SERIOUS HAZARDS OF TRANSFUSION SHOT

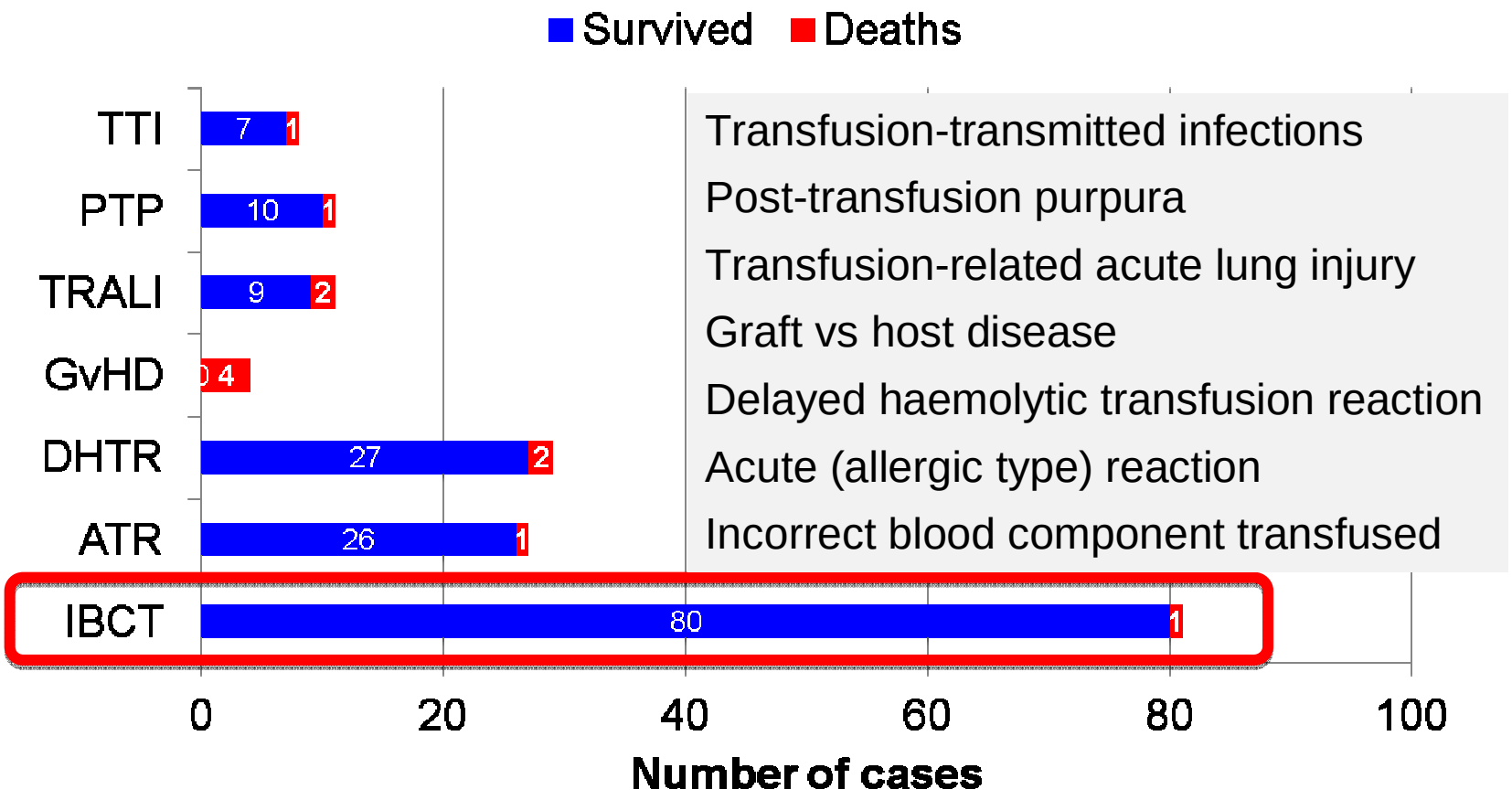
Why do we make mistakes? Human factors in transfusion practice

East of England Regional Transfusion Committee
'Blood transfusion: What now? What if? What next?'

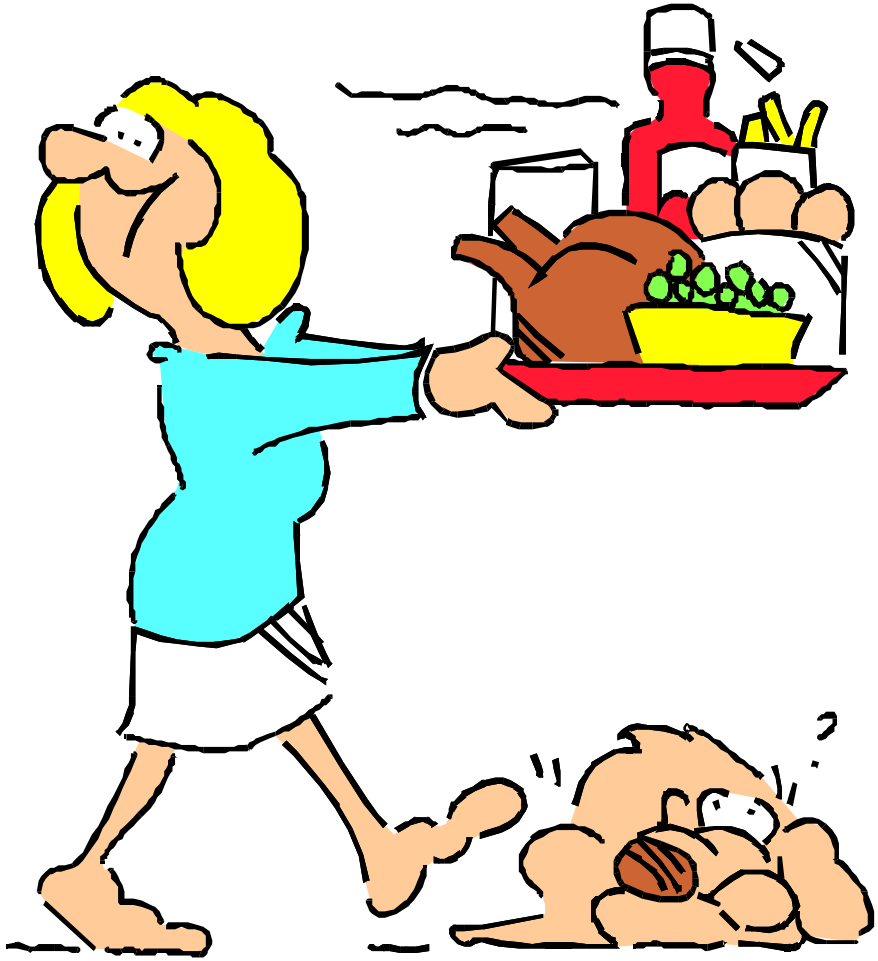
Alison Watt – SHOT Operations Manager
Paula Bolton-Maggs – Medical Director

