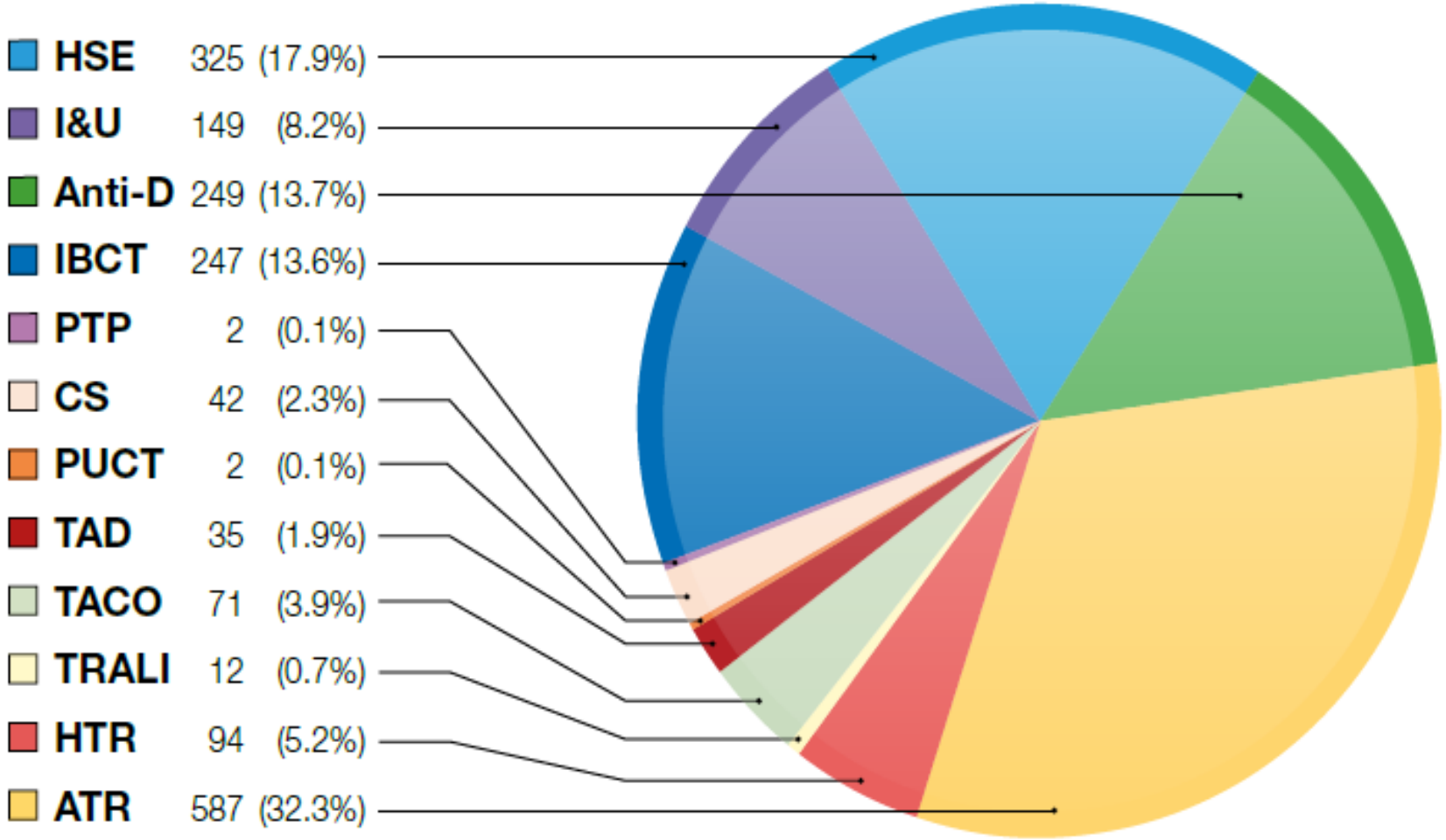
Transfusion reactions in the elderly

What do we mean by “transfusion reaction”?

- Febrile and allergic reactions?
- All adverse reactions to transfusion?

Cases reviewed in 2011 (excluding near miss and instances where the patient received a correct component despite errors having occurred – RBRP)

n=1815



Patient exhibiting possible features of an acute transfusion reaction, which may include:
Fever, chills, rigors, tachycardia, hyper- or hypotension, collapse, flushing, urticaria, pain (bone, muscle, chest, abdominal), respiratory distress, nausea, general malaise

STOP THE TRANSFUSION-undertake rapid clinical assessment, check patient ID/blood compatibility label, visually assess unit
Evidence of:
Life-threatening Airway and/or Breathing and/or Circulatory problems and/or wrong blood given and/or evidence of contaminated unit

Yes

SEVERE/LIFE-THREATENING
- Call for urgent medical help
- Initiate resuscitation-ABC
- Is haemorrhage likely to be causing hypotension? If not-discontinue transfusion (do not discard implicated unit/s)
- Maintain venous access
- Monitor patient: e.g. TPR, BP, urinary output, oxygen saturations

- If likely anaphylaxis/severe allergy-follow anaphylaxis pathway
- If bacterial contamination likely start antibiotic treatment
- Use BP, pulse, urine output (catheterise if necessary) to guide intravenous physiological saline administration
- Inform hospital transfusion department
- Return unit (with administration set) to transfusion laboratory
- If bacterial contamination suspected contact blood service to discuss recall associated components
- Perform appropriate investigations (see Table I)

- Review at HTC
- Report to SHOT/MHRA as appropriate

No

Inform medical staff

MODERATE
- Temperature ≥ 39°C or rise ≥ 2°C and/or
- Other symptoms/signs apart from pruritus/rash only

- Consider bacterial contamination if the temperature rises as above and review patient's underlying condition and transfusion history
- Monitor patient more frequently e.g. TPR, BP, oxygen saturations, urinary output

- Not consistent with condition or history
- Discontinue (do not discard implicated unit/s)
- Perform appropriate investigations (see Table I)

If consistent with underlying condition or transfusion history consider continuation of transfusion at slower rate and appropriate symptomatic treatment

Transfusion-related event

Transfusion unrelated

MILD
- Isolated temperature ≥ 38°C and rise of 1-2 °C and/or
- Pruritus/rash only

- Continue transfusion
- Consider symptomatic treatment (see text)
- Monitor patient more frequently as for moderate reactions
- If symptoms/signs worsen, manage as moderate/severe reaction (see left)

