

# **Health Education England – Large Speciality Programme, simulation of new commissions for Obstetrics and Gynaecology Trainees**

**Briefing paper – March 2016**

**DRAFT 1 (15<sup>th</sup> Mar 2016)**



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## Executive summary

This report provides intelligence to inform the commissioning decisions for Obstetrics and Gynaecology (O&G) based on the latest data and judgements by experts in this specialty area. This work will inform proposals for 2017 education commissioning and the relevant geographical breakdown of the national picture.

The modelling is the product of work with LETBs in the Workforce Modelling Collaborative with Wessex as the lead LETB. As such the model structure and assumptions have been through several rounds of constructive challenge and validation by local planners and clinicians. The current set of assumptions and model logic are set out in this report and are based on the latest HEE national and local assumptions and intelligence. The model assumptions also reflect the informed opinion of those with whom we have engaged (see Appendix). The modelling approach has followed WSP's 'best practice' in the use of System Dynamics modelling, attested in a range of settings over many years<sup>1</sup>.

The model underpinning this work represents a 'shell' into which each LETB's data assumptions have been imported. The product at an all-England level is therefore the sum of 11 different models. Each local model will be made available to the respective LETB, as well as access to all 11 models (London LETBs are covered by a single model) for benchmarking and aggregation purposes. This makes for effective collaboration across England in achieving a single overarching goal whilst respecting local difference now and in the future.

The model scope is described in detail in the report. The model pathway starts at ST1 training taking into account factors such as the age and gender, which in turn impacts on the length of training and subsequent migration into the workforce. Evidence on delays, migration and loss between training and taking up post as a consultant is used to inform availability and movement into the consultant workforce, which is in turn distinguished by broad age-band and gender. The latter impacts on participation rates and therefore overall capacity within the workforce.

The modelling tool provides an environment in which different scenarios and sensitivities can be tested. The broad conclusion of this report should not therefore be taken as definitive because the changing environment will alter assumptions and therefore outcomes, but rather provides a current and coherent picture of demand and supply which can be modified to suit latest conditions and planned initiatives. The key factors in the modelling and future view are:

1. The parameters that are used to assess future demand based on population projections of the female population.
2. The impact of 7 day working.
3. Recognising that the adjustments to the training pipeline can cause downstream effects within the workforce and that there may be a need for fine tuning in the local context to optimise the workforce plan.

The overall conclusion based on the assumptions outlined is that current and recent ST1 recruitment is higher than that required to meet medium term demand and that reduced commissioning is appropriate. This conclusion would be mitigated by use of the short term demand requirements as set out in the HEE demand exercise in 2015, and by the way that 7 day working is resourced, but not eliminated. This conclusion is compatible with the recent CfWI report for O&G. In the next 5 years NW, SW, and Wessex, and for a shorter period London, are LETBs which may be particularly vulnerable to oversupply in this respect on the current analysis subject to variation in migration and other key assumptions.

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<sup>1</sup> See <http://www.thewholesystem.co.uk/wp-content/uploads/2014/10/SD-good-practice-WSP.pdf>

# 1 Introduction

## 1.1 Background

Development of a run-through model for O&G was carried out between Oct 2014 and Feb 2015 with Wessex as lead LETB. The original work was carried out using the normal process of:

- Initial engagement with planners and clinicians to establish key parameters
- Extraction and Validation of data
- Building of relevant model
- Testing model process and output
- Signing off the work as fit for purpose.

Participants in the development were Jo Mountfield (Head of School), Simon Plint (Postgraduate Dean Medical and Dental HEW), Paul Newell, Debbie Hilder and Jackie Lamb (Wessex), Amy Day (Wessex Deanery) and John Deagle (WSP). The work was reviewed in September 2015 as part of HEE's Large Specialty Programme to ensure that the tool remained 'fit for purpose'.

A national data gathering exercise was initiated through HEE, with input and review by LETBs. This data was used to populate the revised model, which provides an environment within which decisions about commissioning trainee numbers can be explored. A Learning event workshop took place on 1 Feb 2016 which will inform proposals being made by HEE for trainee commissions from 2017 forward.

