

**NHSBT Board Meeting**  
**Demand Planning Challenges Emerging from COVID-19**

2<sup>nd</sup> December 2021

**1. Summary and Purpose of Paper**

This paper (provided for information only) aims to answer questions previously posed by Board members around the demand outlook for red cells in the context of COVID-19.

Key points for the Board to note are:

- Currently we expect that pre-pandemic annual red cell demand levels will be restored in 2021-22, followed by year-on-year growth of <1% for the following two years.
- The demand outlook is more unpredictable and variable than pre-COVID. It is likely that we will revise our forecast more frequently than usual as key assumptions change.
- Demand for universal components (e.g. O D negative red cells) and Ro red cells are forecast to continue growing.

**2. Demand Forecasting Methodology**

Since mid-2014, the Blood Supply Chain has used an Integrated Supply Planning (ISP) methodology for planning the supply of blood components to hospitals. The 'Demand Review' component of the ISP process consists of a monthly meeting between NHSBT clinicians and subject matter experts, facilitated by the Blood Supply Central Planning Team. Operational, clinical and regulatory intelligence from a range of external stakeholders (e.g. NHS Trusts, National Blood Transfusion Committee, NHS England, NHS Improvement) is reviewed alongside actual demand performance to agree or amend the future forecast.

To complement this process, a comprehensive statistical forecasting model is updated every 6 months (May and November) with actual component demand and projected population data to aid production of a rolling 5-year demand forecast by blood component. This advanced modelling projects trends by day of week, by blood group mix and key product families such as Ro and includes bank holiday/seasonal demand profiling. Notably however, NHSBT does not currently have real-time access to hospital blood usage data (e.g. reason for recipient transfusion, wastage rates in hospitals etc.), although some data can be retrospectively obtained through audit and voluntary provision by hospitals.

**3. Recent Demand Performance Summary**

Prior to the pandemic, demand for most blood components had been steadily declining year-on-year, despite general population growth. This reduction is primarily attributed to better adherence to transfusion guidelines and changes to clinical practices. For example, by end of February 2020 (before the pandemic impacted), overall red cell demand had reduced to 25.7 per 1,000 population vs. 30.6 at 5 years prior.

Despite this recent continuous decline in overall demand, some segments of demand did not follow the same trend. Demand for the universal red cell group O D negative declined by just c2% over the same five-year period (vs. c16% overall red cell decline). Demand for Ro Kell negative type red cells had increased by c85% over the five years preceding the pandemic; primarily a result of a growing population of Black ethnicity patients requiring treatment for haematological conditions and a move towards automated blood exchange programmes to better treat these conditions. NHSBT is only able to meet c55% of Ro demand currently, with clinically suitable alternative products (often O D negative) provided as a substitution.

While pre-pandemic changes in demand have been gradual and relatively simple to forecast with extant methods, COVID-19 created significant disruption in hospital activity. This has created more demand variability, often with short notice. Appendix one demonstrates the extent to which demand forecasting accuracy for red cells has become less accurate during the pandemic.

#### **4. Future Challenges: Continued Variability and Rising Segments of Demand**

Less predictable and more variable demand patterns are expected to continue as the health system adjusts to new norms and reorganises backlogged services. While there is little certainty, some insights can be drawn from available information at this stage.

Additional NHS funding of £5.9 billion was announced to help tackle backlogs in elective care and transform diagnostic services in October's Governmental Spending Review. Nationally the elective waiting list increased by 42 per cent between April 2020 and July 2021<sup>1</sup>, while undiagnosed illnesses because of diagnostic delays are likely to result in patients presenting with more advanced illnesses. Additional funding in these areas will lead to increased demand for blood components, however this increase is likely to be spread over a long period. Large surges in the short-term appear unlikely for several reasons:

- Only 6% of total red cell demand is generated from clinical specialities that were both affected by the pandemic and likely to benefit from the funding increases (see appendix two). Moreover, regularly updated guidance published by NHS England<sup>2</sup> offers two further crucial insights. Firstly, priority is initially being given to completion of high volume, low complexity (HVLC) elective procedures that rarely require blood. Secondly, more complex elective activity requires high dependency beds and skilled teams, where resources are likely to remain constrained in the short to medium-term.
- A further c14% of red cell demand is generated by clinical specialities that were suppressed to some extent by the pandemic largely due to societal changes (e.g. trauma and plastic surgery). Demand generated by these specialties could gradually rise, but sharp increases are not expected.
- The majority (c80%) of red cell demand is generated by clinical specialities that have been operating at normal capacity, largely unaffected by the pandemic or likely to benefit from additional elective funding.