Continue Transfusion

Document in notes that no HTT/HTC review/SHOT report necessary

To summarise actions

- Stop transfusion and maintain line with saline
- Quickly assess patient ID and vital signs
- Decide whether life-threatening or moderate/mild
- Treat clinical features
- Will you continue the transfusion?
- Investigate as appropriate
- Plan management of future transfusions
- Review and report
  - Internally
  - SHOT, SABRE

Contaminated platelets

To summarise actions

- Stop transfusion and maintain line with saline
- Quickly assess patient ID and vital signs
- Decide whether life-threatening or moderate/mild
- Treat clinical features
- Will you continue the transfusion?
- Investigate as appropriate
- Plan management of future transfusions
- Review and report
  - Internally
  - SHOT, SABRE

Dealing with symptoms or signs

- Mild
  - Pyrexia without rigors or rash only
    - Symptomatic treatment

Deal with clinical features, rather than assume it is a particular type of reaction

- Moderate
  - Rigors,chills
    - Exclude sepsis
    - Symptomatic treatment: Paracetamol or anti inflammatory
  - Dyspnoea
    - Exclude underlying condition, TACO
    - Assess oxygen saturation
    - Treat appropriately :Oxygen, salbutamol

- Severe
  - Shock, hypotension
    - Urgent need for skilled help
    - Recognise and treat anaphylaxis if present Adrenaline is first line
    - Transfer patient into appropriate area
    - Discuss with NHSBT in case recall of components needed

To summarise actions

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  - SHOT, SABRE

SHOT vignette, 2011

- 82 year old woman with iron deficiency
- Hb 4.5 g/dL
- Given 4 units of red cells, each over 2.5 hours
- Then developed acute dyspnoea, oxygen sats 54%
- Pulmonary oedema
- Tachycardia, 110 bpm
- BP initially rose to 200/100 then dropped suddenly to 50/20
- Required intubation, 2 days ventilation on ITU
- Recovered

What’s this?

- Allergic reaction?
- TACO?
- TRALI?
- Unrelated to transfusion?

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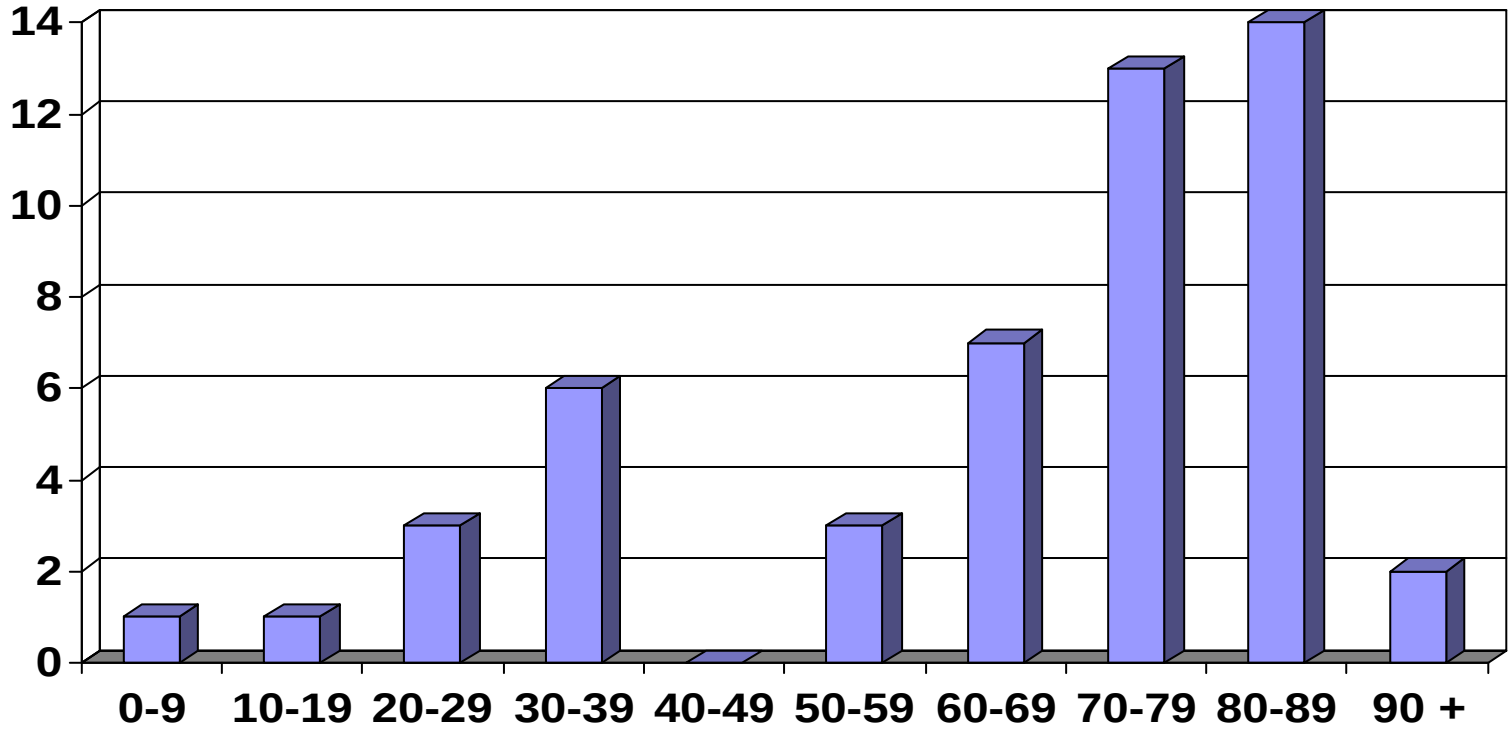
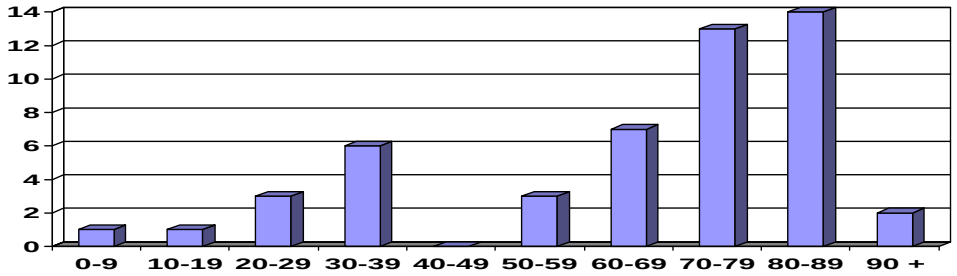
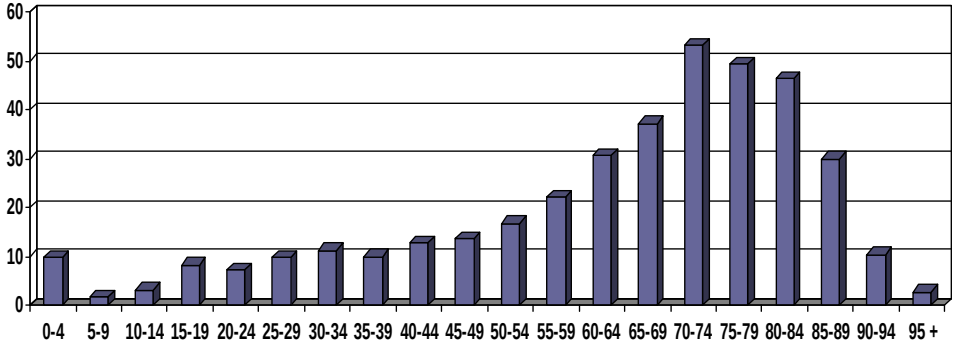
2011 TACO cases



