Blood Stocks Management Scheme

Inventory Practice Survey Full Report 2025

Emergency Blood Component Transfusion

Published February 2026

Acknowledgments

We would like to thank the transfusion teams who took the time and effort to respond to this survey. Your responses have been valuable in producing this report and will provide evidence to support improvement across the blood supply chain.

Authors/contributors

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Summary

The Blood Stocks Management Scheme (BSMS) invited hospitals and organisations to complete the annual inventory practice survey on the provision of blood components for emergency use, including red blood cells (RBC), platelets (PLT) and fresh frozen plasma (FFP). The practices related to provision and management of emergency units are of value to blood providers due to the use of components in high demand; O D negative RBC, A D negative PLT and AB FFP.

This survey was designed by the BSMS and open to all participants of the scheme, including hospitals and organisations served by NHS Blood and Transplant (NHSBT), Welsh Blood Service (WBS) and Northern Ireland Blood Transfusion Service (NIBTS), between June and July 2025. The duplicate responses were removed, leaving 184 responses. For the hospitals and organisations served by NHSBT the responses represent 73% of annual RBC issues, 72% PLT issues and 72% FFP issues (2024). For WBS 41% annual RBC issues, 32% PLT issues and 35% FFP issues and NIBTS 31% annual RBC issues, 19% PLT issues (FFP issues data unavailable for this period).

The responses showed variation in provision and specification of group O RBC for emergency use where the blood group is unknown or unavailable, with 56/184 (30%) providing O D negative RBC to a female >51 years and 32/184 (17%) to a male >18 years. Where O D negative RBC are held as emergency stock in the laboratory issue fridge (151/184, 82%), CDE- K- are additionally specified by 70/151 (46%). Further specifications are required by 45/151 (30%) respondents, including Haemoglobin S negative (HbS-), cytomegalovirus negative (CMV-) and irradiated. Where O D positive RBC units are held in the laboratory, 34/78 (44%) have additional phenotype requirements such as c-E-K- (2/78, 3%) and 32/78 (41%) require O D positive RBC for emergency use to be K-.

There were 38/184 (21%) respondents stating provision of A D negative PLT to males >18 years where the blood group is unknown or unavailable. Responses also indicated provision of AB FFP for patients where the blood group is unknown or unavailable (93/184, 51%). Respondents indicated provision of RBC (17/184, 9%) and FFP (14/17, 82%) for use by Helicopter Emergency Medical Services (HEMS)/Blood on Board (BOB), 12/14 (86%) provide group A FFP and 2/14 (14%) provide group AB FFP.

The responses show variation in the provision and inventory management of emergency components. Practices regarding management of stock such as high de-reservation times and rotation of stock close to expiry may lead to excess wastage whilst the over specification of components puts pressure on the supply chain. The components under the most strain within the supply chain are those commonly used for patients of an unknown or unavailable blood group, however, many of these patients are unlikely to require these additional specifications (D negative, K-, CMV, HbS-). Where recommendations and guidelines state the blood group and specification of units for emergency use, we urge hospitals and organisations to evaluate

their practice against these recommendations. This is to protect the supply chain and conserve these units for patients where there is no alternative.

Recommended Actions Identified

	Guidelines for best practice	Data from this survey to support action required	Action identified to promote best practice
1	Use of O D positive RBC for emergency use for males >18 years and females >51 years, to conserve O D negative RBC. (National Blood Transfusion Committee, 2024a, 2024b; Patient Blood Management, NHSBT, 2025)	• O D negative RBC for males >18 years in emergency = 32/184 (17%). • O D negative RBC for females >51 years in emergency = 56/184 (30%).	Review of local policies with stakeholders and the evidence for use of **O D positive units for males >18 years and females >51 years in trauma/major haemorrhage where the blood group is unknown.**
2	Use of A D positive PLT for emergency use to conserve A D negative PLT. (Estcourt *et al.*, 2017; British Society for Haematology, 2022)	• A D negative PLT for males >18 years in emergency = 38/184 (21%). • A D negative PLT for stock routinely = 48/102 (47%).	Review of local policies with stakeholders and the evidence for use of **A D positive (HT-) PLT for males >18 years and females >51 years in trauma/major haemorrhage where the blood group is unknown.**
3	Use of group A FFP for emergency use to conserve group AB FFP. (Green *et al.*, 2018)	• AB FFP for males >18 years in emergency = 93/184 (51%) • AB FFP for HEMS/BOB = 2/17 (12%)	Review of local policies with stakeholders and the evidence for use of **group A (HT-) FFP in trauma/major haemorrhage where the blood group is unknown.**
4	Use of appropriate specification of emergency components and limit specifications unless clinically required on a named patient basis. (National Blood Transfusion Committee, 2024b; Patient Blood Management, NHSBT, 2025)	• Additional Rh specifications for O D negative emergency RBC in issue fridge (C-E-) = 71/151 (47%). • Additional specifications (other than Rh/K) for O D negative emergency RBC in issue fridge = 45/151 (30%). • Additional Rh and K specifications for O D positive emergency RBC in issue fridge = 34/78 (44%). • Specification combinations for stock PLT requested = 11 different specification profiles	Review local policies for specification of emergency RBC for adult patients. For females with childbearing potential consider use of **D negative, K negative only**. (*CMV- to be considered only for pregnant trauma/haemorrhage patients where blood group is unknown).* **O D positive emergency RBC do not need additional Rh or K- specification.** Order components with additional specifications on a named patient basis where possible.
5	Best practice for inventory management of issued units, pre-issued emergency units, emergency units in satellite fridge locations and PLTs for stock to conserve blood components and reduce wastage. (Blood Stocks Management Scheme, 2022; National Blood Transfusion Committee, 2024b)	• De-reservation time 24 hrs or more for RBCs = 62/184 (34%), • De-reservation time 24 hrs or more for PLTs = 141/184 (77%) • Variation in emergency red cell rotation time before expiry.	Ensure protocols for **de-reservation, stock rotation and stock sharing are optimised** to reduce excess stock and wastage.

Introduction

The Blood Stocks Management Scheme (BSMS) provides organisations with insights into blood stock and component wastage through the monthly component report. In addition to this, an annual survey is open to participating hospitals and organisations to enhance understanding of how blood components are used within hospitals. This Emergency Component Inventory Practice Survey 2025 captured data on emergency blood component stock and the selection of emergency components used in the clinical setting. The results of this survey will allow organisations to benchmark their practices to others and to the relevant recommendations and guidelines.

The practices related to provision of emergency units are of interest because the components commonly utilised are considered to be a challenge within the supply chain. These components are therefore of high priority to conserve where possible - O D negative RBC, A D negative PLT and group AB FFP - often considered ‘universal’, for use with patients of an unknown or unavailable blood group. However, the evidence for the use of emergency components promotes alternative suitable blood groups for patients where the blood group is unknown or unavailable, to conserve these components for patients where there is no alternative.

In England there are 241 hospitals and organisations, 19 in Wales and 10 in Northern Ireland that utilise components from blood providers and contribute stock and wastage data to the BSMS. Whilst certain stock provision protocols can sometimes be determined from the data of component issues, stock and wastage, there are local practices that cannot be easily seen from the BSMS data.

Whilst we recognise the extensive nuances that can lead to variation in practices, this survey is an opportunity for BSMS and the blood services, to determine the detail of the variation in practice regarding emergency blood components. Tailored support can be offered to improve practices, promote best practice guidelines and ultimately drive an improvement of inventory management and wastage rates for these valuable components. Every change to practice, even to conserve a single unit can make a difference in blood component demand, those incremental and marginal gains are vital to protect supply for all.

Purpose and Aims

The purpose of this survey was to obtain quantitative and qualitative data from hospitals and organisations on their current inventory management practices for the provision of emergency blood components (RBC, PLT, FFP). The survey sought to understand blood component stock provision protocols, the type and specification of components stocked and where, and the protocols of which component would be selected, in an emergency transfusion situation.

The survey was designed to consider the national recommendations and guidelines for emergency components. Where guidelines suggest there are suitable alternative blood groups or specification that may be used to conserve components within the supply chain, it was asked whether the policies of hospitals and organisations were aligned with recommendations and guidelines. There were questions around the quantity and type of components routinely stocked, to understand a baseline value of emergency stock that is within hospitals and organisations. Specification of components was also of interest, to understand the local policies driving demand.

Inventory management processes such as de-reservation times and emergency stock rotation protocols were included. Finally, hospitals and organisations were asked about provision of components for HEMS/BOB to understand the volume and specification of components provided.

Method

- The survey was open between June and July 2025. Hospitals and organisations in England, Wales and Northern Ireland participating in the BSMS were invited to complete the survey. Invitations were sent through several methods to ensure high coverage of respondents, via BSMS component reports, newsletter, blood service routine communications and social media.
- We asked that each site designate a single representative to answer the questions to the best of their knowledge.
- The questions related to adult RBC, PLT and FFP components.
- The survey was designed in Microsoft Forms, hosted virtually and data compiled through Microsoft Excel. There were 93 questions divided into five sections: general questions about the hospital or organisation and the transfusion arrangements, RBC questions, PLT questions, FFP questions and HEMS/BOB questions.
- BSMS user group categories have been used for some of the survey analysis. BSMS user groups were revised in May 2025 (Blood Stocks Management Scheme, 2025).
- The proportion of component issues that these respondents represent are taken from NET component issues January - December 2024.

Results

Respondents and laboratory arrangements

184 responses out of a possible 271 hospitals and organisations participating in the BSMS, a response rate of 68%. This included 1/184 respondent that was not a member of the BSMS, but does receive components from UK blood services (a Ministry of Defence service provider).

- Average response time 21:08 minutes

Response rate and the proportion of annual issues

- For the hospitals and organisations served by:
  - NHSBT the responses represent 73% of annual RBC issues, 72% PLT issues and 72% FFP issues (2024).
  - WBS the responses represent 41% of annual RBC issues, 32% PLT issues and 35% FFP issues (2024).
  - NIBTS the responses represent 31% of annual RBC issues and 19% PLT issues (2024). FFP issues data is unavailable for this period.