Data from 1st SHOT Report

(1997)



The greatest risk from transfusion is that somebody will make a mistake



Not just in transfusion practice:

1GM Wednesday December 24 2014 | THE TIMES

Thousands of patients killed by drug and equipment errors

Safe as Planes

The NHS has a lot to learn from airlines about avoiding unnecessary risk

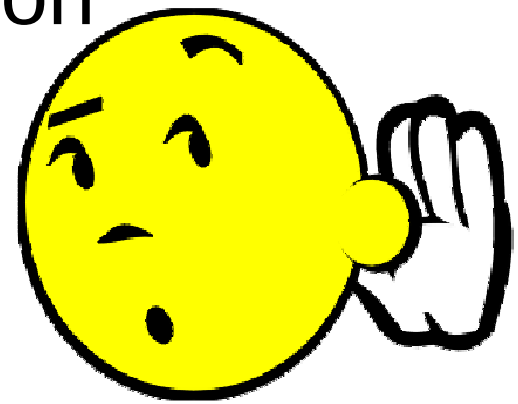
‘Official figures show that at least 8000 patients a year are killed or severely harmed needlessly by drug errors’ - a report by Jane Reid

‘We should design errors out of the system by making them much harder or impossible to commit’ - Leading article

Transfusion safety – 3 critical factors in patient safety

- Identification
- Documentation
- Communication

But these apply in all areas of medical practice



Lethal intrathecal vincristine 2001

Drugs sent together

- 18 yr old in CR from ALL died 4 weeks after the event
- 14 separate factors
- Communication and hierarchy
- Assumptions and ‘newcomer syndrome’
- Physician *and* pharmacy error in 69% of 55 cases 1968-2006

An unexpected death

- 29 March 2005, Elaine Bromiley, a 37-year-old mother of two had routine minor surgery
- Anaesthetist's perception of elapsed-time failed while trying to intubate
- Nurse tried to intervene, but failed, partly due to issues of theatre hierarchy
- This contributed to the introduction of the WHO Surgical Safety Checklist, 2009

(28 years after air industry's Crew Resource Management in 1981)

Quotation from Independent Report into death of Elaine Bromiley

“So that others may learn, and even more may live."

Martin Bromiley, husband of Elaine, airline pilot and founder of Clinical Human Factors Group (CHFG)

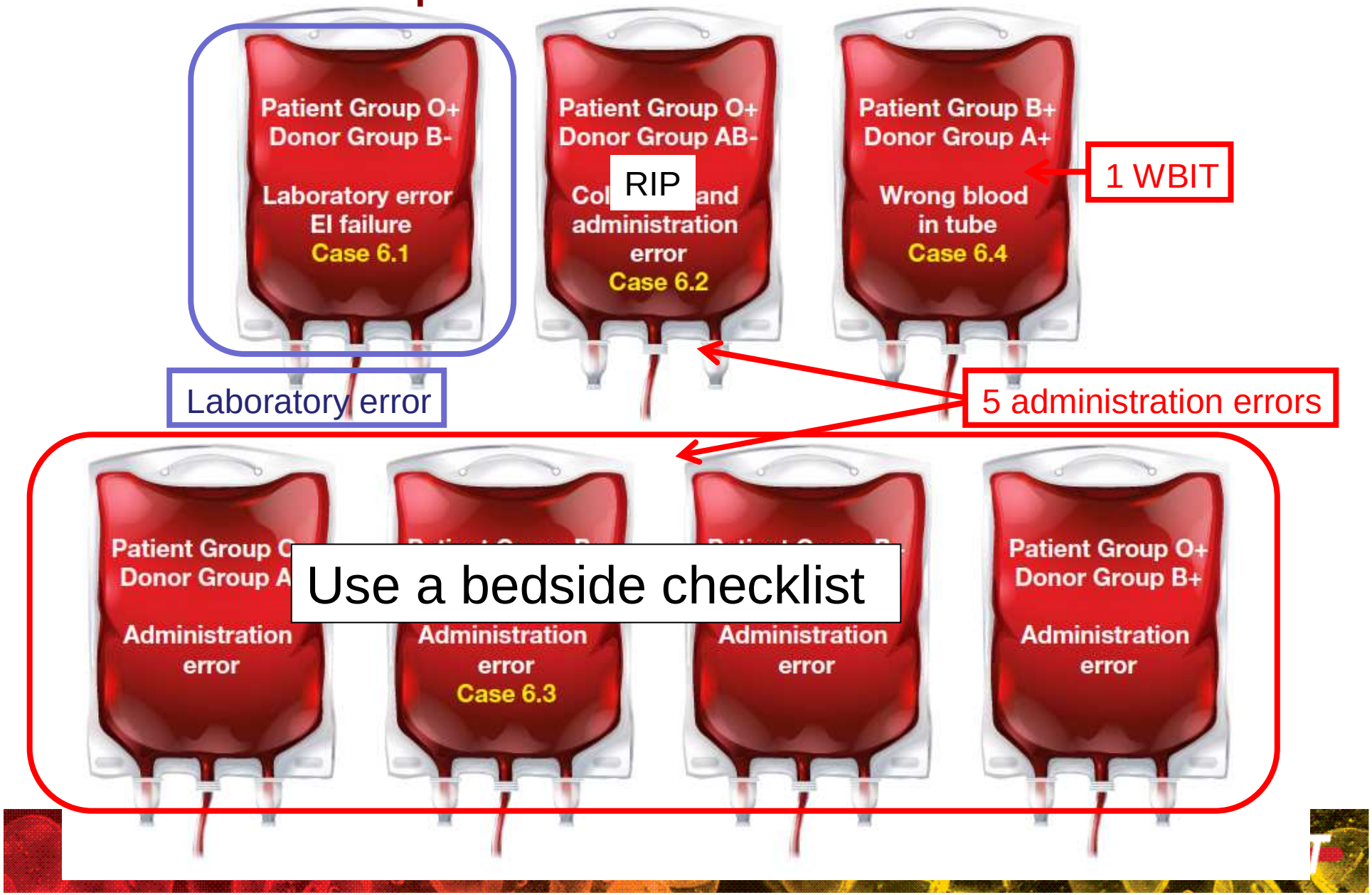
Human factors

- The science of optimising human performance through better understanding of human behaviour and interactions
- Clinical Human Factors Group (www.chfg.org)
- The Human Factors Concordat - National Quality Board, NHS England
- ‘Sign up to safety’ – NHS campaign

