

Responding to Secretary of State letter following referral of the permanent closure of consultant-led maternity services at the Horton General Hospital

Work Stream 4 Size and share of the market (activity and population modelling)

1. Introduction

- a) The purpose of this work stream is to collate and analyse activity and develop activity projections that take into account population growth for areas that access services in Oxfordshire. This incorporates analysis of the current and future demand for services at the Horton General Hospital (HGH), including an assessment population growth as a result of future housing and growth plans.
- Get full understanding of shift in location for births from 12 month pre-change period (01.10.15 to 30.09.16) to 24 month post temporary closure period (01.10.16 to 30.09.18) for Oxfordshire residents and for Warwickshire and Northamptonshire practices that are significant users of Oxfordshire services (currently based on 18 months data being updated)
 - SCBU/neonatal activity – please see paper on service description
 - Work with District Councils to look at future housing and population growth and consider what this might mean for numbers of births
 - Undertake some sensitivity analysis to vary population share of births that take place at different sites to give an indication of the size of shift required to increase the numbers of births at the Horton General Hospital to over 2,500.

Completion of this work will be demonstrated by presentation of past activity and projections based on District Council provided housing growth figures with any assumptions identified.

This paper is presented as a draft for discussion and comments are particularly invited on:

- Are all main geographical areas included in the analysis?
- Is the modelling clear?
- Are the assumptions about a shift of baseline towards the Horton General Hospital by geography reasonable? Should other options be modelled?

2. Summary of level of births by practice groups prior to temporary closure of Horton obstetric service

From 1 October 2015 to 30 September 2016 there were 1,307 births at the HGH to mothers from Oxfordshire, south Northamptonshire or south Warwickshire. This was the last full 12 month period prior to the temporary closure of the obstetric services.

Table 1 below shows by groups of practices the births that took place in the 12 months prior to the temporary closure of the obstetric unit at HGH.

Table 1 – Birth distribution for practices in HGH catchment area

| | Birth numbers | | Birth per cent | |
|---|---------------|--------------|----------------|-------|
| | HGH | Other | HGH | Other |
| Banbury practices | 617 | 147 | 81% | 19% |
| Brackley and Byfield | 177 | 64 | 73% | 27% |
| Practices around Banbury | 110 | 78 | 59% | 41% |
| Chipping Norton | 54 | 77 | 41% | 59% |
| Shipston, Kineton and Fenny Compton | 53 | 135 | 28% | 72% |
| Bicester practices | 134 | 431 | 24% | 76% |
| Other West Oxfordshire (Charlbury, Woodstock) | 25 | 82 | 23% | 77% |
| Witney, Eynsham and surrounds | 25 | 415 | 6% | 94% |
| Kidlington and Islip Practices | 9 | 265 | 3% | 97% |
| Other | 103 | | | |
| TOTAL | 1,307 | 1,694 | | |

This table has grouped practices that had significant flow to HGH or are deemed to be within a wider catchment where it may prove attractive for greater numbers to use the HGH if the service was re-established. Those included in other contain many practices where the numbers of births occurring at the HGH were only 1 or 2 and accounted for less than 1% of the practice births (this group includes some of the south Northamptonshire and south Warwickshire practices).

For the rest of the analysis and discussion in this paper the practices are considered in two groups:

Group 1: HGH main catchment area (Banbury practices, Brackley and Byfield, Practices around Banbury and Chipping Norton)

Group 2: HGH wider catchment area (Shipston, Kineton and Fenny Compton, Bicester practices, Other West Oxfordshire (Charlbury, Woodstock), Witney, Eynsham and surrounds and Kidlington and Islip)

3. What we knew in 2017

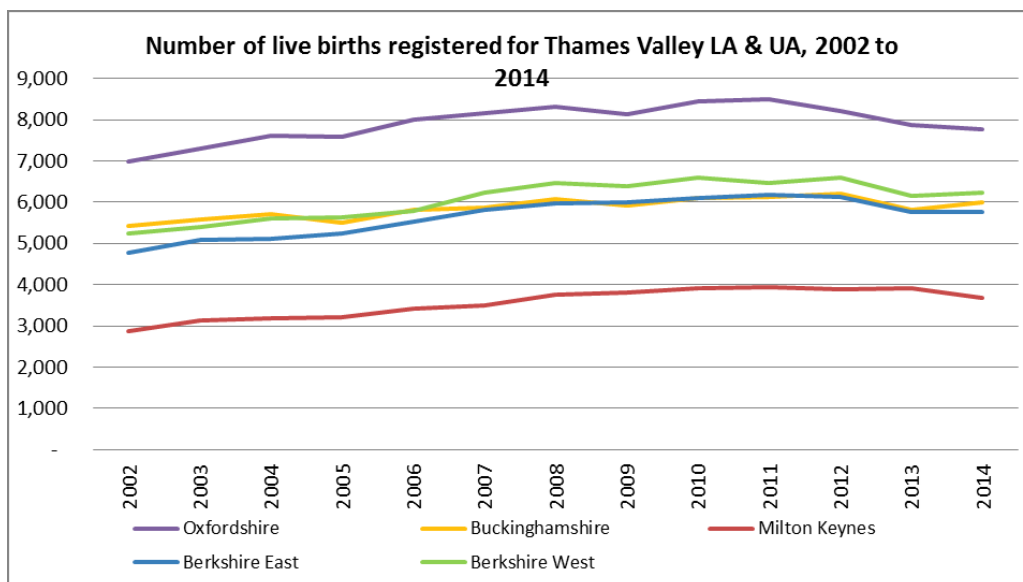
The data presented in 2017 was based on the review undertaken by the Thames Valley Strategic Clinical Network.¹