The recent history for the O&G Consultant workforce is that it has grown substantially since 1997 (Figure 1), being close to that of all consultants, and higher than other medical and dental. The wider O&G workforce in total has also grown in excess of 50% over the same period.

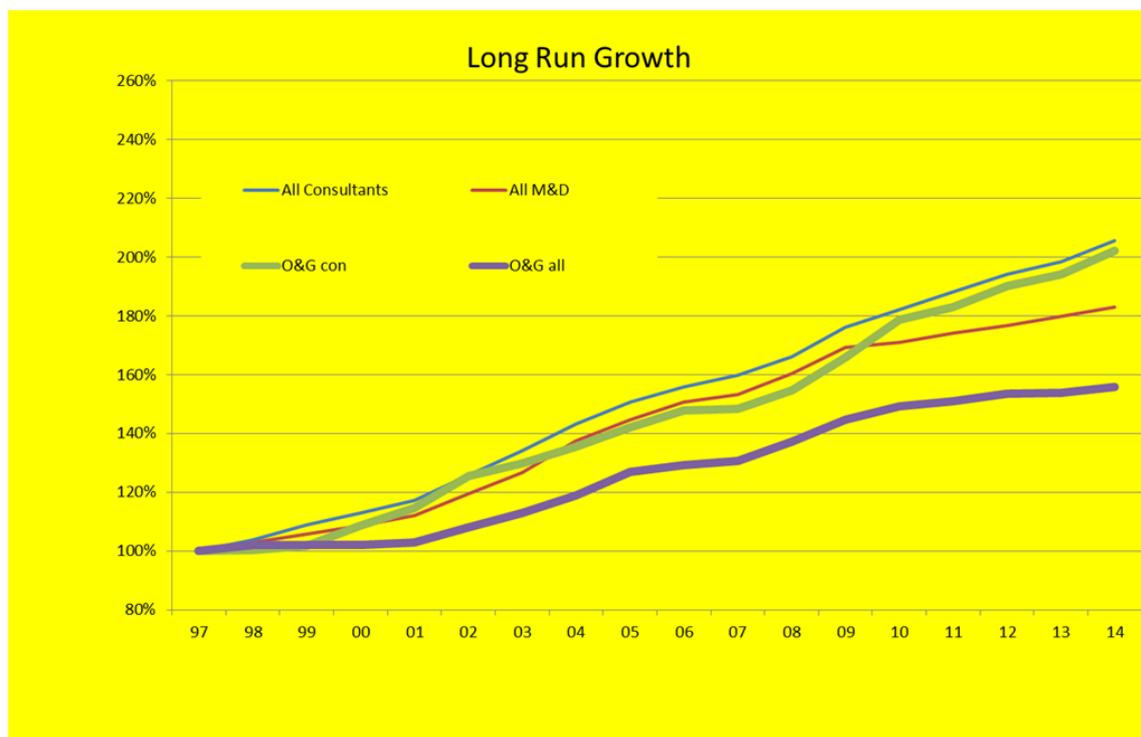


Figure 1 Long run growth O&G consultants and staff vs all consultants and all M&D

## 1.2 Model purpose

The purpose of the model is to answer the question: At what rate should we train O&G consultants to provide sufficient supply in the LETB over the next 20 years in the light of:

- Changing demographics including a shift toward more part time working as the gender balance changes;
- Ongoing development of networks and policy changes;
- Training capacity and any changes in retirement rates and other supply levers;
- Service contribution from those in training?

The modelling tool is able to answer this question at a national level as well as providing insights about local recruitment numbers.

## 1.3 Modelling approach

The approach adopted in developing a modelling tool that is 'fit for purpose' for both the issue and the context within which it has been developed has followed the 'good practice' guide published by the Whole Systems Partnership<sup>2</sup>. This has built on over 20 years of experience in using these tools. Using system dynamics modelling supports the development of understanding and decision support in a number of ways:

- It looks at flows through the system enabling identification of key drivers/components of the system;
- By being focused on the question to be answered, it enables boundaries to be drawn, and prevents drift into non critical topics;
- It encourages clinical and data expert engagement, and the owning of models by those making the decisions;
- Through examination of 'what if' questions, practical and political constraints can be used to override model parameters, thereby enabling the full range of determining factors to be taken into account;
- Using a consistent modelling approach across local areas enables efficient calibration and benchmarking for enhanced understanding of regional variations.

