South Yorkshire and Bassetlaw Integrated Care System

Hospital Services Programme

Strategic Outline Case

Annex E: Addendum to HSR Financial Modelling

Changes to the financial analysis in the HSR

Changes to figures in the financial analysis: technical annex

In the last few days before publication of the Hospital Services Review, some Trusts provided the Review team with updated activity data. This supplemented the Reference Cost data which the Review team had used during the analysis as it was the most consistent source of publicly available data.

Owing to time constraints, the new activity data was used to inform the workforce analysis, but could not be used to update the financial and capacity analysis.

For purposes of consistency the financial and capacity analysis was updated following publication to incorporate the new data. The revised activity data, and the changes to the numbers that this contributed to, are summarised in the following 2 slides.

The changes were marginal and did not alter the recommendations of the Review.

Slides 6 onwards lay out an updated version of the Technical Annex including the revised activity data for all areas.

Activity summary

Clarification of changes

The table below shows the

- **Activity values, based on reference costs, that were used throughout the HSR analysis** and which inform the finance and capacity modelling published in the HSR Final Report (blue columns)
- **Revised activity values** (green columns) that were supplied by three trusts shortly before publication. These were used to inform the workforce analysis in the Final Report, but owing to time constraints were not used to re-model the finance and capacity modelling at that stage.
- The changes can be seen to be marginal in most cases, with the greatest change relating to paediatrics activity at Rotherham hospital.

	Activity figures used in finance/capacity modelling published 9th May	Updated activity figures	Activity figures used in finance/capacity modelling published 9th May	Updated activity figures
	Maternity activity		Care of Acutely Ill Child activity	
BH	**2,949**	**3,012**	**3,134**	**3,217**
DON	3,391	3,391	4,277	4,277
BAS	1,507	1,507	1,493	1,493
MON				
SCH			10,043	10,043
STH	**6,745**	**6,924**		
RH	**2,562**	**2,678**	**2,089**	**3,833**
CRH	2,845	2,845	4,838	4,838
Total	**19,999**	**20,357**	**25,874**	**27,701**

Financial impact

Following publication of the HSR Final Report, the HSR team has, for purposes of consistency, re-run the financial analysis (and the capacity analysis that sits behind it) based on the new activity figures.

The updates have had limited impact. The majority of costs changed by no more than £300,000 from previous estimates, with the greatest impact being an increase of c.£1m in the upper range of certain scenarios. As a result, the changed financial data did not affect on the recommendations put forward by the HSR.

Absolute change from figures published on the 9th of May		UEC	Care of the acutely ill child	Maternity	Gastroenterology and endoscopy
Option 1 (1 site fewer)	Current out-of-hospital plans	£0.1m to £0.1m	£0.1m to £0.1m	£0.1m to £0.7m	£0.0m to £0.0m
	More ambitious out-of-hospital plans	£0.0m to £0.9m	£0.0m to £0.0m	£0.0m to £1.3m	£0.0m to £0.0m
Option 2 (2 sites fewer)	Current out-of-hospital plans	£0.0m to £0.2m	£0.1m to £0.7m	£0.1m to £0.6m	£0.0m to £0.0m
	More ambitious out-of-hospital plans	£0.0m to £0.8m	£0.0m to £1.1m	£0.0m to £1.4m	£0.0m to £0.0m
Option 3 (3 sites fewer)	Current out-of-hospital plans	£0.1m to £0.1m	£0.7m to £0.4m	£0.3m to £0.6m	£0.0m to £0m
	More ambitious out-of-hospital plans	£0.0m to £0.2m	£0.3m to £1.1m	£0.1m to £1.3m	£0.0m to £0.0m

Updated version of the

Technical annex: financial analysis

for the Hospital Services Review

Contents

Executive Summary

Executive Summary (1/5)

Introduction

South Yorkshire, Bassetlaw, and North Derbyshire (SYB(ND)) is facing significant sustainability problems which are laid out in the Hospital Service Review's (HSR) Stage 1A, Stage 1B and Stage 2 reports.

A number of transformational solutions have been proposed by the HSR to tackle workforce challenges, reduce unwarranted clinical variation and solve the problems of tomorrow through innovation. The HSR has not modelled the financial impact of these transformational solutions, in order to avoid the risk of double counting with provider cost improvement programmes (CIPs) and commissioner QIPP schemes.

Despite these solutions, with growing workforce shortages and constrained resources, all five advisory Clinical Working Groups took the view that it is not possible to continue to provide all the services that are currently provided, on all the sites that currently provide them. In some areas, the scale of the challenge is so great that the HSR team do not consider that they can be met by transformation alone (e.g. solely through new workforce models)

A number of reconfiguration scenarios have been modelled that consolidate senior consultant presence and middle grade doctors onto fewer sites in order to increase quality and consistency of care through meeting the Royal College guidelines. Each option has been assessed against the HSR's five evaluation criteria, and this report focusses on the workforce and affordability aspects of this evaluation.

The analysis was undertaken at a high-level, with workforce, activity, capacity and financial modelling targeted at providing greater clarity around the cost and benefits related to the different configuration scenarios. Six scenarios have been modelled, to test the impact of the removing the smallest and largest 1, 2 and 3 sites.

Executive Summary (2/5)

Reconfiguration scenarios

The reconfiguration scenarios we have looked at include the following:
Stroke options were not modelled, in the context of an ongoing challenge to the hyper-acute stroke unit (HASU) business case.

		Option 0 – status quo	Option 1	Option 2	Option 3
	Urgent and emergency care	6 Emergency Departments + 7 MIUs (or equivalent)	5 Emergency Departments + 7 UTC	4 Emergency Departments + 7 UTC	3 Emergency Departments + 7 UTC
Interdependent	**Care of the acutely ill child**	6 IP Units + 3 24/7 SSPAUs + 3 part time SSPAUs	5 IP Units + 5 24/7 SSPAUs + 1 part-time SSPAU	4 IP Units + 4 24/7 SSPAUs + 2 part-time SSPAUs	3 IP Units + 3 24/7 SSPAUs + 3 part-time SSPAUs
Interdependent	**Maternity**	6 CLUs + 2 AMLUs + Home births service	5 CLUs + 5 AMLUs + 1 SMLU + Home births service	4 CLUs + 4 AMLUs + 2 SMLUs + Home births service	3 CLUs + 3 AMLUs + 3 SMLUs + Home births service
	Gastroenterology and endoscopy	5 independent Out-of-Hours (OOH) rota	4 full OOH rotas & formal network arrangements	3 full OOH rotas & formal network arrangements	2 full OOH rotas & formal network arrangements

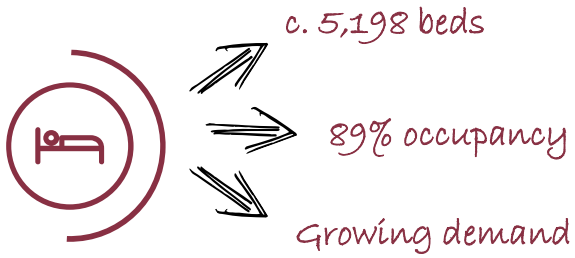
Scenarios definition

- In order to assess the range of potential impacts resulting from the configuration scenarios, site specific scenarios were required (i.e. defined activity shifts from one site to another).
- Given that the analysis is meant to be non-site specific, these site specific scenarios were developed by the HSR using high-level rules based on service size (defined by level of activity).
- While the scenarios used data from actual sites (the smallest and largest units in the system for each service) in order to generate a realistic range of potential impacts, data from these sites are used for illustrative purposes and do not imply that any specific sites are being considered for reconfiguration.

Executive Summary (3/5)

The capacity challenge

There are currently c.5,198 beds in the system with an average bed occupancy rate of 89%. The STP's current assumptions around the impact of out-of-hospital schemes means that additional capacity would be required in five years time to meet growing levels of demand. To avoid this, while achieving an average bed occupancy of 85% and freeing up some space to allow for potential services changes, the HSR has considered the potential impact of more ambitious out-of-hospital schemes.



The workforce challenge

c. £17M

Temporary staffing costs

- For three of the services considered by the HSR – urgent and emergency care, care of the acutely ill child, and maternity – high-level workforce analysis was undertaken to inform the overall cost-benefit assessment.
- Based on the information returned from the trusts, the system has spent c.£17m on temporary staff (including bank and agency) in the previous year, and many trusts are not meeting the suggested staffing levels outlined by Royal College guidelines.
- Expected growth in workforce based on numbers supplied by Health Education England (HEE) will help trusts to reduce reliance on temporary staff and support trusts in bridging the gap with Royal College Guidelines where these are not currently met. However in some cases this is not sufficient to bridge the gap.

Urgent and Emergency Care

A very small investment in ED consultants would be required to meet the Royal College guidelines under the status quo option, although we recognise these are aspirational in nature.

A gap in Middle Grade doctors persists, and would need to be rectified by alternative workforce models.

Care of the acutely ill child

An investment in paediatric consultants would be required to meet the Royal College guidelines under the status quo option.

Converting up to two inpatient sites into Short Stay Paediatric Assessment Units (SSPAUs) would enable SYB(ND) to better meet the consultant requirements. Commissioners may wish to consider changing 24/7 SSPAUs to part-time SSPAUs to further reduce the consultant requirement.

Maternity

Further work is required to understand the direct clinical care PAs in addition to those covering the delivery suite across each DGH. Three scenarios have been considered in this analysis for units between 2500-4000 deliveries per year, depending on the specific specialties covered by the unit. which show that consultant numbers are projected to be sufficient to staff 6 units with lower levels of consultant presence.

Should commissioners wish to move units up to a minimum of 98 hours of consultant presence to reflect the high levels of complex births in SYB(ND)'s population, this could be achieved by converting two obstetric units into Standalone Midwifery Led Units.

An investment in midwives is required in order to meet Royal College guidelines around the ratio of midwives to births.

There are important interdependencies between maternity and paediatrics, and neonatology. Therefore solutions for maternity and paediatrics will need to be considered jointly.

Executive Summary (4/5)

Financial Impacts

- Due to the limited spare capacity estimated to be available in the system in 2021/22, most configuration scenarios would require additional investment to be undertaken. This investment is in the form of capital for additional new build beds or refurbished beds.
- This could be partially offset by assuming a greater impact of out-of-hospital schemes, which would free up capacity at existing sites and reduce the requirement for additional beds.
- When reconfiguration occurs from a small 'donor' site to a 'receiving' site with spare capacity, the overall capacity change and associated capital investment is low.

Urgent and emergency care

Capital costs of replacing an ED with a GP-led UTC can become very large. This is because a significant amount of non elective activity can no longer be treated on the site and has to be moved elsewhere. Removing consultant led services at the ED significantly reduces the services that a site can provide. However, better use of primary care onsite (through the UTCs) and the expected impact of out of hospital schemes can help to prevent unnecessary A&E attendances and admissions.

Small **workforce savings** are possible with the replacement of two small EDs (due to fewer ED doctors being required), however, Commissioners may wish to consider if these are sufficiently large to warrant significant disruption for staff and the public. UTCs on all sites will also reduce the ED workforce requirement, notwithstanding that more GPs would be required.

Care of the acutely ill child

Capital costs depend on the size of the 'donor' site and the spare capacity of the 'receiving' site. For example, if one site is running below 85% bed utilisation, capital costs are lower in scenarios involving transferring activity to this site.

Some capital investment is required across all options and this should be seen in the context of meeting the Royal College guidelines around safer staffing levels. Capital would also need to be found to expand neonatology on the receiving site.

Workforce savings may not be possible given there is a consultant gap currently, however consultant locum usage may be mitigated as the IP units across the system are consolidated. However, Health Education England anticipates a reduction in the number of other medical grades.

Maternity

Capital costs can be significant. At present there is little spare capacity across SYB(ND) in maternity, which creates the requirement to build additional capacity upon reconfiguration.

Greater levels of out-of-hospital shift could create additional capacity, however, this spare capacity would need to be refurbished. In addition, capital would need to be found to expand neonatology on the receiving site, which is expensive.

Capital investment should be seen in the context of achieving greater levels of consultant presence for the high risk births across SYB(ND).

Workforce savings may not be possible given an apparent gap in midwives.

Next Steps

- The analysis was not prepared at business case level at this stage; and does not constitute level of detail that would be required for consultation. As such further refinements and analysis will be needed to inform the final decision on a proposed option for each of the services under consideration.

Executive Summary (5/5)

Recommendations

The below recommendations have been developed through the careful consideration across all the HSR's evaluation criteria (workforce, affordability, access, quality and interdependencies). Based on all these factors, the HSR recommends:

01

Urgent and Emergency Care (Emergency Departments):

- The HSR recommends maintaining all 6 consultant-led EDs with the proposition that these would be the front door to different ranges of services on different sites.
- The sustainability of other medical grades should be supported through new and alternative workforce roles
- Commissioners should note this model needs to be supported by a strong and effective model for Urgent Treatment Centres and out-of-hospital care.

02

Care of the acutely ill child:

- The HSR recommends further site-specific modelling to understand the implications of closing 1 or 2 inpatient paediatric units across SYB(ND), to meet the Royal College guidelines for consultant staffing.
- Commissioners may wish to consider if the shortfall in consultant numbers could be mitigated to some degree by converting full-time SSPAUs into part-time SSPAUs on sites that have an inpatient unit.

03

Maternity:

- The HSR considers that the current range of provision does not meet the aims of patient choice laid out in *Better Births,* nor does it account for the high degree of complex births for the population of SYB(ND).
- The HSR recommends this is not an area where gaps in consultant numbers is driving reconfiguration, however, the HSR heard from clinicians that the pressure in some units of delivering high and medium risk births with only 60 hours of consultant presence was putting significant pressure on staff.
- Commissioners may wish to consider moving to a minimum of 98 hours of consultant presence, which would only become sustainable if 2 obstetric units were to convert to a midwifery-led unit across SYB(ND).
- Further work is required to understand the impact of additional clinical care PAs not relating to the delivery suite across each DGH in SYB(ND). For example, PAs allocated to gynaecology and other non-delivery suite related obstetrics activity.
- There are important interdependencies between maternity, paediatrics, and neonatology. Therefore solutions for maternity and paediatrics will need to be considered jointly. In addition, capacity would need to be found to expand neonatology on the receiving site.

04

Gastroenterology and Endoscopy

- The HSR recommends consolidating services for urgent gastrointestinal bleeds out-of-hours onto a smaller number of sites, with elective endoscopy services maximised on each site where possible.

05

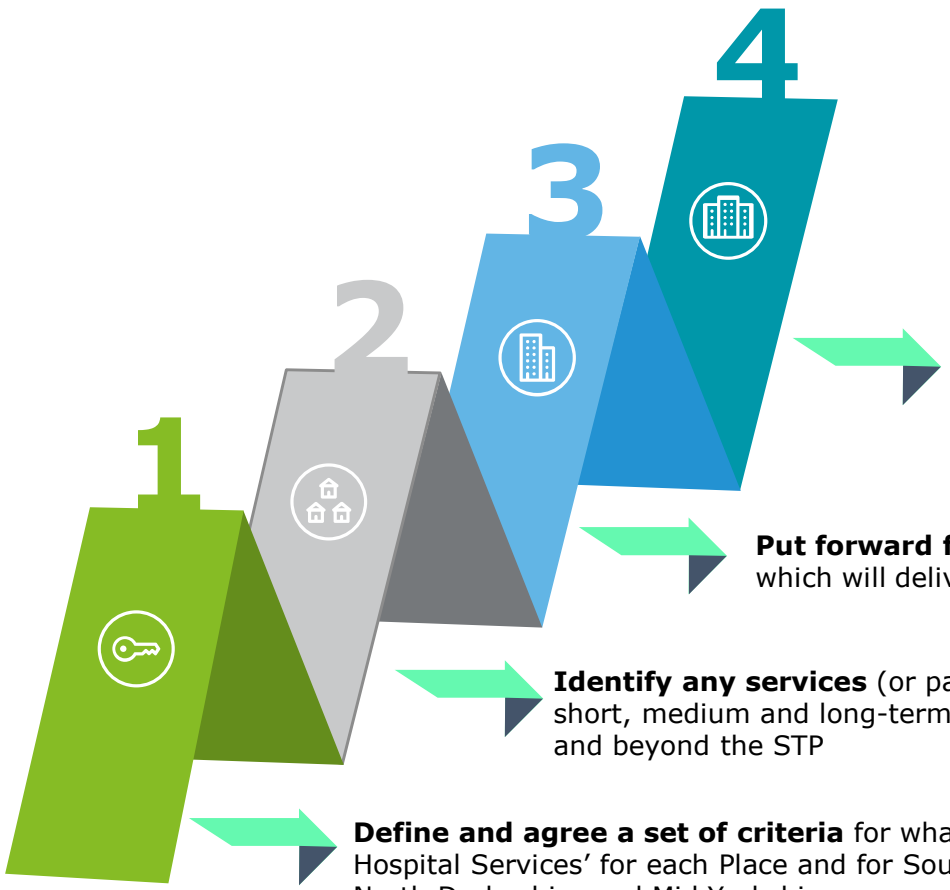
Stroke:

- No reconfiguration options have been proposed; it is believed that services can be made sustainable through shared working.

Introduction

Aims and objectives of the Hospital Services Review

The Hospital Services Review (HSR) has the following aims and objectives.



Define and agree a set of criteria for what constitutes 'Sustainable Hospital Services' for each Place and for South Yorkshire and Bassetlaw, North Derbyshire and Mid Yorkshire

Identify any services (or parts of services) **that are unsustainable**, short, medium and long-term including tertiary services delivered within and beyond the STP

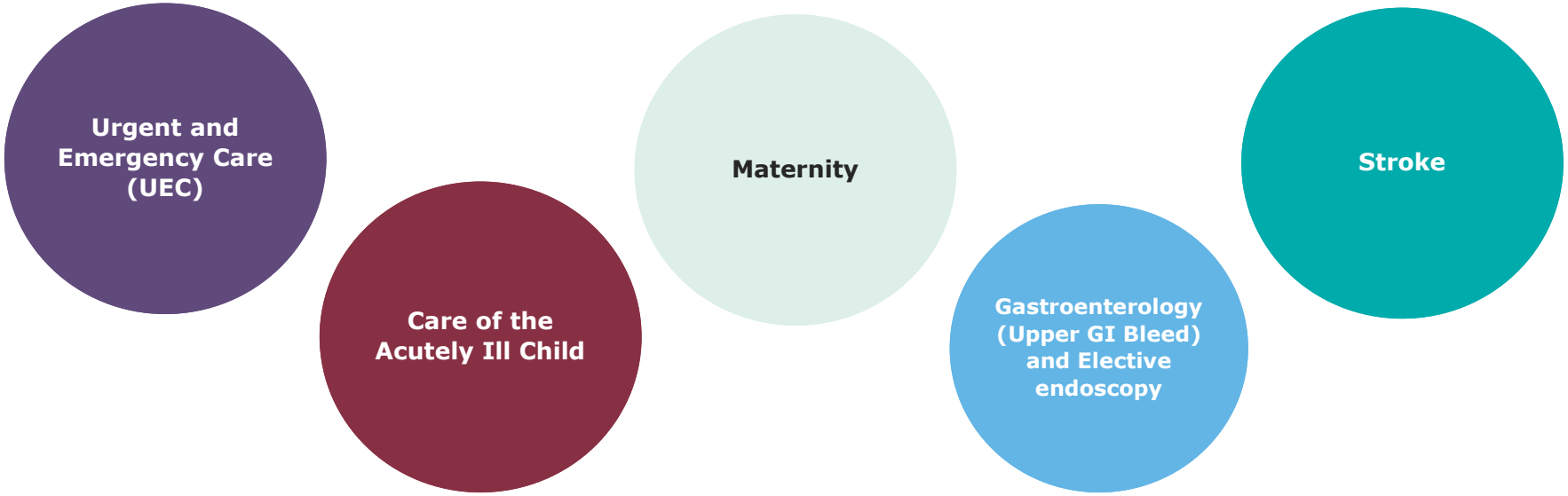
Put forward future service delivery model or models which will deliver sustainable hospital services

Consider what the future role of a District General Hospital is in the context of the aspirations outlined in the South Yorkshire and Bassetlaw Sustainability and Transformation Plan (STP) and emergent models of sustainable service provision

.