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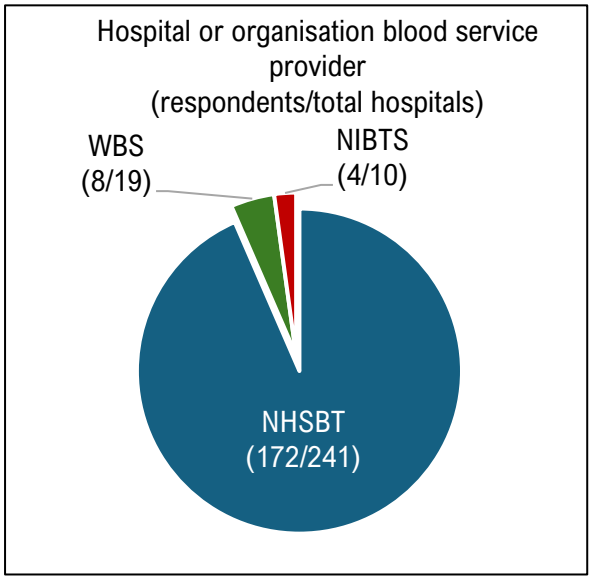
Figure 1



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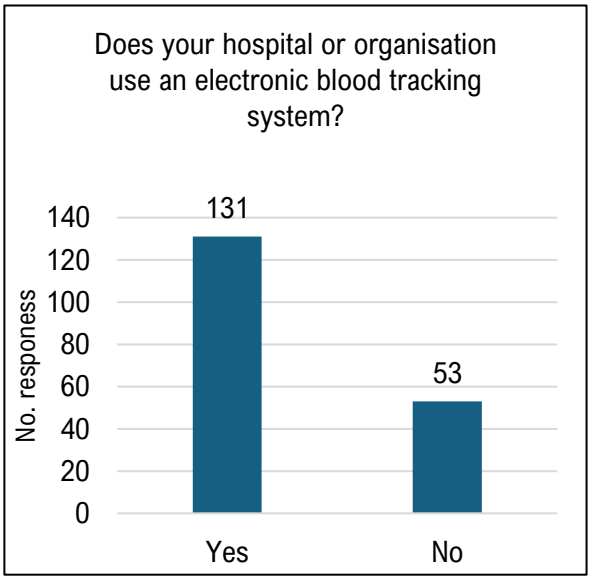

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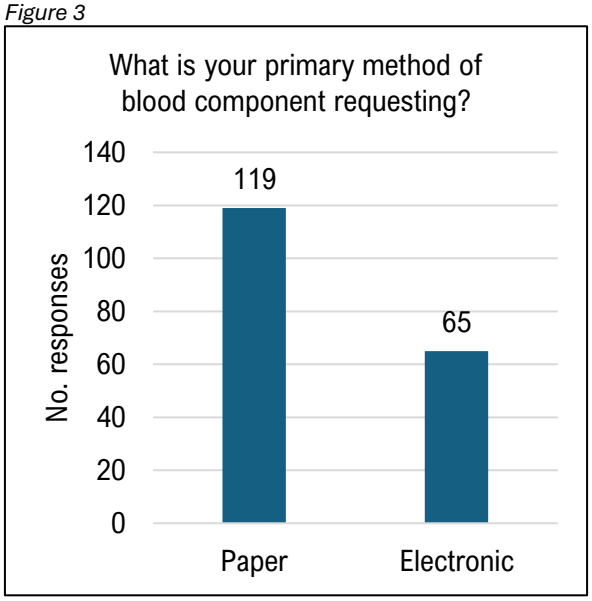

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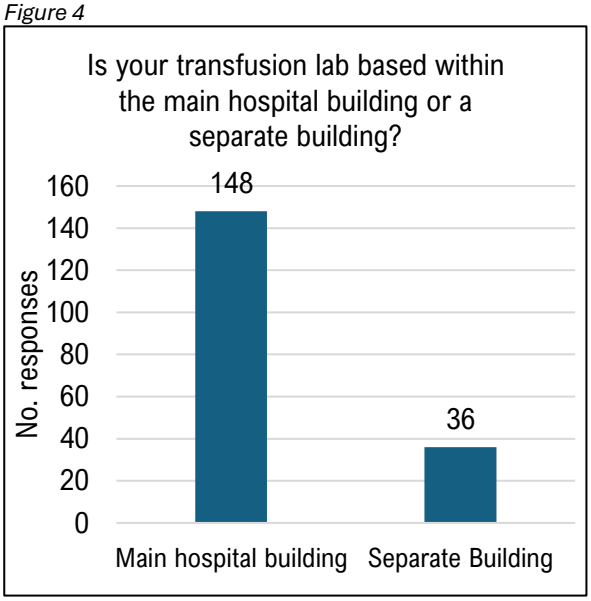

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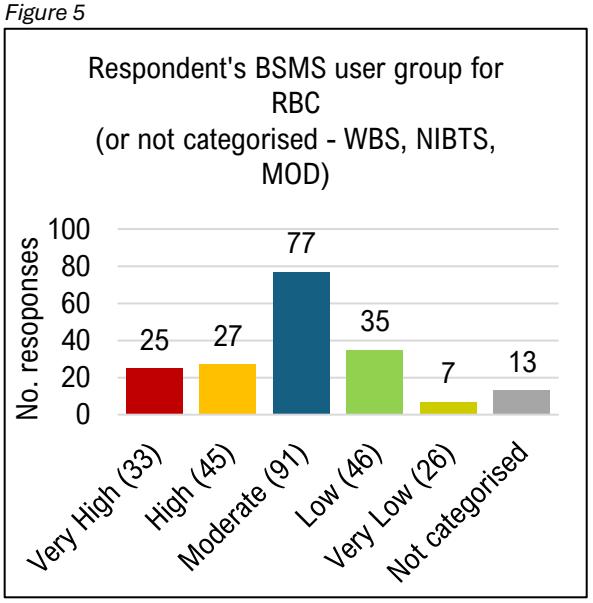

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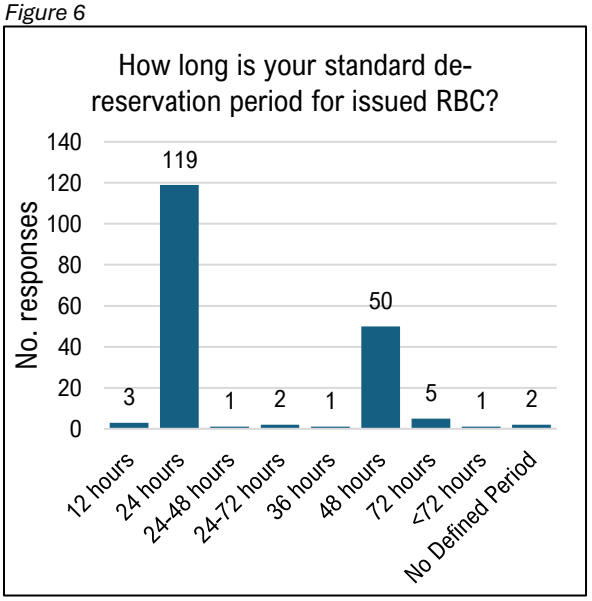

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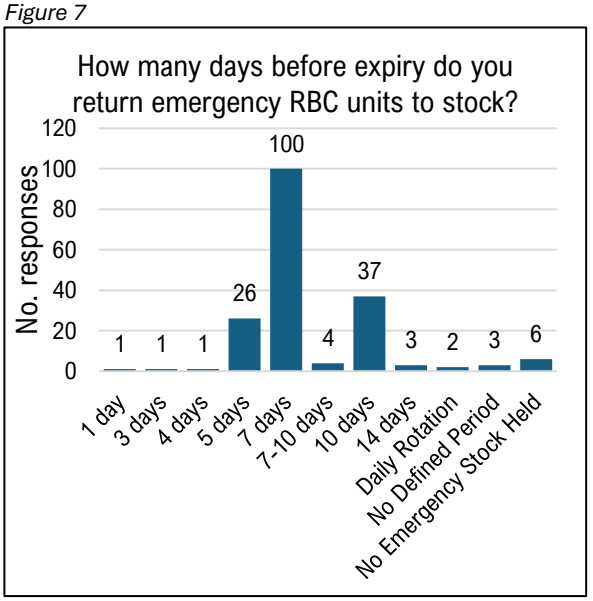

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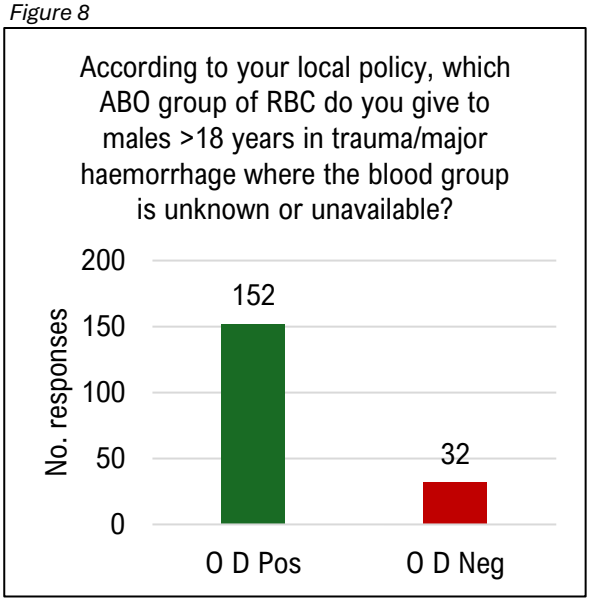

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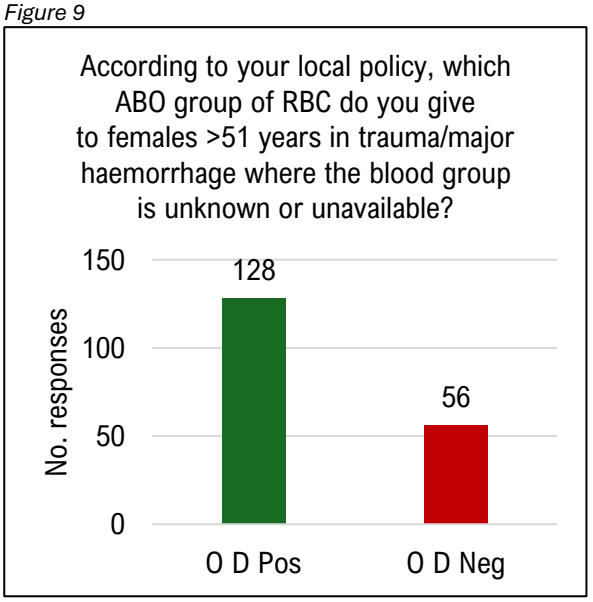

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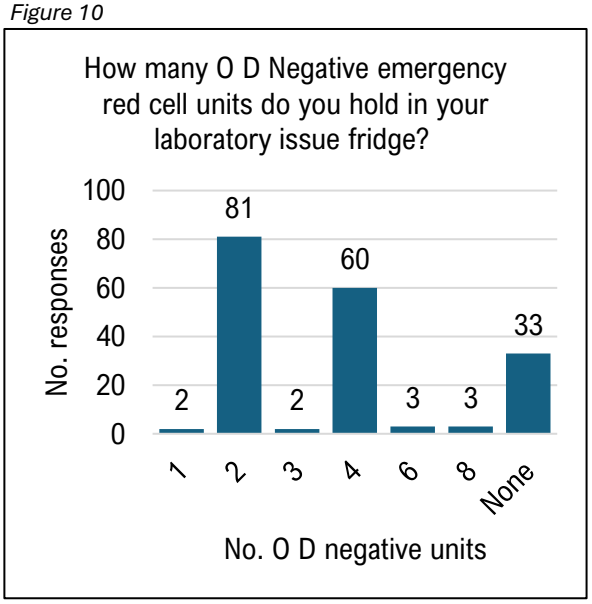

