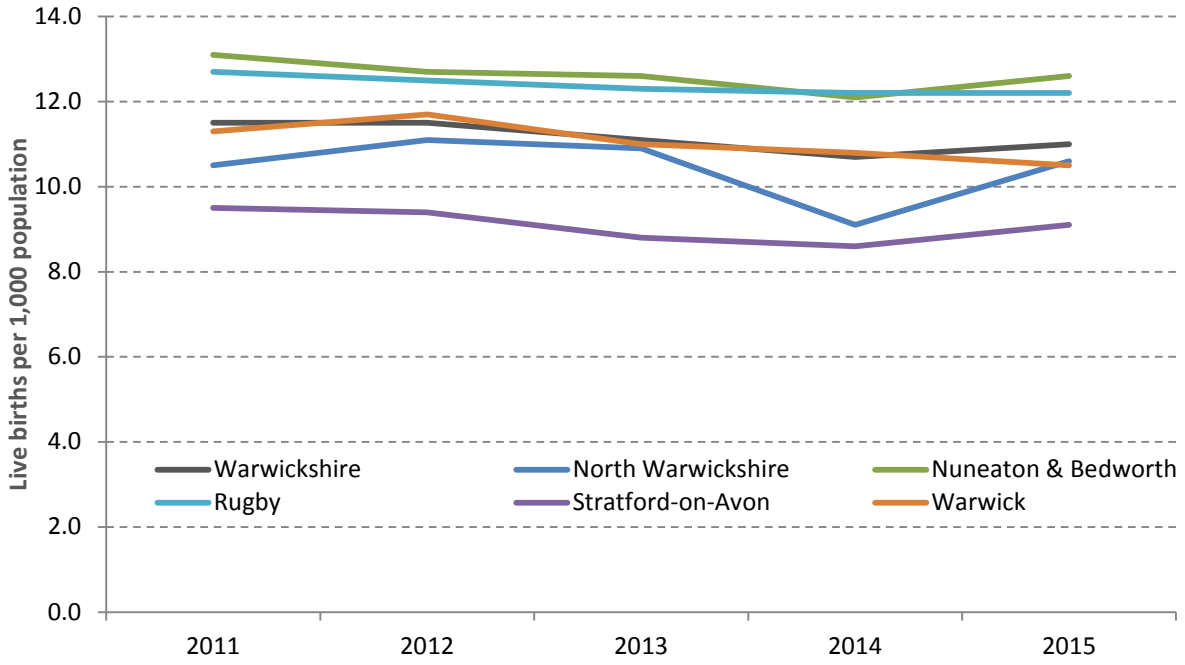
Figure 7 compares the crude birth rates between England, West Midlands, Coventry and Warwickshire showing that, in line with England, Warwickshire has seen a fall in the crude birth rate in the five year period and the Warwickshire rate is consistently lower than the equivalent national rate. The lowest crude birth rates at a District/Borough level are in Stratford-on-Avon District and North Warwickshire Borough.

Figure 7: Crude birth rates, 2011-2015



Source: Office for National Statistics

Figure 8: Live and still births, 2015

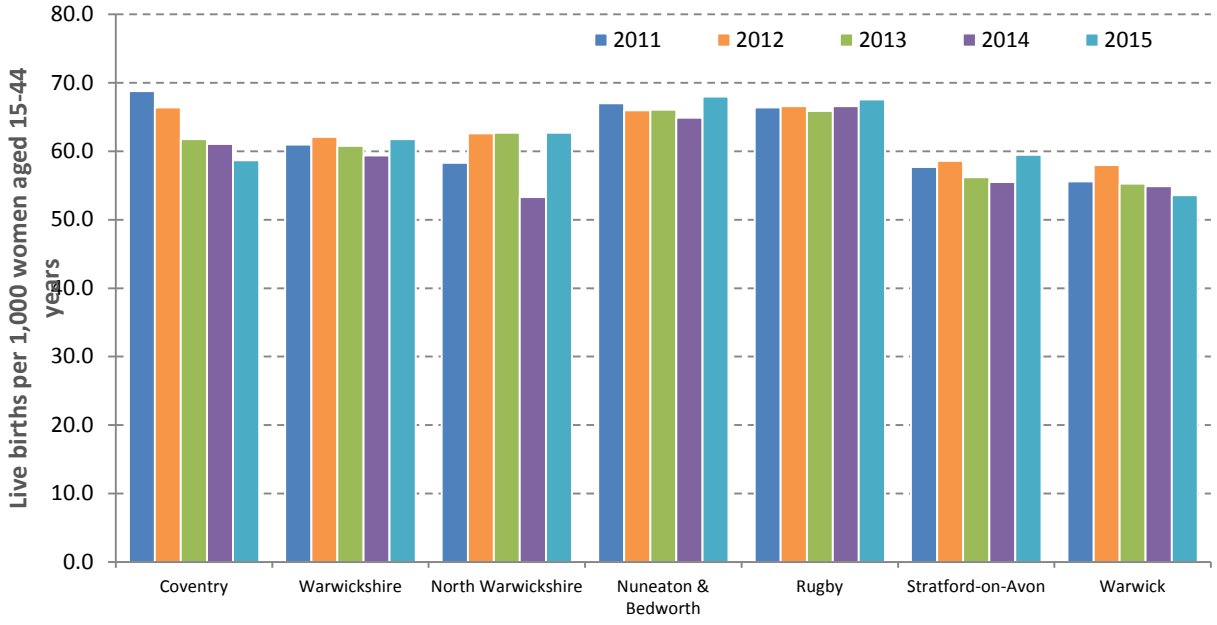


Source: Office for National Statistics

FERTILITY RATES AND RATIOS

Fertility rates are used as a more accurate measure of fertility. The general fertility rate (GFR) is the number of births per 1,000 resident women aged 15-44 years.

Figure 9: General fertility rates for Coventry & Warwickshire, 2011-2015

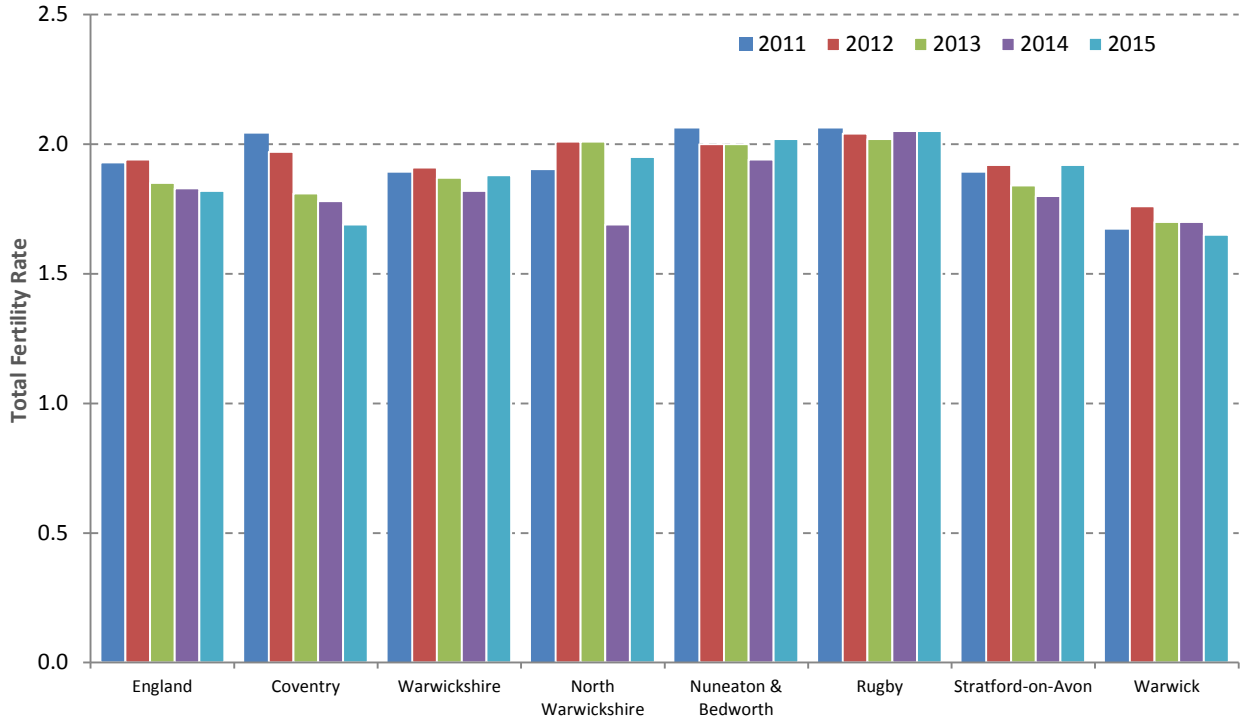


Source: Office for National Statistics

Warwickshire's GFR rates have been consistently lower than the national rates, rates for Nuneaton & Bedworth Borough and Rugby Borough are higher than the equivalent national rate while Coventry's general fertility rate (58.7 births per 1,000 women aged 15-44 years) has fallen consistently over the past five years and now falls below the national GFR rate in 2015 (62.5 births per 1,000 women aged 15-44 years).

Another measure of fertility is the period or total fertility rate, which is shown in Figure 10. This considers the average number of live-born children a woman would have if the current age specific fertility rates were applied over the 30 years of her reproductive span (i.e. age 15 to 44 years).

Figure 10: Period or total fertility rates for Coventry & Warwickshire, 2011-2015



Source: Office for National Statistics

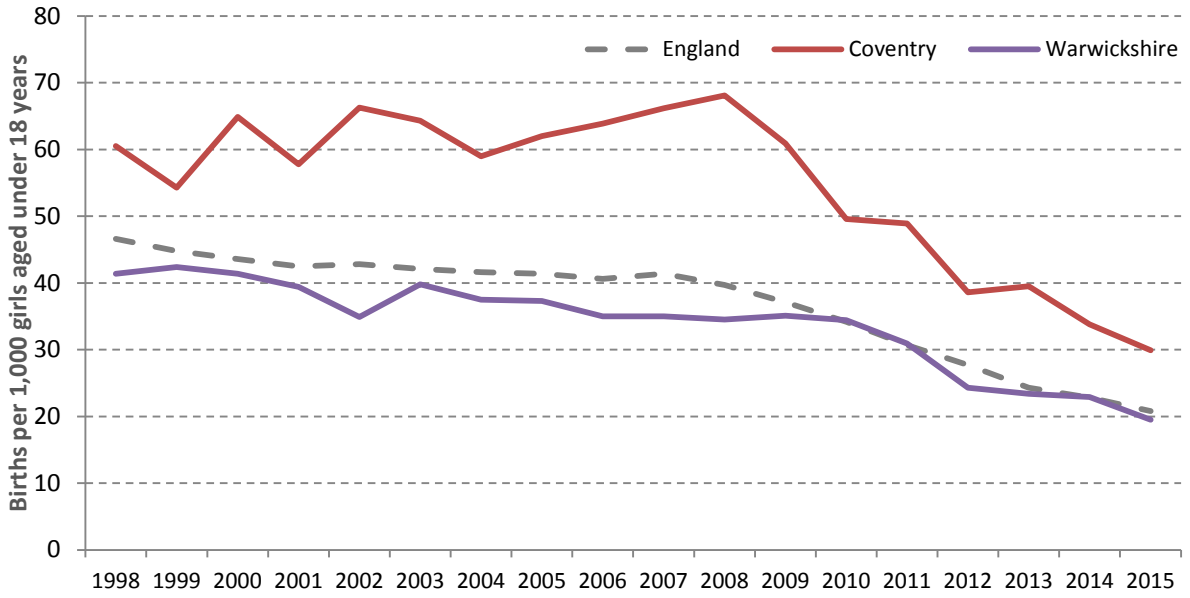
For the years 2011-2015, the average period or total fertility rate in Warwickshire is 1.87, the same as the England average over that period and similar to the Coventry figure (1.86). Looking at the period or total fertility rate for 2015 shows more variation. Warwickshire's rate is 1.88, higher than the Coventry (1.69) and national rate (1.82) in 2015. Rugby Borough and Nuneaton & Bedworth Borough both have period or total fertility rates above 2.0, highlighting the potential increasing family size at the population level in these two Boroughs.

It is also worth reflecting the likely impact of migration and housebuilding on fertility rates both now and in the future. Migrant households tend to have higher birth rates on average and a number of the houses due to be built in some areas of Warwickshire have been identified for young families. This will likely have an impact on fertility rates and should be considered alongside these rates.

TEENAGE PREGNANCY

Reducing the rate of teenage pregnancy (conception) is a key target for local government, the Department of Health and the Department for Education & Skills, namely to reduce the under 18 conception rate by 50% by 2010 from the 1998 baseline. For Warwickshire, this translated to 22.3 births per 1,000 teenage girls by 2010. Figure 11 shows the rates from 1998 to 2015. While the teenage pregnancy rate for Warwickshire remains lower than the national average, the 2010 target was not achieved. Warwickshire observed a 16% reduction in teenage pregnancy rates (41.4 per 1,000 girls under 18 years in 1998 to 34.8 per 1,000 girls under 18 years in 2010), compared to 24% reduction nationally (46.6 per 1,000 in 1998 to 35.4 per 1,000 in 2010). Coventry's under 18 conception rate has been falling since 2008, although it has been consistently above the Warwickshire and national benchmarks since 1998. In 2015, Coventry's teenage pregnancy rate has come down considerably from 2013 and 2014 rates and is now at 29.9 per 1,000 girls aged under 18 years, compared to a national average of 20.8.

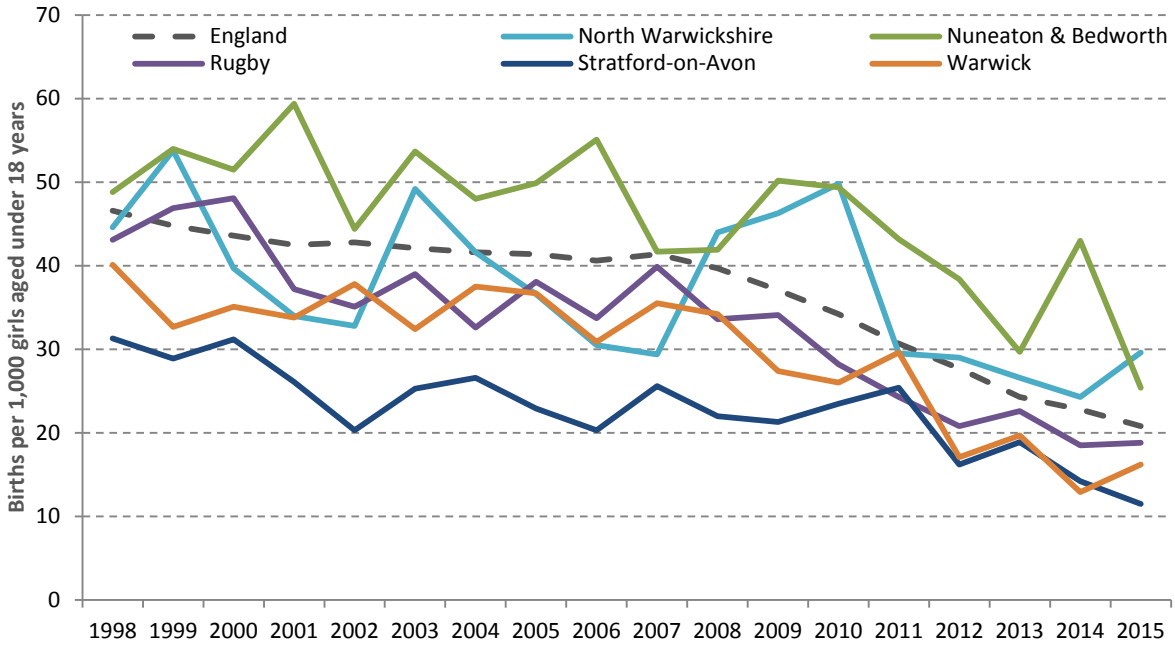
Figure 11: Under 18 conception rate, 1998-2015



Source: Fingertips

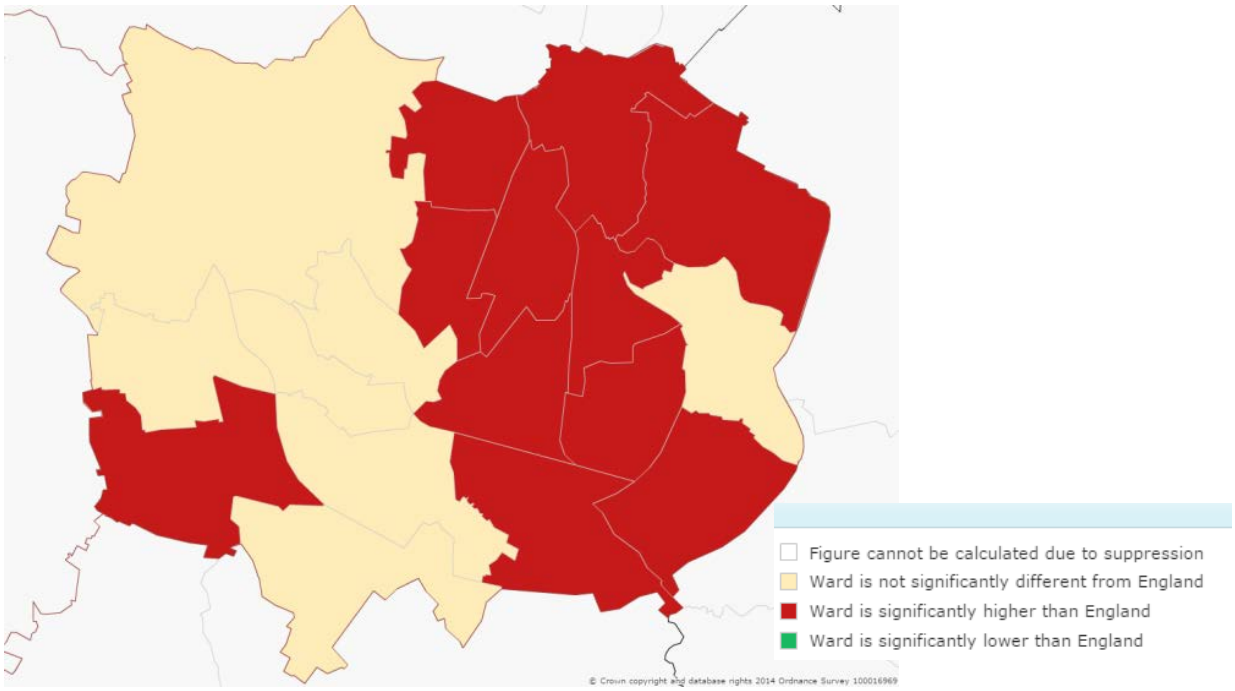
Nuneaton & Bedworth Borough has had consistent higher teenage pregnancy rates than the national average between 1998 and 2015, although the rate has fallen sharply in the latest year, from 43 births per 1,000 girls aged under 18 years in 2014 to 25.4 births per 1,000 girls aged under 18 years in 2015. North Warwickshire Borough's under 18 conception rate in 2015 was higher than the rate for Nuneaton & Bedworth Borough at 29.6 births per 1,000 girls aged under 18 years. Figure 13 and 14 shows the significance of ward teenage pregnancy rates compared to the England average for wards in Coventry & Warwickshire.