Incidence of TACO

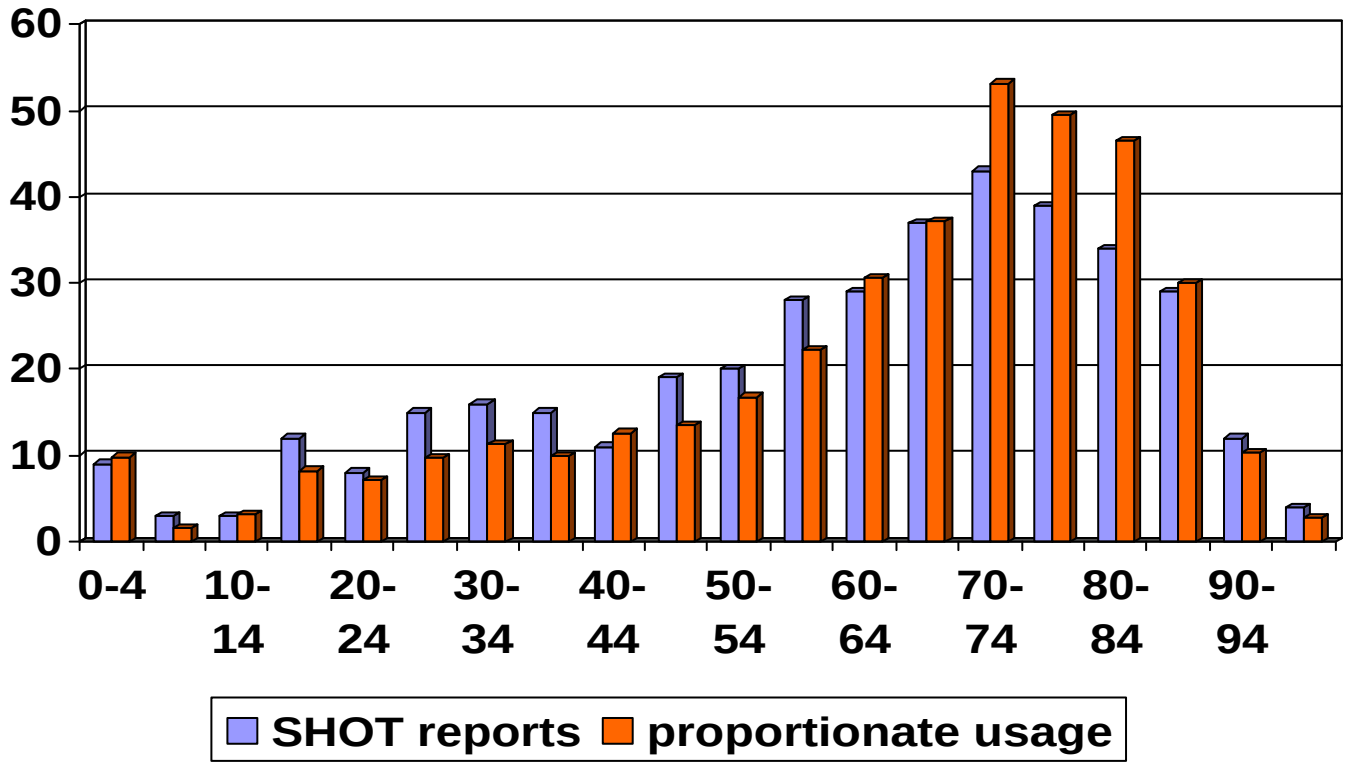


SHOT TACO cases, 2011

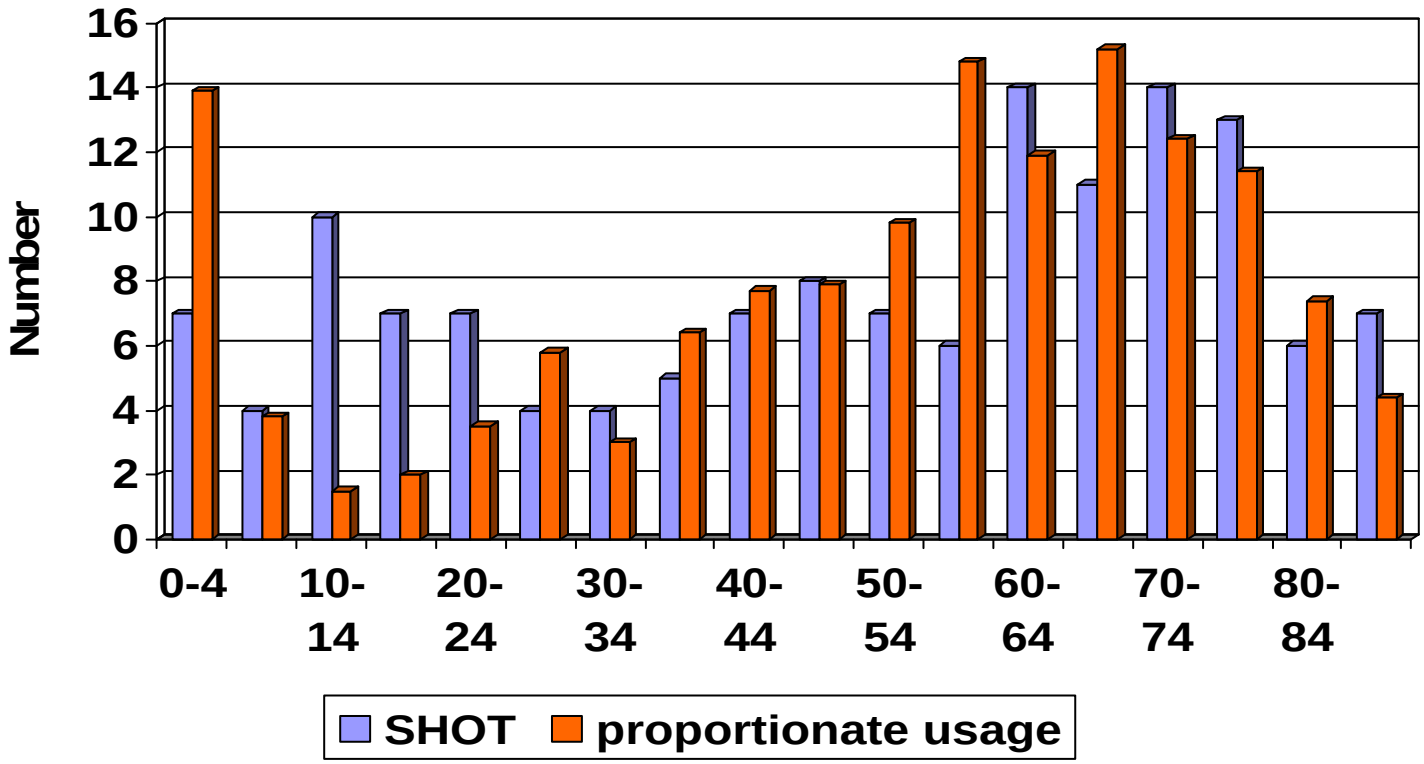


Blood usage in NE region, 2009

