

**Inventory Practice Survey December 2009  
- -Frozen Components (v1.1) - -**

<b>1 Background.....</b>	<b>1</b>
<b>2 Summary of key findings and recommendations.....</b>	<b>1</b>
<b>3 Survey Response.....</b>	<b>3</b>
<b>4 Frozen Component Ordering.....</b>	<b>4</b>
4.1 Use of standard protocols for frozen components requests within hospitals .....	4
4.2 Standard Operating Procedures for ordering from the blood service or commercial companies .....	5
4.3 Ad-hoc deliveries .....	6
<b>5 Frozen Component Storage and Stocks .....</b>	<b>8</b>
5.1 Storage guidelines .....	8
5.2 Stocks .....	9
5.2.1 Commercial frozen product – Octaplas.....	9
<b>6 Training .....</b>	<b>10</b>
<b>7 Should the Blood Stocks Management Scheme collect data on frozen components ? .....</b>	<b>12</b>

**1 Background**

The Blood Stocks Management Scheme (BSMS) collects data on red cells and platelet issues and wastage. The BSMS does not currently collect data on frozen components and there is no data available on hospital ordering and stock management practice in hospitals relating to frozen components. A survey looking at frozen component ordering, storage, stocks and training in its use was distributed to hospitals in 2009. Hospitals were also asked for their views on whether the BSMS should collect data on stock and wastage of frozen components.

**2 Summary of key findings and recommendations**

- There has been significant progress in the management of both major haemorrhage and massive transfusion in recent years and this is reflected in the protocols now available in hospitals.
- Availability of a frozen component ordering standard operating procedure, the review period of SOPs, and meeting the UKBTS (Red Book) storage guidelines show high levels of compliance. These outcomes have been driven by the implementation of the Blood Safety and Quality Regulations 2005.

- The relatively long shelf life of frozen components, 24 months, implies that the main limitation to hospitals holding sufficient stock is their storage capacity.  
Hospitals should review and adjust their stock levels of frozen components on a regular basis.
  - Ensuring stocks are adequate to meet emergency requirements
  - Hospitals should review their storage capacity ensuring that it is sufficient to meet their needs
- The majority of hospitals use ad hoc deliveries to some extent for their delivery of frozen components. Emergency requests, having no stock on site and stock depleted due to an emergency were reasons given for this practice. Where possible delivery of frozen components should be limited to routine deliveries as delays to ad hoc deliveries can occur if numerous components are being requested.
- 3% (6/225) of hospitals who do not store frozen components come from the Very Low red cell usage hospitals.
- Higher proportions of groups B and AB are held as stock in hospitals than would occur in the general population. Lower proportions of group O are held as hospital stock. This is true for all types of frozen components but less so for cryoprecipitate.
- 7 hospitals are holding a stock of Octaplas but holding no Adult FFP stock. The majority of these hospitals were hospitals treating children.
- Training on indications for use is provided to junior doctors but not by all hospitals. The role of the Transfusion Practitioner appears to have been key to the provision of training. Delivery of training and education about the appropriate use of frozen components to staff may ensure appropriate use.
- The majority of hospitals have indicated that the BSMS should collect data from hospitals on stock and wastage of frozen components. The BSMS will look into the feasibility of creating the facility to collect and report stock and wastage data for frozen components.

### 3 Survey Response

The 2009 Inventory Practice Survey was sent to 294 hospitals in England, Wales and Northern Ireland.

There were 225 responses to the survey, corresponding to a 77% response rate.

The response rate was 76% or higher for hospitals served by each of the different blood services (Table 1).

Blood Service	Number of hospitals that responded	Number of hospitals served by blood service	Response rate
NHSBT	203	268	76%
NIBTS	8	10	80%
WBS	14	16	88%
Total	225	294	77%

As frozen component data is not collected by the BSMS there are no corresponding frozen component usage categories within BSMS. Therefore the red cell usage categories have been used as a proxy to allow comparison of practice across similar hospitals and to compare high usage hospitals with low usage hospitals (Table 2).

Red Cell usage category	Red Cell Units /Annum
Very High	> 10,000
High	6,501 – 10,000
Moderate	4,001 – 6,500
Low	801 – 4,000
Very Low	0 - 800

The response rate was above 60% for all red cell usage categories (Table 3).