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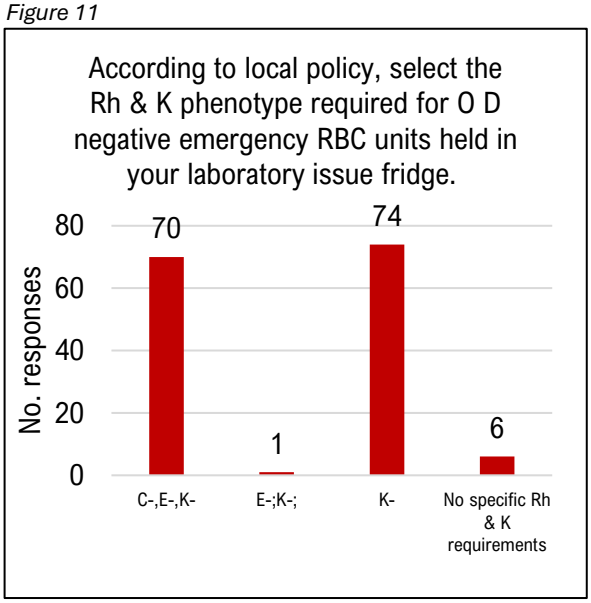

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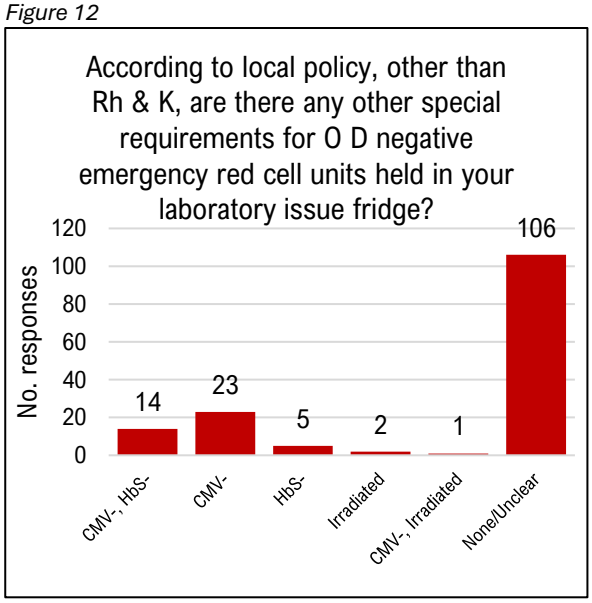

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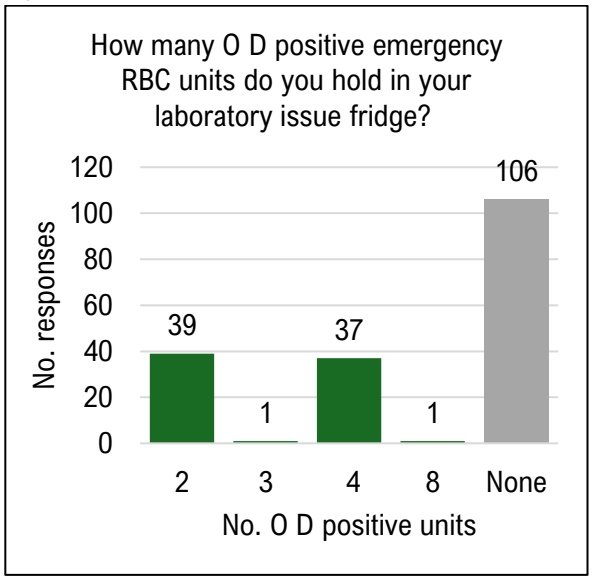

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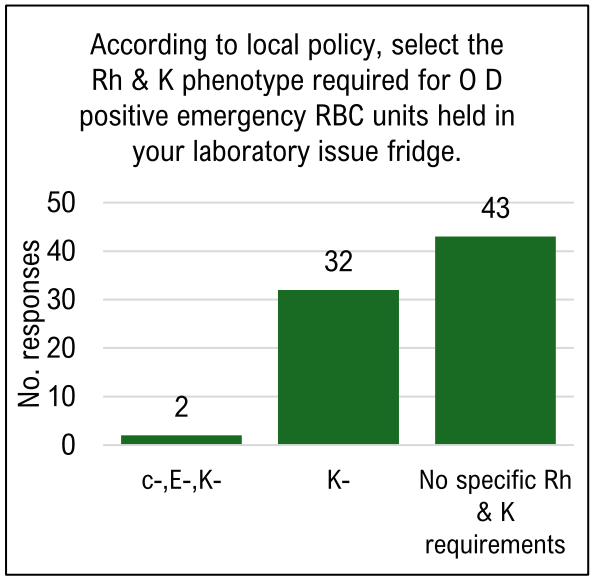

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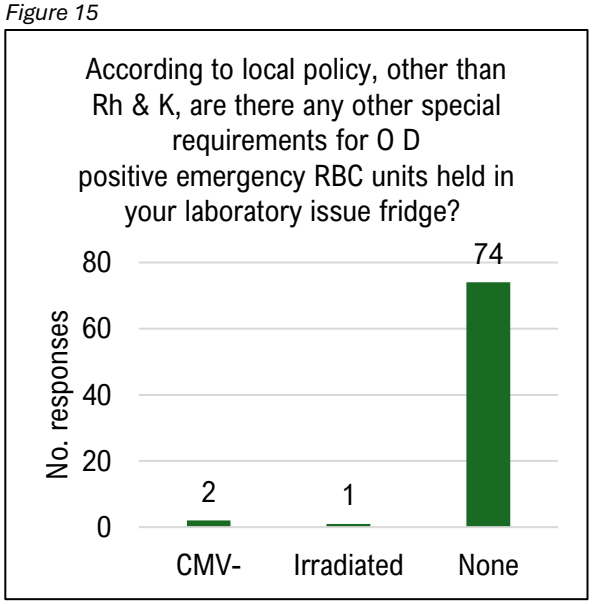

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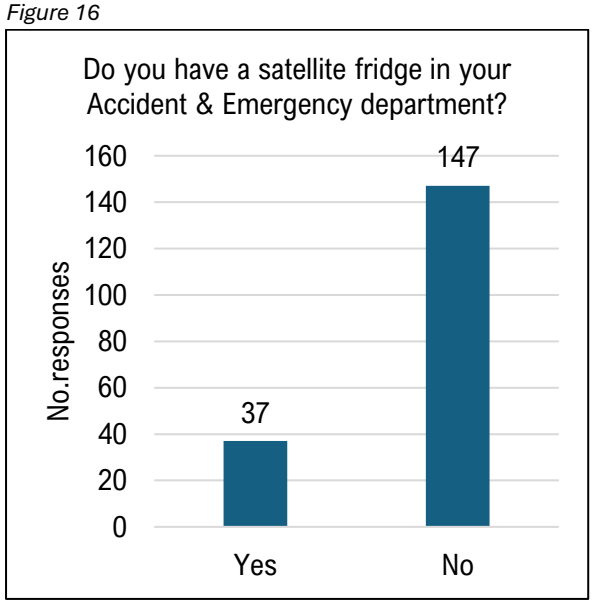

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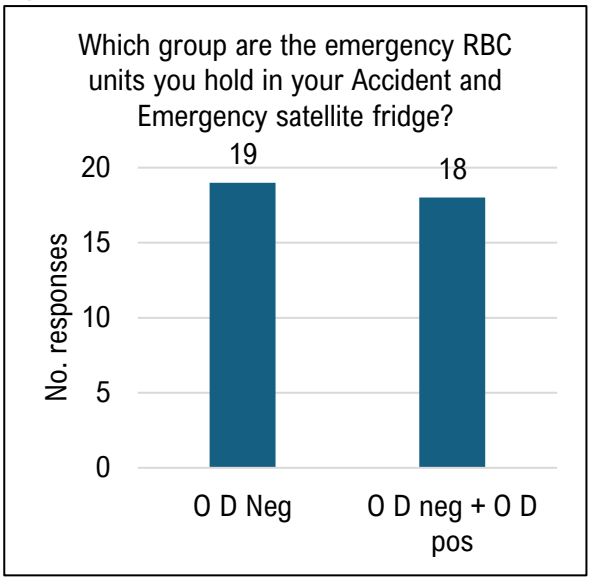

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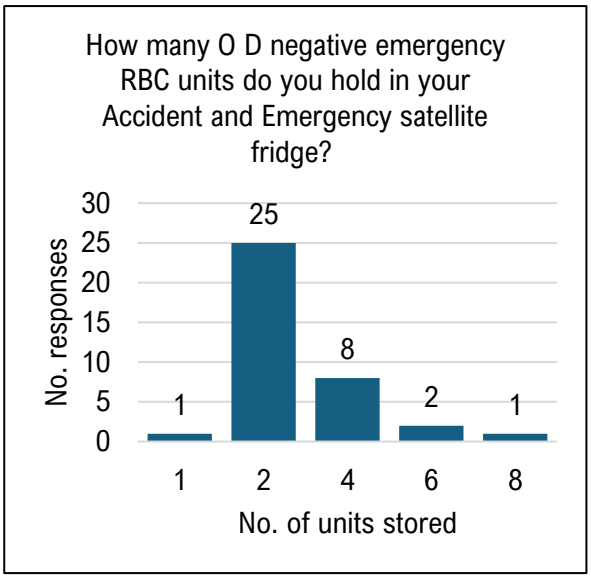

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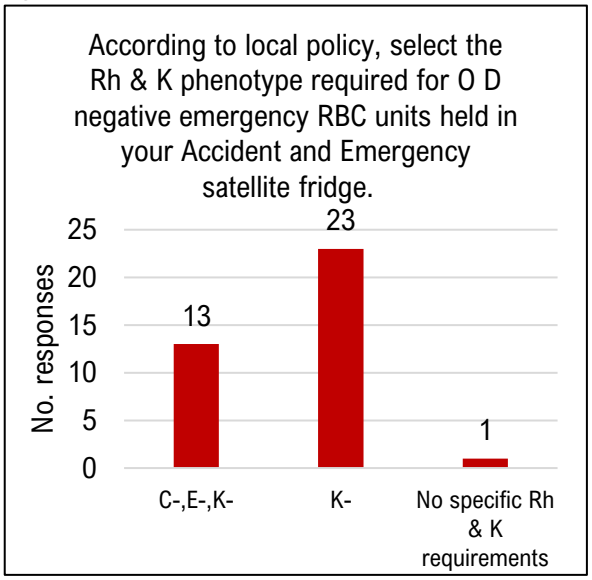

