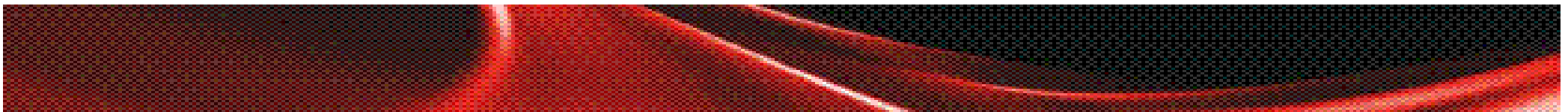


SHOT data 2008

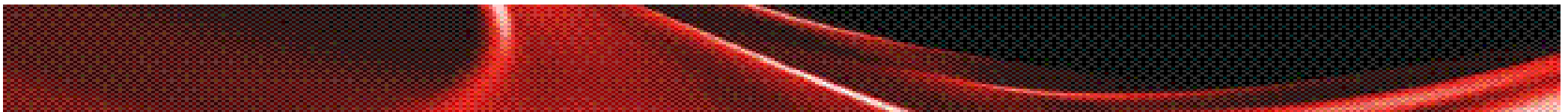
Part 1

Dr Clare Taylor
Medical Director of SHOT
June 30th 2009
Royal Society of Medicine



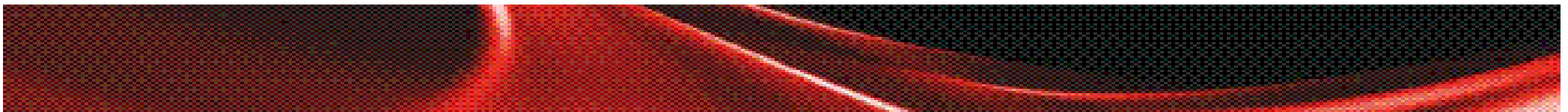
Contents

- New developments in SHOT in 2008/9
- Overview of 2008 data
- Total figures for 2008 and cumulative data
- IBCT overview and breakdown
 - 'Wrong blood' and ABO incompatible transfusions
 - Special requirements not met
 - Laboratory related cases
- Inappropriate and unnecessary transfusion
- Handling and storage problems
- Anti-D related cases
- Near Miss
- Key Message 2008



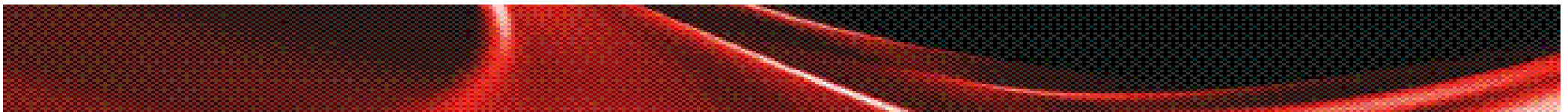
SHOT in 2008-9

- Changes to IBCT section sub-categories
 - Error based reports vs physiological reactions
 - HSE
 - inappropriate and unnecessary transfusion
- New chapters and sections
 - TACO
 - TAD
 - autologous transfusion and cell salvage
 - paediatrics
- Cases of under transfusion
- Assessment of appropriateness from existing SHOT data
- Participation data
- Denominator data



New SHOT database

- Dendrite Clinical systems
 - track record in developing, maintaining and producing reports for national and international databases across many clinical specialities
- Reporters should still enter SABRE and make notification, and check 'report to SHOT'
- Basic details will automatically be sent to new SHOT database, and an email will be sent to the reporter the next day with a link to the database
- Data can be entered directly, mostly tick boxes
 - database leads you to correct pages for the case being reported
- A further login will be required for SHOT
- Demonstration stand and registration forms today