Figure 12: Under 18 conception rate, 1998-2015, by District/Borough



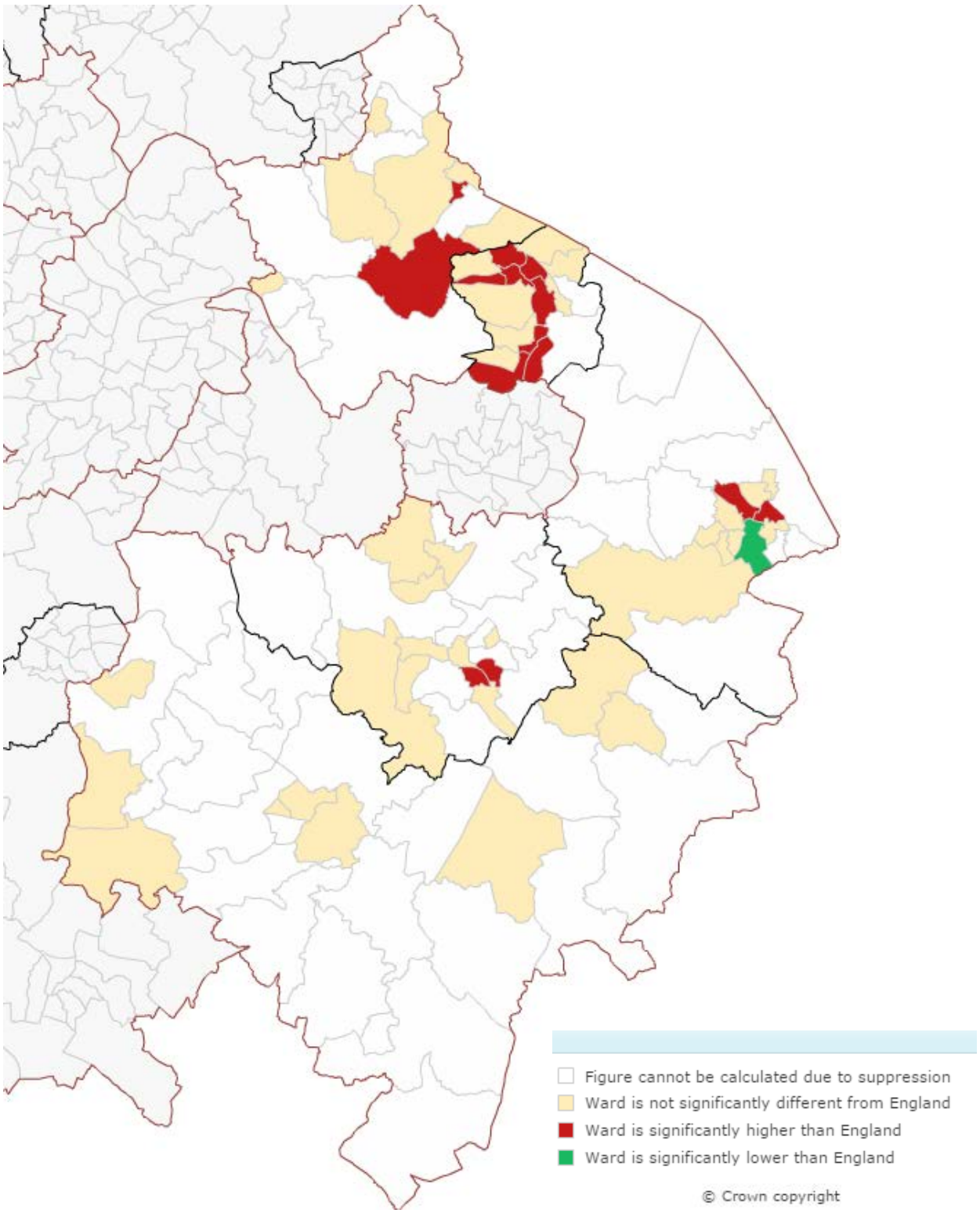
Source: Fingertips

Figure 13: Teenage pregnancy rates significance against England at ward level for Coventry, 2012-2014



Source: Chimat Atlas:
http://atlas.chimat.org.uk/IAS/dataviews/report/fullpage?viewId=498&reportId=511&geoId=100&geoReportId=4644

Figure 14: Teenage pregnancy rates significance against England at ward level for Warwickshire, 2012-2014



Source: Chimat Atlas:
http://atlas.chimat.org.uk/IAS/dataviews/report/fullpage?viewId=498&reportId=511&geoId=100&geoReportId=4644

NUMBER OF BIRTHS BY SMALL AREA

Figure 15 highlights the number of live births by Lower Super Output Area (LSOA). The births are grouped into wide intervals to ensure data confidentiality; however, the map does highlight those areas across Warwickshire with a higher number of births in 2015.

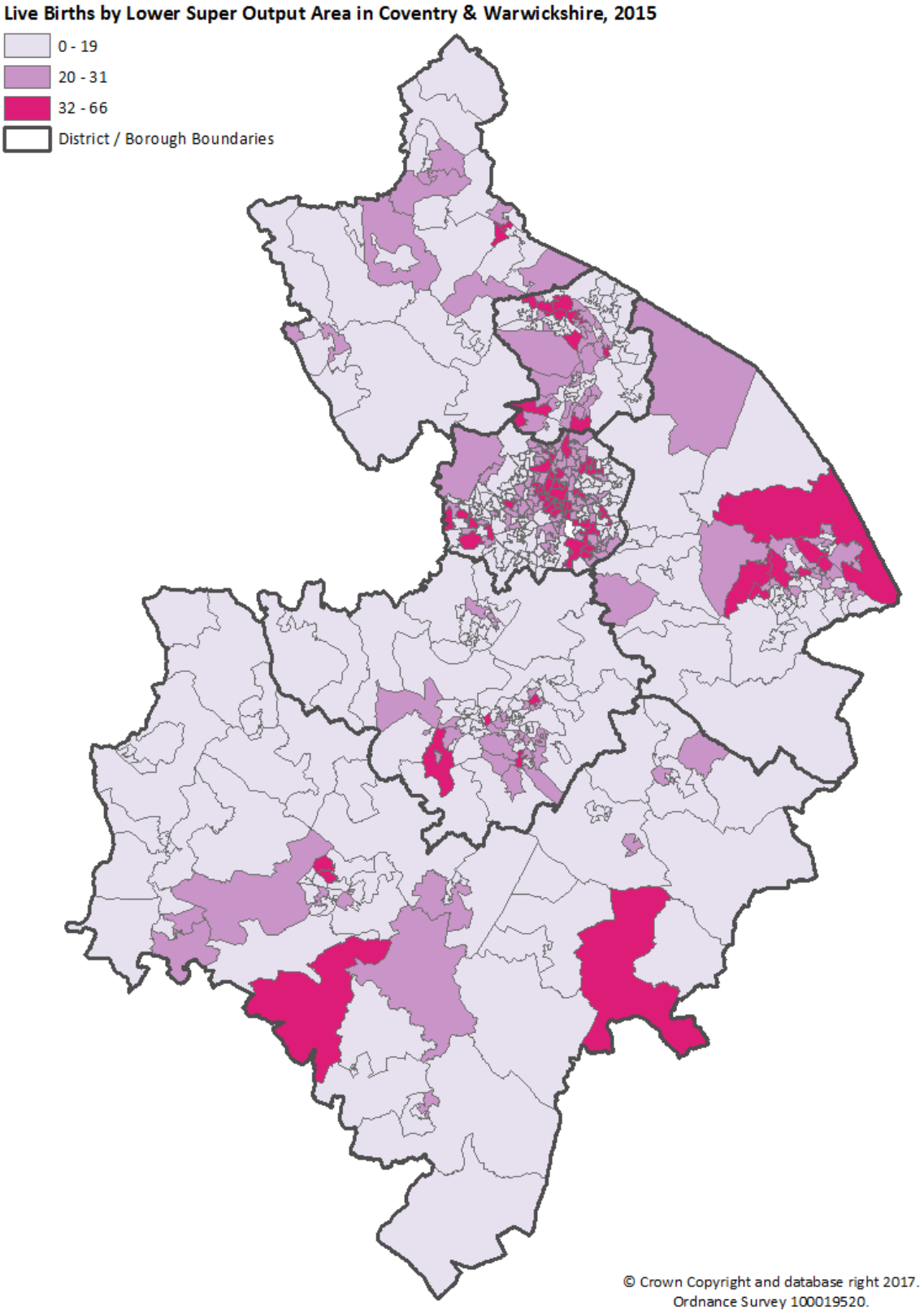
There are 11 areas across Coventry & Warwickshire that had more than 50 births in 2015. This has implications for service delivery in terms of targeting those areas with the highest numbers of births and these areas are highlighted below. From a Warwickshire perspective, three of these are in Rugby Borough, two in Nuneaton & Bedworth Borough and one in Warwick District. In Coventry, the areas with the highest births are located to the North and East of the city.

Figure 15: Lower Super Output Areas (LSOAs) with more than 50 live births in 2015

LSOA	LSOA Name	District/ Borough	2015 Live Births
E01009619	Peugeot, Dominion Plaza & Humber Road North	Coventry	95
E01031164	Long Lawford South	Rugby	66
E01009636	Hillfields - Swans Lane Thacknall Street	Coventry	63
E01009572	Foleshill - Paragon Park Red Lane	Coventry	62
E01032890	Camp Hill Village & West	Nuneaton & Bedworth	57
E01031141	Brownsover South Junction One	Rugby	56
E01009640	Hillfields - Coronation Road Swanswell Basin	Coventry	56
E01032892	Easenhall, Newton & Biggin and Harborough Magna	Rugby	53
E01033255	Kings Meadow & Longbridge	Warwick	52
E01009620	Stoke Green - New Century Park	Coventry	52
E01031075	Camp Hill East & Quarry	Nuneaton & Bedworth	51

Source: Warwickshire & Coventry Public Health

Figure 16: Live births by Lower Super Output Area (LSOA), 2015



Source: Warwickshire & Coventry Public Health

PROJECTED NEEDS: PROJECTED BIRTHS

By 2039, there is projected to be a 5.1% increase in the number of births in Warwickshire and a projected increase of 31.5% in Coventry based on 2014 population projections. The national rate of increase is 6.8% between 2014 and 2039, highlighting further the significant increase Coventry is expected to see. This has implications for service delivery in Coventry and reflects the younger age profile of the population and the increased diversity of households when compared to Warwickshire.

There is considerable variation at District/Borough level in Warwickshire (Figure 18). Warwick District is projected to see the greatest increase in numbers of births: a total projected increase of 163 births or 10.9%. Interestingly, Stratford-on-Avon has the second highest projected rate of increase in Warwickshire at 6.8% from 2014 to 2039.

Figure 17: Projected live births in Coventry & Warwickshire, 2014-2039

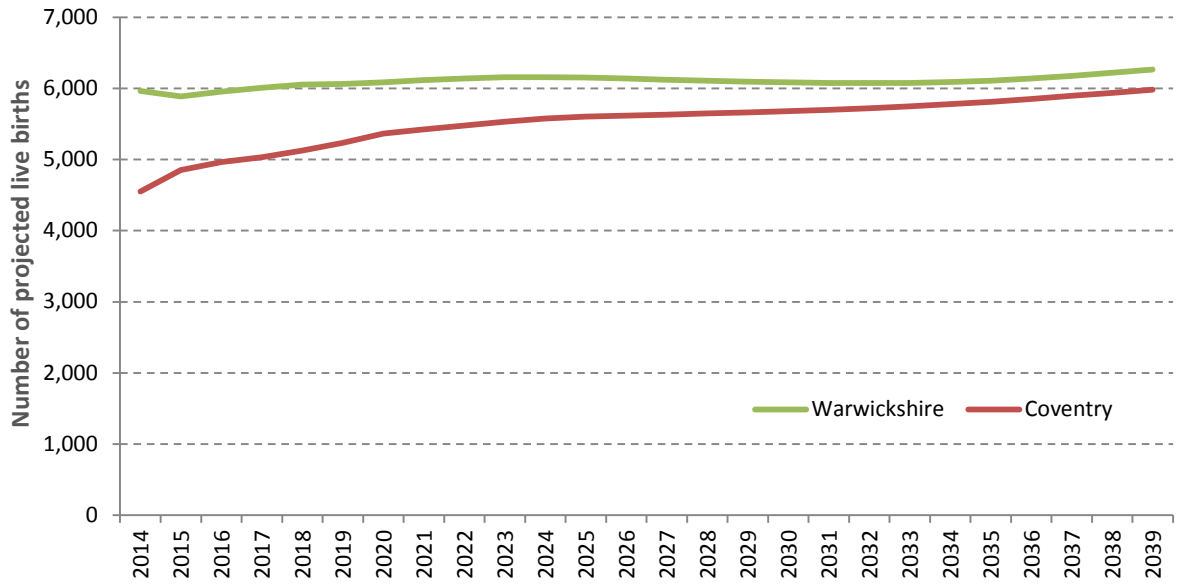
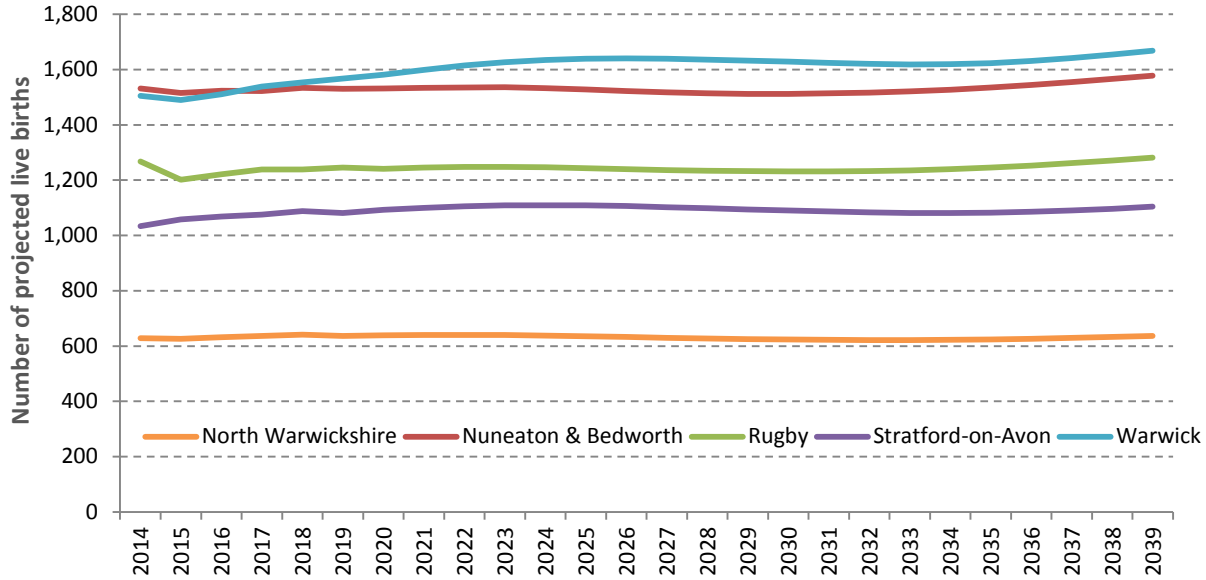


Figure 18: Change in numbers of live births between 2014 and 2039

	Change in births 2014-2039	
	Number	**% change**
North Warwickshire	8	1.3%
Nuneaton & Bedworth	46	3.0%
Rugby	14	1.1%
Stratford-on-Avon	70	6.8%
Warwick	163	10.9%
Warwickshire	**303**	**5.1%**
Coventry	**1,433**	**31.5%**
England	44,917	6.8%

Source: Sub-national population projections, Office for National Statistics

Figure 19: Projected live births for Warwickshire's Districts/Boroughs, 2014-2039



Source: Sub-national population projections, Office for National Statistics

Caution must be taken when analysing live birth projections. Projections are subject to fluctuations due to migration, economic factors, changes in local demographics and do not take into account the impact of new housing developments for example.

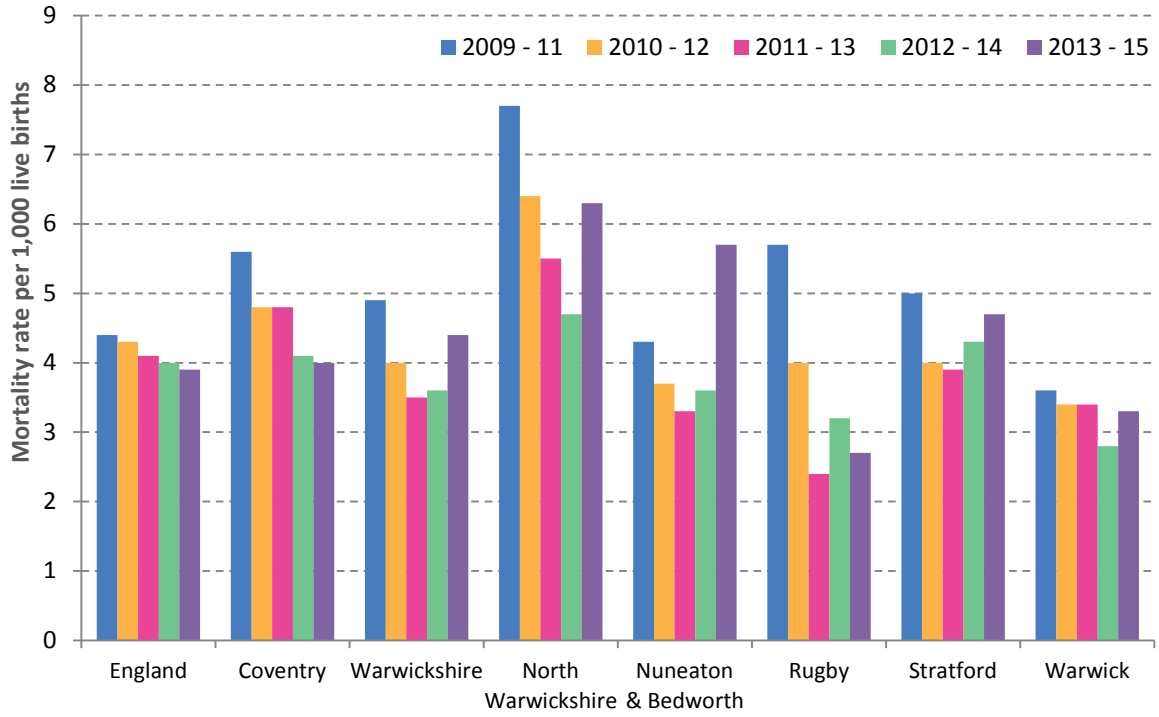
INFANT MORTALITY

Infant mortality is an indicator of the general health of an entire population. It reflects the relationship between causes of infant mortality and upstream determinants of population health such as economic, social and environmental conditions. Deaths occurring during the first 28 days of life (the neonatal period) in particular, are considered to reflect the health and care of both mother and newborn.

INFANT MORTALITY RATES (IMR)

Figure 20 (below) shows that infant mortality rates across Coventry and Warwickshire have generally been falling in the last five years. Despite the variability, particularly at district and borough levels, none of the rates are statistically significantly different to the national rates.

Figure 20: Coventry & Warwickshire Infant Mortality Rates, per 1,000 live births



Source: Office for National Statistics

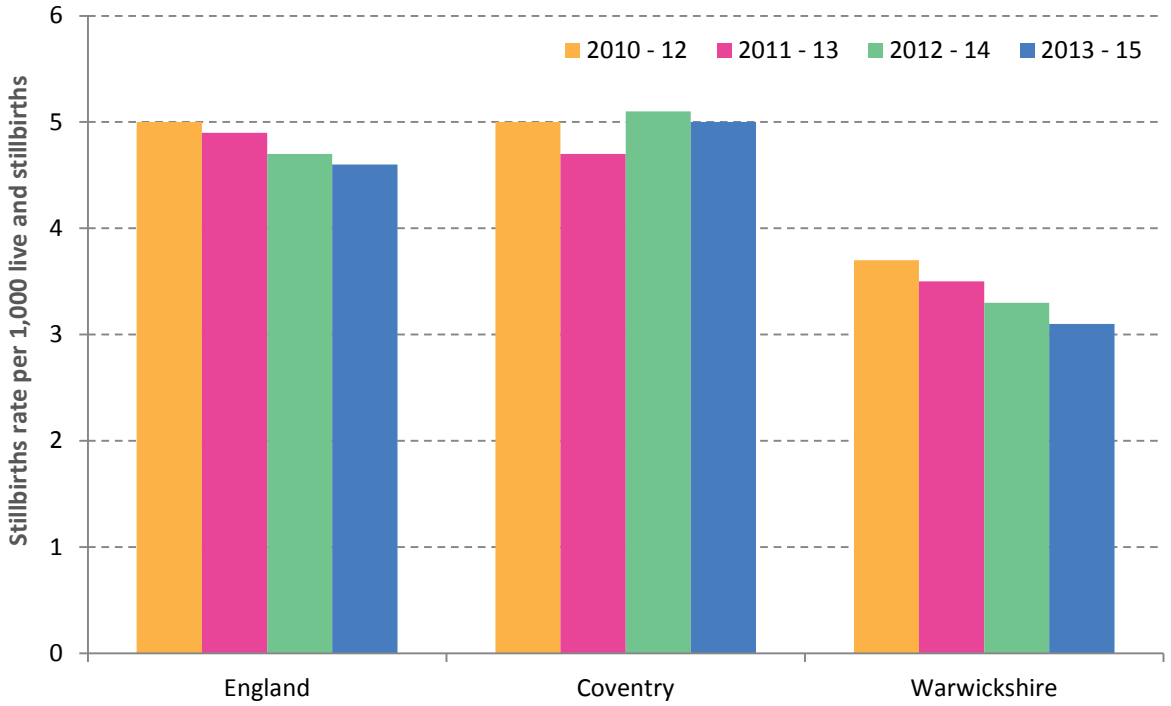
STILLBIRTH RATES

Although, from 2003-13, national neonatal and stillbirth rates fell by over 20%, the Government announced, in 2015, an ambition to improve maternity outcomes by reducing the rate of stillbirths, neonatal and maternal deaths in England by 50% by 2030[7].