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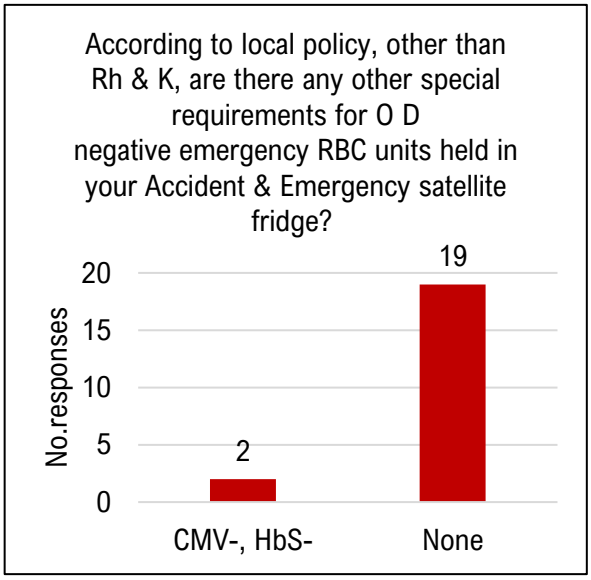

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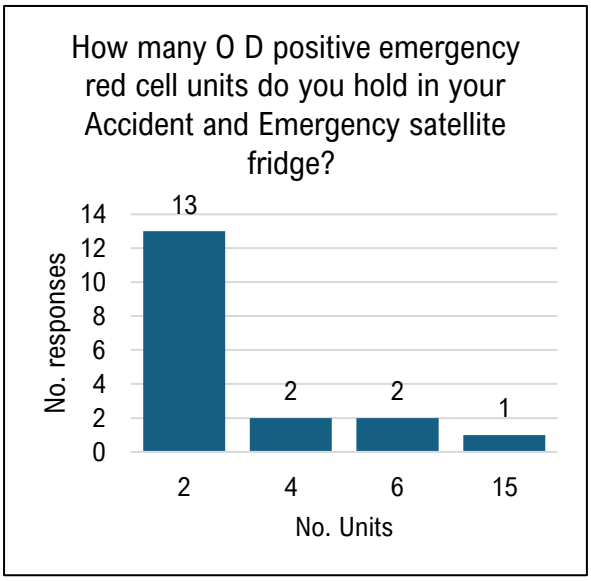

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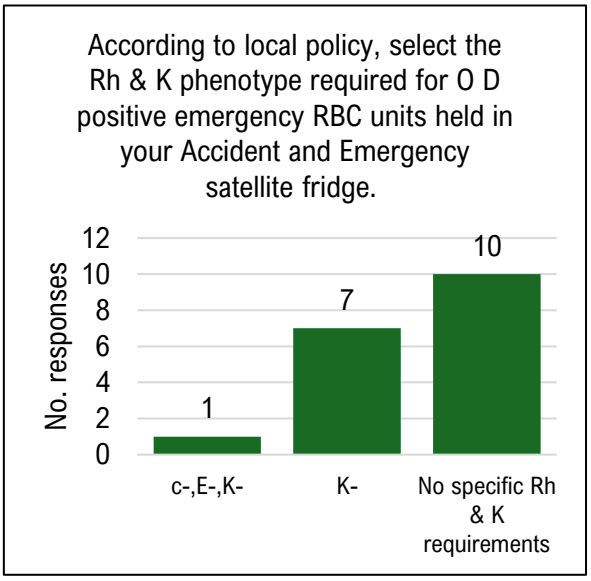

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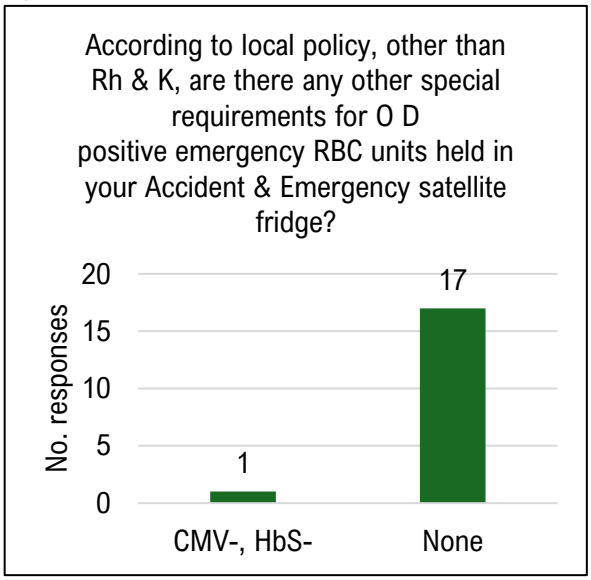

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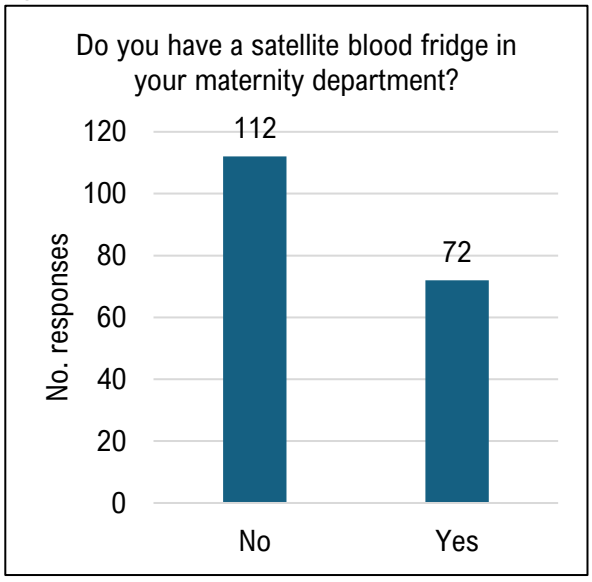

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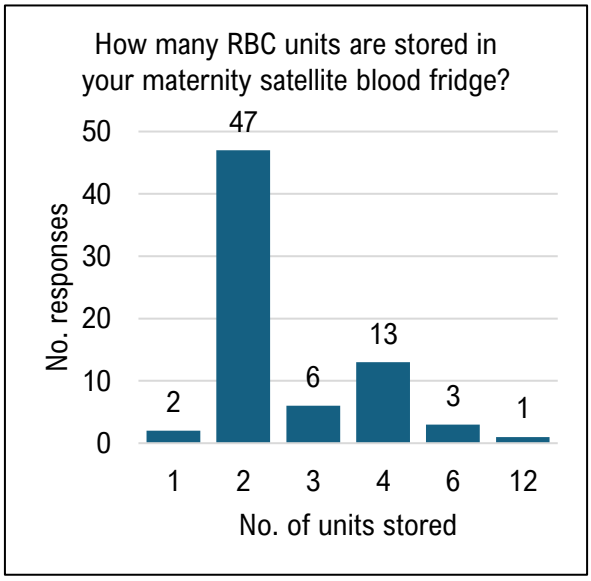

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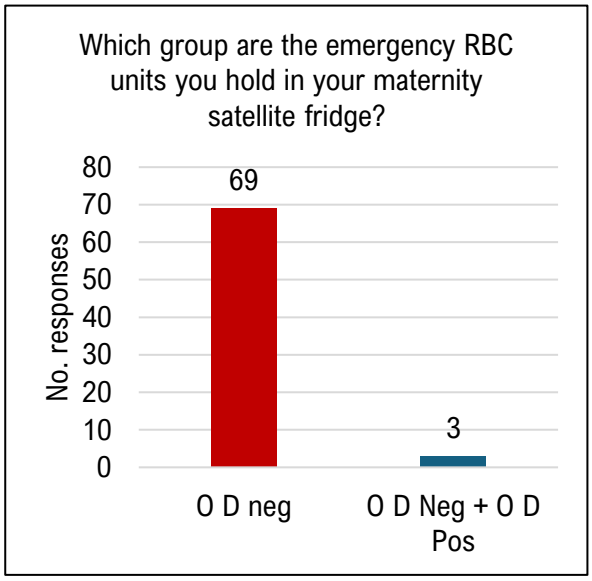

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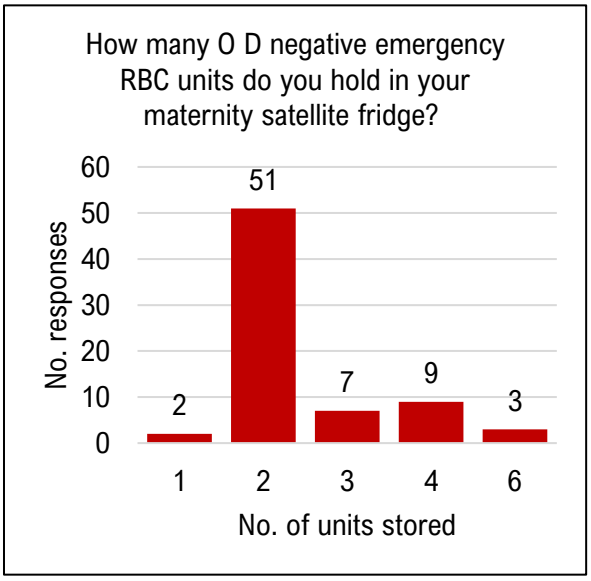

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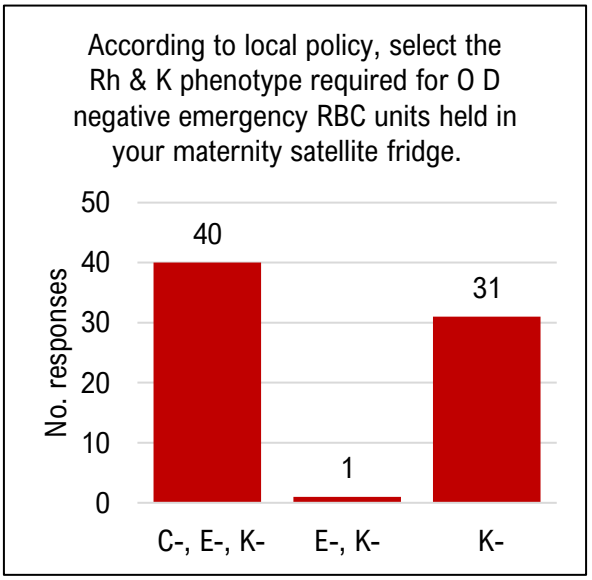