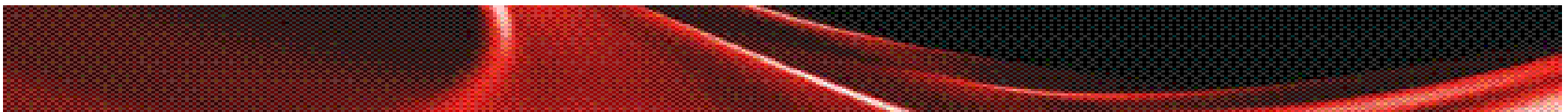
Number of cases 2007 and 2008

- Cases in 2007 Annual Report

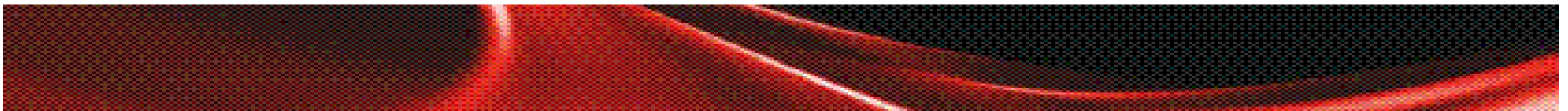
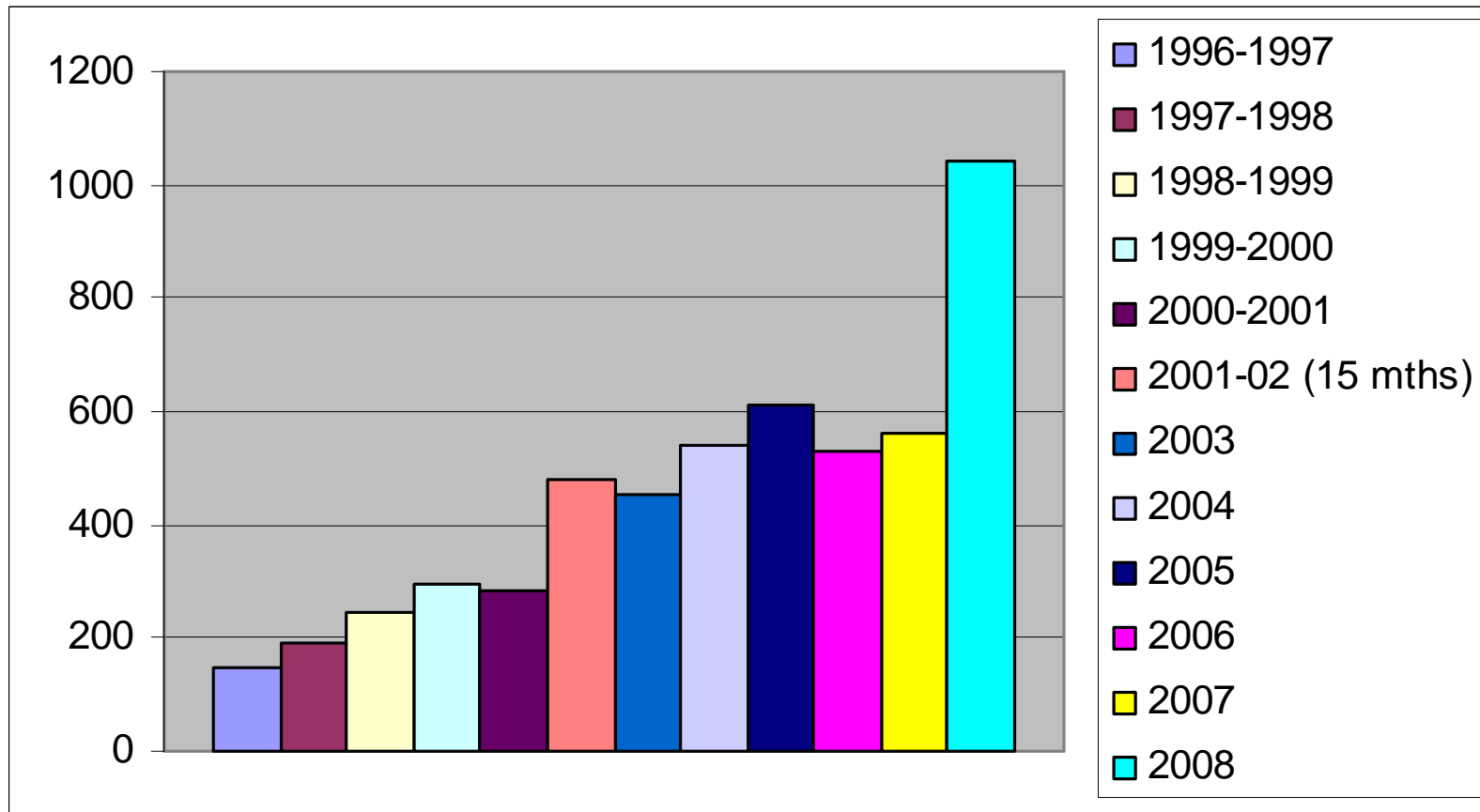
IBCT	Anti-D	ATR	HTR	TRALI	PTP	TA-GVHD	TTI	Totals
332	63	114	23	24	2	0	3	561

