# Better Use of Data:
# The AIM II Trial

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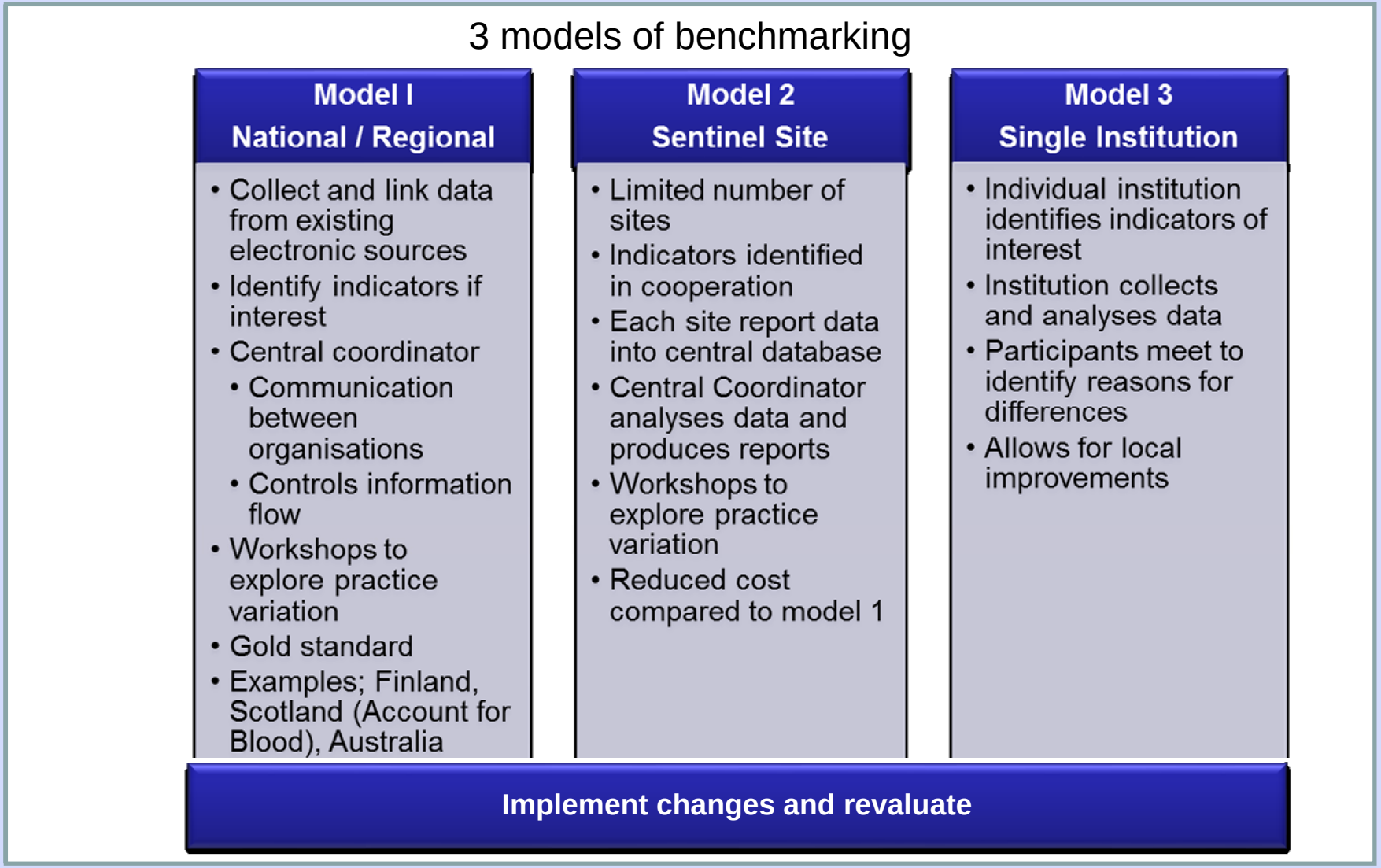
# Overview

- Setting the scene: using benchmarking data to support Patient Blood Management
- Overview of AIM II
- The AIM II dataset
- Progress with the trial
- Benchmarking list for the Trial
- What could benchmarking look like?
- Developing the national minimum dataset
- Action Plan for improvement

