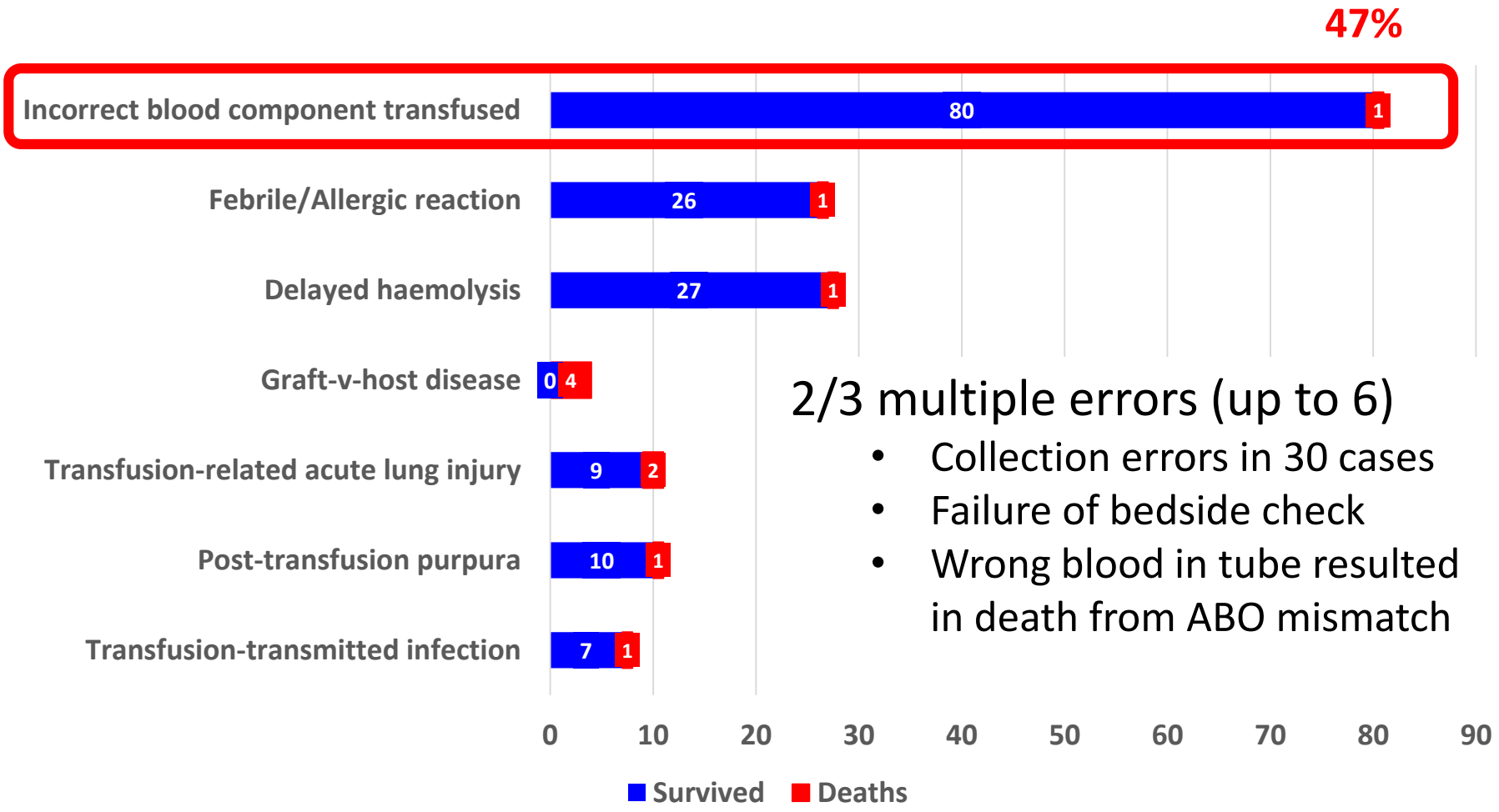
# SHOT: Learning from error, understanding the causes, delivering a safer future

Paula Bolton-Maggs

Medical Director of SHOT 2011-2018

# Data from 1st SHOT Report 1998

## Data for 1996-7, 169 reports from 94 hospitals

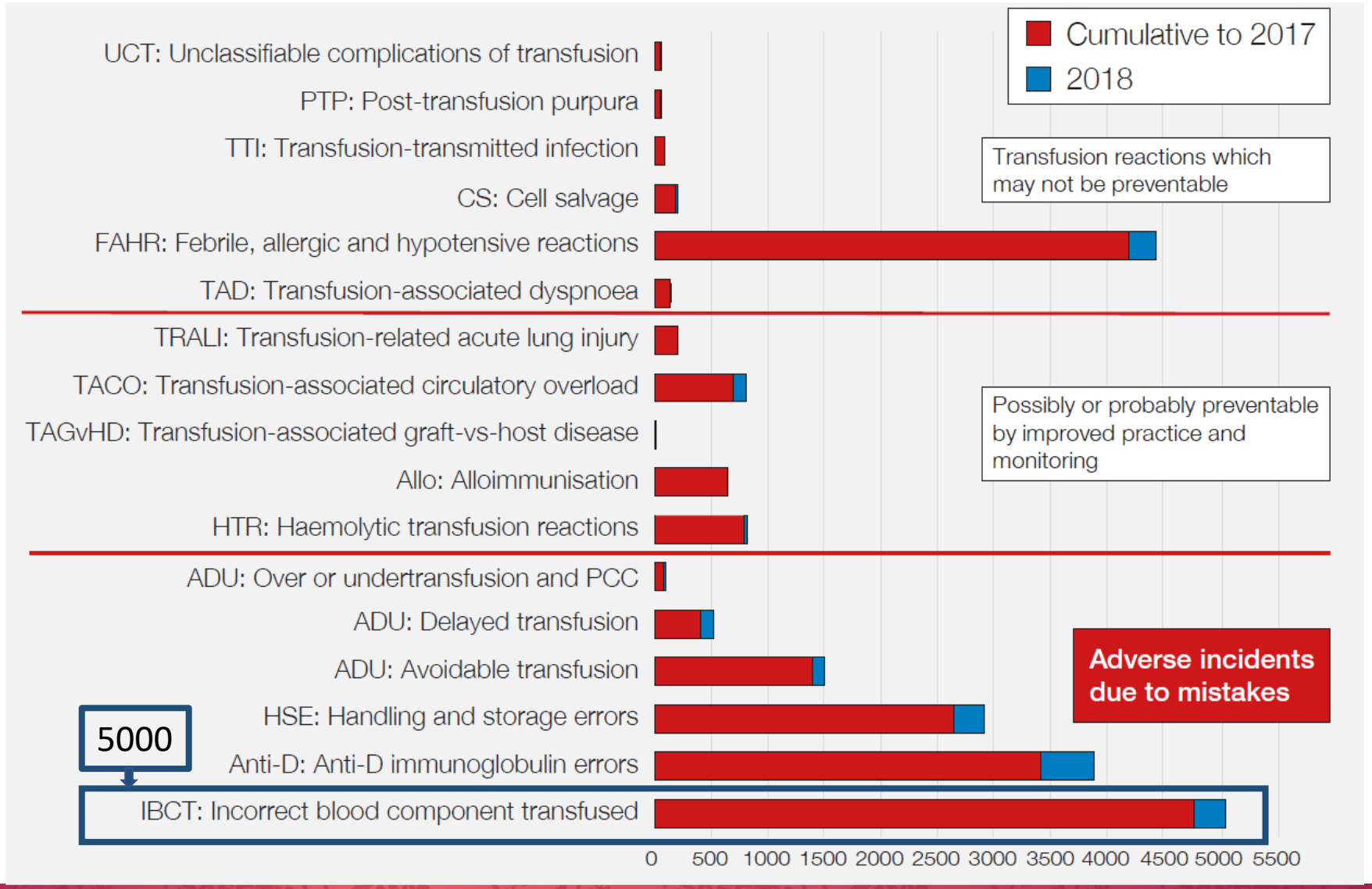


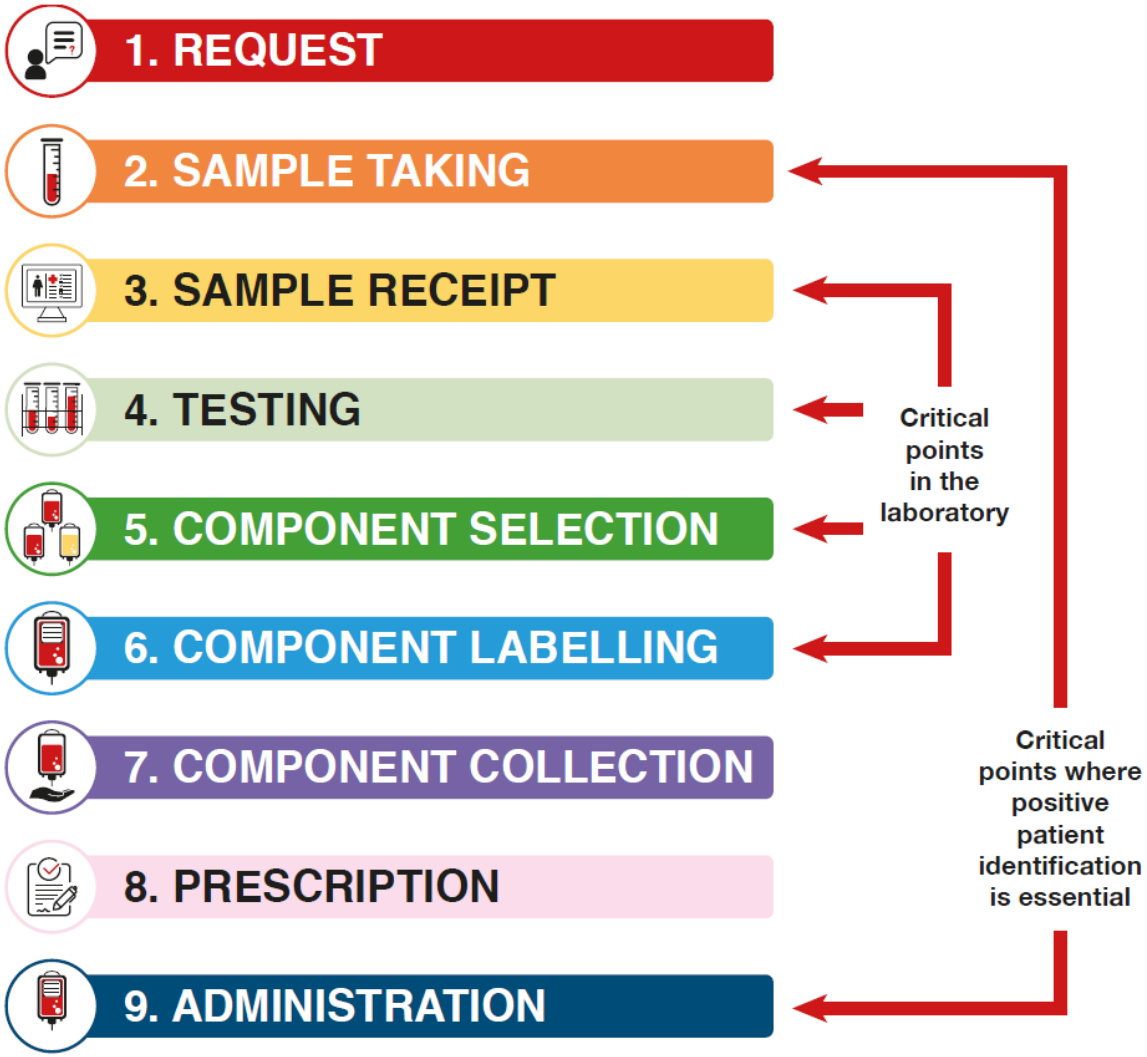

2/3 multiple errors (up to 6)

- Collection errors in 30 cases
- Failure of bedside check
- Wrong blood in tube resulted in death from ABO mismatch

The greatest risk from transfusion is that somebody will make a mistake (slip, trip, lapse….)