The report included work reviewing historic birth trends and undertaking projections. The following information is taken from the report (for Oxfordshire this is based on the County Council area which covers a slightly different population than the CCG is responsible for).

3.1 Historic Trends

Figure 1 depicts the number of live births across Thames Valley over the last 12 years. Within the TVSCN there has been a 15% increase in the number of live births from 2002 to 2014.

Figure 1 Number of Live births across Thames Valley SCN 2002-2014

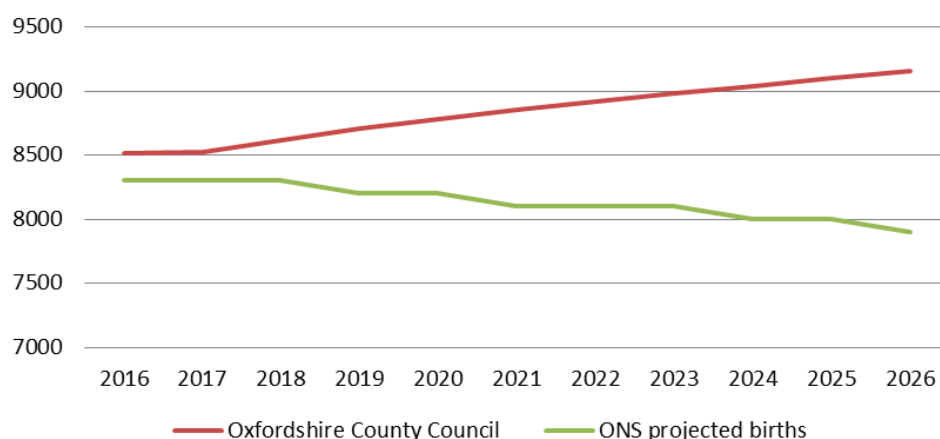


3.2 Projections

The work undertaken by the SCN projected number of births in each council area including additional births as a result of housing growth and resulting population growth. The graph below shows the difference between the ONS projections for changes in numbers of births (a decrease) and those forecast by the County Council taking into account housing growth which show an 8% increase over the 10 years from 2016.

¹ TVSCN Maternity Capacity and Future planning Report; Conclusion Paper June 2016

Forecast births in Oxfordshire



3.3 Recent trends (based on CCG data)

Table 2 below shows the actual births from 2013/14 to 2018/19 based on the CCG registered population. As can be seen this shows that numbers of births rose to maximum of 6,937 in 2015/16 and then has decreased again.

| Year | Number of births |
|---|------------------|
| 2013/14 | 6,430 |
| 2014/15 | 6,287 |
| 2015/16 | 6,937 |
| 2016/17 | 6,853 |
| 2017/18 | 6,478 |
| 2018/19 (extrapolated from 9 months data) | 6,599 |

4. Housing growth

The most recent housing growth figures have been obtained from Cherwell District Council², West Oxfordshire District Council³ South Northamptonshire District Council⁴, Stratford-upon-Avon District Council⁵. The full analysis used can be found in Appendix 1; the District Council present the data slightly differently and the following data has been included/excluded:

| | Included | Excluded |
|---|---|-------------------------------------|
| Cherwell District Council | Deliverable (available, suitable and achievable sites) Specific developable sites | Remaining allocation |
| South Northamptonshire District Council | All from Appendix 4 Major sites Minor sites Windfalls | |
| West Oxfordshire District Council | All from Appendix 2 Large commitments Local plan allocations | |
| Stratford-Upon-Avon District Council | Under construction Initial site works commenced Outline permission Permission not started Resolution to grant | Expired No permission Stalled |

A summary of this is shown on the next page with Table 2 containing data for the HGH main catchment area and Table 3 containing data for the wider catchment area.