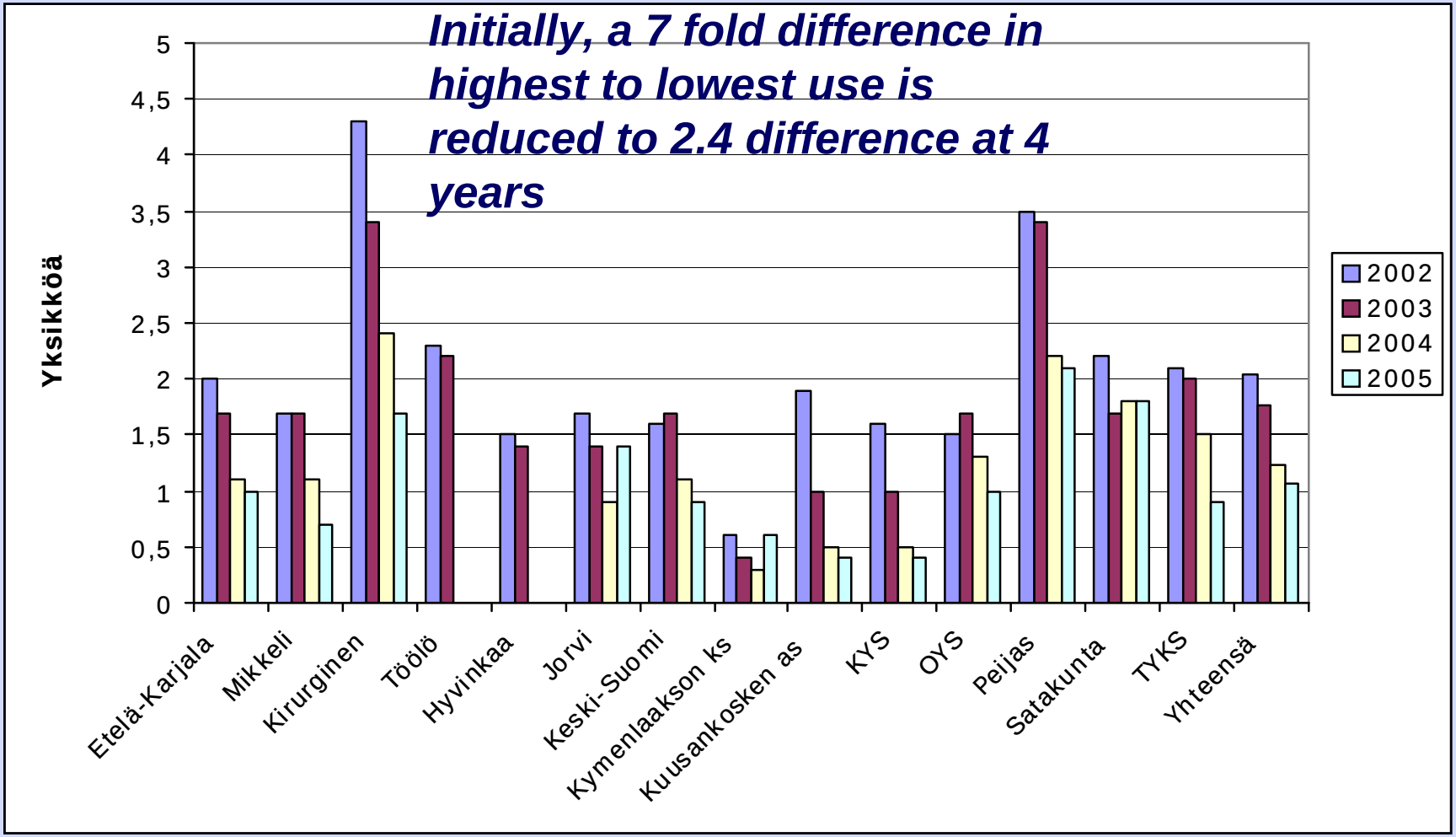
# Setting the Scene

3 models of benchmarking



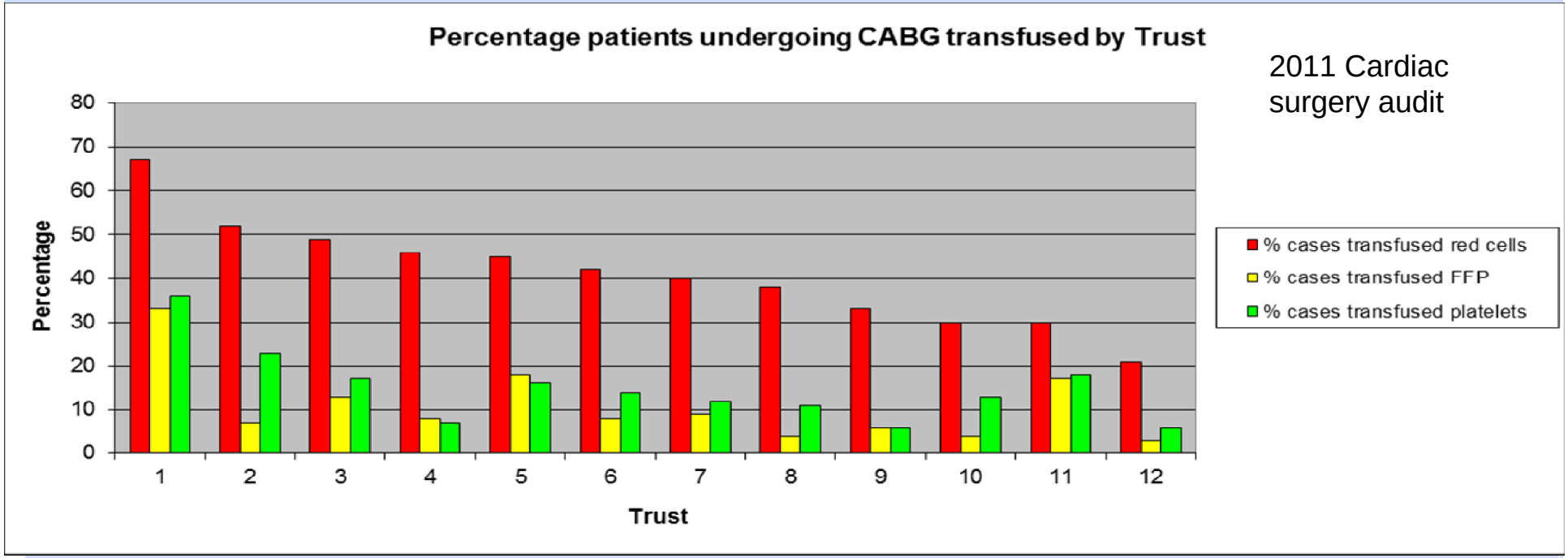

Apelseth et al 2012 Benchmarking: Applications to Transfusion Medicine ***Transfusion Medicine Reviews*** *in press*

# Finnish Red Cross
# Red Cell Usage in Hip Replacement



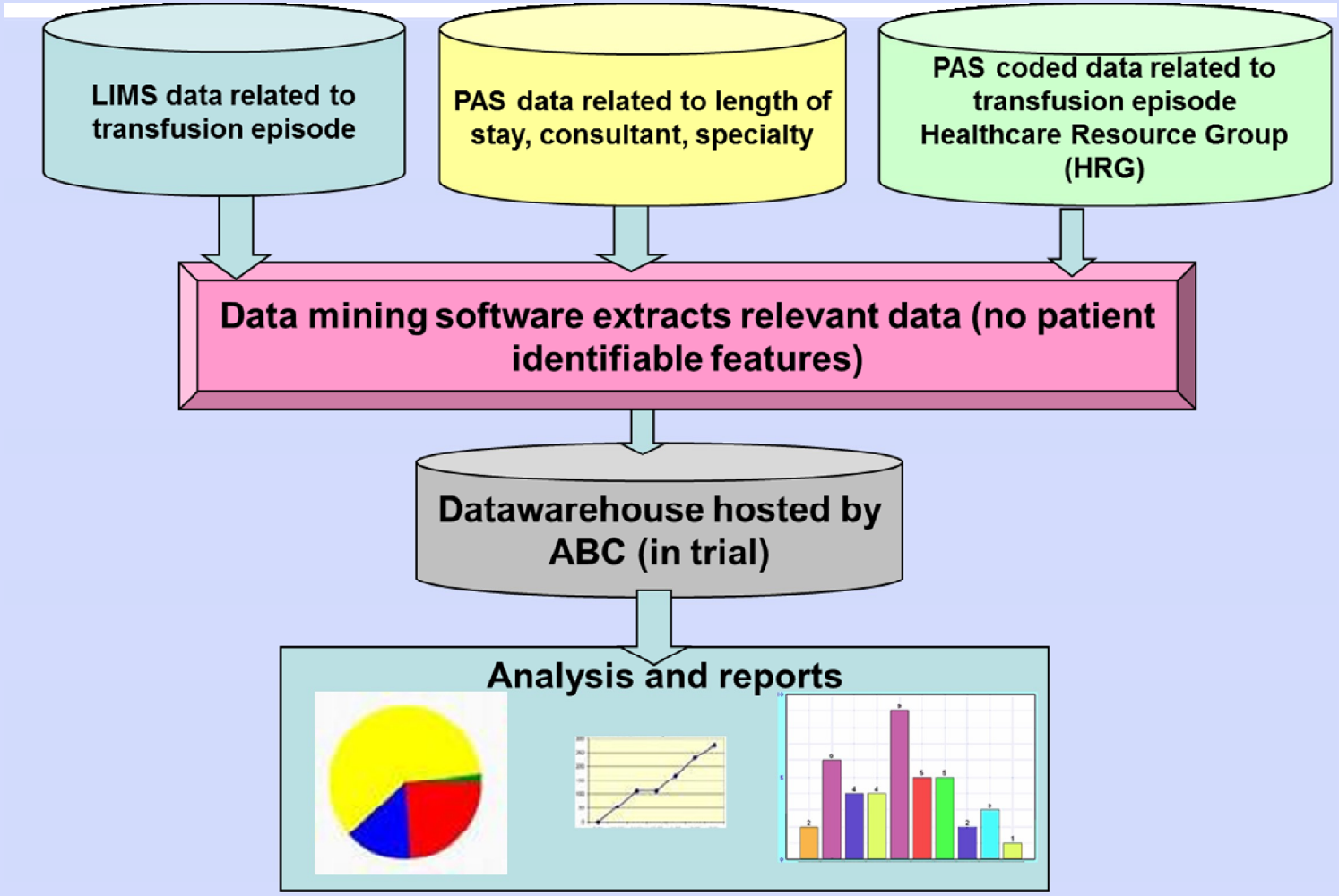
# How can we find out how blood is being used in England?

