

## Background

Lincoln County Hospital is a busy district general serving the city of Lincoln and the Lincolnshire area.

The hospital is part of the United Lincolnshire NHS trust (ULHT), which includes Pilgrim Hospital Boston, Grantham and District Hospital and Louth County Hospital.

- All major clinical specialties
- 24/7 A&E department
- 6804 RBC units transfused annually (Apr 19 – Mar 20) - a reduction in transfusion rates is being seen.

## The Problem – RBC Inventory Management

It was identified through using BSMS stock and wastage data that Lincoln hospital had higher than cluster average RBC wastage levels.

A correlation was seen between the higher than necessary RBC stock levels and the increased time expiry (TIMEX) wastage.

## The Actions

Multiple action steps were taken over the past 3 years to reduce the amount of stock and use up all available units to avoid time expiry.

### Dereservation

- All RBC units issued with 24 hour dereservation period (some exceptions based on the clinical diagnosis)
- Dereservation of RBC units is performed twice daily

### Short Dated

- Expiring RBC units are highlighted to staff using a whiteboard and with visible alert cards/tags on units in the stock fridge
- An electronic transfusion monitoring system (Blood 360) enables staff to monitor and review RBC stock units in remote fridges, issued units and expiry dates

### Policy

- 'Appropriate use' policy now embedded in practice and clinical training on appropriate use in targeted locations.
- Implementation of a O D Pos major haemorrhage protocol pack for male patients >18years and female patients >51years.

### Deliveries

- Blood products ordered in small batches twice a day (15:15, 19:30) to spread expiry dates. It is recommended to blood bank staff order up to 10 units/blood group (although in practice 4-6 units).
- Sharing of stock across the trust with local transport agreements.

Figure 1. The visual aids used to identify short dated blood units in the blood bank



## Covid-19 Pandemic Response

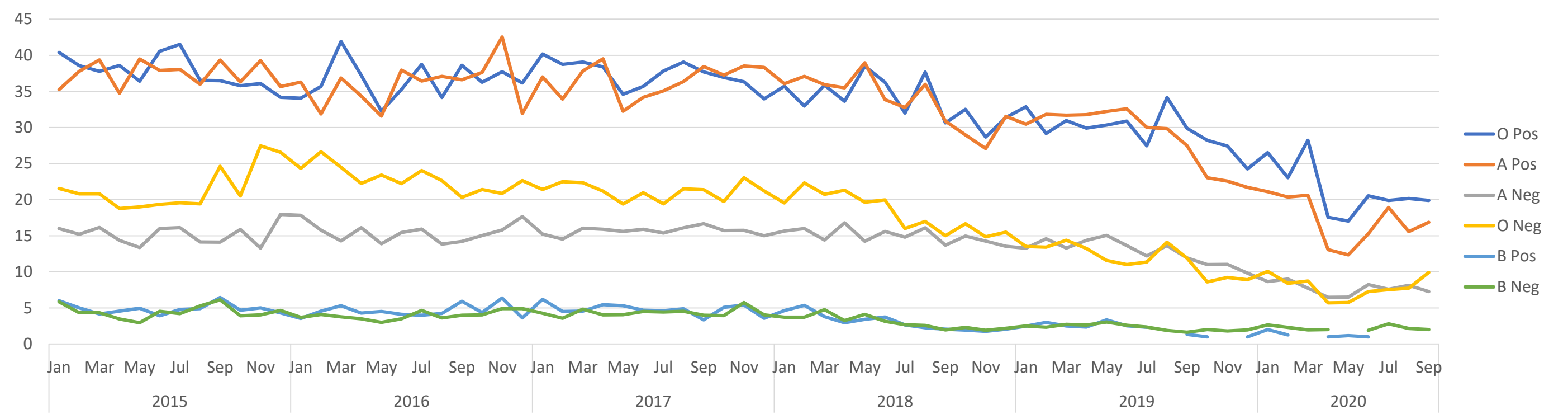
### March – September 2020

The blood bank reduced stock levels quickly in response to the pandemic (fig 2) and did not see an increase in TIMEX wastage (fig 3).

The clinical activity and blood product stock were monitored and stock levels reviewed on a weekly basis and adjusted accordingly. RBC stocks were shared between all ULHT hospitals to reduce wastage at all sites.