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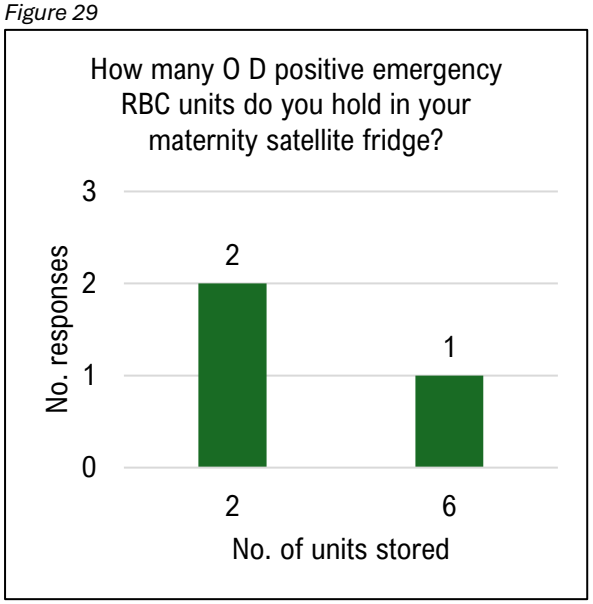

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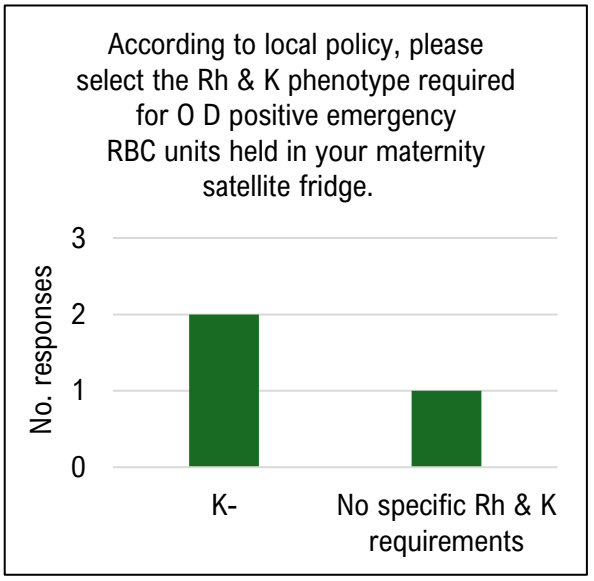

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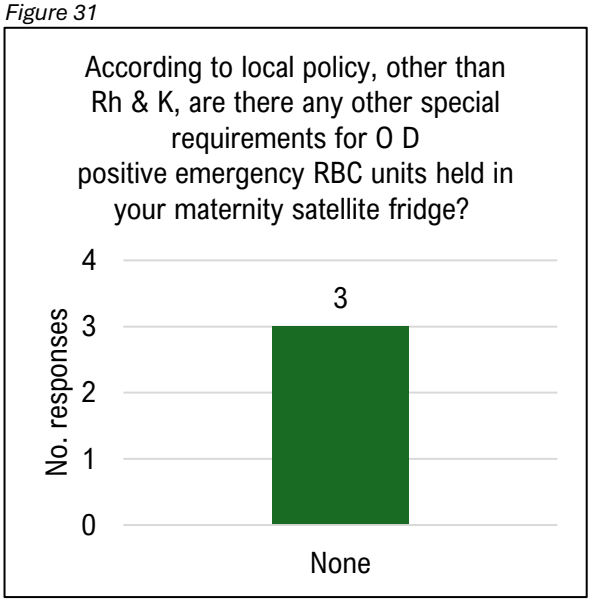

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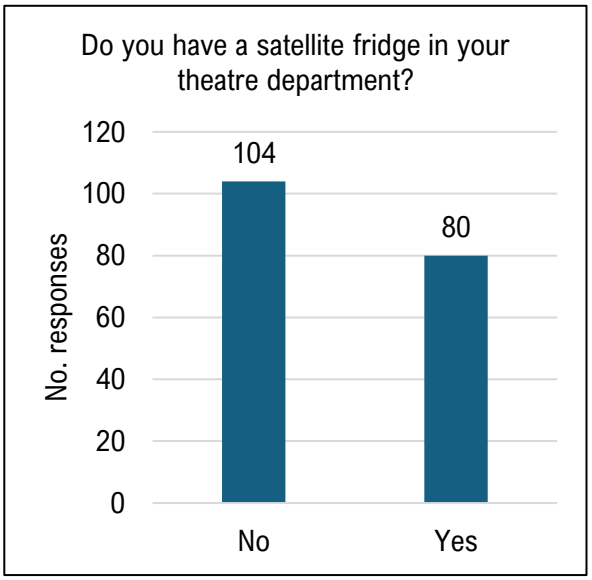

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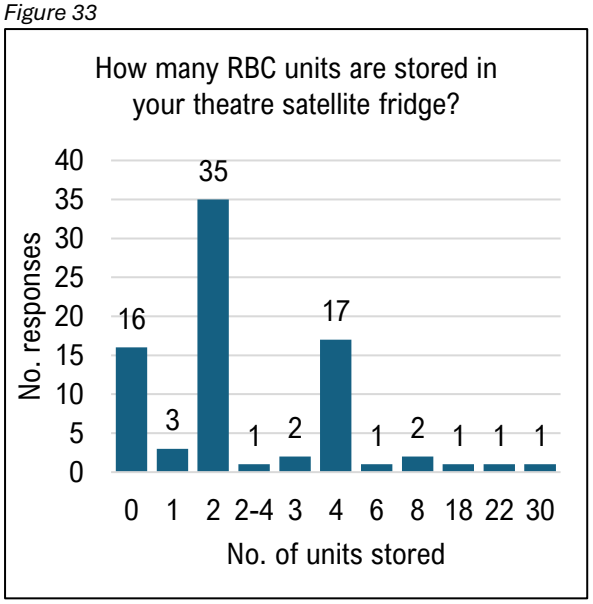

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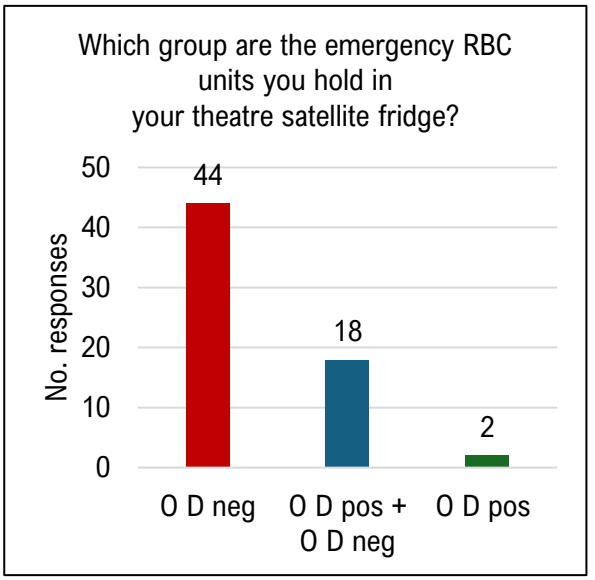

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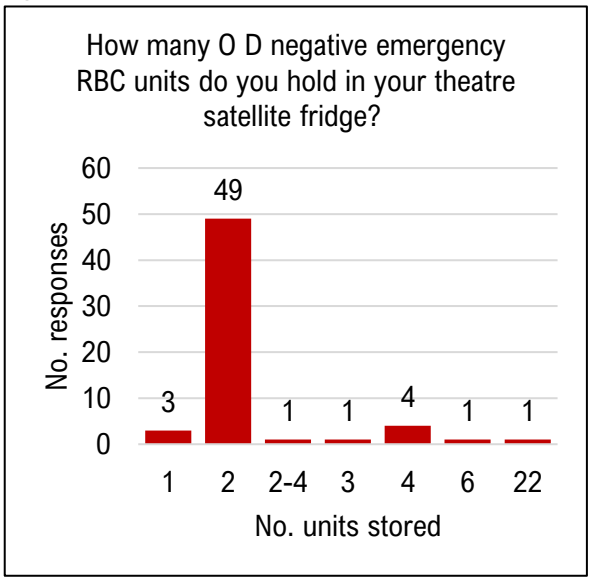

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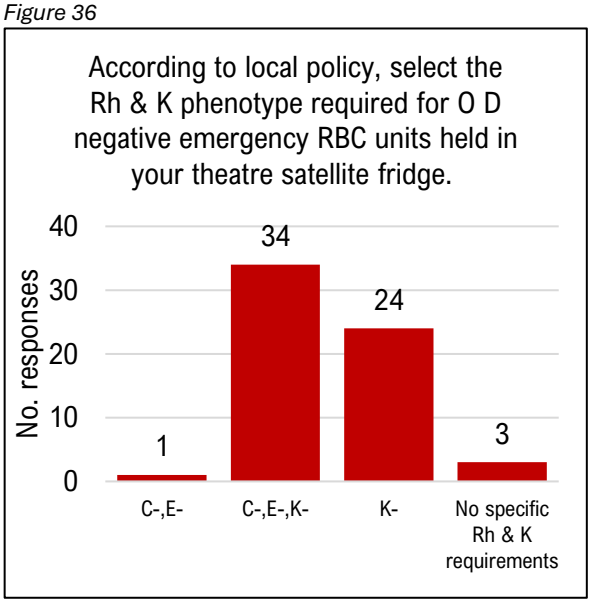

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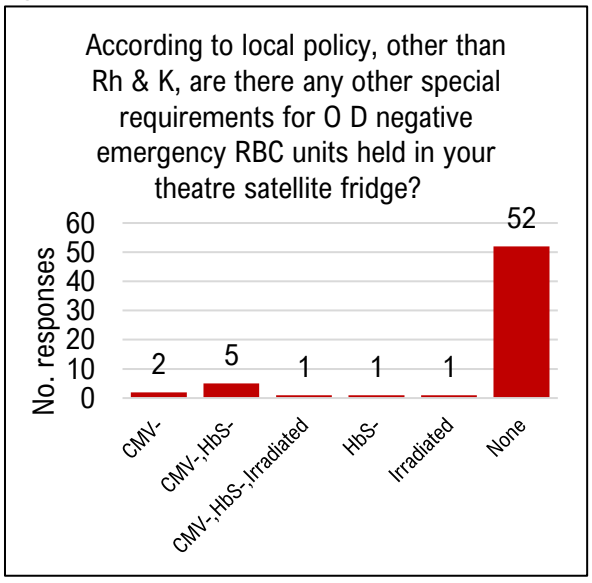

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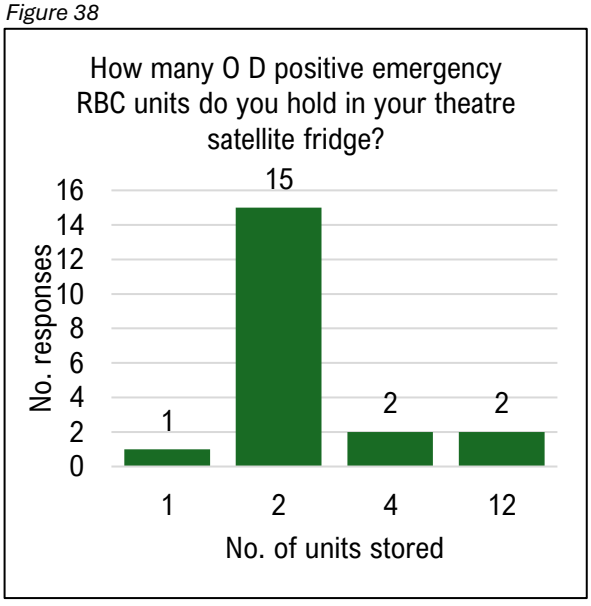