- Cases in 2008 annual report

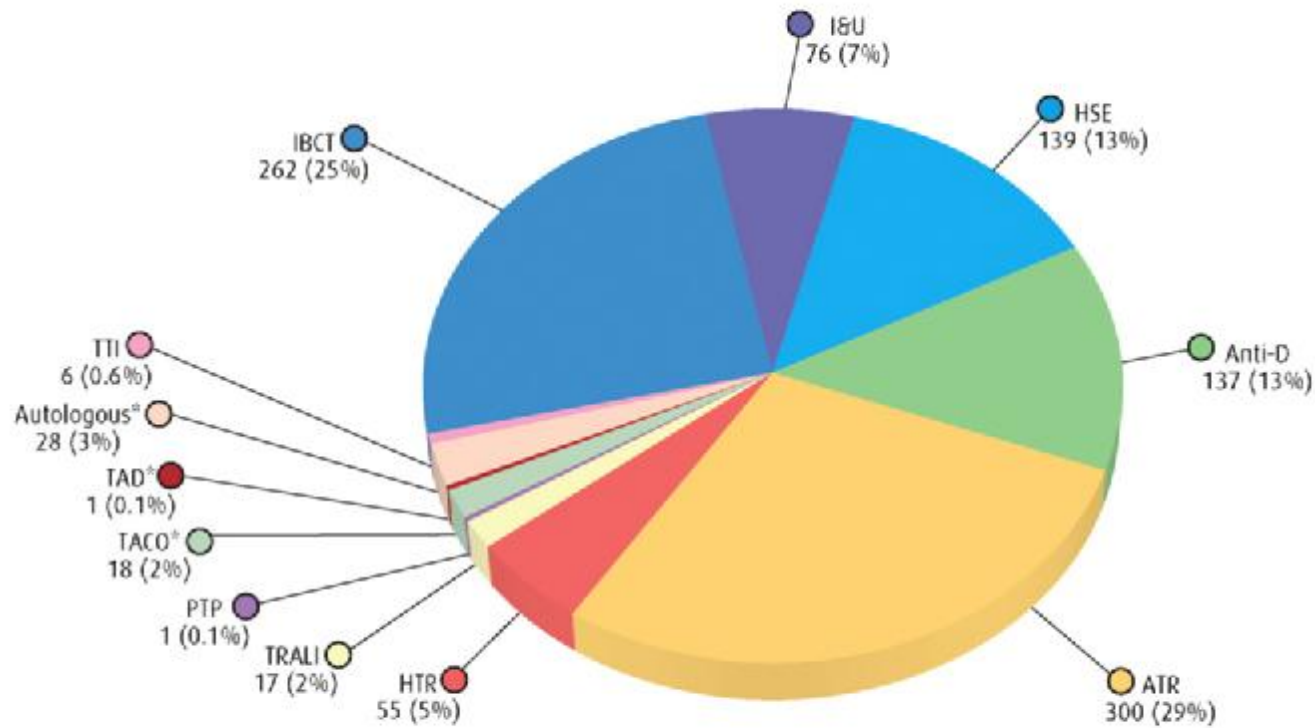
IBCT	I&U	HSE	ANTI-D	ATR	HTR	TRALI	PTP	TA-GvHD	TTI	TACO	TAD	AUTO-LOGOUS	Totals
262	76	139	137	300	55	17	1	0	6	18	1	28	1040