Red Cell usage category	Number responding	Number in category	Response rate
Very High	42	59	71%
High	57	66	86%
Moderate	68	83	82%
Low	30	49	62%
Very Low	28	37	76%

## 4 Frozen Component Ordering

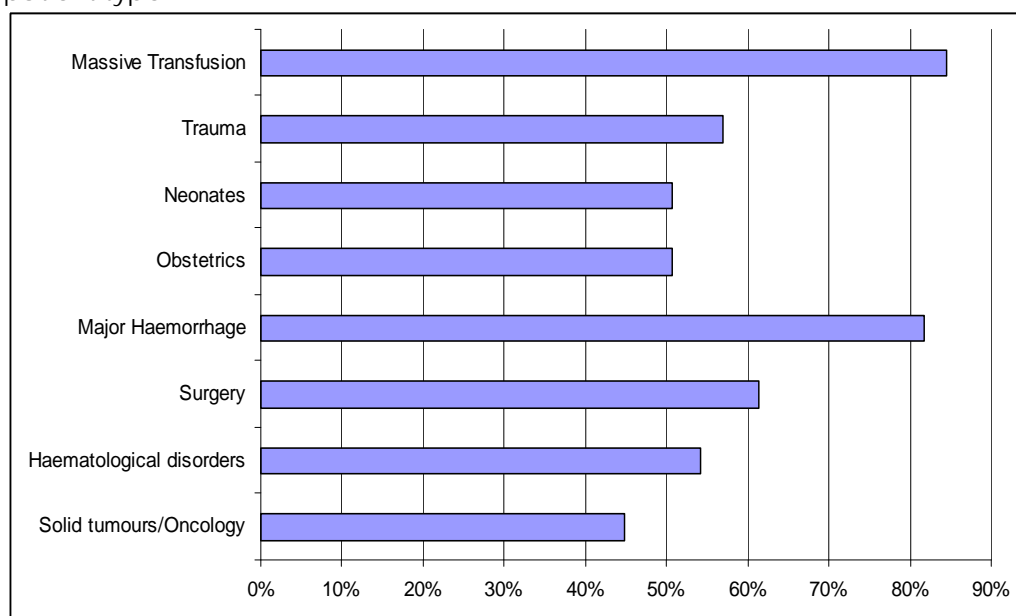
Hospitals were asked to provide information about their frozen component ordering practices. Topics covered included standard protocols available, standard operating procedures and deliveries.

### 4.1 Use of standard protocols for frozen components requests within hospitals

Hospitals were asked whether standard protocols were available for those generating requests for frozen components.

The two most common standard protocols available in hospitals are for Massive Transfusion and Major Haemorrhage patients (Figure 1).

Figure 1: Percentage of hospitals that have a standard protocol in place for each patient type.



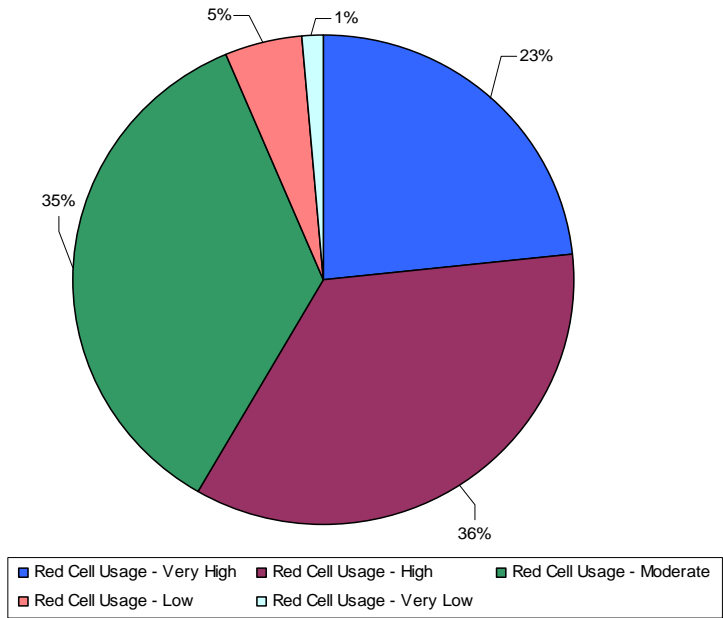
- 77 hospitals have SOPs for all eight patient types (Table 4).
- There is a clear relationship between level of frozen component usage and the number of hospitals that have all 8 protocols available (Table 4). This is likely to be because some of the smaller hospitals do not provide services to all patient types.