- By time consuming retrospective studies or prospective audit




- Or by asking transfusion teams for anecdotal information
- Or by using information produced for recharging cost of blood transfusion to clinical areas

# AIM II – Mining the data



# Data Elements for Blood Utilization Analysis

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| DATA ELEMENT - | TRANSF | ID | DOA | DOD | DQTR | LOS | AGE_CATS | SEX | MSDRG | PAYOR | VERIFIED_D_T | C_EVENT_DISP | RESULT_VAL | PR_PROD_DISP | PROD_NBR | SUB_NBR | PROD_EXP_DATE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Definition | transfusion | encrypted patient ID # | date of admiss | | | | | | | | | | al event tory | d | Donation Identification Number-unit umber | ISBT 128 or codabar Product code | Expiration date of the blood product |
| Value | alpha (YES, NO) | alphanume | | | | | | | | | | | | | | na/ umeric | Date (Month/Day/Year) |
| Required | yes | yes | | | | | | | | | | | | | | Yes | No |
| Comments | YES or NO for each record for each unique ID | Patient records should not include unique identifiers to ensure HIPAA compliance. Repeats for each record for a unique patient | Ex: 06/16/2009 | Ex: 06/16/2009 | Ex: Qtr 3 | | | | | | | | elet | USED populates ns field from product code data | Used for hospital review of records | Provided for standardized product mapping | Provided to evaluate outcomes based upon age of component transfused |

- Transfusion yes or no?
- Patient ID (encrypted)
- Date of admission and discharge
- Year of birth
- Gender
- Healthcare Resource Group (HRG)
- Date and time of transfusion
- Transfused component
- Pre and post transfusion lab test result
- Donation number and product code
- Expiry date
- Ordering physician
- Directorate
- Adverse events
- Mortality Flag

# Progress with the Trial…(10 months in)

- All 4 trial sites are currently extracting data (2 years of data)
- 3 Trusts are currently validating data prior to analysis
- 1 Trust has validated 1 month dataset
- Stakeholder group meeting regularly

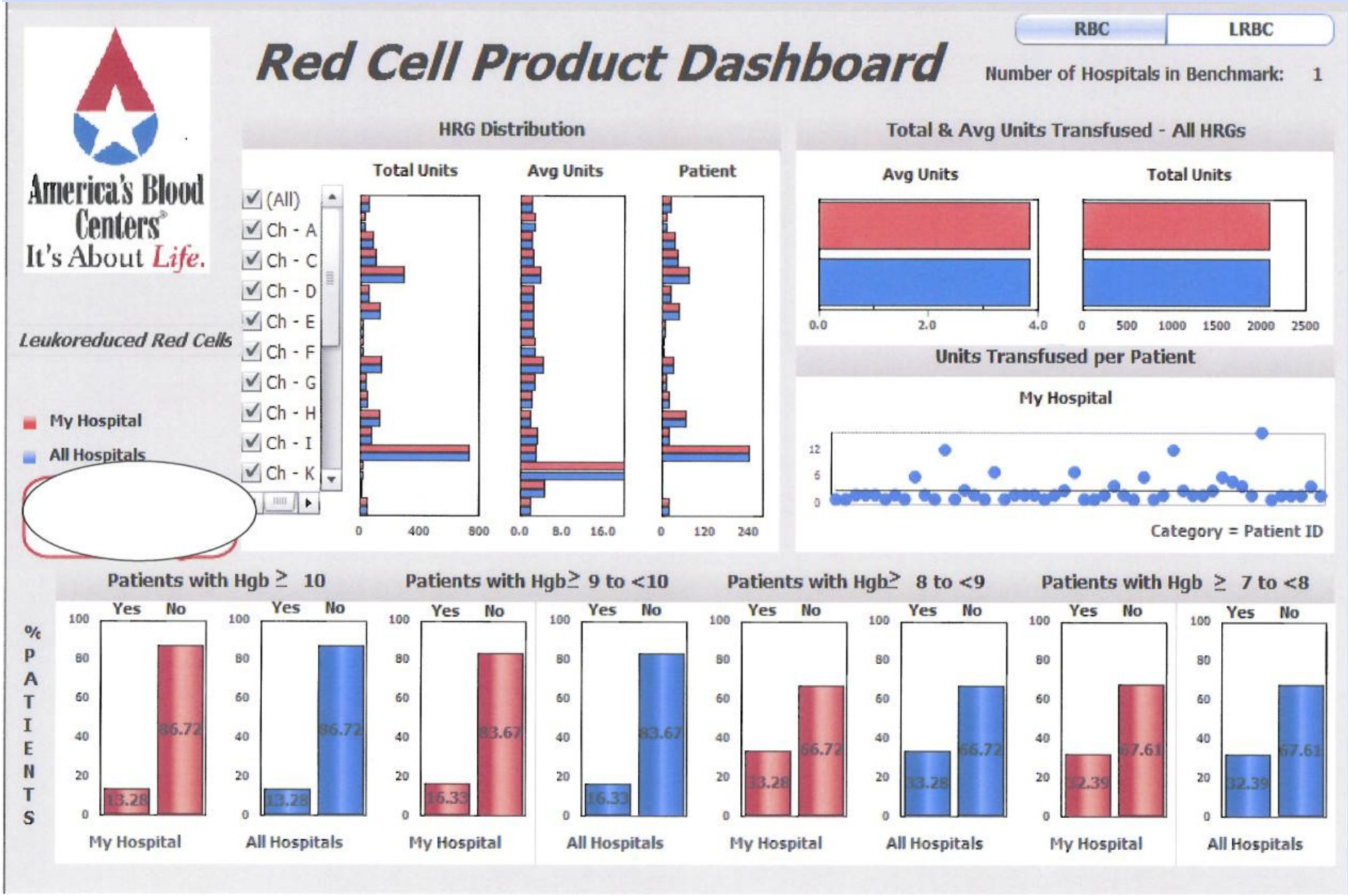
- Time and resource from Lab, Trust and LIMS IT specialists
- Matching the data between LIMS and PAS (easier if there is a data warehousing facility)
- HRG coding is not ideal