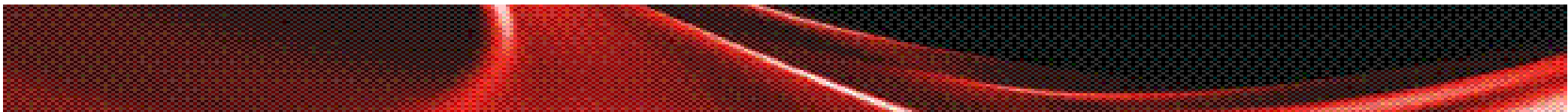
Total number of SHOT reports



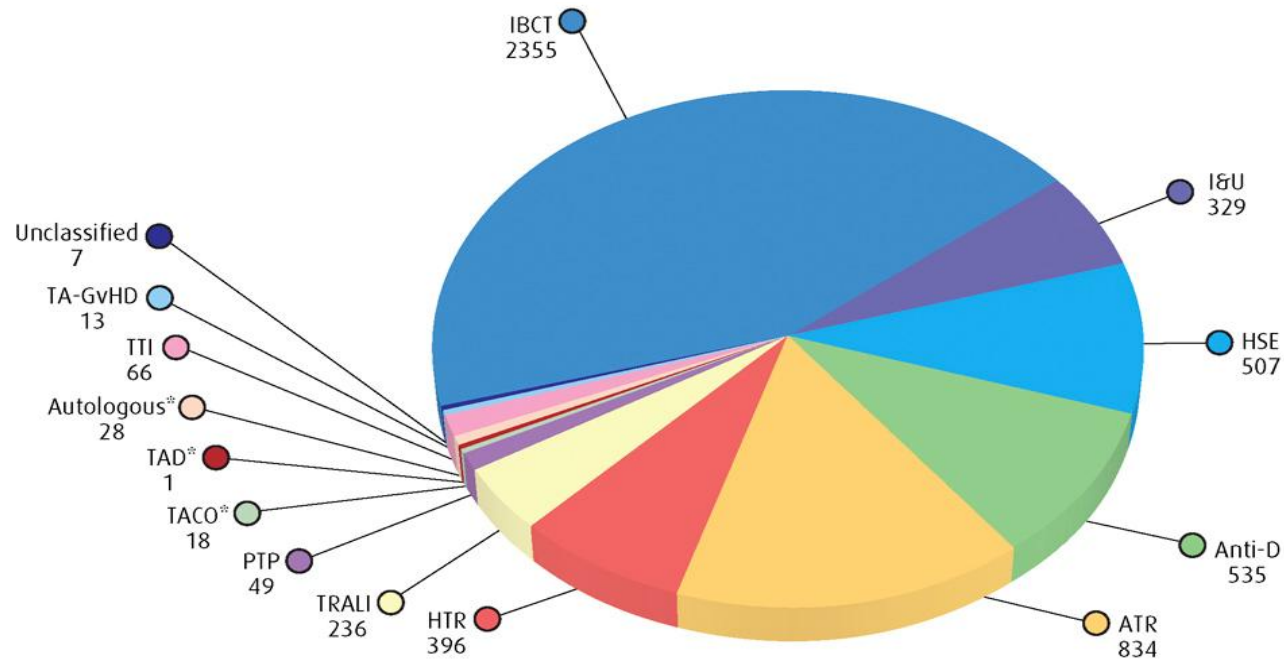
SHOT cases 2008



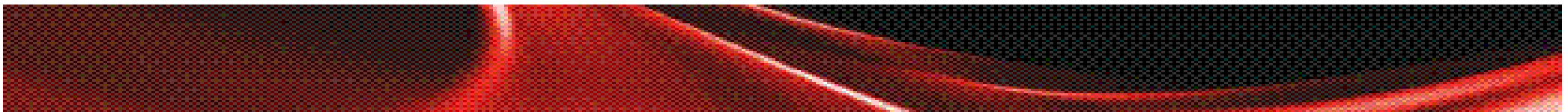
*New Categories for this year