**Table 4: Number of hospitals with standard protocols by patient type and red cell usage category**

Standard Protocol	Red Cell usage category				
	Very High	High	Moderate	Low	Very Low
Solid tumours/Oncology	23	29	31	10	8
Haematological disorders	26	34	39	11	12
Surgery	29	35	44	13	17
Major Haemorrhage	37	48	57	24	18
Obstetrics	28	33	39	10	4
Neonates	28	35	38	12	1
Trauma	30	36	44	14	4
Massive Transfusion <sup>1</sup>	38	49	57	25	21
All 8 protocols	18	27	27	4	1

<sup>1</sup> Definition Handbook of Transfusion Medicine, UK Blood Services, 4<sup>th</sup> Edition, D B L McClelland

Figure 2: Percentage of hospitals with all 8 protocols by red cell usage category



#### 4.2 Standard Operating Procedures for ordering from the blood service or commercial companies

All hospitals were asked if they have a Standard Operating Procedure in place for ordering from the blood service or commercial companies.

- 91% of respondents have a Standard Operating Procedure (SOP) available to blood transfusion staff for placing orders for frozen components with the blood service or commercial companies.
- Of the 7% (16 hospitals) that did not have a SOP in place, 8 have no plans in place to introduce one, and 6 plan to introduce one in the next year. The remaining 2 hospitals did not answer.

### How often are SOPs reviewed?

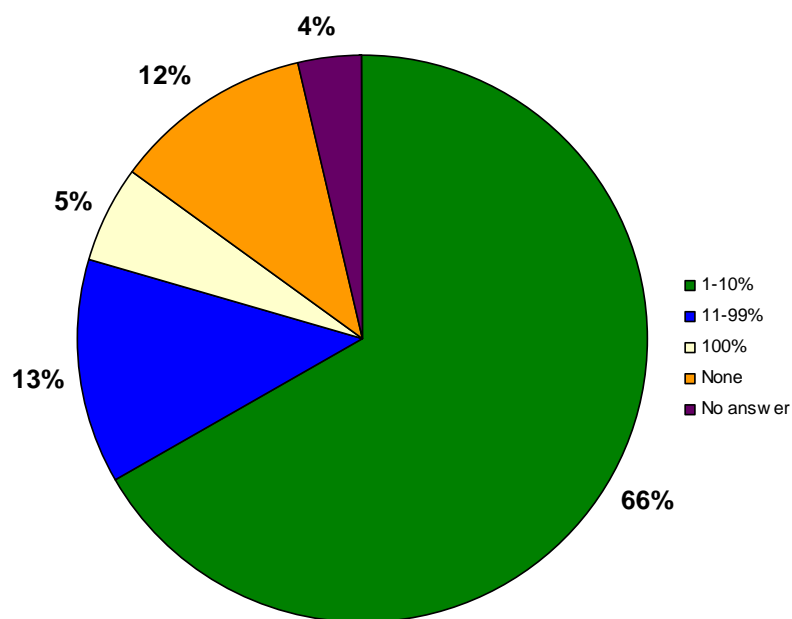
- 95% (192/205) of those with a SOP are reviewing them either every 12 months or every 2 years.

### 4.3 Ad-hoc deliveries

Hospitals were asked what percentage of frozen components are delivered on an ad hoc basis and the reasons for ad hoc deliveries. Hospitals were asked to estimate their reliance on ad-hoc deliveries ranging from no reliance to 100% reliance.

- 66% (150/225) of hospitals order 1-10% of their frozen components on an ad-hoc basis (Figure 3).
- 5% (12/225) of hospitals rely completely on ad-hoc deliveries.
- 12% (26/225) stated that they do not have any ad-hoc deliveries for frozen products.