- Benchmarking of data between trial sites and internationally (USA, Sanguin)
- Incorporate coded reason for clinical use chosen at time of request by clinician
- Future roll out will depend on the success of the trial and the size of the hurdles to be overcome

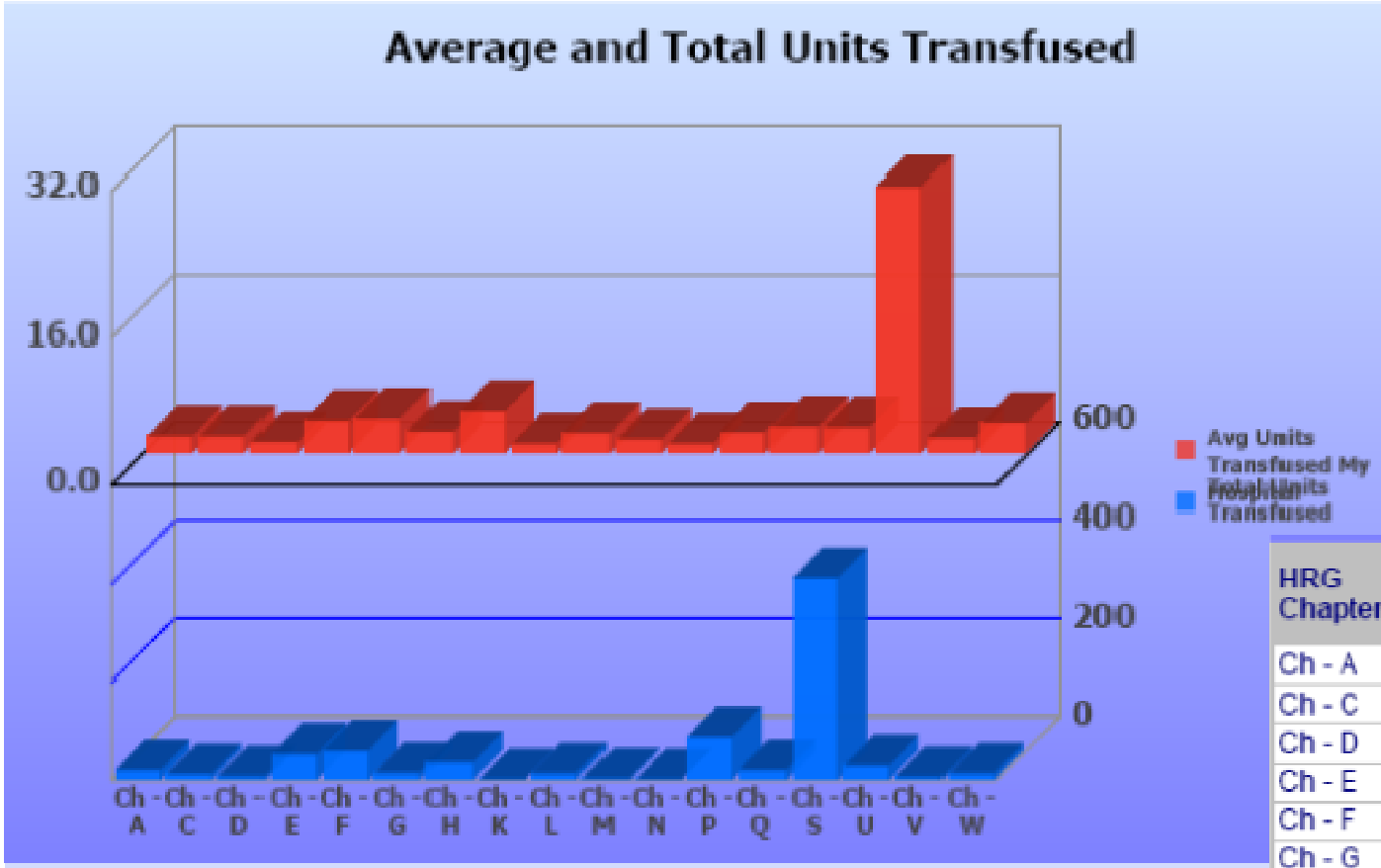
| |
|---|
| Primary hip replacement |
| Revision hip replacement |
| Repair fractured hip |
| |
| Primary coronary artery bypass grafting |
| Redo coronary artery bypass grafting |
| Coronary artery bypass grafting plus other procedure |
| |
| Variceal upper GI haemorrhage |
| Non-variceal upper GI haemorrhage |
| Anterior resection |
| Oesophagectomy |
| Gastrectomy |
| Whipples / pancreatectomy |
| Nephrectomy |
| Cystectomy |
| Radical prostatectomy |
| Caesarean section elective |
| Abdominal aortic aneurysm (open) |
| |
| Paediatrics |
| Neonatal disorders |
| |
| Haematological malignancy |
| Non-malignant haematology |

# Benchmarking List for the AIM II Trial

# 1 month’s data from 1 UK Trial Hospital



Transfused Product: 9, Apheresis Platelets, Month of Discharge: Total per HRG Chapter