Cumulative cases 1996 - 2008

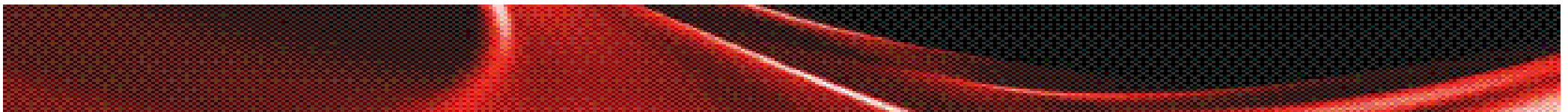


*New Categories for this year



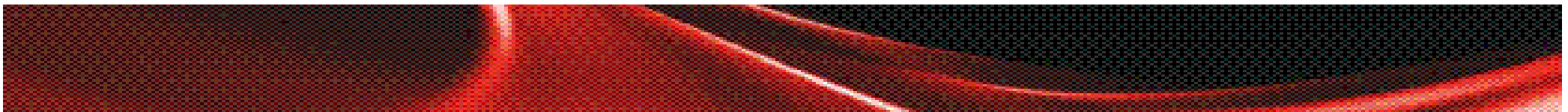
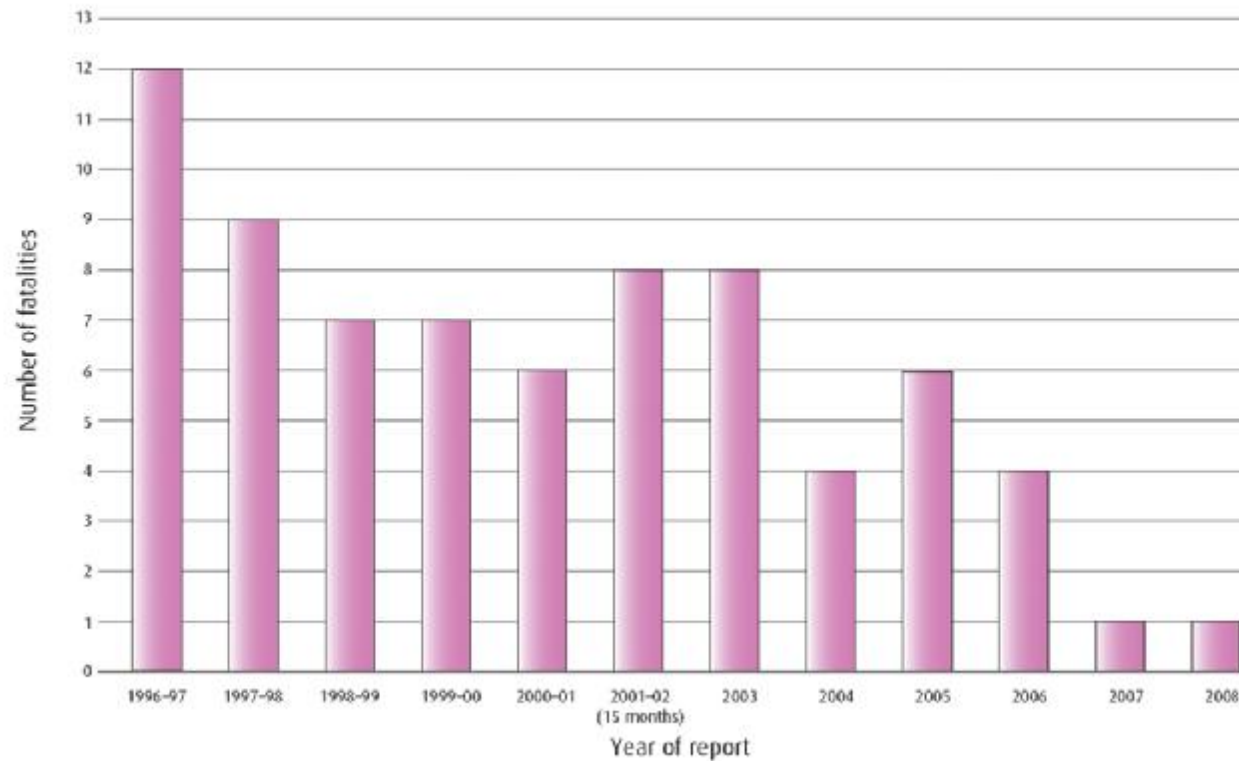
Mortality 2008