Missed specific requirements – many factors

- A **telephone request** for red cells was received in the transfusion laboratory for a 39 year old lymphoma patient who was being worked up for haemopoietic stem cell transplant (HSCT) but **specific requirements were not discussed**
- The BMS was **distracted** by a number of complex telephone queries at the time and **did not complete** the appropriate checks with the requestor
- The specific requirements were documented on the 2nd comments page on the LIMS but were **missed** and non-irradiated red cells were issued
- The patient asked not to be disturbed while he was on a work-related conference call but agreed the nurse could start the transfusion
- The **bedside check was compromised** to minimise interruptions and the nurse failed to notice the specific requirements on the prescription
- The **patient** notified the nurse that the blood was not irradiated when he saw there was no irradiation sticker on the unit
- The blood transfusion was stopped

ABO-incompatible red cell transfusions n=7



ABO-incompatible transfusion – serious harm

- A 29 year old male in sickle crisis required transfusion of 3 units of red cells
- The patient was known to be group O D-positive with no alloantibodies
- The BMS selected 3 group B D-negative red cell units in error and proceeded to issue these electronically via the LIMS
- Warnings stating the ABO discrepancy were displayed, but were overridden by the BMS by pressing a f… …uirement to enter text such as 'yes p…
- Error not detected at the … unit, the patient felt unwell and transfusion was stopped
- The unit was returned to the laboratory but rather than initiating an investigation, the unit was placed in quarantine until the day staff came on duty when the ABO discrepancy was noticed
- Overnight, 2 further ABO-incompatible units were transfused to the patient

Permitted by an electronic issue (EI) system which was not fit for purpose as it had not been validated

ABO-incompatible transfusion and death of the patient

- An elderly man had urgent coronary artery bypass surgery and required postoperative transfusion
- The wrong unit was collected from a remote issue refrigerator, and an error was made when checking the patient identification against the blood
- The error was not realised until after the full unit had been transfused
- The patient developed suspected cardiac tamponade and died after some hours of active intervention
- This case occurred in 2014 and the nurse was charged with manslaughter
- In another case a nurse hid the evidence and was suspended by the NMC for 6 months

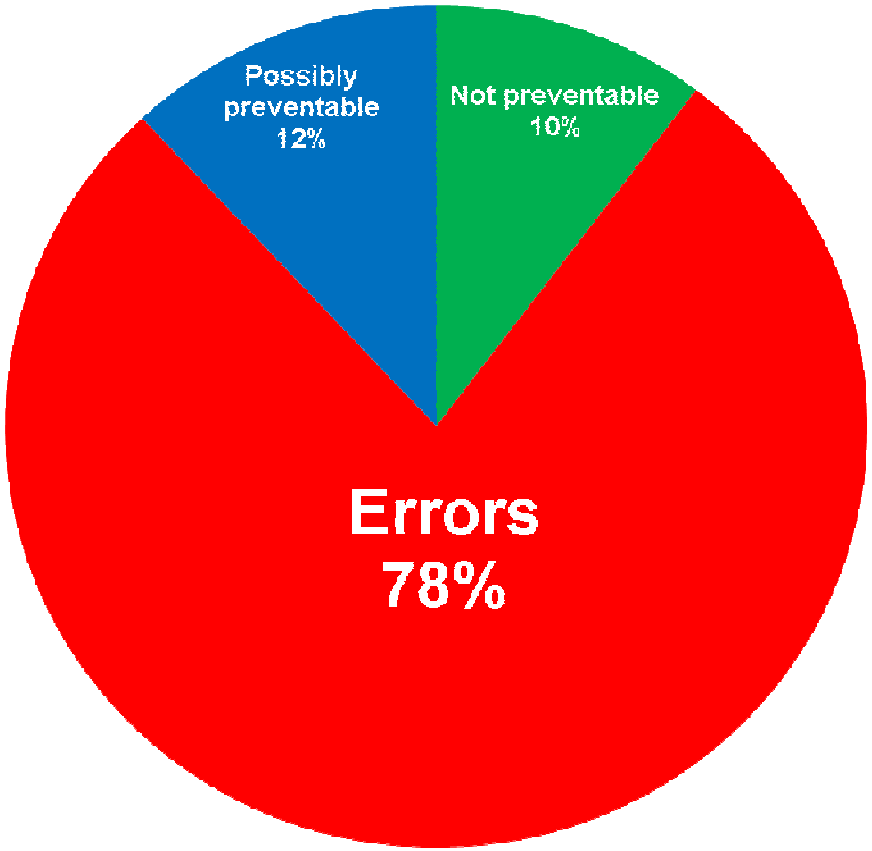
Human factors

Why do we make mistakes?

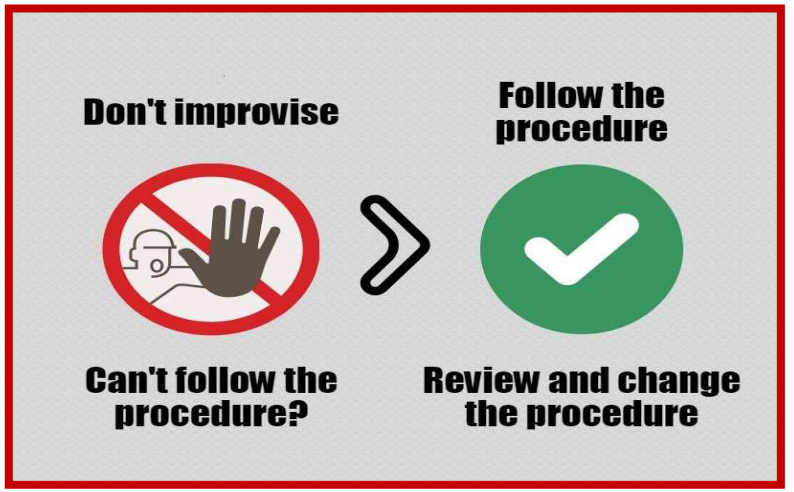
O D-negative units are incompatible

- An 81 year old patient developed acute blood loss during colorectal surgery (03:50)
- The patient had known anti-E and anti-c. A unit of emergency O D-negative red cells was removed from a ward-based remote issue refrigerator and transfused to the patient
- This would, by definition, be incompatible with anti-c
- The clinical staff did not discuss the use of the emergency blood with the transfusion laboratory and did not wait for crossmatched blood to be supplied
- There was no known adverse outcome for the patient