As a result of these factors, the long-term demand forecast revised during November 2021 anticipates annual demand by the end of 2021-22 will reach 1.378m. This represents annual growth of +6.9% vs. 2020-21, effectively meaning the pre-pandemic annual demand levels of 2019-20 will be restored. Demand is then forecast to grow by <1% year-on-year for the following two years, before broadly stabilising from 2024-25 (see appendix three). Finally, demand for universal O D negative and Ro red cells are expected to continue increasing (appendix three).

#### **5. Next Steps**

- (i) We will continue to build insights from multiple sources to inform our demand planning assumptions and regularly review/adjust our forecasts as required (ongoing).
- (ii) We will present a supply resilience plan to the Board to demonstrate how we will plan sufficient supply through a period of continued demand variability. This will include lessons learnt from 2021 stock challenges (Q4 2021-22).

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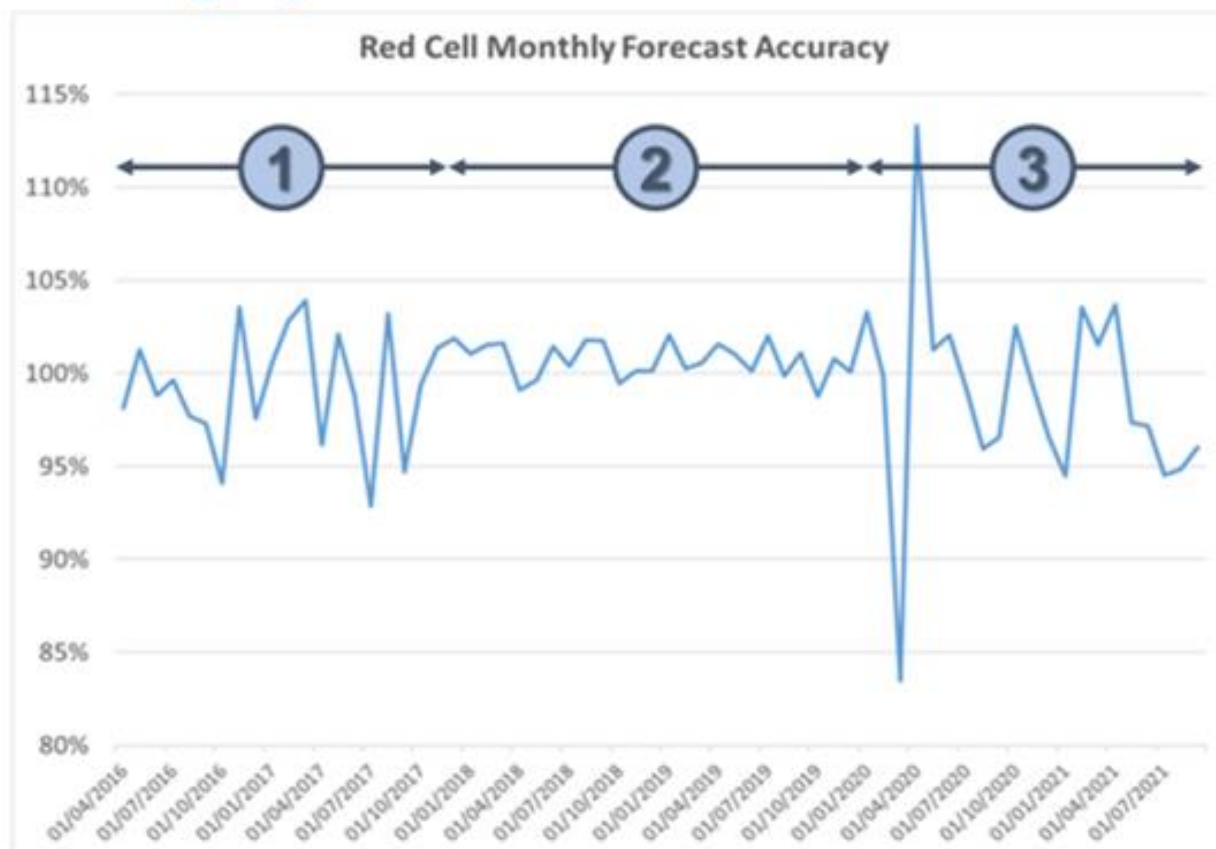
<sup>1</sup> <https://www.kingsfund.org.uk/blog/2021/09/elective-backlog-deprivation-waiting-times>