Figure 3: Percentage of frozen component deliveries that are ad hoc



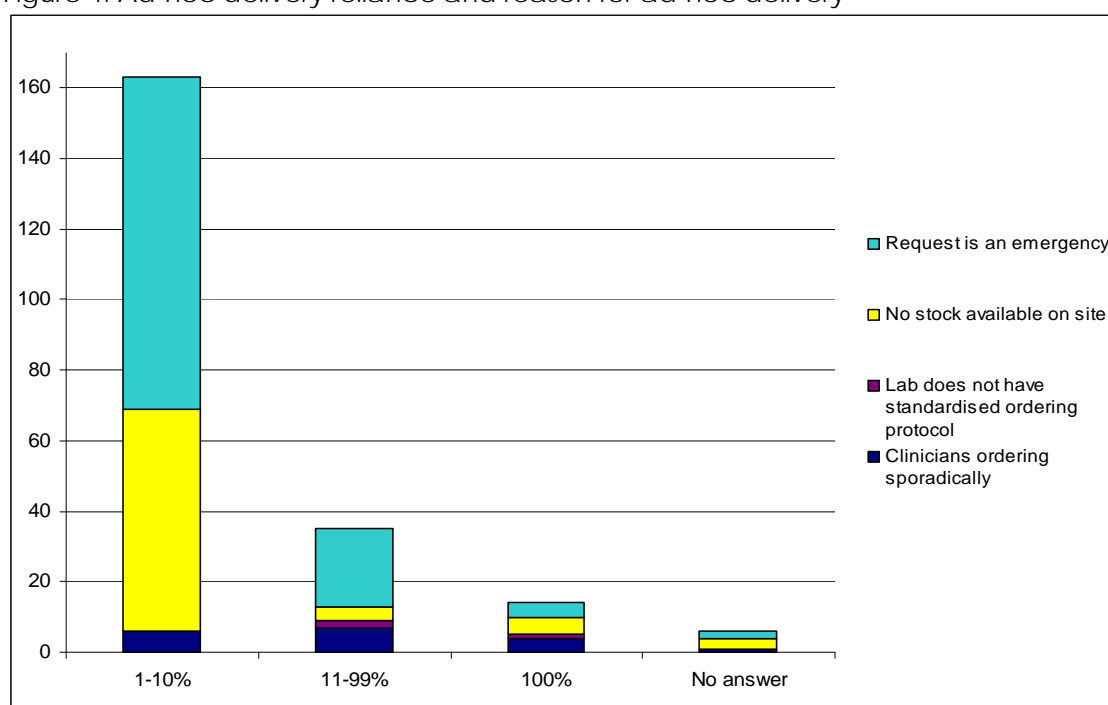
Of those hospitals that order 1-10% of frozen components on an ad-hoc basis, 50% (75/150) are either a Very High or High red cell usage category hospital (Table 5).

75% (9/12) of those hospitals that order 100% of their frozen components on an ad-hoc basis are either a Very Low or Low red cell usage category.

81% (21/26) of hospitals that do not rely on ad-hoc deliveries are from the Very High, High and Moderate red cell usage categories.

Red Cell usage category	Percentage delivered on an ad-hoc basis				
	1-10%	11-99%	100%	None	No Answer
Very High	33	3		6	
High	42	7	1	6	1
Moderate	48	7	2	9	2
Low	20	6	1	2	1
Very Low	7	6	8	3	4

Figure 4: Ad-hoc delivery reliance and reason for ad-hoc delivery



The 191 hospitals that use ad hoc deliveries to some extent were then asked to provide information about the reasons why their frozen components are received on an ad-hoc basis. Hospitals could give multiple answers.

- Emergency request was the most commonly given reason (122 hospitals), followed by having no stock on site with 75 hospitals

- 45 hospitals gave an “other” reason, the main one being that stock had been depleted due to an emergency.

## 5 Frozen Component Storage and Stocks

The relatively long shelf life of frozen components, 24 months, implies that the main limitation to hospitals holding stock is their storage capacity. The aim of this section is to look at how many units are being stocked and of which blood group. This section also looks at the storage facilities across all hospitals.

### 5.1 Storage guidelines

Hospitals were asked if their frozen components were stored in compliance with the UKBTS guidelines. Hospitals had the option to answer that they do not store frozen components.