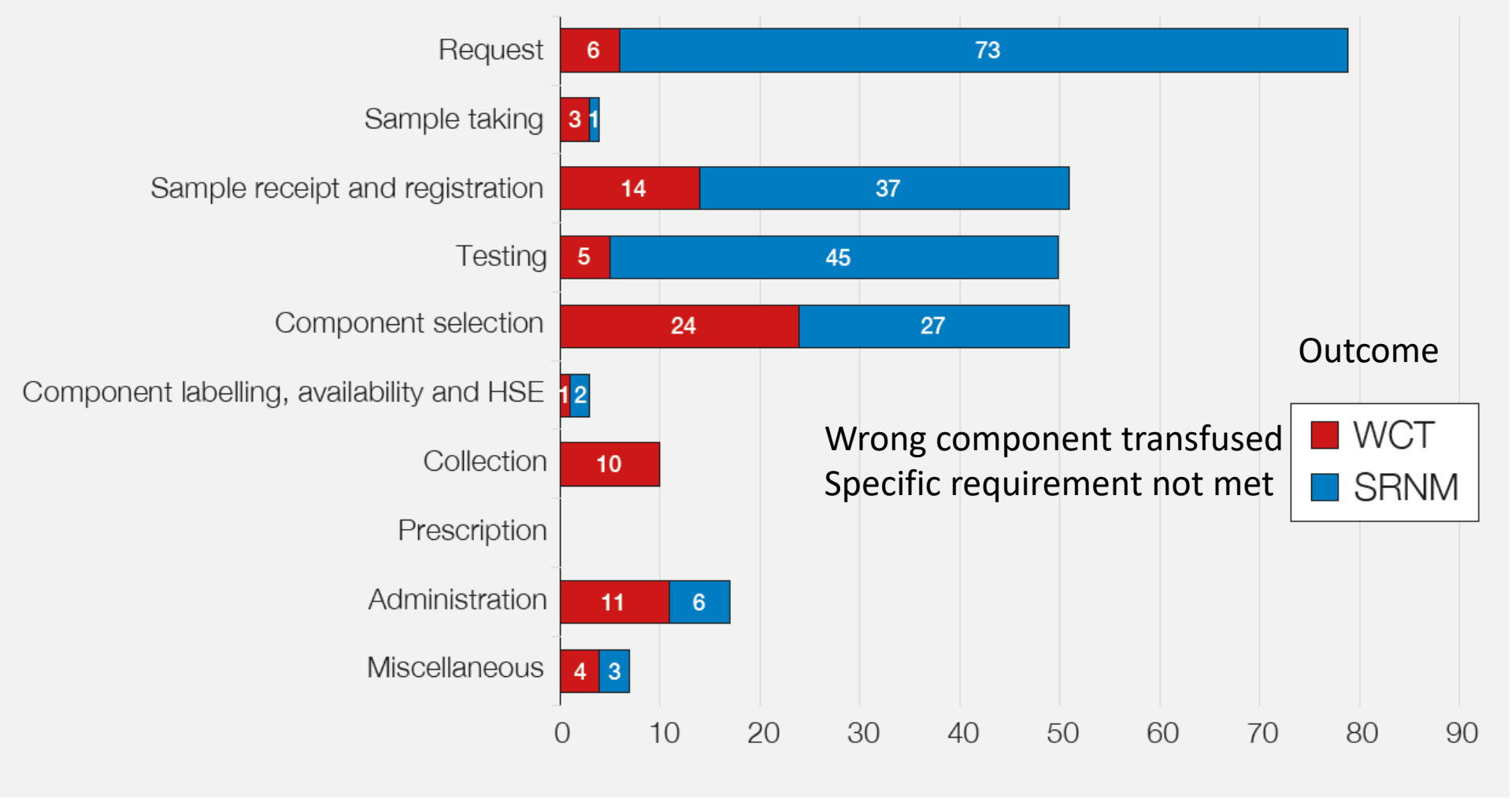
# SHOT data 1996-2018 (22 years)



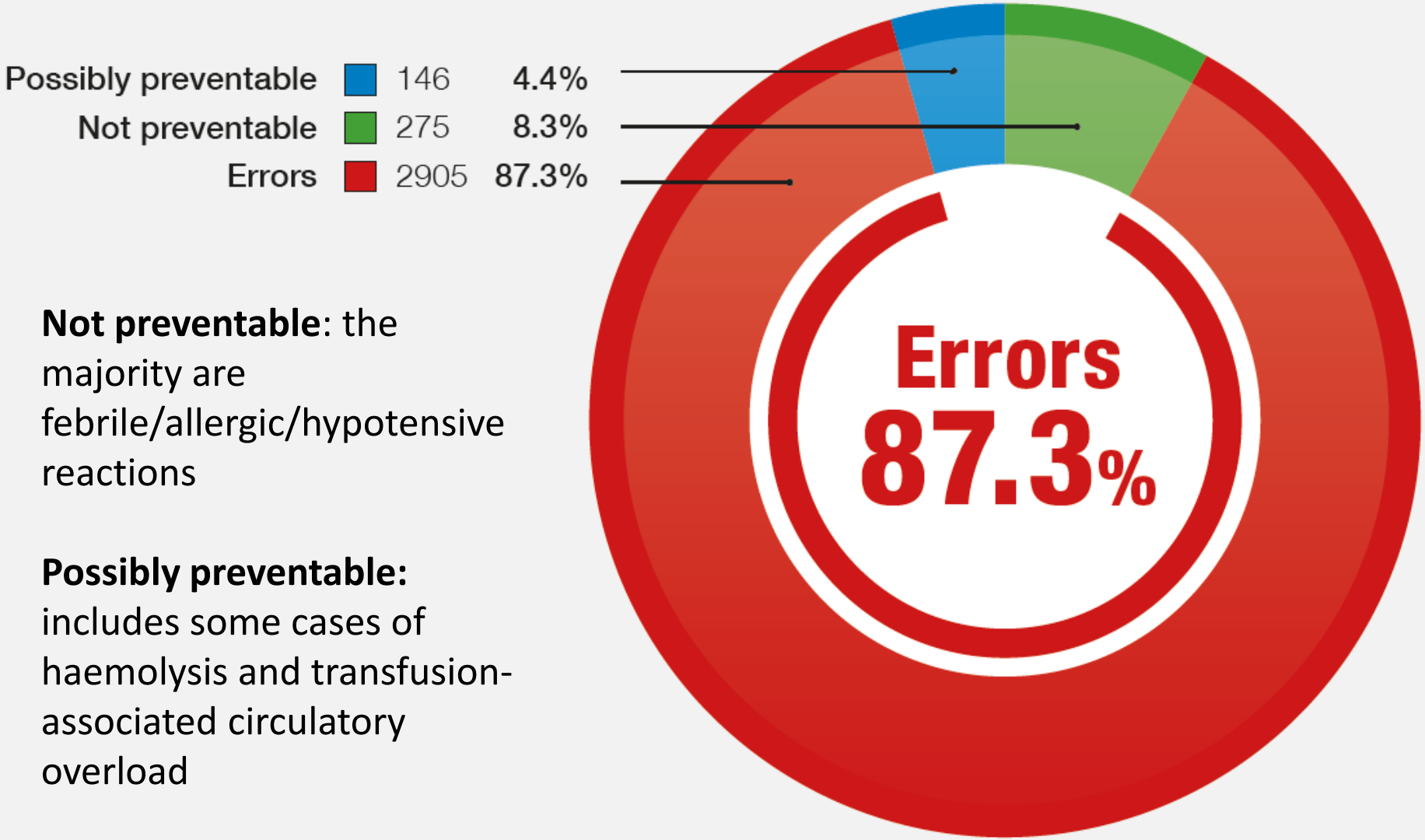



*Note: Once a decision to transfuse is made, the authorisation or prescription may be written at variable times during this sequence, but* ***must be checked at the final stage****.*