[7] https://www.england.nhs.uk/signuptosafety/maternity/

Stillbirth rates across Warwickshire are consistently significantly better than those nationally and have been reducing in recent years. Numbers are too small to be able to produce meaningful rates at district and borough level across the county. In Coventry, rates are more variable but not significantly different to the England rate.

Figure 21: Coventry & Warwickshire Stillbirth Rates, per 1,000 live and stillbirths



Source: Office for National Statistics

NEONATAL MORTALITY RATE

Neonatal mortality rates refer to deaths within the first 28 days of life and exclude stillbirths. Figure 22 (below) shows three year average rolling neonatal mortality rates. Nationally, they appear to be continuing to fall however, in recent years at a local level, small numbers mean rates are more variable. In 2015, there was an increase in neonatal deaths in Nuneaton & Bedworth largely related to multiple-birth deaths where the cause was extreme prematurity. These affected the Warwickshire rate for 2013-15.

The two leading causes of neonatal mortality are prematurity/low birth weight and birth defects. There are a number of risks factors for prematurity that include medical conditions such as diabetes, infections and clotting disorders; and lifestyle factors such as smoking, drinking alcohol and extreme stress. Smoking and passive smoking in pregnancy increase the risk of infant mortality by an estimated 40%[8].

[8] The National Institute of Health and Care Excellence, (2010) Smoking: stopping in pregnancy and after childbirth.

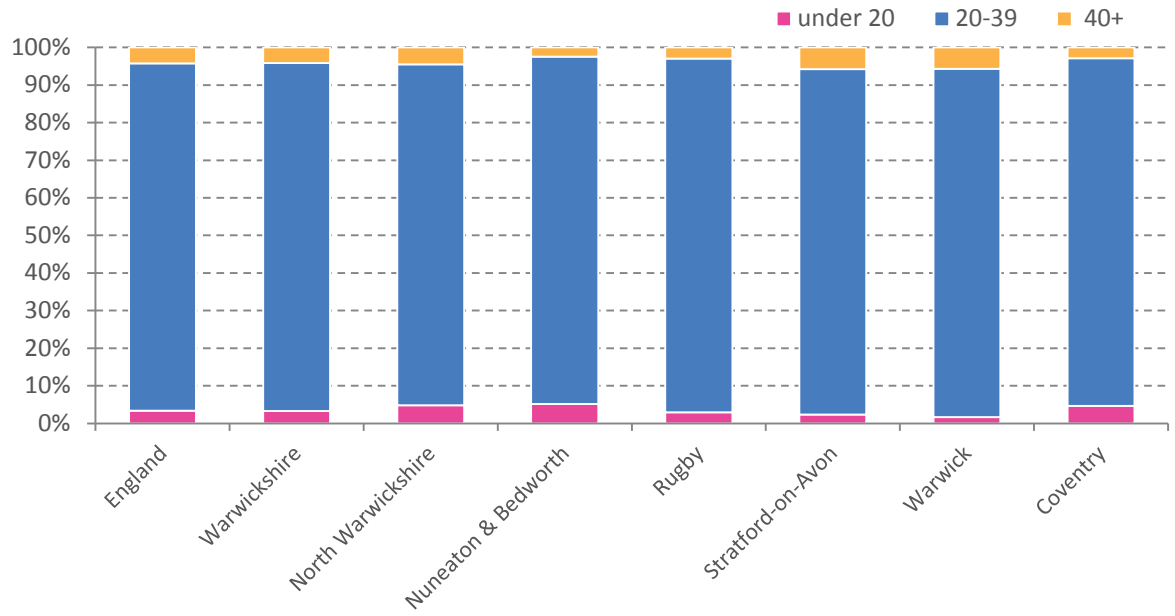
Figure 22: Coventry & Warwickshire Neonatal Mortality Rates, per 1,000 live births

Source: Office for National Statistics

AGE OF MATERNITY: PREGNANCY BY AGE GROUP

Maternal age impacts on pregnancy and infant outcomes. Babies of teenage mothers are more likely to be born prematurely or at a low birth weight, and are 60% more likely to die in the first year of life than babies of mothers aged 20-39[9]. Women over the age of 40 have an increased risk of having a baby with congenital abnormalities[10] and associated increased risk of infant morbidity/mortality. In Warwickshire the majority of live births are to women aged 20 to 39, as is also the case in Coventry (Figure 23). Nuneaton & Bedworth followed by North Warwickshire and Coventry have the highest proportion of live births to women under 20 years old (Figure 24). Stratford-on-Avon and Warwick Districts have higher proportion of births to women over 40 years.

Figure 23: Proportion of live births by age of mother (2015)



Source: Office for National Statistics

Figure 24: Proportions of live births to women under 20 years and 40 years and above

Age	England	Warwickshire	North Warwickshire	Nuneaton & Bedworth	Rugby	Stratford-on-Avon	Warwick	Coventry
Under 20 (%)	3.4	3.3	4.8	5.2	2.9	2.4	1.6	4.6
40+ (%)	4.2	4.2	4.5	2.5	3.0	5.8	5.7	2.9

Source: Office for National Statistics, 2015

[9] Teenage Pregnancy Independent Advisory Group & Royal College of Practitioners, Briefing -Teenage pregnancy: You can make a real difference to teenage pregnancy, 2012.

[10] West Midlands Perinatal Institute 2007 *Stillbirth and infant mortality, West Midlands 1997-2005: Trends, Factors, Inequalities* West Midlands Perinatal Institute West Midlands Perinatal Institute 2007 *Stillbirth and infant mortality, West Midlands 1997-2005: Trends, Factors, Inequalities* West Midlands Perinatal Institute.

ANTENATAL CARE

Health and social care assessment of needs, risks and choices

All women are encouraged to access maternity services for a *health and social care assessment of needs, risks and choices* to give them the full benefit of personalised maternity care and improve outcomes and experience for mother and baby[11]. *Health and social care assessment of needs, risks and choices* is defined as an antenatal care "booking visit" where the hand held maternity record is completed. This must include:

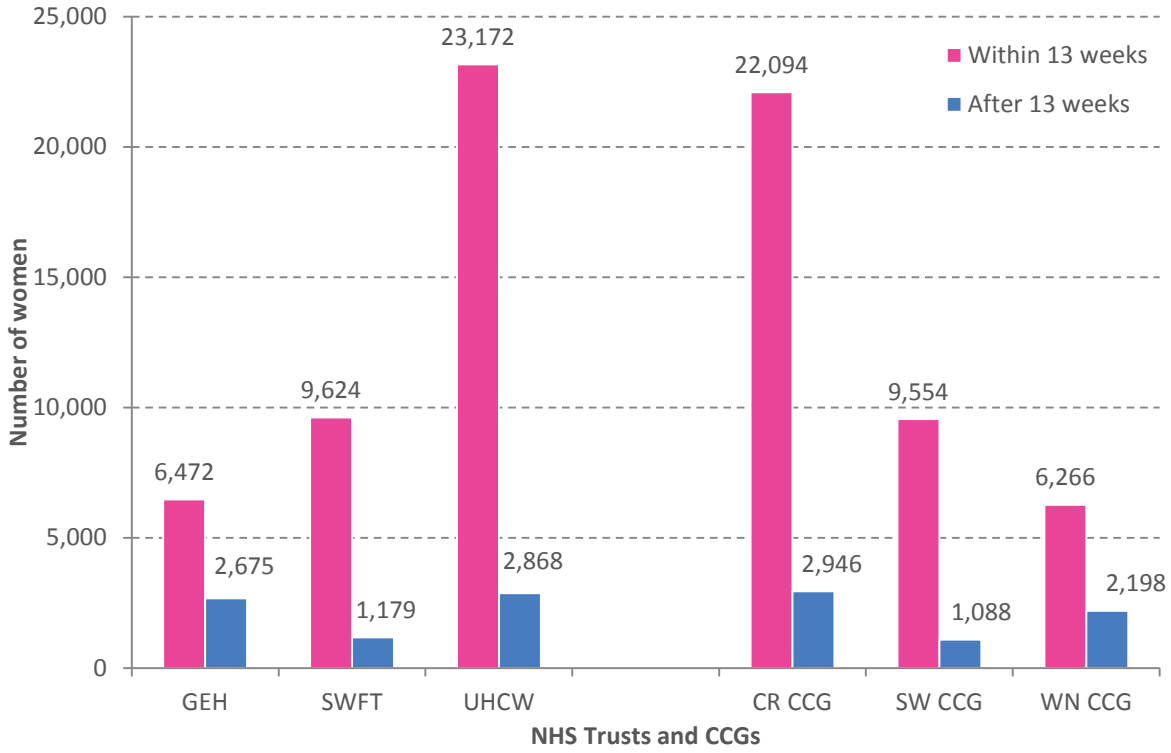
- Information provided on the choice of type of antenatal care as in the NHS Choice Framework
- Antenatal information, checks and tests described in the NICE antenatal care guidance of March 2008 including:
    - Vitamin D supplements
    - Screening for risk factors of gestational diabetes
    - Maternal height and weight; body mass index calculated
    - Screening questions for depression and other mental disorders
    - Offer of screening for anaemia
    - Offer of early ultrasound scan for gestational age assessment
    - Smoking status at time of delivery
- Assessment of incidence of domestic abuse.

Information is collected on the number of women who have seen a midwife or a maternity health care professional for an assessment by 12 weeks and 6 days of pregnancy (CCG Outcome Indicator Set 1.13). The proportion of pregnant women having an assessment within 13 weeks varies by provider (Figure 25). Over a period of 3 years and 9 months (Q1 2013/14 to Q3 2016/17), 89% of women had an assessment within 13 weeks at both South Warwickshire NHS Foundation Trust (SWFT) and University Hospitals Coventry and Warwickshire NHS Trust (UHCWT), and 71% at George Eliot Hospital NHS Trust (GEH). The corresponding percentages for the three CCGs are 88% NHS Coventry and Rugby CCG, 90% NHS South Warwickshire CCG and 74% NHS Warwickshire North CCG. The lower percentage for women attending the George Eliot Hospital NHS Trust (and registered with a GP practice within Warwickshire North CCG) are mainly due to assessments carried out during 2014/15 (Figure 26). There were some data quality issues reported where internally women transferring into GEH at different gestations were being captured; these have since been resolved.

The data presented only includes women who have had an assessment during pregnancy; a small number of women will not have an assessment. In addition, in some cases a pregnant woman may have more than one assessment.

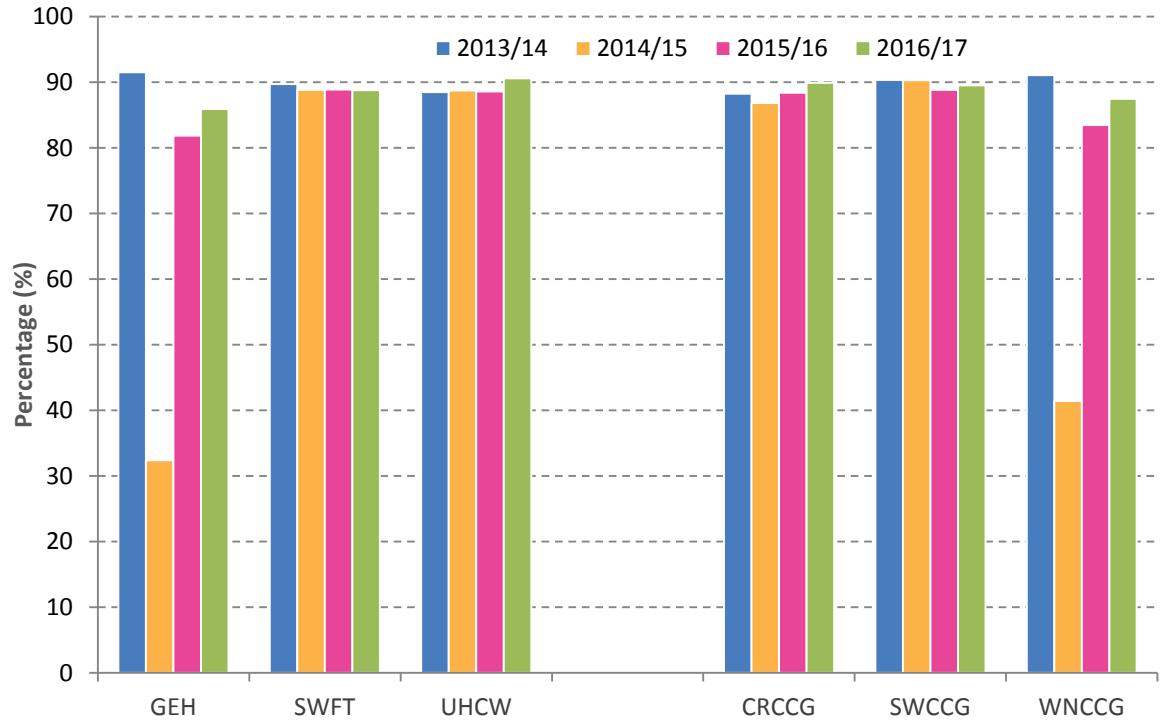
[11] NHS England, Data Flows for Direct Commissioning <12 Week Maternal Assessment, Breastfeeding Initiation, UNIFY Collections: Guidance, 2016.

Figure 25: Maternal 12 week assessment, 2013/14 Q1 to 2016/17 Q3



Source: NHS England: Breastfeeding & 12 week maternal assessment. Note: The data source is classified as experimental

Figure 26: Percentage of pregnant women having an assessment within 13 weeks



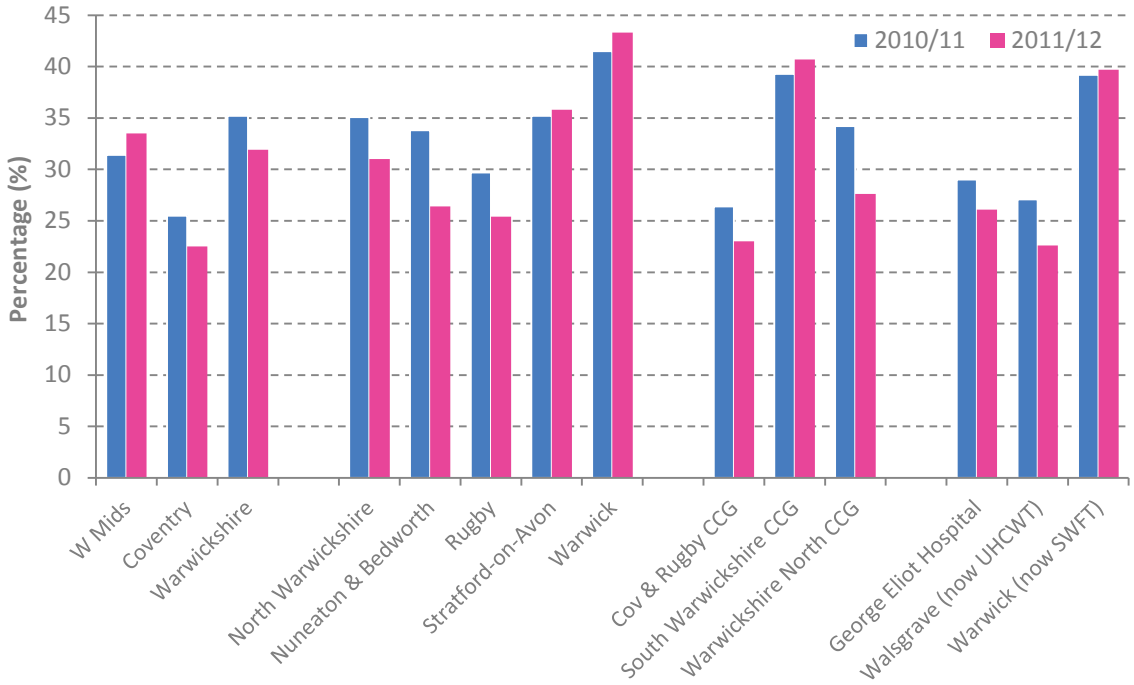
Source: NHS England: Breastfeeding & 12 week maternal assessment (for 2016/2017 – percentages are based on 9 months of data). Note: The data source is classified as experimental.

Detection of Growth Restricted Babies

Antenatal detection of growth restricted babies is important and has been shown to reduce stillbirth risk significantly as it gives the option to consider timely delivery of the baby at risk. However, antenatal detection of small for gestational age (SGA) babies has been poor and there is currently no requirement to collect and report detection rates. The Saving Babies Lives care bundle, published in 2016 and designed to tackle stillbirth and neonatal death[12] makes recommendations around risk assessment and surveillance for fetal growth restriction. An evaluation of implementation of this guidance is ongoing with completion due in November 2017. A survey carried out between March and June 2016 suggests that only 21% of providers had been able to implement 100% of the guidance around risk assessment and surveillance for fetal growth restriction[13].

Annual detection rates of intrauterine growth restriction (IGR) were collected by the Perinatal Institute until its closure in 2013. In Warwickshire, the most recently available data suggested that 31.9% cases of IGR were detected. Detection rates were lower in women in Coventry and Rugby than those living in Stratford and Warwick (Figure 27).

Figure 27: Detection of Intrauterine Growth Restriction by District, CCG & Maternity Unit



Source: Perinatal Institute-PEER View (http://www.perinatal.nhs.uk/peer/peerview.htm)

MATERNAL OBESITY

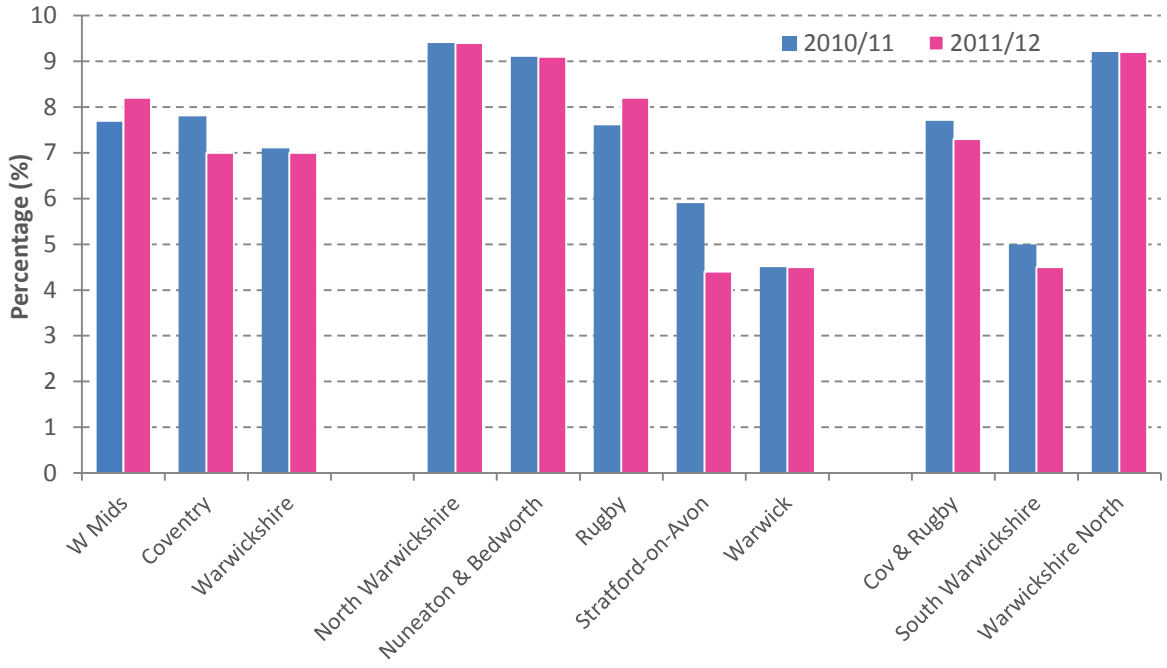
Obesity in adults is defined as a body mass index (BMI) greater than or equal to 30 kg/m^2. Women who are obese when they become pregnant face an increased risk of complications during

[12] O'Connor D, Saving Babies' Lives: A care bundle for reducing stillbirth, NHS England, 2016.
[13] https://www.england.nhs.uk/blog/matthew-jolly/ Accessed 25/5/17

pregnancy and childbirth[14]. These include the risk of impaired glucose tolerance and gestational diabetes, miscarriage, pre-eclampsia, thromboembolism and maternal death[15]. Babies born to obese women are at a higher risk of fetal death, stillbirth, congenital abnormality, shoulder dystocia, macrosomia and subsequent obesity[16].