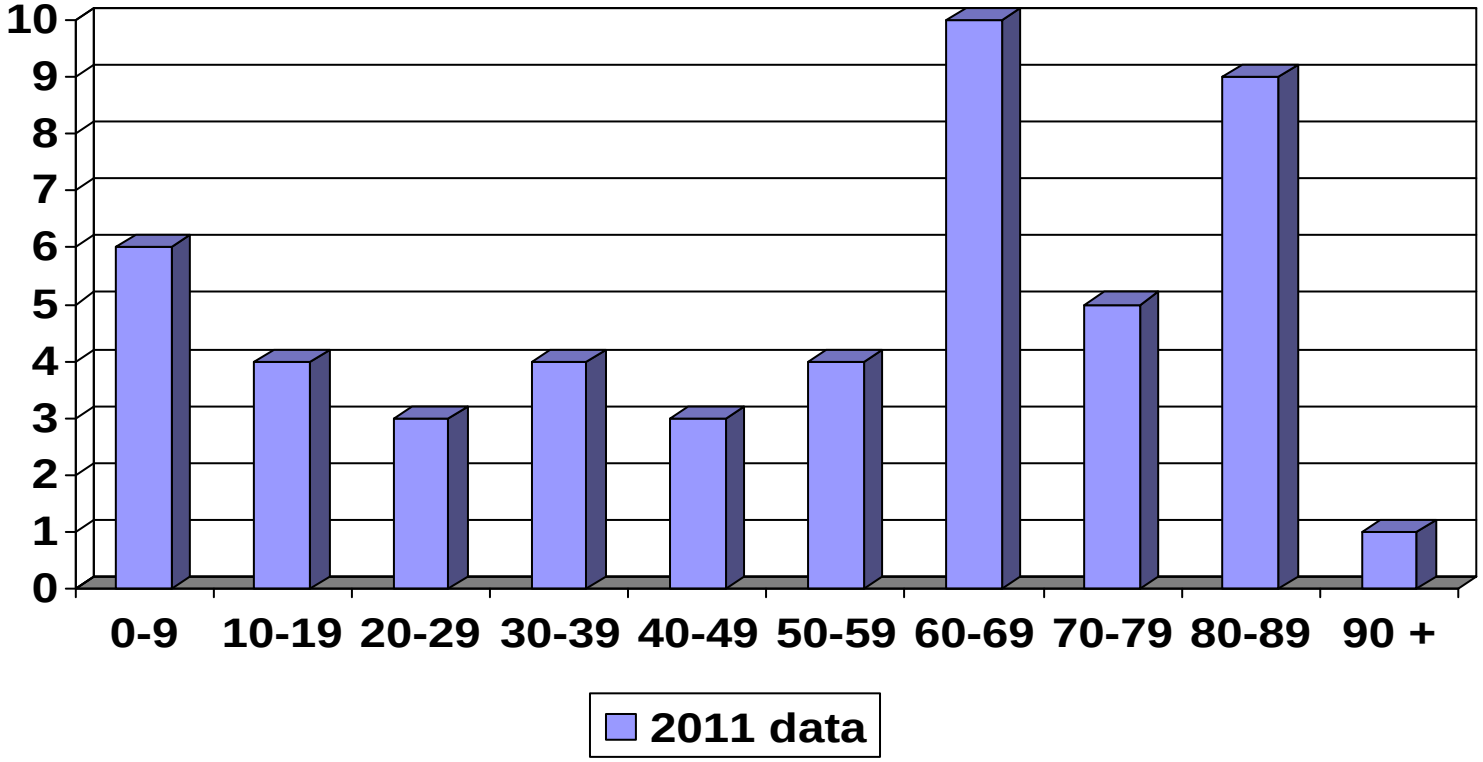
ATRs with red cells: reports and usage



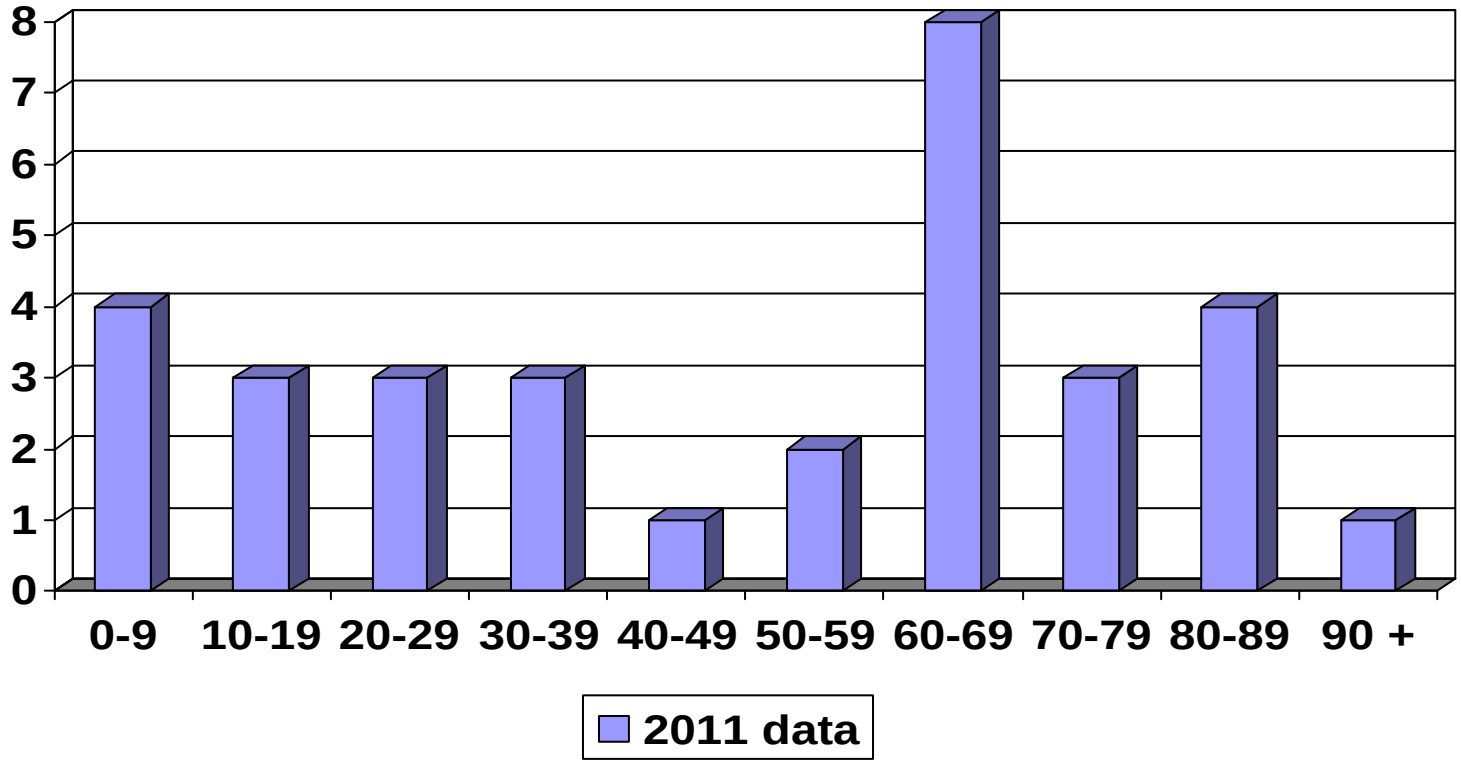
ATRs with platelets (145 reports)