# Points where first mistake occurred in 272 cases of incorrect component transfused in 2018



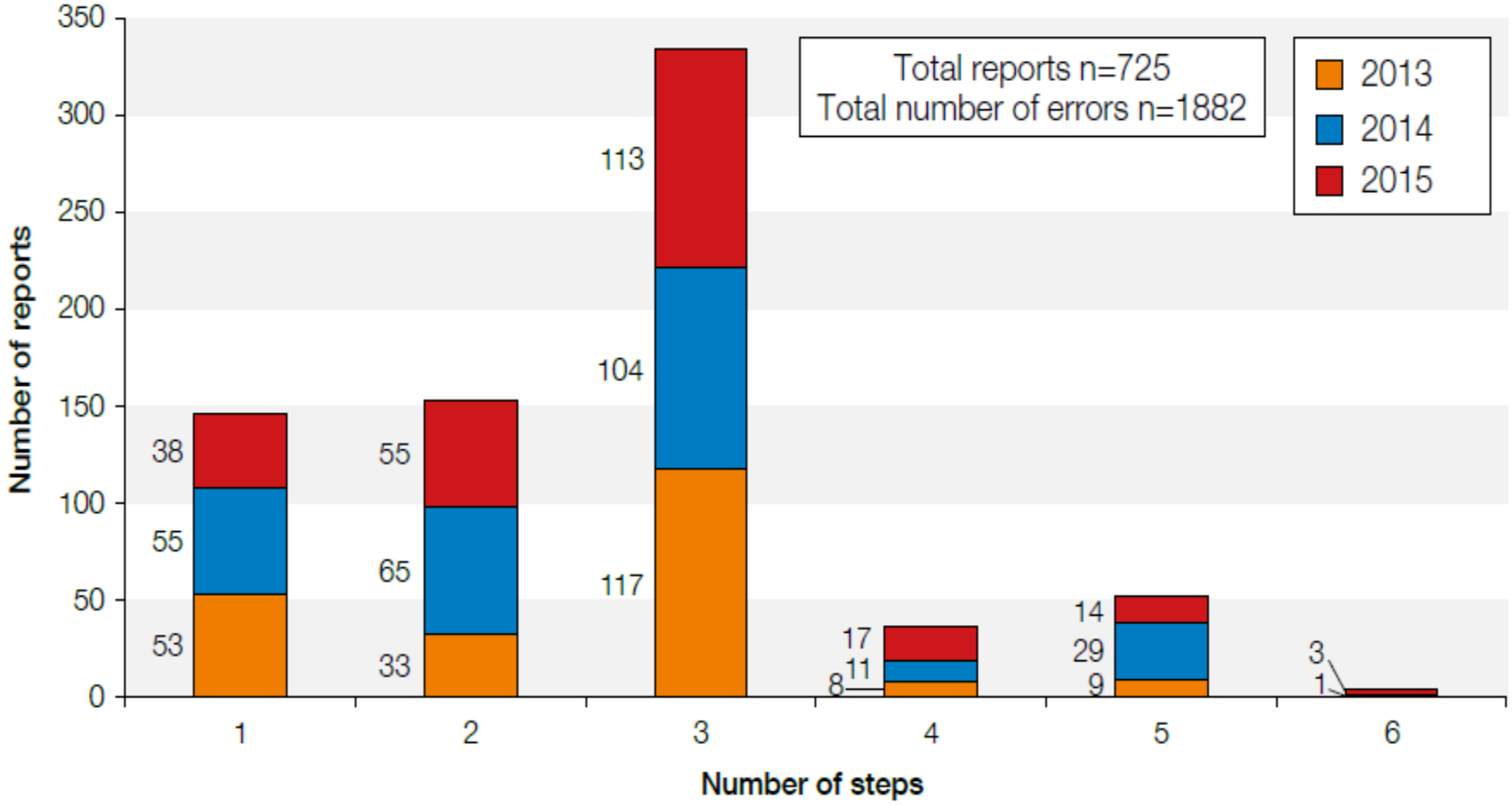
# SHOT incidents 2018




**Not preventable**: the majority are febrile/allergic/hypotensive reactions

**Possibly preventable:** includes some cases of haemolysis and transfusion-associated circulatory overload

# Multiple errors are common – incorrect blood components transfused 2013-2015



ELSEVIER
SAUNDERS

Anesthesiology Clin N Am
23 (2005) 253 - 261

ANESTHESIOLOGY
CLINICS OF
NORTH AMERICA

# Errors in Transfusion Medicine

Dorothy Stainsby, FRCP, FRCPath

*National Blood Service, Holland Drive, Barrack Road, Newcastle upon Tyne NE2 4NQ, UK*

Analysis of incorrect blood component transfused:
Multiple errors
70% clinical area
Failure of bedside check

So nothing new..

# Serious Hazards of Transfusion: A Decade of Hemovigilance in the UK

Dorothy Stainsby, Hilary Jones, Deborah Asher, Claire Atterbury, Aysha Boncinelli, Lisa Brant, Catherine E. Chapman, Katy Davison, Rebecca Gerrard, Alexandra Gray, Susan Knowles, Elizabeth M. Love, Clare Milkins, D. Brian L. McClelland, Derek R. Norfolk, Kate Soldan, Clare Taylor, John Revill, Lorna M. Williamson, and Hannah Cohen, on behalf of the SHOT Steering Group

*Transfusion Medicine Reviews*, Vol 20, No 4 (October), 2006: pp 273-282

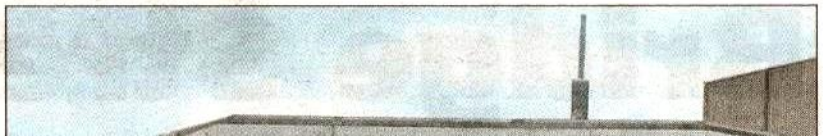
Thursday May 29th 2014

Local newspaper
Front page headline:

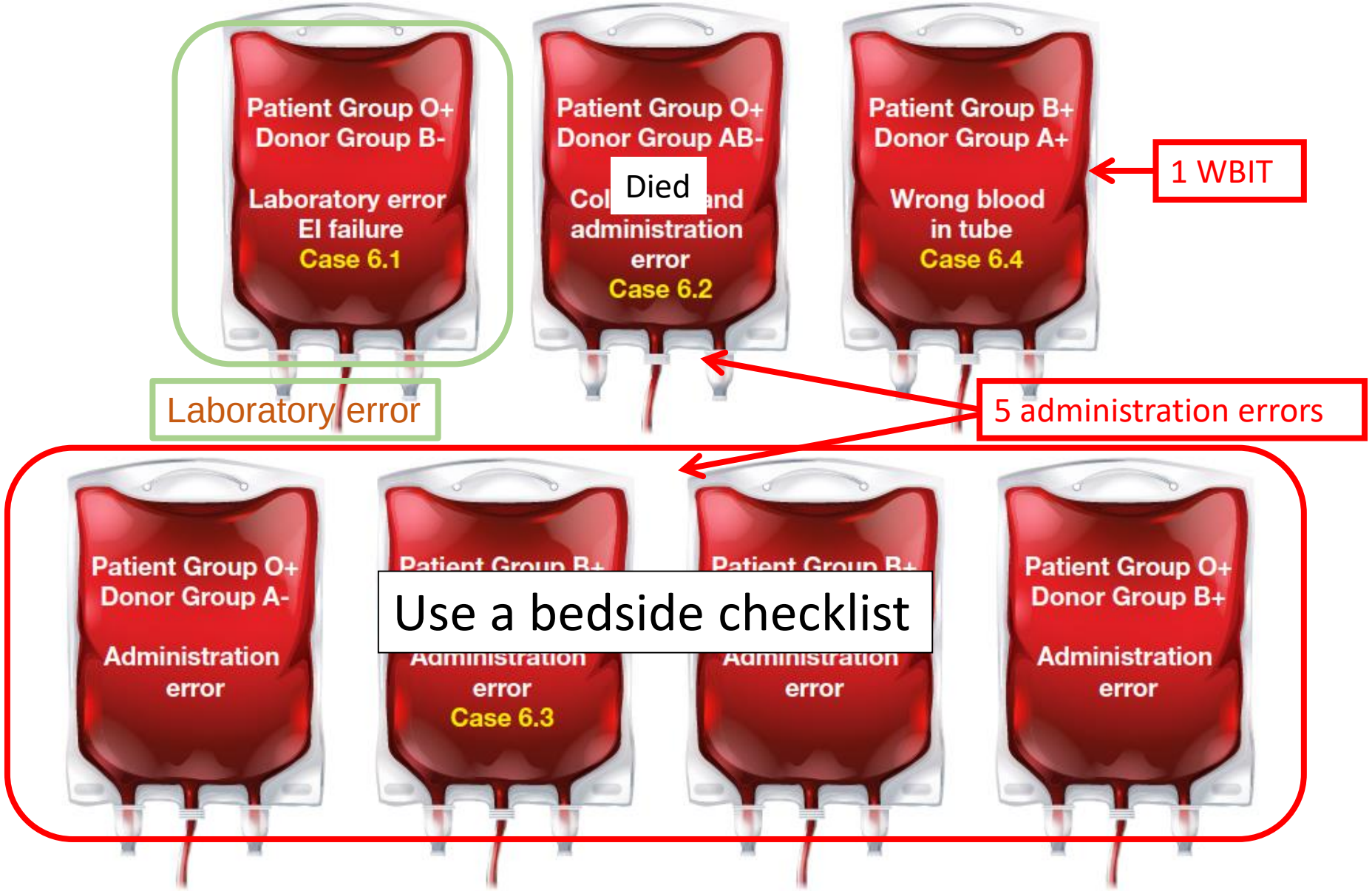
What message does this give to hospital staff?