- 96% (217/225) responded that their frozen components are stored in compliance with the UKBTS guidelines (Table 6).
- 3% (6/225) of hospitals do not store frozen components come from the Very Low red cell usage hospitals.
- One hospital that was not storing in compliance with the UKBTS guidelines, gave the reason of “Insufficient financial resources”.

<b>Red Cell Usage Category</b>	<b>Very High</b>	<b>High</b>	<b>Moderate</b>	<b>Low</b>	<b>Very Low</b>
<b>Storage facilities meet the guidelines</b>	42	56	67	30	22
<b>Don't store</b>					6
<b>Storage facilities do not meet the guidelines</b>			1		
<b>No answer</b>		1			

Hospitals were asked if stocks of frozen components were made available to other laboratories either within or outside of the hospital/Trust.

- 78% (171/218) of hospitals do not make their frozen component stock available for use to other laboratories.
- 21% (46/218) make stock available to other laboratories.

## 5.2 Stocks

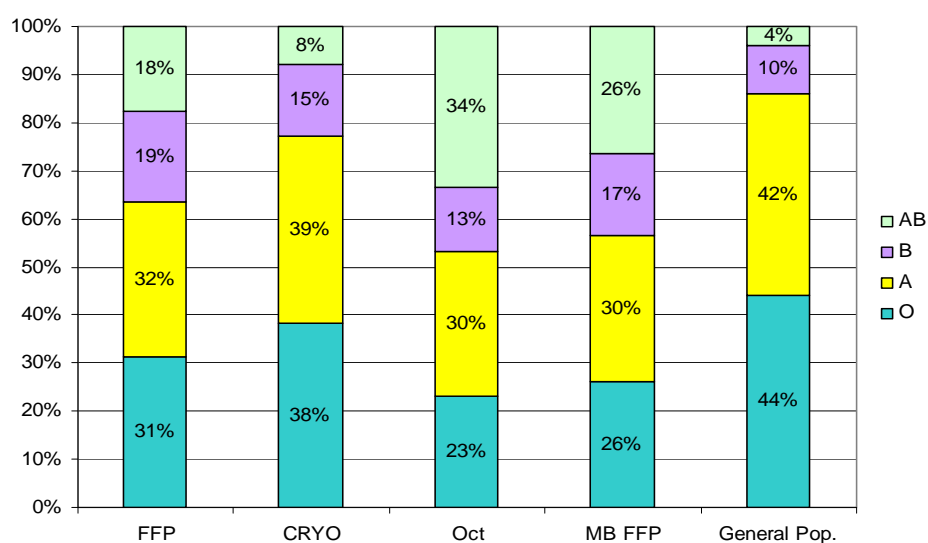
All hospitals were asked about the numbers and ABO group of the frozen components stocked. This was requested by type of frozen component.

- 91% (204/225) of hospitals stock adult fresh frozen plasma (FFP)
- 76% (172/225) of hospitals stock cryoprecipitate pools
- 68% (154/225) of hospitals stock MB FFP (250ml)
- 30% (67/225) of hospitals stock Octaplas

The ABO groups for the different types of frozen components stocked were compared with those in the general population<sup>1</sup> (Figure 5).

- Higher proportions of groups B and AB are held as stock in hospitals than would occur in the general population. This is true for all types of frozen components but less so for cryoprecipitate.

Figure 5 : ABO group units & type of frozen component held as stock compared to population distribution figures.



1 <http://www.blood.co.uk/about-blood/blood-group-basics/>

### 5.2.1 Commercial frozen product – Octaplas

Hospitals were asked about stocks of the frozen product Octaplas. There is a clear relationship between holding stocks of Octaplas and the hospital red cell usage categories.

- 73% (49/67) of the hospitals holding a stock of Octaplas are in the Very High and High red cell usage category (Table 7).
- 7 hospitals are holding a stock of Octaplas but holding no Adult FFP stock. The majority of these hospitals were hospitals treating children.