Data collected by the Perinatal Institute until 2012 showed that for the years 2010/11 and 2011/12 the rates of pregnant women with a BMI ≥ 35 were around 7% in Warwickshire which were lower than national and regional averages. Coventry has also now reduced in 2011/12 to percentages that are similar to the Warwickshire average. However, higher rates were observed among women in North Warwickshire, Nuneaton & Bedworth and Rugby Districts/Boroughs (Figure 28).

Figure 28: Percentage of pregnant women with a BMI ≥35



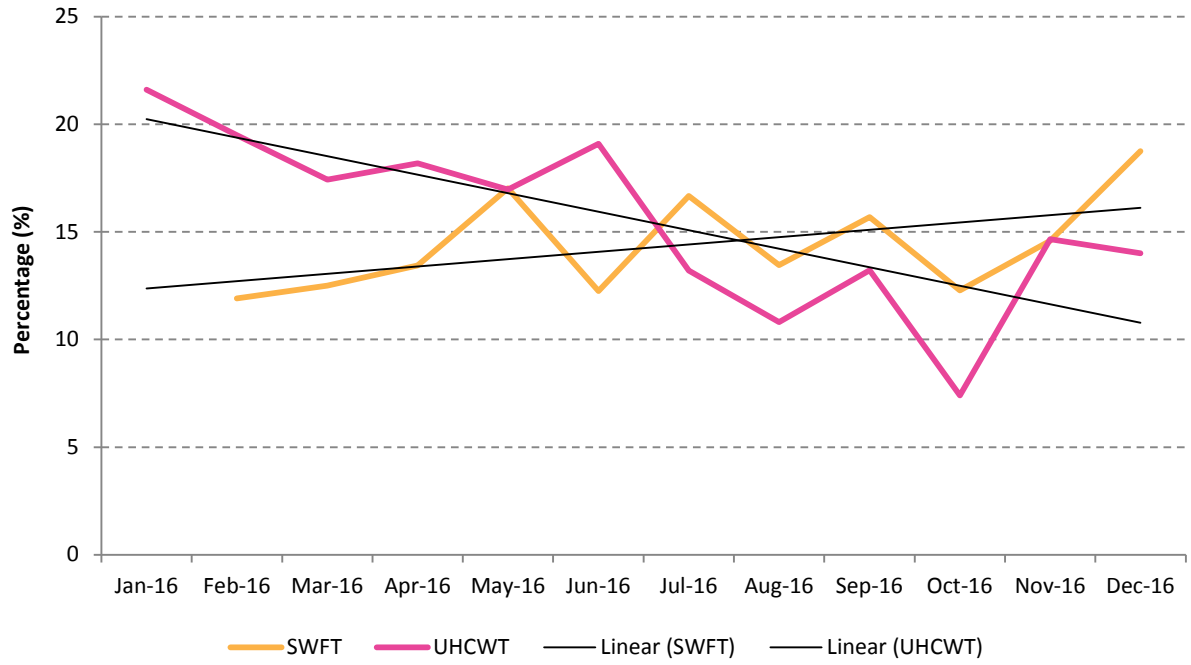
Source: Perinatal Institute-PEER View (http://www.perinatal.nhs.uk/peer/peerview.htm) – NB Data only available until Q2 2012/2013

Since January 2016, data is reported by providers on the number of women who are underweight, normal weight, overweight or obese at the booking appointment (Figure 29). During 2016, for South Warwickshire NHS Foundation Trust (SWFT) there is an upward trend in the percentage of women presenting at the booking appointment with a BMI ≥30, whereas for University Hospitals Coventry and Warwickshire NHS Trust (UHCWT) there is a downward trend. The average percentage of obese women during 2016 was 14.4% for SWFT and 15.5% for UHCWT. There was no available data for

[14] NICE, Weight Management before, during and after pregnancy, Public Health Guidance 27, July 2010.
[15] Centre for Maternal and Child Enquiries and the Royal College of Obstetricians and Gynaecologists (2010) Joint guideline – Management of women with obesity in pregnancy. London: CMACE/ Centre for Maternal and Child Enquires and the Royal College of Obstetricians and Gynaecologists
[16] Ramachenderan J, Bradford J, McLean M (2008) Maternal obesity and pregnancy complications: a review. Australian and New Zealand Journal of Obstetrics and Gynaecology 48: 228–35

George Eliot Hospital. Given the high rates of pregnant women with a BMI ≥35 in the North of Warwickshire, this data needs to be recorded.

Figure 29: Percentage of pregnant women with a BMI ≥30 at booking (2016)



Source: Maternity Services Data Set (MSDS), Health and Social Care Information Centre, Community and Mental Health Team 2016. Note: The data source is classified as experimental – data unavailable for this variable for George Eliot Hospital NHS Trust.

SMOKING DURING PREGNANCY

Smoking during pregnancy can cause complications during labour and results in increased risk of miscarriage, premature birth, stillbirth, low birth-weight, sudden unexpected death in infancy and infant mortality[17]. Woman aged 20 and younger are more likely than those aged 35 and over to smoke throughout pregnancy[18].

Women's smoking status at time of delivery (SATOD) provides a measure of the prevalence of smoking amongst pregnant women. Figure 30 shows that the prevalence of women known to be SATOD has decreased in all CCG populations in Warwickshire since 2014/15. The figures presented may not show a true picture as smoking status is unknown for a small percentage of pregnancies. This varies between CCGs; in 2016/17 the percentage of women whose smoking status was not known at time of delivery was: Coventry & Rugby CCG 0.3%, South Warwickshire CCG 2.8%, Warwickshire North CCG 7.8%. From 1st April 2017, the definition of the indicator for the proportion of women smoking at the time of delivery will change to exclude those maternities with an unknown

[17] Royal College of Physicians (1992) Smoking and the young. London: Royal College of Physicians
[18] McAndrew F, Thompson J, Fellows L et al. (2012) Infant feeding survey 2010. A survey conducted on behalf of the Information Centre for Health and Social Care. Leeds: The Information Centre for Health and Social Care

smoking status from the denominator. This will have minimal impact for CCGs with good data quality (i.e. few unknowns) but will have a much larger impact for CCGs with a lot of unknowns who will see their indicator value increase quite noticeably. For example, Warwickshire North CCG has a rate of unknowns for 2016/17 of 7.8%, compared to 2.8% in South Warwickshire CCG and 0.3% in Coventry & Rugby CCG.

Figure 30: Smoking Status at Time of Delivery, 2014/15 - 2016/17

	2014/15			2015/16			2016/17		
	Maternities	SATOD (no.)	SATOD (%)	Maternities	SATOD (no.)	SATOD (%)	Maternities	SATOD (no.)	SATOD (%)
Coventry & Rugby CCG	5,616	692	12.3	5,726	699	12.2	5,611	610	10.9
South Warwickshire CCG	2,606	228	8.7	2,652	203	7.7	2,611	194	7.4
Warwickshire North CCG	2,140	299	14.0	2,281	266	11.7	1,962	225	11.5

Source: NHS Digital

Currently all pregnant women who smoke at booking are referred to the Smoking in Pregnancy (SiP) service. Numbers referred to SiP for each CCG since 2013/14 are shown in Figure 31. In 2009-10 carbon monoxide (CO) testing was introduced in Midwifery Services at booking. This gives a more accurate measure of smoking status than self-report. Coverage of CO reading at booking for each CCG is shown in Figure 31.

Figure 31: Carbon Monoxide reading at booking & referrals to the Smoking in Pregnancy service

	Referrals to the SiP service			CO reading at booking coverage (%)		
	2013/14	2014/15	2015/16	2013/14	2014/15	2015/16
South Warwickshire CCG	217	234	216	65%	62%	73%
Warwickshire North CCG	403	372	402	67%	75%	76%
Rugby only	231	181	209	75%	85%	81%
Total	851	787	827	69%	73%	77%

Source: SiP Service, George Eliot NHS Hospital Trust

ETHNICITY & COUNTRY OF BIRTH OF MOTHER

Evidence highlights that particular ethnic groups (South Asian, African and Caribbean groups) are at increased risk of low birth weight, congenital abnormalities and late uptake of antenatal services and greater risk of premature birth, stillbirth, perinatal and neonatal mortality[19]. In 2013, in England and

[19] West Midlands Perinatal Institute 2007 *Stillbirth and infant mortality, West Midlands 1997-2005: Trends, Factors, Inequalities* West Midlands Perinatal Institute

Wales, Pakistani, Black Caribbean and Black African babies (6.7, 6.6 and 6.3 deaths per 1,000 live births respectively) had the highest infant mortality rates[20].

Over a quarter (29.0%) of live births in England in 2016 were to women born outside the UK, the highest level on record, with Poland, Pakistan and India being the three most common countries of birth[21]. In Warwickshire, 18.6% of live births were to women born outside the UK with the majority (45.4%) of these women originating from countries in the new EU (Figure 32). Rugby Borough has the highest percentage (28.4%) of live births to women born outside the UK in Warwickshire with over half (56.6%) of these women originating from countries in the new EU. Warwick District has the highest proportion (32.9%) of women originating from the Middle East and Asia. In Coventry, 40.4% of live births were to women born outside the UK with the highest proportions of these women being from the Middle East and Asia (35.3%), the new EU (31.6%) and Africa (26.4%).

Figure 32: Country of birth of mothers and area of usual residence, 2016

Area of usual residence of mother	All live births	Mothers born within United Kingdom	Mothers born outside United Kingdom							
			Total	% of live births to non-UK born mothers	EU	New EU[22]	Rest of Europe (non EU)	Middle East and Asia	Africa	Rest of World
ENGLAND	663,157	470,759	192,355	29.0	69,940	50,777	9,751	64,722	33,895	14,047
Warwickshire	5,951	4,842	1,108	18.6	639	503	42	258	97	72
North Warwickshire	614	576	38	6.2	25	20	4	2	5	2
Nuneaton & Bedworth	1,575	1,304	271	17.2	151	131	5	79	26	10
Rugby	1,224	876	348	28.4	227	197	13	56	32	20
Stratford-on-Avon	1,097	938	159	14.5	96	74	7	25	12	19
Warwick	1,441	1,148	292	20.3	140	81	13	96	22	21
Coventry	4,531	2,700	1,831	40.4	641	579	35	646	483	26

Source: ONS, 2017[23] Note: The 'New EU' constitutes the countries which joined the European Union (EU) between 2004 and 2013 (see footnote). The countries which joined the EU between 2004 and 2015 are included in both the New EU and the EU categories.

From April 2015, data has been collected by providers of maternity services in England on the ethnic group of mother as part of the Maternity Service Data Set (MSDS). This data was incomplete for George Eliot Hospital so has not been presented.

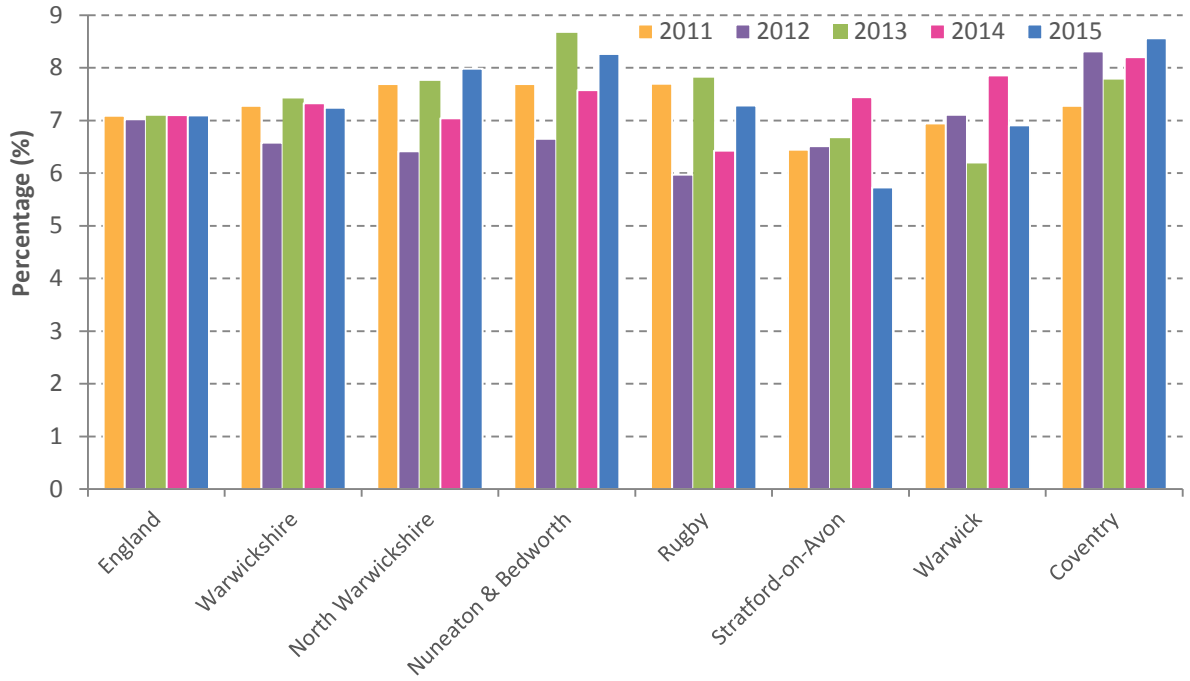
[20] ONS (2015) Statistical Bulletin: Pregnancy and ethnic factors influencing births and infant mortality: 2013
[21] ONS (2016), Statistical bulletin: Births by parents' country of birth, England and Wales: 2016
[22] New EU: Joined in 2004: Estonia, Latvia, Lithuania, Czech Republic, Hungary, Poland, Slovakia, Malta, Cyprus (EU), Cyprus (not otherwise stated), Slovenia, Czechoslovakia not otherwise stated; Joined in 2007: Bulgaria, Romania; Joined in 2013: Croatia.
[23] https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/datasets/parentscountryofbirth

LOW BIRTH WEIGHT

Low birth weight is defined as less than 2500g at birth. Low birth weight is an indicator of increased likelihood of morbidity and mortality in the early neonatal period and infancy. Risk factors for low birth weight can be categorized into socio-demographic risks (e.g. maternal age, ethnicity); medical risks before pregnancy (e.g. Chronic hypertension, renal disease); risks of the current pregnancy (e.g. maternal nutrition, multiple pregnancies); prenatal health care; and environmental and behaviour risks (e.g. smoking, alcohol consumption)[24].

In Warwickshire the percentage of births that are low birth weight has been slightly above the percentage in England in recent years (Figure 33) this is particularly true for babies born to women living in Nuneaton & Bedworth. Coventry has consistently higher percentages of births that are low birth weight with 8.6% of babies born to women living in Coventry weighing <2500g in 2015.

Figure 33: Percentage of live births that are low birth weight (<2500g)



Source: Office for National Statistics

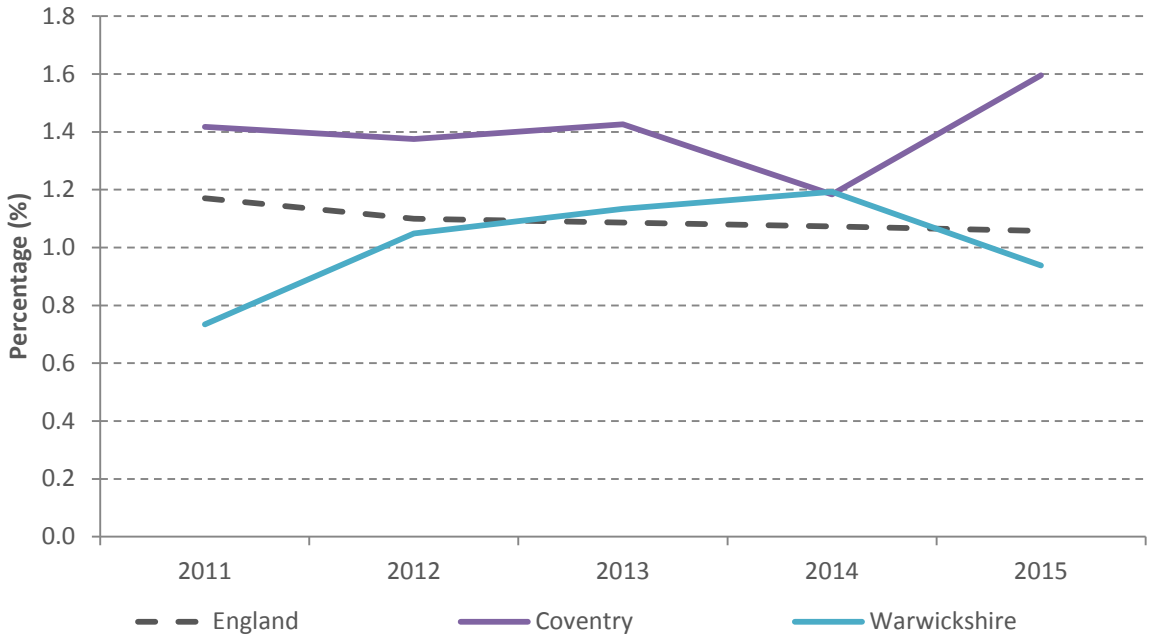
VERY LOW BIRTH WEIGHT

Very low birth weight is defined as less than 1500g at birth. This group presents yet a greater likelihood of morbidity and/ or mortality during neonatal and infant life. In England, the percentage of babies being born with a very low birth weight was around 1.1-1.2% between 2011 and 2015. The pattern has been more variable across Warwickshire (Figure 34) with percentages ranging from 0.5%

[24] De Bernabé JV, Soriano T, Albaladejo R et al. Risk factors for low birth weight: a review, European Journal of Obstetrics & Gynecology and Reproductive Biology, 2004; 116 (1), 3-15.

of babies born to women living in Warwick District to 1.5% of babies born to women living in North Warwickshire Borough in 2015. In Coventry, the percentage of babies being born with a very low birth weight was consistently higher than in England and Warwickshire between 2011 and 2015 (1.4% to 1.6%).

Figure 34: Percentage of live births that are very low birth weight (<1500g)



Source: Office for National Statistics

BREASTFEEDING

Current UK policy is to promote exclusive breastfeeding (feeding only breast milk) for the first six months[25]. NICE guidance recommends that all maternity care providers (whether working in hospital or in primary care) should implement an externally evaluated, structured programme that encourages breastfeeding, using the Baby Friendly Initiative as a minimum standard[26].

Data is collected by providers on the number of new mothers known to have initiated breastfeeding within the first 48 hours of birth i.e. either she puts the baby to the breast or the baby is given any of the mothers breast milk. Breastfeeding is deemed to have been initiated even if the mother later ceases to breastfeed or feed the baby expressed breast milk. Figure 35 shows that since Q1 2013/14 the percentage of women initiating breastfeeding within the first 48 hours is highest in UHCWT and SWFT with around 80% initiation in more recent years. George Eliot Hospital Trust has lower levels of breastfeeding initiation with percentages dropping below 60% since Q2 2015/16.