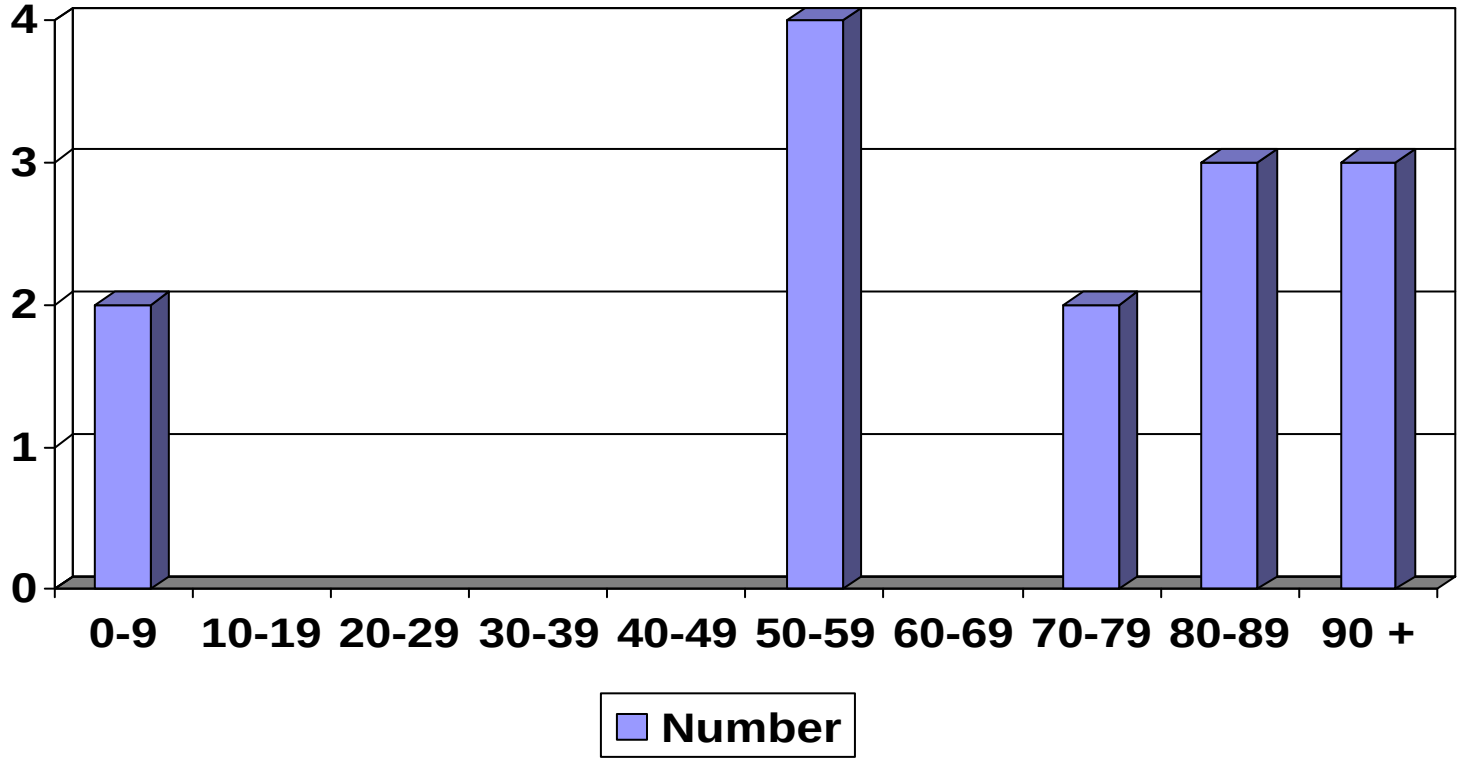
Age profile of severe reactions

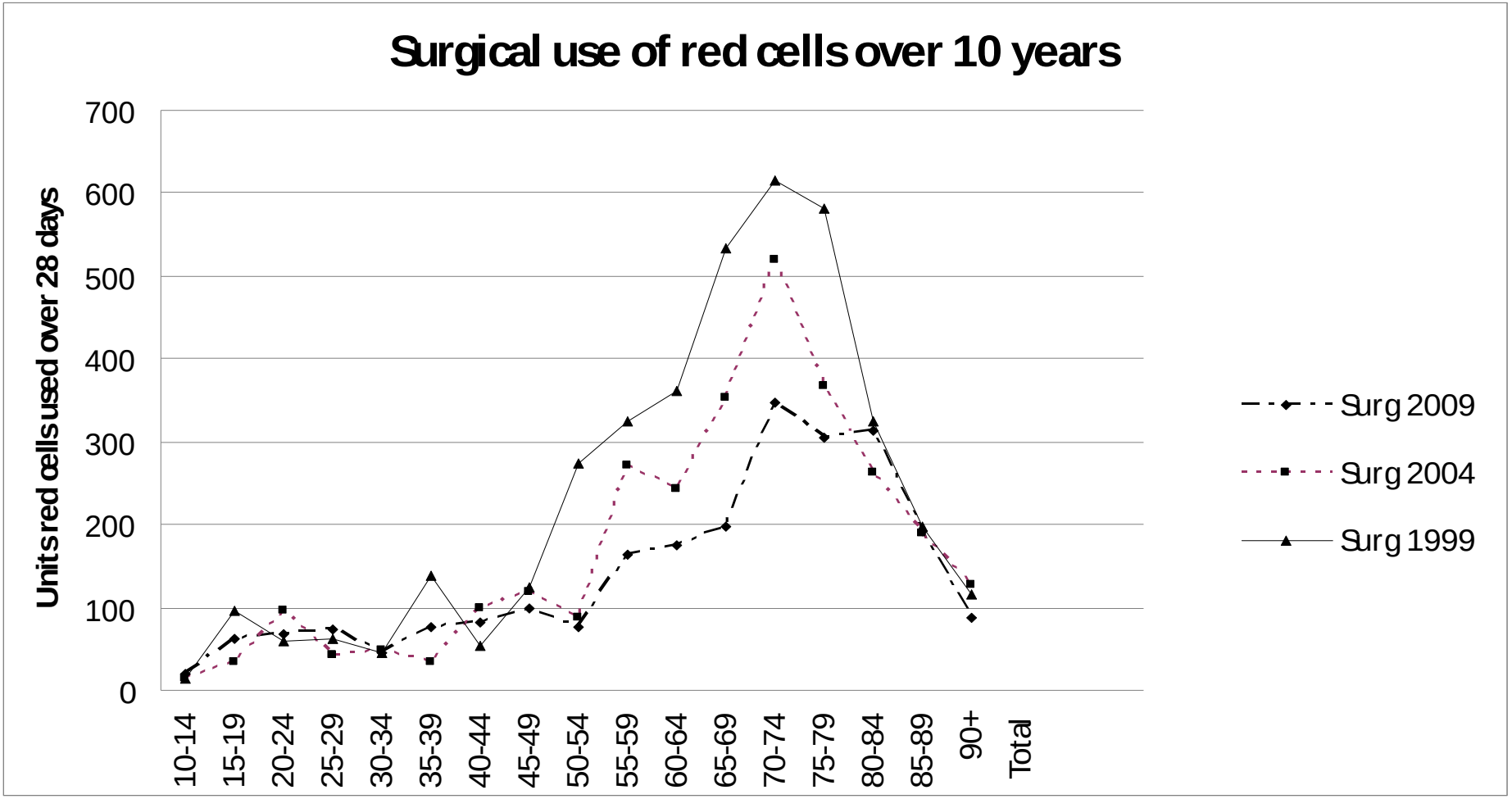


Anaphylaxis: age profile



Mortality from ATR since 2006: all imputabilities



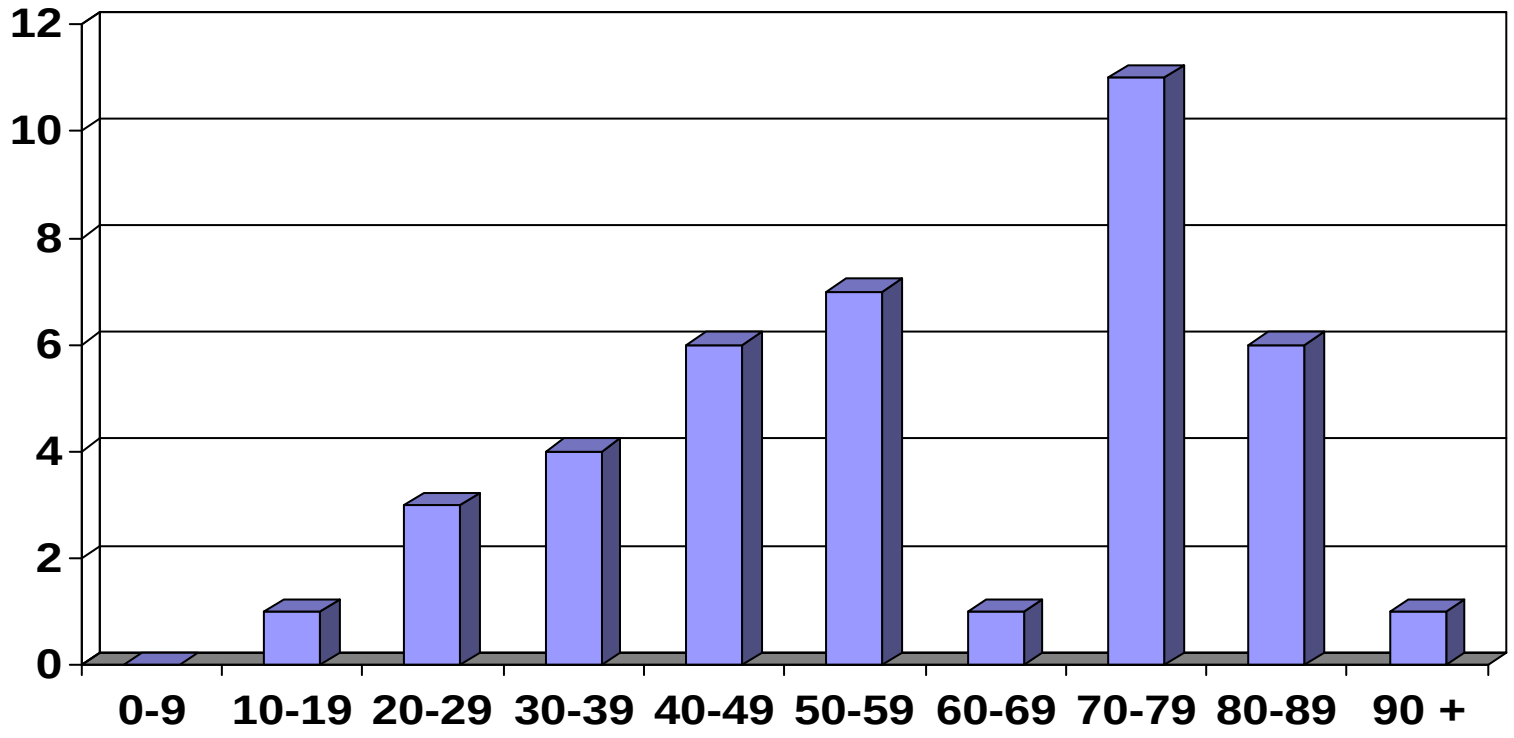


Transfusion, 2012

TRALI and TACO

- TRALI: age is not an independent variable
- TACO
  - SHOT 2011 figures show 41/70 (59%) aged ≥70 (C.I. 25.5)
  - Small stature
  - More females

2011 haemolytic reactions by age



Despite these stats It is important to consider reactions in the elderly

Are they under reported?

Case History

- Elderly man was transfused 3 units of B pos red cells perioperatively (amputation for gangrene)
- He developed respiratory problems, further anaemia and jaundice
- These were ascribed to his underlying condition, and perhaps to fluid overload
- He required further transfusion and was in fact found to be O positive

Older patients

- Higher incidence of conditions requiring long term transfusion
- Leading to:
  - Delayed haemolytic reactions
  - TACO
  - ATRs
- Increasing co-morbidity

SHOT vignette, 2011

- Elderly male with multiple co-morbidities including pneumonia, disordered liver function, oesophageal stricture and PE
- Required insertion of PEG tube
- Abnormal liver function and on heparin
- FFP given
- Developed florid “maroon” coalescing rash

Continued

- Acute dyspnoea
- Cardiac arrest from which he could not be resuscitated
- Post mortem inconclusive
- IgA normal
- Concluded that anaphylaxis could not be ruled out
- Transfusion team reviewed the case: FFP had been given appropriately

Classical anaphylaxis.. but avoidable?

- Elderly woman given 3 units of FFP for warfarin reversal prior to surgery
- Rash, dyspnoea, angioedema
- BP dropped from 109/82 to 67/40