Rationale for the final choice of services

The services chosen focus largely on the emergency, 24/7 services. The HSR team anticipate that the review will also consider how elective services might be located across the system in order to support any proposals in these services



The services identified by the HSR are those which:

- **Are facing significant difficulties with workforce and / or quality of care.**
- **Have a significant number of interdependencies:** setting these services on a more sustainable footing will significantly help to improve the service as a whole.
- **Have a significant impact on the service as a whole.**

HSR analysis

The analysis to support this review will be developed through 3 stages

1

High-level non site specific scenario analysis

We have undertaken high-level workforce and capacity modelling targeted at understanding the feasibility of 'extreme' scenarios to provide a range. The analysis is non site specific.

Early- to mid-February

We are here!

2

Non site specific scenario analysis

We have undertaken high-level financial, workforce activity and capacity modelling targeted at providing greater clarity around the cost and benefits related to the different scenarios. The analysis is presented in a non site specific way.

Mid-February to mid-April

3

Site specific option analysis

Financial, workforce, activity, travel time and capacity modelling should be refined and undertaken to provide greater clarity around the cost and benefits of each site specific option.

After publication of the Report

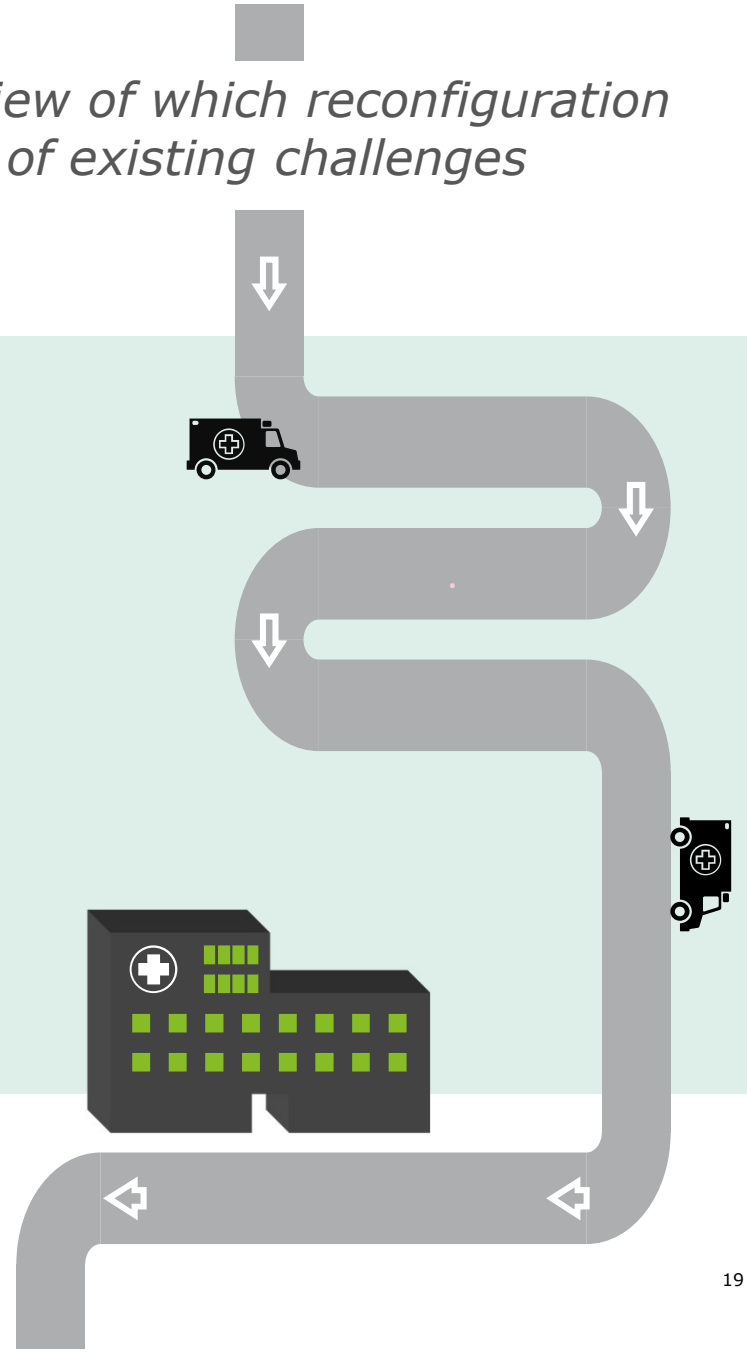
Our approach to the analysis

HSR analysis overview (1/4)

The purpose of the analysis is to inform a view of which reconfiguration options are most likely to address the scale of existing challenges

The Hospital Services Review analysis was undertaken at a high-level, with financial, workforce, activity and capacity modelling targeted at providing greater clarity around the cost and benefits related to the different configuration scenarios.

The analysis is used to inform a view of which reconfiguration scenarios are most likely to mitigate the scale of the existing challenges. It seeks to enable the system to **rule out** scenarios at this stage rather than providing recommendations on a preferred way forward.



HSR analysis overview (2/4)

Collecting and validating data

The following process was followed in terms of collecting and validating data:

Data request

A data request on workforce, activity, service components and other key performance indicators was sent to all the trusts in September 2017 and data was received throughout Q4 of 2017.

Sense-checking

A process of discussing and sense-checking the data as it was received was followed.

Quantitative analysis

The HSR used this data to quantitatively assess the service challenges and summarised findings in service-specific data packs which were circulated to all trusts for sign-off in December 2017. Where incomplete data was received from trusts, the HSR drew on publicly available 2016/17 Reference Costs data to supplement it. Reference Costs data was used for the capacity analysis.

Validation of workforce data

The trusts were asked to reconfirm workforce figures in February 2017 to ensure they were still valid and up to date. More detail was requested on the workforce split within the specialties (e.g. detailed assumptions around workforce split / time spent for e.g. obstetrics and gynaecology; and paediatrics and neonatology care).

Validation of other specific data sets

Further requests were made to trusts to validate specific areas of data:

- Service definitions in February 2018 (email sent on 20 February);
- Staff in post FTEs (email sent on 20 February);
- Locum expenditure and FTEs in April 2018; and
- Staff in post and establishment FTEs, as well as activity in April/May 2018.

HSR analysis overview (3/4)

Validating the assumptions behind the modelling

The modelling is intended to be high level and non site specific. As such it is based on a number of assumptions, which are described in detail in this document.

These assumptions were discussed in the following forums:

- Discussions were held with clinical leads and clinicians in the system in March and April 2018 (following an email sent on 20 March) to discuss and refine assumptions used in the workforce analysis.
- Key financial assumptions, for example the costs of capital, were discussed with Directors of Finance on 19 March and 11 April.
- Assumptions around workforce, e.g. the use of Royal College Guidelines, were discussed with the HSR Steering Group and the AOs / CEOs throughout January and February 2018.
- Detailed data and assumptions pack sent to the steering group on 31st April and discussed individually with Medical Directors.

HSR analysis overview (4/4)

Key assumptions used in the HSR analysis

Activity shifts

The HSR has identified a range of services which are currently facing sustainability challenges. The Clinical Working Groups set out a range of reconfiguration scenarios that would potentially improve service sustainability by moving services between sites.

The aim of the analysis was to identify the maximum and minimum potential impact of any reconfiguration scenario for South Yorkshire and Bassetlaw. In order to do this realistically, the analysis used a set of rules to identify the largest and smallest sites in each service, and modelled the potential maximum and minimum impacts using scenarios and data from these sites.

The use of this real data does not indicate that a site is being considered for reconfiguration. The modelling is illustrative and the data has been presented in a non site-specific way to show the maximum and minimum potential impacts. This is intended to allow the system and the public the opportunity to comment on the proposed approach before modelling is carried out for all the potential combinations of potential sites.

Site-specific modelling will need to be taken forward in the next stage of the work to understand the detailed implications of the different scenarios for all the possible combinations of SYB(ND) sites.

Workforce

The purpose of the workforce analysis is to inform the cost-benefit analysis and provide an indication of the scale of the current workforce challenge, spend on locums, and potential gap in medical workforce in 5 years' time based on HEE projections.

The analysis is based on Royal College standards for consultant numbers, acknowledging their aspirational nature, but using them to give an indication of how close a particular option takes the system to guidelines.

Capital

The modelling of capital costs is intended to give a range of smallest to largest impacts of any changes within the system. The analysis is based on activity shifts, on the basis of which bed requirements are estimated across sites. As mentioned above, the results are presented in a non site specific way.

Capital requirements for interdependent services have been considered at a high-level. Capital expenditure for some of these might be higher than the general rule of thumb used.

Scope and limitations

HSR analysis

The scenarios were developed by the HSR based on high level rules to provide a wide range of potential reconfiguration impacts

As described in the previous slide, data from the largest and smallest sites in the system, and those with the largest and smallest travel times, were used to create an illustrative range of the maximum and minimum potential impacts. The analysis is presented in a non site specific way and cannot be used to draw any conclusions about sites.

This is in order to give the public and stakeholders the opportunity to comment on the proposed approach before it is applied to potential sites. These discussions will occur in the period following April 2018.

For the purposes of this analysis, specific scenarios were developed by the HSR using a range of high-level rules based on size (defined as activity) and travel distance across different sites. This is described in more detail in the example below.

Example

This illustrative example is a high-level description of service relocation rules:

- *The targeted sites are progressively identified based on size (i.e. smallest and largest). This is because size is one of the key drivers of reconfiguration impacts (such as capacity and economies of scale). As such, this enables the analysis to reflect the widest possible range of impacts on most metrics.*
- *Each service moves individually, based on service size.*
- *For example, in the 1 site fewer scenario, the activity covered by the service is relocated to the nearest hospital within the system currently providing the same service, identified by the shortest drive time from the hospital site rather than patients' homes.*

HSR analysis

The capacity and workforce analysis has been developed to identify how far the scenario meets the evaluation criterion of costing no more than the current system

Workforce

Is the scenario likely to deliver workforce standards without increasing workforce costs?

Capacity

Is additional capacity required to accommodate services? How much spare capacity is generated?

Activity

What is the scale of consolidation across the different scenarios?

Finance

Is the scenario cost-neutral?

HSR analysis

There are limitations to this initial analysis that would need to be addressed in the next stage of modelling

Summary limitations

Data sources. To ensure consistency between trusts, the capacity and hence the financial analysis were developed using Reference Costs data rather than more detailed HES/SUS data. In the next stage of modelling we would ask trusts to complete all original data returns. For the workforce analysis, data on FTEs provided by trusts was used.

Information gaps. The analysis was developed using the information provided by the system. Gaps have been noted and addressed through assumptions which are clearly reported in the Appendices.

Scenario development. The scenarios were developed using simplistic rules to give an indication of the range of potential impact. As such, these will need to be revisited at an operational level of detail with real life costs when the reconfiguration scenarios and options are developed in the next stage of modelling.

Travel time and catchment areas. The analysis currently assumes that as a service is reconfigured, all activity moves to the site closest to the original service provider. This does not take into account that activity may go to different sites based on different patient travel times and patient choice.

Quality Assurance and level of detail. Due to the high number of scenarios considered the analysis has currently been conducted at a relatively high-level. This has included engagement with clinical leads, Medical Directors and the Directors of Finance, and this will need to be revisited with more detailed engagement as the HSR conducts the next stage of site specific modelling.

Interdependencies and flow backs. The analysis provides an initial account of the potential clinical interdependencies and additional changes that could be implemented to free up capacity. This would need to be revisited in further detail in the next stage of modelling.

A more detailed description of the limitations related to the finance, workforce and capacity analysis, and the assumptions behind them, is provided in the Appendices.

Notwithstanding the limitations above, the data is necessarily high level and represents in principle scenarios at this stage. However, it provides an indication of the potential workforce and capital implications to enable us to assess the relative impacts of the different options and advance to the next stage of identifying and modelling high level options.

Findings

HSR analysis

Summary of HSR analysis

This rest of this section is structured as follows:

1. Baseline
    - Capacity challenge
    - Workforce challenge
2. Reconfiguration impacts
    - Scenario definition
    - Workforce impacts
    - Financial impacts

1. Baseline

Summary

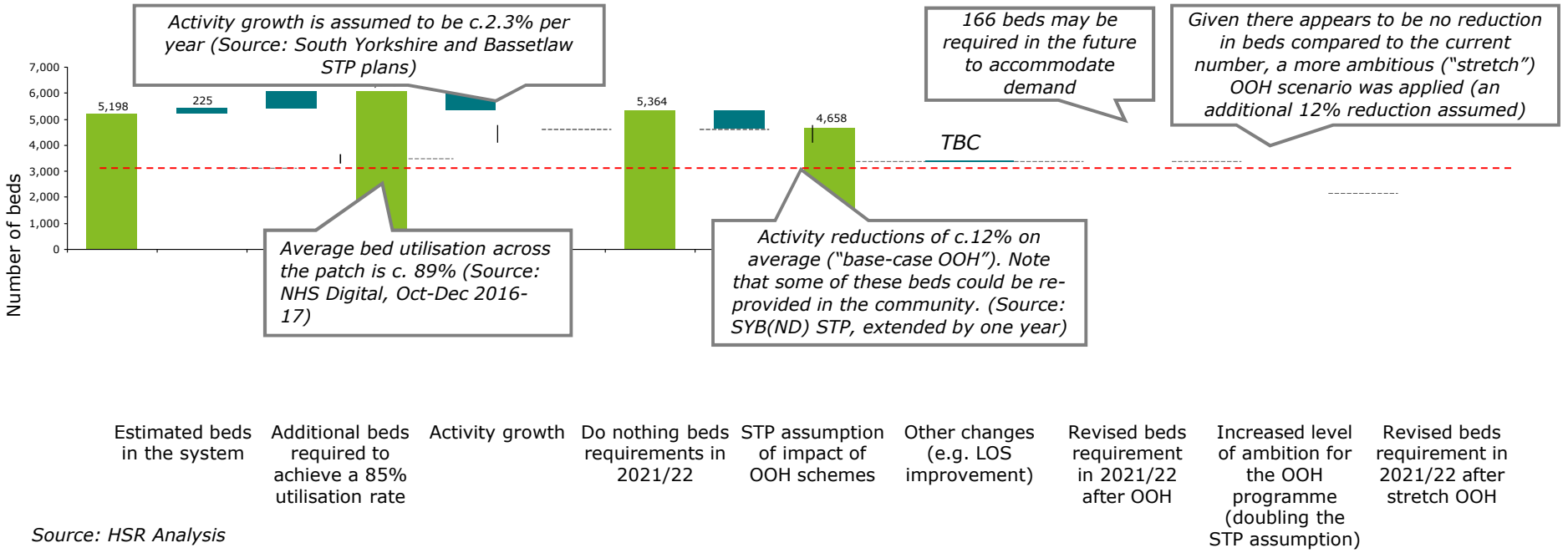
The capacity challenge

The workforce challenge

1.HSR analysis – capacity challenge

The system needs more ambitious out-of-hospital shifts to reduce the number of beds over the next five years

There are currently c. 5198 beds in the system at an average bed utilisation of 89%. If no other changes were made apart from activity growth, to achieve a target utilisation of 85%, 6,070 beds would be required in 2021/22.



Source: HSR Analysis

Current STP(ND) estimates (extended by one year) for out-of-hospital schemes (c. 12% reduction) would reduce the number of beds to c. 5,364 beds in 5 years time. At the next stage of the analysis, the HSR will further consider the deliverability of the 12%, given evidence from other systems across the NHS.

The HSR has considered the impact of a more ambitious OOH impact (working assumption of 24% activity reduction). This would result in the system requiring c. 4,658 beds.

Note that the system would need to consider the potential impact on transformation funding required to deliver these more ambitious schemes.

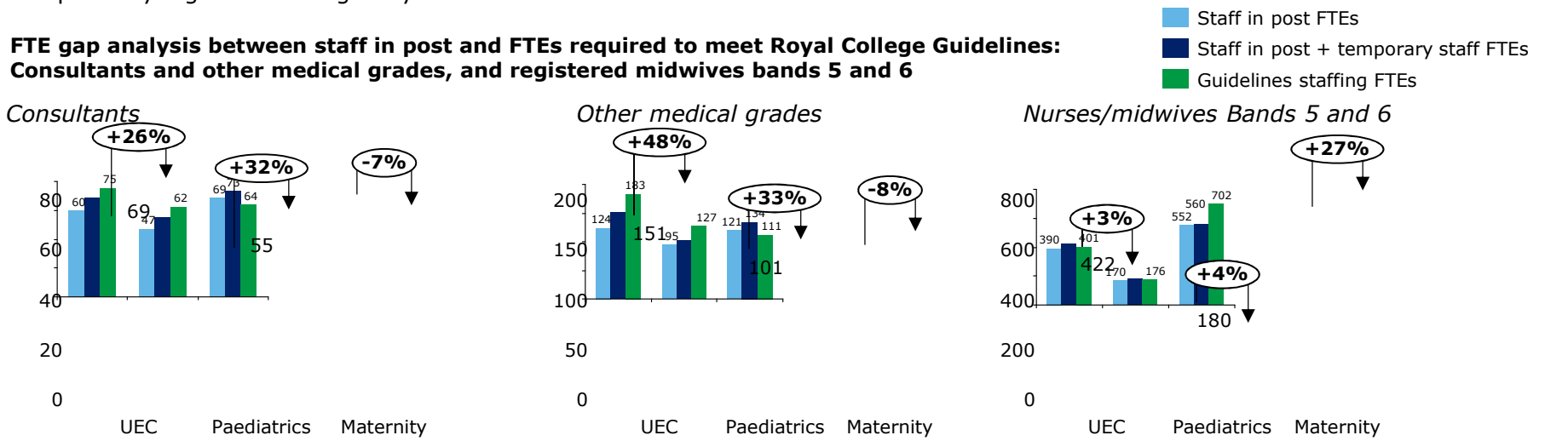
1. HSR analysis – workforce challenge

The services considered as part of the review are also facing workforce challenges

For three of the services considered by the HSR – maternity, paediatrics (care of the acutely ill child) and UEC – workforce analysis has been undertaken. Current staff in post FTEs have been compared against Royal College Guidelines FTEs. Royal College Guidelines have been used as they represent good practice and as an indication of how close different options take the system to the guideline level, although in some cases clinicians have noted these are aspirational in nature.