[25] Department of Health (2003) Infant Feeding Recommendation
[26] NICE, Postnatal care up to 8 weeks after birth: Clinical Guideline CG37, Updated February 2015

Figure 35: Percentage of women initiating breastfeeding within the first 48 hours of birth

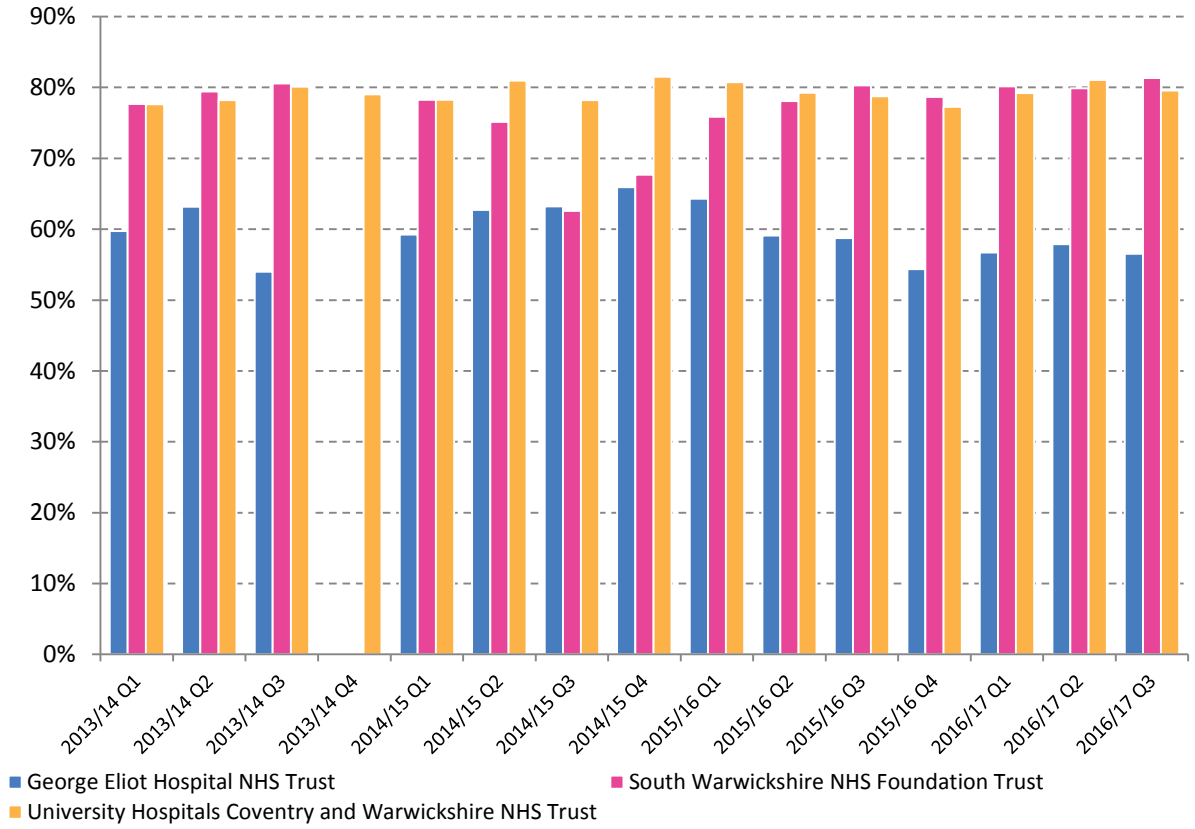
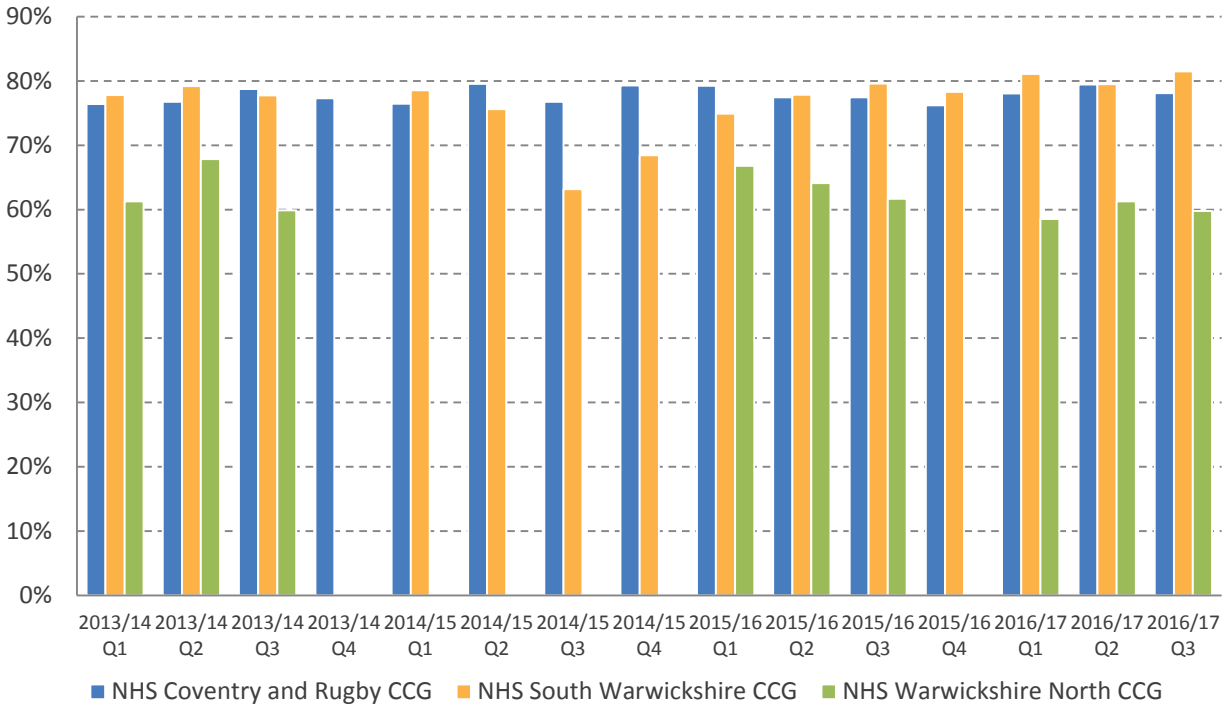


Figure 36: Percentage of women initiating breastfeeding within the first 48 hours of birth by CCG

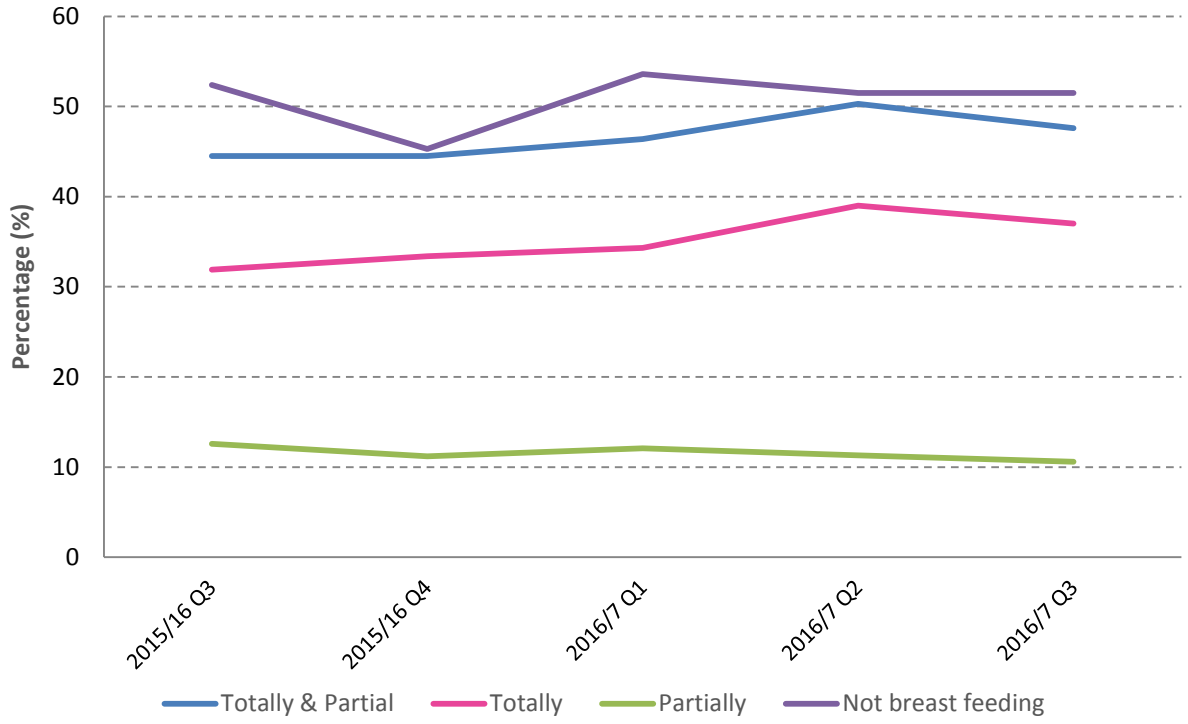


Source: NHS England, 2014-1017 – Statistical Release Breastfeeding Initiation NB – where blank data did not meet validation criteria.

Figure 36 shows a similar pattern for CCGs with NHS Coventry and Rugby CCG and NHS South Warwickshire CCG performing better than NHS Warwickshire North CCG where there has also been an issue with data validation.

Information collected on breast feeding status at 6-8 weeks shows that in Warwickshire around 40-50% of women are breast feeding either partially or totally 6-8 weeks after the baby has been born (Figure 37).

Figure 37: Breastfeeding status at 6-8 weeks in Warwickshire



Source: Public Health England, 2016-17 (NB: Experimental Statistics)

NEONATAL CARE

Each year, over 90,000 babies (around 1 in 8) are admitted to neonatal care in the UK because they have either been born prematurely, or are full term but sick[27]. In 2014-15, the most frequently recorded birth complications in England were neonatal jaundice from other and unspecified causes (n=54,637; 8.51%), disorders related to short gestation and low birth weight (n=53,241; 8.3%), intrauterine hypoxia (n=40,241; 6.27%), disorders related to long gestation and high birth weight (n=31,403; 4.89%), and respiratory distress of newborn (n=29,577; 4.61%)[28].

[27] http://www.bliss.org.uk/neonatal-care-and-admissions, *accessed 19/5/17*
[28] Health and Social Care Information Centre, NHS Maternity Statistics; England, 2014-2015, Nov 2015, NHS Digital

At a national level in 2014, 14.6% of all recorded days of neonatal care were provided by Special Care Units (SCUs), 37.4% were provided by Local Neonatal Units (LNUs) and 48% were provided at Neonatal Intensive Care Units (NICUs) (Figure 38).

Figure 38: Total number of care days provided in neonatal units, by designation, between 1st January 2014 and 31st December 2014 (England, Scotland and Wales)

	Care Level					
Unit type	**Intensive Care**	**High Dependency Care**	**Special Care**	**Normal Care**	**Unknown**	**Proportion of care days provided in these units**
Special Care Unit (n=45)	10,412	18,307	125,004	9,457	82	14.6%
Local Neonatal Unit (n= 82)	28,464	69,908	305,109	14,195	187	37.4%
Neonatal Intensive Care Units (n=49)	113,606	126,012	283,834	12,141	206	48%
Total	**152,482**	**214,227**	**713,947**	**35,793**	**475**	**100%**

Source: Imperial College London, Neonatal Data Analysis Unit, 2014 Report

In Coventry and Warwickshire, there are three neonatal units provided by University Hospitals Coventry & Warwickshire NHS Trust (University Hospital), George Eliot Hospital NHS Trust (George Eliot Hospital) and South Warwickshire NHS Foundation Trust (Warwick Hospital). Each unit has different clinical thresholds. A care pathway has been produced by the Central Newborn Network with the aim of providing a neonatal service that ensures that mothers and babies are able to access the best and most appropriate level of care at the right place and at the right time, and as close to home as possible. The pathways detail the clinical thresholds that are expected to be used in order to guide care and to clarify when discussions should take place. The care pathways are summarised in Figure 39.

University Hospital (UHCW) is the only unit in Coventry and Warwickshire classified as an intensive care unit, Warwick and George Eliot are special care units. The network perinatal centre is located at Leicester Royal Infirmary (LRI). Neonatal units are organised into regional neonatal networks with designated transport services to transfer babies between units when necessary. The ability to transfer the mother to the appropriate unit before the birth is important in order to avoid where possible the postnatal transfer of a vulnerable baby.

Figure 39: Overview of care pathways for Neonatal Units in Coventry and Warwickshire[29]

	University Hospital (UHCW)	George Eliot Hospital and Warwick Hospital
Fetal Anomaly	Babies may deliver in UHCW if an agreed postnatal management plan is in place. Babies with antenatally identified surgical conditions will normally be delivered at a unit with neonatal surgery facilities. Following input from a Paediatric Cardiologist, it may be appropriate to deliver babies with some antenatally detected cardiac problems in UHCW.	Babies may deliver if an agreed postnatal management plan has been discussed by a consultant neonatologist and consultant obstetrician and is in place. Babies with antenatally identified surgical conditions will normally be delivered in a unit with neonatal surgery facilities. Following input from a Paediatric Cardiologist, it may also be appropriate to deliver some antenatally detected cardiac problems in a cardiac or Network Perinatal Centre (LRI).
Gestation Limit	Can treat babies of the entire gestational age spectrum	Where possible, women in premature labour at less than 32^{+0} weeks' gestation will be transferred to deliver at LRI or at an appropriate Neonatal Unit. If, for whatever reason, a baby below this gestation limit is delivered at GEH or Warwick, the baby will be stabilised and assessed and appropriate arrangements put into place following discussion with UHCW.
Complex Intensive Care	Can provide respiratory support with symptoms of additional organ failure (e.g. hypotension, DIC, renal failure, metabolic acidosis)	Babies requiring respiratory support with symptoms of additional organ failure will require transfer to LRI
Ventilation	All ventilatory modalities provided	If any baby continues to require conventional ventilation or nasal CPAP or HF02 at 4 hours of age, or is anticipated to do so, the baby will be discussed with the consultant neonatologist on service for UHCW and will normally be transferred to LRI or an appropriate Neonatal Unit.
HFOV[30]	Babies who require HFOV will be assessed and remain at UHCW if appropriate.	Babies who are likely to require HFOV, ECMO or Nitric Oxide will need to be transferred to a specialist centre and early consideration should be given to this.
ECMO[30]	Babies will need to be transferred to an ECMO centre	
Nitric Oxide	Term babies who need iNO will be managed at UHCW	
CPAP[30]	Babies requiring CPAP will remain at UHCW.	Babies requiring CPAP beyond 4 hours of age will normally be transferred to LRI or an appropriate Neonatal Unit.
HFO[2 30]	Babies requiring HFO[2] will remain at UHCW.	Babies requiring HFO[2] beyond 4 hours of age will normally be transferred to LRI or an appropriate Neonatal Unit.
PN[30]	Babies requiring PN will be managed at UHCW.	Babies requiring PN will normally be transferred to LRI or an appropriate Neonatal Unit. Where it is difficult to decide if an infant should receive PN, discussion should take place with UHCW.
Surgery	Babies who require surgery or a surgical opinion will be transferred to a neonatal surgical centre unless it has been possible for the baby to be assessed by a visiting Paediatric Surgeon.	Babies who require surgery or a surgical opinion will be transferred out to a neonatal surgical centre.
Cooling	Newly born babies who require cooling for treatment of perinatal asphyxia will be managed at UHCW	Newly born babies who require cooling for treatment of perinatal asphyxia will be transferred to LRI or an appropriate Neonatal Unit.
Suspected Cardiac/PDA[30]	Where a possible cardiac problem is suspected, after discussion with the	Where a possible cardiac problem is suspected, after discussion with the Cardiologist, discussion should take place

[29] NHS Central Newborn Network, Service Specification/ Care Pathways, 27 September 2016.

[30] HFOV - high-frequency oscillatory ventilation; ECMO - extracorporeal membrane oxygenation; CPAP - Continuous positive airway pressure therapy; HFO[2]- high-flow oxygen; PN – parenteral nutrition; PDA - Patent ductus arteriosus

Cases	Cardiologist, discussion should take place with the transport consultant or the perinatal centre before transfer. This is to allow optimisation of ventilatory treatment before ambulance transfer is undertaken.	with the transport consultant or the perinatal centre before transfer. This is to allow optimisation of ventilatory treatment before ambulance transfer is undertaken. Babies with PDA who require surgery must be discussed with the perinatal centre before discussion with the cardiologists, as per the agreed PDA pathway.

The number of babies admitted to each neonatal unit in Coventry and Warwickshire between 2014/15 and 2016/17 is shown in Figure 40. Non-neonatal unit care refers to care on a Transitional Care (TC) unit or post-natal ward. Predominately this refers to University Hospital which has two dedicated TC cots situated next to the post-natal ward. Transitional care is defined as care of the baby beyond what could be provided by the mother and normal midwifery care alone, but with mother and baby remaining together and the mother remaining the primary carer (i.e. a low level of special care). This reduces the number of admissions to neonatal units and enhances maternal-infant bonding and breastfeeding[31].

The number of babies admitted to the neonatal units at George Eliot and Warwick has remained steady over the three years whereas there has been a marked increase in those admitted to the unit at University Hospital. The latter is mainly due to an increase in babies being admitted for transitional care. For all units around 10-20% of babies admitted for neonatal care (not TC) are not born at the hospital where they receive the neonatal care.

Figure 40: Number of babies admitted to neonatal units in Coventry & Warwickshire, 2014/15-2016/17

	Neonatal Unit								
	UHCW			GEH			Warwick		
	2014/15	2015/16	2016/17	2014/15	2015/16	2016/17	2014/15	2015/16	2016/17
At least 1 neonatal unit day									
Total babies	504	532	579	209	206	213	308	264	283
Inborn	420	445	494	174	176	173	282	236	254
% Inborn	83.3	83.6	85.3	83.3	85.4	81.2	91.6	89.4	89.8
All non- neonatal unit (Transitional Care)									
Total babies	636	802	1054	31	54	28	0	0	0
Inborn	628	795	1051	31	54	28	0	0	0
% Inborn	98.7	99.1	99.7	100.0	100.0	100.0	n/a	n/a	n/a
All babies									
Total babies	1140	1334	1633	240	260	241	308	264	283
Inborn	1048	1240	1545	205	230	201	282	236	254
% Inborn	91.9	93.0	94.6	85.4	88.5	83.4	91.6	89.4	89.8

Source: Central Newborn Network, BadgerNet download, 10th August 2017.

Health Resource Group (HRG) dependency codes are used to report activity data in neonatal units. These are the NHSE commissioning currencies used and are automatically generated by the

[31] NHS Improvement. Reducing harm leading to avoidable admission of full-term babies into neonatal units – Findings and resources for improvement. NHSI, 2017

BadgerNet system[32] dependent on the care required by babies per 24 hour period. The HRG codes are:

HRG1 - ITU Level Care (Intensive Care)
HRG2 - HDU Level Care (High Dependency Care)
HRG3 - SCBU Level Care (Special Care - Carer not resident alongside baby)
HRG4 - Lower SCBU Level Care/ Transitional Care
HRG5 - Normal Care

The number of days babies are cared for at each HRG level is shown in Figure 41 for each neonatal unit in Coventry and Warwickshire from 2014/15 to 2016/17. UHCW's intensive care unit status is reflected in the higher number of days babies are cared for at HRG1 and HRG2 than the other units. The number of days babies are cared for has increased between 2014/15 and 2016/17 at HRG1 for all neonatal units; at HRG2 for UHCW; at HRG3 for all units and at HRG4 for UHCW and Warwick.

The number of CCGs who have had babies of mothers registered within one of their GP practices admitted to the units is also shown along with the number of days for babies of mothers from Coventry and Warwickshire CCGs and the percentage of babies from these CCGs. University Hospital's neonatal unit has cared for babies from over 30 CCGs nationally between 2014/15 and 2016/17.