# HOSPITAL STAFF SACKED OVER BLOOD BLUNDER

Two workers dismissed for putting patient's life at risk

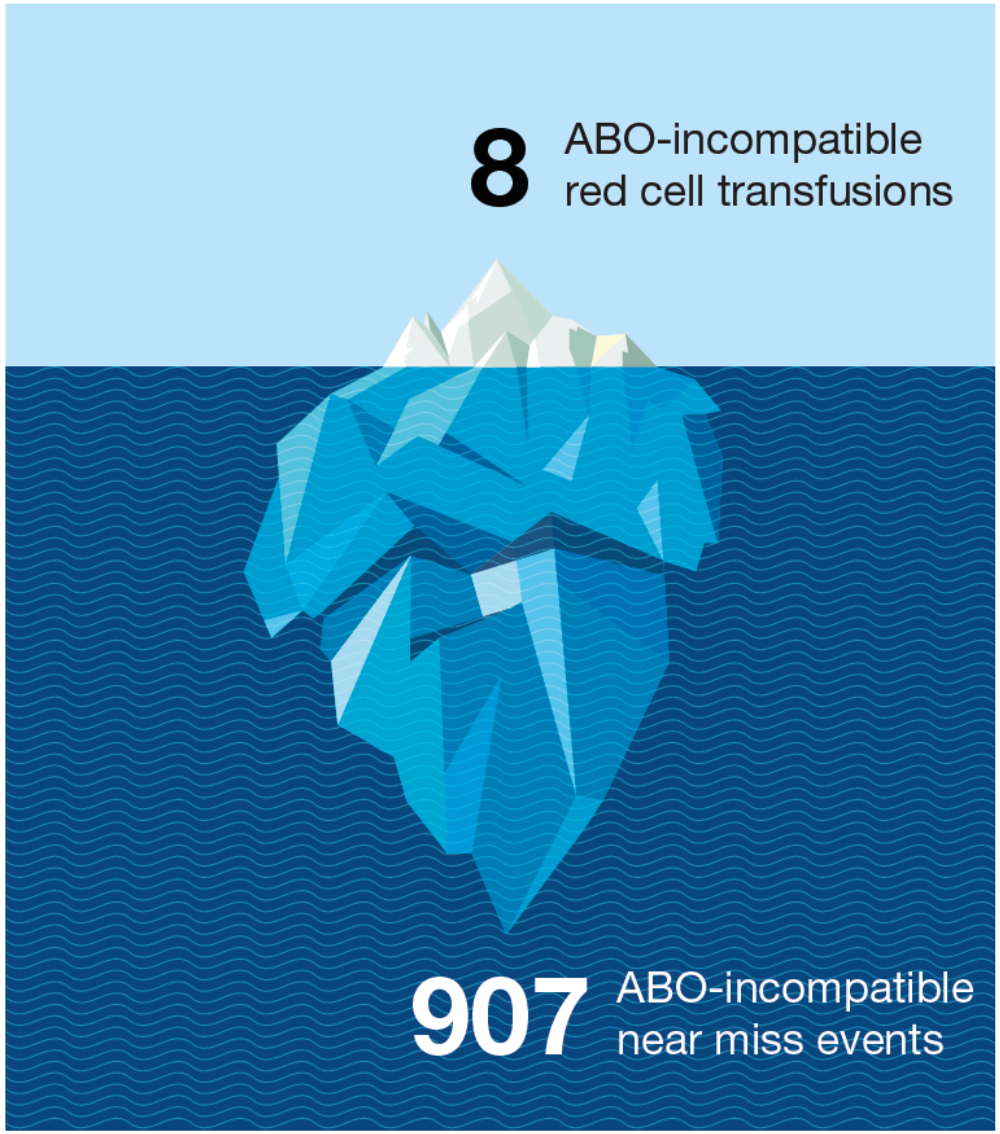


# ABO-incompatible red cell transfusions 2015 n=7

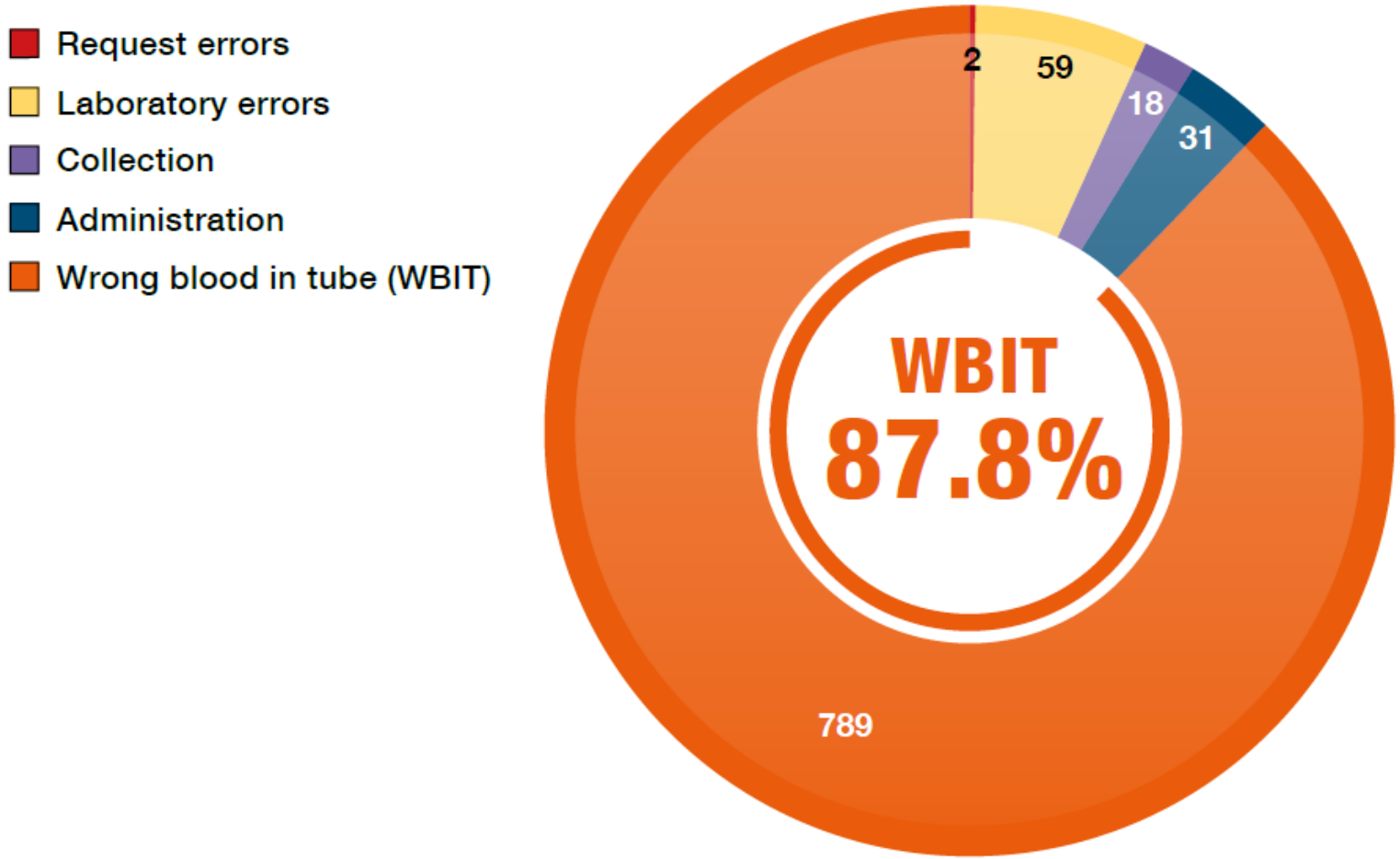


# SHOT data 2016 – 2018

# (no deaths)



# Most ‘near miss’ incorrect blood component transfused were wrong blood in tube errors (2017 data)



This was a midwifery near miss error with non-transfusion blood samples. HSIB endorsed the recommendation for IT vein-to-vein solutions

HSIB

HEALTHCARE SAFETY INVESTIGATION BRANCH

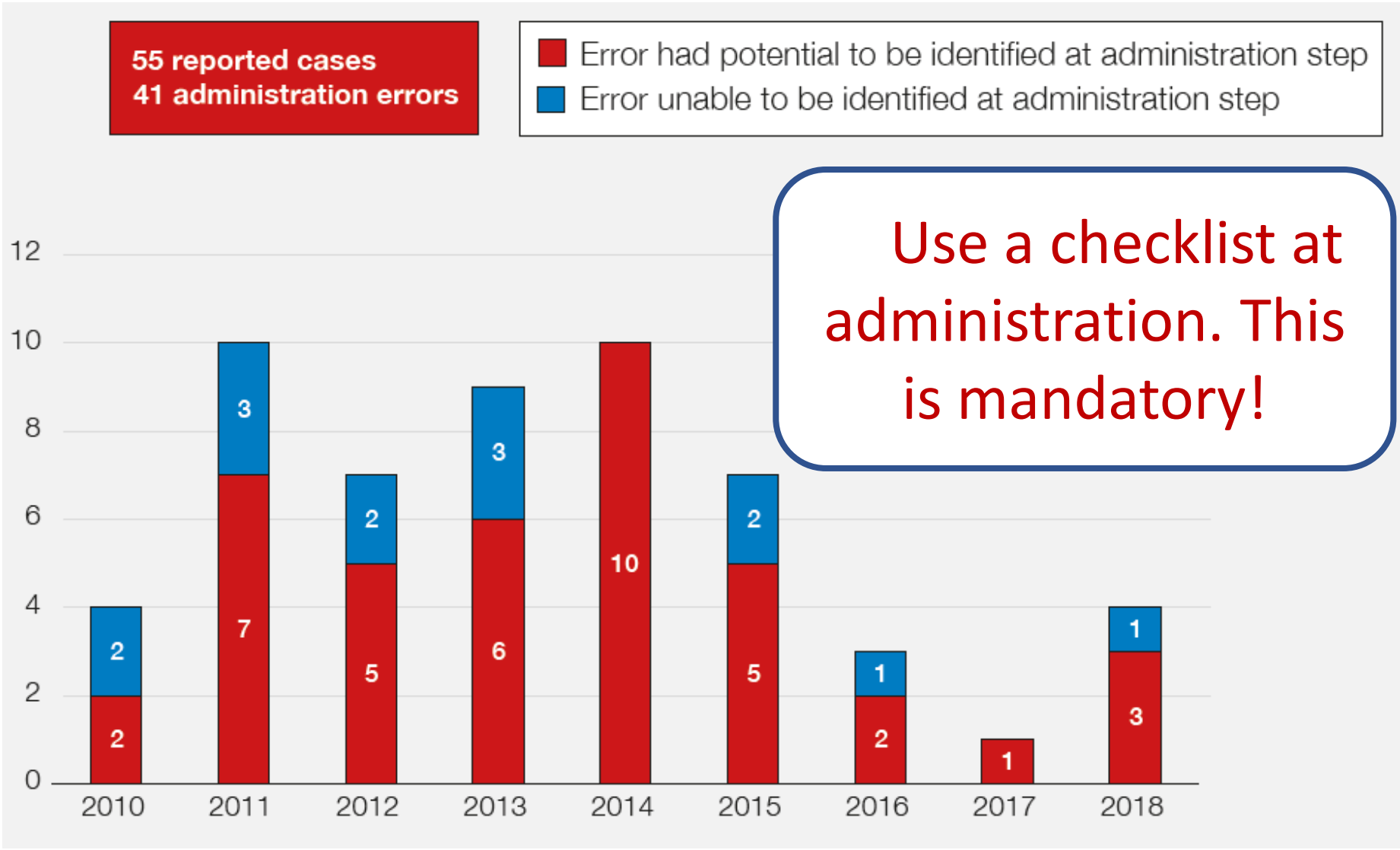
WWW.HSIB.ORG.UK

# WRONG PATIENT DETAILS ON BLOOD SAMPLE

**Healthcare Safety Investigation** I2019/003

September 2019 Edition

# ABO-incompatible transfusions




Use a checklist at administration. This is mandatory!

# A sequence of errors put life at risk

- 29 year old man admitted in sickle crisis 4 days earlier
- Pulmonary symptoms worsened so an exchange transfusion was indicated
- Sample sent down 16:00, and one unit was venesected at 18:00 prior to planned transfusion
- Sample tested on automated machine at 17:36, group confirmed and matched with previous records as group O D-pos and no antibodies

# History 2

- The BMS in error selected  B D-neg units instead of O D-pos 1
- Entering these onto the LIMS, he overrode the warnings about different ABO group 2
- The system asked if the BMS wanted to proceed and let him answer ‘yes’ 3
- Labels attached to units at 18:10 and placed ready for collection

LIMS = Laboratory Information Management System

# History 3

- Unit collected by trained and authorised porter and taken to ward at 19:25
- Registered nurse made pre-administration checks and set unit up at 19:45
- The nurse had not done a transfusion competency assessment 4
- Pre-administration observations were not recorded and this nurse went off duty at 20:00 5
- No recorded 15 minute observations 6

# History 4

- The unit was stopped when the patient became shivery with T 38°C, P 126, $O_2$ sat 94%
- Seen by doctor on call, discussed with consultant haematologist
- Blood stopped, analgesics, take FBC and return unit to lab (assumption that pain was due to sickling). No record of this visit in case notes 7
- Symptoms settled; unit returned to lab and another one transfused at 22:00 and third at 02:55 8 9
- Patient reported that he had felt unwell (ongoing and acute pain) between 02:00 and 04:00 in the night and called with the bell but no-one came 10