² Cherwell District Council Annual Monitoring Report 2018 and appendices (December 2018)

³ West Oxfordshire District Council Housing Land Supply Position Statement (November 2018)

⁴ South Northamptonshire District Council Housing Land Report 2018 (April 2018)

⁵ Stratford-upon-Avon District Council Housing Sites Spreadsheet 2011-2031 position at 31 March 2018

Table 2 Planned Housing growth in HGH main catchment area

| | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | 2024/25 | 2025/26 | 2026/27 | 2027/28 | 2028/29 | 2029/30 | 2030/31 | TOTAL |
|--|------------|------------|--------------|--------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|--------------|
| Cherwell District Council (Banbury area) | 526 | 656 | 921 | 923 | 695 | 551 | 460 | 390 | 317 | 253 | 117 | 117 | 52 | 5,978 |
| West Oxfordshire District Council (Chipping Norton area) | 196 | 114 | 100 | 73 | 75 | 75 | 100 | 100 | 100 | 100 | 150 | 150 | 173 | 1,506 |
| South Northamptonshire District Council (Brackley area) | 155 | 170 | 218 | 202 | 192 | 86 | 40 | 40 | 40 | 40 | 30 | 0 | 0 | 1,213 |
| TOTAL | 877 | 940 | 1,239 | 1,198 | 962 | 712 | 600 | 530 | 457 | 393 | 297 | 267 | 225 | 8,697 |

Table 3 Planned Housing growth in HGH wider catchment area

| | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | 2024/25 | 2025/26 | 2026/27 | 2027/28 | 2028/29 | 2029/30 | 2030/31 | TOTAL |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------|---------------|
| Cherwell District Council (Bicester area) | 365 | 618 | 688 | 807 | 838 | 845 | 809 | 620 | 575 | 555 | 455 | 425 | 311 | 7,911 |
| Cherwell District Council (Other area) | 347 | 473 | 387 | 232 | 238 | 211 | 180 | 180 | 180 | 180 | 180 | 150 | 133 | 3,071 |
| West Oxfordshire District Council (Woodstock, Bladon and Charlbury) | 81 | 98 | 90 | 97 | 95 | 75 | 80 | 50 | 50 | 50 | 0 | 0 | 0 | 766 |
| West Oxfordshire District Council (Witney, Eynsham and surrounds) | 249 | 477 | 473 | 789 | 695 | 777 | 730 | 645 | 620 | 595 | 558 | 445 | 345 | 7,398 |
| Stratford-Upon-Avon District Council (all except Alcester, Bidford-on-Avon, Henley-in-Arden, Southam, Stratford-on-Avon and Studley) | 530 | 846 | 686 | 649 | 502 | 538 | 485 | 240 | 200 | 200 | 200 | 200 | 200 | 5,476 |
| TOTAL | 1,572 | 2,512 | 2,324 | 2,574 | 2,368 | 2,446 | 2,284 | 1,735 | 1,625 | 1,580 | 1,393 | 1,220 | 989 | 24,622 |

5. Modelling increase in births from housing growth

As highlighted in section 3.2 Oxfordshire County Council has forecast the expected number of births taking into account the planned housing growth (see page 41 of TVSCN Maternity Capacity and Future planning Report; Conclusion Paper June 2016). This methodology uses the number of new estimated women (in-house forecast) in each age group in a given year and the expected age-fertility rates for that age group in that year. This was for the whole of the county and indicated a rise in births of 641 from 8,514 in 2016 to 9,155 in 2026; using these estimates would only predict an increase of about 200 births by 2026 for the Oxfordshire part of the Horton catchment. The CCG is working with the Public Health team to determine whether it is possible to apply this more sophisticated methodology to provide birth projections for the population in the Horton catchment area.

Much of the previous analysis has been undertaken at County level and for this work it is important to be able to consider housing growth in particular locations. Therefore a very simple approach to modelling the increase in births from housing growth has been used which gives an estimate based on births per 1,000 households. If this is based on current birth rate this is about 24 births per 1,000 houses. Often new housing developments attract a higher proportion of younger people so a second projection has been undertaken applying a birth rate of 48 births per 1,000 homes for the new housing (that is double the current birth rate). These assumptions have been applied to the housing growth in the main and wider HGH catchment areas. A summary of this is shown on the next page with Table 4 containing data for the HGH main catchment area and Table 5 containing data for the wider catchment area. These assumptions give upper estimates to the number of additional births there may be in the catchment area as they assume all residents of the new housing are new to Oxfordshire.

