

# Calculating paediatric consultant supply and demand for the UK

## 1 Introduction

Modelling the demand for paediatric consultants in the UK is a complex and possibly contentious activity. Many “what if” scenarios can be introduced to the modelling process, with various options for the configuration of future services and developments of alternative workforces. However, the purpose of setting a demand level is not only to set specific targets for staffing, but to show the extent of workforce shortages given no change in the way services are currently organised or the way the workforce is deployed. If we are aware of certain planned changes, e.g. a reduction in the number of NICUs, such changes can be brought into our calculations.

For the current exercise, we have based our modelling on these assumptions:

- Service structure remains as it was in 2017-2018 in terms of the number of inpatient units, neonatal units, PICUs, number of CCH services.
- The number of SAS doctors will not increase significantly.
- The number of GP trainees, nurses and other workforce groups who can work on rotas will not grow under current workforce policies operated by governments in the four UK nations.

Of course, all modelling results in an estimate and amending factors and assumptions in the modelling only slightly, can change the outcome figures considerably. RCPCH is happy to work with College members and other interested parties to continue to refine our modelling.

Setting a consultant target is useful in making service and workforce planners aware of the scale of the problems and to stimulate discussion about how best the problem can be resolved i.e. are there other solutions which can help with the workforce problem?

## 2 Overview of demand calculation

The methodology we have used estimates demand for consultants in five different areas of paediatrics: general, neonatal, intensive care, community child health and other paediatric specialties, and aggregates the result to reach an overall total consultant demand figure.

The calculations result in a demand figure in terms of WTE (whole time equivalent) and recognises that some consultant roles will cover different branches of paediatrics, especially general and community child health.

### 3 The calculations

#### 3.1 Acute (general consultants)

##### Step 1

For each hospital seeing paediatric inpatient units, RCPCH obtained the latest figures (generally covering the year 2016/2017) for the number of paediatric emergency admissions from relevant bodies in each of the four UK nations.

For each unit, we used the number of admissions to classify the size of a hospital in terms of workload. We then equated the “unit size” with an estimate of the number of consultant-led general paediatric outpatient clinics required each week. This is illustrated in Table 1 below, which also shows the number of units in the UK which fall into each size category.

*Table 1: Unit size according to number of admissions and outpatient clinics. Final column indicates the number of paediatric inpatient units in the UK in each size category.*

<b>Paediatric Emergency admissions</b>	<b>“Unit size”</b>	<b>General paediatric outpatient clinics per week</b>	<b>Number of units in 2017 (UK)<sup>1</sup></b>
Less than 1500	Very small	10	5
1500 to 2499	Small	15	30
2500 to 4999	Medium	20	84
5000 to 5999	Large	25	26
6000+	Very large	25	42

##### Step 2

A calculation was undertaken using a model in Excel<sup>2</sup> to find the number of WTE consultants required for each unit size. Several assumptions have been made in this calculation:

- Prospective Cover is 20% i.e. a consultant is on leave, study leave etc. for one-fifth of a year and this time needs to be covered by other consultants.

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<sup>1</sup> Total number of units do not correspond to the census report, as 2 units included in the census described as seeing inpatients see specialist patients not general paediatric patients

<sup>2</sup> This model will be further refined and added to census resources in the next update, enabling users to adjust many of the assumptions below to reflect local circumstances.

- A consultant is present and readily available in the hospital for a minimum of 12 hours a day, seven days a week in line with standard one of RCPCH's Facing the Future Standards.<sup>[1]</sup>
- Outpatient clinics take one PA (four hours) plus one hour for administration. This assumes good clerical/administrative support is available to consultants.
- One hour allowed for handovers
- Ward rounds will be undertaken by the consultant present in the hospital.
- All consultants contribute equally to the resident and on-call rota
- On-call time is calculated at 25%, e.g. for a 12 hour on call shift at night the consultant will be paid for three hours (one PA). There is limited evidence for this, but given rising admissions and junior doctor shortages, RCPCH believe this is a reasonable assumption.