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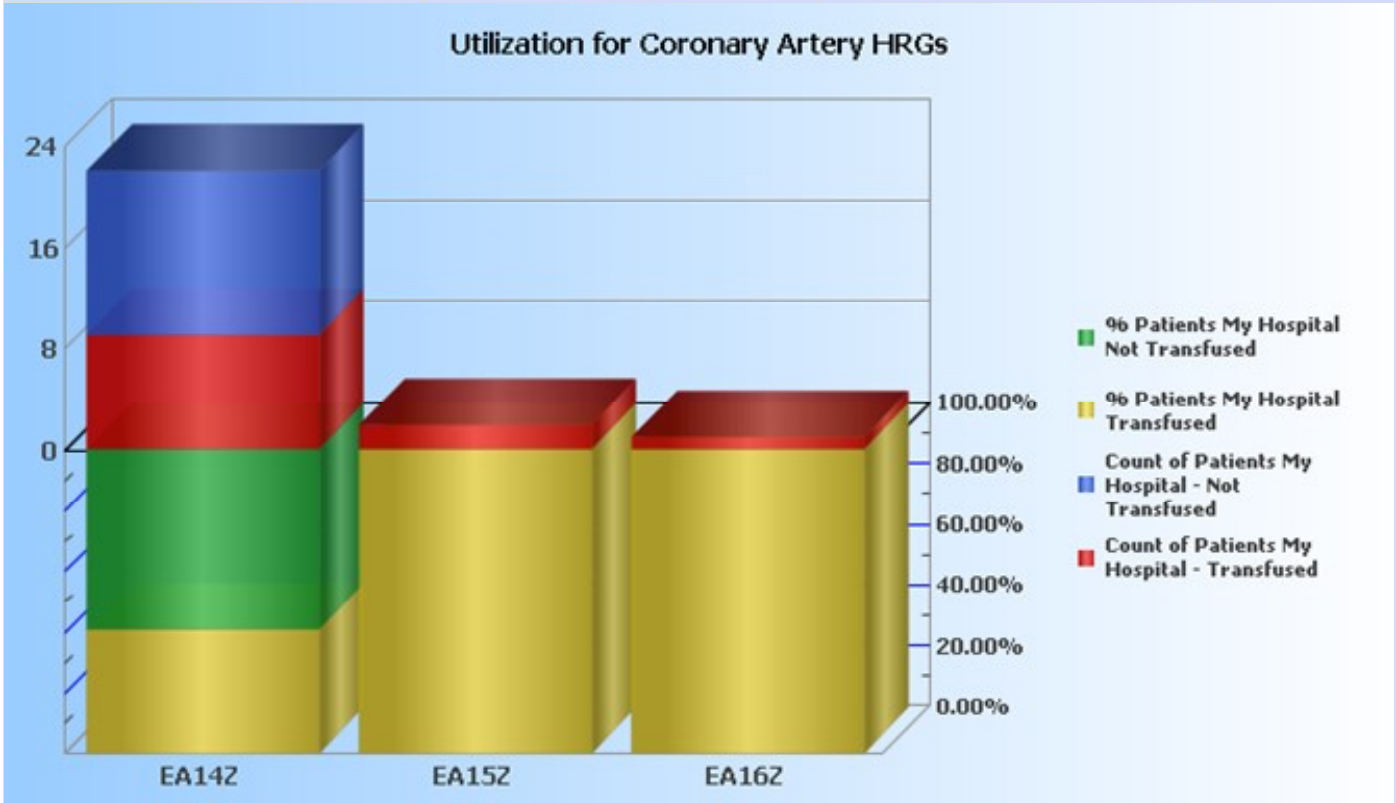
# Platelet Use in 1 UK hospital in 1 month by HRG Chapter

| HRG Chapter Metrics | Avg Units Transfused My Hospital | Total Units Transfused |
|---|---|---|
| Ch - A | 1.8 | 20 |
| Ch - C | 1.8 | 11 |
| Ch - D | 1.2 | 7 |
| Ch - E | 3.5 | 53 |
| Ch - F | 3.8 | 61 |
| Ch - G | 2.3 | 14 |
| Ch - H | 4.6 | 37 |
| Ch - K | 1.0 | 1 |
| Ch - L | 2.2 | 13 |
| Ch - M | 1.5 | 3 |
| Ch - N | 1.0 | 1 |
| Ch - P | 2.3 | 89 |
| Ch - Q | 2.9 | 20 |
| Ch - S | 2.8 | 411 |
| Ch - U | 29.0 | 29 |
| Ch - V | 1.7 | 5 |
| Ch - W | 3.3 | 13 |

# 1 month's data for red cell transfusion in CABG in 1 UK hospital

Month of Discharge: October 2010
Hospital: XXXX Hospital

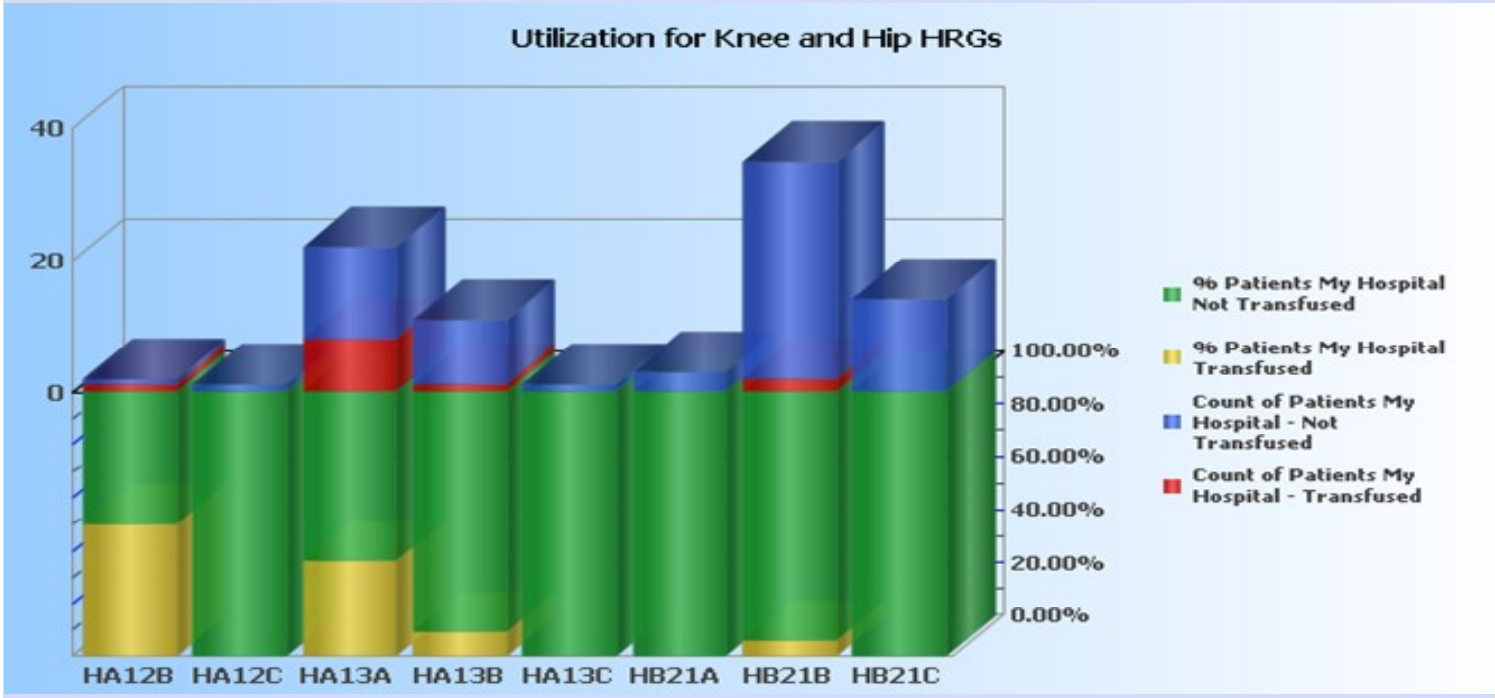



| International Diagnosis | Metrics | Count of Patients My Hospital - Transfused | Count of Patients My Hospital - Not Transfused | % Patients My Hospital Transfused | % Patients My Hospital Not Transfused |
|---|---|---|---|---|---|
| EA14Z | | 9 | 13 | 40.91% | 59.09% |
| EA15Z | | 2 | 0 | 100.00% | 0.00% |
| EA16Z | | 1 | 0 | 100.00% | 0.00% |