The analysis, model development and testing are all embedded in an iterative engagement process that ensures clarity, transparency and ownership of the end product. The current version of the model has been developed as part of HEE's Large Specialty Programme, building on the previous work for the Workforce Modelling Collaborative, and has involved data gathering at a national level with local validation, plus presentation and discussion at a national 'sharing and learning event' in February 2016 including planners, education commissioners and clinicians.

## 2 Model assumptions

### 2.1 Introduction

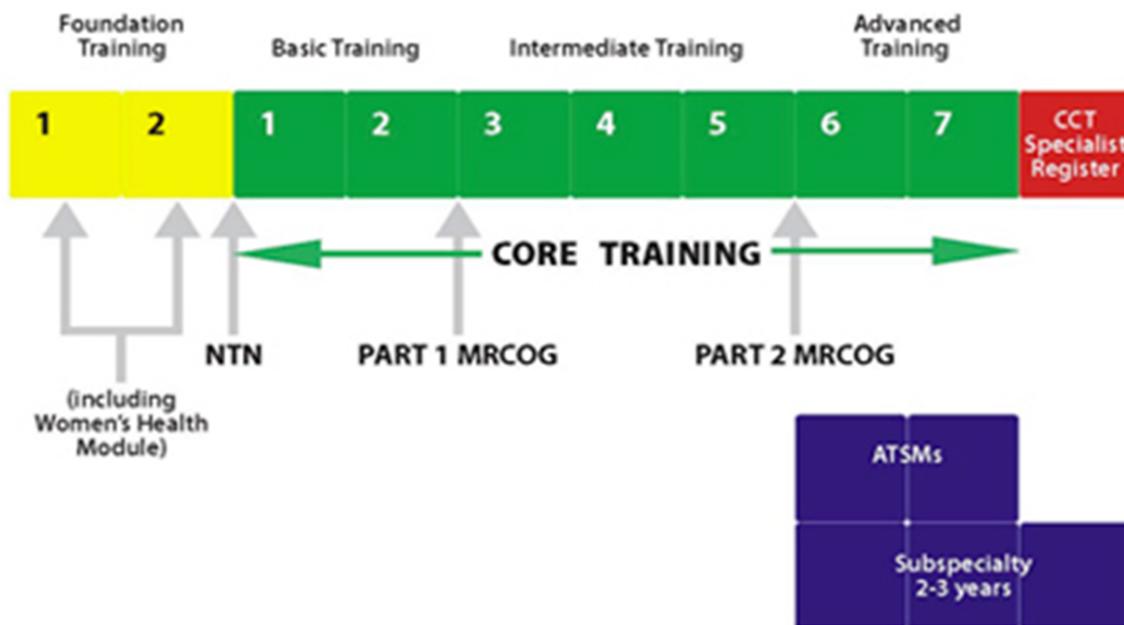
This section sets out the assumptions used to initialise the model for each LETB. The modelling tool has been built as a 'shell' into which each area's data can be input and simulated independently. In addition, the aggregation of the outputs from these models at an all-England level is facilitated through the use of an online tool. National assumptions can be used to provide an envelope within which local assumptions are made. This ensures a national steer that reflects policy commitments and resource considerations. National and local planners have access to both their own off-line versions of the model and also to the on line benchmarking tool.

The model works on the basis of dynamic feedback at each time step, for example by capturing the wte of consultant radiologists expected to retire and factoring that in to the number of new trainees required. However, due to time delays, in this case between trainee starts and taking up a full time post, the model interface provides an opportunity for the user to over-ride and anticipate these changes in ways that are not possible for the model on its own. Because of the number of variables in play at the same time the user interface provides an invaluable learning environment with regard to the impact and sensitivity of different assumptions and any unintended consequences arising from the decisions made.

## 2.2 O&G Trainees and the training pathway

The model is initialised with the number of people in training by year of training and gender. This split was felt to be the most appropriate level of differentiation that would have impact on the outcomes of the model.

Figure 2 shows a simple representation of the model structure.