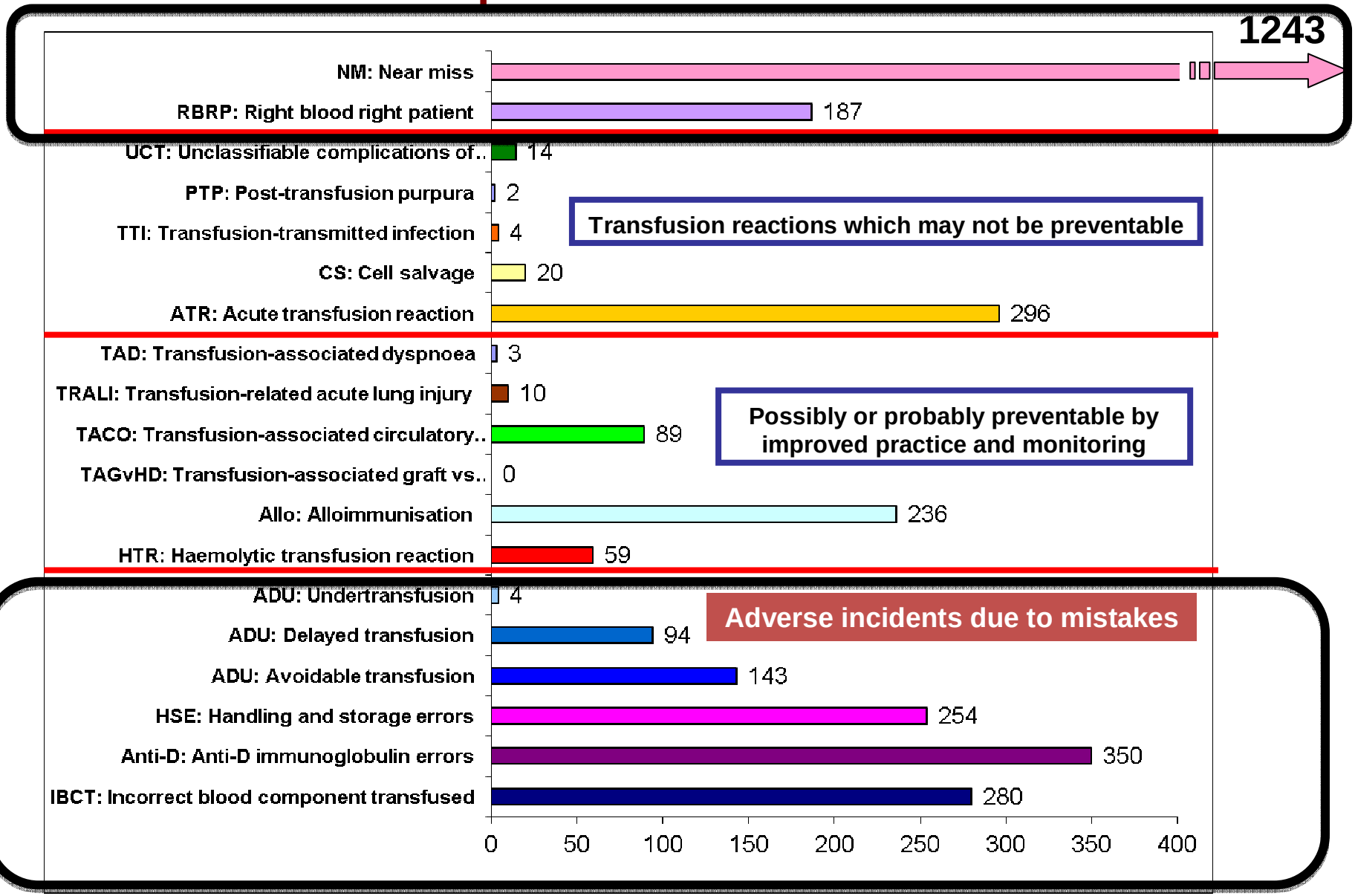
SHOT reports 2015 n=3288



SABRE reports:
740/765
96.7% errors



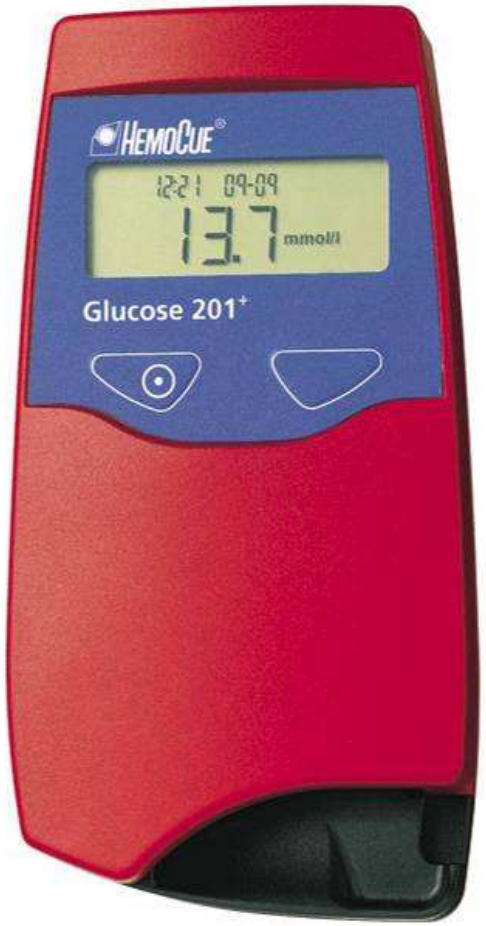
SHOT Reports 2015 n=3288



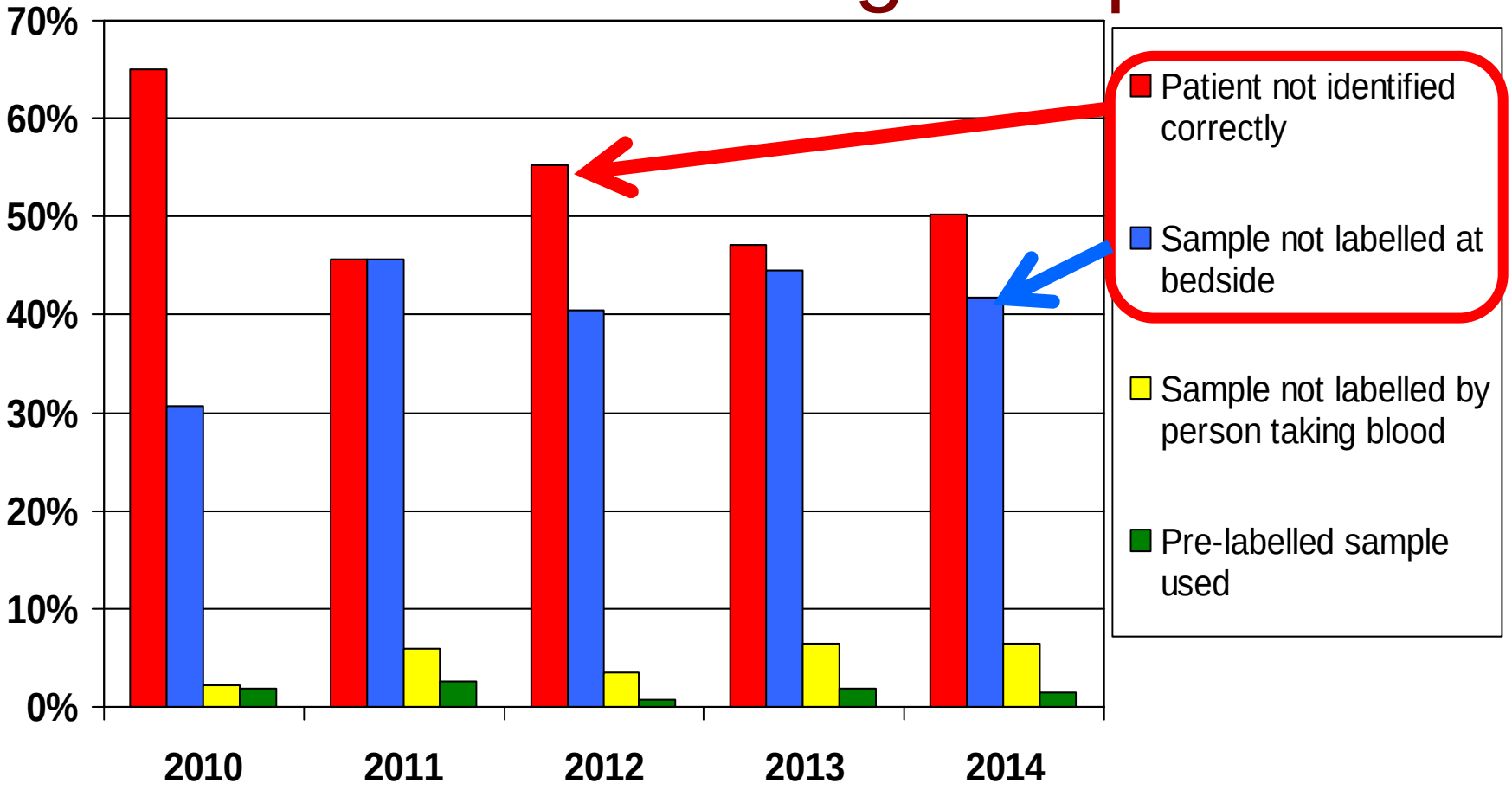
Being set up to fail...