- 1 death definitely attributable to transfusion
 - case of TTI in which the patient died from *Klebsiella pneumoniae* infection proven to have been transmitted from the donor via platelets
- 9 cases in which the patients died and the transfusion reaction was considered to be contributory
 - Two inappropriate and unnecessary transfusions (I&U)
 - Four ATR
 - One HTR
 - One TACO
 - Another TTI, in fact the other half of the donation above

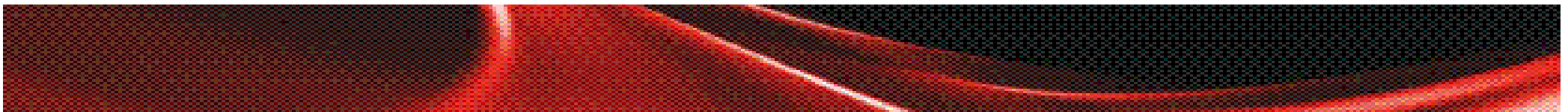
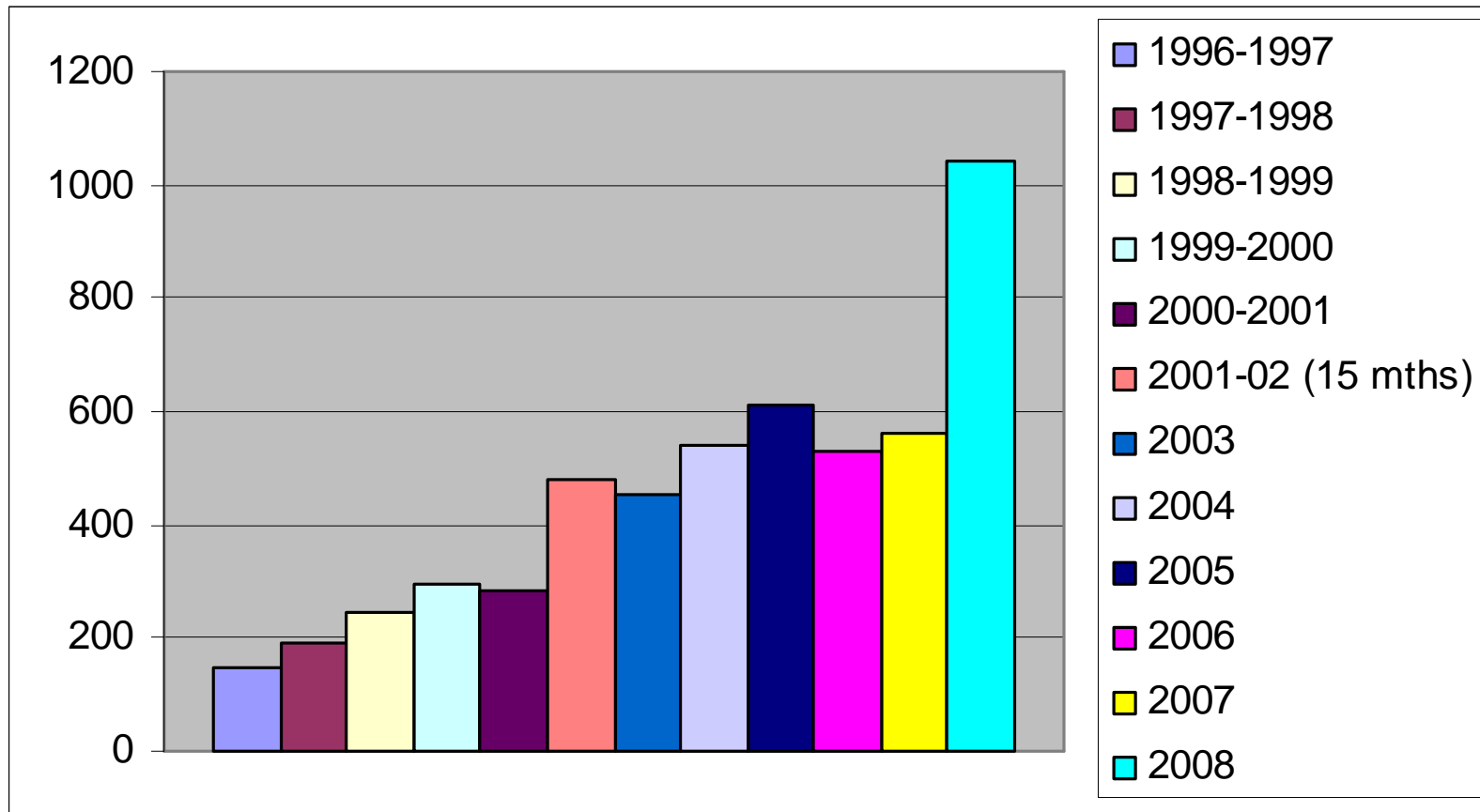