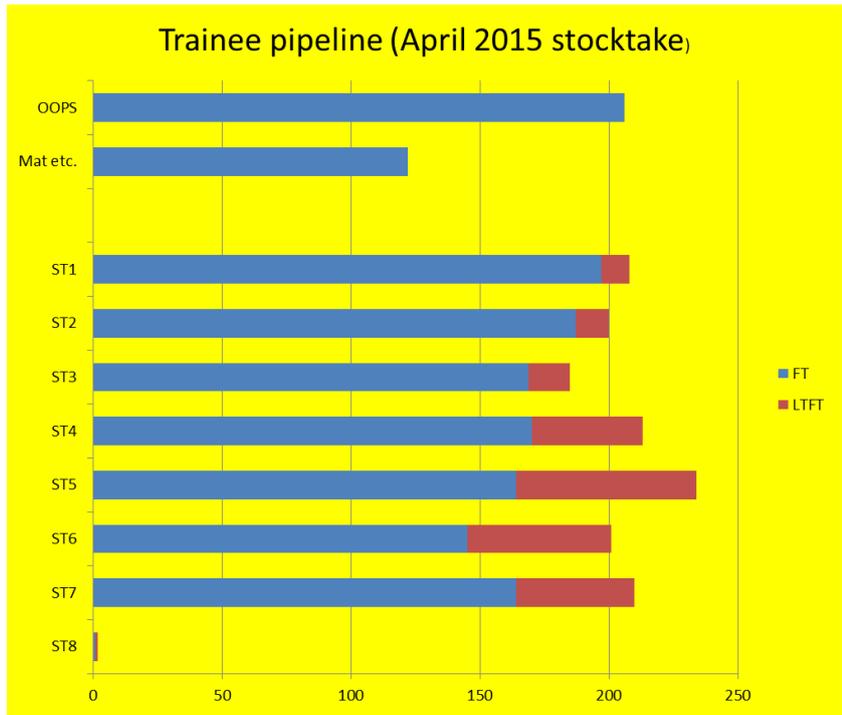


**Figure 2 The simplified training and adoption pathways**

Although the model doesn't cover foundation years there is a fill rate which represents recent experience and future assumptions of success at achieving planned commissions. Subspecialty training is incorporated into the model as a factor affecting the elapsed length of training.

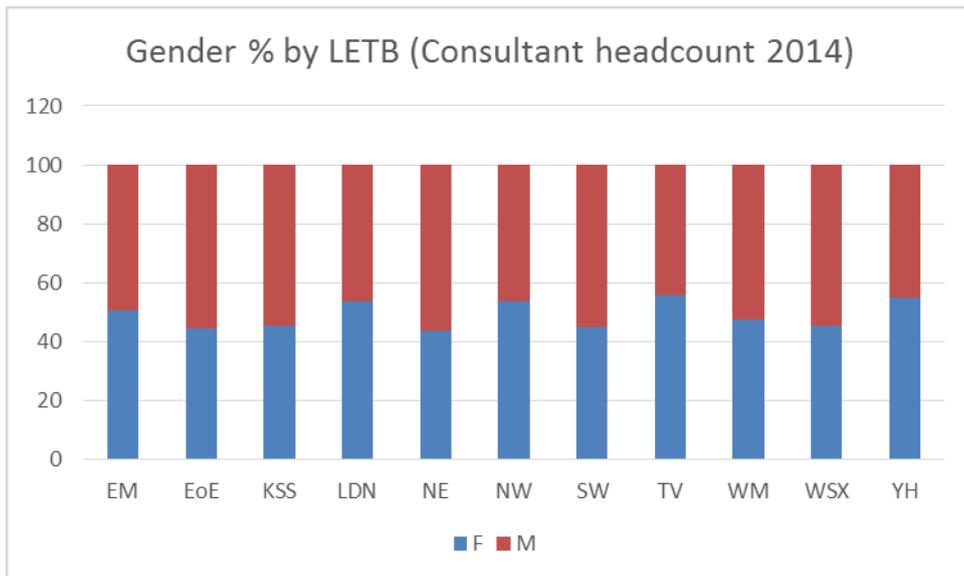
## 2.3 Baseline data

At the September 2015 stocktake there were 1,917 O&G trainees (including 315 OOP and Maternity) and 2,030wte O&G consultants working in England (with an average participation rate of 96.8%). New commissions in the last two years were just over 200 (207, 205) with fill rates virtually 100%.