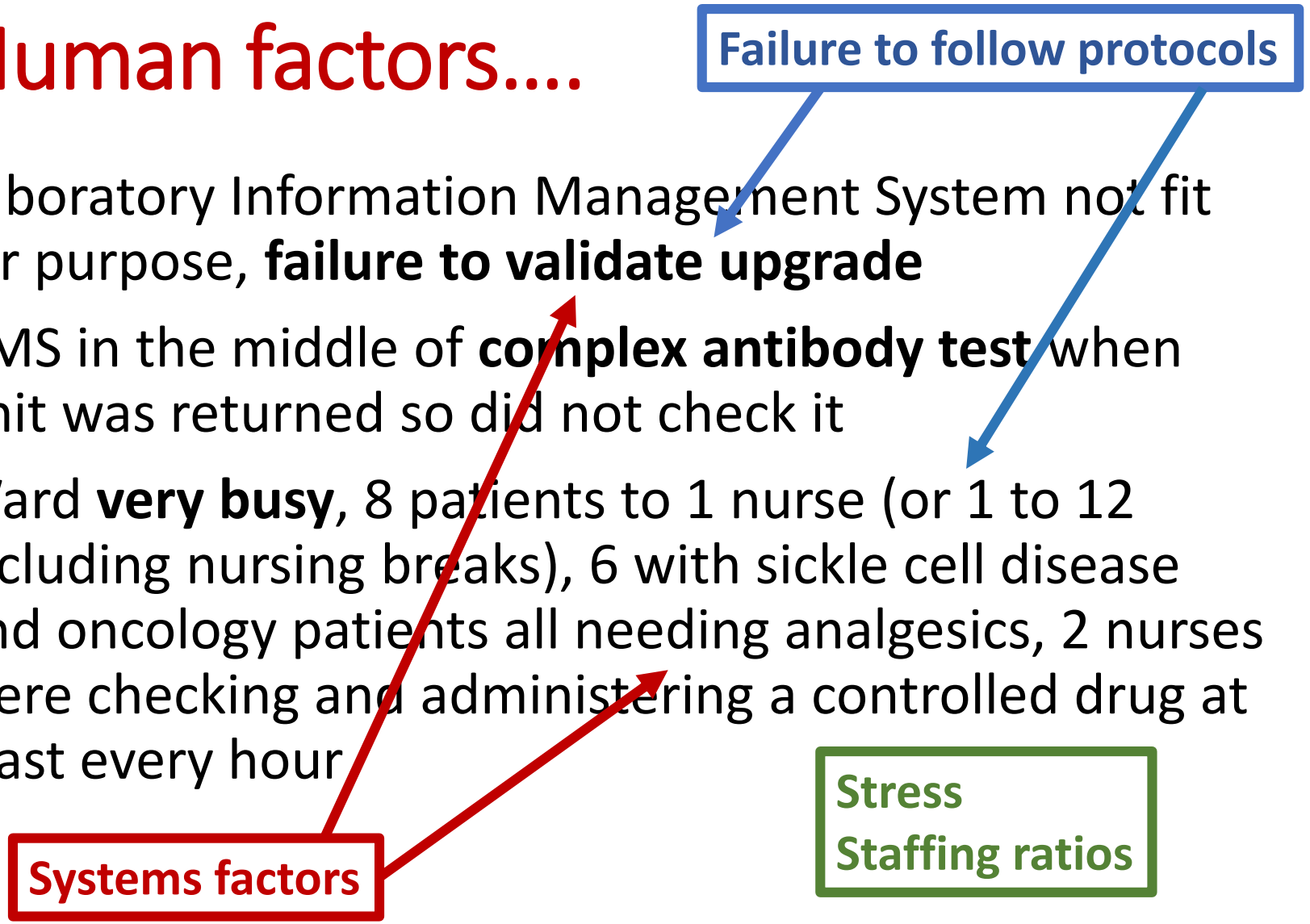
# History 5

- The returned unit was quarantined overnight and then in the morning at handover at 08:30 lab staff noted that **the label said patient group O D+ and unit B D-**

Why didn't the nursing staff notice this?

- Patient immediately reviewed and sent to another hospital for urgent exchange transfusion at 11:15

# Human factors….




- Laboratory Information Management System not fit for purpose, **failure to validate upgrade**
- BMS in the middle of **complex antibody test** when unit was returned so did not check it
- Ward **very busy**, 8 patients to 1 nurse (or 1 to 12 including nursing breaks), 6 with sickle cell disease and oncology patients all needing analgesics, 2 nurses were checking and administering a controlled drug at least every hour

# 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

# Death in 2014 from ABO-incompatible transfusion

**Filipina nurse who killed a pensioner when she mixed up his name with another patient and gave him the wrong blood during a transfusion is facing jail**

- Lea Ledesma was working at London Heart Hospital as a nurse
- She injected Ali Huseyin, 76, with blood meant for Irfan Hussain
- Her blunder caused Mr Huseyin to have a heart attack and die
- She was today found guilty of manslaughter and cried at verdict

By ANTHONY JOSEPH FOR MAILONLINE

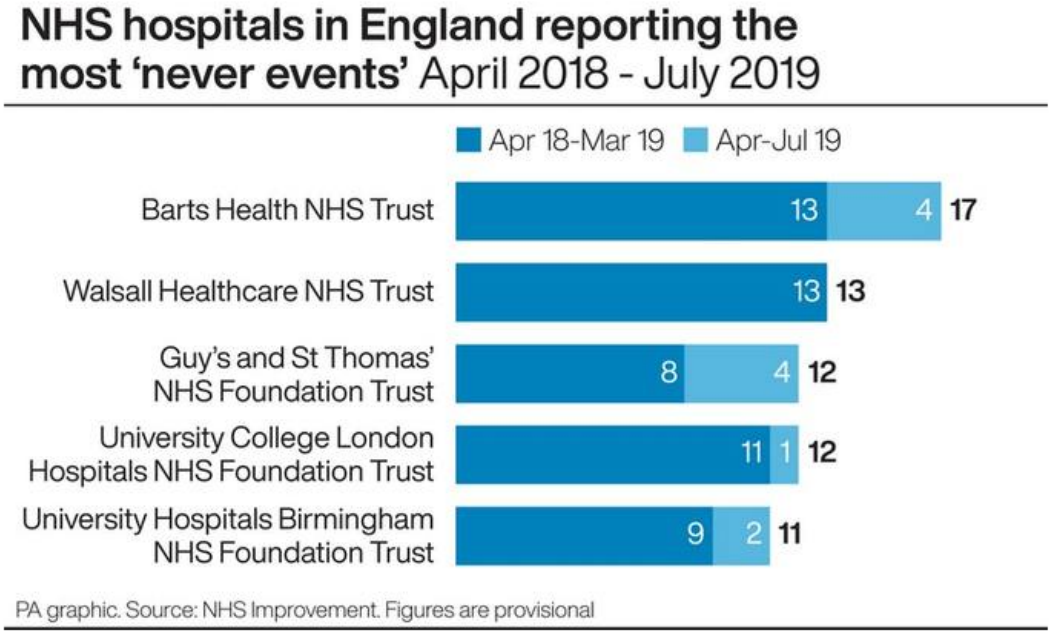
**PUBLISHED:** 21:53, 14 December 2016 | **UPDATED:** 07:42, 15 December 2016

She was respected and experienced and known as ‘the mother’ of the intensive care unit. She received a suspended sentence

**NEWS** 16/09/2019 10:29 BST | **Updated** 20 hours ago

# NHS Blunders Saw 621 Patients With Wrong Body Parts Amputated, Surgical Tools Left Inside Them, And Other 'Never Events'

One patient had the wrong toe amputated, while another had the wrong part of their colon removed.




*Credit: PA Graphics*

Two men were mistakenly circumcised, while a woman had a lump removed from the wrong breast and two others had a biopsy taken from their cervix rather than their colon.

A further six women had ovaries removed in error during hysterectomies, plunging them into menopause.

**6 cases of wrong transfusions**

'It is vital that all theatre staff use, and are involved in, the World Health Organisation pre- and post-operative checklist.

It is also important that the NHS continues to promote a culture of openness and transparency'

# It's undeniable

- We all make mistakes
- Inattention
- Distraction
- Fatigue
- Inadequate staffing
- Failure to notice what is in front of us
- Etc….

Jet bound for Malaysia went to Melbourne by mistake

Australia

**Bernard Lagan** Sydney

An airline captain who wrongly programmed his onboard navigation system ended up flying passengers to Melbourne instead of Kuala Lumpur.

We don't mean to do it

HMS Queen Elizabeth: crew 700. Twin propellers, 1 of 5 blades 26mm out of line

Error in calculation about bolt sizes made years ago leading to a hidden weakness

Knocking noise heard on sea trials

Sparks on the disc brake shaft

Crack in the block which anchors drive shaft to hull

# Noticing

# Irradiation of blood components

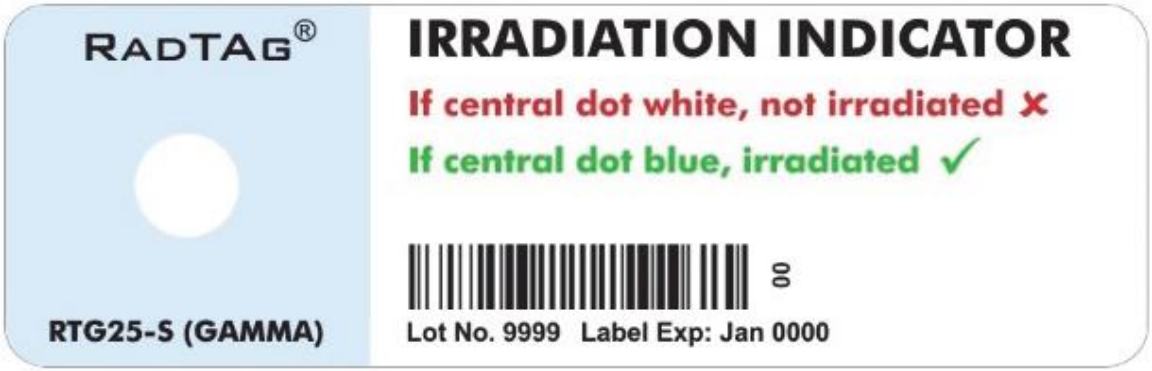
From this:


To this:


**An Innovative Way to Confirm Your Blood Products Were Irradiated**

Saving: £14K per month

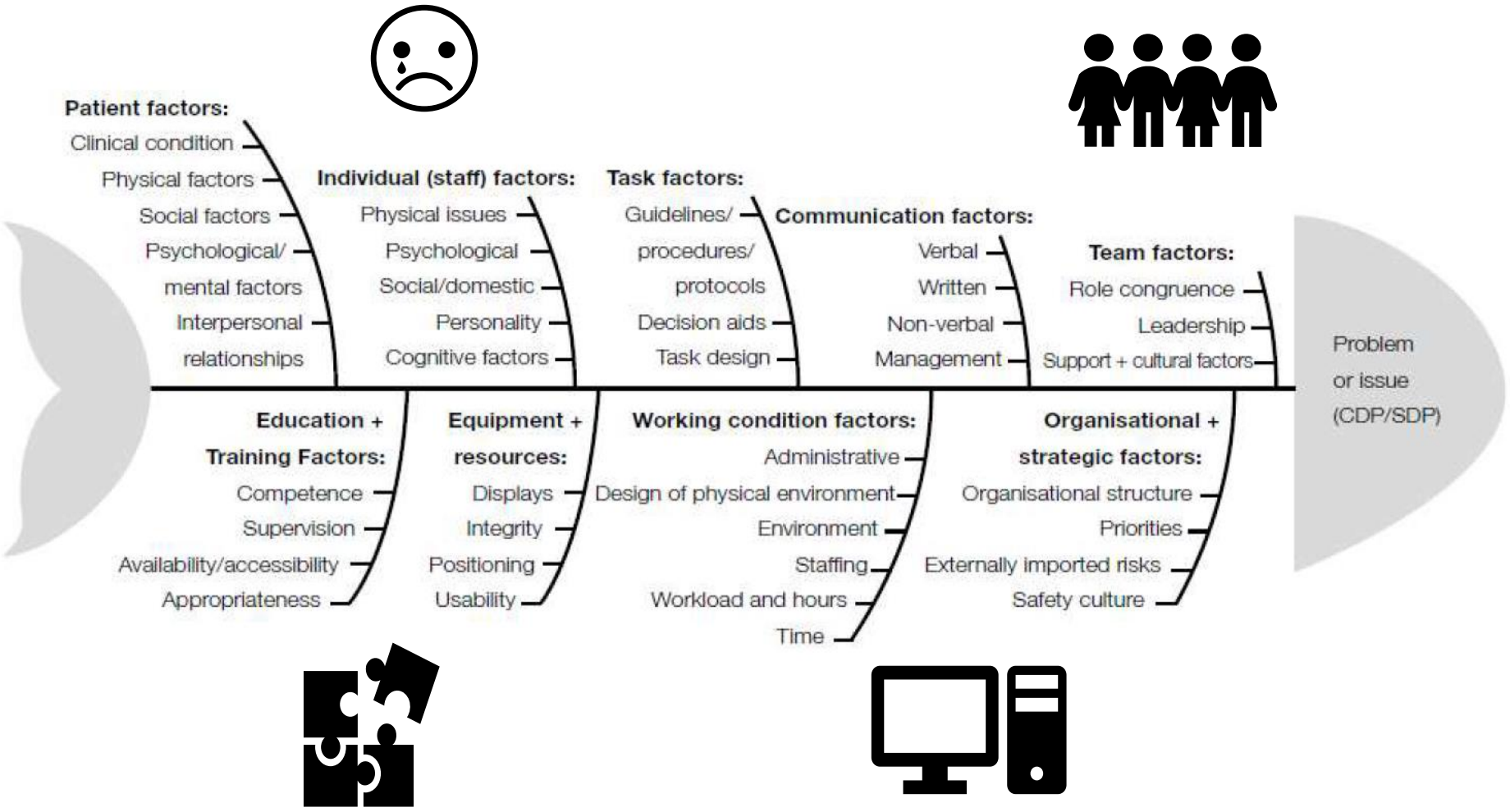
# Human factors consultation followed by redesign





Cost of consultation: £10K

# And speaking of fish…



# Why review incidents?

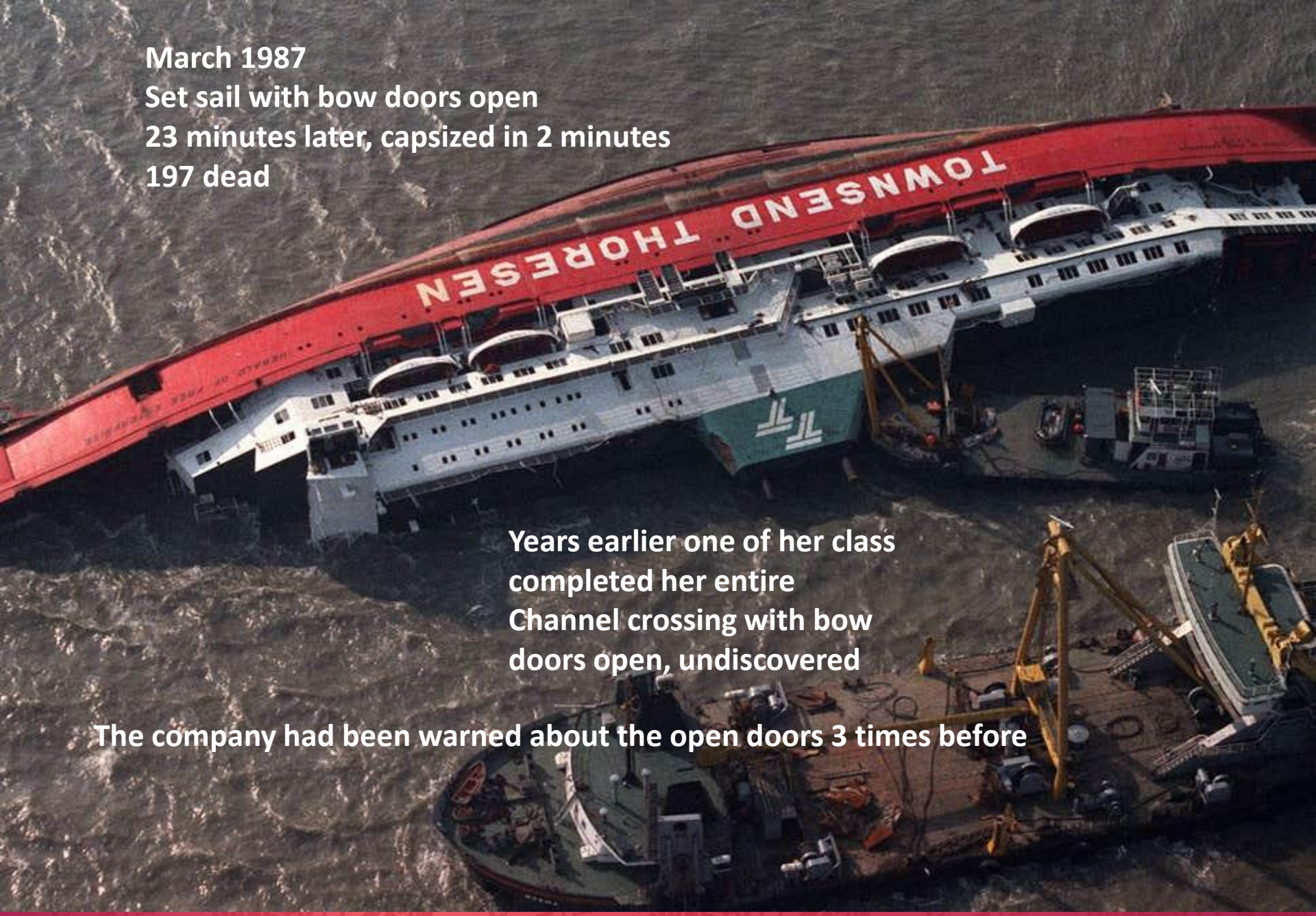
- Much can be learnt by review of accidents
- Just culture: an individual may contribute to a disaster
- The findings can help change the systems to reduce the risks
- AAIB, MSIB, HSIB

# Marine Accident Investigation Branch

Extract from The Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 – Regulation 5:

**"The sole objective of a safety investigation into an accident under these Regulations shall be the prevention of future accidents through the ascertainment of its causes and circumstances.**

**It shall not be the purpose of such an investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame."**




March 1987
Set sail with bow doors open
23 minutes later, capsized in 2 minutes
197 dead

Years earlier one of her class completed her entire Channel crossing with bow doors open, undiscovered

The company had been warned about the open doors 3 times before

# Why did Concorde crash in 2000?


**Multiple factors:**

- Failure of maintenance
- Debris on the runway
- Overload of baggage
- Change in wind direction

The undercarriage had locked because of a missing spacer not replaced a week before the crash (meanwhile two return trips to NY)

**'When the undercarriage bogeys are taken apart and reassembled, the work must be done according to a rigid formula, and rigorously inspected and assessed'**

HOME » NEWS » WORLD NEWS » EUROPE » FRANCE

The Telegraph, 6 December 2010

# Concorde crash: Continental Airline found responsible for 2000 crash

Let's blame somebody

Continental Airlines has been found guilty of manslaughter over the crash of a Concorde jet 10 years ago in which 113 people died.

The American airline and one of its mechanics were found criminally responsible by a French court after a piece of metal which had fallen from one of the airline's aircraft was found to have caused the crash.

The metal debris shredded one of the Concorde's tyres, propelling rubber into the fuel tanks and sparking a fire, according to investigators.

Footage of the aircraft showed flames burning from its engine before it ploughed into a hotel.

**December 9, 2012**
**LAST WEEK, A FRENCH APPEALS COURT overturned a manslaughter conviction against Continental Airlines for its role in the crash of an Air France Concorde outside Paris twelve years ago.**

**This appears to have been a crash with more than one contributing factor, most of which were avoidable…**
**Men, not God, caused Concorde to crash, and their omissions and errors may have turned an escapable mishap into catastrophe.**

# BA flight 5390: Birmingham to Malaga June 1990

Captain Lancaster's window blew out at 17,000 ft (similar incident over China in 2018)

# AIRCRAFT ACCIDENT REPORT 1/92


**Many features in common with transfusion accidents**

# Investigation

- Crew – no issues
- Air traffic controller
- Maintenance – replacement of the windscreen

Don't ignore the bedside transfusion checklist

- Accident to  near miss 1 in 400-1 in 600

In an industrial context, **degraded standards** may exist for some time before a serious accident occurs or the situation becomes apparent to an independent observer.

The number of errors perpetrated on the night of this job came about because **procedures were abused**, 'short-cuts' employed and mandatory instructions ignored'.

# Shift maintenance engineer – 33 yrs experience

Many of the actions taken that night may be described as evidence of a **lack of sufficient care** in the execution of his responsibilities.