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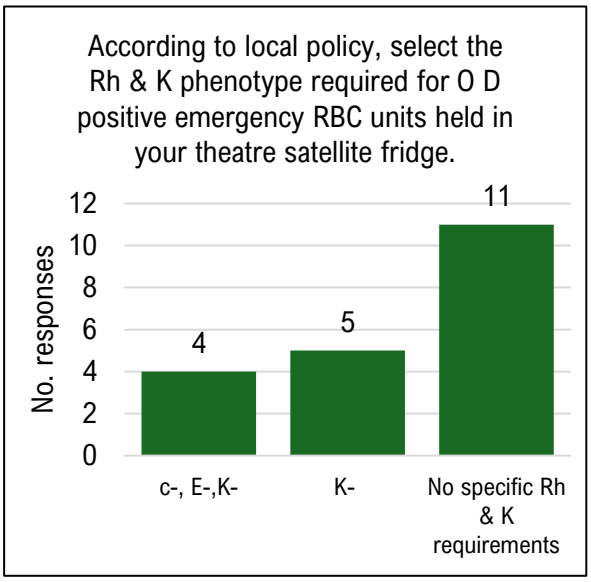

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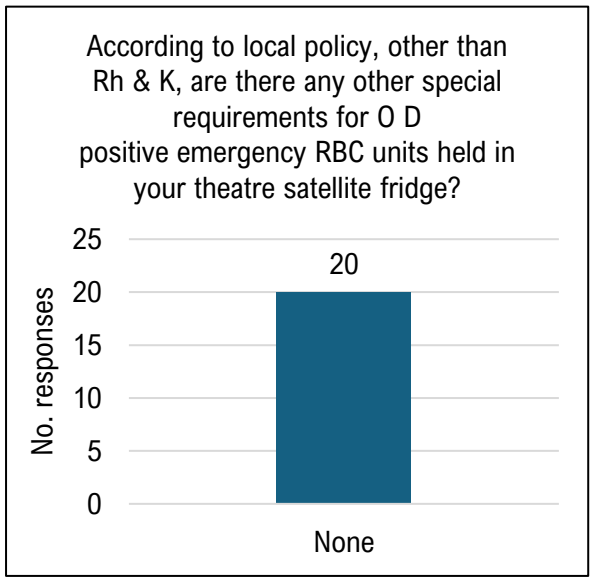
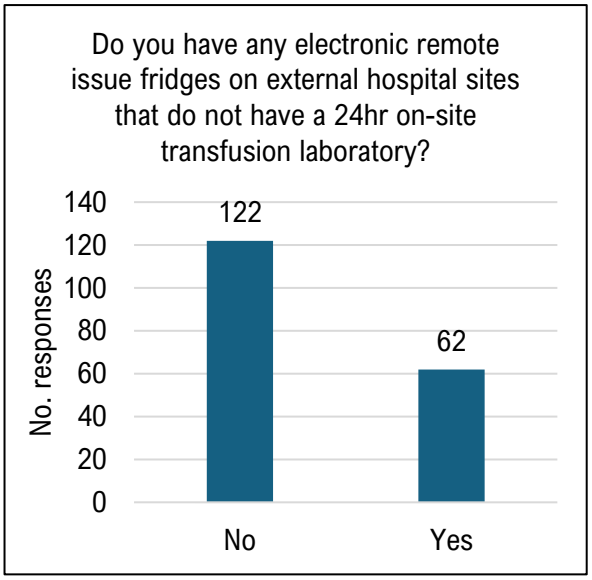


Figure 41



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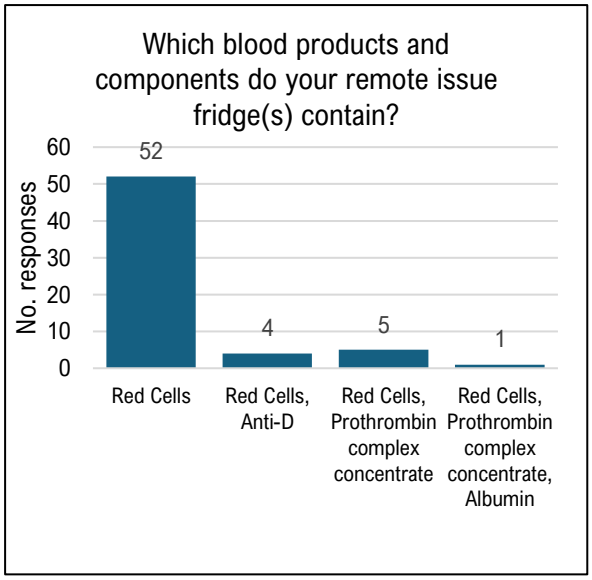

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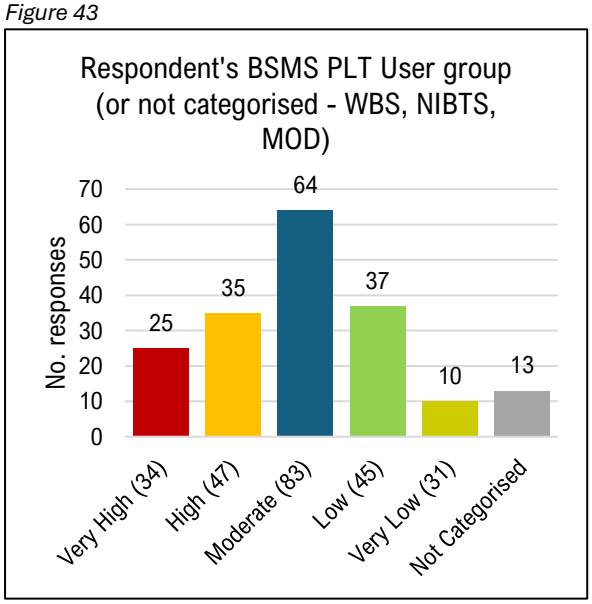

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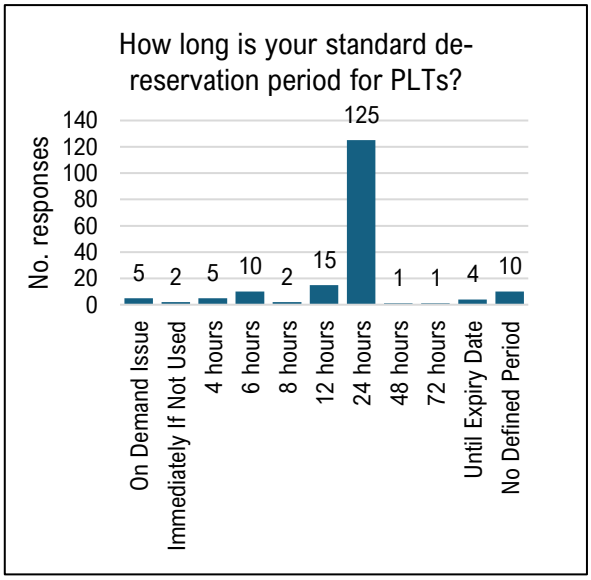

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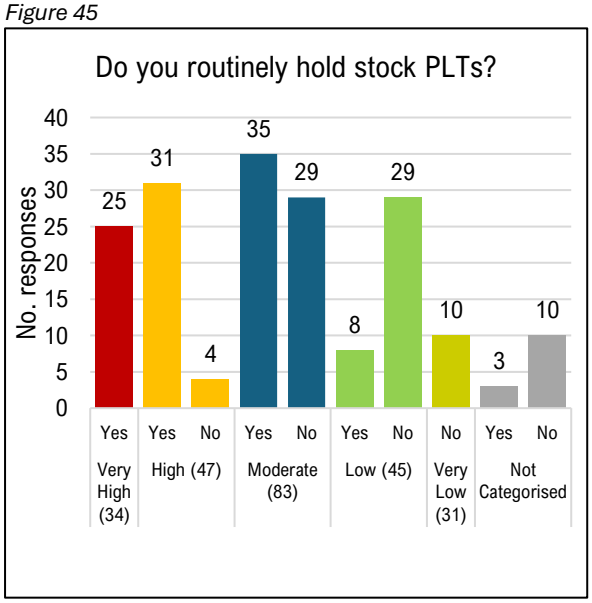

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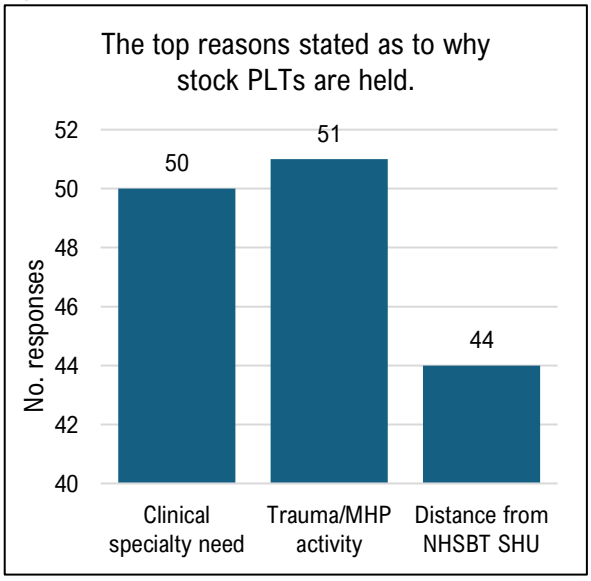

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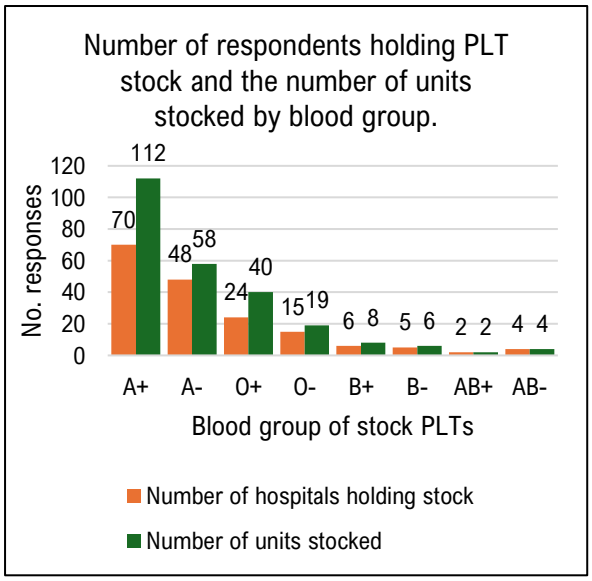