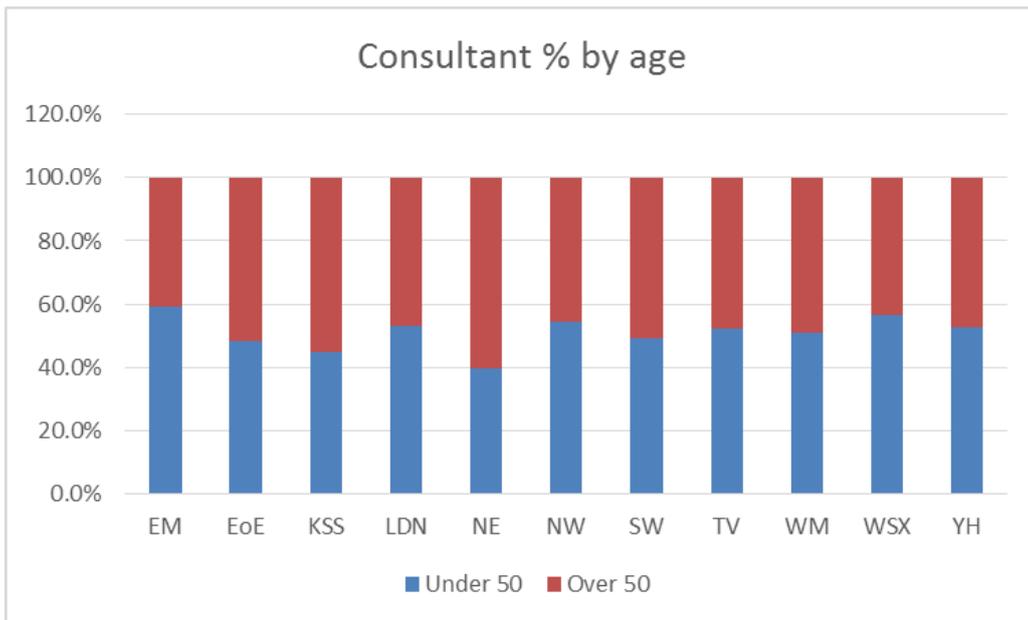
**Figure 3 Snap-shot of trainee numbers from HEE 2015 trainee census**

This chart demonstrates that even allowing for attrition there is a reasonable consistent spread of trainees over the years. There is a relatively high level of OOP and Maternity absence from the training programme which adds to the gap between training start and completion.



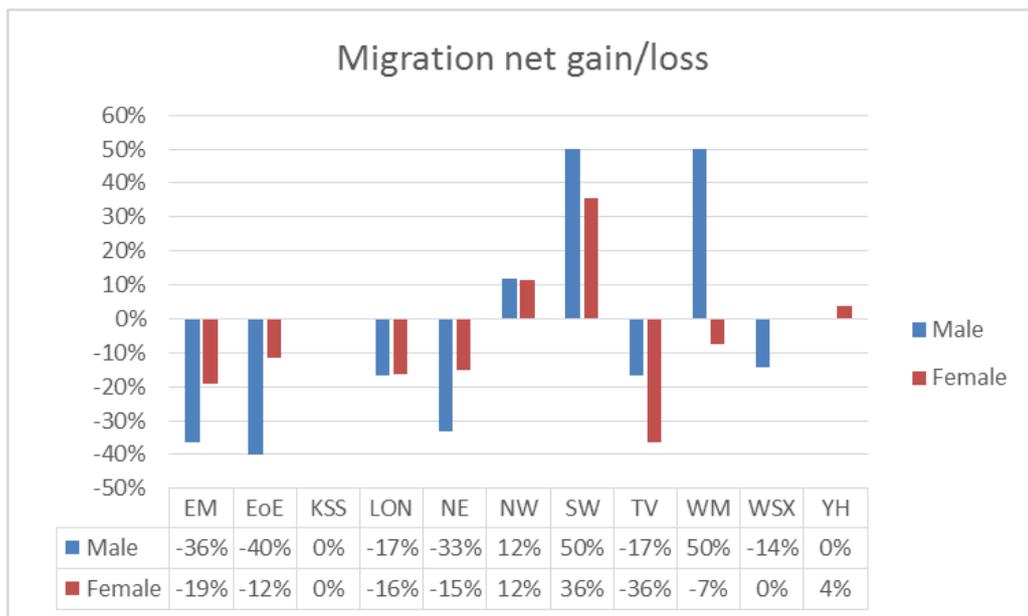
**Figure 4 % gender mix consultants - HEE data ratified by LETBs**