Based on the information returned from the trusts, the system has spent c. £17m on temporary staff (including bank and agency) in the past year. The equivalent number of FTEs was estimated to be c. 145, although in some cases this may be distorted by exceptionally high rates charged by some locums for some shifts.

FTE gap analysis between staff in post and FTEs required to meet Royal College Guidelines: Consultants and other medical grades, and registered midwives bands 5 and 6



Source: Reference Costs for activity data, with updated figures from some of the trusts received in April/May 2018. For FTE values, trust returns from September 2017, with updates received in April/May 2018.

Notes: 2016/17 workforce data was collected from Trusts in September 2017. Some but not all Trusts subsequently updated their data with 2017/18 numbers. For locum FTEs 2017/18 data was used.

The FTE values above include consultants and other medical grades, and registered midwives bands 5 and 6. Other categories of staff not included. Maternity numbers are consistent with Scenario A, as described on the following slides.

Workforce analysis was conducted for Maternity, Paediatrics and UEC as reconfiguration on these services is more likely to yield direct workforce efficiencies. Reconfiguration for Stroke was not included in the context of the ongoing challenge to the HASU business case. Reconfiguration analysis for GI Bleeds services was not undertaken given the extremely low volumes of activity; and the fact that the major driver behind reconfiguration is to remove inequalities in access across SYB(ND) by ensuring that all patients can access emergency services overnight.

For further details on workings and assumptions refer to Appendix: Workforce data pack and assumptions.

2. Reconfiguration impacts

A. Scenario definition

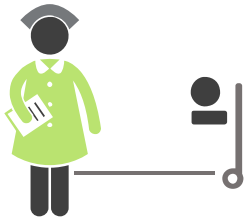
B. Workforce

C. Financial impacts

2. Reconfiguration impacts

A. Scenario definition

Summary



Scenarios definition

2.HSR analysis – reconfiguration scenarios

Reconfiguration impacts have been estimated for a range of scenarios

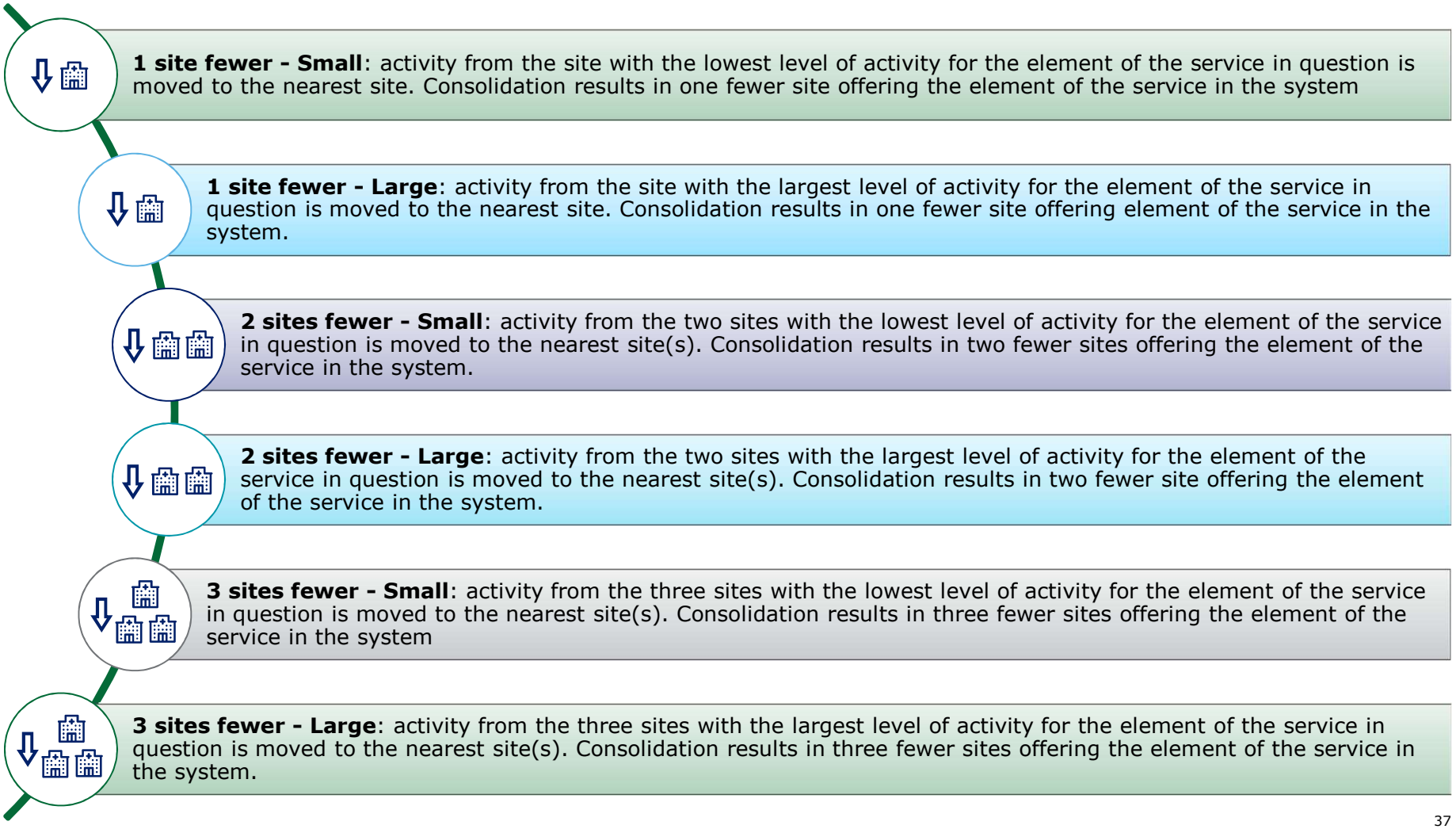
The reconfiguration scenarios we have looked at include the following:
Stroke options were not modelled, in the context of the ongoing challenge to the HASU business case.

	Option 0 – status quo	Option 1	Option 2	Option 3
Urgent and emergency care	6 Emergency Departments + 7 MIUs (or equivalent)	5 Emergency Departments + 7 UTC	4 Emergency Departments + 7 UTC	3 Emergency Departments + 7 UTC
Care of the acutely ill child	6 IP Units + 3 24/7 SSPAUs + 3 part time SSPAUs	5 IP Units + 5 24/7 SSPAUs + 1 part-time SSPAU	4 IP Units + 4 24/7 SSPAUs + 2 part-time SSPAUs	3 IP Units + 3 24/7 SSPAUs + 3 part-time SSPAUs
Maternity	6 CLUs + 2 AMLUs + Home births service	5 CLUs + 5 AMLUs + 1 SMLU + Home births service	4 CLUs + 4 AMLUs + 2 SMLUs + Home births service	3 CLUs + 3 AMLUs + 3 SMLUs + Home births service
Gastroenterology and endoscopy	5 independent Out-of-Hours (OOH) rota	4 full OOH rotas & formal network arrangements	3 full OOH rotas & formal network arrangements	2 full OOH rotas & formal network arrangements

Interdependent

2.HSR analysis – reconfiguration scenarios

We have provided a range of reconfiguration impacts with the range being driven off the smallest and largest sites

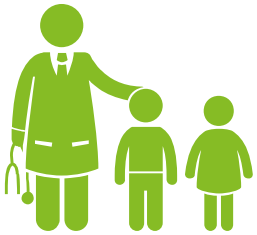


2. Reconfiguration impacts

B. Workforce

Workforce Summary

UEC:



Care of the acutely ill child:

Maternity

1. HSR analysis – notes on HEE projections

Future growth in consultants could improve service sustainability if the expected decrease in other medical grades is mitigated effectively

HEE projections

There are a number of factors to consider when utilising HEE projections:*

- **Comparison to establishment**. Where growth rates suggest consultant numbers are above current establishment rates, the system would need to decide whether to hire the additional staff or maintain establishment rates. According to Health Education England (HEE), consultant numbers could grow by 2021/22 (compared to current numbers) for all three services considered. This growth in consultant numbers could help reduce reliance on temporary staff and support trusts in bridging the gap with Royal College Guidelines where these are not currently met.
- **Reduction in other medical grades**. However, other medical grades FTEs are projected to decrease. This will increase either the gap to the Royal College Guidelines or reliance on locums for these roles. This could potentially be mitigated by training / employing more ANPs or ENPs to fill the middle grade rota, or by substituting consultants or nurses to fill these roles where available.
- **Configuration impact on nursing**. The HSR has focussed closely on how nurse and midwife numbers can be supported. However, nurse numbers are linked to the absolute number of patients much more closely than consultants or other medical grades. Number of nurses needed would only be marginally impacted by the configuration scenarios and, as such, were not considered in this stage of quantitative analysis. Royal College guidelines around midwifery ratios have been analysed and are included in this report.
- **Growth in nursing.** The impact on nursing staff has not been estimated by HEE at this stage. If there are insufficient nurses in the future, this would make role substitution more of a challenge (e.g. there may be less ANPs/ENPs to assist with the middle grade rota).
- **Retirement rates.** HEE numbers do not include retirement rates. Therefore the estimated projections may be on the high side and should be treated with caution.

Workforce growth estimates provided by HEE will factor in historic trends on retirement profiles; however, we have not included trust-specific projections on retirement as these are difficult to predict given changes to the retirement age, and data was not available at trust and service level.

As the analysis becomes site-specific, and service models are further defined, workforce modelling will need to be updated regularly to respond and take into account flows into and out of the workforce.

**Notes from HEE:*
These numbers have been formulated using the Forecast function in Excel and do not account for trainee supply currently in the system or the current demographics of current staff (i.e. age and expected retirements). Due to the limited numbers of staff in each area, estimates could be made more robust by having a greater sample.

2. HSR analysis – workforce growth

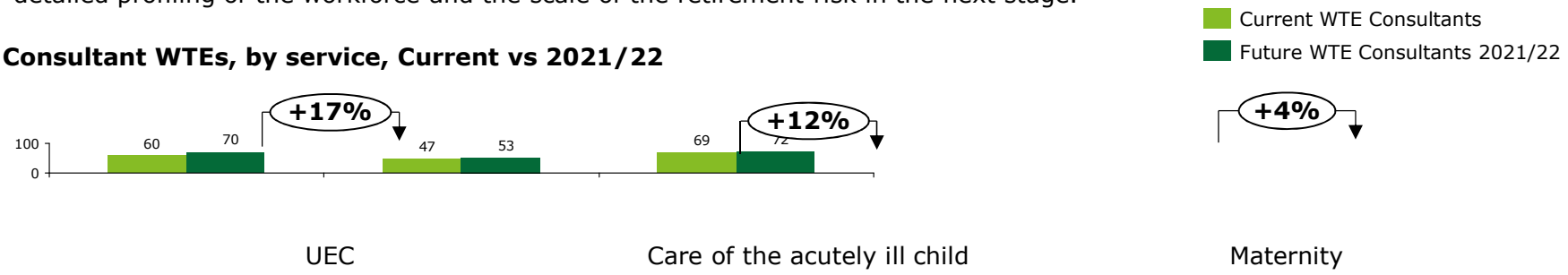
HEE is anticipating a growth across all services, with strong growth in UEC, and lower growth in maternity and paediatrics

According to Health Education England (HEE), consultant numbers could grow by 2021/22 for all three services considered. This growth in consultant numbers could help reduce issues around the reliance on temporary staff and help trusts meet the Royal College Guidelines for consultants.

- For urgent and emergency care, this represents a 17% increase from the current base of 60 to 70 consultants in 2021/22.
- For care of the acutely ill child, this represents a 12% increase from the current base of 47 to 53 consultants in 2021/22.
- For maternity, this represents only a 4% increase from the current base of 69 to 72 consultants in 2021/22.

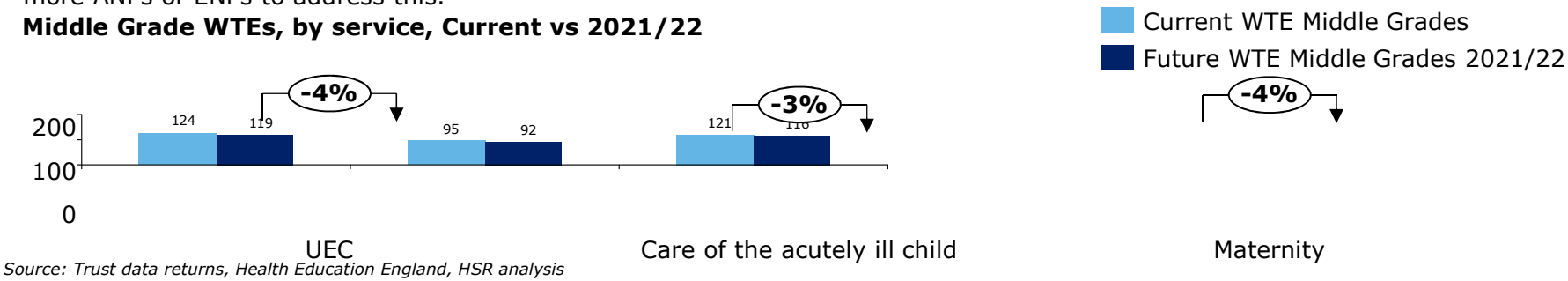
However, some of the projected growth might be outweighed by retirement rates. The system will need to engage in more detailed profiling of the workforce and the scale of the retirement risk in the next stage.

Consultant WTEs, by service, Current vs 2021/22



The same analysis for other medical grades suggests that the position will worsen across all services. Role substitution (e.g. consultants, nurses) could potentially mitigate this reduction in trainee grades. Another alternative could be to train or employ more ANPs or ENPs to address this.

Middle Grade WTEs, by service, Current vs 2021/22



Source: Trust data returns, Health Education England, HSR analysis
Notes: For FTE values, trust returns from September 2017 were used, with updates received in April/May 2018. SCH FTEs not included in UEC analysis, as SCH is not part of UEC reconfiguration due to its specialised nature (paediatrics A&E). Trust / Staff Grade doctors, middle grade doctors and junior doctors are included in this middle grade category.

3.HSR analysis – UEC

Consultant numbers

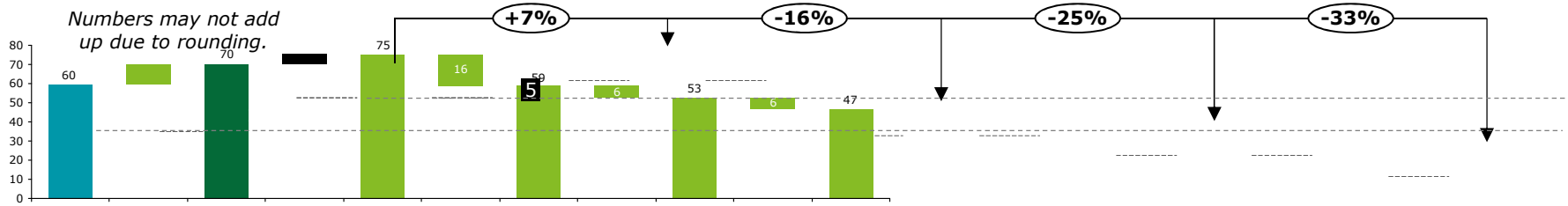
Key findings:

There are 58 consultant WTEs now and this is anticipated to rise to 76 in 2021/2022. Based on this growth, there is a small gap of 5 consultant FTEs in order for all six emergency departments to meet the Royal College guidelines for emergency medicine under the status quo option. Given the guidelines are anticipated to be aspirational in nature, the HSR deems this gap sufficiently small to retain all 6 EDs. This analysis is based on two main assumptions:

1. That trusts in SYB(ND) are able to **retain** their consultant workforce through making SYB(ND) a more attractive place to work. Should retention continue to be a problem and consultant numbers subsequently decrease, further consolidation may have to be considered.

2. That the **Urgent Treatment Centres** reduce activity that flows into each Emergency Department, reducing the requirement for a greater number of Consultants in the Emergency Department. An assumption of 6 GPs per UTC has been made by the HSR at this stage. Whilst this has been included in the cost-benefit analysis, it is not shown on these slides. The future service model, which will be defined at the next stage of the analysis, will need to balance the workforce across GPs and ED consultants, given the difficulties in recruiting GPs, and taking into account growth in both workforces and the use of ENPs in the UTCs.

Consultant WTEs, UEC, Current vs 2021/22 vs Option 1, 2, 3



Source: Trust data returns, Health Education England, HSR analysis
Notes: Reference Costs for activity data, with updated figures from some of the trusts received in April/May 2018. For FTE values, trust returns from September 2017 were used, with updates received in April/May 2018. SCH FTEs not included in UEC analysis, as SCH is not part of UEC reconfiguration due to its specialised nature (paediatrics A&E). 6 scenarios have been modelled, for simplicity the average impact for the 1 site fewer, 2 sites fewer and 3 sites fewer is presented

3.HSR analysis – UEC

Other medical grades numbers

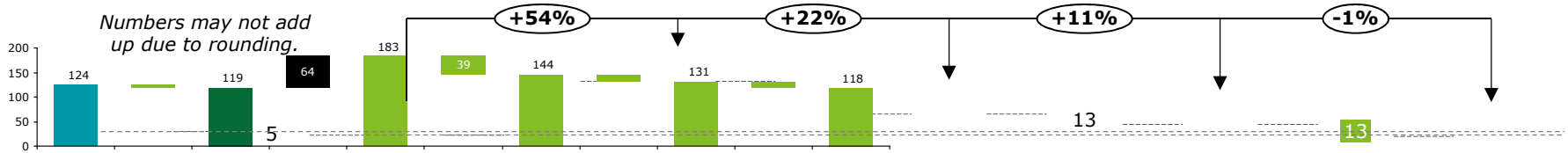
Key findings:

There are 124 other medical grades WTEs now and if current trends continue this is anticipated to decrease to 119 in 2021/2022. These trends could be reversed by the workforce recommendations outlined in the HSR Report around workforce recruitment and retention. In order to meet the Royal College Guidelines in 2021/22 an additional 59 Middle Grade WTEs would be required. This gap in Middle Grade doctors is consistent with the clinical opinion in the UEC Clinical Working Group which cited the key issue around middle grade sustainability in particular. There two options to reduce this significant gap in other medical grades:

- Role substitution (for example, consultants or nurses) could partially mitigate this reduction in other medical grades. Another alternative could be to train or employ more Physician Associates, Advanced Nurse Practitioners or Emergency Nurse Practitioners to address this (for example the training of c. 20 ENPs could address a third of this gap, but this would risk creating a shortage in nurses in the absence of creating a truly incremental workforce). The CWGs recognised this alternative workforce could be used to provide support although time would be needed for the appropriate training.
- If the above workforce solution does not go far enough, then SYB(ND) might need to consider the reconfiguration to two fewer Emergency Departments in the longer term to allow for the sustainable staffing of Middle Grade doctors. However this would be a significant step given the level of public concern that is likely, and the significant capital costs that would be involved, so the HSR does not recommend it.