<sup>2</sup> <https://www.england.nhs.uk/publication/21-22-priorities-and-operational-planning-guidance-oct-21-march-2022/>

## Appendix One – Red Cell Demand Forecasting Accuracy

### COVID-19 has made demand forecasting more challenging

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- 1 Early stage of forecasting maturity.** Forecasting was typically within  $\pm 6\%$  accurate.
- 2 Enhanced demand forecasting capability.** Forecasting was typically within  $\pm 2\%$  accurate.
- 3 COVID-19 pandemic.** Forecast accuracy declined to  $\pm 5\%$ , with exception of initial pandemic impact.

## Appendix Two – Red Cell Demand by Clinical Speciality

### COVID-19 Impact and Red Cell Demand Proportion by Clinical Specialty

  
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Category	Clinical Specialities	Proportion of Total Red Cell Demand (pre-COVID)
Demand has been <b><i>largely unaffected</i></b> by COVID-19 and <b><i>backlogged demand is minimal</i></b>	GI Bleed, Haematology, Medical, Neonatal/Foetal, Neurosurgery, Obstetrics, Other	80.4%
Demand has been <b><i>potentially suppressed</i></b> by COVID-19 (largely due to societal changes) and <b><i>backlogged demand may exist</i></b>	Orthopaedics, Plastic Surgery, Solid Organ Transplant, Trauma, Urology	13.6%
Demand has been <b><i>confirmed as suppressed</i></b> by COVID-19 and <b><i>backlogged demand does exist</i></b>	Cardiothoracic, GI, Oncology, Vascular	6.0%

## Appendix Three – Long-Term Demand Forecast (Red Cells)

### Forecast Proposal – Red Cell Total<sup>1</sup>



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Financial Year	Demand Forecast	Lower 50% Prediction Interval	Upper 50% Prediction Interval	YoY % Change	YOY % Change vs 2019/20	O D negative Demand Forecast	Ro Kell negative Demand Forecast
2019/20 (actuals)	1,378,818	-	-	-2.6%	-	182,252	65,696
2020/21 (actuals)	1,288,808	-	-	-6.5%	-6.5%	179,046	66,009
2021/22	1,378,220	1,358,339	1,398,101	+6.9%	-0.0%	184,288	75,122
2022/23	1,383,281	1,331,273	1,435,289	+0.4%	+0.3%	185,862	80,276
2023/24	1,391,904	1,321,918	1,461,889	+0.6%	+0.9%	188,472	84,795
2024/25	1,392,477	1,303,900	1,481,053	+0.0%	+1.0%	189,861	88,216
2025/26	1,393,113	1,286,113	1,500,113	+0.0%	+1.0%	191,141	91,220

- The five year red cell forecast anticipates that pre-COVID annual demand levels will be restored by end of 2021/22. Demand is then forecast to steadily increase further by <1% year-on-year until 2023/24 and stabilise thereafter.
- The prediction interval is used to demonstrate the range within which annual demand could lie. There is a 50% probability that actual demand will lie within this interval.

<sup>1</sup> Reviewed during November 2021 long-term demand forecast process. Forecast not yet published, pending approval at Consensus Review.