Figure 48

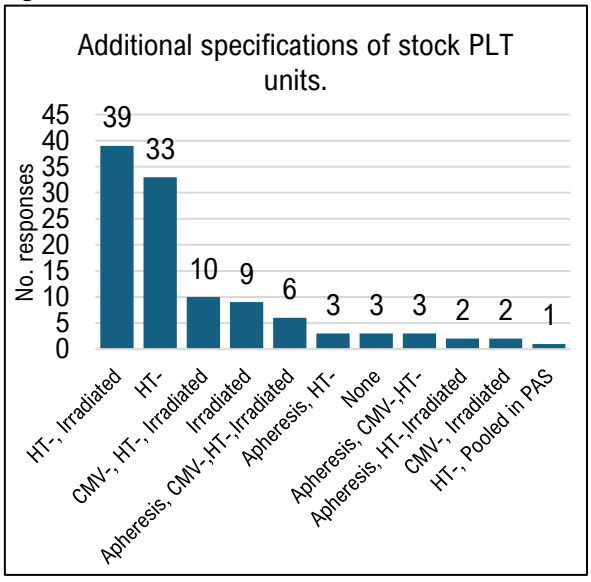


Figure 49

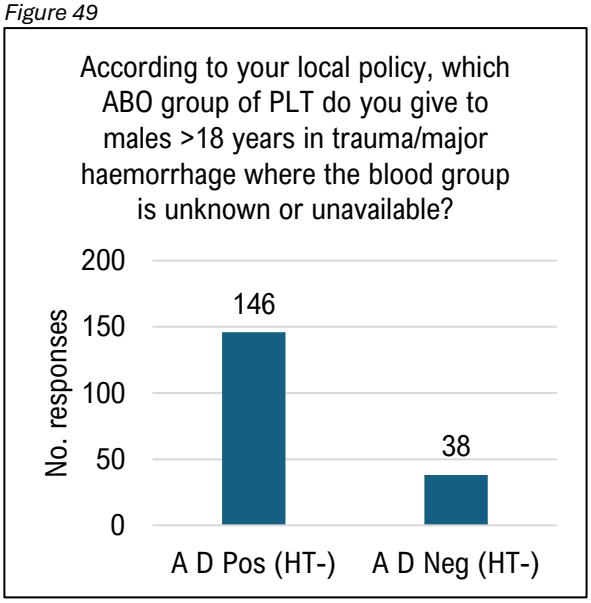
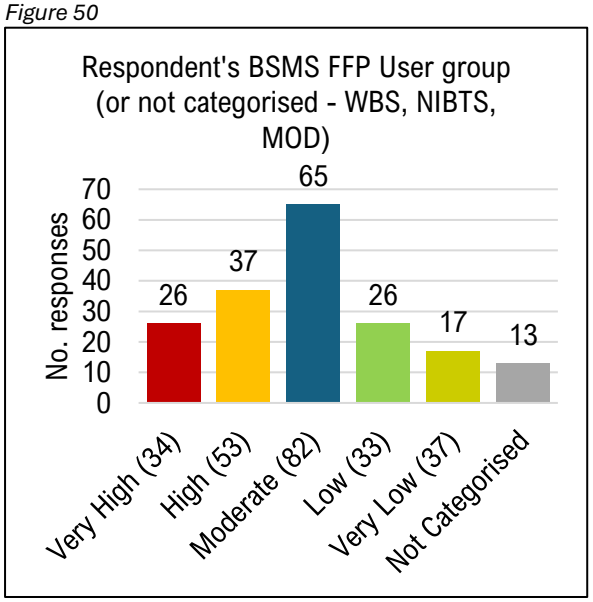

According to your local policy, which ABO group of PLT do you give to males >18 years in trauma/major haemorrhage where the blood group is unknown or unavailable?
No. responses
200
150
100
50
0
146
38
A D Pos (HT-)
A D Neg (HT-)

Figure 50



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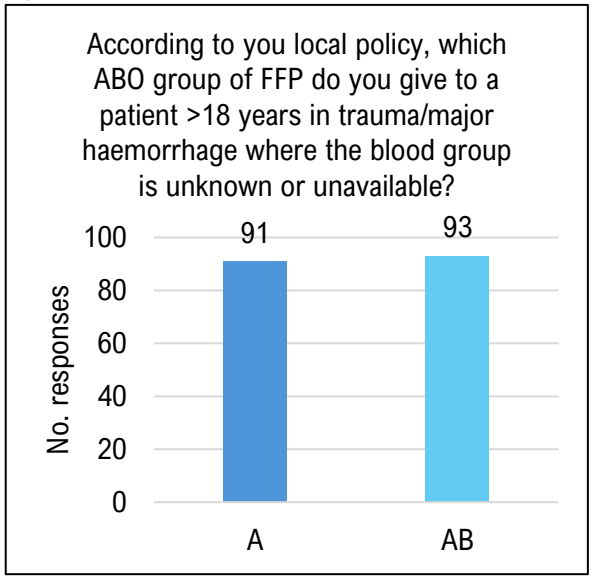