Figure 41: Number of days care at each HRG level for neonatal units in Warwickshire

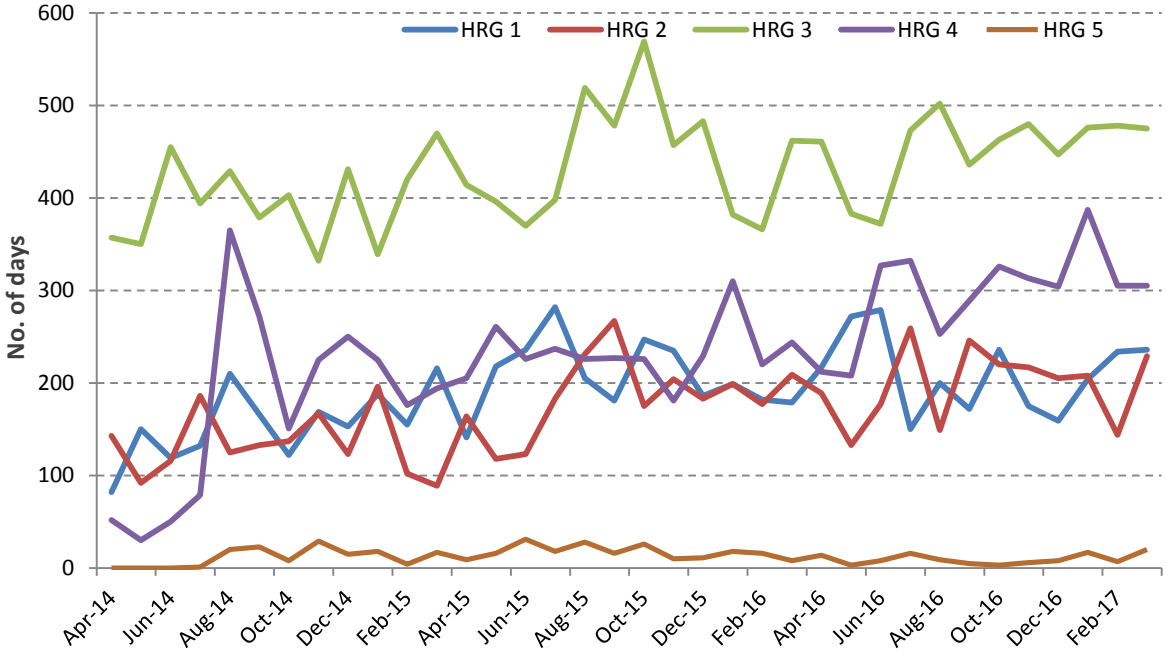
		HRG Level								Local CCG				
Unit	**Year**	**HRG1**	**HRG2**	**HRG3**	**HRG4**	**HRG5**	**NK**	**Total**	**No. of CCGs**	**C&RCCG**	**SWCCG**	**WNCCG**	**Total**	**%**
GEH	2014/15	45	86	1805	256	56	1	2249	12	294	28	1604	1926	85.6
	2015/16	59	30	1937	304	80	3	2413	10	266	0	1639	1905	78.9
	2016/17	60	74	2222	249	36	3	2644	13	266	0	1655	1921	72.7
UHCW	2014/15	1851	1591	4652	2053	134	0	10251	31	7425	674	903	9002	87.8
	2015/16	2475	2181	5258	2767	206	0	12887	34	10183	374	983	11540	89.5
	2016/17	2524	2366	5425	3542	116	0	13973	34	10316	882	978	12176	87.1
Warwick	2014/15	91	129	1955	48	472	0	2695	9	30	2402	157	2589	96.1
	2015/16	98	83	2030	50	390	0	2651	11	212	2276	0	2488	93.9
	2016/17	126	120	2168	70	263	0	2747	10	128	2171	0	2299	83.7
Not known	2014/15	0	0	0	0	0	0	0	0	0	0	0	0	-
	2015/16	0	0	0	4	0	0	4	1	0	0	4	4	100.0
	2016/17	0	0	0	0	0	0	0	0	0	0	0	0	-
Total	2014/15	1987	1806	8412	2357	662	1	15195	52	7749	3104	2664	13517	89.0
	2015/16	2632	2294	9225	3125	676	3	17955	56	10661	2650	2626	15937	88.8
	2016/17	2710	2560	9815	3861	415	3	19364	57	10710	3053	2633	16396	84.7

Source: Central Newborn Network, BadgerNet download, 10th August 2017

[32] BadgerNet Neonatal system forms a single record of care for all babies within neonatal services and is used by all neonatal units in England.

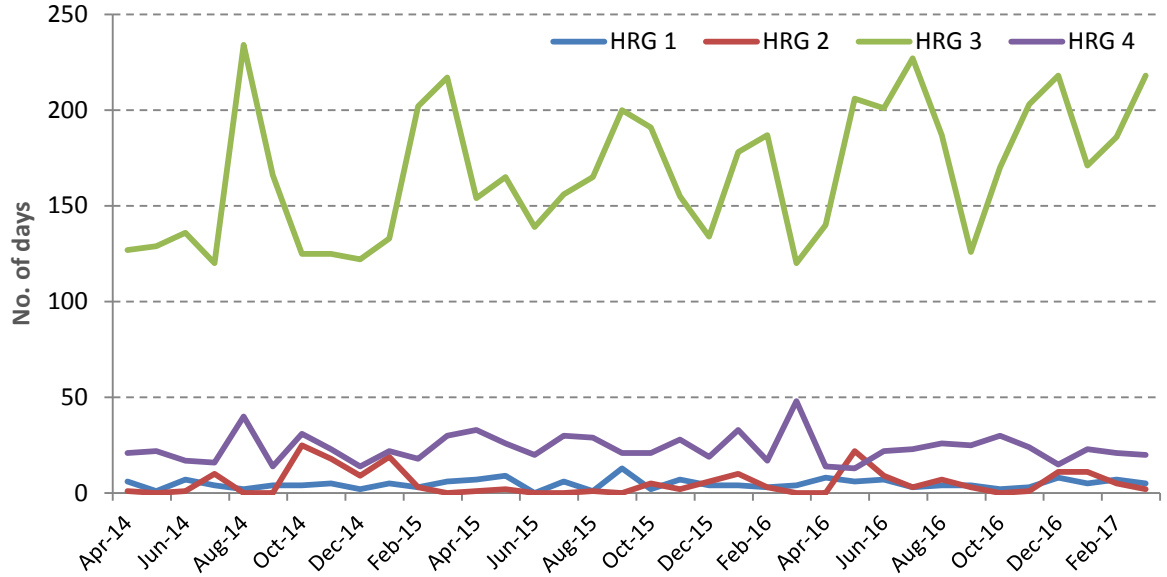
The number of days of neonatal care at each HRG level for each month between April 2014 and March 2017 are shown in Figures 42 to 44. The figures clearly display that the most frequent level of care provided by each unit is HRG level 3 i.e special care. However, whilst Warwick Hospital and George Eliot Hospital are providing low levels (<50 days) of other types of care level each month, as would be expected University Hospital are providing higher levels of intensive and high dependency care (HRG levels 1 &2) but also transitional care.

Figure 42: Neonatal Unit HRG Care Level by Month - University Hospital (April 2014 - March 2017)



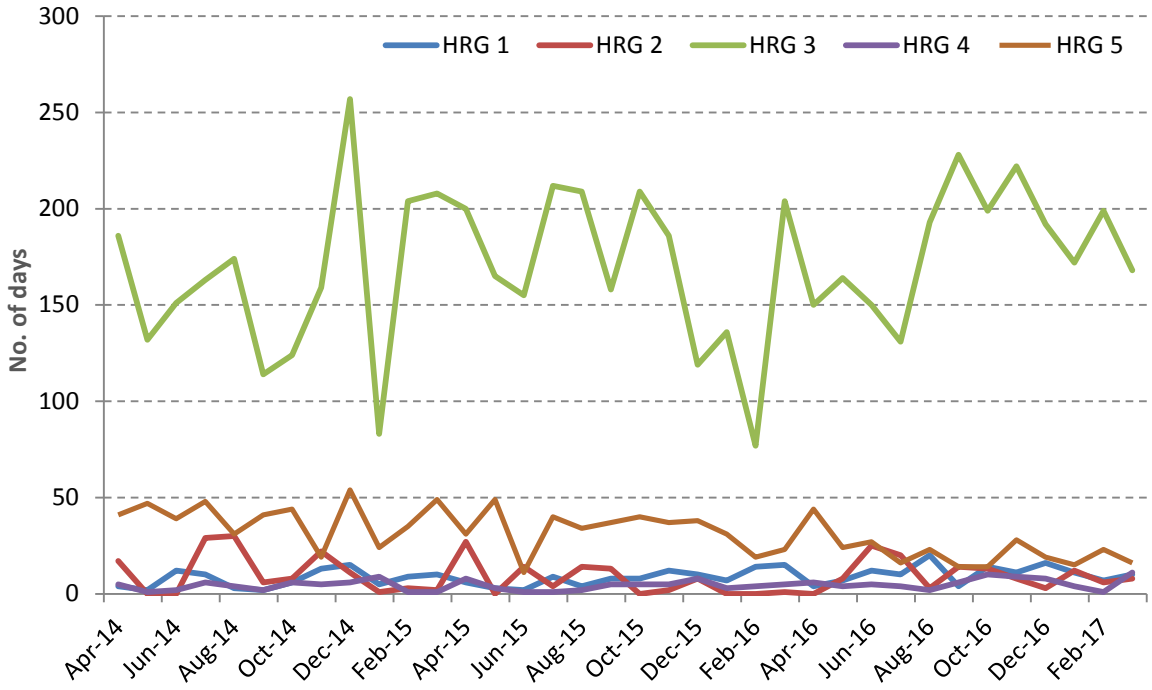
Source: Central Newborn Network, BadgerNet download, 10th August 2017

Figure 43: Neonatal Unit HRG Care Level by Month - George Eliot Hospital (Apr 2014 - Mar 2017)



Source: Central Newborn Network, BadgerNet download, 10th August 2017

Figure 44: Neonatal Unit HRG Care Level by Month - Warwick Hospital (April 2014 - March 2017)



Source: Central Newborn Network, BadgerNet download, 10th August 2017

Figure 45 shows the number of days of care at each HRG level for each CCG in Coventry and Warwickshire from 2014/15 to 2016/17. The total number of days of care has increased over the three years for Coventry & Rugby CCG from 8,577 in 2014/15 to 11,468 in 2016/17; the largest increase is for care provided at HRG4 i.e. transitional care as reflected in Figure 41 .

Figure 45 also shows the number of neonatal units where babies of mothers registered with GPs covered by each CCG have been cared for throughout the UK, and the number of days at neonatal units in Coventry and Warwickshire and the proportion of care at these units. For the past three years, over 90% of babies requiring neonatal care who are registered with Coventry and Rugby CCG have received care at local units, figures are lower for babies registered with SWCCG and WNCCG.

Low birth weight and a short gestation are frequently the cause for admittance to a neonatal unit with these babies often in need of the higher levels of care. In line with the care pathway, the majority of babies born in Warwickshire before 32 weeks are cared for at University Hospital neonatal unit (Figure 46). Similarly the very low birth weight (<1500g) babies are more likely to be cared for at University Hospital (Figure 47). The numbers of babies being cared for by neonatal units in Coventry and Warwickshire who are born before 32 weeks has increased each year since April 2015 (2014/15 n=117, 2015/16 n=136, 2016/17 n=140). The same is true for numbers of very low birth weight babies (2014/15 n=103, 2015/16 n=126, 2016/17 n=135) although it recognised that some of the babies born before 32 weeks will be these babies.

Figure 45: Number of days of care at each HRG level for Coventry and Warwickshire CCGs, 2014/15 to 2016/17

		HRG Level							Local neonatal unit				
CCG	Year	HRG1	HRG2	HRG3	HRG4	HRG5	Total	No. of units	GEH	Warwick	UHCW	Total	%
C&RCCG	2014/15	1211	1186	4137	1886	157	8577	24	294	157	7425	7876	91.8
	2015/16	1747	1801	5019	2511	209	11287	23	266	212	10183	10661	94.5
	2016/17	1568	1632	4871	3257	140	11468	20	266	128	10316	10710	93.4
SWCCG	2014/15	519	459	2244	145	438	3805	25	28	2402	674	3104	81.6
	2015/16	418	314	2006	165	348	3251	20	0	2276	374	2650	81.5
	2016/17	494	343	2219	226	206	3488	25	0	2171	882	3053	87.5
WNCCG	2014/15	530	591	2018	300	50	3489	16	1603	0	903	2506	71.8
	2015/16	586	404	1970	358	78	3396	20	1642	0	983	2625	77.3
	2016/17	471	512	1864	381	23	3251	17	1652	0	978	2630	80.9

Source: Central Newborn Network, BadgerNet download, 10th August 2017

In line with the service use data, the number of babies who are born after 36 weeks or are >2500 grams (i.e. those less likely to need neonatal care), who are cared for at University Hospital has increased each year since April 2015. These are the babies likely to be receiving lower levels of care, particularly transitional care.

Figure 46: Number of babies by gestation cared for at neonatal units in Coventry and Warwickshire, 2014/15-2016/17

			Gestation (weeks)									
Unit	Year	Origin	<24	24-25	26-27	28-29	30-31	32-33	34-36	>36	NK	Total
UHCW	2014/15	Inborn	5	9	17	20	46	70	263	605	0	1035
		Outborn	0	0	1	0	1	1	4	11	0	18
		Total	**5**	**9**	**18**	**20**	**47**	**71**	**267**	**616**	**0**	**1053**
	2015/16	Inborn	4	26	19	28	38	54	322	742	0	1233
		Outborn	1	0	0	2	0	0	1	7	0	11
		Total	**5**	**26**	**19**	**30**	**38**	**54**	**323**	**749**	**0**	**1244**
	2016/17	Inborn	6	17	24	28	43	81	394	941	0	1534
		Outborn	1	0	2	1	0	0	5	8	0	17
		Total	**7**	**17**	**26**	**29**	**43**	**81**	**399**	**949**	**0**	**1551**
GEH	2014/15	Inborn	0	3	2	1	2	10	68	112	0	198
		Outborn	0	0	0	0	0	0	1	6	0	7
		Total	**0**	**3**	**2**	**1**	**2**	**10**	**69**	**118**	**0**	**205**
	2015/16	Inborn	0	3	1	4	6	12	64	138	0	228
		Outborn	0	0	0	1	0	0	1	1	0	3
		Total	**0**	**3**	**1**	**5**	**6**	**12**	**65**	**139**	**0**	**231**

	2016/17	Inborn	0	1	2	8	4	25	65	94	0	199
		Outborn	0	0	0	0	0	0	0	3	0	3
		Total	**0**	**1**	**2**	**8**	**4**	**25**	**65**	**97**	**0**	**202**
Warwick	**2014/15**	Inborn	0	1	0	3	6	28	61	183	0	282
		Outborn	0	0	0	0	0	0	0	0	0	0
		Total	**0**	**1**	**0**	**3**	**6**	**28**	**61**	**183**	**0**	**282**
	2015/16	Inborn	0	0	0	0	3	24	62	144	0	233
		Outborn	0	0	0	0	0	0	0	4	0	4
		Total	**0**	**0**	**0**	**0**	**3**	**24**	**62**	**148**	**0**	**237**
	2016/17	Inborn	0	2	0	0	7	25	79	138	0	251
		Outborn	0	0	0	0	0	0	0	4	0	4
		Total	**0**	**2**	**0**	**0**	**7**	**25**	**79**	**142**	**0**	**255**

Source: Central Newborn Network, BadgerNet download, 10th August 2017

Figure 47: Number of babies by birthweight cared for at neonatal units in Coventry and Warwickshire, 2014/15-2016/17

			Birth weight (grams)							
Unit	**Year**	**Origin**	**<750**	**750-999**	**1000-1499**	**1500-1999**	**2000-2499**	**>2500**	**NK**	**Total**
UHCW	**2014/15**	Inborn	16	16	50	106	220	627	0	1035
		Outborn	0	0	3	2	4	9	0	18
		Total	**16**	**16**	**53**	**108**	**224**	**636**	**0**	**1053**
	2015/16	Inborn	24	22	58	95	249	785	0	1233
		Outborn	1	0	1	2	1	6	0	11
		Total	**25**	**22**	**59**	**97**	**250**	**791**	**0**	**1244**
	2016/17	Inborn	22	25	62	125	304	996	0	1534
		Outborn	1	2	1	2	2	9	0	17
		Total	**23**	**27**	**63**	**127**	**306**	**1005**	**0**	**1551**
GEH	**2014/15**	Inborn	3	3	4	27	34	126	1	198
		Outborn	0	0	0	0	2	5	0	7
		Total	**3**	**3**	**4**	**27**	**36**	**131**	**1**	**205**
	2015/16	Inborn	4	0	11	22	37	154	0	228
		Outborn	0	0	1	0	0	2	0	3
		Total	**4**	**0**	**12**	**22**	**37**	**156**	**0**	**231**
	2016/17	Inborn	0	2	12	23	39	123	0	199
		Outborn	0	0	0	0	0	3	0	3
		Total	**0**	**2**	**12**	**23**	**39**	**126**	**0**	**202**
Warwick	**2014/15**	Inborn	0	2	6	32	67	175	0	282
		Outborn	0	0	0	0	0	0	0	0
		Total	**0**	**2**	**6**	**32**	**67**	**175**	**0**	**282**

	2015/16	Inborn	0	0	4	33	58	138	0	233
		Outborn	0	0	0	0	0	4	0	4
		Total	**0**	**0**	**4**	**33**	**58**	**142**	**0**	**237**
	2016/17	Inborn	1	2	5	30	70	143	0	251
		Outborn	0	0	0	0	0	4	0	4
		Total	**1**	**2**	**5**	**30**	**70**	**147**	**0**	**255**

Source: Central Newborn Network, BadgerNet download, 10th August 2017

It should be noted that the Neonatal clinical reference group (CRG) will send all sustainability and transformation partnerships (STPs) a data pack in Autumn 2017 from validated data collected as part of the National Neonatal Review.

CURRENT MODELS OF CARE

NATIONAL GUIDELINES

Routine antenatal care

The National Maternity Tariff payment system is based on three levels of care on the Antenatal and Postnatal Pathway: standard, for women with an uncomplicated pregnancy, and intermediate or intensive for women who have specified risk factors. NICE guidance for uncomplicated pregnancies sets out recommendations for principles and models of care, including maternal and foetal monitoring and screening; management of lifestyle factors and common symptoms; and planning for the birth.[33]

Midwife- and GP-led models of care should be offered to women with an uncomplicated pregnancy, with obstetricians only involved if and when complications arise. Clear referral paths should be in place for women requiring additional care by specialist teams.

Antenatal care should be provided by a small group of healthcare professionals with whom the woman feels comfortable, and readily and easily accessible to all pregnant women. There should be continuity of care throughout the antenatal period. A schedule of 10 appointments should be adequate for first-time mothers with an uncomplicated pregnancy (7 appointments for parous women).

Care should be sensitive to the needs of individual women and the local community, and provide safe environments for discussing sensitive issues (e.g. domestic violence, sexual abuse, psychiatric illness and recreational drug use). Pregnant women should be offered opportunities to attend participant-led antenatal classes, including breastfeeding workshops. Women's decisions should be respected, even when this is contrary to the views of the healthcare professional.

Antenatal information should be given to pregnant women according to the schedule set out in Figure 49. The antenatal and newborn screening timeline is shown in Figure 48.

