Leicestershire, Leicester and Rutland Joint Health Scrutiny Committee
Briefing paper – UHL Bed Capacity
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Context:

This briefing paper outlines the methodology behind the UHL bed model and how this compares to expected demand in 19/20.

National picture:

The number of beds needed to provide health care effectively, and how they are used, depends on a number of interrelated factors. These can be thought of in three broad categories: underlying patient demand; national policy – including funding, workforce supply and access standards; and local circumstances – such as availability of other services and internal hospital processes. The interplay of these factors changes over time and varies across the country. Consequently, the number of beds that the health service needs to maintain to deliver an optimal service changes over time.

The total number of NHS hospital beds in England has more than halved over the past 30 years, from around 299,000 to 142,000, while the number of patients treated has increased significantly.

Though bed numbers have been falling consistently across the UK for a number of years; NHS England data suggests that the numbers of beds closed, particularly general and acute beds, has slowed from around 13.1 per cent between 1987/8 and 1991/92 to 2.3 per cent between 2012/13 and 2016/17. As bed numbers have fallen, England's population has grown, from around 47.3 million in 1987 to approximately 55.2 million in 2016 (Office for National Statistics 2017a). As a result, the number of beds per head of population has fallen faster than the absolute reduction in number of beds.

The fact that the population has increased and aged over time and yet the NHS bed base has decreased seems counterintuitive. However, when we consider that there have been significant reductions in the *average length of stay*, (e.g. patients after hip surgery would previously have stayed at least a week post operatively) and that clinical improvements (e.g. the increase in *minimally invasive* keyhole surgery) enable many patients who once would have stayed in hospital overnight to now be seen as *day cases*. And the fact that older concepts like 'bed rest' are increasingly found to be detrimental to patient outcomes, a logic to the reductions emerges.

The national picture, and the changes in the way that surgery and medicine are practiced is recognised locally. However, taking all this into account and factoring in the increased demands of multi-morbidity, an ageing population and the deliverability

of system-level demand management schemes, we have modeled a modest increase in the number of acute beds from a baseline of 1,994 to 2048 over the life of our current plan. This remains under constant review at hospital and system level.

UHL bed modelling – 2018/19-2022/23:

The UHL bed model is built using the following methodology:

- The model covers a five year period from 2018/19 to 2022/23
- The baseline activity is a midday bed state count derived from ward stay data
- For emergency activity, the baseline used was 2017/18 actual occupancy, uplifted by 1% as contracted in 18/19. An annual growth rate of 1.4% has then been applied each year.
- For elective day case and inpatient activity 2016/17 data has been used. (The distribution of elective activity would have been skewed if 17/18 data had been used due to the high number of cancellations during the winter period as mandated by NHS England). The baseline has then been uplifted to 18/19 with a growth rate of 1.4% applied (as advised by Public Health colleagues).
- Annual growth rate of 3% applied for ICU demand. (As previously discussed with JHOSC, ICU demand is growing faster than typical acute demand)

This modelling resulted in a projected bed base requirement of 2,269 beds by 2022/23 *if nothing were to change in terms of models of care or efficiency*:

	Change	Total beds
Baseline inpatient & day case beds (Dec 2017)		1994
1.4% growth to 22/23	157	2151
Additional ICU growth (3%)	28	2179
Reduced bed occupancy	90	2269

This modelling was validated with acute clinicians and with our wider LLR health and social care system partners.

Once models of care and efficiency opportunities were taken into account through the work of our system and hospital based transformation programmes we have revalidated the number of beds required across our acute sites. A number of evidence-based schemes have been tested with our clinicians and our primary and community services partners, including:

- Improving internal efficiencies (based on Model Hospital, GIRFT, benchmarking)
- Preventing c4,000 avoidable admissions (based on evidence from NHS RightCare case studies)
- Reducing elective demand (based on NHS Right care case studies)

These plans have also been validated with the East Midlands Clinical Senate with validation of the bed model also undertaken by NHS England at a regional level.

This has resulted in a reduction in the total number of beds required in 2023 by between 164 and 237 beds:

	Change	Total beds
Baseline inpatient & day case beds (Dec 2017)		1994
1.4% growth to 22/23	157	2151
Additional ICU growth (3%)	28	2179
Reduced bed occupancy	90	2269
Minimum efficiency	(164)	2105
Maximum efficiency	(237)	2032
Planned bed numbers 22/23		2048

In undertaking this modelling, UHL has considered a number of scenarios in terms of growth and occupancy levels together with sensitivity around the delivery of all the bed efficiency opportunities identified. As a result of detailed work internally and with our partners, we are assured as we can be that the planned future bed base of 2,048 remains sufficient to accommodate growth in demand and does not overstate the opportunities afforded by efficiencies and new models of care.