The challenges around other medical grades represent a long term sustainability challenge that must be addressed through making SYB(ND) an attractive place to work. Since nursing numbers are based on activity ratios; the consolidation of emergency departments does not affect the numbers of nurses, and has not been modelled.

Other medical grades WTEs, UEC, Current vs 2021/22 vs Option 1, 2, 3

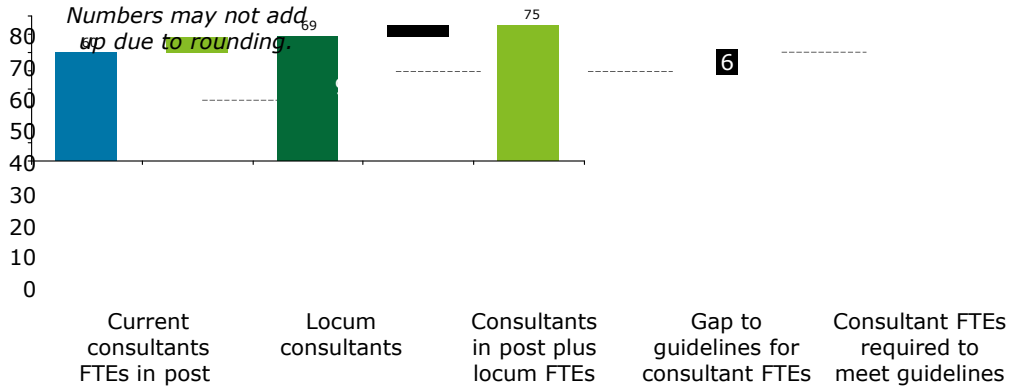


Source: Trust data returns, Health Education England, HSR analysis
Notes: Reference Costs for activity data, with updated figures from some of the trusts received in April/May 2018. For FTE values, trust returns from September 2017 were used, with updates received in April/May 2018. SCH FTEs not included in UEC analysis, as SCH is not part of UEC reconfiguration due to its specialised nature (paediatrics A&E). Trust / Staff Grade doctors, middle grade doctors and junior doctors are included in this other medical grades category.
6 scenarios have been modelled, for simplicity the average impact for the 1 site fewer, 2 sites fewer and 3 sites fewer is presented

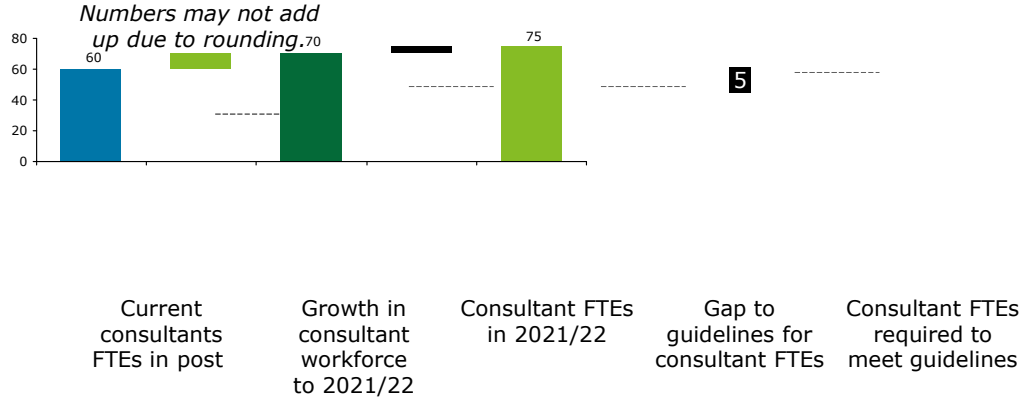
3.HSR analysis – workforce challenge

UEC locum expenditure could be mitigated in the future if the consultant workforce grows in line with HEE projections

Current consultant FTEs



Projected consultant FTEs



- Currently the system spends c. £1.7m on consultant locums, equivalent to c. 9 FTEs.
- The agency premium rate appears to be c. 20%. This has been calculated based on HSR data returns submitted in April 2018.
- In the future, if HEE projections materialise, the system will have 10 more consultants in post, however there would still be a gap to guidelines of c. 5 FTEs, which may need to be filled with locums if the system intends to meet the guidelines in full.

Source: Based on HSR data returns, with assumptions where data was inconsistently filled in or not provided.
Notes: Reference Costs for activity data, with updated figures from some of the trusts received in April/May 2018. For FTE values, trust returns from September 2017 were used, with updates received in April/May 2018. Locum expenditure is based on 2017/18 data provided by the Trusts in April 2018.

3.HSR analysis – Care of the acutely ill child

Consultant numbers

Key findings:

There are 47 consultant WTEs attributed to acute paediatrics now and this is anticipated to rise to 53 in 2021/2022. There is currently a 10 WTE shortfall against the number of consultants that would be required to meet Royal College guidelines under the status quo option. While the guidelines are aspirational, the HSR considers that they represent a sustainable workforce, and the system should aim to get closer to them.

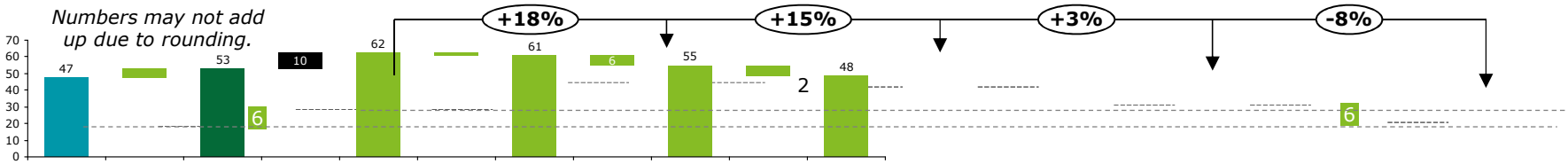
One way to reduce the number of consultants needed is to consolidate inpatient paediatric units (although as the size of units increase upon consolidation, so does the requirement for additional consultant presence on both larger inpatient units and co-located 24/7 SSPAUs.)

Changing two or three inpatient units into SSPAUs would allow SYB(ND) to get closer to or meet the Royal College guidelines, and reduce the reliance on locum staff which is explored overleaf. A further option would be to convert the 3 current 24/7 SSPAUs to part-time SSPAUs. This would reduce the overall consultant requirement across SYB(ND) by 4 consultant FTEs under the Status Quo option.

Given the guidelines are aspirational in nature and the significant disruption that could be caused by converting 3 inpatient units into SSPAUs, the HSR recommends commissioners further explore the converting 1 or 2 inpatient units into SSPAUs in the site-specific stage of modelling.

Other medical grades numbers have not been modelled in the same way, as no comparable Royal College guidelines could be found. Since nursing numbers are based on activity ratios; the consolidation of inpatient units does not affect the numbers of nurses, and has not been modelled.

Consultant WTEs, Care of the Acutely Ill Child, Current vs Option 1, 2, 3

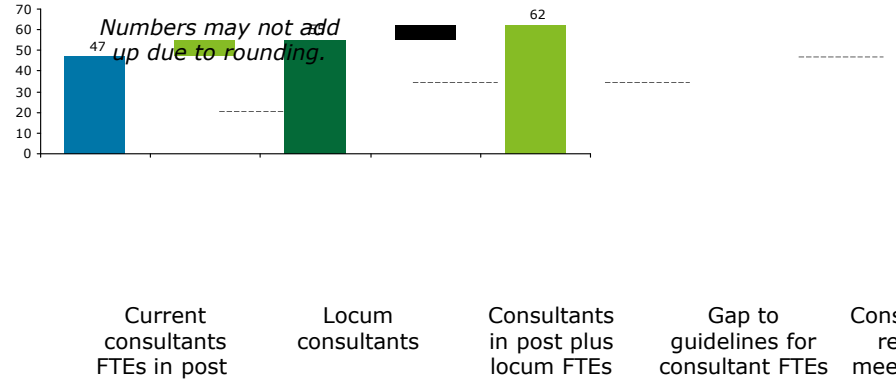


Source: Trust data returns, Health Education England, HSR analysis
Notes: Reference Costs for activity data, with updated figures from some of the trusts received in April/May 2018. For FTE values, trust returns from September 2017 were used, with updates received in April/May 2018. Staff WTEs exclude estimated time commitment for neonatology services, and are for acute paediatrics only. Only hospital sites with Level 1 Neonatology units have workforce that covers both the paediatrics and neonatology rotas.
6 scenarios have been modelled, for simplicity the average impact for the 1 site fewer, 2 sites fewer and 3 sites fewer is presented.

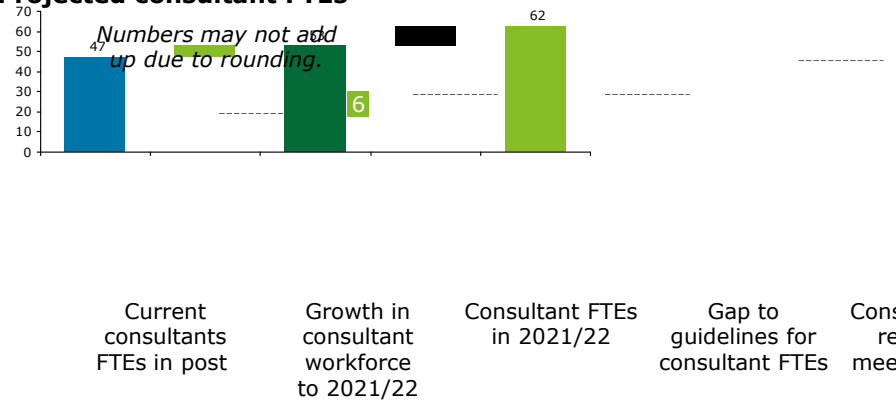
3.HSR analysis – workforce challenge

Paediatrics locum expenditure could be partially mitigated in the future if the consultant workforce grows in line with HEE projections, however there may still be a need for locum consultants

Current consultant FTEs



Projected consultant FTEs



- Currently the system spends c. £1.7m on consultant locums, equivalent to c. 8 FTEs.
- The agency premium rate appears to be c. 29%. This has been calculated based on HSR data returns submitted in April 2018.
- In the future, if HEE projections materialise, the system will have 6 more consultants in post. However the growth in workforce does not appear sufficiently high to entirely mitigate the need for locums, if the system retains 6 inpatient sites.

Source: Based on HSR data returns, with assumptions where data was inconsistently filled in or not provided.
Notes: Reference Costs for activity data, with updated figures from some of the trusts received in April/May 2018. For FTE values, trust returns from September 2017 were used, with updates received in April/May 2018. Locum expenditure is based on 2017/18 data provided by the Trusts in April 2018.

3.HSR analysis – Maternity

Consultant numbers (1/3)

Key findings

There are 69 consultant obstetrician and gynaecologist WTEs in SYB(ND) and this is anticipated to rise to 72 in 2021/2022. The HSR team has used RCOG 2009 Guidelines, *The future workforce in obstetrics and gynaecology,* to estimate the number of consultant WTEs that are required according to the size of unit (the guidelines are attached in the appendix). The HSR recognises these are aspirational in nature, so have been used as a target to understand the potential shortfall in consultants and how to potentially address this.

The RCOG guidelines allow of a wide range of consultant presence, depending on the specific specialties covered by the unit. The HSR team have modelled three scenarios for units between 2500-4000 deliveries per year:
Scenario A: a total of 8 consultants are required across obstetrics and gynaecology combined; and
Scenario B: 10 consultants are required.
These two scenarios reflect the advice in the guidelines that each hospital should have a range of direct clinical care PAs in addition to those covering the delivery suite (that is, for maternal and foetal medicine, antenatal clinic, gynaecology theatre or outpatient clinics). Further analysis would need to be undertaken in the next stage of the HSR to understand the relative requirements across the trusts in SYB(ND).
Scenario C: involves all units that are currently operating at 60 hours of consultant presence increase to 98 hours of consultant presence to account for the high levels of medium or high complex births across the SYB(ND) population.

In order to meet Royal College guidelines an additional 0.3 WTEs would be required under the status quo option for Scenario B and a decrease in 7.7 WTEs for Scenario A. Under both scenarios, consultant numbers does not appear to be driving the need for reconfiguration although further work is required to test the appropriate number of direct clinical care PAs that are required in addition to the delivery suite (that is, for maternal and foetal medicine, antenatal clinic, gynaecology theatre or outpatient clinics).

Whilst the consultant workforce for maternity may not be a driving a requirement for change, the interdependency with paediatrics mean that if there is a change in the number of IP paediatric units there will ned to be a change in the number of obstetric units and neonatal units. There is also a quality driver, as members of the Clinical Working Groups have said that workload pressures led to significant amounts of unplanned overtime. Moving to a 98 hour unit would potentially reduce the pressures on staff.

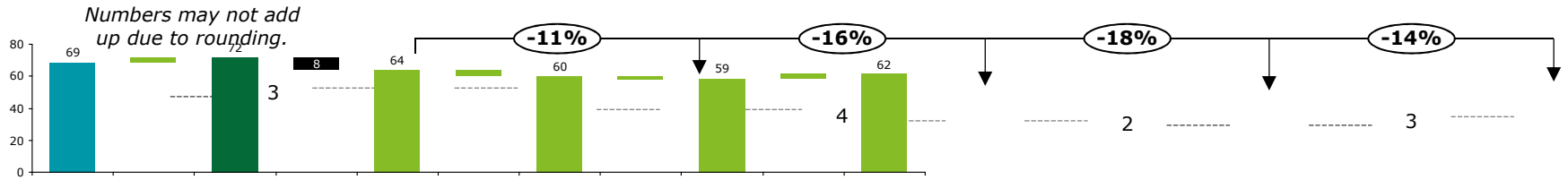
All three scenarios are presented on the following two pages.

Source: Trust data returns, Health Education England, HSR analysis
Notes: 2016/17 workforce data was collected from Trusts in September 2017. Some but not all Trusts subsequently updated their data with 2017/18 numbers
WTEs are for both obstetrics and gynaecology to mirror how the RCOG 2009 guidelines have been stated.

3.HSR analysis – Maternity

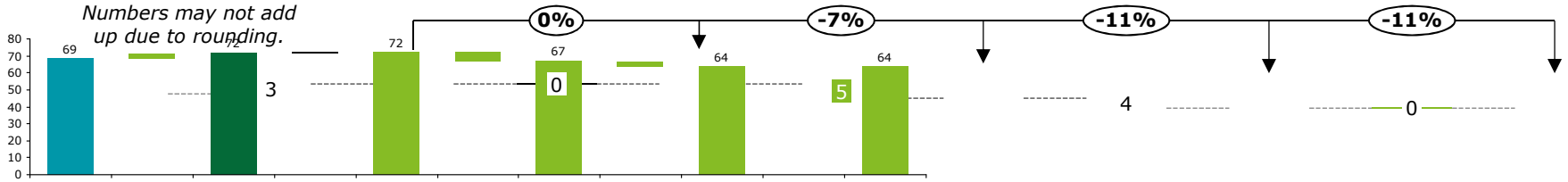
Consultant numbers (2/3)

Consultant WTEs, Obstetricians and Gynaecologists, Current vs 2021/22 vs Option 1, 2, 3 – Scenario A



Consultants in post FTEs | Growth in consultant workforce to 2021/22 | Growth in consultant workforce to 2021/22 | Gap to guidelines for consultants | Consultants required to meet guidelines (status quo) | 1 site fewer | Consultants required after reconfiguration (1) | 2 sites fewer | Consultants required after reconfiguration (2) | 3 sites fewer | Consultants required after reconfiguration (3)

Consultant WTEs, Obstetricians and Gynaecologists, Current vs 2021/22 vs Option 1, 2, 3 – Scenario B



Consultants in post FTEs | Growth in consultant workforce to 2021/22 | Growth in consultant workforce to 2021/22 | Gap to guidelines for consultants | Consultants required to meet guidelines (status quo) | 1 site fewer | Consultants required after reconfiguration (1) | 2 sites fewer | Consultants required after reconfiguration (2) | 3 sites fewer | Consultants required after reconfiguration (3)

Source: Trust data returns, Health Education England, HSR analysis
Notes: Reference Costs for activity data, with updated figures from some of the trusts received in April/May 2018. For FTE values, trust returns from September 2017 were used, with updates received in April/May 2018. WTEs are for both obstetrics and gynaecology to mirror how the RCOG 2009 guidelines have been stated. Interdependencies with paediatrics and neonatology have not been considered at this stage. 6 scenarios have been modelled, for simplicity the average impact for the 1 site fewer, 2 sites fewer and 3 sites fewer is presented

3.HSR analysis – Maternity

Consultant numbers (3/3)

Key findings:

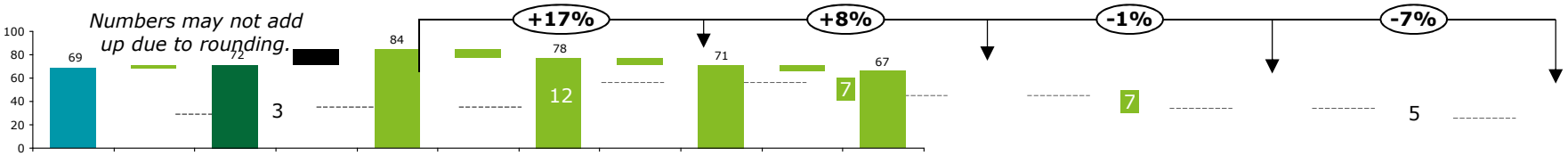
Currently there are 69 consultant obstetrician and gynaecologist WTEs in SYB(ND) and this is anticipated to rise to 72 in 2012/22. The average proportion of low risk births across SYB(ND) is 29% of total deliveries, which represents a relatively complex population compared to the national average, with 71% of all deliveries being medium or high risk.

This translates into a high intensity role for obstetricians, and during the Clinical Working Groups, we were told that the current consultants encounter high levels of overtime.

In the context of a higher risk population, we have therefore modelled a Scenario C which increases the levels of consultant presence on sites that are currently offering 60 hours of consultant presence to 98 hours of consultant presence. Under this scenario, there is a 12 consultant FTE gap between the predicted consultant complement in 2021/22 and the number of consultants required to meet 98 hours of consultant presence.

The consolidation of two obstetric units offsets this additional requirement and allows SYB(ND) to meet Royal College guidelines of greater consultant presence, which is in keeping with the relatively high risk population across SYB(ND).

Consultant WTEs, Obstetricians and Gynaecologists, Current vs 2021/22 vs Option 1, 2, 3 – Scenario C



Consultants in post FTEs	Growth in consultant workforce to 2021/22	Growth in consultant workforce to 2021/2	Gap to guidelines for consultants	Consultants required to meet guidelines (status quo)	1 site fewer	Consultants required after reconfiguration (1)	2 sites fewer	Consultants required after reconfiguration (2)	3 sites fewer	Consultants required after reconfiguration (3)

Source: Trust data returns, Health Education England, HSR analysis
Notes: Reference Costs for activity data, with updated figures from some of the trusts received in April/May 2018. For FTE values, trust returns from September 2017 were used, with updates received in April/May 2018. WTEs are for both obstetrics and gynaecology to mirror how the RCOG 2009 guidelines have been stated. 6 scenarios have been modelled, for simplicity the average impact for the 1 site fewer, 2 sites fewer and 3 sites fewer is presented.