Report Filter:

(Hospital = XXXX Hospital) And ({International Diagnosis Type} = NHSBT) And ({Month of Discharge} = October 2010) And ({International Diagnosis} = EA14Z:Coronary Artery Bypass Graft (First Time), EA15Z:Coronary Artery Bypass Graft (First Time) with Cardiac Catheterisation, EA16Z:Coronary Artery Bypass Graft (First Time) with Percutaneous Coronary Intervention, Pacing, EP or RFA)

Month of Discharge: October 2010
Hospital: XXXX Hospital




# 1 month's data for hips and knees in 1 UK hospital

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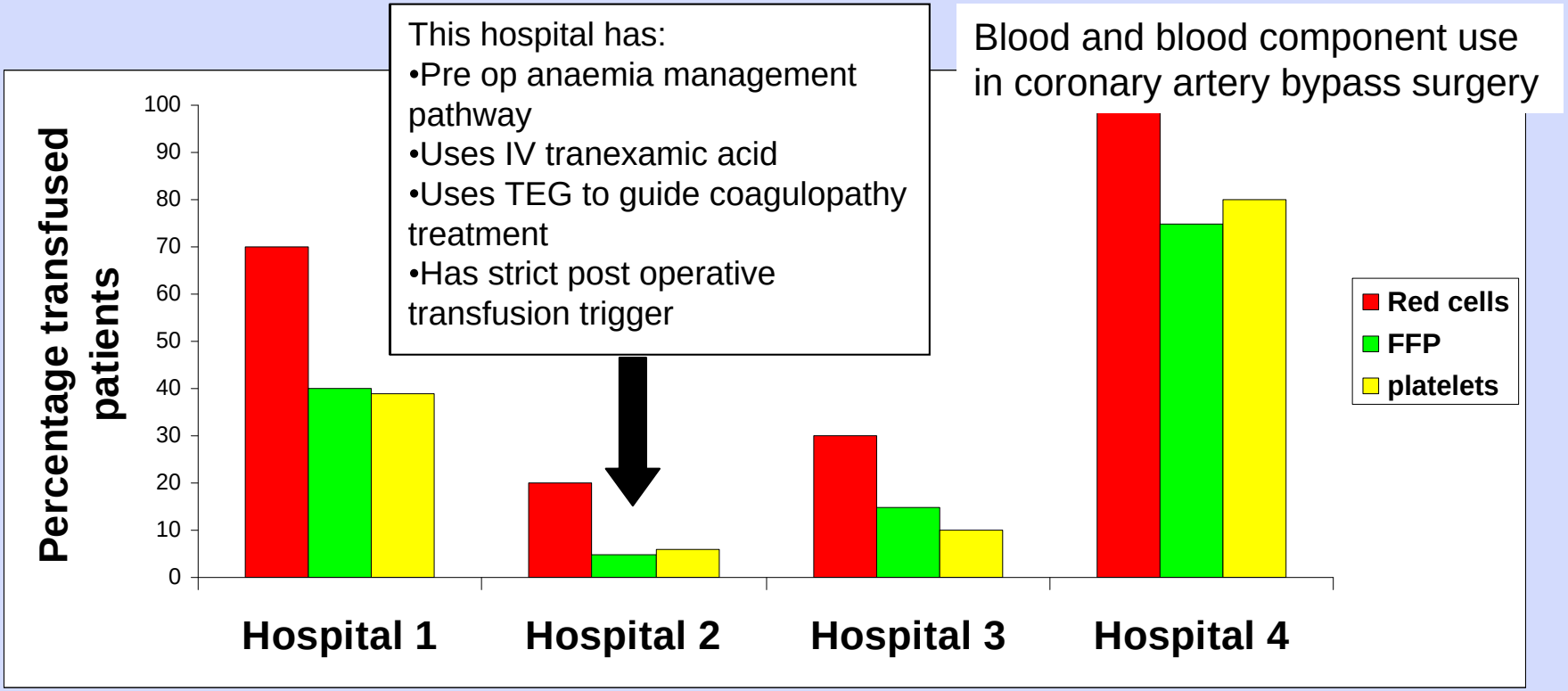
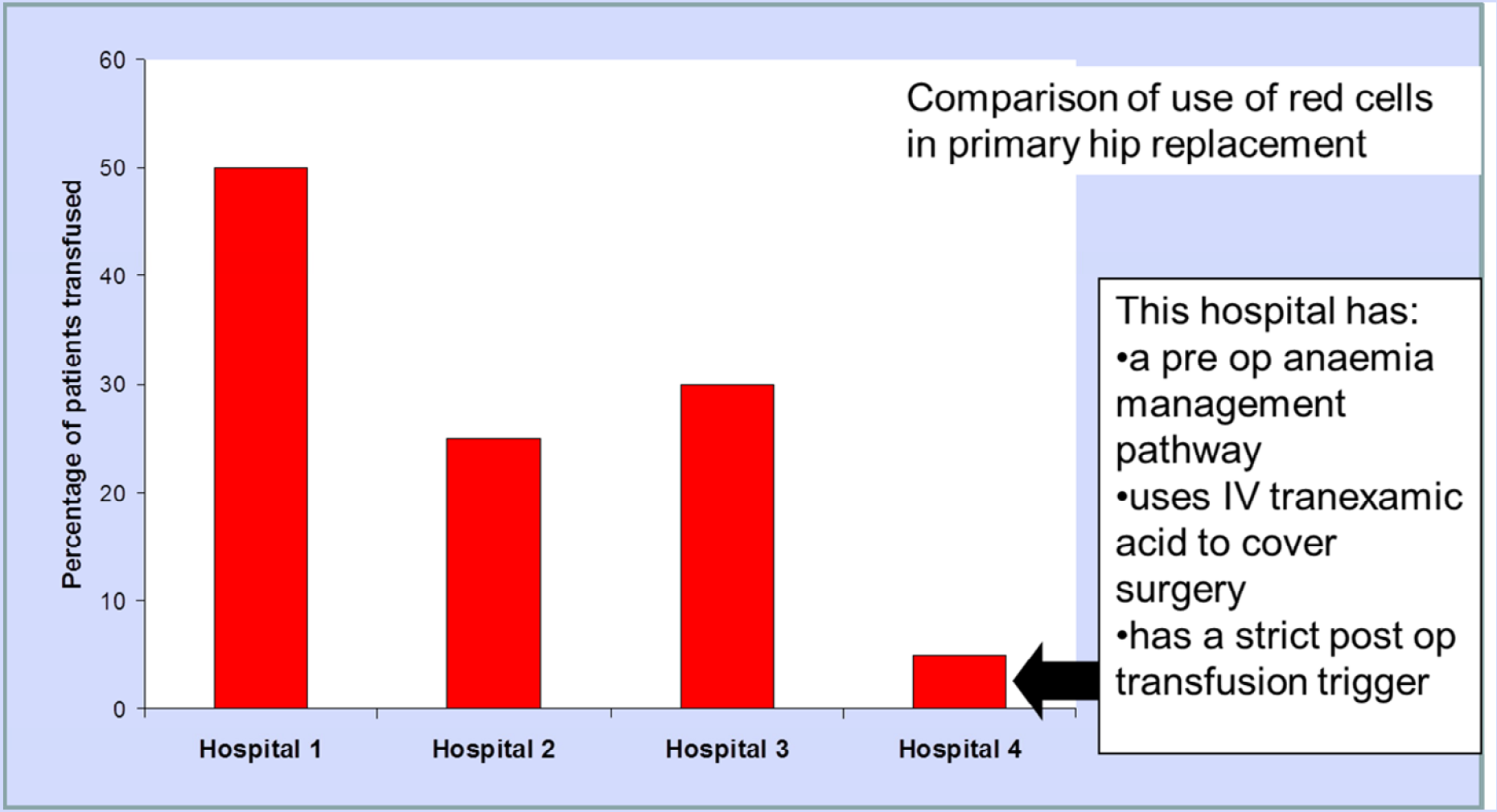
| International Diagnosis | Metrics | Count of Patients My Hospital - Transfused | Count of Patients My Hospital - Not Transfused | % Patients My Hospital Transfused | % Patients My Hospital Not Transfused |
|---|---|---|---|---|---|
| HA12B | | 1 | 1 | 50.00% | 50.00% |
| HA12C | | 0 | 1 | 0.00% | 100.00% |
| HA13A | | 8 | 14 | 36.36% | 63.64% |
| HA13B | | 1 | 10 | 9.09% | 90.91% |
| HA13C | | 0 | 1 | 0.00% | 100.00% |
| HB21A | | 0 | 3 | 0.00% | 100.00% |
| HB21B | | 2 | 33 | 5.71% | 94.29% |
| HB21C | | 0 | 14 | 0.00% | 100.00% |