Mortality 1996 - 2008

NB The 'year' 2001-2002 was a 15 month period

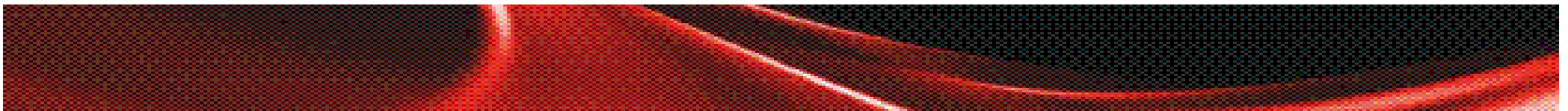


Total number of SHOT reports



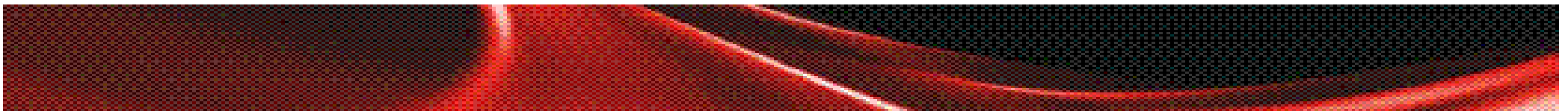
Major Morbidity 2008

- IBCT – there were 2 cases of major morbidity
 - 2 ABO incompatibility
- Inappropriate and unnecessary transfusion
 - 1 over transfusion of a 1 year old, requiring venesection
- Anti-D – 58 cases
 - potential sensitisation of women of childbearing age to the D antigen
- A total of 36 cases of major morbidity in categories of physiological reaction
 - to be discussed in part 2
- Minor or no morbidity – 933 cases