...an accident waiting to happen

Errors have been made in theatre with point-of-care testing

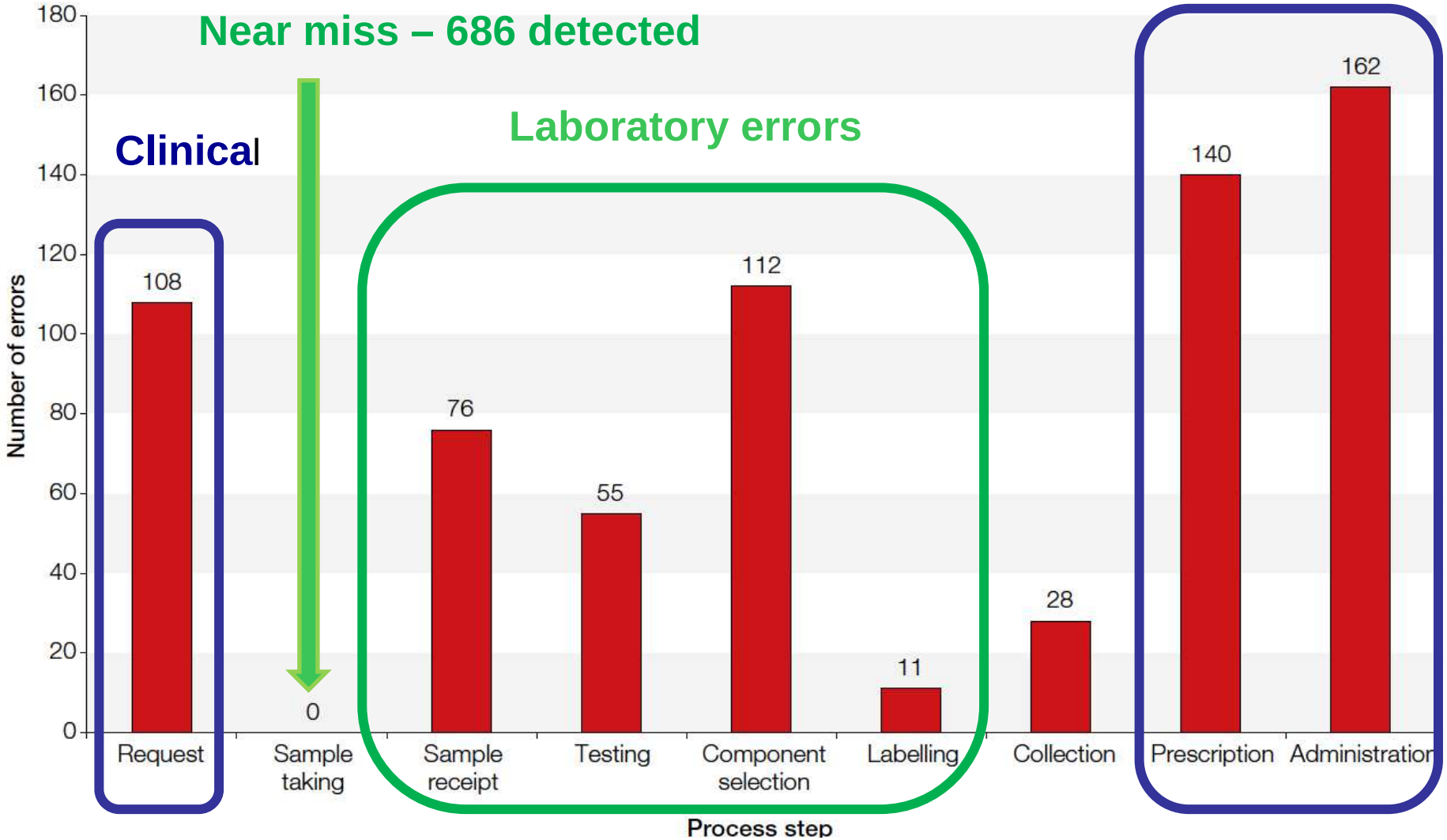


Near Miss: wrong blood in tube
Reasons for wrong samples



Wrong transfusions, where are the mistakes made?

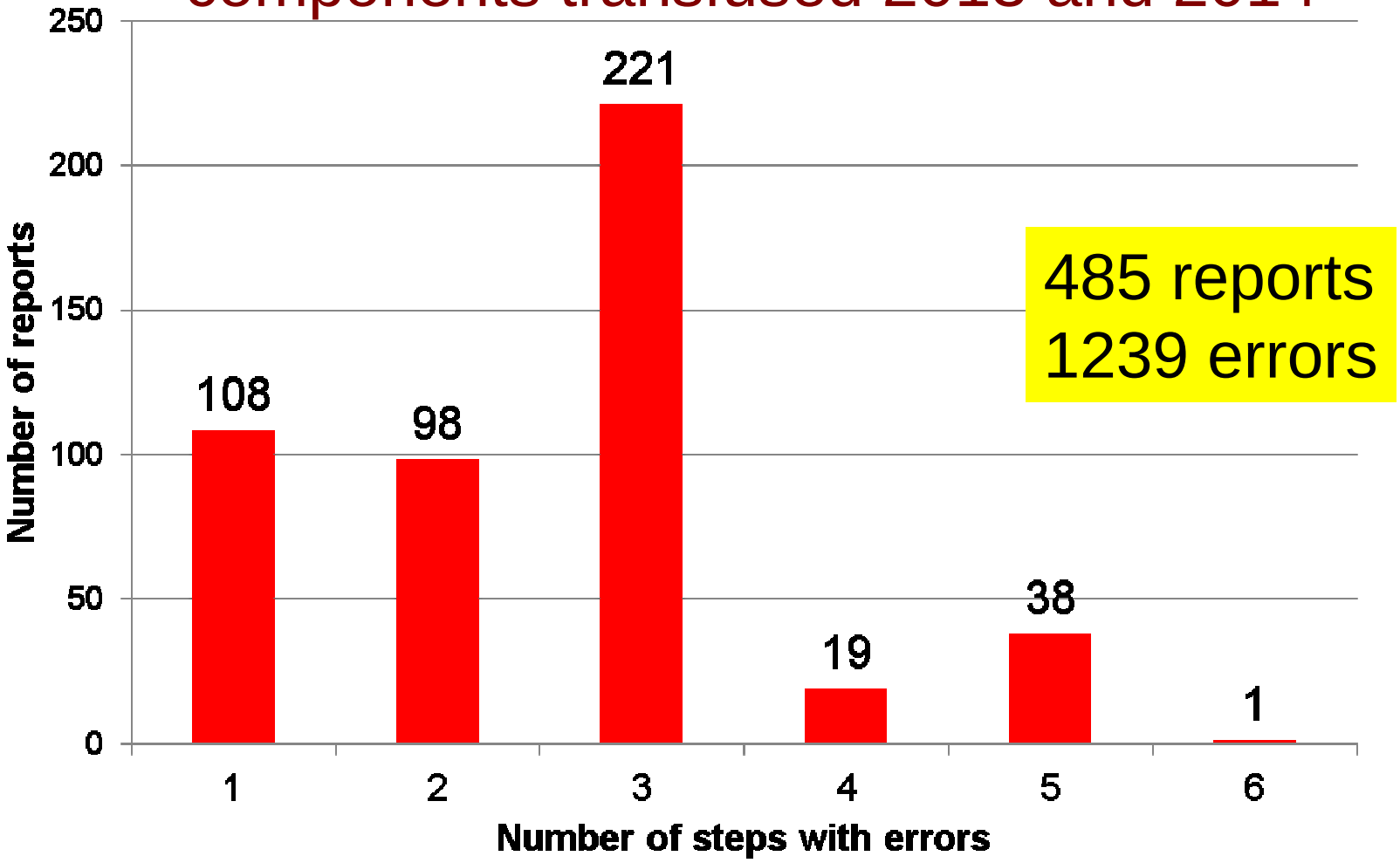
Data for 2014



Near miss 2015

- 1240 reports (about a third of the total)
- Wrong component transfusions 887 (71.5%)
- Wrong blood in tube 780
- **ABO-incompatible transfusions would have resulted in 288 (36.9%) cases**
- Actual ABO-incompatible red cell
- These are serious incidents but the solution is not to dismiss 288 staff, it is to understand why and change the process

Multiple errors are common – incorrect blood components transfused 2013 and 2014



Key Recommendation from Annual SHOT Report 2013

Process redesign

Annual SHOT data consistently demonstrate errors to be the largest cause of adverse transfusion incidents.

In line with human factors and ergonomics research it may be better to redesign the transfusion process by process mapping and audit at local and national level, to design out the medical errors.

A different approach

- **Safety-I** Situations where nothing goes wrong and responses are **reactive** – responding to adverse events when they happen: fire-fighting
- **Safety-II** Working environment where things go right. It is **proactive** – adjustments to performance so that risky situations do not occur

Study One - Retrospective analysis of reports to SHOT

a) What went wrong in actual incidents (Safety I)

b) What went right to stop an incident so that it therefore became a near miss, with no patient harm (Safety II)

c) Development of a Human Factors Investigation Tool (HFIT) for use by transfusion incident investigators – draft v1 live since Jan 2016 in SHOT Database

Study Two – Prospective analysis of the transfusion process (in partnership with National Comparative Audit):

a) to define the critical control points of the transfusion process within healthcare establishments

a) to make recommendations for improved practice

Resilience

- The intrinsic ability of a system to adjust its functioning before, during or after changes and disturbances, so that it can sustain required operations under both expected and unexpected conditions
- Requires the abilities to anticipate, to monitor and respond, and to learn

Demonstration of resilience

When you walk through a crowd like this, how often do you make minor adjustments to avoid bumping into people?