Red Cell Usage category	Number	Percentage
Very High	27	40.3%
High	22	32.8%
Moderate	12	17.9%
Low	5	7.5%
Very Low	1	1.5%

## 6 Training

Good inventory management relies on communication between the laboratory and clinical staff. All hospitals were asked to provide information about whether training on local guidelines for the use of frozen components is provided to junior medical staff, and if so what it entails and who it is provided by.

- 45% (101/225) of hospitals provide training on local guidelines for the use of frozen components to junior medical staff as part of their induction (Figure 6).
- 30% (67/225) of hospitals reported that training is not provided to junior medical staff on the use of frozen components.

Figure 6: Is training in the indications for frozen component use provided to junior medical staff?

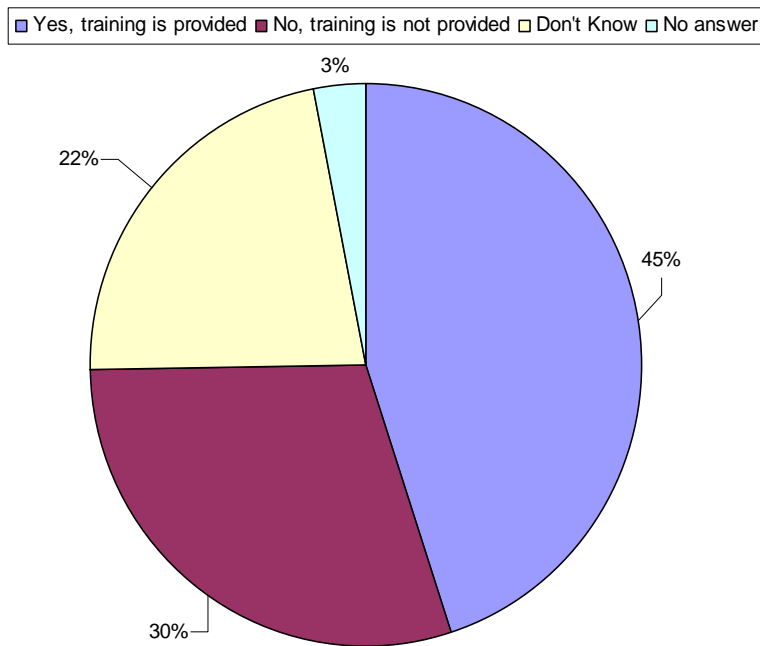
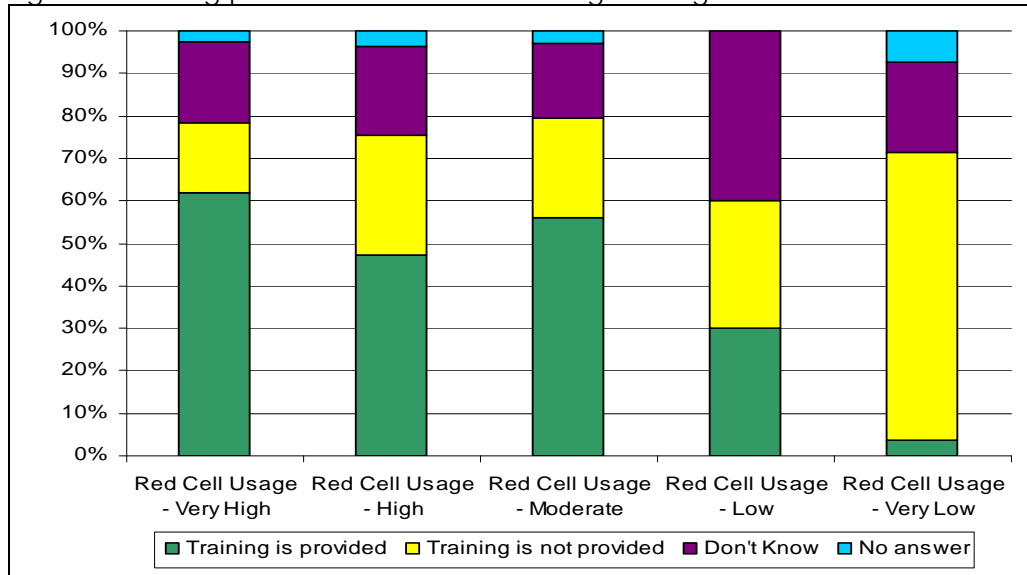


Figure 7: Training provision across red cell usage categories



Hospitals also provided information about who in the hospital provides the training in the use of frozen components. Hospitals could give more than one answer if several people contribute to the training.