Table 4 Estimate of increased numbers of births from Planned Housing growth in HGH main catchment area

| | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | 2024/25 | 2025/26 | 2026/27 | 2027/28 | 2028/29 | 2029/30 | 2030/31 |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Births at 24 per 1,000 houses | 21 | 23 | 30 | 29 | 23 | 17 | 14 | 13 | 11 | 9 | 7 | 6 | 5 |
| Cumulative increase current birth rate | 21 | 44 | 73 | 102 | 125 | 142 | 157 | 169 | 180 | 190 | 197 | 203 | 209 |
| Births at 48 per 1,000 houses | 42 | 45 | 59 | 58 | 46 | 34 | 29 | 25 | 22 | 19 | 14 | 13 | 11 |
| Cumulative increase double birth rate | 42 | 87 | 147 | 204 | 250 | 285 | 313 | 339 | 361 | 380 | 394 | 407 | 417 |

Table 5 Estimate of increased numbers of births from Planned Housing growth in HGH wider catchment area

| | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | 2024/25 | 2025/26 | 2026/27 | 2027/28 | 2028/29 | 2029/30 | 2030/31 |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Births at 24 per 1,000 houses | 38 | 60 | 56 | 62 | 57 | 59 | 55 | 42 | 39 | 38 | 33 | 29 | 24 |
| Cumulative increase current birth rate | 38 | 98 | 154 | 216 | 272 | 331 | 386 | 428 | 467 | 504 | 538 | 567 | 591 |
| Births at 48 per 1,000 houses | 75 | 121 | 112 | 124 | 114 | 117 | 110 | 83 | 78 | 76 | 67 | 59 | 47 |
| Cumulative increase double birth rate | 75 | 196 | 308 | 431 | 545 | 662 | 772 | 855 | 933 | 1,009 | 1,076 | 1,134 | 1,182 |

As can be seen from these tables, the highest upper estimate of additional births (by 2031) for the wider HGH catchment area is between 800 (current birth rate) and 1,599 (double birth rate). It would not be expected on current flows (and because some mothers will need specialised services) that all these births would take place at the HGH.

Table 6 below models a shift in flow from the wider HGH catchment and applies that percentage to the increased number of births. This gives a revised baseline (as of now) for HGH births of 1,760 and an upper limit in 2031 of 2,148 (current birth rate) to 2,536 (double birth rate). To achieve this level of births at HGH requires a significant shift (at least doubling) in current patient flows from Bicester, Woodstock, Witney and Kidlington areas and the birth rate for all new housing developments to be double the current birth rate.

Table 6 – Modelling an increase in share of the market and share of additional births at HGH

| | Baseline HGH | | Shift towards HGH | Revised Baseline | Additional births per 1,000 homes by 2030/31 | |
|---|--------------|------|-------------------|------------------|--|------------|
| | Births | %HGH | | | 24 | 48 |
| Banbury practices | 617 | 81% | 81% | 617 | 115 | 230 |
| Brackley and Byfield | 177 | 73% | 73% | 177 | 21 | 42 |
| Practices around Banbury | 110 | 59% | 75% | 141 | 0 | 0 |
| Chipping Norton | 54 | 41% | 55% | 72 | 20 | 40 |
| Shipston, Kineton and Fenny Compton | 53 | 28% | 40% | 75 | 53 | 106 |
| Bicester practices | 134 | 24% | 50% | 283 | 95 | 190 |
| Other West Oxfordshire (Charlbury, Woodstock) | 25 | 23% | 50% | 54 | 9 | 18 |
| Witney, Eynsham and surrounds | 25 | 6% | 30% | 132 | 53 | 106 |
| Kidlington and Islip Practices | 9 | 3% | 30% | 82 | 22 | 44 |
| Other | 128 | | | 128 | | |
| TOTAL | 1,332 | | | 1,760 | 388 | 776 |

The proposed shifts are given as examples and are estimated using a combination of the following factors:

- It is unlikely that more than 80% of births even from practices in the main catchment area would take place at HGH as some mothers would choose an MLU or would need to give birth in the specialist centre. Therefore where the proportion of births at the HGH was over 70% this was not increased.
- For other areas the size of the potential shift was estimated based on proximity to HGH relative to another hospital and baseline flow.

For the revised baseline position the increase in market share for the HGH shifts 428 births from other hospitals (mostly the John Radcliffe Hospital and a few from Warwick Hospital) to the HGH; this would not be deemed to be significant against the overall number of births at these hospitals.

6. Conclusions and next steps

Given the assumptions used the numbers modelled give an upper limit to the numbers of births that may occur at an obstetric unit at the HGH. We are working with the County Council to review these predictions against their modelling that takes into account new housing, age breakdown and fertility rates.

The number of births in a unit is one factor that contributes to the ability to have a sustainable and safe staffing model. The options identified to be taken forward into the option appraisal include a variety of different staffing models and we are also linking with the Royal College of Obstetricians and Gynaecologists and collecting information from other small units around the country to see if there are other potential staffing models.

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14.02.19