Table 2 below shows the outcomes of this modelling for each size of unit. Additionally, it shows the differing whole time equivalent requirements for different values of the average number of PAs for Supporting Professional Activities (SPAs). These vary across the UK, but in our overall calculations we have used 2.5 SPAs, to reflect BMA recommendations.

*Table 2: Consultant WTE required by unit size and number of SPAs*

	<b>Number of SPAs</b>				
<b>Unit size</b>	<b>1</b>	<b>1.5</b>	<b>2</b>	<b>2.5</b>	<b>3</b>
Very small (10 clinics)	6.6	7.0	7.4	7.9	8.5
Small (15 clinics)	7.5	7.9	8.4	8.9	9.6
Medium (20 Clinics)	8.3	8.8	9.4	10	10.7
Large (25 clinics)	9.2	9.7	10.3	11	11.8
Very large (25 clinics)	14.0	14.9	15.8	16.8	18.0

### **Step 3**

The number of units in the final column of Table 1 were then multiplied with the appropriate cell in Table 2 to establish the number of whole time general paediatric consultants required, resulting in a demand figure of 2138.1 WTE compared to the census estimate of 1723.7 WTE.

### **3.2 Neonatal Intensive Care**

The British Association of Perinatal Medicine (BAPM) Service standards for hospitals providing neonatal care<sup>[2]</sup> recommend that for each Neonatal Intensive Care Unit (NICU) there should be “a minimum of 7 consultants on the on-call rota with resident consultants on the tier 2 rota additional to this number. All tier 3 consultants should be identified neonatal specialists.”

We have interpreted this as a minimum of 8 WTE neonatal specialists are required for each NICU.

The BAPM standards further state that for *larger* Neonatal Intensive Care Units, “special consideration should be given to the number of staff required at each tier throughout the 24 hours ... with increasing size ... essentially the whole of the staffing structure ... should be doubled”.

We estimate there are currently 59 NICUs in the UK, a minimum 12 of which could be considered “larger” by having 6000 plus births per year.

A simple calculation therefore gives us  $(59 \times 8) + (12 \times 8) = 568$  WTE specialist neonatal consultants required. 2017 census = 500.5 WTE neonatal consultants.

### **3.3 Community Paediatrics**

In the RCPCH and BACCH publication *Covering all Bases (2017)*<sup>[3]</sup> we developed a workforce calculator which used average referral/appointment data alongside waiting times and arrived at a population based demand of 1578 WTE community paediatricians required.

This demand figure of 1578 WTE consists of both consultants and SAS doctors. Using the ratio of total community consultant WTE/total community SAS doctor WTE recorded in the RCPCH Census for 2017, we estimate the demand for community child health consultants is 1028.17 WTE.

### **3.4 Paediatric Intensive Care**

Information collected from the Census reports 29 Paediatric Intensive Care Units across the UK. The Paediatric Intensive Care Society advocates a minimum 7 consultants per unit. We are therefore estimating  $29 \times 7 = 203$  WTE consultants to cover existing paediatric intensive care demand.

### **3.5 Other specialties**

The growth required for NICU and PICU consultants from existing staffing levels is 12.6%. Detailed workforce standards and requirements are not readily available for other subspecialties. Therefore, we have applied the same growth rate to existing staffing levels for all the remaining subspecialties and arrived at a demand of 915 WTE consultants, see Table 3.

*Table 3: Aggregate WTE demand for consultants.*

<b>Specialty</b>	<b>Estimated requirement WTE</b>
General paediatrics	2138.1
Neonatal Intensive Care	568
Community Paediatrics	1028.17
Paediatric Intensive Care	203.0
Other specialties	915
<b>Total Demand</b>	<b>4852.27</b>
<b>Census 2017 total</b>	<b>3997.07</b>
<b>Current consultant shortfall</b>	<b>855.8</b>

#### **4 Calculating supply of paediatric specialty trainees**

Traditionally, modelling supply of doctors would be based on the objective of meeting future consultant demand. However, we know that the bulk of paediatric trainees' time is taken up with the provision of vitally important service, and junior doctor workforce shortages are potentially damaging to both the well-being of doctors and the safe care of children. Therefore, our modelling is focussed on the supply of trainees to ensure that paediatric and neonatal rotas meet standards and provide good quality training and education, alongside better care.