Such a catalogue of events does not equate to a momentary lapse in behaviour but is more indicative of the approach of a conscientious and pragmatic engineer working in a **non-procedural manner.**

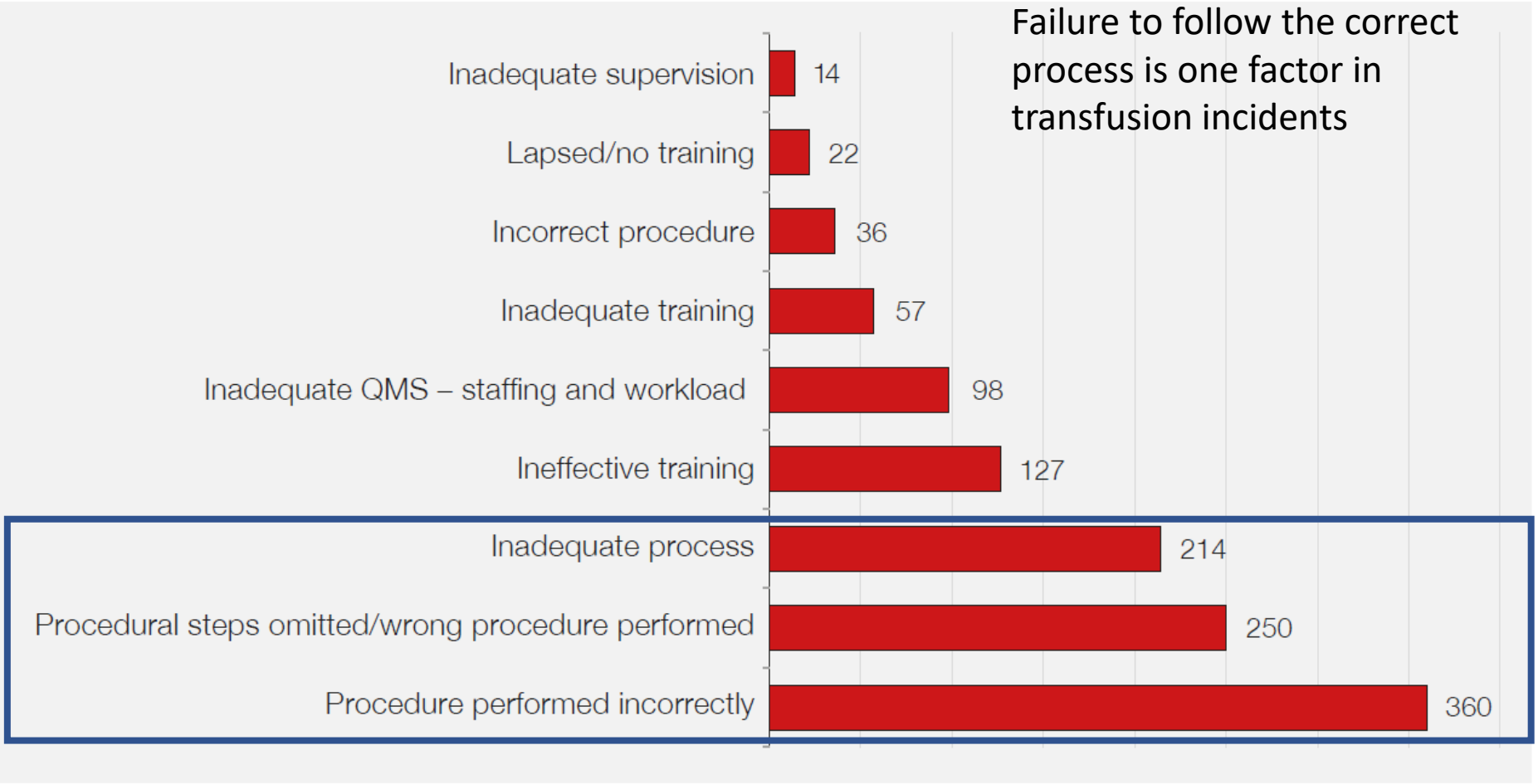
Such a description of the individual is not necessarily inconsistent with his exemplary record, because until matched with a task such as this windscreen change, his approach was **capable of going undetected** by anything other than a close observation of his work practices.

Check of full BA fleet windscreen bolts – 2 other aircraft had a total of 41 short bolts

Check of 4 other planes from another airline found errors in 2 with 107 short bolts

Captain Lancaster returned to flying after 5 months

# Transfusion: MHRA findings 2018 – Human error reports for serious adverse events




*QMS=quality management system*

# What are the common factors?

All these incidents had preceding or associated near miss events

Failure to follow the process through

Short cuts

Missing out steps

‘I know what I’m doing, I’ve done it thousands of times before’

# Guidelines are not rules

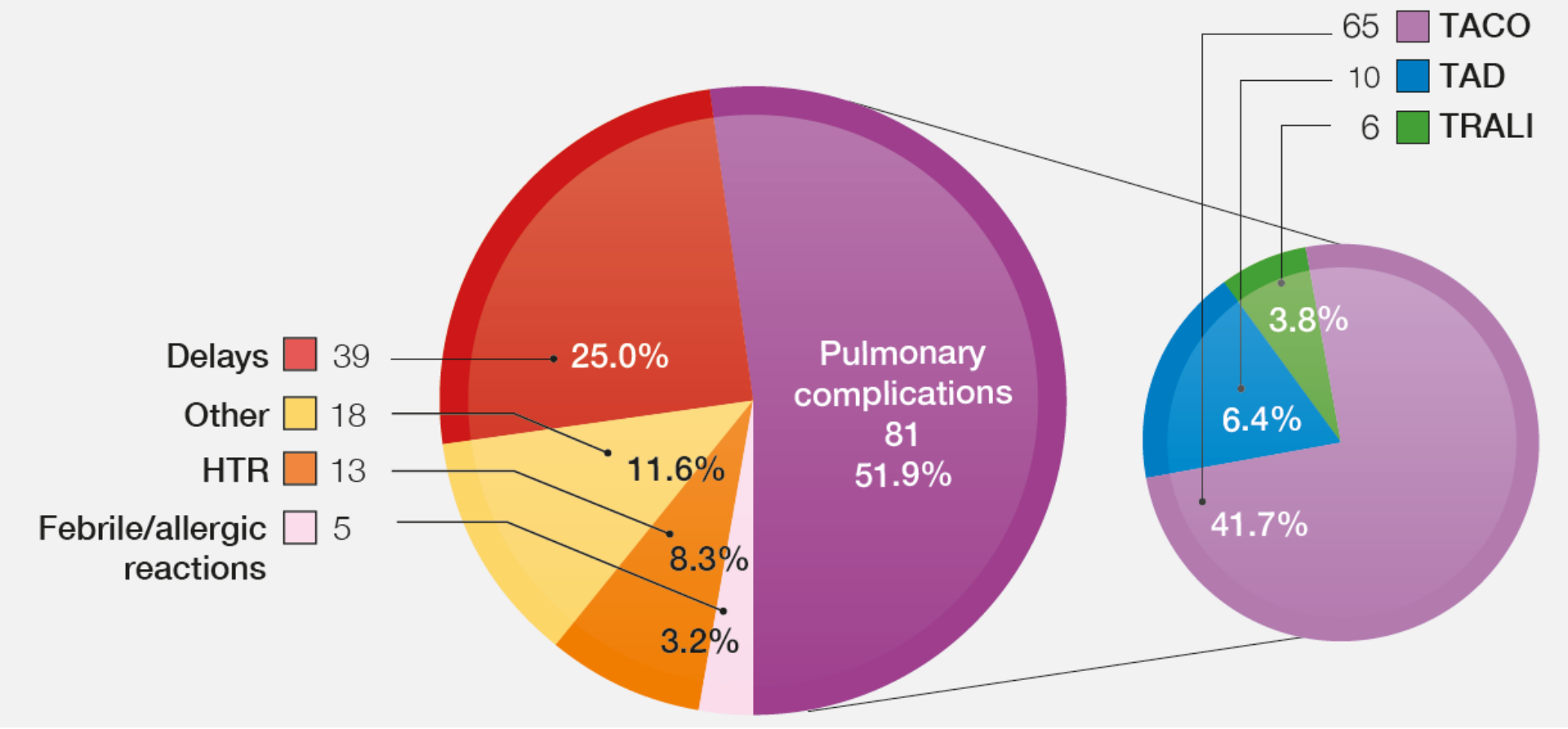
## The difference between SOPs and clinical variability

- Transfusion at night should only take place if clinically essential (SHOT Report 2003)
- ‘We never transfuse at night’
- Patients harmed
- Refusal to set up working system for haemoglobinopathy patients
- Revised in SHOT Report 2014

# Major haemorrhage protocols

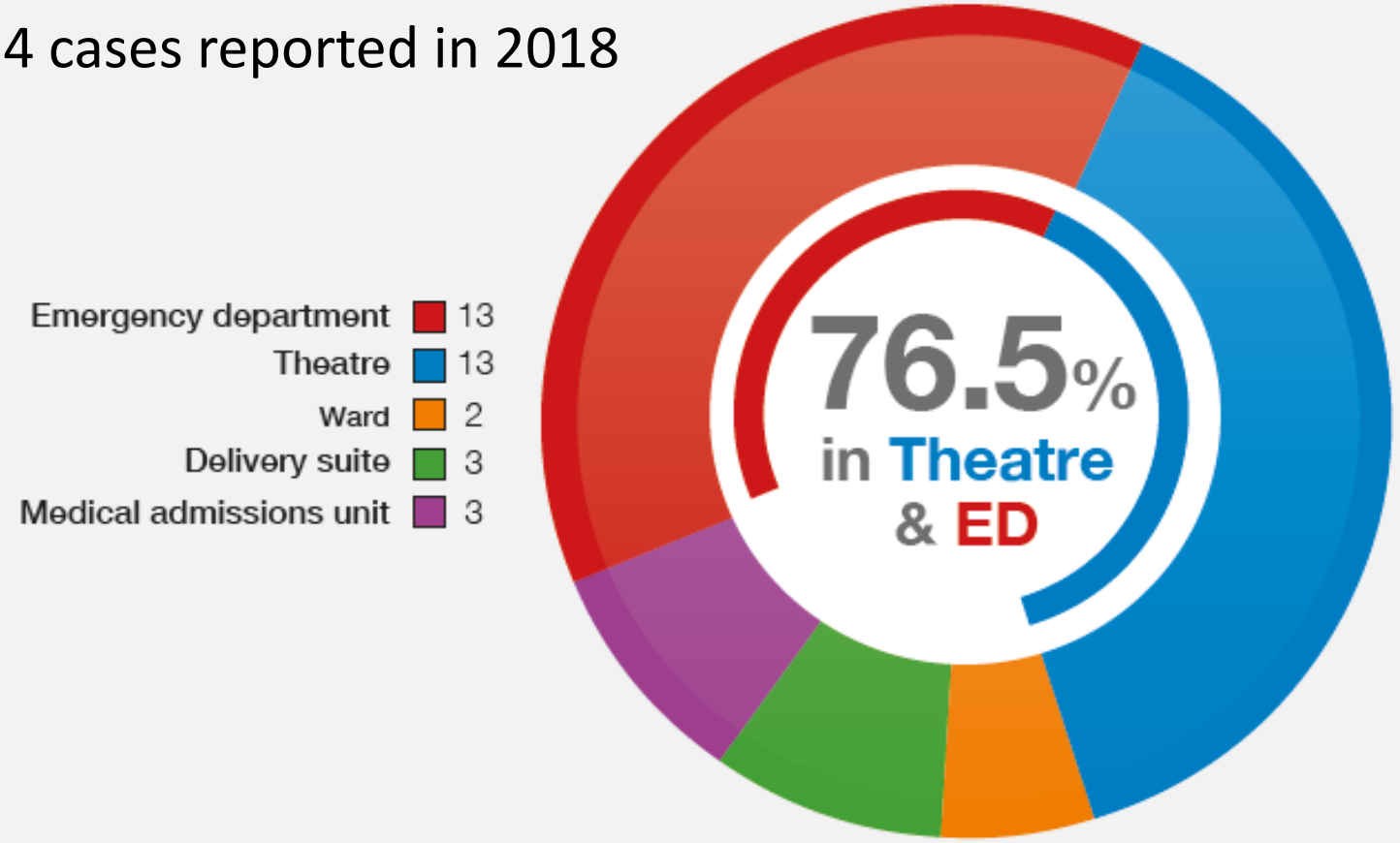
- 103 reports related to MHP in 5-year period
- Delay in 54/71 (71%) reported 2016-2018
- 6 deaths
- Poor communication 64/103 (62%)
- Increase in number reported over time
  - 8 in 2014
  - 34 in 2018