Fig 4 shows a close to 50:50 current balance of male:female which will be progressively changed by the higher female presence in training numbers. The LETB variation in female proportion varies from 43% in NE to 55% in Thames Valley



**Figure 5 Age mix - consultants – HEE data ratified by LETBs**

There are equal numbers of over 50 and under 50s in the current consultant workforce with EM relatively young (60% under 50) and NE (60% over 50) relatively old.



**Figure 6 Migration between training and taking up a consultant post by LETB**

In terms of migration between the point of completion of training and taking up a post the analysis indicated significant gainers and losers among the LETBs. SW and WM show significant gains and to lesser extent NW.

## 2.4 Model parameters – training

The following assumptions have a significant impact on understanding the future need for trainee starts:

- 80% of those entering training are female which over time will change the balance for consultants and impact on overall participation levels.
- Attrition during training amounts to 8% per annum across the training years.
- Over 10% of trainees are Out of Programme (OOP inc maternity) at any one point and on average will be out of programme for 16 months.

Other factors considered to be of secondary impact on the key question of numbers to recruit into O&G training were

- Inter Deanery Transfer IDTs;
- Independent Activity;
- Sexual and Reproductive Health – now separate specialty;
- Shift to the Community;
- Immigration requirements may impact on O&G trainees;
- Adjustable caps have been applied to represent capacity and viability constraints.

These factors may become more significant when other questions are being addressed but are not factored into the existing model.

## 2.5 O&G consultant supply - Key clinician input

Assumptions material to the O&G consultant workforce sector of the model are:

- Participation overall is 96.8%;
- There are minimal or no career breaks;
- The average age of retirement was calculated as 60 for men and 57 for women.

## 2.6 O&G demand - Key factors from clinician input

During the model development process the following demand side considerations were highlighted:

- Service Configuration changes planned (Large and Small Units, Hospital and Community);
- The impact of 7 day working;
- Demography – Population and Birth rates linked to the balance of Obstetric work and Gynaecology work. The birth:age profile is shifting;
- New national demand data is available from the recent HEE exercise;
- Changes in complexity, and contributory factors (eg obesity).

Whilst this model is focussed on supply side a decision was made to factor in demographics and allows assumptions to be made for the potential impact of 7-day working as key to understanding this supply side. Other considerations would need further detailed work outside the scope of this model.

## 2.7 Modelling changes incorporated following review for LSP, and Learning Event discussion

An initial prototype model was developed based on experience from earlier Workforce Modelling Collaborative work. This was then discussed through the model local engagement process and at a national learning event. The learning from this engagement led to the following model refinements:

- The training pathway would be modelled as individual years;
- The model would be able to account for fill rates that are lower than 100%;
- NCCG rationale/skill mix – the base model would reflect the same growth factors as for consultants;
- Birth rates and weighted capitacion could also be used as a yardstick (see later). There is a need to better define O&G demand drivers – something that could form part of future work in this area;
- The demand driver within each model enables an assessment of variation between LETBs, but a consistent approach is needed especially for 7 day working. Collaboration with RCOG would provide a potential route forward.

## 3 Model outputs

### 3.1 O&G demand

Various options are available as drivers for future demand (birth rates, female population 15-54, overall female population) Efficiency improvement and skill mix changes may also change the relationship between activity and consultant demand. This requires further work but the model at this point pragmatically uses 50% of the total female population demographic growth which equates to an 8% increase over a 20 year period.