- Transferred to ITU
- Adrenaline, antihistamine, hydrocortisone
- Recovered
- On review, MCTs showed rise and fall pattern

Effect of treatment for ATR?

- A female patient in her 60s with leukaemia received a unit of platelets as a day case, for prophylaxis. Hydrocortisone and antihistamine were given as prophylaxis.
- She developed a rash on her arm which appeared to be spreading.
- She was given further IV antihistamine, and quickly lost consciousness.
- The arrest team were called: IV fluids were given, plus hydrocortisone. The patient quickly recovered.
- Cause for the collapse not clear: IV chlorphenamine can cause hypotension in older patients

A special area for concern

- Hypotensive reactions can be severe
  - Isolated fall in systolic BP of 30 mm or more
- In US, seen in patients on ACE inhibitors but reduced by wbc removal
- Commoner in patients on bypass
- May be hard to distinguish hypotensive reaction from bleeding

Hypotensive reaction

- Elderly male patient experienced 2L blood loss during cardiac bypass surgery
- Transfused 3 units. The third unit was transfused in HDU
- During the 3rd unit, he became tachycardic. BP fell from 128/72 to 82/30
- Recovery staff decided this was due to continued bleeding, whilst awaiting surgeon's decision, transfused 4th unit: hypotension worsened

Mystery patient

- Elderly female with Ca colon and chronic anaemia
- Hb 6.7 g/dL (measured on POCT device, not checked in lab)
- Transfused 5 red cells over 3 days and discharged with Hb of 10.3 g/dL
- 11 days later readmitted
- Hb 3.5 g g/dL
- What is going on?

Results

- Raised bilirubin, raised LDH
- Low haptoglobins
- Positive DAT
- Patient now has anti Jk^a plus autoantibody
- 4/5 units Jk^a positive
- Dramatic Hb fall (but was initial Hb correct?)