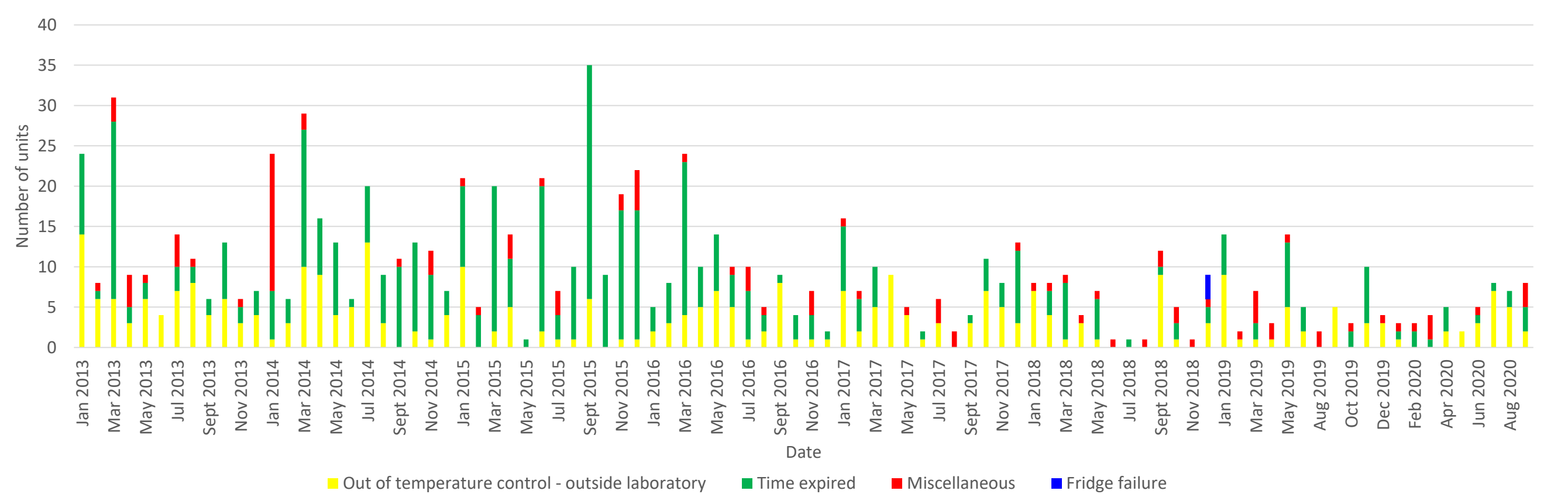
## Red Cell Stock levels

Figure 2. Average daily stock levels (ABO) Jan 2015 - Sept 2020



## Red Cell Wastage

Figure 3. Time Expiry (TIMEX) wastage has been reduced and is no longer the largest proportion of wasted units.



The aim is to minimise components that reach their expiry date. Other red cell wastage attributed to clinical wastage and fridge failure are more difficult to control and not directly related to stocking excess blood units.

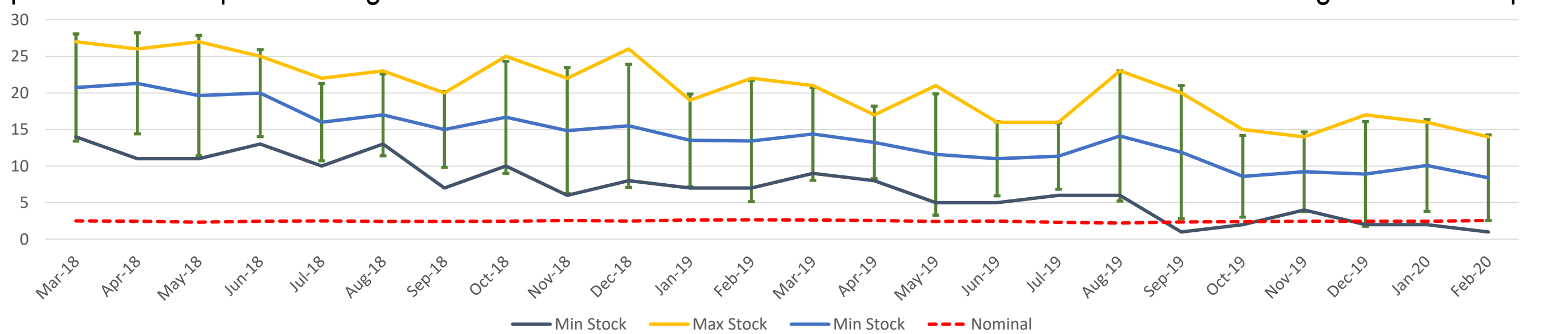
Table 1. Lincoln Hospital current and recommended stock levels (based on nominal stock values) with a target ISI stock level based on hospital size and distance from NHSBT centre.

	O+	O-	A+	A-	B+	B-	AB+	AB-	Total
<b>Recommended RBC stock level for 5 day ISI</b>	29	12	25	9	2	2	1	0	81
<b>Current RBC stock</b>	24	6	20	8	0	2	0	0	74
<b>Current Irradiated RBC stock</b>	2	2	2	2	0	0	0	0	8
<b>Current Paediatric RBC stock</b>		1							1

## Optimising RBC Stock levels

Figure 4. Max, Min, Average and Nominal O Neg stock

Nominal stock is the average daily issues calculated from the past 6 months data, it approximates one day's worth of stock required at the hospital. Having stock levels closer to the nominal stock value is an efficient stock management technique.



The blood bank team attended a BSMS workshop and were able to identify several areas for improvement using data submitted to Vanesa (reducing excess stock, TIMEX wastage). This data is shared with blood bank staff on a noticeboard in the blood bank to communicate the progress their stock management actions were making.

## Summary of Outcomes

- **TIMEX Wastage As a Percentage of Issues (WAPI) average reduced to 0.4%** - 78% below average compared to other high usage hospitals (1.83% WAPI).
- **Decreasing stock held by 63 units/day, a one off saving of £8799** - Average daily stock levels for RBC units held (ABO) have decreased by 52% (Mean daily stock 2015 vs 2020) (fig 2).
- **Wastage savings of £15,271 over the 4 year period – a saving of £3800 per year (mean)**. Largest proportion of wasted RBC units wasted was TIMEX (139 units in 2015 to 29 units in 2019), but now replaced by units out of temperature control (OTCOL) (fig 3).
- **Hospital Issuable Stock Index (ISI) decreased** - to below that of other high usage hospitals and is around the recommended target ISI of 4-5 days. O Neg RBC levels are in line with 2-3 days of stock.
- **Stable stock levels closer to nominal stock value** - The max/min graphs for ABO units show a reduced fluctuation in stock values, narrowing of the max/min range and a decrease towards the nominal stock value (fig 4).

Supporting blood bank staff by providing the evidence and encouraging the team effort has been essential for staff to engage with the changes. It has been key to encourage staff to trust the stock levels and not order additional stock to cover the 'just in case' scenarios.