Reality

- Standard operating procedures (SOPs) and protocols may work well in the lab and for the bedside check

- They do not work so well in the busy complex clinical environment
  - Multitasking is common
  - Distraction is everywhere
  - Assumptions…

Resilience
Managing the unexpected

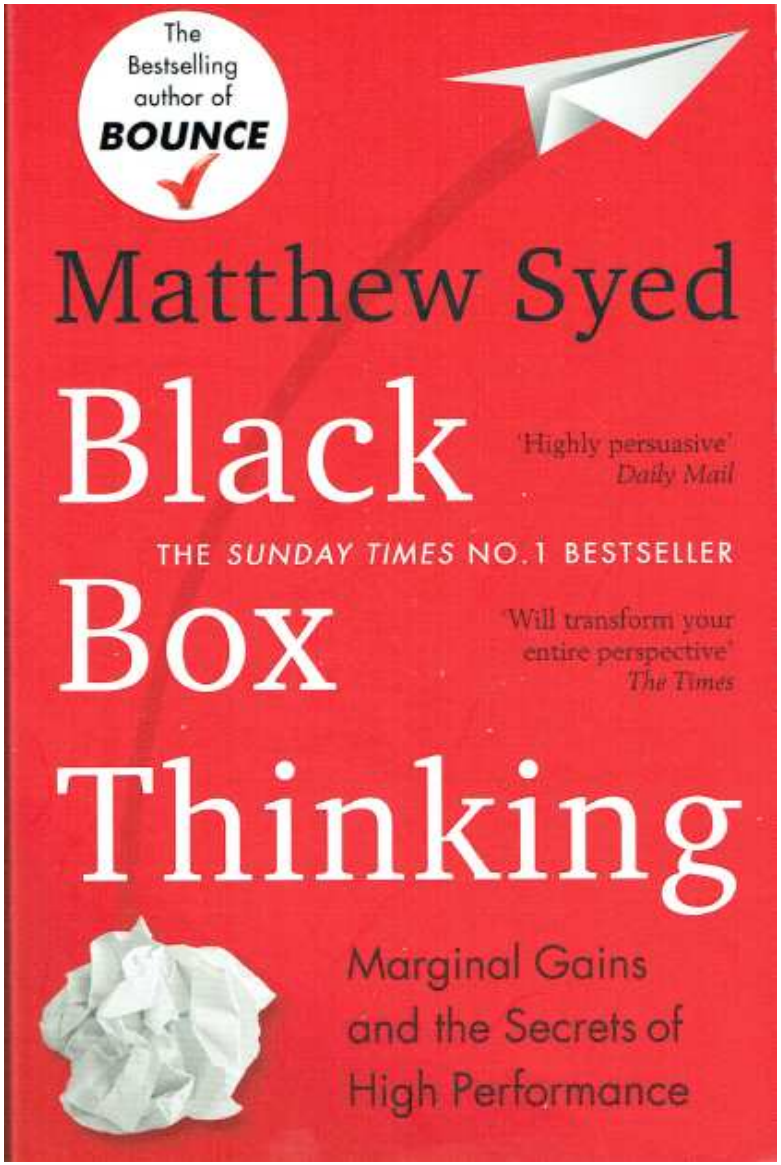
Hudson river plane crash, 2009. Pilot Chesley Sullenberger saved all 155 lives

Incident investigation and feedback is very important

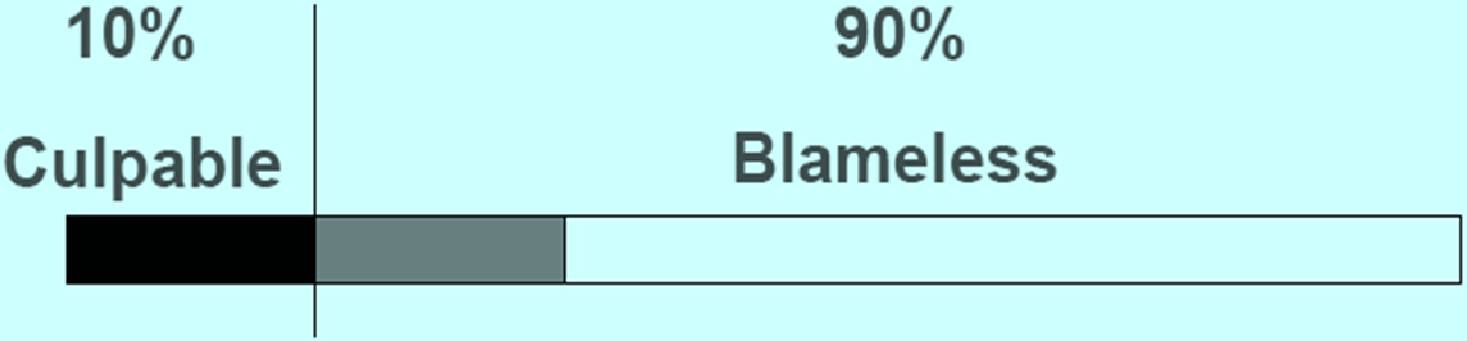
- Why did it happen?
- What can be learned from it?
- Corrective and preventative actions to reduce likelihood of recurrence

The health services need to learn all they can from incidents just as the air industry does

Perhaps as few as 5% of incidents are reported



The behavioural range: Incident Decision Tree guides decisions in the grey area



Sabotage
Substance abuse
Reckless violations
etc.

System-induced violations
System-induced errors
'Honest' errors
etc.