- Responsibility for training is primarily taken by the Transfusion Practitioner. They were involved with the training in 38 % of hospitals (Table 8).
- “Other” answers included e-learning.

Table 8: Who provides training in the use of frozen components?	
Training provider	Responses
Transfusion Practitioner	85
Transfusion Laboratory Personnel	24
Consultant Haematologist	46
Clinician other than Haematologist	2
Other	11

## 7 Blood Stocks Management Scheme

All hospitals were asked for their views regarding whether the BSMS should collect data from hospitals on stock and wastage of frozen components.

- 66% (147/225) of hospitals responded that that they would like the BSMS to collect data on stock and wastage of frozen products (Figure 8).
- 15% (34/225) of hospitals do not want the BSMS to collect data on frozen components stock and wastage.
- Between 58% and 75% of hospitals in each of the 5 red cell usage categories have indicated that they would like the BSMS to collect data on stock and wastage of frozen components (Figure 9).

Figure 8: Should the BSMS collect data on stock and wastage of frozen components?

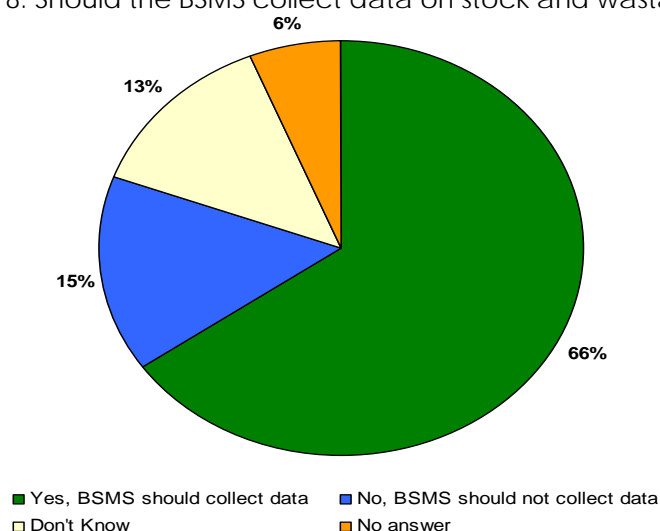
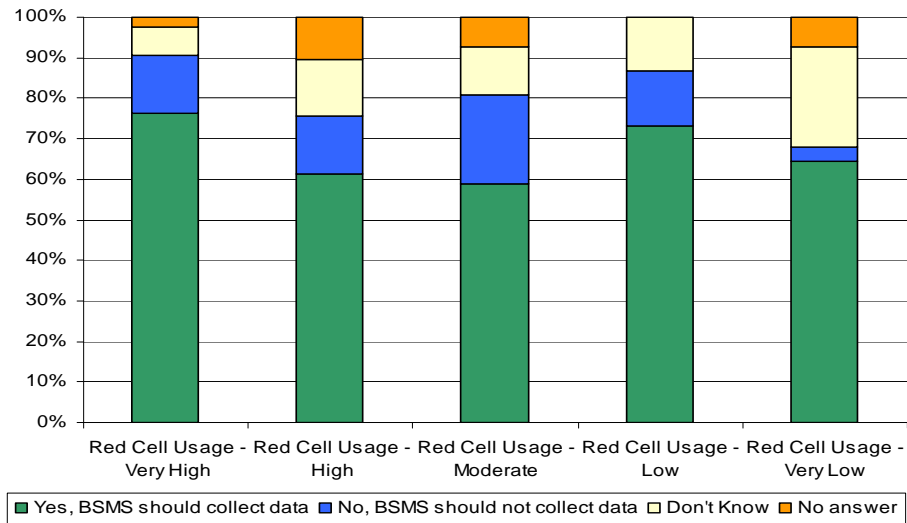


Figure 9: BSMS Collection of frozen component data by red cell usage category.



Changes to document V1.0

Version 1.1

- 1. Addition of reference for massive transfusion Page 5
- 2. Table 6 Heading Change Page 8