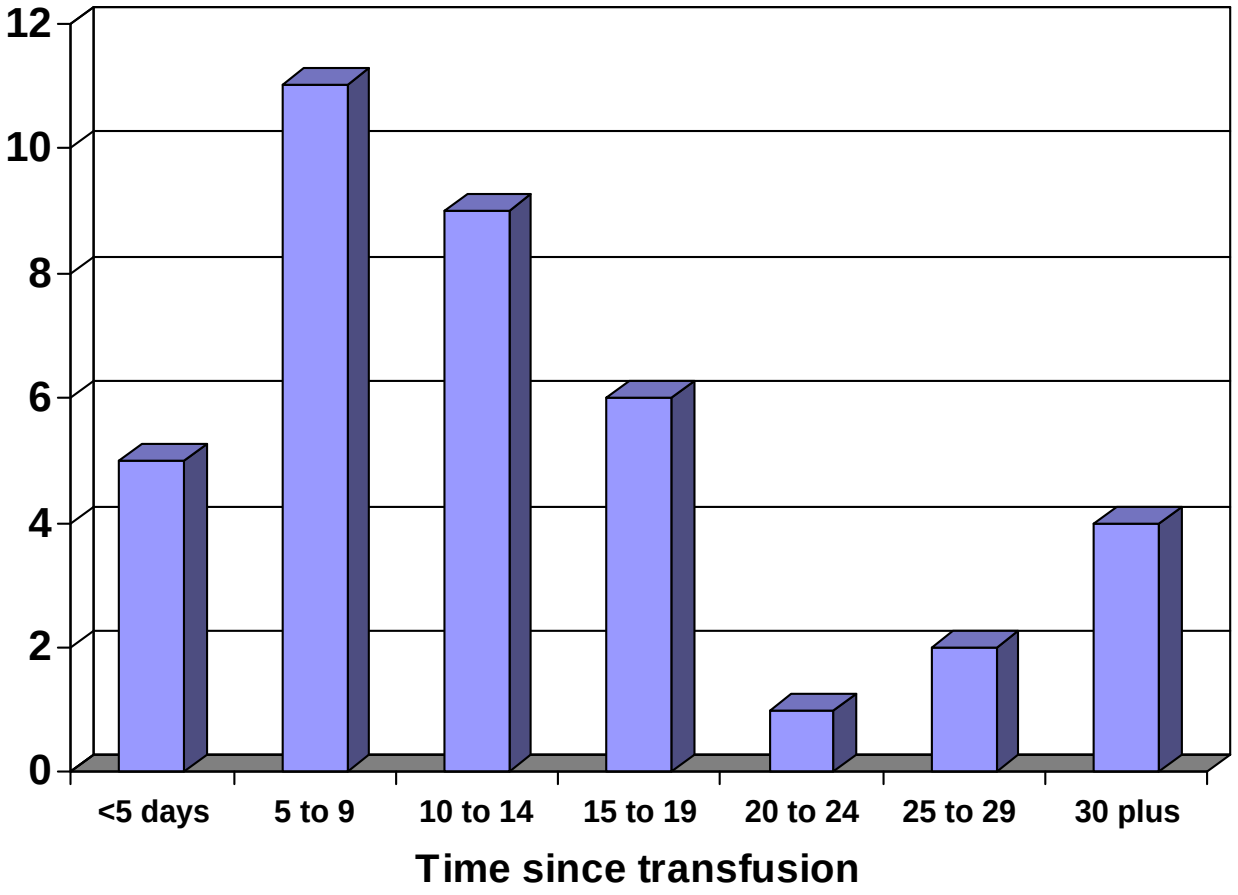
Delayed haemolytic reactions

- One of the more frequent causes of major morbidity or even death
  - 6 fatalities in SHOT up to 2006
  - In 2011, 9 cases of major morbidity
  - Often due to associated conditions
- Under recognised
  - About 1 in 2000 units transfused
- Almost always due to a secondary immune response in previously transfused patient

Acute and Delayed HTRs

Acute	Delayed
Usually ABO	Rh, Jk a and b, etc
Immediate	Present 5-10 days later
Easily recognised	Under-recognised
IgM mediated	IgG mediated
Intravascular haemolysis, haemoglobinuria	Less evidence of haemolysis

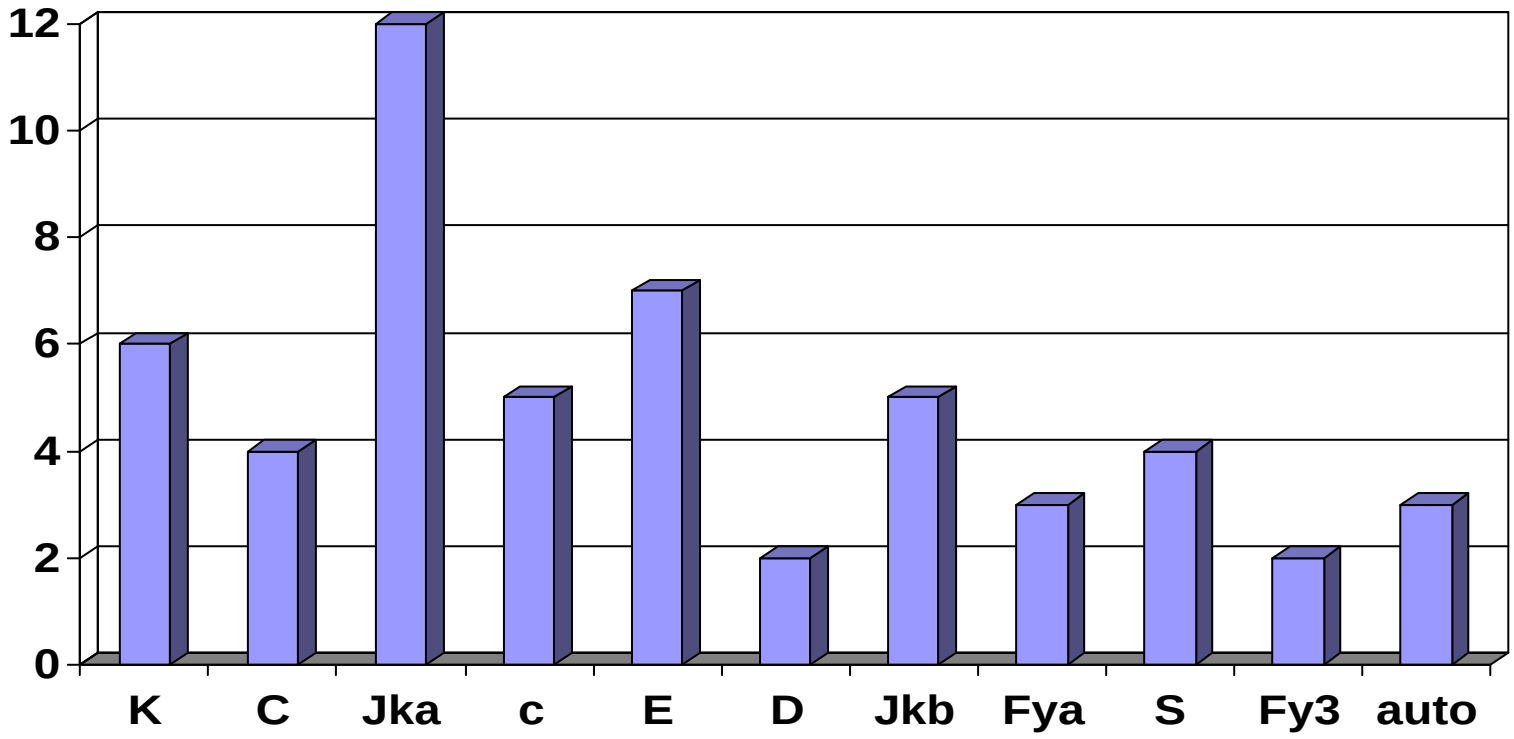
When do DTRs occur?



30 plus:

54, 60, 70,74 days (? due to haemolysis)

Antibodies implicated in DTRs



In summary...

- Are we actually seeing a transfusion reaction or underlying condition?
- Which clinical features will be less well tolerated?
  - Hypotension
  - Hypoxia
  - Hypertension
- Response to medication
  - Antihistamines

Reducing the risk in the elderly

- All transfusions should be appropriate
- All patients should be transfused in clinical areas where they can be directly observed, and where staff are trained in the administration of blood components
- Fluid balance
- Patients with small stature need close monitoring
  - Have you checked the BMI?
- There is no evidence to support routine premedication
- Drugs used to treat reactions should be given cautiously
- Remember that DHTR may present with subtle features
- Moderate or severe reactions should be reported to SHOT and SABRE

Thank you

- To all who report to SHOT
- To the SHOT data analysts and my fellow SHOT writers
- To Angus Wells, Jonathan Wallis and colleagues for work on WDBG including the latest round, and to the WDPG team