3.HSR analysis – Maternity

Midwife numbers

Key findings:

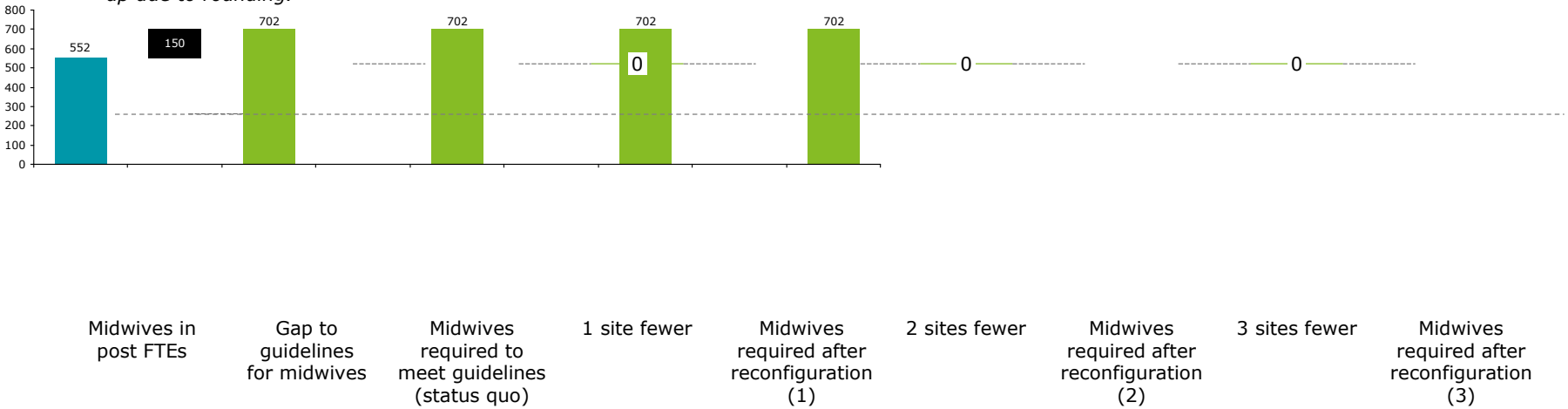
There are 552 midwives (Bands 5 and 6) across SYB(ND). No growth projections have been supplied by Health Education and as such all modelling has occurred off the current baseline. Clinicians in the Maternity Clinical Working Group cited the removal of the bursary as having a significant negative impact on the number of midwives being trained.

Standards for midwifery range from 1:28 to 1:30. For the purposes of this analysis, an average of 1 midwife to 29 births, which was ratified through engagement with clinicians, was used. Based on this, SYB(ND) would require an additional 150 band 5 and 6 midwives to ensure appropriate care during labour. Any growth in the number of midwives over the next five years would reduce the size of the gap.

Since midwife numbers are based on activity ratios, and each option maintains midwifery-led care in each place, the consolidation of obstetric-led care does not affect the numbers of midwives. The Clinical Working Group noted that many midwives are now approaching retirement age, and there was a risk that they might decide to retire early rather than move to a new model of working. However the timeline for reconfiguration would be likely to be long enough that there would be limited impact.

Midwives Bands 5 and 6 WTEs, Maternity, Current vs Option 1, 2, 3

Numbers may not add up due to rounding.



Source: Trust data returns, Health Education England, HSR analysis
Notes: Reference Costs for activity data, with updated figures from some of the trusts received in April/May 2018. For FTE values, trust returns from September 2017 were used, with updates received in April/May 2018. 6 scenarios have been modelled, for simplicity the average impact for the 1 site fewer, 2 sites fewer and 3 sites fewer is presented

4. HSR analysis – further notes

In addition, future transformation focused on new workforce models and technologies could further mitigate existing workforce challenges

Transformation benefits

The HSR is exploring a wide range of additional transformation benefits, for example as a result of new workforce models or increased use of technology such as Robotic Process Automation ('RPA'). These could be represented by the "frontier shift" in efficiency which has been estimated as part of the National Tariff development. This term captures increases in efficiency over time, as new technologies and processes enable lower service delivery costs.

The frontier shift can lead to up to 1% savings on costs p.a. However, given the level of risk in the existing Cost Improvement Plans (CIPs) developed by each Trust, these benefits have not been incorporated into the analysis.

2017/18 and 2018/19 National Tariff Payment System. NHS England and NHS Improvement.
https://nhsicorporatesite.blob.core.windows.net/green/uploads/documents/2017-18_and_2018-19_National_Tariff_Payment_System.pdf

Growth in activity

The analysis is based on 2016/17 activity levels, as taken from Reference Costs 2016/17. Growth in activity for paediatrics and UEC was assumed to be mitigated by the impact of OOH schemes. For maternity growth in activity is estimated to be c. 1.6% over 5 years, 2022 compared to 2017 (ONS, 2014-based Subnational population projections, Table 5).

See *Appendix: Workforce data pack and assumptions* for further details.

2. Reconfiguration impacts

C. Financial impacts

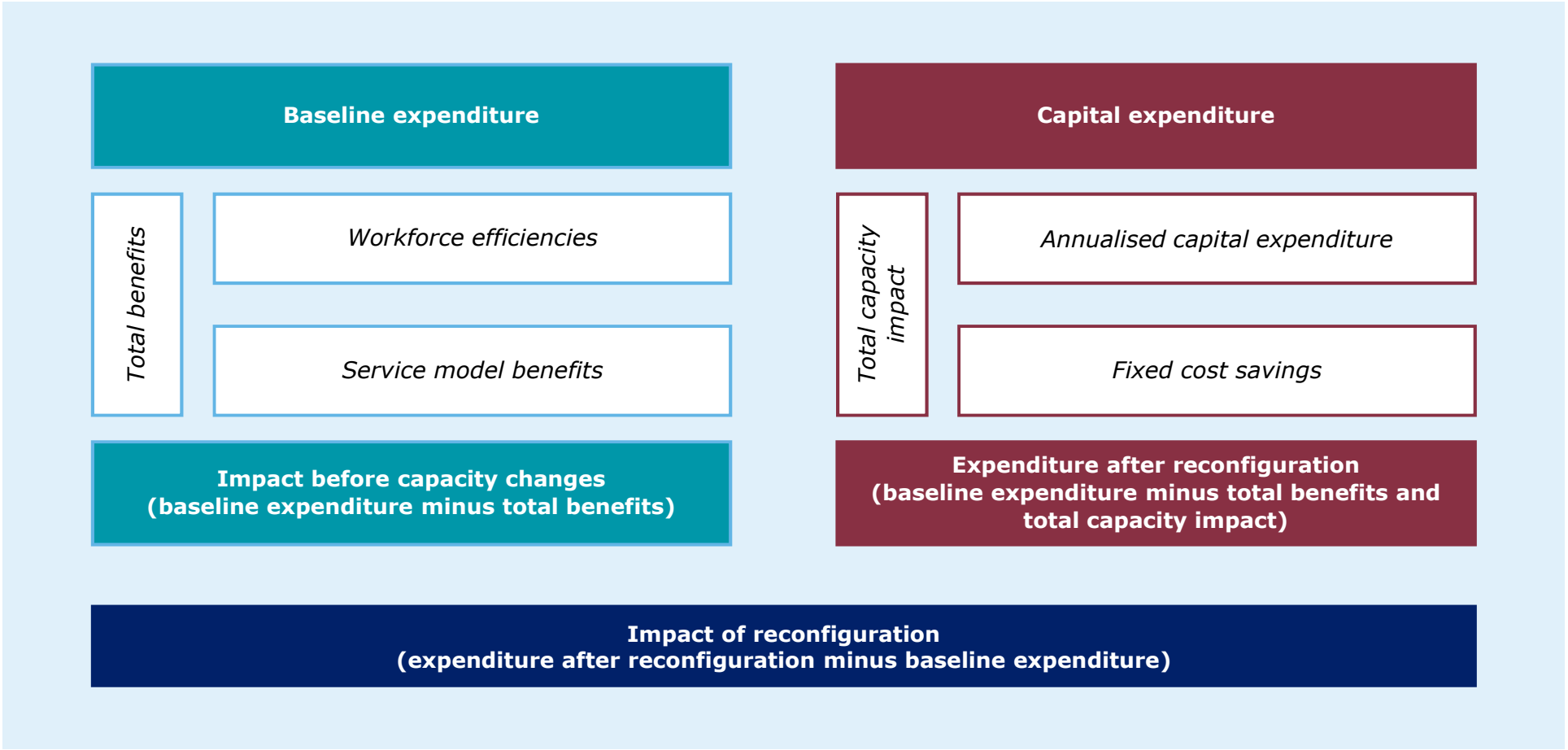
Financial impact summary

Range of finance impacts (with annualised capital costs)		UEC	Care of the acutely ill child	Maternity	Gastroenterology and endoscopy
Option 1 (1 site fewer)	Current out-of-hospital plans	**-£0.3m** to **£62.9m**	**£0.3m** to **£3.3m**	**£1.2m** to **£12.2m**	GI: **£0.1m** to **£0.2m** EL: **£0.4m** to **£1.8m**
	More ambitious out-of-hospital plans	**-£1.2m** to **£48.1m**	**£0.1m** to **£2.6m**	**£0.6m** to **£10.9m**	GI: **£0.0m** to **£0.0m** EL: **£0.0m** to **£0.8m**
Option 2 (2 sites fewer)	Current out-of-hospital plans	**£8.1m** to **£84.3m**	**£0.3m** to **£4.6m**	**£2.4m** to **£15.9m**	GI: **£0.2m** to **£0.4m** EL: **£0.5m** to **£2.6m**
	More ambitious out-of-hospital plans	**£2.3m** to **£65.7m**	**£0.1m** to **£4.2m**	**£1.7m** to **£14.6m**	GI: **£0.0** to **£0.1m** EL: **£0.0m** to **£1.2m**
Option 3 (3 sites fewer)	Current out-of-hospital plans	**£22.7m** to **£103.9m**	**£0.8m** to **£5.0m**	**£4.3m** to **£18.8m**	GI: **£0.2m** to **£0.5m** EL: **£1.2m** to **£3.2m**
	More ambitious out-of-hospital plans	**£15.2m** to **£76.9m**	**£0.3m** to **£4.6m**	**£3.0m** to **£17.4m**	GI: **£0.0m** to **£0.2m** EL: **£0.3m** to **£1.5m**

Financial saving | **Cost impact <= £1m** | **Cost impact > £1m**

3. Financial impacts

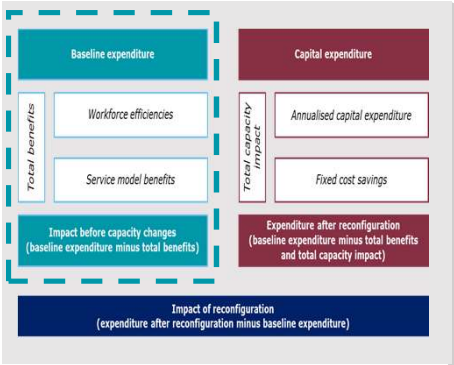
The following analysis looks at the below finance areas.



Descriptions are expanded overleaf

HSR analysis

The table below presents a description of the different areas considered in the financial cost-benefit analysis

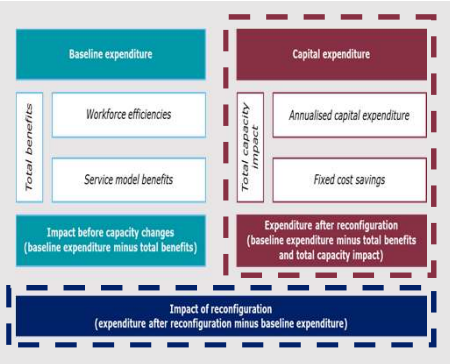


Finance area	Description	
Baseline expenditure	Total provider costs in 2021/22 before any configuration changes. This was taken from the STP plans and includes the impacts of Cost Improvement Programmes (CIPs), out-of-hospital schemes and other service changes.	
Workforce efficiencies	These are benefits resulting from reductions in locum usage and from economies of scale as you consolidate.	These benefits combined are realised when configuration changes take the required workforce below the estimated workforce available in 2021/22 as presented in the workforce analysis. These are generated only for UEC whilst care of the acutely ill child and maternity require investment to meet standards.
Service model benefits	These are benefits from new delivery models such as UTCs which take out activity out of A&Es and have lower costs (as not staffed by ED medics, but by GPs and nurses). These service benefits can also be qualitative.	
Total benefits	The combination of workforce efficiencies and service model benefits.	
Impact before capacity changes	Baseline expenditure minus total benefits.	

Note that the level of activity and costs that would potentially move out of the system has not been modelled at this stage, since the scale of this and the sites affected would be dependent on site-specific modelling. This will be assessed in the next stage of the analysis'.

HSR analysis

The table below presents a description of the different areas considered in the financial cost-benefit analysis



Finance area	Description
Capital expenditure	Costs required to accommodate the reconfigured service on another site. These are developed based on the additional number of beds required. If the receiving site has no spare space, the incoming bed would be a new build and cost £750k. If the receiving site has spare space but not in the same department, the spare bed would need to be refurbished for £375k (50% of new build cost). If the receiving site has spare space in the same department, the incoming bed could be accommodated for no cost.
Annualised capital expenditure	Revenue cost of the capital expenditure required to accommodate the reconfigured service on another site. These are equally phased over a 10-year period.
Fixed cost savings	Savings generated by spare capacity when activity is shifted out of a site. This has been estimated on the basis of a percentage reduction in beds associated with the activity that is shifted out. The % reduction is quantified only for the spare capacity that generated the requirement for a new build bed at the receiving site. Note that fixed costs are typically around 20% of total costs.
Total capacity impact	The combination of annualised capital expenditure and fixed cost savings.
Expenditure after reconfiguration	Baseline expenditure minus total benefits and capacity impact.
Impact of reconfiguration	**Expenditure after reconfiguration minus baseline expenditure.**
Transition costs	Estimated as 6 months of double-running for the reconfigured service.

3.HSR analysis – Financial analysis

The financial analysis focuses on the cost impacts of the different scenarios

The following slides show the impacts of the different scenarios considered (1,2 or 3 sites fewer*) under three lenses:

Base-case out-of-hospital shifts

- Activity reductions of c.12% on average, based on the SYB(ND) STP assumptions.

Stretch out-of-hospital shifts

- HSR sensitivity: doubling the impact of the base-case out-of-hospital assumptions c. 24%.

3.HSR analysis – Bed impacts

Given limited spare capacity in the system, most scenarios would result in additional capacity being required…

Amount of additional inpatient capacity, after using up any spare capacity

UEC		
1 site fewer	2 sites fewer	3 sites fewer
11-1,074 beds	**164 – 1,428 beds**	**410-1,746 beds**

These beds represent activity related to Type 1 and Type 2 admissions. Due to limited spare capacity in the system, most of the activity shifted would generate a requirement for additional capacity at the receiving site.

Care of the Acutely Ill Child		
1 site fewer	2 sites fewer	3 sites fewer
3-76 beds	**3-98 beds**	**9-99 beds**

These beds represent activity related to long-stay paediatrics beds. Due to limited spare capacity in the system, most of the activity shifted would generate a requirement for additional capacity at the receiving site.

Maternity		
1 site fewer	2 sites fewer	3 sites fewer
16-199 beds	**43-260 beds**	**56-307 beds**

These beds represent activity related to consultant led births and neonatology. Due to limited spare capacity in the system, most of the activity shifted would generate a requirement for additional capacity at the receiving site.

GI bleed		
1 site fewer	2 sites fewer	3 sites fewer
0-3 beds	**1-4 beds**	**2-6 beds**
Elective endoscopy		
1 site fewer	2 sites fewer	3 sites fewer
3-25 beds	**7-38 beds**	**12-48 beds**

These beds represent activity related to out-of-hours GI bleed and Endoscopy/Colonoscopy/Sigmoidoscopy. Due to limited spare capacity in the system, most of the activity shifted would generate a requirement for additional capacity at the receiving site, although volumes are extremely small.

Source: HSR Analysis

Comments

- After accounting for growth, changes in bed utilisation and the impact of out-of-hospital schemes the system requires additional inpatient capacity.
- This limits the ability to accommodate additional services at any particular site without having to incur capital expenditure.

Note: *the activity figures use data from 16/17 Reference Costs.*

3.HSR analysis – Bed impacts

….this could be partially offset by a greater impact of OOH schemes…

Amount of additional inpatient capacity, after using up any spare capacity

UEC		
1 site fewer	2 sites fewer	3 sites fewer
0-835 beds	**54 – 1,135 beds**	**263-1,330 beds**

Care of the Acutely Ill Child		
1 site fewer	2 sites fewer	3 sites fewer
0 beds	**0-23 beds**	**0-23 beds**

Maternity		
1 site fewer	2 sites fewer	3 sites fewer
0-124 beds	**0-185 beds**	**0-232 beds**

GI bleed		
1 site fewer	2 sites fewer	3 sites fewer
0 beds	**0 beds**	**0 beds**

Elective endoscopy		
1 site fewer	2 sites fewer	3 sites fewer
0 beds	**0 beds**	**0 beds**

Source: HSR Analysis

Comments

- Greater impacts of out-of-hospital schemes (c.24% vs c.12%)* could contribute to generating spare capacity – reducing capital expenditure required
- Capacity modelling for UEC considers the beds which would be impacted if an ED would be changed into an UTC. Therefore the bed numbers reflect the activity associated with admissions via the ED (non-elective activity).
- **The South Yorkshire and Bassetlaw STP assumes that activity reductions of c.12% on average could be achieved by 2021/22 as a result of investing in out-of-hospital (OOH) schemes. However, because the current STP assumption on the impact of OOH schemes does not free up any capacity across the system, the HSR has considered the potential impact of more ambitious OOH schemes (working assumption of 24% activity reduction).*

Note: *the activity figures use data from 16/17 Reference Costs.*

3.HSR analysis – Financial impacts

With limited spare capacity in the system, most scenarios would require additional investment to be undertaken…

Summary impacts (with annualised cost of capital)

UEC		
1 site fewer	2 sites fewer	3 sites fewer
-£0.3m to **£62.9m**	**£8.1m** to **£84.3m**	**£22.7m** to **£103.9m**

The workforce analysis identified the potential to achieve an average c.20% workforce efficiencies and service model benefits on Type 1 and Type 2 activity. This offsets a proportion of the capital requirement to build new capacity. In addition, more ambitious out-of-hospital impacts could further reduce capital expenditure required.

Care of the Acutely Ill Child		
1 site fewer	2 sites fewer	3 sites fewer
£0.3m to **£3.3m**	**£0.3m** to **£4.6m**	**£0.8m** to **£5.0m**

There is limited scope for workforce efficiencies and service model benefits for this service due to the high levels of consultant requirements in inpatient units and SSPAUs. Capital requirements are slightly mitigated by the spare capacity available at one of the providers. In addition, more ambitious out-of-hospital impacts could further reduce capital expenditure.