(Hospital = XXXX Hospital) And ({International Diagnosis Type} = NHSBT) And ({Month of Discharge} = October 2010) And ({International Diagnosis} = HB21A:Major Knee Procedures for non Trauma Category 2 with Major CC, HB21B:Major Knee Procedures for non Trauma Category 2 with CC, HB21C:Major Knee Procedures for non Trauma Category 2 without CC, HA12B:Major Hip Procedures Category 1 for Trauma with CC, HA12C:Major Hip Procedures Category 1 for Trauma without CC, HA13A:Intermediate Hip Procedures for Trauma with Major CC, HA13B:Intermediate Hip Procedures for Trauma with Intermediate CC, HA13C:Intermediate Hip Procedures for Trauma without CC)

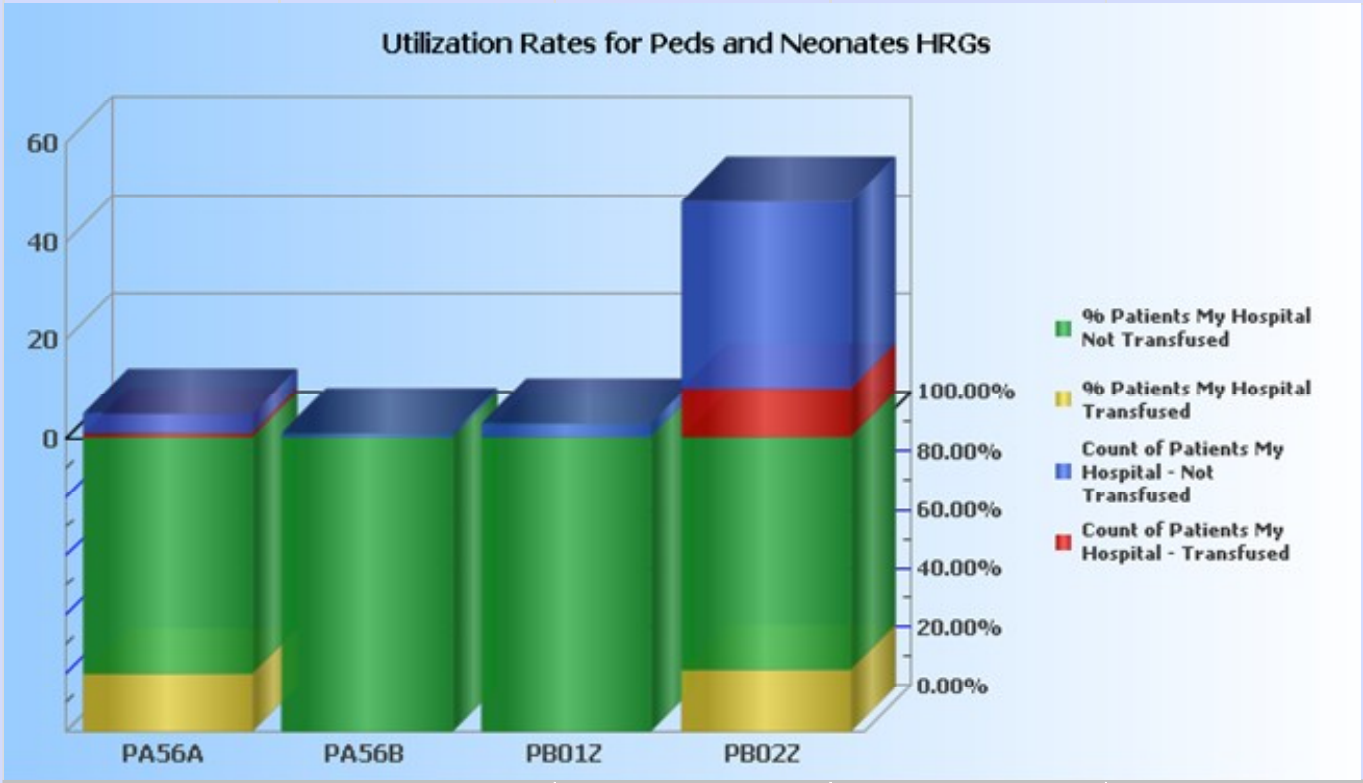
# What could benchmarking look like? (hypothetical data)