[33] NICE Pathways. Antenatal care for uncomplicated pregnancies overview. http://pathways.nice.org.uk/pathways/antenatal-care-for-uncomplicated-pregnancies (last updated 20 Jan 2017)

Figure 48: Antenatal and newborn screening timeline (PHE, 2016)

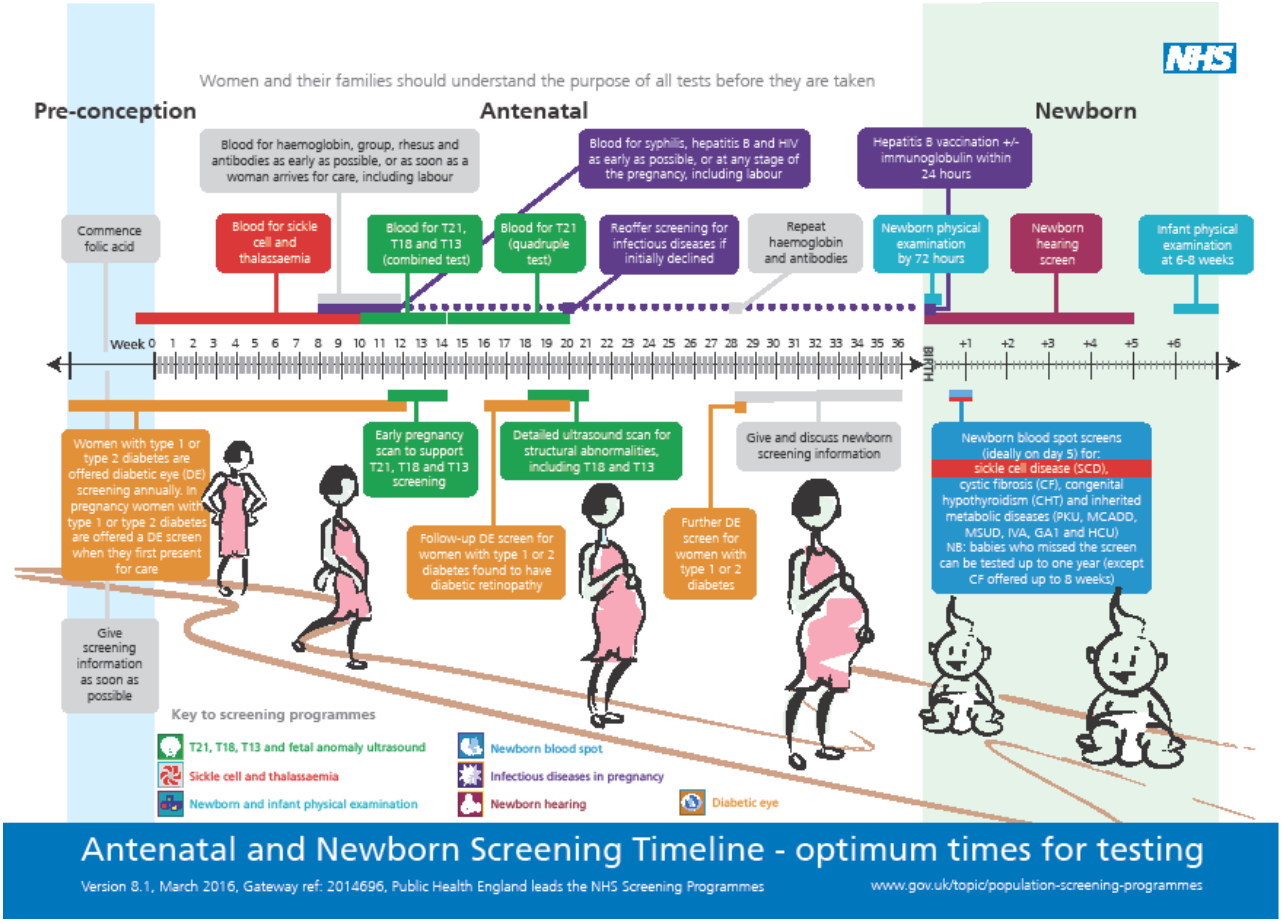


Figure 49: Information and support for pregnant women (NICE Pathway on antenatal care for uncomplicated pregnancies)

At first contact with healthcare professional	• Folic acid supplementation • Food hygiene, including how to reduce the risk of a food-acquired infection • Lifestyle advice, including smoking, alcohol and drugs • All antenatal screening, including haemoglobinopathies, anomaly scan and Down's syndrome, as well as risks and benefits of screening
At booking (ideally by 10 weeks)	• How the baby develops during pregnancy • Nutrition and diet, including vitamin D supplementation and details of the Healthy Start programme • Exercise, including pelvic floor exercises • Place of birth (see planning place of birth in this pathway) • Pregnancy care pathway • Breastfeeding, including workshops • Participant-led antenatal classes • Further discussion of all antenatal screening • Discussion of mental health issues (see NICE pathway on antenatal and postnatal mental health)

Before or at 36 weeks	• Breastfeeding information, including technique and good management practices, such as detailed in the UNICEF Baby Friendly Initiative • Preparation for labour and birth, including coping with pain in labour and the birth plan • Recognition of active labour • Care of the new baby • Vitamin K prophylaxis • Newborn screening tests • Postnatal self-care • Awareness of 'baby blues' and postnatal depression
At 38 weeks	• Options for management of prolonged pregnancy
Supporting information	• NICE guidance on appointments schedule • *The pregnancy book* (Department of Health 2007) and other relevant resources, e.g. UK National Screening Committee publications and MIDIRS information leaflets ➢ Information should be easy to understand and accessible to pregnant women with additional needs, such as physical, sensory or learning disabilities, and to those who do not speak or read English. ➢ Information can also be given in other forms such as audiovisual or touch-screen technology; this should be supported by written information. ➢ Pregnant women should be offered information based on the current available evidence together with support to enable them to make informed decisions about their care - including where they will be seen and who will undertake their care. ➢ At each antenatal appointment, healthcare professionals should offer consistent information and clear explanations, with opportunities to discuss issues and ask questions. ➢ Pregnant women should be informed about the purpose of any test before it is performed. The healthcare professional should ensure the woman has understood this information and has sufficient time to make an informed decision. The right of a woman to accept or decline a test should be made clear. ➢ Information about antenatal screening should be provided before the booking appointment in a setting where discussion can take place, either in a group setting or on a one-to-one basis. This should include balanced and accurate information about the condition being screened for.

MANAGEMENT OF HIGHER-RISK PREGNANCIES

Figure 50 lists the factors that indicate the mother will require either intermediate or intensive care on the Antenatal and Postnatal Pathway.[34]

[34] NHS National Tariff Payment System 2016/17. https://www.gov.uk/government/publications/nhs-national-tariff-payment-system-201617

Figure 50: Risk factors indicating requirements for intermediate or intensive maternity care

	Antenatal Pathway factors		Postnatal Pathway factors	
	Intermediate	Intensive	Intermediate	Intensive
Current factors	• Complex Social Factors[35] • BMI greater than 35 and less than or equal to 49 • BMI less than 18 • Sensory or physical disabilities • Substance use • Alcohol use	• Expecting twins or more	• Complex Social Factors • Substance use • Alcohol use • BMI over 35	
Medical factors	• Mental health • Hepatitis B or C • Inherited disorder • Epilepsy requiring anti-consultants • Previous uterine surgery • Hypertension • Respiratory disease • Gastrointestinal disorder • PAPP-A <0.415 MoM	• HIV • Renal disease • Diabetes and other endocrine disorders • Rhesus isoimmunisation • Cardiac disease • Haemoglobinopathy • Cancer • Thromboembolic disorder • Autoimmune disease • Haematological condition: Thrombophilia/clotting disorder • Central Nervous System disorder • Previous organ transplant • Cystic Fibrosis • BMI >49	• Mental health • Diabetes or other endocrine disorder • Inherited disorder • Rhesus isoimmunisation • Cardiac disease	• HIV • Renal disease
Previous obstetric history	• Pre-eclampsia, eclampsia or HELLP • Puerperal psychosis • Early pre-term birth (<34 weeks) • 3 or more consecutive miscarriages • Fetal Loss (12-24 weeks) • Neonatal death	• Previous fetal congenital anomaly that required specialist fetal medicine	*During this pregnancy:* • Multiple pregnancy • Gestational hypertension • Gestational diabetes • Neonatal death • Still birth	

[35] This is a composite and will be positive if any one of seven factors is present: alcohol or drug misuse, recent migrant or asylum seeker status, difficulty reading or speaking English, aged under 20, domestic abuse.

	• Stillbirth • Intrauterine growth restriction • Placenta accreta • Low weight term baby – less than 2½ kg • High weight term baby – more than 4½ kg • Fetal congenital anomaly		• Pre-eclampsia, eclampsia or HELLP • Deep vein thrombosis or pulmonary embolism	

NICE guidance on care pathways for non-routine or complicated pregnancies sets out what women with key risk factors should receive *in addition to* routine antenatal care, including monitoring of health conditions.[36] Factors that may discourage some pregnant women with complex social factors from using antenatal care services include being overwhelmed by the involvement of multiple agencies; being unfamiliar with antenatal care services; having practical problems that make it difficult for them to attend antenatal appointments; finding it hard to communicate with healthcare staff; or being anxious about the attitudes of healthcare staff.[37]

LOCAL PATHWAYS IN COVENTRY AND WARWICKSHIRE

There are three main providers of maternity services at University Hospital Coventry & Warwickshire (UHCW), South Warwickshire Foundation Trust (SWFT), and George Eliot Hospital (GEH). In 2015/16, there were 6,113 live births at UHCW, 2,606 at SWFT, and 2,078 at GEH. Women in Coventry and Warwickshire can also opt to use the standalone midwife-led unit in Solihull.

Women can either book directly with a midwife, or via their GP. They are offered a choice of a hospital or home birth, with levels of care provided as per the National Maternity Tariff. For uncomplicated pregnancies, intervention is kept at a minimum and led by a midwife. Care for pregnancies considered higher-risk is automatically consultant led, as per national standards.

The Family Nurse Partnership is a voluntary programme for young first time mothers (and their partners) aged 19 years or under, and is also delivered locally. Specially-trained nurses provide regular home visits, from early pregnancy until the child is aged two.[38]

There is a well-established perinatal network across Coventry & Warwickshire, chaired by the Deputy Director of Commissioning, Coventry & Rugby CCG. This is attended by representatives from the three main providers, including clinical leads and specialists (for example, clinical directors, midwifery leads and obstetricians). The purpose of the network is to share evidence-based best

[36] NICE Pathways. Pregnancy. https://pathways.nice.org.uk/pathways/fertility-pregnancy-and-childbirth/pregnancy (accessed 10 April 2017).
[37] NICE (2010). Pregnancy and complex social factors: a model for service provision for pregnant women with complex social factors. CG110: https://www.nice.org.uk/guidance/cg110
[38] South Warwickshire Foundation Trust. Family Nurse Partnership. https://www.swft.nhs.uk/our-services/children-and-young-peoples-services/family-nurse-partnership (accessed 10 Apr 2017) and Coventry & Warwickshire Partnership Trust Family Nursing Partnership https://www.covwarkpt.nhs.uk/service-detail/health-service/family-nurse-partnership-82/

practice, and support each other to improve local care and deliver the implementation of the Maternity Five Year Forward View. The plan for implementation is to be submitted to NHSE by October 2017. The local Strategic Partnership (via the STP) has established a Local Maternity Board, which is developing an action plan to implement Better Births, Safer Births and improve outcomes for pregnant women and their babies.

The main challenges locally are around continuity of care, reflecting the national picture (see more below). *Better Births* highlights the importance of personalised care, but this is challenging to deliver due to many midwives working less than full time, labours lasting longer than shifts in some cases, and community care being shared within midwifery teams. There are also issues around poor record keeping, e.g. for smoking at the time of delivery; this is partly due to the mix of electronic and paper-based systems. Electronic systems that do not allow progression without completing all fields, such as that used at UHCW, would help to improve this.

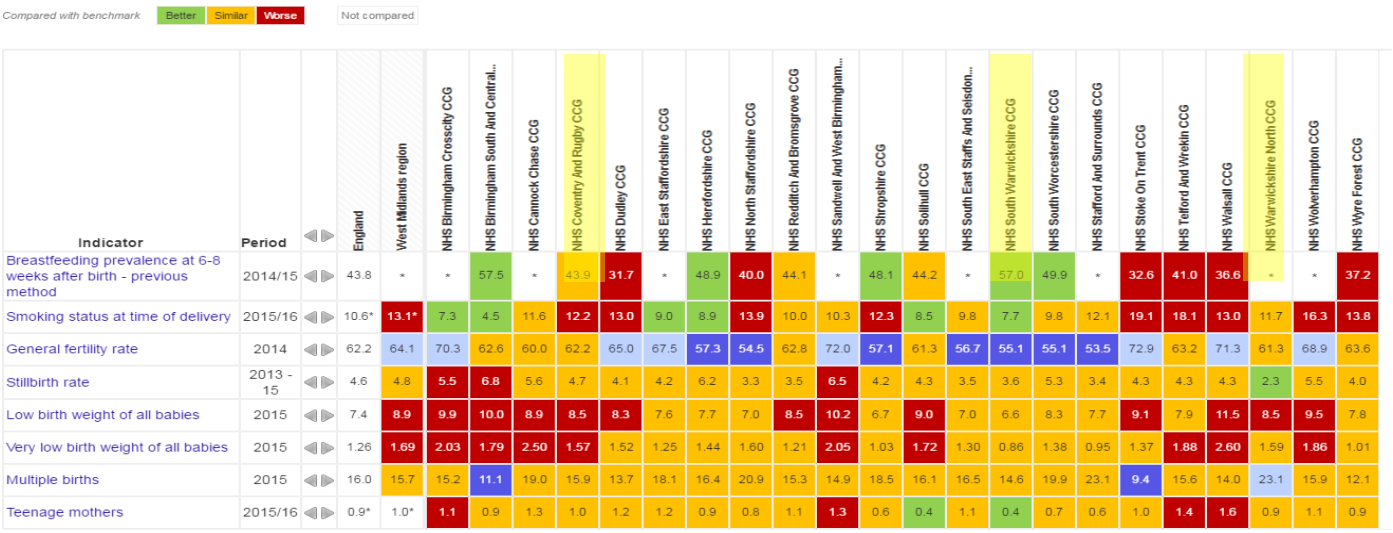
A lack of universally accessible antenatal groups may increase health inequalities in the region, as not all women will be able to afford to join groups such as the National Childbirth Trust (NCT). This gap has been highlighted in recent research undertaken by Warwickshire's Smart Start Programme in 2016.

CURRENT OUTCOME AND PERFORMANCE INDICATORS

Figure 51 below shows a number of key pregnancy and birth indicators for CCGs in the West Midlands. Smoking at the time of delivery, low birth weight and very low birth weight are all significantly higher for the West Midlands overall and Coventry & Rugby CCG than the England average. Warwickshire North CCG also has a significantly higher percentage of low birthweight babies, and a higher rate of maternities with multiple births, but a significantly lower stillbirth rate.

By contrast, South Warwickshire CCG is similar to the national average for stillbirths, birth weight and multiple births, but has fewer deliveries to teenage mothers, fewer women smoking at the time of delivery, and more mothers breastfeeding at 6-8 weeks after birth. However, the general fertility rate in South Warwickshire is also lower.

Figure 51: Key pregnancy and birth indicators in the West Midlands by CCG



Compared with benchmark: Better | Similar | Worse | Not compared

Indicator	Period	England	West Midlands region	NHS Birmingham Crosscity CCG	NHS Birmingham South And Central...	NHS Cannock Chase CCG	NHS Coventry And Rugby CCG	NHS Dudley CCG	NHS East Staffordshire CCG	NHS Herefordshire CCG	NHS North Staffordshire CCG	NHS Redditch And Bromsgrove CCG	NHS Sandwell And West Birmingham...	NHS Shropshire CCG	NHS Solihull CCG	NHS South East Staffs And Seisdon...	NHS South Warwickshire CCG	NHS South Worcestershire CCG	NHS Stafford And Surrounds CCG	NHS Stoke On Trent CCG	NHS Telford And Wrekin CCG	NHS Walsall CCG	NHS Warwickshire North CCG	NHS Wolverhampton CCG	NHS Wyre Forest CCG
Breastfeeding prevalence at 6-8 weeks after birth - previous method	2014/15	43.8	*	*	57.5	*	43.9	31.7	*	48.9	40.0	44.1	*	48.1	44.2	*	57.0	49.9	*	32.6	41.0	36.6	*	*	37.2
Smoking status at time of delivery	2015/16	10.6*	13.1*	7.3	4.5	11.6	12.2	13.0	9.0	8.9	13.9	10.0	10.3	12.3	8.5	9.8	7.7	9.8	12.1	19.1	18.1	13.0	11.7	16.3	13.8
General fertility rate	2014	62.2	64.1	70.3	62.6	60.0	62.2	65.0	67.5	57.3	54.5	62.8	72.0	57.1	61.3	56.7	55.1	55.1	53.5	72.9	63.2	71.3	61.3	68.9	63.6
Stillbirth rate	2013 - 15	4.6	4.8	5.5	6.8	5.6	4.7	4.1	4.2	6.2	3.3	3.5	6.5	4.2	4.3	3.5	3.6	5.3	3.4	4.3	4.3	4.3	2.3	5.5	4.0
Low birth weight of all babies	2015	7.4	8.9	9.9	10.0	8.9	8.5	8.3	7.6	7.7	7.0	8.5	10.2	6.7	9.0	7.0	6.6	8.3	7.7	9.1	7.9	11.5	8.5	9.5	7.8
Very low birth weight of all babies	2015	1.26	1.69	2.03	1.79	2.50	1.57	1.52	1.25	1.44	1.60	1.21	2.05	1.03	1.72	1.30	0.86	1.38	0.95	1.37	1.88	2.60	1.59	1.86	1.01
Multiple births	2015	16.0	15.7	15.2	11.1	19.0	15.9	13.7	18.1	16.4	20.9	15.3	14.9	18.5	16.1	16.5	14.6	19.9	23.1	9.4	15.6	14.0	23.1	15.9	12.1
Teenage mothers	2015/16	0.9*	1.0*	1.1	0.9	1.3	1.0	1.2	1.2	0.9	0.8	1.1	1.3	0.6	0.4	1.1	0.4	0.7	0.6	1.0	1.4	1.6	0.9	1.1	0.9

Source: Child & Maternal Health Profile, PHE

Figure 52 shows maternity performance in Warwickshire for births in NHS hospitals 2013/14, including unassisted and assisted deliveries, elective and emergency Caesarean sections, breastfeeding initiation and Care Quality Commission (CQC) ratings. With the exception of the Hospital of St Cross in Rugby, which is part of UHCW, all were rated as 'requiring improvement'.

Figure 52: Maternity performance in Warwickshire for births in NHS hospitals, 2013/14[39]

Hospital	Annual number of births	Unassisted deliveries	Assisted deliveries	Elective caesarean	Emergency caesarean	Breastfeeding initiation	CQC ratings
University Hospital (Coventry) Hospital of St. Cross, Rugby	5,941	63%	37%	11%	14%	79%	Requires improvement Good
Warwick Hospital (SWFT)	2,547	54%	45%	13%	16%	81%	Requires improvement
George Eliot Hospital, Nuneaton	1,890	66%	34%	11%	11%	59%	Requires improvement

Engagement about maternity services in Coventry and Warwickshire was carried out during December 2016 and January 2017 to help inform planning for the future of local services as part of the Sustainability and Transformation Plan for Coventry and Warwickshire. 57 interviews were carried out at a number of community and health venues to understand the care experiences of parents and carers before, during and after birth. Key points that interviewees felt were important included:

[39] My NHS https://www.nhs.uk/service-search/Performance/Search

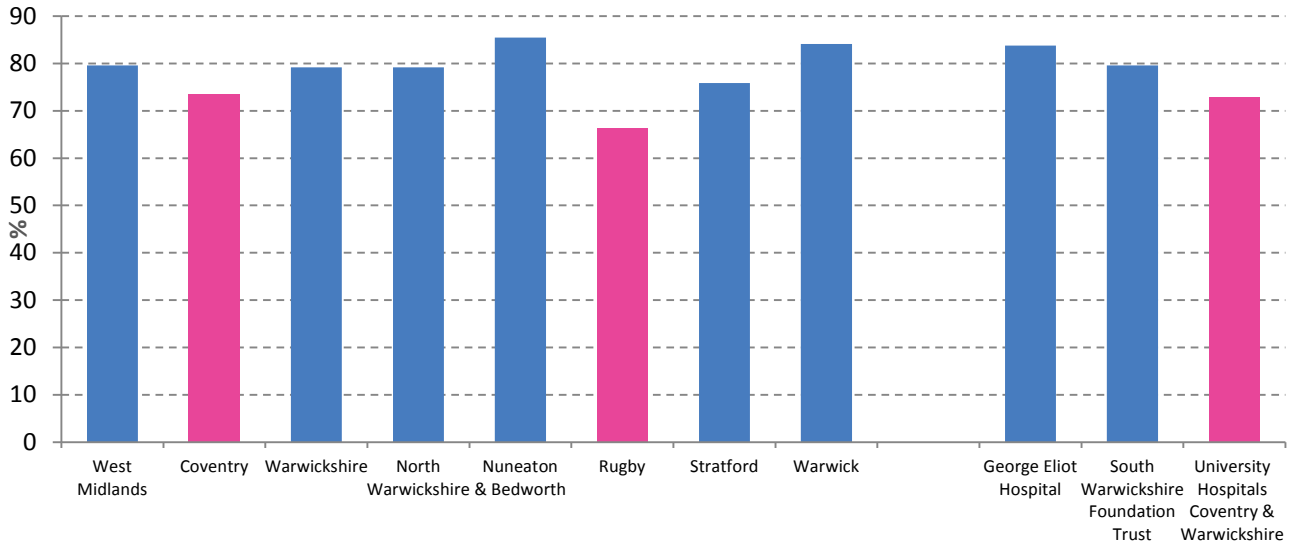
- consistency of care
- being listened to
- personalised care
- family friendly care
- professional attitude of staff
- being reassured
- support with breastfeeding and other aspects of caring for a new baby, including antenatal classes and postnatal support groups
- access to information
- good communication

These findings were also reflected in the Smart Start foundation research and ethnographic research carried out in 2015 and 2016.

CONTINUITY OF CARE

An important key performance indicator is antenatal continuity of carer, i.e. 75% of community visits with the same midwife. Commissioners and providers are advised to consider a locality based service to increase economies of scale, reduce travel and permit greater cohesion of maternity care. Until 2010/11, when the target was modified to include continuity of care with a team of two midwives, most trusts attained less than 40% continuity of care with the same midwife. The West Midlands, continuity of care with team of two midwives, 2011/12 average was 79.6% and in Warwickshire it was 79.2%. However, both Rugby (66.4%) and Coventry (73.4%) were below the 75% target as was University Hospitals Coventry & Warwickshire (72.8%). Collection of this data ceased with the closure of the Perinatal Institute in 2013.