(James Reason, 2004)

Error reporting – example

- A child with beta thalassaemia major, blood group O, receives 3 mL of an incompatible unit of blood group A
- Recognised early, stopped, no harm done, but kept in hospital overnight for observation
- Blame culture – dreadful deed, sack the nurse
- Just culture- understand the circumstances which led to this and take action to prevent recurrence

Investigation – several issues

Root Causes: Collection of three units at the same time, and later failure to do the final bedside check immediately prior to transfusion

- The nurse was working alone in the day unit
- Three people needed transfusions – she collected a
- S k a p
- She was using aseptic technique to access the portacath, and the second nurse handed her the wrong un bedside
- In h bedside check

The staff were accepting a culture of chronic understaffing – audit showed solo working 75% of the time. Lone working was also associated with a poor record (42%) of correct observations during transfusion. **As a result of this investigation, an addition member of staff was employed**

The layout of the day unit was reviewed and changed

So, the RCA resulted in several SOLUTIONS

Learning from what goes wrong

- Concept of a ‘just culture’
- Incident reporting more likely if non-punitive – trust is critical
  - Avoid ‘omerta’ the code of silence
- Accountability
  - Looking backwards for a scapegoat to blame
  - Looking forwards to see what can be learned and changed to avoid recurrence

Just culture: Sidney Dekker 2nd ed. Ashgate 2012

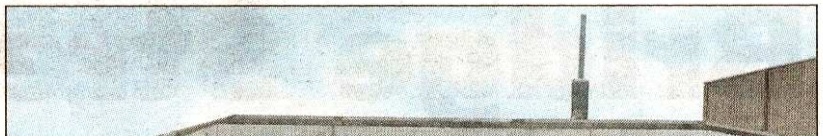
Thursday May 29th 2014

Local newspaper Front page headline:

What message does this give to hospital staff?

HO FF
SA
BLOOD BLUNDER

Two workers dismissed for putting patient's life at risk



Criminal prosecution?

- Increasing trend for criminal investigation into potentially avoidable deaths
- 10 instances of health professionals facing criminal charges Dec 2014-2015
- 2 convicted of manslaughter by gross negligence (others incomplete at time of reporting)

Vaughan 2016 Bulletin RCS Engl 98(2):60-62

Situational awareness - Noticing

- Sherlock Holmes - The curious incident of the dog in the night time ... it didn’t bark
- Noticing when things do not go as anticipated

Nurse notices an unusual irradiation sticker

- A unit of irradiated platelets was taken to the ward. A nurse noticed the irradiation sticker on the component was still red and the word **NOT** was still visible
- Although the component had been signed and dated as having been irradiated, the nurse contacted the laboratory to double-check
- The nurse was advised to return the unit as it had not been irradiated and thus prevented the patient receiving an incorrect unit

Shared learning

“Learn from the mistakes of others.

You can’t live long enough to make them all yourself."

Eleanor Roosevelt

Sign up to Safety

Harnessing the commitment of staff across the NHS in England to make care safer

(http://www.england.nhs.uk/signuptosafety/wp-content/uploads/sites/16/2015/06/homepage-image.jpg)

Sign up to Safety is harnessing the commitment of staff across the NHS in England to make care safer. A patient safety campaign, it is one of a set of national initiatives (http://www.england.nhs.uk/ourwork/patientsafety/) to help the NHS improve the safety of patient care. Collectively and cumulatively these initiatives aim to reduce avoidable harm by 50% and support the ambition to save 6,000.

Patient safety should be the golden thread of learning

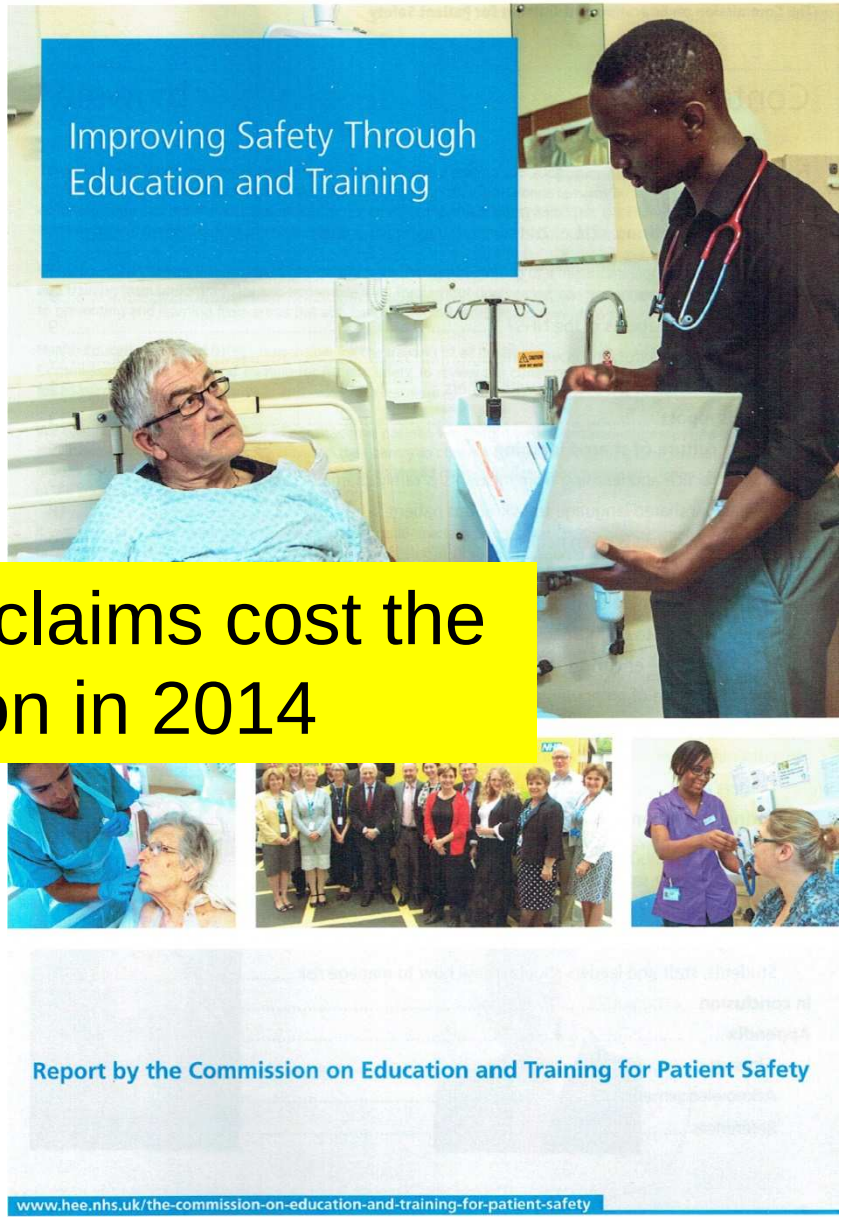
1/10 patients admitted will experience a safety incident

Half of these are avoidable

The learning environment must suppo
respor
patien

Principles of human factors must be embedded across education and training

Mostly a result of complex interaction of human factors and organisational problems



Clinical negligence claims cost the NHS £1.1 billion in 2014

Acknowledgements

- SHOT Team in Manchester
- SHOT Working and Writing Expert Group
- SHOT Steering Group
- UK healthcare organisations for reporting