Maternity		
1 site fewer	2 sites fewer	3 sites fewer
£1.2m to **£12.2m**	**£2.4m** to **£15.9m**	**£4.3m** to **£18.8m**

There is limited scope for workforce efficiencies and service model benefits for this service due to the investment in midwives required and the growing levels of consultant presence as units sizes grow. The finance impact is largely driven by the requirement to build new capacity and, if out-of-hospital services delivered more ambitious targets, refurbish existing beds.

GI bleed		
1 site fewer	2 sites fewer	3 sites fewer
£0.1m to **£0.2m**	**£0.2m** to **£0.4m**	**£0.2m** to **£0.5m**

Elective endoscopy		
1 site fewer	2 sites fewer	3 sites fewer
£0.4m to **£1.8m**	**£0.5m** to **£2.6m**	**£1.2m** to **£3.2m**

There is limited scope for workforce efficiencies and service model benefits for this service given the low levels of activity that moves. The finance impact is largely driven by the requirement to build new capacity and, if out-of-hospital services delivered more ambitious targets, refurbish existing beds.

Comments

- After accounting for growth, changes in bed utilisation and the impact of out-of-hospital schemes the system requires additional inpatient capacity
- This limits the ability to accommodate additional services at any particular site without having to incur capital expenditure
- Note these assessments do not account for transition costs (assumption of 6 months of double-running across sites) – these are reported in the Appendix
- Note that these tables include the annualised cost of capital.

Source: HSR Analysis

Legend **Financial saving** | **Cost impact <= £1m** | **Cost impact > £1m**

3.HSR analysis – Financial impacts

….this could be partially offset by a greater impact of OOH schemes…

Summary impacts (with annualised cost of capital)

UEC		
1 site fewer	2 sites fewer	3 sites fewer
-£1.2m to **£48.1m**	**£2.3m** to **£65.7m**	**£15.2m** to **£76.9m**

Care of the Acutely Ill Child		
1 site fewer	2 sites fewer	3 sites fewer
£0.1m to **£2.6m**	**£0.1m** to **£4.2m**	**£0.3m** to **£4.6m**

Maternity		
1 site fewer	2 sites fewer	3 sites fewer
£0.6m to **£10.9m**	**£1.7m** to **£14.6m**	**£3.0m** to **£17.4m**

GI bleed		
1 site fewer	2 sites fewer	3 sites fewer
£0.0m to **£0.0m**	**£0.0** to **£0.1m**	**£0.0** to **£0.2m**

Elective endoscopy		
1 site fewer	2 sites fewer	3 sites fewer
£0.0m to **£0.8m**	**£0.0m** to **£1.2m**	**£0.3m** to **£1.5m**

Comments

- Greater impacts of out-of-hospital schemes (c.24% vs c.12%)* could contribute to generating spare capacity – reducing capital expenditure required
- Note these assessments do not account for transition costs (assumption of 6 months of double-running across sites) – these are reported in the Appendix
- Note that these tables include the annualised cost of capital.
- ** See note on previous slide*

Source: HSR Analysis

Legend **Financial saving** | **Cost impact <= £1m** | **Cost impact > £1m**

3. HSR analysis

UEC – base case

This analysis considers the impact (which is derived from workforce efficiencies and service model benefits) and compares that against expenditure (which is largely made up of capital expenditure and any applicable transition costs).

£m	1 site - small	1 site - large	2 site - small	2 site - large	3 site - small	3 site - large	Comment
Baseline expenditure	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	*The workforce analysis identified the potential to achieve an average c.20% workforce efficiencies and service model benefits on Type 1 and Type 2 activity. This offsets a proportion of the capital requirement to build new capacity. In addition, more ambitious out-of-hospital impacts could further reduce capital expenditure required.*
Leakage	*To be modelled in next stage*						
Workforce efficiencies & service model benefits	-£1.3	-£1.3	-£2.0	-£2.2	-£2.7	-£2.9	
Total benefits	-£1.3	-£1.3	-£2.0	-£2.2	-£2.7	-£2.9	
Impact before capacity changes	£2,303.0	£2,302.9	£2,302.3	£2,302.0	£2,301.5	£2,301.3	
Capex requirement							
Capital expenditure	£9.8	£807.0	£124.5	£1,071.8	£309.0	£1,311.0	*Due to limited spare capacity in the system, most of the activity shifted would need a new build bed. More ambitious out-of-hospital plans would free up capacity in non-elective wards, lowering overall capital requirements.*
Annualised capital expenditure	£1.0	£80.7	£12.5	£107.2	£30.9	£131.1	
Fixed cost savings	£0.0	-£16.5	-£2.4	-£20.7	-£5.5	-£24.3	
Total capacity impact	£1.0	£64.2	£10.1	£86.5	£25.4	£106.8	
Expenditure after reconfiguration	£2,303.9	£2,367.1	£2,312.4	£2,388.5	£2,326.9	£2,408.1	
Impact of reconfiguration	**-£0.3**	**£62.9**	**£8.1**	**£84.3**	**£22.7**	**£103.9**	
Transition costs	£15.9	£207.5	£40.4	£261.1	£80.2	£306.1	

3. HSR analysis

Care of the Acutely Ill Child – base case

This analysis considers the impact (which is derived from workforce efficiencies and service model benefits) and compares that against expenditure (which is largely made up of capital expenditure and any applicable transition costs).

£m	1 site - small	1 site - large	2 site - small	2 site - large	3 site - small	3 site - large	Comment
Baseline expenditure	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	*There is limited scope for workforce efficiencies and service model benefits for this service due to the high levels of consultant requirements in inpatient units and SSPAUs. Capital requirements are slightly mitigated by the spare capacity available at one of the providers. In addition, more ambitious out-of-hospital impacts could further reduce capital expenditure required.*
Leakage	*To be modelled in next stage*						
Workforce efficiencies & service model benefits	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0	
Total benefits	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0	
Impact before capacity changes	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	
Capital expenditure	£3.0	£58.5	£3.0	£74.3	£7.5	£80.3	*One provider is currently operating at bed utilisation levels below 85%. This enables it to accommodate a degree of paediatrics capacity at no capital expenditure. More ambitious out-of-hospital plans would free up capacity, lowering capital requirements.*
Annualised capital expenditure	£0.3	£5.9	£0.3	£7.4	£0.8	£8.0	
Fixed cost savings	£0.0	-£2.6	£0.0	-£2.9	£0.0	-£3.0	
Total capacity impact	£0.3	£3.3	£0.3	£4.6	£0.8	£5.0	
Expenditure after reconfiguration	£2,304.5	£2,307.5	£2,304.5	£2,308.8	£2,305.0	£2,309.2	
Impact of reconfiguration	**£0.3**	**£3.3**	**£0.3**	**£4.6**	**£0.8**	**£5.0**	
Transition costs	£0.5	£33.1	£1.4	£35.4	£3.6	£36.7	

Capex requirement

3. HSR analysis

Maternity – base case

This analysis considers the impact (which is derived from workforce efficiencies and service model benefits) and compares that against expenditure (which is largely made up of capital expenditure and any applicable transition costs).

£m	1 site - small	1 site - large	2 site - small	2 site - large	3 site - small	3 site - large	Comment
Baseline expenditure	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	*There is limited scope for workforce efficiencies and service model benefits for this service due to the investment in midwives required and the growing levels of consultant presence as units sizes grow. The finance impact is largely driven by the requirement to build new capacity and, if out-of-hospital services delivered more ambitious targets, refurbish existing beds.*
Leakage	*To be modelled in next stage*						
Workforce efficiencies & service model benefits	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0	
Total benefits	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0	
Impact before capacity changes	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	
Capex requirement							
Capital expenditure	£13.5	£150.8	£33.8	£195.8	£52.5	£231.0	*Due to limited spare capacity in the system, most of the activity shifted would need a new build bed. More ambitious out-of-hospital plans would free up capacity but not on maternity wards, lowering capital requirements at refurbishment levels.*
Annualised capital expenditure	£1.4	£15.1	£3.4	£19.6	£5.3	£23.1	
Fixed cost savings	-£0.2	-£2.9	-£1.0	-£3.6	-£0.9	-£4.3	
Total capacity impact	£1.2	£12.2	£2.4	£15.9	£4.3	£18.8	
Expenditure after reconfiguration	£2,305.4	£2,316.4	£2,306.7	£2,320.2	£2,308.6	£2,323.1	
Impact of reconfiguration	**£1.2**	**£12.2**	**£2.4**	**£15.9**	**£4.3**	**£18.8**	
Transition costs	£1.8	£29.0	£6.8	£40.2	£14.1	£46.6	

3. HSR analysis

GI bleed – base case

This analysis considers the impact (which is derived from workforce efficiencies and service model benefits) and compares that against expenditure (which is largely made up of capital expenditure and any applicable transition costs).

£m	1 site - small	1 site - large	2 site - small	2 site - large	3 site - small	3 site - large	Comment
Baseline expenditure	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	*There is limited scope for workforce efficiencies and service model benefits for this service. The finance impact is largely driven by the requirement to build new capacity and, if out-of-hospital services delivered more ambitious targets, refurbish existing beds.*
Leakage	*To be modelled in next stage*						
Workforce efficiencies & service model benefits	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0	
Total benefits	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0	
Impact before capacity changes	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	
Capex requirement							
Capital expenditure	£0.8	£2.3	£1.5	£3.8	£1.5	£4.5	*Due to limited spare capacity in the system, most of the activity shifted would need a new build bed. More ambitious out-of-hospital plans would free up capacity, lowering overall capital requirements.*
Annualised capital expenditure	£0.1	£0.2	£0.2	£0.4	£0.2	£0.5	
Fixed cost savings	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0	
Total capacity impact	£0.1	£0.2	£0.2	£0.4	£0.2	£0.5	
Expenditure after reconfiguration	£2,304.3	£2,304.5	£2,304.4	£2,304.6	£2,304.4	£2,304.7	
Impact of reconfiguration	**£0.1**	**£0.2**	**£0.2**	**£0.4**	**£0.2**	**£0.5**	
Transition costs	£0.1	£0.8	£0.3	£1.2	£0.5	£1.5	

3. HSR analysis

Elective Endoscopy – base case

This analysis considers the impact (which is derived from workforce efficiencies and service model benefits) and compares that against expenditure (which is largely made up of capital expenditure and any applicable transition costs).

£m	1 site - small	1 site - large	2 site - small	2 site - large	3 site - small	3 site - large	Comment
Baseline expenditure	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	*There is limited scope for workforce efficiencies and service model benefits for this service. The finance impact is largely driven by the requirement to build new capacity and, if out-of-hospital services delivered more ambitious targets, refurbish existing beds.*
Leakage	*To be modelled in next stage*						
Workforce efficiencies & service model benefits	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0	
Total benefits	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0	
Impact before capacity changes	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	£2,304.2	
Capex requirement							
Capital expenditure	£3.8	£20.3	£6.8	£30.0	£11.6	£36.8	*Due to limited spare capacity in the system, most of the activity shifted would need a new build bed. More ambitious out-of-hospital plans would free up capacity, lowering overall capital requirements.*
Annualised capital expenditure	£0.4	£2.0	£0.7	£3.0	£1.2	£3.7	
Fixed cost savings	£0.0	-£0.2	-£0.2	-£0.4	£0.0	-£0.5	
Total capacity impact	£0.4	£1.8	£0.5	£2.6	£1.2	£3.2	
Expenditure after reconfiguration	£2,304.6	£2,306.1	£2,304.8	£2,306.9	£2,305.4	£2,307.4	
Impact of reconfiguration	**£0.4**	**£1.8**	**£0.5**	**£2.6**	**£1.2**	**£3.2**	
Transition costs	£2.4	£10.0	£3.1	£12.6	£6.2	£15.4	

Next steps required to develop site-specific analysis

HSR analysis

The following next steps need to be undertaken in order to finalise the analysis and reach pre-consultation stage

Baseline finance and activity. A financial gap baselining exercise would need be undertaken, to revise and confirm the assumptions used in the first stage of the analysis and align these across the system. This would result in a revised Year 0 and Year 5 position, to use as a basis for analysing the impact of the solutions.

Baseline workforce. Understanding the critical workforce gaps and challenges will be a key part of the programme. A set of recommended staffing levels for each service under consideration should be agreed by the system, and revised consolidation benefits estimated on this basis. Such analysis would need to be undertaken at PCBC stage where the scenarios become site-specific.

Defining solutions. At this stage it will be important to agree on the level of CIPs, out-of-hospital models of care, as well as the service reconfiguration options in more detail, specific to each site. For the latter it will be important to understand the proposed model for each service, the options for each service, as well as overall options across all services.

Solutions modelling. At this stage it will be important to understand the financial, activity and clinical impacts of the overall model of care at the health economy level, taking into account opex and capex, and assumptions about phasing of impacts and transition costs. Organisational level impacts could also be developed if organisations agree on pricing models.

Stakeholder engagement. It will be essential to the programme that financial and clinical leads continue to be engaged throughout, to sense-check the methodology and any outputs of the analysis, as well as provide guidance in their areas of expertise.

Key interdependencies. The system will need to agree a list of options and a set of evaluation criteria. It may be best to focus the modelling and analysis on a short list of options (and the do nothing scenario) rather than the long list. The analysis at the next stage needs to look at complete and coherent sets of potential solutions, taking into account the interdependencies across each site, rather than seeking to model impacts of services individually.

Appendix: Additional finance assumptions

HSR analysis

There are currently significant limitations to this initial financial analysis

Limitations and assumptions of this initial analysis

1. **Data sources.** The analysis was developed using reference cost data, STP financial forecasts and SLR information where provided (Barnsley). HES/SUS/wider SLR data could not be used as not all Trusts provided the information.
2. **Financial challenge.** The estimates of the 5-year financial challenge were taken from the model developed as part of the STP process. Information was available solely for overall income and expenditure under a do-nothing and a 'do-something' scenarios (after CIPs and out-of-hospital schemes). 21/22 was not estimated as part of the STP process and has been projected based on the latest trend.
3. **Stretch out-of-hospital impact.** The impact of the stretch out-of-hospital scenario on the provider cost base has been estimated by proportionately increasing the impact of these solutions (x2).
4. **Split of Doncaster, Bassetlaw and Montague cost base.** The Trust-level financial projections and service-level reference costs have been apportioned to the different sites using planned capacity figures.
5. **Apportionment to HSR services.** The STP provider financial projections have been apportioned to the services considered as part of the HSR by using Reference Costs dataset.
6. **Split of total cost across fixed, semi-fixed and variable.** Barnsley SLR was used to estimate the proportion of each service costs.
7. **Workforce efficiencies & service model benefits application.** The workforce efficiencies and service model benefits derived from the workforce analysis have been applied to the proportion of semi-fixed costs related to staffing of the impacted providers. This has been done after having normalised the system-wide impacts to capture the impacted sites and having taken the average of the three scenarios considered.
8. **Split of A&E Type 1, 2 and 3 costs.** The split of total costs identified through Reference Costs dataset has been adjusted to reflect activity volumes weighted by cost as the costs.
9. **Alignment of workforce and finance analysis.** It has been assumed that the STP baseline finance analysis has incorporated similar assumptions in terms of workforce growth as the ones presented in the pack.
10. **Fixed costs savings.** Fixed cost savings have been estimated only when leaving capacity/beds generated a new build at the receiving site.
11. **New build and refurbishment costs.** New build and refurbishment costs have been developed based on publically available information (examples below) on business cases and capital development programmes and stakeholder engagement.
12. **Capital expenditure.** Estimates capture the capital costs related to areas such as cubicles, theatres, equipment etc. through the number of beds and new build/refurb costs associated with that. These additional areas have not been assessed separately as part of this analysis.
13. **Alignment of financial and workforce pay assumptions.** The financial analysis uses Reference Costs, STP financial projections and SLR information provided. The costs identified through these datasets have been sense-checked against workforce figures, high-level pay assumptions (publically available) and locum/substantive pay provided by Trusts in April 2018. A full reconciliation of these different estimates has not been undertaken.
14. **Reviews.** Whilst the results have been shared with Directors of Finance, the analysis has received limited QA.

https://www.healthiernorthwestlondon.nhs.uk/sites/nhsnwlondon/files/documents/PAPER%203_3%2020120610_Estates_Strategy_Programme_%20Board_Presentation_v1.0_final.pdf
https://www.stgeorges.nhs.uk/wp-content/uploads/2014/11/TBR-27.11.14-Paper-10-Adult-Critical-Care-Expansion-Plan-OBC.pdf
http://hertsvalleysccg.nhs.uk/publications/your-care-your-future
https://www.northhampshireccg.nhs.uk/wp-content/uploads/2017/12/PRESENTATION-Transforming-Care-Services-in-North-and-Mid-Hampshire-Joint-Governing-Bodies-Meeting.pdf
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/144106/Healthcare_premises_cost_guides.pdf

3. HSR analysis

UEC – out-of-hospital stretch assumption

This analysis considers the impact (which is derived from workforce efficiencies and service model benefits) and compares that against expenditure (which is largely made up of capital expenditure and any applicable transition costs).

£m	1 site - small	1 site - large	2 site - small	2 site - large	3 site - small	3 site - large
Baseline expenditure	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4
Leakage			*To be modelled in next stage*			
Workforce efficiencies & service model benefits	-£1.2	-£1.3	-£1.9	-£2.1	-£2.6	-£2.8
Total benefits	-£1.2	-£1.3	-£1.9	-£2.1	-£2.6	-£2.8
Impact before capacity changes	£2,188.2	£2,188.1	£2,187.5	£2,187.2	£2,186.8	£2,186.6
Capex requirement						
Capital expenditure	£0.0	£626.3	£41.3	£851.3	£197.3	£999.0
Annualised capital expenditure	£0.0	£62.6	£4.1	£85.1	£19.7	£99.9
Fixed cost savings	£0.0	-£13.3	£0.0	-£17.3	-£2.0	-£20.2
Total capacity impact	£0.0	£49.4	£4.1	£67.9	£17.8	£79.7
Expenditure after reconfiguration	£2,188.2	£2,237.5	£2,191.6	£2,255.1	£2,204.6	£2,266.2
Impact of reconfiguration	**-£1.2**	**£48.1**	**£2.3**	**£65.7**	**£15.2**	**£76.9**
Transition costs	£15.0	£196.9	£38.3	£247.7	£76.0	£291.0

3. HSR analysis

Care of the Acutely Ill Child – out-of-hospital stretch assumption

This analysis considers the impact (which is derived from workforce efficiencies and service model benefits) and compares that against expenditure (which is largely made up of capital expenditure and any applicable transition costs).

£m	1 site - small	1 site - large	2 site - small	2 site - large	3 site - small	3 site - large
Baseline expenditure	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4
Leakage			*To be modelled in next stage*			
Workforce efficiencies & service model benefits	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0
Total benefits	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0
Impact before capacity changes	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4
Capex requirement						
Capital expenditure	£0.8	£25.9	£0.8	£42.0	£2.6	£46.1
Annualised capital expenditure	£0.1	£2.6	£0.1	£4.2	£0.3	£4.6
Fixed cost savings	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0
Total capacity impact	£0.1	£2.6	£0.1	£4.2	£0.3	£4.6
Expenditure after reconfiguration	£2,189.5	£2,192.0	£2,189.5	£2,193.6	£2,189.6	£2,194.0
Impact of reconfiguration	**£0.1**	**£2.6**	**£0.1**	**£4.2**	**£0.3**	**£4.6**
Transition costs	£0.5	£31.4	£1.4	£33.6	£3.4	£34.8

3. HSR analysis

Maternity – out-of-hospital stretch assumption

This analysis considers the impact (which is derived from workforce efficiencies and service model benefits) and compares that against expenditure (which is largely made up of capital expenditure and any applicable transition costs).