Figure 52

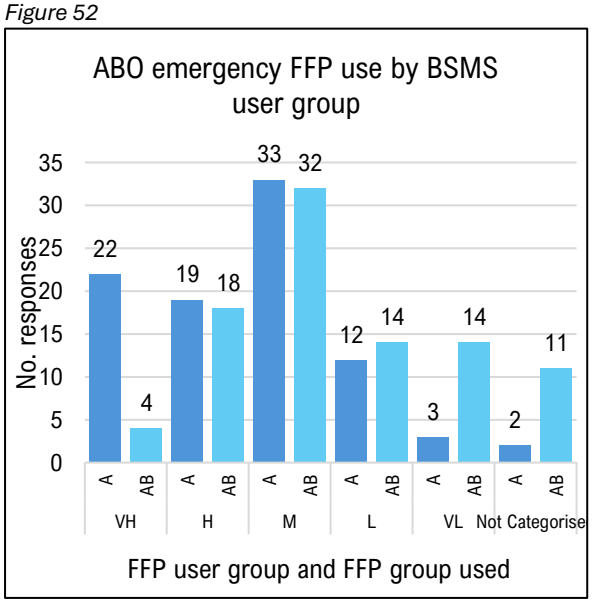


Figure 53

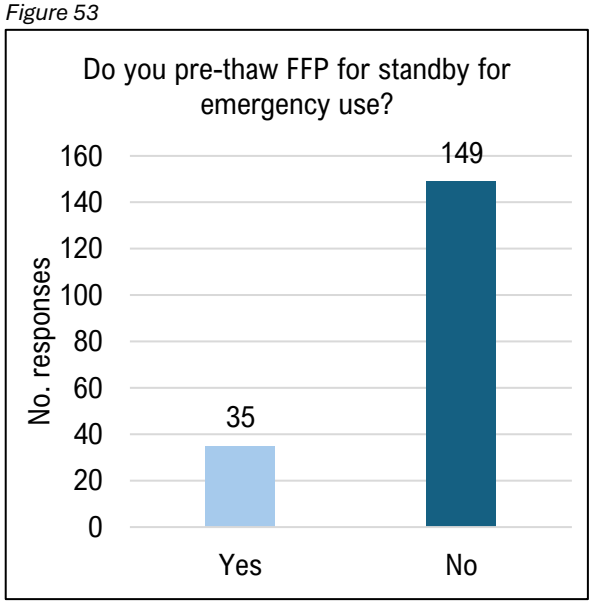


Figure 54

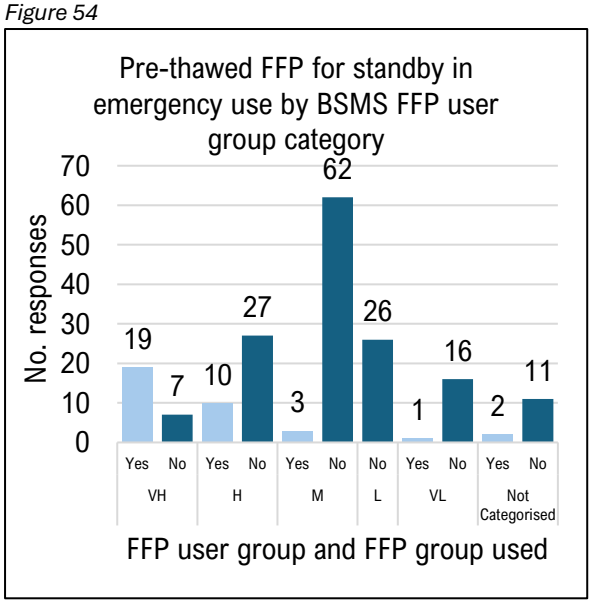


Figure 55

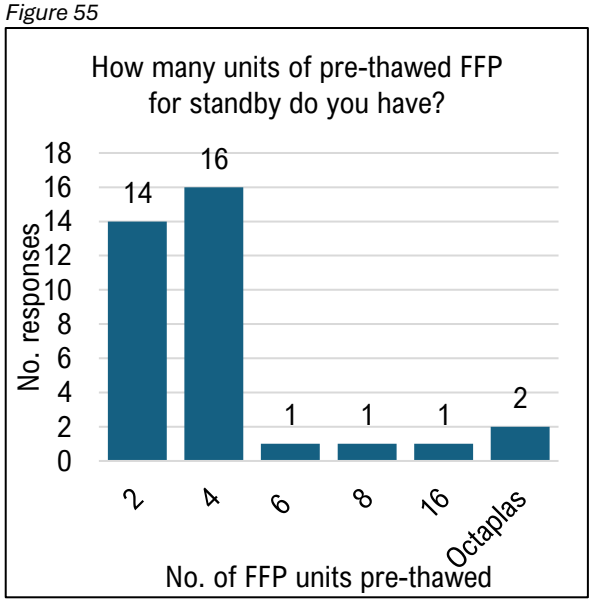


Figure 56

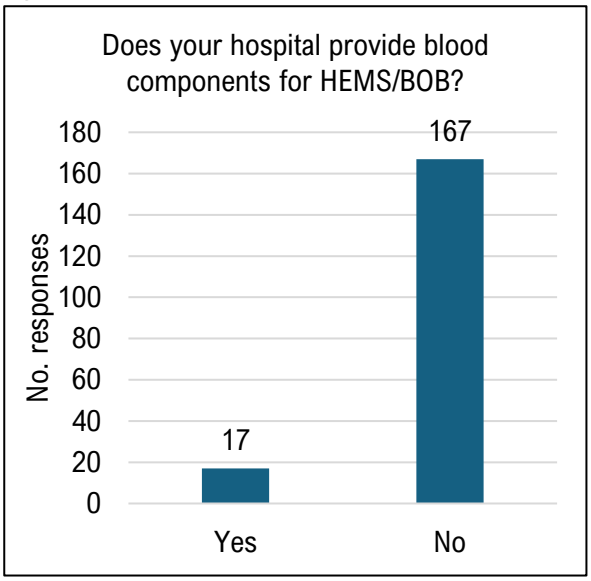


Figure 57

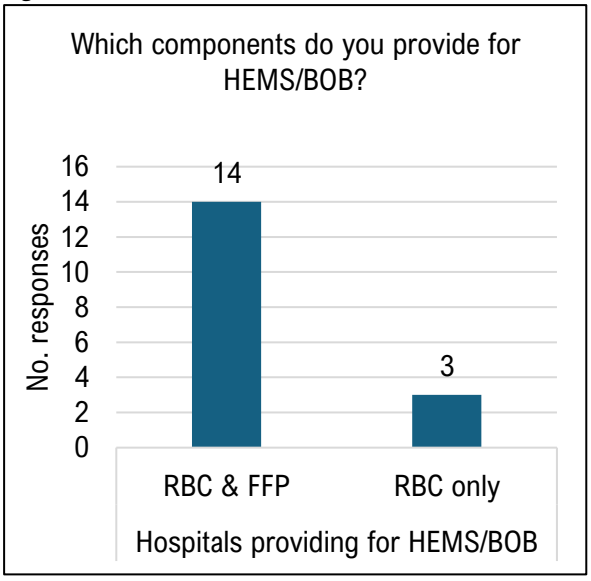


Figure 58

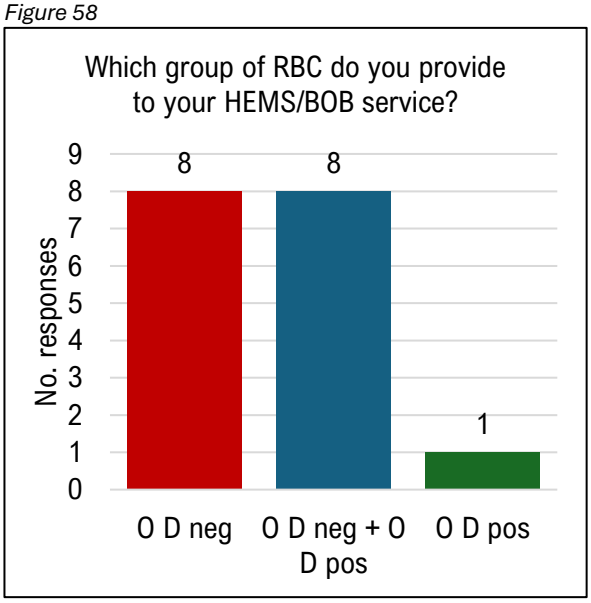
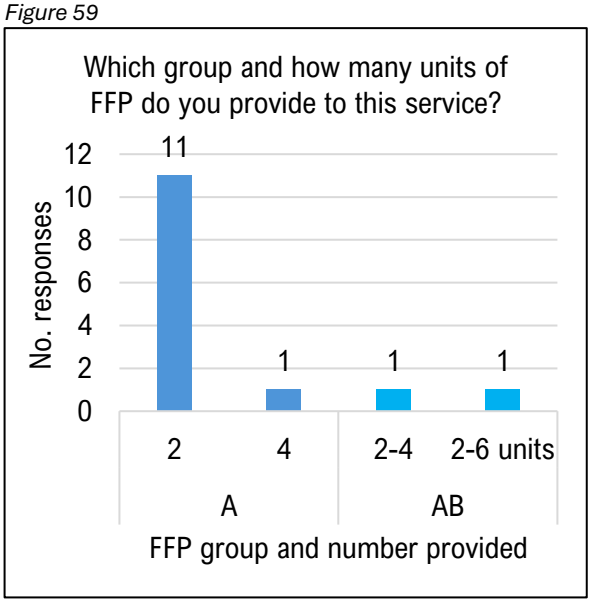


Figure 59



Discussion

The practices related to provision of emergency units are of interest to the BSMS because of the impact these components have on the supply chain. This inventory practice survey designed by the BSMS and was open to all participants of the scheme, including hospitals and organisations served by WBS and NIBTS, from June 2025 to July 2025. The duplicate and incomplete responses were removed from the data, leaving 184 responses.

The responses highlighted variation in provision and specification of components for emergency use. National guidelines for emergency RBC use promotes O D positive RBC for emergency use for males >18 years and females >51 years where the blood group is unknown or unavailable, to conserve O D negative RBC (National Blood Transfusion Committee, 2024b, 2024a). The responses showed 32/184 (17%) provide O D negative RBC to a male >18 years (fig. 8) and 56/184 (30%) provide O D negative RBC to a female >51 years (fig. 9), where the blood group is unknown or unavailable in an emergency situation. In addition, recommendations also state O D negative units do not require additional Rh specification and may only need to be K- when needed for females ≤50 years old. The survey responses showed additional component specifications were required by local policy for many of the respondents; 71/151 (47%) have additional Rh specifications (C-E-) for O D negative emergency units in the issue fridge (fig. 11), 45/151 (30%) additional specifications other than Rh and K for O D negative emergency units in the issue fridge (CMV-, HbS-, irradiated) (fig. 12) and 34/78 (44%) have additional Rh and K specifications for O D positive emergency units in the issue fridge (fig. 14).

Guidelines and recommendations for emergency components help to protect the more valuable and vulnerable components in the supply chain whilst maintaining the safety of patients receiving blood components. The appropriate use and conservation of O D negative RBC units is a priority for blood services and the support from the clinical setting for these components is essential to protect the supply chain. Additional specification on components that is not necessary on an individual patient basis adds complexity to the provision from the blood service and may increase wastage of units within the supply chain without additional attributes.

Extended specification requests for stock PLT are also seen in the survey responses. Stock PLT are held by 102/184 (55%) respondents (fig. 45), there were 11 different combinations of specifications indicated, including HT-, CMV-, apheresis and irradiated (fig. 48). It is understood that these requirements do help avoid wastage by having stock units available that are suitable for different patient groups, however, these additional specifications increase blood service wastage and supply chain complexity. According to local policy 146/184 (79%) respondents provide group A D positive (HT-) PLT to males >18 years where the blood group is unknown or unavailable, with the remaining respondents providing A D negative (HT-) PLT (38/184, 21%) (fig. 49). National guidelines recommend A D positive (HT-) PLT are a suitable alternative group for this use (Estcourt *et al.*, 2017).

Responses show variation in local protocol for provision of FFP to patients where the blood group is unknown or unavailable, 93/184 (51%) provide group AB FFP (fig. 51). To preserve group AB FFP for patients where there is no alternative, national guidelines recommend the use of group A (HT-) FFP for use in trauma/major haemorrhage (Green *et al.*, 2018). Pre-thawing FFP for standby is also performed by 35/184 (19%) respondents (fig. 53), and 7/35 (20%) pre-thaw AB FFP to have on standby. A proportion of respondents (14/184, 8%) also provide FFP for use by HEMS/BOB (fig. 57), 12/14 (86%) provide group A FFP and 2/14 (14%) provide group AB FFP (fig. 59).

Provision of components for HEMS/BOB puts pressure on the supply chain for O D negative RBC and group AB FFP. Of respondents providing RBC for this purpose, 8/17 (47%) provide O D negative, 8/17 (47%) provide a mix of O D negative and O D positive and 1/17 (6%) provide O D positive RBC (fig. 58). It is acknowledged that providing components for these services does increase wastage, particularly of FFP, however, it is difficult to determine the extent of the wastage nationally because the routine BSMS data collection methodology does not provide a method to categorise wastage as a result of this practice.

Wastage may also be increased through inventory management practices such as longer de-reservation times for issued RBC and PLT. The responses showed variation in practices, anything from 'on-demand' provision of PLT (no de-reservation time) (5/180, 3%) to those leaving PLT allocated until expiry (4/180, 2%) or no defined period (10/180, 6%) (fig. 44). Good practice for PLT de-reservation time is to allocate for as short period as is clinically possible, to minimise time allocated to a patient and to increase the likelihood of being used before expiry (Blood Stocks Management Scheme, 2022). Similarly for RBC, a longer de-reservation period increases the likelihood of wastage, and although the majority of respondents indicated a de-reservation time of 24 hours or less (122/184, 66%), there were 62/184 (37%) respondents with a de-reservation period of >24 hours, or not defined (fig. 6), which would likely contribute to increased RBC wastage.

There were variations indicated in the length of time prior to expiry for rotation of emergency units (fig.7). Good practice for avoiding wastage is to rotate units regularly with enough time before expiry to enable use for other patients and recycle units either within the hospital or organisation or with an external site where possible. Whilst there is no defined period in the recommendations, it is advised that sites review the policy and ensure their procedure is optimised, with stock sharing where possible, to minimise wastage of these components.

There were 17 responses from hospitals identified as a Major Trauma Centre (MTC) for either adult, children's or both adult & children's trauma, representing a response rate of 61% (17/28 MTCs). For the MTCs a lower number of responses indicated that local policies did not reflect national guidelines or recommendations for emergency component provision, 2/17 (12%) provide O D negative RBC to a male >18 years and 4/17 (24%) provide O D negative RBC to a female >51 years. For platelet provision to males >18 years where the blood group is unknown or unavailable, 16/17 (94%) provide A D positive (HT-) PLT. There were 3/17 (18%)

responses from MTCs indicating provision of group AB FFP to patients where the blood group is unknown or unavailable, 2/3 of those responses were from children's MTCs.

The MTC respondents indicated additional specification for emergency O D negative and O D positive was indicated for most emergency units held in either laboratory issue fridges or satellite fridges including C-, E- and K- phenotypes and CMV- and HbS- specifications. Where O D negative stock is held in the laboratory issue fridge (12/17, 71%), C-E-K- was required by 3/12 (25%), K- by 8/12 (67%) and 3/12 (25%) additionally require units to be CMV-, whilst 2/7 (29%) MTC respondents require O D positive emergency stock units in the laboratory issue fridge to additionally be K-. Additional specifications of stock platelets are required by 16/17 (94%) MTCs, 12/17 (71%) require stock platelets to be irradiated amongst other additional specifications including HT- (12/17, 71%), CMV- (4/17, 24%) and pooled in Platelet Additive Solution (PAS) (1/17, 5%).

It is acknowledged there are limitations with survey methodology when gathering data on transfusion practices. Whilst the survey questions were designed to gather information on local policy, rather than subjective opinion, there may still be error and missing data with responses. The responses reflect what local policy states the practice should be and there may be variation in practice from what the policy states. There is also missing data from the hospitals and organisations that did not respond and some aspects of the emergency provision of components not included in the survey, such as provision of emergency PLT for female patients with an unknown or unavailable blood group.

The responses received highlight variation in the demand, usage and inventory management of emergency components. The components under the most strain within the supply chain are the components commonly used for patients of an unknown or unavailable blood group, however, many of these patients are unlikely to require these additional specifications. Where there are published recommendations and guidelines for the blood group and specification of units for emergency use, we urge hospitals and organisations to evaluate their practice and adopt these recommendations where possible.

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