Figure 53: Proportion of mothers receiving continuity of care with two midwives (2011/12)



Source: West Midlands Perinatal Institute

Although the above presented continuity of care data is from 2011/12, this remains an important theme highlighted in recent engagement in terms of the importance of consistency of care and there still being a feeling of a 'gap' from those using maternity services.

BIRTHS BY PLACE OF BIRTH

Women and their partners have a choice of access to maternity care, choice of antenatal care, place for delivery and post-natal care. Choice could include hospital, maternity led community units or home.

There are three main providers of acute and community maternity services:

- The George Elliot (GEH)
- University Hospitals of Coventry and Warwickshire (UHCW)
- South Warwickshire Foundation Trust (SWFT)

Figure 54 (below) shows that across Coventry and Warwickshire the proportion of births that have taken place in NHS hospitals from 2011-15 is slightly higher than the England rate (97.2%). At district and borough levels, the proportions in Rugby (97.1%) and Stratford (96.5%) are slightly lower than England, rates which reflect larger proportions of home births.

Overall less than 3% of births occur at home. Between 2011 and 2015, the proportion of NHS hospital births in Warwickshire remained above 97% annually whereas in Coventry they were above 98%.

Figure 54: Proportion of births to women registered with Warwickshire GPs by place of birth, 2011-15

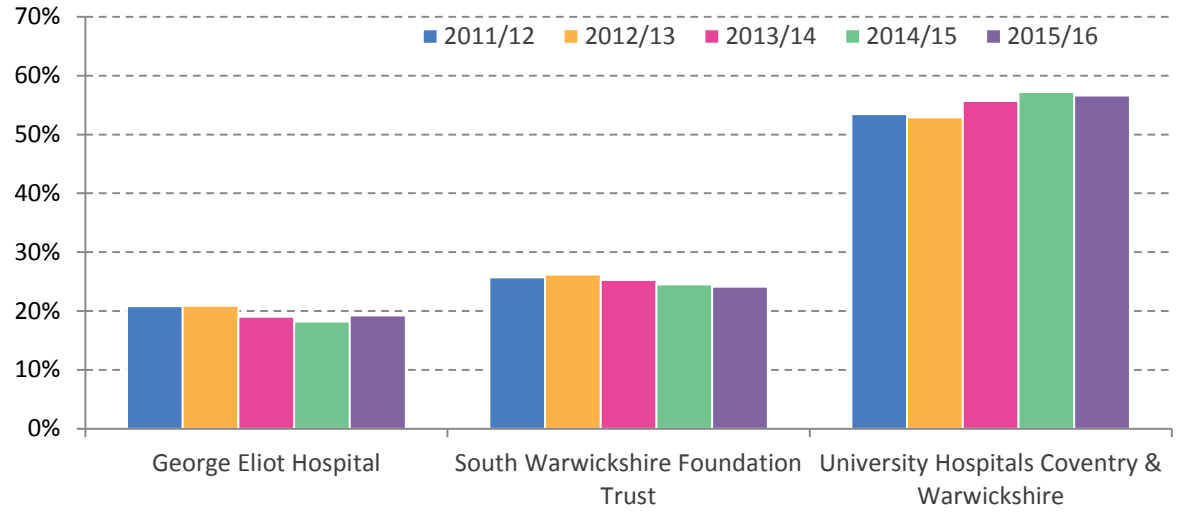
	England	Coventry	Warwickshire	North Warwickshire	Nuneaton & Bedworth	Rugby	Stratford	Warwick
NHS Hospitals	97.2	98.4	97.3	97.6	97.7	97.1	96.5	97.4
Non-NHS Hospitals	0.3	0.0	0.0	0.0	0.0	0.1	0.1	0.0
At Home	2.2	1.4	2.5	2.1	2.1	2.6	3.2	2.5
Elsewhere	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Office for National Statistics

Of the 53,448 NHS hospital births to Coventry and Warwickshire mothers from 2011/12 to 2015/16, a total of 29,481 (55.2%) took place at University Hospitals Coventry and Warwickshire (UHCW).

Overall, residents in Warwick and Stratford normally attend South Warwickshire Foundation Trust (SWFT). Residents in Nuneaton and Bedworth generally attend George Eliot Hospital (GEH) and those from Coventry and Rugby attend UHCW. It should be noted that intensive neonatal services are provided at UHCW for the whole of Coventry and Warwickshire.

Figure 55: Proportion of Coventry & Warwickshire Births by NHS Provider, 2011/12 to 2015/16



Source: NHS Digital

PREMATURE BIRTH RATES

Globally premature birth (less than 37 weeks gestation) is the leading cause of death for children under the age of five[40]. There is substantial evidence that smoking during pregnancy and exposure to second-hand-smoke can lead to premature birth among many other adverse health effects including complications during labour, low birth-weight at full term and increased risk of miscarriage and stillbirth.

Since 2009-11, it appears that premature birth rates have been slowly increasing at a national level. Similarly, in Coventry the rates are also increasing but are statistically significantly worse than both the Warwickshire and England rates. At district and borough levels, the pattern is a more variable due to smaller numbers.

Figure 56: Premature births (less than 37 weeks gestation), crude rate per 1,000

	2009 - 11	2010 - 12	2011 - 13	2012 - 14	2013 - 15
England	75.9	75.7	76.7	77.7	78.4
Coventry	78.8	82.0	82.1	84.8	86.8
Warwickshire	73.9	75.0	78.4	78.8	79.3
North Warwickshire	85.6	86.3	90.2	84.7	88.4
Nuneaton & Bedworth	75.4	76.5	84.6	86.6	90.8
Rugby	75.8	75.5	79.3	80.9	80.4
Stratford-on-Avon	75.0	75.6	74.8	72.8	69.0
Warwick	65.0	67.9	68.9	70.8	70.0

Source: Office for National Statistics adhoc table request

[40] Breslow NE, Day NE. *Statistical methods in cancer research, volume II: The design and analysis of cohort studies.* Lyon: International Agency for Research on Cancer, World Health Organization; 1987:69

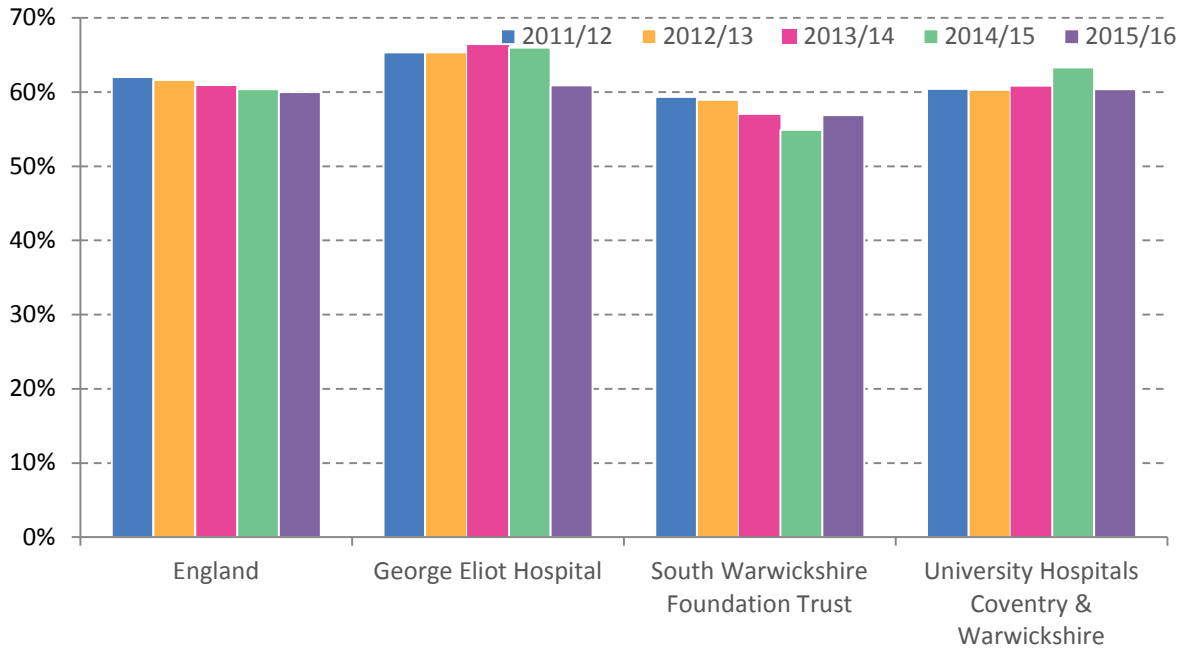
TYPE OF DELIVERY

The data on type of delivery is analysed by NHS Digital and released as Hospital Episode Statistics. The graphs below show the percentage of deliveries by type of delivery: normal, caesarean, instrumental, and induction and by provider. The data presented is not geographically specific but to all births at each of the main providers across Coventry and Warwickshire.

An overall summary of type of delivery for 2015/16 includes:

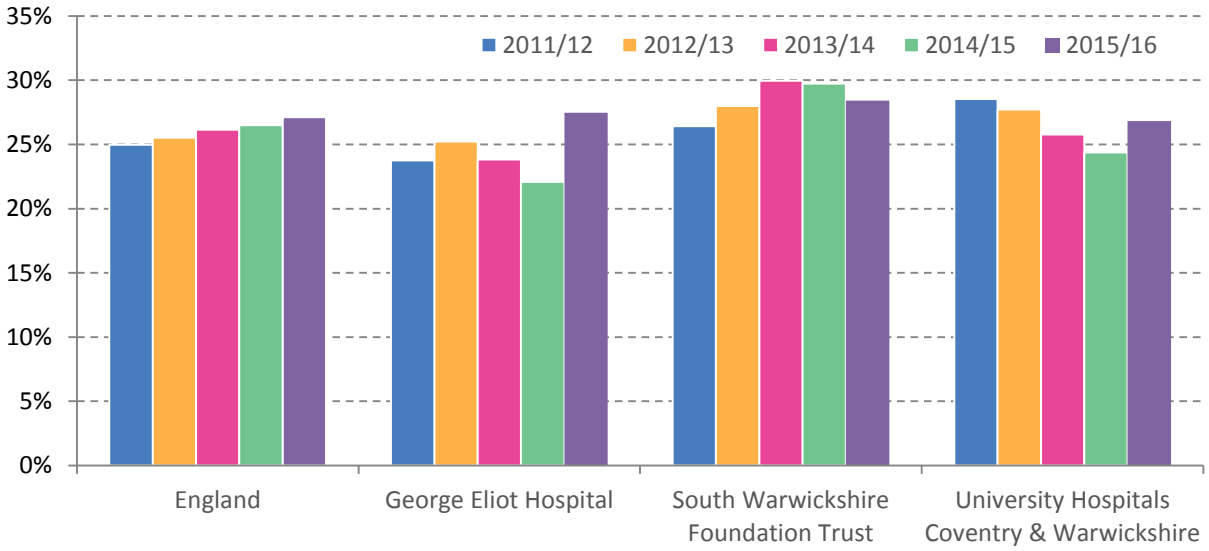
- Normal delivery: both UHCW (60.4%) and GEH (60.9%) have higher rates than the England average (60.0%). SWFT rates are lower at 56.9%.
- Caesarean sections: Only GEH (27.5%) has higher rates than the England average (27.1%).
- Instrumental deliveries: SWFT rates (14.7%) are higher than the England average of 12.9%.
- Induction of labour: only GEH has a lower induction rate (26.9%), SWFT and UHCW have rates above the England average (27.9%)

Figure 57: Normal deliveries as percentage of all births 2011/12 to 2015/16 by main provider compared to England



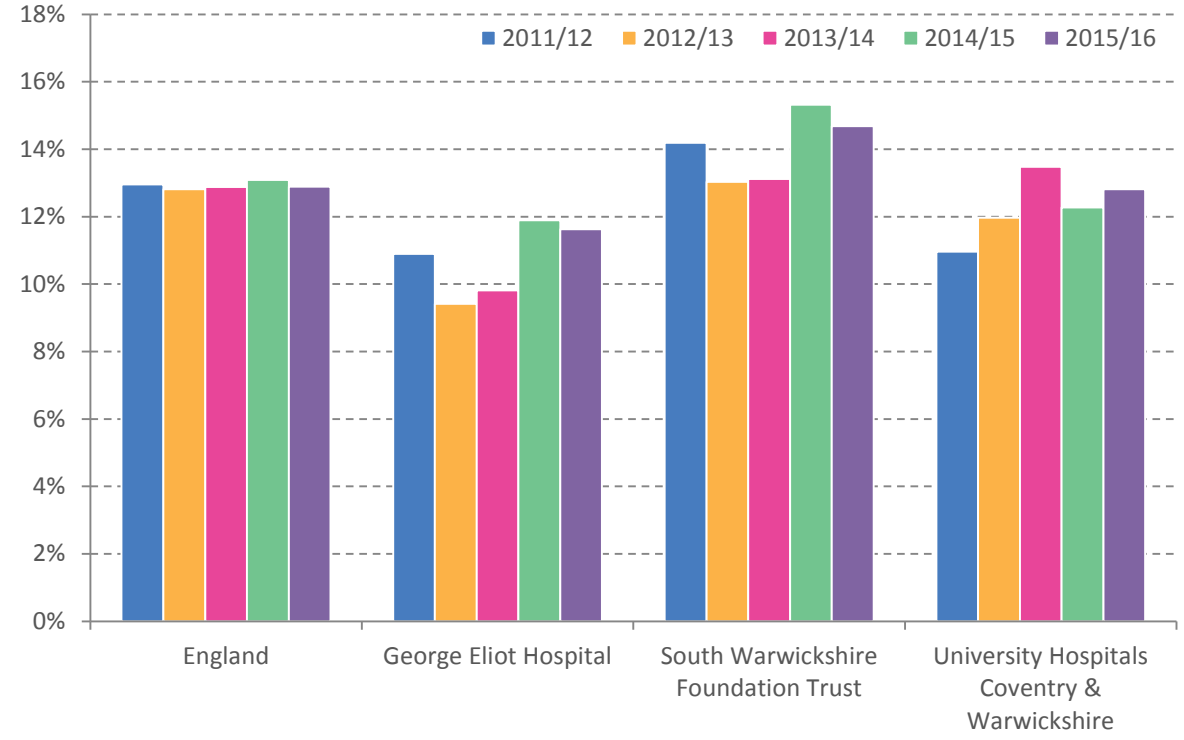
Source: NHS Digital

Figure 58: Caesarean deliveries as percentage of all births 2011/12 to 2015/16 by main provider compared to England



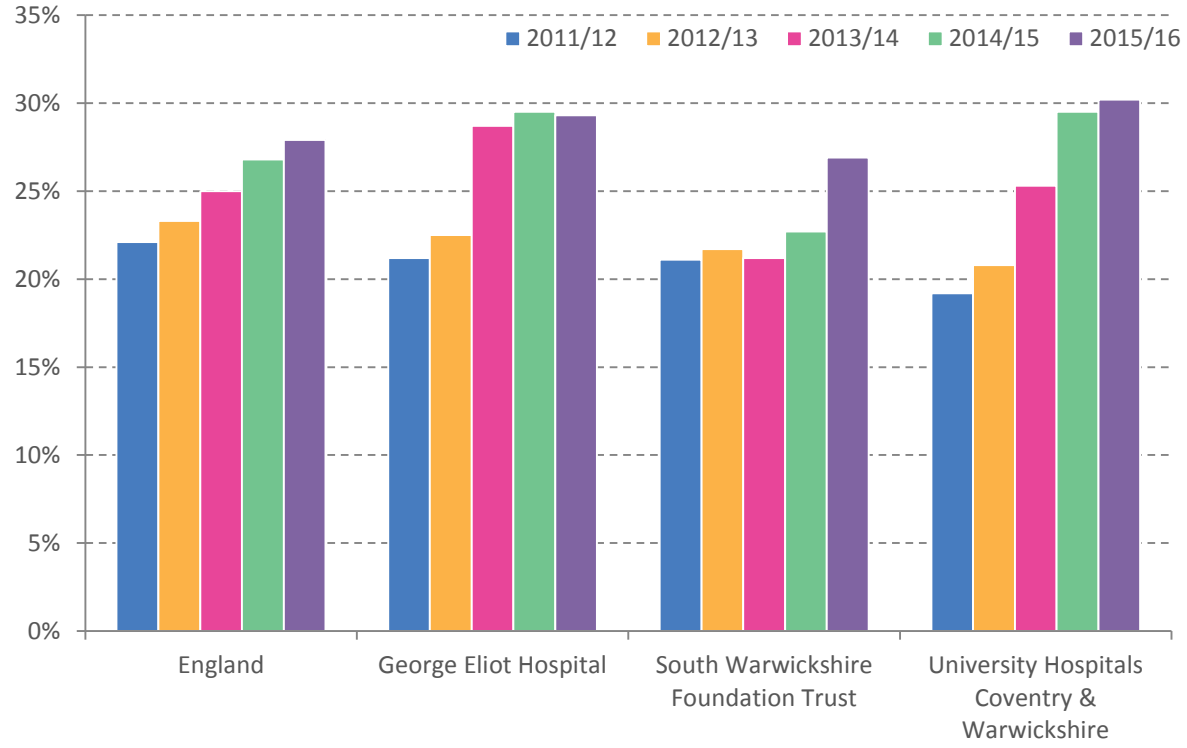
Source: NHS Digital

Figure 59: Instrumental deliveries as percentage of all births 2011/12 to 2015/16 by main provider compared to England



Source: NHS Digital

Figure 60: Induction deliveries as percentage of all births 2011/12 to 2015/16 by main provider compared to England



Source: NHS Digital

NEWBORN BLOODSPOT SCREENING

The UK National Screening Committee recommend that all babies in the UK are offered NBS screening for sickle cell disease, cystic fibrosis, congenital hypothyroidism and six inherited metabolic diseases: phenylketonuria, medium-chain acyl-CoA dehydrogenase deficiency, maple syrup urine disease, isovaleric acidaemia, glutaric aciduria type 1 and homocystinuria (pyridoxine unresponsive). The overall goal is to prevent ill health, disability and death through early diagnosis and effective intervention.

One of the main objectives of newborn blood spot screening is to ensure that eligible babies whose parents accept an offer of screening are tested within an effective timeframe. Timely information on screening coverage is key in order to identify trends and to monitor the effectiveness of service improvements.

Coverage is a measure of the delivery of timely screening to an eligible population. Low coverage might indicate that:

1. not all eligible babies have been offered screening;
2. those offered screening are not accepting the test; and/or
3. those accepting the test are not being tested within an effective timeframe.

Data from NHS Child Health Information Systems for 2015/16 suggests that 96.9% of babies, in Warwickshire, eligible for newborn blood spot screening were screened. This is statistically

significantly better than the England rate (95.6%). In Coventry, for the same time period the uptake (94.4%) was statistically significantly worse.

Avoidable repeat of neonatal blood-spot sampling of up to 0.5% is regarded as achievable and up to 2.0% is generally regarded as acceptable. The main reasons for repeat sampling was insufficient sampling and unsuitable samples (e.g. on an expired blood spot card, contaminated, in transit for more than fourteen days, anti-coagulated sample). Poor quality samples resulting in avoidable repeat sampling and testing cause delay in identification and treatment of screen positive babies, anxiety to parents, distress to babies and waste of healthcare resources.

GLOSSARY OF TERMS AND ABBREVIATIONS

General fertility rate	Live births per 1000 resident women aged 15-44 years
Crude birth rate	Live births per 1000 resident population
Maternity	Live or still birth
Still birth rate	Stillbirths per 1000 live and still births. Definition of still birth is death after 24 weeks gestation to delivery.
Perinatal mortality rate	Still births and deaths within 1st 6 completed days of life per 1000 still and live births
Neonatal mortality rate	Deaths within the 1st 27 completed days of life per 1000 live births
Period fertility rate	The average no. of live-born children that would be born per woman if women experienced the age-specific fertility rates of this year throughout their child bearing life span.
Standardised fertility ratio	An estimate of the observed live births as a % of the expected LB (expected = no. That would occur if the population of the area experienced the age-specific fertility rates of E&W)) the SFR for England and Wales is 100.
Infant mortality rates	Infant deaths from birth to 1 year age per 1000 live births. NB excludes stillbirths.
RU	Rugby Borough
SA	Stratford-on-Avon District
NB	Nuneaton and Bedworth Borough
Eng	England
NW	North Warwickshire Borough
WK	Warwick District
Warks	Warwickshire
UHCW	University Hospitals of Coventry and Warwickshire
GEH	George Elliot
SWH	South Warwickshire Hospital
LDP	Local Delivery Plan
Teenage pregnancy rates	Number of conceptions per 1000 women aged 15-17 years