£m	1 site - small	1 site - large	2 site - small	2 site - large	3 site - small	3 site - large
Baseline expenditure	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4
Leakage			*To be modelled in next stage*			
Workforce efficiencies & service model benefits	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0
Total benefits	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0
Impact before capacity changes	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4
Capex requirement						
Capital expenditure	£6.4	£121.5	£16.5	£167.3	£30.4	£202.5
Annualised capital expenditure	£0.6	£12.2	£1.7	£16.7	£3.0	£20.3
Fixed cost savings	£0.0	-£1.2	£0.0	-£2.1	£0.0	-£2.8
Total capacity impact	£0.6	£10.9	£1.7	£14.6	£3.0	£17.4
Expenditure after reconfiguration	£2,190.0	£2,200.3	£2,191.0	£2,204.0	£2,192.4	£2,206.8
Impact of reconfiguration	**£0.6**	**£10.9**	**£1.7**	**£14.6**	**£3.0**	**£17.4**
Transition costs	£1.7	£27.5	£6.4	£38.1	£13.5	£44.2

3. HSR analysis

GI bleed – out-of-hospital stretch assumption

This analysis considers the impact (which is derived from workforce efficiencies and service model benefits) and compares that against expenditure (which is largely made up of capital expenditure and any applicable transition costs).

£m	1 site - small	1 site - large	2 site - small	2 site - large	3 site - small	3 site - large
Baseline expenditure	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4
Leakage			*To be modelled in next stage*			
Workforce efficiencies & service model benefits	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0
Total benefits	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0
Impact before capacity changes	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4
Capital expenditure	£0.0	£0.0	£0.0	£0.8	£0.0	£1.5
Annualised capital expenditure	£0.0	£0.0	£0.0	£0.1	£0.0	£0.2
Fixed cost savings	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0
Total capacity impact	£0.0	£0.0	£0.0	£0.1	£0.0	£0.2
Expenditure after reconfiguration	£2,189.4	£2,189.4	£2,189.4	£2,189.5	£2,189.4	£2,189.5
Impact of reconfiguration	**£0.0**	**£0.0**	**£0.0**	**£0.1**	**£0.0**	**£0.2**
Transition costs	*£0.1*	*£0.8*	*£0.3*	*£1.2*	*£0.5*	*£1.5*

Capex requirement

3. HSR analysis

Elective Endoscopy – out-of-hospital stretch assumption

This analysis considers the impact (which is derived from workforce efficiencies and service model benefits) and compares that against expenditure (which is largely made up of capital expenditure and any applicable transition costs).

£m	1 site - small	1 site - large	2 site - small	2 site - large	3 site - small	3 site - large
Baseline expenditure	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4
Leakage			*To be modelled in next stage*			
Workforce efficiencies & service model benefits	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0
Total benefits	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0
Impact before capacity changes	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4	£2,189.4
Capex requirement						
Capital expenditure	£0.0	£7.5	£0.0	£11.6	£3.0	£14.6
Annualised capital expenditure	£0.0	£0.8	£0.0	£1.2	£0.3	£1.5
Fixed cost savings	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0
Total capacity impact	£0.0	£0.8	£0.0	£1.2	£0.3	£1.5
Expenditure after reconfiguration	£2,189.4	£2,190.1	£2,189.4	£2,190.5	£2,189.7	£2,190.8
Impact of reconfiguration	**£0.0**	**£0.8**	**£0.0**	**£1.2**	**£0.3**	**£1.5**
Transition costs	*£2.3*	*£9.5*	*£3.0*	*£11.9*	*£5.9*	*£14.6*

Appendix: Additional capacity workings and assumptions

HSR analysis – capacity assumptions

There are currently limitations to this initial analysis

Limitations of this initial analysis

1. **Data sources.** The analysis was developed using Reference Costs 2016-17 data and capacity. The trusts included in the analysis are: Doncaster and Bassetlaw, Rotherham, Sheffield Children's, Sheffield Teaching, Chesterfield and Barnsley. HES/SUS data was provided for some trusts but not all, as such it could not be used consistently for all organisations. Some Trusts provided revised activity estimates in April/May 2018, as such Reference Costs admissions were updated in line with these new estimates, and bed days were uplifted on the basis of the same length of stay as derived initially from Reference Costs.
2. **Activity and capacity reconciliation.** We have not reconciled activity and capacity data due to the limited information available within Reference Costs (e.g. no OPCS codes).
3. **Services captured**. The capacity (and finance) analysis captures a wider range of activity (e.g. all of paediatrics) and some interdependencies between services (e.g. neonatology) that has been accounted for in the workforce analysis. This was done to ensure a broader range of capital expenditure estimates.
4. **Non-elective beds.** We have identified the proportion of non-elective beds related to Type 1 and 2 A&E admissions using publically available data. This proportion has been used to estimate the number of beds related to these admissions without recognising the likely differential in length of stay (LoS). Type 1 and Type 2 generated admissions are likely to have longer LoS. This assumption can be improved by using SUS/HES data at the next stage of the analysis.
5. **Service definition.** The activity related to the services in the scope of this review has been identified through a combination of rules based on HRGs and LoS. These rules have been tested with the HSR Steering Group and would need to be refined and ideally updated through the use of a more suitable rule-set (e.g. based on diagnosis and OPCS codes).
6. **Utilisation levels.** These assumptions were identified through publicly available data rather than data supplied by the Trusts and do not reflect any potential differences in utilisation rates across departments within the Trusts.
7. **Leakage.** The analysis currently does not assume any activity leakage to out-of-area providers. This would be included as modelling becomes site-specific in the next stage of the analysis.
8. **Out-of-hospital (OOH) impacts.** Assumptions on the impact of out-of-hospital schemes have been mapped at point of delivery level to the services in scope of this review.
9. **Trust level.** The analysis is currently undertaken at Trust rather than site level (except Doncaster and Bassetlaw which has been split into sites based on high-level assumptions provided by the Trust).
10. **Activity flows.** Whenever a provider sends out its activity, 100% of it is assumed to flow to the nearest site which currently provides this service. This assumption does not account for a difference in the travel time from patient's homes and as such the receiving provider is the closest destination only for a fraction of shifted activity. As such, modelled beds are likely to overestimate the impact on the receiving provider and underestimate capacity requirement for other sites in the system.
11. **Travel times.** In some instances there may be more than one equally-distant provider from the site shifting its activity away. In such cases, 100% of shifted activity was assumed to flow to the largest of the equally-distant providers for the reasons of consistency with overall rule on activity moving to the single nearest provider. This may result in overestimation of capacity requirement for the receiving site and underestimate the impact on other providers.
12. **Activity leakage out of system.** This initial analysis treats the system in isolation and does not account for the fact that for some patients the next closest provider might be outside the system in consideration. Assuming 0% leakage from the system is likely to result in overestimation of capacity requirement for the receiving sites.
13. **Scenario ranking.** The non-site specific nature of this analysis and the travel time rules to the nearest site from the smallest / largest provider(s) may result in a situation where the capacity requirement is non-linear across scenarios. For example, it may be possible for a "3 less sites" scenario to result in a smaller overall capacity requirement for the system relative to the "2 less sites". This is because the activity flows to the nearest provider currently offering the service even if there is another eligible site in the system with more spare capacity.

HSR analysis – capacity assumptions

A number of additional assumptions have been used in order to undertake the analysis – these will need to be refined at a later stage of the analysis

Further assumptions

1. The **service definitions** were revised and circulated to HSR stakeholders. These expand on the initial definitions and some clinical dependencies were also assumed to be in scope (e.g. maternity and neonatology were assumed to be clinically dependent).
2. Activity captured under the following **departments in Reference Costs 2016-17** has been included: EL, NEL, EL_XS, NEL_XS, DC, NES, CC, REHABL1, REHABL2, REHABL3.
3. Activity recorded within EL_XS, NEL_XS, CC, REHABL1, REHABL2, REHABL3 was interpretad as bed days.
4. Activity shifted out of one site has been assumed to move to the next nearest site (as opposed to it being distributed equally to all other sites). The nearest site was estimated based on Google Maps driving travel times, at around 2-3pm on a Monday. This does not take into account travel times at peak times during the day, which may influence the designation of the closest site.
5. Only the sites that currently provide a service are assumed to be able to receive activity for that particular service. For example, SCH is assumed to be able to receive paediatric activity only, but no stroke, maternity, gastro or A&E activity. However, no assumptions/restrictions were applied to activity being sent out of any particular sites. For example SCH can send out paediatric inpatient activity to other sites and no assumption is made about the percentage of activity that is specialised. These assumptions would need to be refined at a later stage, once the reconfiguration scenarios are made site specific.
6. In terms of activity shifts, the following assumptions were used:
    a) Elective endoscopy was treated separately to non-elective endoscopy, a subset of the latter being captured under urgent GI bleeds (which are further assumed to the non-elective). This subset is the out of hours (OOH) activity, assumed to be 28% of total activity. This figure is an average of OOH A&E attendances across the 6 trusts, with OOH taken to mean activity between 8pm and 8am. A&E attendances are used as a proxy for urgent GI bleeds admissions, as patients are likely to present themselves to A&E before being admitted to hospital. The underlying assumption is that admissions from A&E are distributed evenly at all hours of the day, any day of the week.
    b) For maternity, activity deemed to be low-risk (and thus attributed to an MLU according to the service definition) is not shifted between sites. The CLU activity (medium or high risk) will move to wherever the closest CLU is; the MLU activity remains to be addressed in each site - either in MLU alongside CLU or if there is no CLU, the assumption is that there will be a stand-alone MLU.
    c) Other NEL indirectly in scope is 73% of total Other NEL bed days. This is based on the average share of emergency admissions from Type 1 and Type 2 A&E at an average Trust in England.
7. Assumptions provided by Doncaster & Bassetlaw NHS FT on bed capacity by site and service were used to split Reference Cost data, which is only available at trust level. Activity at Sheffield Teaching Hospitals NHS FT was not split by site.
8. MLU activity was revised to 22.5% of total activity, based on conversations with clinicians in March-May 2018. Literature suggests a two-thirds in general are a lower risk, and so there may be other changes to clinical models that increases the share of MLU births that could be factored into analysis at later stage.
9. **Alignment of scenarios between capacity and workforce modelling**. In some cases, due to service definition and/or Reference Costs data anomalies, the scenarios picked up in the capacity analysis are not fully aligned to the workforce modelling scenarios.

HSR analysis

Baseline capacity is activity-based and derived from Reference Costs 2016-17 data

Services in scope

Service Group	Service
GI bleed	GI bleed, Colonoscopy, Sigmoidoscopy
Paediatrics	Paeds SS, Paeds LS, Paediatric CC,
Stroke	HASU / ASU, Stroke Rehab, TIA
Maternity	CLU, MLU, Neonatology, Neonatology CC,
Elective Endoscopy	EL Endoscopy
Other NEL	73% of other NEL activity including Adult CC

Operational assumptions

Metric	BAR	ROT	DON	CHE	STH	SCH	BAS	MON
Utilisation rate	87.1%	88.3%	83%	91.9%	92.6%	73.5%	83%	83%
Target utilisation	85%	85%	85%	85%	85%	85%	85%	85%
Throughput	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40

HSR analysis

Activity shift assumptions inform reconfiguration scenarios

These assumptions were tested with the Steering Group and have been used to categorise activity

Service	**HRG codes defining the service**
Endoscopy	All HRG codes within Subchapters FE and GB, excluding Colonoscopy and Sigmoidoscopy
Neonatology - CLU dependency	All HRG codes within Subchapter PB
Other	All Other HRG codes within NEL, EL, NEL_XS, EL_XS, NES, DC, CC, REHABL1, REHABL2, REHABL3 which do not fall into definitions of any other service in this table
PaedSS	All HRG codes within Subchapter PC-PX within NES or DC departments or with average LOS<2
PaedLS	All HRG codes within Subchapter PC-PX with average length of stay of at least 2
Neonatology CC - CLU dependency	All HRG codes within Subchapter XA
Paediatric CC	All HRG codes within Subchapter XB
CLU dependency	All HRG codes within NZ17-26 (A,B) and NZ27Z, NZ71Z, NZ72Z, MA18D, MA20Z, MB08A, MB08B
Colonoscopy/Sigmoidoscopy	All HRG codes referring to “Colonoscopy” or “Sigmoidoscopy”
GI bleed	All HRG codes referring to “Gastrointestinal Bleed”
MLU / CLU	NZ16Z, NZ21Z, NZ25Z
HASU /ASU if required	All AA22, AA23 and AA35 HRG codes
Adult CC	All HRG codes within Subchapter XC
High/Medium risk (CLU)	All NZ31 – NZ51 HRG codes
Low risk (MLU)	All NZ30 HRG codes
TIA	All AA29 HRG codes
Stroke rehab	All VC04 HRG codes

Appendix: Workforce data pack and assumptions

HSR analysis – UEC (1/3)

A number of key assumptions were required for this analysis

Key assumptions

1. The HSR assumes that each of the Urgent Treatment Centres (UTCs) are staffed by 6 GPs each, in addition to nurses, recognising this will depend on the service model and further recognising difficulties in recruiting GPs. This is a working assumption based on discussions with the trusts. The range provided by the trusts was 4 to 8, depending on the model of care, in particular support from ENPs, further depending on whether a service is co-located or on a different site, and further depending on activity (e.g. for co-located UTCs the requirement could be higher). The future service model will further need to balance out GPs against ED consultants, taking into account growth in workforce and the use of ENPs in the UTCs. The GP staffing assumptions will be refined at the next stage of the analysis, when the service model for the UTCs is further defined by the NHS England and SYB(ND).
2. SCH is not in scope of the A&E (adults) reconfiguration and remains a fixed point. As such SCH's UEC workforce and activity were not considered in the analysis.
3. Feedback from the trusts cite total budgeted FTE numbers might look small compared to guidelines because of difficulties in recruitment. The service has been tailored to match the staffing structure.
4. At this stage in the analysis, is no consideration of ambulance journeys. This will need to be factored in at the next stage of the analysis.
5. A&E attendances (incl. UTC type attendances) were taken from Reference Costs 2016/17 and updated activity numbers were provided by Barnsley Hospital NHSFT and Chesterfield Royal Hospital NHSFT. The proportion of patients that could be seen in an UTC varies significantly, depending on the service model or local factors. The range of values provided by the trusts was generally within 20 to 25%, therefore an average of 22.5% was taken. This assumption will be refined at the next stage of the analysis when the UTC service model is further defined by the NHS England and SYB(ND).
6. Attendances deemed to be minor/low-risk (and thus could be treated in UTCs) are not shifted between sites. The A&E activity (major/high risk) will move to wherever the next closest A&E is; the UTC activity remains to be addressed in each site.
7. FTE rules were taken from the Royal College of Emergency Medicine (RCEM), 2015 (https://www.rcem.ac.uk/docs/Workforce/RCEM%20Rules%20of%20Thumb%20for%20Medical%20and%20Practitioner%20Staffing%20in%20EDs.pdf). Relationships for consultant workforce and other medical grades were inferred based on the examples given in the document.
8. Nursing requirements were not estimated at this stage of the analysis because growth assumptions were not provided by Health Education England (HEE), and because nurse numbers are linked to activity (and not a fixed FTE requirement) – no efficiencies can be gained upon reconfiguration. This would need to be refined in the future, as scenarios become site-specific. Note RH did not provide FTEs for nursing; the nursing FTEs were estimated using the average consultant to nurse ratio in the system (7 nurses for one consultant).

HSR analysis – UEC (2/3)

Staffing and activity assumptions

Assumptions

Table: Current establishment FTEs

Site	Total A&E attendances (incl. UTC type) in 16/17	A&E type activity in the scenarios[1]	UTC type activity in the scenarios[1]	Consultants Establishment FTEs	Other medical grades[2] Establishment FTEs	Nursing[3] Establishment FTEs
BH	83,545	64,747	18,798	11.8	18.7	53.2
DON	106,812	82,779	24,033	12.0	19.0	76.5
BAS	59,616	46,202	13,414	6.0	8.0	39.3
MON						
SCH						
STH	147,147	114,039	33,108	18.0	36.4	91.9
RH	76,970	59,652	17,318	10.0	20.0	88.4[4]
CRH	80,431	62,334	18,097	10.0	23.0	51.3

Source: Reference Costs for activity data, with updated figures from some of the trusts. For FTE values, trust returns from September 2017, with updates received in April/May 2018. No A&E at MON and SCH out of scope for A&E reconfiguration.

Notes: [1]Assuming 22.5% of current activity could be seen in UTCs, as per the previous slide. This reflects the scenarios rather than the status quo. [2]Other medical grades include trainee grades and staff grades. [3]Nursing FTEs presented for bands 5 and 6 (registered nurses). [4]RH did not provide numbers for budgeted nursing FTEs – the staff in post number was assumed to hold instead.

Table: Staffing "rules of thumb"

	60k ED - FTEs	100-120k ED - FTEs	*100% increase in activity[2] results in x% FTE increase*
Consultants	10	14 (12 to 16)	*40%*
Tier 3/4	12	15 (14 to 16)	*25%*
Tier 2 doctors/ANPs	12	20 (16-24)	*67%*
Tier 2 and tier 3/4 combined[1]	24	35	*46%*
ENPs	5 (4 to 6)	10 (8 to 12)	*100%*

Source: RCEM, 2015. "Rules of Thumb" for Medical and Practitioner Staffing in Emergency Departments. (https://www.rcem.ac.uk/docs/Workforce/RCEM%20Rules%20of%20Thumb%20for%20Medical%20and%20Practitioner%20Staffing%20in%20EDs.pdf).

Notes: [1]Combined and used as a proxy for "other medical grades". [2]Based on the two data points given (60k and 120k attendances), the activity to FTE relationships were estimated as per the last column in this table).

HSR analysis – UEC (3/3)

A number of additional assumptions have been used in order to undertake the analysis

Assumptions

Table: Current establishment consultant FTEs compared RCEM, 2015 *"Rules of Thumb" for Medical and Practitioner Staffing in Emergency Departments*

Site	Total A&E attendances (incl. UTC type) in 16/17	Consultants staff-in-post FTEs	Consultants establishment FTEs	Consultants recommended FTEs
BH	83,545	13.0	11.8	11.6
DON	106,812	9.0	12.0	13.1
BAS	59,616	4.0	6.0	10.0
MON				
SCH				
STH	147,147	16.0	18.0	18.0
RH	76,970	10.0	10.0	11.1
CRH	80,431	7.7	10.0	11.4
Total	**554,521**	**59.7**	**67.8**	**75.2**

Source: Reference Costs for activity data, with updated figures from some of the trusts. For FTE values, trust returns from September 2017, with updates received in April/May 2018.