# Deaths related to transfusion 2010-2018



# Location of major haemorrhage incidents

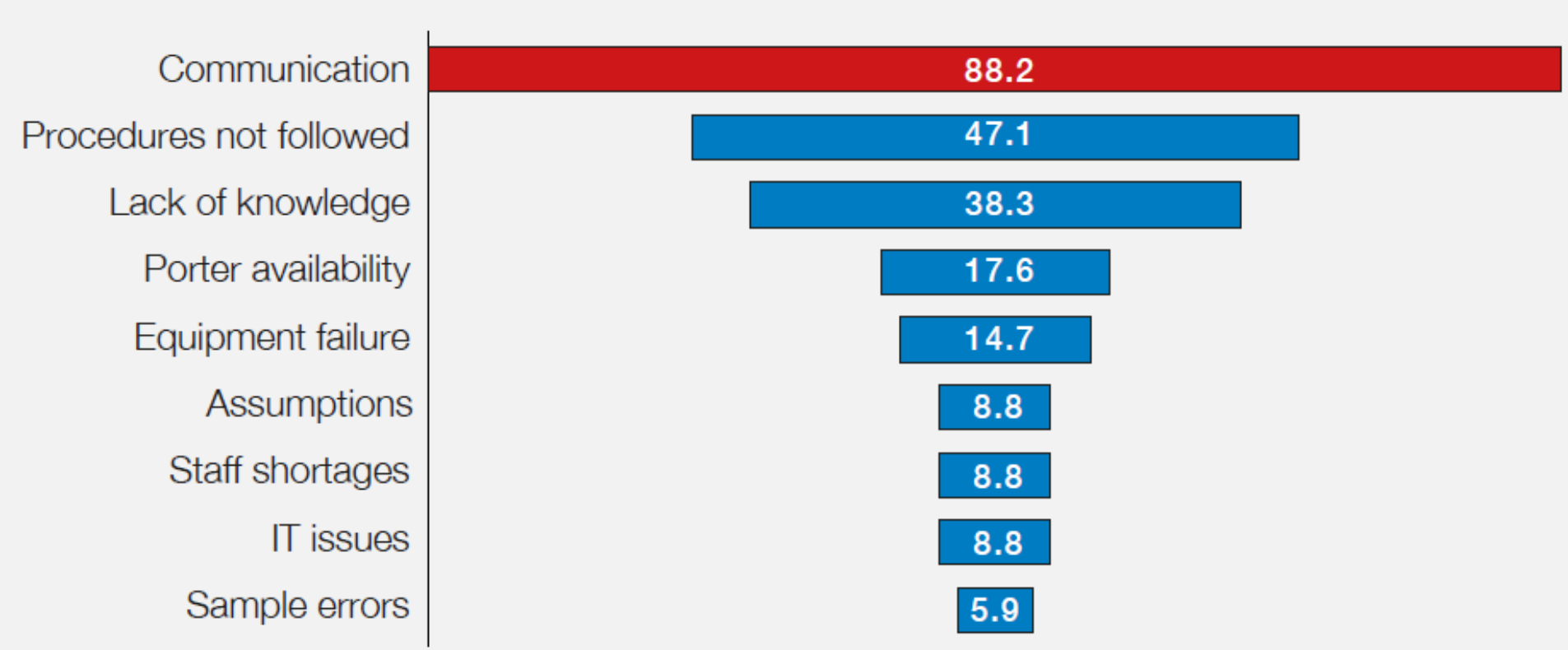
34 cases reported in 2018

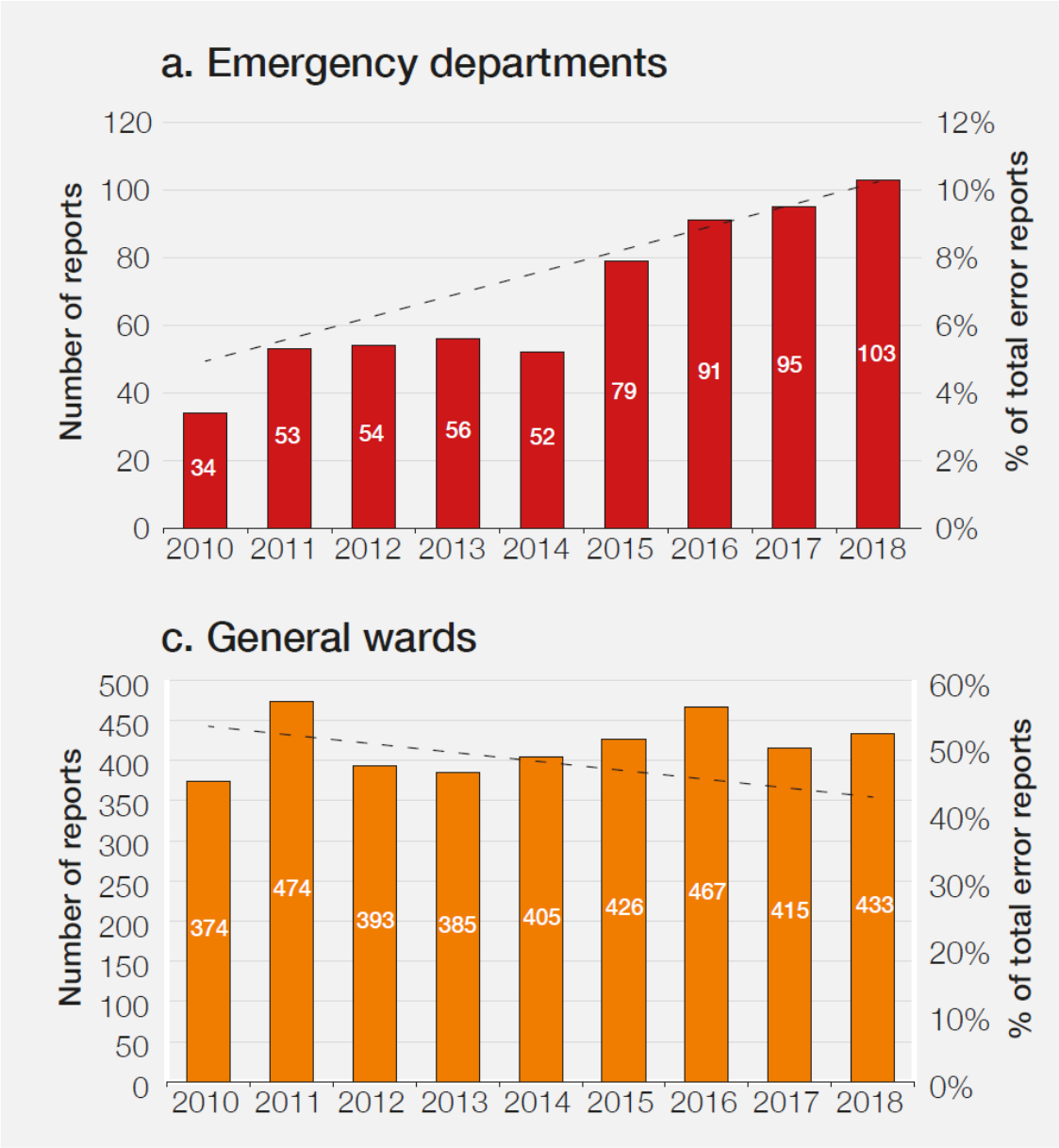


# Poor communication is the most common factor contributing to errors in MHP-related reports 2018

(results as %)

**Factors identified in 34 major haemorrhage cases (27 MHP calls) n=81 (often more than one per case)**





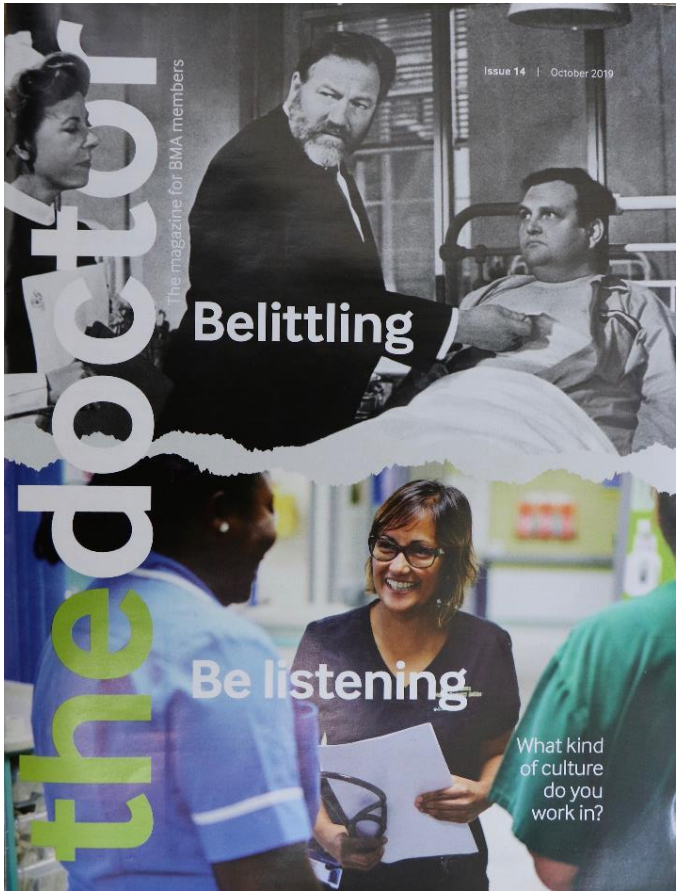

# Error reports: Differences between departments

# Key SHOT messages 2018

- **Learning from near misses**: identifying and investigating these is a key element to finding and controlling risks before actual harm results. These can significantly improve transfusion safety and enhance the safety culture within healthcare
- **Investigating incidents**: investigations must be systematic and thorough, proportionate to risk and impact. Investigation should identify systems-based corrective and preventative actions

# Conclusion

- You are an essential part of a team
- Do your own job well



# Acknowledgements


- SHOT team
- Working expert group
- Steering group
- Mark Bellamy (Chair)
- UK Forum (the 4 UK blood services who fund SHOT)
- Hospital reporters