The supply modelling must reflect the demand for service, not just the demand for a consultant trained workforce. It is better for the health of CYP to have well-staffed junior rotas and a potential oversupply of consultants than potentially dangerous rotas and a "just about" right supply of consultants. Indeed, findings from the RCPCH study of new CCT holders is beginning to show that the current supply pipeline is generating less competition for consultant roles<sup>[4]</sup>.

**Step 1 - Establish staffing needed on tier 1 (junior) rotas.**

The RCPCH established that there were approximately 260 general and neonatal rotas and that 48 rotas were double rotas, i.e. 2 doctors on the on-call rota at the same time due to workload volume. The RCPCH Facing the Future standard<sup>[5]</sup> is that there should be 10 WTE staff on each rota. Therefore, WTE staff required = 3080 i.e. (260+48) X 10.

**Step 2 - Establish the number of trainees needed for tier 1 rotas.**

The number of non-paediatric trainees on tier 1 rotas, weighted to account for where rota breakdown information was not received (not available) is 1699.05 WTE. The RCPCH does not believe this figure is likely to increase dramatically, because of the following reasons:

- 1) The flow of Foundation Year (FY) doctors moving into subspecialty training is decreasing.
- 2) There is no increase in numbers of GP trainees taking up paediatric placements.
- 3) There is no increase in numbers of Advanced Nurse Practitioners (ANPs) and Advanced Neonatal Nurse Practitioners (ANNPs) working in paediatrics.
- 4) SAS doctor numbers are static or falling.

Therefore, the balance needs to be provided by 1380.94 WTE paediatric ST1-3 trainees.

**Step 3 - Calculate how many trainee places required at ST1.**

- 1) RCPCH training data show that 9% of trainees are Out of Programme (OOP) at any one time. This increases the requirement from 1380.94 to 1505.23 WTE.
- 2) Allow for 25% of trainees working LTFT at 0.5 WTE increases requirement to 1720.26.
- 3) By incorporating 5% attrition between ST1 and ST2, and between ST2 and ST3, this means that 602.1 WTE accepted training places at ST1 are needed to meet demand.

We propose that this number of places are reviewed in five years which may allow time for nurse, GP and possibly Physician Associate pipelines to be put in place to fill more of these rota positions.

RCPCH Workforce team

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Version 1.0

1. Royal College of Paediatrics and Child Health, *Facing the Future: Standards for Acute General Paediatric Services*. 2015: [https://www.rcpch.ac.uk/sites/default/files/2018-03/facing\\_the\\_future\\_standards\\_for\\_acute\\_general\\_paediatric\\_services.pdf](https://www.rcpch.ac.uk/sites/default/files/2018-03/facing_the_future_standards_for_acute_general_paediatric_services.pdf).
2. British Association of Perinatal Medicine, *Service Standards for Hospitals Providing Neonatal Care*. 2010, British Association of Perinatal Medicine: <https://www.bapm.org/resources/service-standards-hospitals-providing-neonatal-care-3rd-edition-2010>.
3. Royal College of Paediatrics and Child Health and British Association for Community Child Health, *Covering all bases - Community Child Health: A paediatric workforce guide*. 2017: <https://www.rcpch.ac.uk/resources/covering-all-bases-community-child-health-paediatric-workforce-guide>.
4. Royal College of Paediatrics and Child Health, *CCT and CESR Class of 2016: Where are they now?* 2018: <https://www.rcpch.ac.uk/resources/cct-cesr-follow-cohort-study>.
5. Royal College of Paediatrics and Child Health, *Facing the Future: Standards for Paediatric Services*. 2010.