Table: Current other medical grades and nursing FTEs

Site	Other medical grades staff-in post FTEs	Other medical grades establishment FTEs	Nursing staff-in post FTEs[2]	Nursing establishment FTEs[3]
BH	19.0	18.7	53.2	53.2
DON	16.0	19.0	72.9	76.5
BAS	8.9	8.0	37.3	39.3
MON				
SCH				
STH	33.7	36.4	91.2	91.9
RH	20.0	20.0	88.4	88.4[1]
CRH	26.0	23.0	47.3	51.3
Total	**123.6**	**125.0**	**390.2**	**400.5**

Source: Trust returns from September 2017, with updates received in April/May 2018.

Notes: [1]Not provided – assumed same as staff-in-post. [2]Other medical grades include trainee grades and staff grades. [3]This includes only bands 5 and 6 nurses (registered nurses).

HSR analysis – Paediatrics (1/4)

Activity and staffing assumptions

Key assumptions

1. Inpatient admissions (long and short stay) were taken from Reference Costs 2016/17 and updated activity numbers were provided by Barnsley Hospital NHSFT and The Rotherham NHS FT.
2. For SCH, an assumption of 60-40% was applied to split activity between general paediatric (60%) and specialist paediatric services (40%), the latter being out of scope. This is based on discussions with SCH clinicians.
3. Assumptions on activity split between Doncaster Royal Infirmary and Bassetlaw DGH were based on assumptions provided by Doncaster and Bassetlaw Teaching Hospitals NHS FT.
4. The assumption in the reconfiguration scenarios is that only IP activity is shifted across sites – each site keeps its SSPAU activity.
5. A consultant delivered SSPAU model, given the more senior input in clinical decisions, may result in lower inpatient admissions than what is currently reflected in the data.
6. Given the medical workforce may also cover neonatology rotas, and the data returns provided by the Trusts were unclear as to whether neonatology cover was included, the following assumptions were applied: if a site has a Level 1 Neonatology unit (Bassetlaw DGH), the medical workforce complement was assumed to provide a 70-30% split between paediatric services and neonatology cover. Chesterfield Royal provided updated FTE data separating acute paediatrics from community paediatrics and neonatology, and this updated data was used in the analysis. For all other trusts, with Level 2 or 3 Neonatology units, 100% of the workforce complement was assumed to be for paediatric cover. This is based on discussions with the clinical lead.
7. Consultant FTE example requirements as per the guidance produced by the RCPCH, 2011 *"Facing the Future: A Review of Paediatric Services.* https://www.rcpch.ac.uk/sites/default/files/page/FTF%20Full.pdf (Table 7).
8. In the absence of specific guidelines, the same proportion of consultant FTE impacts were assumed to apply to all other medical grades (staff grades, middle grade and junior doctors). Note however that the impact on FTE requirements could be even higher than for consultants because of guidelines requiring a patient to be seen within 4 hours. Other medical grades are the ones who typically see patients first, therefore the 4hour standard would affect them primarily, whereas consultants need to meet a 12h standard. Therefore once a threshold of activity is reached, there will be a requirement for another middle grade rota. This should be considered in more detail at the next stage of the analysis.
9. Where a site provided both IP and SSPAU, the recommended staffing complement was estimated based on the requirements of the different units separately accounting for synergies of c. 20% across an IP unit and a co-located SSPAU. This level of synergies will be investigated further at the next stage of the analysis.

HSR analysis – Paediatrics (2/4)

Activity and staffing assumptions

Key assumptions

1. The requirements for nursing staff complements is in line with activity and/or beds.
    1. In an SSPAU the children's nurse staffing for example should be a minimum of two children's nurses for every six to eight beds, with regular audit of patient acuity using appropriate tools to ensure that levels are appropriate for the number, dependency and case mix of infants, children and young people normally cared for by the service (RCPCH, 2017 *"Standards for Short-Stay Paediatric Assessment Units".* https://www.rcpch.ac.uk/system/files/protected/news/SSPAU%20College%20Standards%2021.03.2017%20final.pdf
    2. There should be a minimum of two registered children's nurses at all times in all inpatient and day care areas. In general children's wards and departments, bedside, deliverable hands-on care for children < 2 years of age 1:3 registered nurse:child, day and night; for children > 2 years of age 1:4 registered nurse:child, day and night (RCN, 2013 *"Defining staffing levels for children and young people's"* – currently under review). https://www.rcn.org.uk/professional-development/publications/pub-002172
2. There could be consolidation savings not accounted for in the analysis at this stage, depending on type of patients (their acuity/dependency level) and on whether the rotas are fully staffed currently. For example for nursing staff consolidation could lead to a higher number of nurses being required, depending on the number of high dependency patients at the receiving sites.
3. Whilst the analysis has not assumed any change in nursing requirements at this stage, note that this assumptions would only hold true under the following assumptions:
    - All trusts apply the same standards, incl. bed occupancy rate; and
    - Nurses are willing to move with the inpatient units where these are moved.

    This will be considered further in the next stage of the analysis.

HSR analysis – Paediatrics (3/4)

Activity and staffing assumptions

Assumptions

Table: Current establishment FTEs, paediatrics including neonatology at Barnsley and Chesterfield, and community paediatrics at Chesterfield

Site	Total activity in 16/17	Long-stay (IP) activity[1]	Short-stay (SSPAU) activity[1]	Consultants Establishment FTEs[4]	Other medical grades Establishment FTEs[4]	Nursing Establishment FTEs[5]
BH	3,217	507	2,710	8.0	19.3	26.8
DON	4,277	1,107[2]	3,170[3]	13.5	23.7	36.8
BAS	1,493	260[2]	1,233[3]	4.7	8.3	12.9
MON						
SCH	10,043	2,059	7,985	7.2	13.0	46.4
STH						
RH	3,833	1,675	2,158	7.7	18.0	27.3
CRH	4838	883	3,955	11.5	21.0	26.3

Source: Reference Costs for activity data, with updated figures from some of the trusts. For FTE values, trust returns from September 2017, with updates received in April/May 2018. No paediatric activity at STH and MON.

Notes: [1]Estimated from Reference Costs 2016/17. Short stay activity was defined as activity recorded under NES and NEL with LoS <2. Long-stay activity was defined as activity recorded under NEL with LoS >2. [2]FTEs apportioned on the basis of beds capacity at Bassetlaw and Doncaster Royal Infirmary. [3]FTEs apportioned on the basis of beds capacity at Bassetlaw and Doncaster Royal Infirmary. [4]Other medical grades include trainee grades and staff grades. [5]Nursing FTEs assumed to be bands 5 and 6 (registered nurses).

Table: Staffing requirements

	8 till late SSPAU with cons cover	24 / 7 Cons led SSPAU	Small / v. small	Medium	Large
Admissions per year	n/a	n/a	0-2500	2501-5000	>5000
WTE Consultants required	4.4	6.2	7.7	9.3	10.9

Source: RCPCH, 2011 "Facing the Future: A Review of Paediatric Services. https://www.rcpch.ac.uk/sites/default/files/page/FTF%20Full.pdf (Table 7).

Notes: From the same document, Table 3, the trainee paediatric workforce requirements are listed as 10 general tier 1 and 10 general tier 2 trainees per cell. It was assumed that this applied to medium size unit, with consultant FTE requirements of 9.3. As such the consultant to trainee medical grades ratio was estimated to be c. 1 to 2.2. This ratio was used for "other medical grades". Note that in practice for other medical grades the relationship requires local consideration, for example the middle grade rota could be partly staffed by nurse practitioners, as such the implications require further analysis.

HSR analysis – Paediatrics (4/4)

Staffing assumptions

Assumptions

Table: Current Consultant FTEs compared to RCPCH, 2011 "Facing the Future: A Review of Paediatric Services

Site	Total activity 16/17	Consultants Staff-in-post FTEs (not adjusted for Neonatology)	Consultants Establishment FTEs (not adjusted for Neonatology)	Consultants Staff-in-post FTEs (adjusted to exclude Neonatology)[1]	Consultants Recommended FTEs (excluding Neonatology)
BH	3,217	8.0	8.0	8.0	9.7
DON	4,277	9.0	13.5	9.0	11.1
BAS	1,493	5.0	4.7	3.5	9.7
MON					
SCH	10,043	12.0	7.2	12.0	11.1
STH					
RH	3,833	5.7	7.7	5.7	9.7
CRH	4,838	12.0	11.5	9.0	11.1
Total	**27,701**	**51.7**	**52.6**	**47.2**	**62.4**

Source: Reference Costs for activity data, with updated figures from some of the trusts. For FTE values, trust returns from September 2017, with updates received in April/May 2018.

Notes: [1]There are 12 consultant FTEs working in paediatrics in Chesterfield, however this includes neonatology rota cover and community paediatrics. To make it comparable to other trusts, only 9 FTEs were attributed to acute paediatrics. This number was provided by the trust. For Bassetlaw, it was assumed that 70% of the medical workforce covers acute paediatrics, therefore 3.5 of the 4.7 FTE staff complement was attributed to acute paediatrics. The 47 FTEs are thus comparable to the 62 FTE guideline figure.

Table: Current other medical grades and nursing FTEs

Site	Other medical grades[1] staff-in post FTEs (not adjusted for Neonatology)	Other medical grades[1] establishment FTEs (not adjusted for Neonatology)	Other medical grades[1,2]Staff-in-post FTEs (adjusted to exclude Neonatology)	Nursing staff-in post FTEs[3]	Nursing establishment FTEs[3]
BH	19.0	19.3	19.0	24.9	26.8
DON	20.8	23.7	20.8	34.8	36.8
BAS	7.2	8.3	5.1	12.2	12.9
MON					
SCH	17.3	13.0	17.3	46.4	46.4
STH					
RH	15.5	18.0	15.5	26.7	27.3
CRH	21.0	21.0	17.7	25.2	26.3
Total	**100.8**	**103.3**	**95.4**	**170.2**	**176.5**

Source: Trust returns from September 2017, with updates received in April/May 2018.

Notes: [1]Other medical grades include trainee grades and staff grades. [2]As above, neonatology and community paediatrics were taken out for the medical workforce. No such adjustments required for nursing however. [3]This includes only bands 5 and 6 nurses (registered nurses).

HSR analysis – Maternity (1/4)

Key assumptions

Key assumptions

1. The number of deliveries were taken from Reference Costs 2016/17 and updated activity numbers were provided by Barnsley Hospital NHSFT, Sheffield Teaching Hospitals NHS FT, and The Rotherham NHS FT.
2. The primary drivers for the consolidation of delivery units would be quality and safety of care, and the need to deliver greater levels of consultant presence for high risk births.
3. The analysis has only considered deliveries (excluding the ante-natal and post-natal activity).
4. MLUs are staffed by midwives only. No medical presence.
5. The analysis focused on FTE requirements for obstetrics and gynaecology, recognising that the medical workforce typically covers both specialities. Neonatology, an important clinical dependency, has been excluded. Further exclusions include anaesthetics and theatres.
6. For maternity, activity deemed to be low-risk (and thus attributed to an MLU according to the service definition) is not shifted between sites but is retained in a midwifery-led unit. The CLU activity (medium or high risk) will move to wherever the closest CLU is; the MLU activity remains to be addressed in each site - either in MLU alongside CLU or if there is no CLU, the assumption is that of a stand-alone MLU.
7. From Reference Costs 2016/17, the average proportion of low-risk births is 29% of total deliveries. Discussions with a clinician in the system have resulted in a value of 22.5% (average of 20-25%) being used instead, as 29% was deemed to be on the high side. This is assumed to be the proportion of activity that stays on all sites.
8. Consultant cover guidelines were taken from the RCOG (https://www.rcog.org.uk/globalassets/documents/guidelines/rcogfutureworkforcefull.pdf).
9. Midwifery guidelines were also taken from the RCOG (https://www.rcog.org.uk/globalassets/documents/guidelines/wprsaferchildbirthreport2007.pdf) and other sources such as (https://www.rcm.org.uk/sites/default/files/Birthrate%20Plus%20Report_1.pdf). The assumed minimum midwife-to-woman ratio is 1:29 for safe level of service to ensure the capacity to achieve one-to-one care in labour (average of 1:28 and 1:30, which has been quoted in the literature). This assumption would need revisiting at the next stage of the analysis to take into account the level of low risk births in the system.
10. In the absence of specific guidelines, the same proportion of consultant FTE impacts were assumed to apply to all other medical grades (staff grades, middle grade and junior doctors).
11. If as a result of reconfiguration activity at the receiving site(s) becomes greater than 7000, two units are assumed instead. This may result in diseconomies of scale. The next stage of the analysis would need to consider the practical implications in more detail.

HSR analysis – Maternity (2/4)

A number of additional assumptions have been used in order to undertake the analysis

Assumptions

Table: Current establishment FTEs

Site	Total deliveries 16/17	Consultants Establishment FTEs	Other medical grades Establishment FTEs[2]	Midwifery establishment FTEs[3]
BH	3,012	8.0	19.0	71.3
DON	3,391	9.7	21.5	136.7
BAS	1,507	4.3	9.5	60.7
MON				
SCH				
STH	6,924	29.0	30.6	213.1
RH	2,678	11.0	15.0	90.6
CRH	2,845	9.0	18.0	91.0

Source: Reference Costs for activity data, with updated figures from some of the trusts. For FTE values, trust returns from September 2017, with updates received in April/May 2018. No deliveries at MON or SCH.

Notes: [1]WTEs apportioned on the basis of activity at Bassetlaw and Doncaster Royal Infirmary. [2]Junior grades, middle grades and junior doctors are included in this category. [3]This includes only bands 5 and 6 midwives (registered).

HSR analysis – Maternity (3/4)

A number of additional assumptions have been used in order to undertake the analysis

Assumptions

Table: Staffing guidelines

Type of CLU	Consultant-led Unit A	Consultant-led Unit B	Consultant-led Unit C1	Consultant-led Unit C2	Consultant-led Unit C3
Deliveries per year (1)	<2,500	2,500 – 4,000	4,000 – 5,000	5,000 – 6,000	>6,0000
# of hours of consultant presence recommended	Based on local need but at least 40 hrs	60 hours	98 hours	168 hours	168 hours
		≈ 9/7 consultant presence	14/7 consultant presence	24/7 consultant presence	two separate rotas required
# of WTEs directly related to delivery suite presence*	2	3	6	12	**
# of WTEs which are related to non-delivery suite direct clinical care (NB – these figures account for and include prospective cover)	1 WTE (HSR assumption)	5 – 7 WTE (assume 30-40 additional PAs)	7 WTE (assume 40 additional PAs)	5-13 WTE (assume 30-80 additional PAs)	**
# of total consultant WTEs required for each type of CLU	3	8 - 10	13	17-25	**

*Source: RCOG, 2009. The future workforce in obstetrics and gynaecology. *Table 2.17, breaks included. **Note that the workforce guidelines are not explicit for CLUs with more than 6000 births, as units of this size are rare and in reality the number of births in any one unit would be capped by geography (i.e. population size within the catchment area of the hospital site on which the unit is located). In the analysis, if as a result of reconfiguration activity at the receiving site(s) becomes greater than 7000, two units are assumed instead. ** The RCOG guidelines are open to interpretation regarding units greater than 6,000 deliveries, and this is primarily due to the range in the number of direct clinical care PAs that are in addition to delivery suite activities. As such we are unable to credible assume a 'guideline' figure for STH, and whilst not consistent with the other trusts we have assumed this to be the establishment rate. We recognise that at this stage modelling is not site specific and that modelling has occurred in aggregate across the system. As modelling becomes site specific, we will engage further with clinicians to understand the appropriate guideline for STH including the amount of clinical care PAs that relate to activities other than the delivery suite.*

https://www.rcog.org.uk/globalassets/documents/guidelines/rcogfutureworkforcefull.pdf

HSR analysis – Maternity (4/4)

A number of additional assumptions have been used in order to undertake the analysis

Assumptions

Table: Current establishment consultant FTEs compared to RCOG, 2009 *"The future workforce in obstetrics and gynaecology"*

Site	Total deliveries 16/17	Consultants Obstetrics & Gynaecology staff-in-post FTEs	Consultants Obstetrics & Gynaecology establishment FTEs	Consultants Obstetrics & Gynaecology recommended FTEs[1]
BH	3,012	9.0	8.0	8-10
DON	3,391	8.3	9.7	8-10
BAS	1,507	3.7	4.3	3
MON				
SCH				
STH	6,924	28.9	29.0	29[2]
RH	2,678	9.7	11.0	8-10
CRH	2,845	9.0	9.0	8-10
Total	**20,357**	**68.6**	**71.0**	**64-72**

Source: Reference Costs for activity data, with updated figures from some of the trusts. For FTE values, trust returns from September 2017, with updates received in April/May 2018.

Notes: [1]This does not account for the scenario where BH, DON, RH and CRH increase consultant presence to 98h hours/week. [2]Given the advisory nature of the guidelines, which further specify that recommended FTEs should be determined at a local level, the establishment rate of 29 FTEs at STH was taken as the recommended staffing level for a unit of that size.

Table: Current other medical grades and midwifery FTEs

Site	Other medical grades staff-in post FTEs	Other medical grades establishment FTEs	Midwifery staff-in post FTEs[1]	Midwifery establishment FTEs[2]
BH	18.0	19.0	69.0	71.3
DON	21.5	21.5	94.8	136.7
BAS	9.5	9.5	42.2	60.7
MON				
SCH				
STH	38.0	30.6	197.7	213.1
RH	16.5	15.0	65.4	90.6
CRH	17.0	18.0	83.0	91.0
Total	**120.5**	**113.6**	**552.2**	**663.3**

Source: Trust returns from September 2017, with updates received in April/May 2018.

Notes: [1]Other medical grades include trainee grades and staff grades. [2]This includes only bands 5 and 6 midwives (registered nurses).

HSR analysis – temporary spend

A number of additional assumptions have been used in order to undertake the analysis

Assumptions

Table: Temporary staff expenditure, 2017/18

	Maternity	UEC	Paediatrics
Consultants	£708,573	£1,733,053	£1,699,536
Other medical grades	£1,853,458	£4,929,113	£958,677
Nursing/midwifery (bands 5 and 6)	£425,018	£2,349,626	£783,073
Other categories of staff not included above	£291,905	£947,180	£137,674

Table: Locum FTEs, 2017/18

	Maternity	UEC	Paediatrics
Consultants	5	9	8
Other medical grades	14	27	6
Nursing/midwifery (bands 5 and 6)	8	31	10
Other categories of staff not included above	7	19	2

Source: HSR data returns received from trusts in April 2018, supplemented with HSR returns from September 2016/17. Note not all trusts have provided all of the data, as such the values in the table above may not be an accurate refection of the level of temporary staff expenditure. For SCH, 60% of the temporary expenditure was included based on discussions with SCH clinicians. This is based on the share of general paediatric activity (c. 60%), therefore excluding specialised activity.

The number of locum FTEs was provided by most trusts in April 2018 and assumptions were made were the number of FTEs was not provided, based on average pay cost per locum FTE as implied from the data received from Trusts which supplied both sets of data.

Note that the numbers above will need to be reviewed and reconciled at the next stage of the analysis to ensure they are reflective of the service definitions.

Further notes:
- *Maternity: The temporary staff expenditure may not include the additional work undertaken by current staff.*
- *UEC: Locum expenditure may not be additional to budgeted expenditure – a proportion of it might be included in the budgeted figures.*