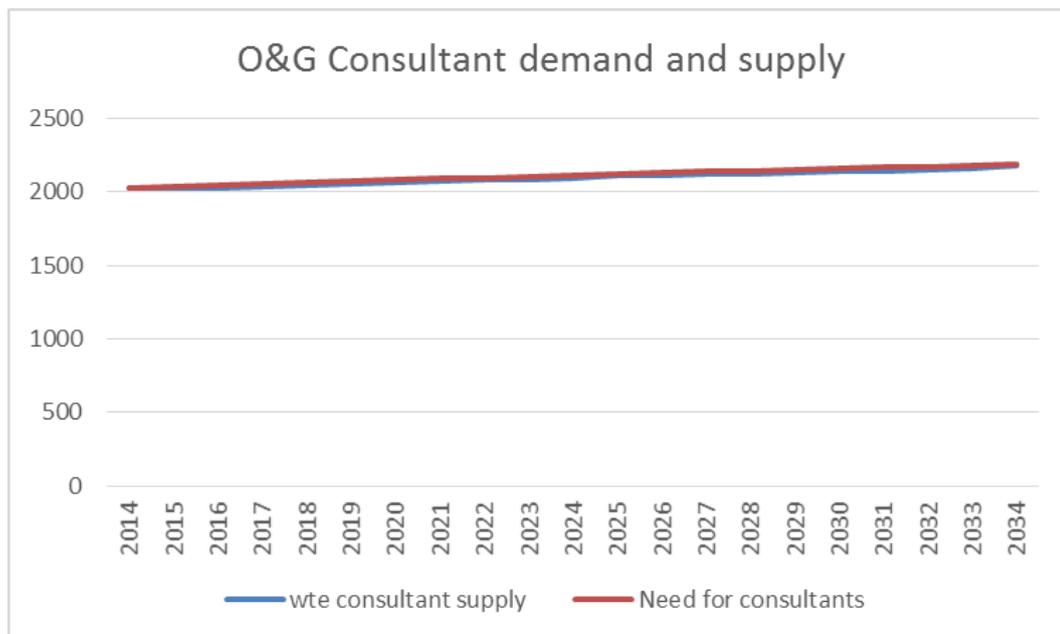


Figure 7 O&G consultant demand and supply

### 3.2 O&G Supply

O&G supply follows the demand pattern by calculating the commissioning starts required to best match demand, allowing for the other assumption areas included in the model. There is also an inevitable delay between starting and completing training, as illustrated in Figure 8. The early years of the model output shown below suggest that there has, in recent years, been a significant rise in new trainees that are ‘working their way through’ the system. Despite the suggested reduction in new trainee starts and the assumptions about attrition from training Figure 7 indicates that future demand for O&G consultants will be met under this scenario. Figure 9 also suggests that the % of consultants who are female in this specialty will rise from c.50% to c.70% over the next 20 years.