# What benchmarking could look like (hypothetical data)



Month of Discharge: October 2010
Hospital: XXXX Hospital




# Paediatric and neonatal transfusion – 1 month's data in 1 UK hospital

| International Diagnosis | Metrics | Count of Patients My Hospital - Transfused | Count of Patients My Hospital - Not Transfused | % Patients My Hospital Transfused | % Patients My Hospital Not Transfused |
|---|---|---|---|---|---|
| PA56A | | 1 | 4 | 20.00% | 80.00% |
| PA56B | | 0 | 1 | 0.00% | 100.00% |
| PB01Z | | 0 | 3 | 0.00% | 100.00% |
| PB02Z | | 10 | 38 | 20.83% | 79.17% |

**(Hospital = XXXX Hospital) And ({International Diagnosis Type} = NHSBT) And ({Month of Discharge} = October 2010) And ({International Diagnosis} = PB01Z:Major Neonatal Diagnoses, PB02Z:Minor Neonatal Diagnoses, PA46Z:Paediatric Thalassaemia, PA56A:Paediatric admission for unexplained symptoms with CC, PA56B:Paediatric admission for unexplained symptoms without CC)**

# Draft Minimum Dataset
# Mandatory Fields

| | | |
|---|---|---|
| Unique Hospital code (pulse code – not suitable for non-blood buyers) | Clinical reason for blood use: standard menu of choices : see Oxford list | Date and time of transfusion accuracy of timing will depend on method of recording – manual or electronic, real time or retrospective |
| Unique patient ID for that admission<br>plus NHS number | HRG code- generated from ICD10 and OPCS4 coding data by grouper software, key information for payment by results; coding results usually complete by 30 days after month end | Transfused component (ISBT 128) what about Octaplas and other batched products – would need a standardised code for these products? |
| Transfusion yes or no (LIMS) accuracy of timing will depend on method of recording – manual or electronic, real time or retrospective | ICD10 code (diagnostic code): provides information on diagnosis as coded by hospital coders: does diagnosis always equal reason for blood use? | Donation number, blood group and expiry date blood group – could look at O Neg to nonO Neg patients, expiry – could look at age of blood at time of transfusion |
| Date of admission and discharge / death | OPCS 4 (procedure) code: provides information on the procedure undertaken – useful for surgical reasons for blood use | Pre and post lab test (Hb, Plt count, fibrinogen, PT, APTT ? What about INR / APTTR – other tests suggested: renal function, ferritin MCV / MCH |
| Year of birth and gender- if date of birth not collected then maintains patient confidentiality in central data warehouse | National Indication Code? This provides useful additional information on top of 'clinical reason for use' and HRG code | Mortality Flag Yes |

# Draft Minimum Dataset
# Desirable fields

| | | |
|---|---|---|
| Ordering physician (or consultant responsible for care) problem areas: A&E, pre op, ANC use consultant coded as responsible for FCE | Date of procedure (surgical) if possible to collect electronically | Volume of salvaged red cells returned Can only be collected if it is recorded electronically |
| Directorate: useful information | Pre operative Hb ? Use USA KPI: Hb check 14-45 days pre op but does not measure if corrective action was taken | Tranexamic prescription in surgery?<br>Can only be collected if it is recorded electronically<br>Not just surgery, also trauma, obstetrics etc |
| Adverse event: discussion suggested that this would be difficult to collect systematically : only record those events reported to SHOT / SABRE?? | Discharge Hb ? useful | ?timely pre operative transfusion sample: use USA KPI |
| What about near patient tests? There would need to be a method of collected near patient test info electronically : Hb, plt count, coag, TEG / ROTEM/ multiplate | Cell salvage used? Can only be collected if it is recorded electronically | Consent: this will be very difficult to collect electronically but desirable |

# Trust requirements to enable participation in potential national benchmarking scheme

- Electronic order communications with menu driven coded reason for transfusion request
- Electronic blood tracking (ideal)
- Trust data warehouse
- LIMS system that supports data retrieval
- Sufficient IT resource in transfusion, haematology and Trust IT
- Buy in from Trust executive team

# Survey of IT Systems Results of Survey 2011
# Regional and National

| Participation | National | NW |
|---|---|---|
| NHS Hospitals | 74% | 67% |

| System Installation | National | NW |
|---|---|---|
| Pre 2000 | 59% | 72% |
| 2001-2011 | 41% | 28% |
| Are you planning to install a new system | 14% | 22% |

| Orders and Requests | National | NW |
|---|---|---|
| Blood is ordered through the PAS with an electronic link to the LIS | 15% | 17% |
| Results from the laboratory are sent from LIS to PAS | 33% | 33% |
| Requests for blood are made electronically by users<br>If yes is it mandatory for users to complete all required fields | 21%<br>75% | 17%<br>100% |
| Data entered in the diagnosis field is mandatory. PAS<br>Data entered in the diagnosis field is mandatory. LIS | 68%<br>42% | 11%<br>33% |
| Data entered in the procedure field is mandatory. PAS<br>Data entered in the procedure field is mandatory. LIS | 52%<br>41% | 11%<br>28% |
| The NBTC Indication code is mandatory? PAS<br>The NBTC Indication code mandatory? LIS | 22%<br>16% | 11%<br>17% |
| Allows a search on the record of transfused patients for diagnosis | 61% | 50% |
| Allows a search on the record of transfused patients for procedure | 58% | 44% |
| Allows a search on the record of transfused patients for reason for tx | 37% | 33% |
| Allows a search on the record of transfused patients for Compliance with triggers | 16% | 6% |
| Allows a search on the record of transfused patients for Quantity of blood units recd | 84% | 89% |
| Allows a search on the record of transfused patients for whether patient is alive | 24% | 39% |
| Allows a search on the record of transfused patients for adverse events | 35% | 50% |

# Action Plan for Improvement

**NBTC**

- Support development of IT systems that can provide patient level data for Patient Blood Management
- Oversee agreement on National Minimum Dataset

**NHSBT**

- Support development of IT connectivity between Hospitals and NHSBT
- Support roll out of AIM II if trial successful

**BCSH**

- Include data requirements for Patient Blood Management in IT guideline

**Hospitals**

- Develop systems to capture the relevant clinical information at the time of request (mandatory / menu driven)
- Ensure LIMS / PAS specification allows for Patient Blood Management
- Make case for resources to enhance transfusion team functions : data analysis / working relationships with Trust and laboratory IT teams

# Acknowledgements


- Transfusion and IT teams from:
  - Oxford University Hospitals NHS Trust
  - University Hospital South Manchester NHS Foundation Trust
  - Newcastle upon Tyne Hospitals NHS Foundation Trust
  - The Dudley Group NHS Foundation Trust
- NHSBT project team
- America’s Blood Centers