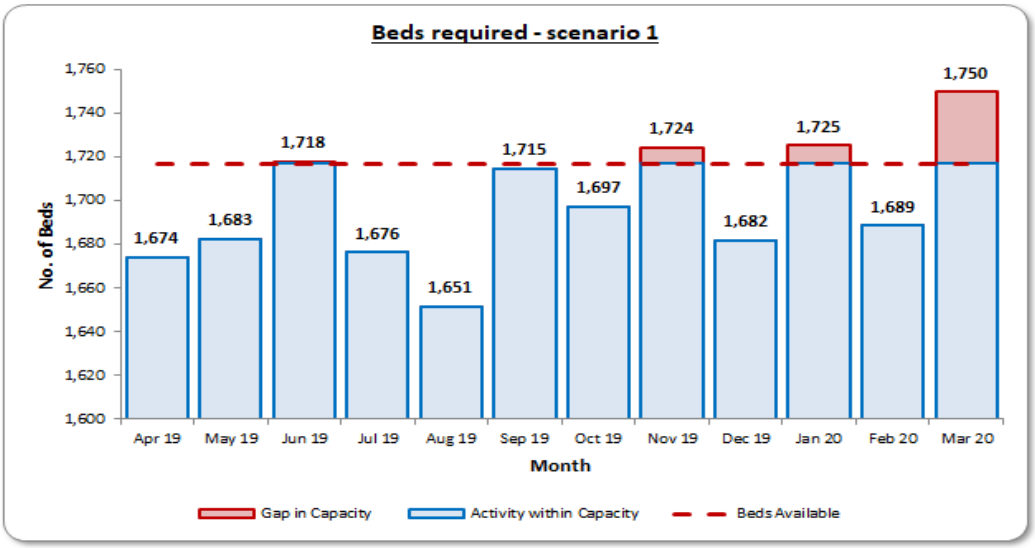
It is worth noting that since this model was completed, the NHS 10 year plan has been published – and much of what was our local system wide planned efficiency programme has now become a national requirement, strengthening our case for change. For example, our programmes of work relating to the prevention of avoidable admissions; improving same day emergency care, cross-sector networks of care and the adoption of 'Home First' principles; are all now mandated within the NHS 10 year plan.

UHL bed modelling – learning from 18/19 to plan for 2019/20:

Through the planning for last year (2018/19), the Trust made a fundamental change to capacity planning, switching from a model based on demand to a model based on capacity; this assumed that at times of high pressure all emergency demand will be accommodated with resulting 'spare' capacity used for elective demand. This has proved successful in terms of patient flows for 18/19, with a positive impact noted for both emergency *and* elective pathways:

2018	2019
Jan/Feb 2018, most planned procedures postponed due to the NHS E mandated elective freeze	Jan/Feb 2019, c1,800 more planned procedures taking place during this time
48% of days during winter 2017/18 spent under Opel Level 4 alert	9% of days during Jan/Feb 19 spent under Opel Level 4 alert
One third of days between Sept 2017 and Sept 2018 spent under Opel Level 4 alert	3% between Sept 18 and Feb 19 (based on hours) spent under Opel Level 4 alert

This learning has been applied to our 19/20 bed model with the same methodology applied. The resulting bed modelling (at a whole hospital level) shows that there will be a small bed deficit during some months of the year… the range being 1-33 beds, as the graph and table below show.



Beds required - scenario 1

Actual Management	Apr 19	May 19	Jun 19	Jul 19	Aug 19	Sep 19	Oct 19	Nov 19	Dec 19	Jan 20	Feb 20	Mar 20
Day Case	12	12	12	10	11	12	11	12	10	11	11	11
Inpatient	184	199	211	212	196	216	215	219	181	189	191	211
Emergency	1,478	1,472	1,495	1,454	1,444	1,487	1,471	1,494	1,490	1,525	1,487	1,528
Total Beds Required	**1,674**	**1,683**	**1,718**	**1,676**	**1,651**	**1,715**	**1,697**	**1,724**	**1,682**	**1,725**	**1,689**	**1,750**
Beds Available	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717
Gap	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**7**	**0**	**8**	**0**	**33**

(Note – The calculations above are based on **Dec 2018** baseline bed model of 1974 beds – this excludes 183 day case beds, 46 escalation beds, 28 EDU/EFU beds. The daycase beds that *are* included above are for + 6 hr LoS)

However, the model does not include any efficiencies, for example LoS stay reductions as yet; nor does it include the potential to open extra winter capacity wards which would completely bridge the gap.

The Trust is therefore assured that at a whole hospital level given current circumstances, capacity is sufficient to meet the projected demand for the year and in line with our longer term modelling.

Risks:

Of course, there are risks:

- If Emergency demand is greater than predicted this will impact on beds required reducing Elective Capacity
- Mid-year pathway changes have been difficult to quantify and account for in the model.

- Changes in case mix, length of stay, acuity of patients, number of stranded patients, etc. from historic data could impact on beds required
- Any variation from the phasing of the activity could impact on beds required/available
- The availability, ease of access and acuity of bedded and non-bedded health and social care services outside of hospital settings

These risks are under constant review and are managed at system level through the System Leadership Team, with quarterly reviews of the bed model to ensure that any variations are understood and taken into account as early as possible in the year.

Summary:

Capacity modelling in the NHS is, to be frank, part science part art; in other words absolute predictions of the numbers of patients requiring acute hospital stays varies from *year to year* based on, for example, the particular strain of influenza in circulation. Equally, looking further ahead the numbers of patients requiring a bed in 10 years' time will be influenced by developments in medical and surgical techniques, new and novel treatment regimens and the success or otherwise of the development and funding for new and improved community services and primary prevention. This is why the NHS locally and nationally will continue to review bed requirements in year and between years.