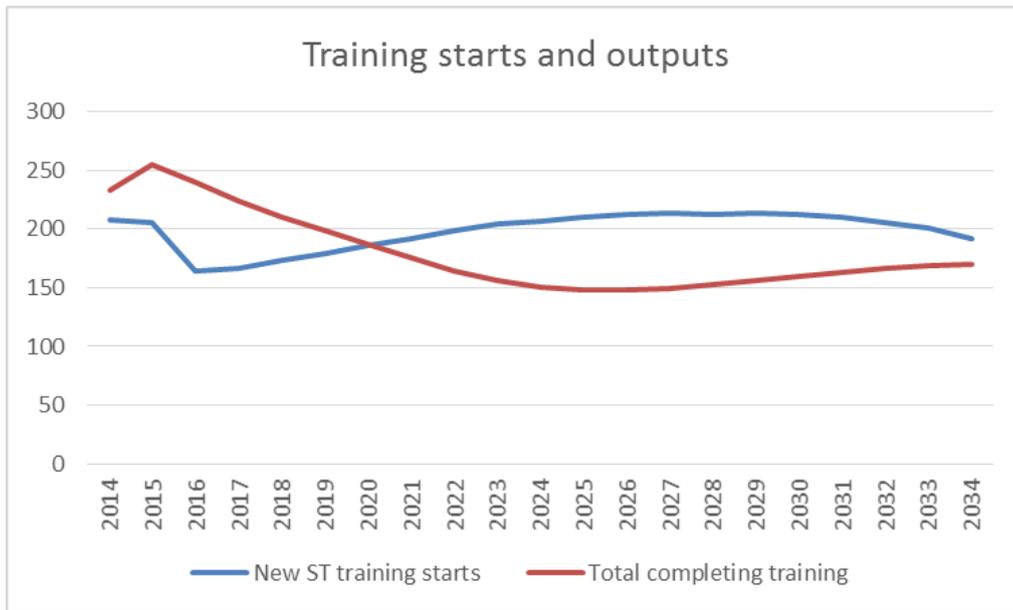


Figure 8 ST1 starts and training completions consistent with projected demand

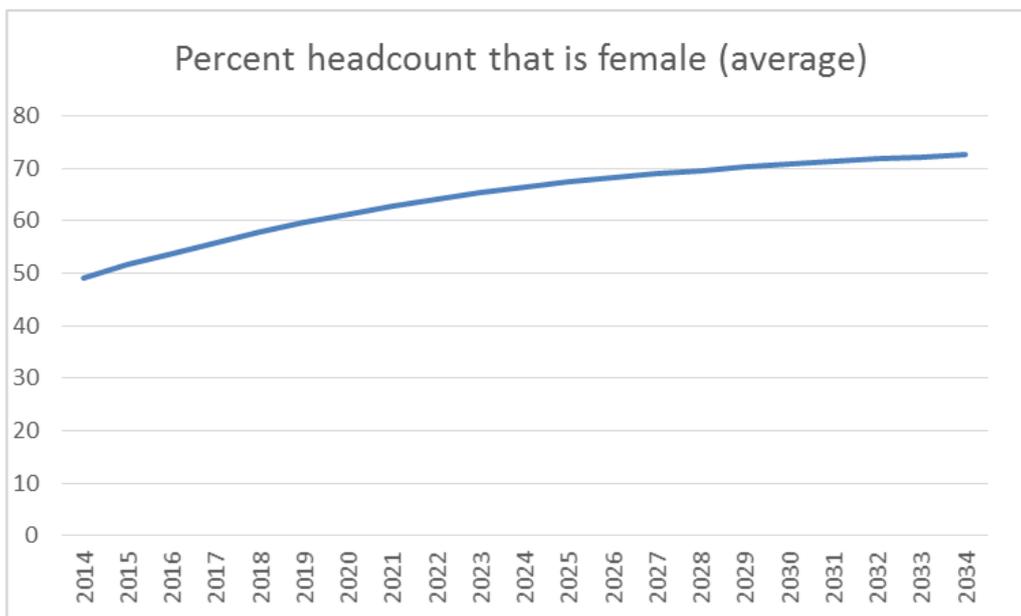


Figure 9 – female % of consultants

### 3.3 Implications and next steps

Under the stated assumptions in the model there is a potential for short term oversupply at the current rate of ST1 commissioning. This potential oversupply could be reduced by adoption of shorter term demand requirements as set out in the HEE demand exercise in 2015, and by the way that 7 day working is resourced. Over the longer term a level of c.200 new ST1 starts broadly supports a gradually growing population once the short term demands have been met.

Initial briefing of HEE staff will be followed by setting up the models for access by the HEE central team on the Collaborative Simulation Platform (CSP). The model will then contribute to the developing of the HEE proposal for O&G overall education commissioning from 2017 onwards and the relevant LETB allocation.

In terms of developing the model for the future, some additional work will be needed in the future covering

- A coordinated approach to the planning for an application of 7 day working;
- Refining the driver information;
- Evidence of the pace of employment of new CCT holders.

## Appendix 1: Key Engagement events/contacts

Dates	Attendees	Content
Feb 2015	Wessex LETB signs off model	Model development
Sept 2015	Wessex clinicians review O&G model and assumptions	Basis for refined model
16 Nov	HEE generated data produced for O&G	Data production
3 Dec 2015	LETBs ratify data	Data validation
1 Feb 2016	HEE Large Speciality Programme Learning event including clinicians	Review of model and assumptions
26 Feb 2016	Model pasover session with HEE	Training in use of model
March 2016	Summary report produced	Final report