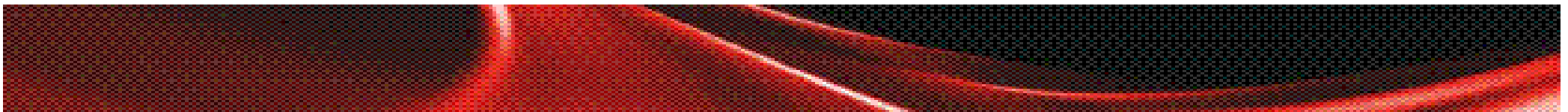
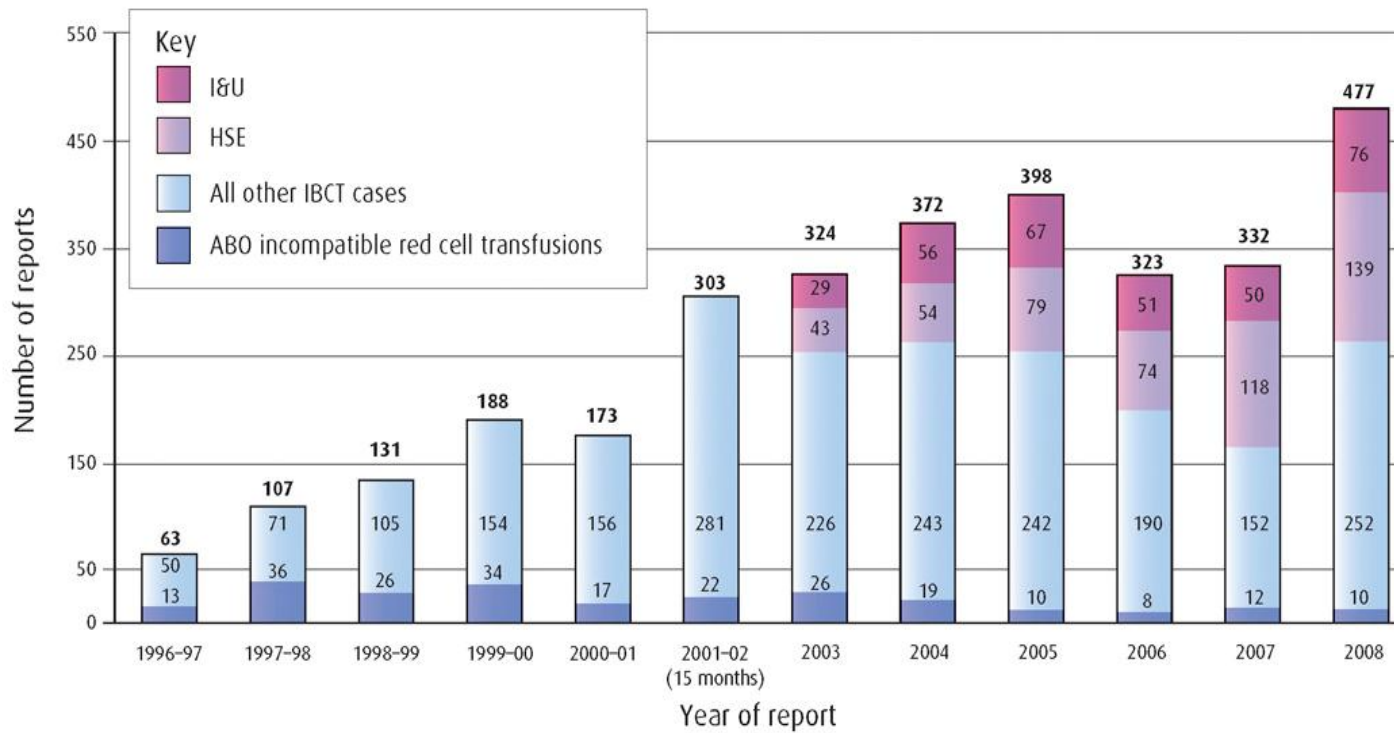


IBCT overview

• Administration of wrong blood	47
• Wrong blood in tube	5
• Special requirements not met <i>cmv / irrad</i>	100
• Special requirements not met <i>other</i>	17
• Laboratory errors	91
TOTAL	262
• Inappropriate or unnecessary transfusion	76
• Handling and storage errors	139
TOTAL	477

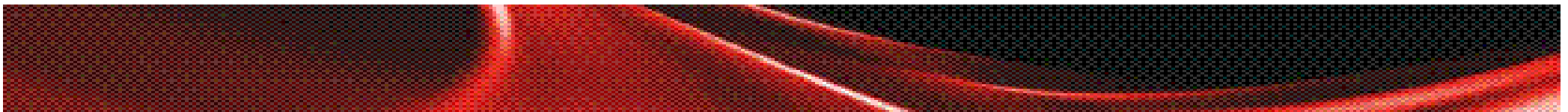


IBCT questionnaires 2008



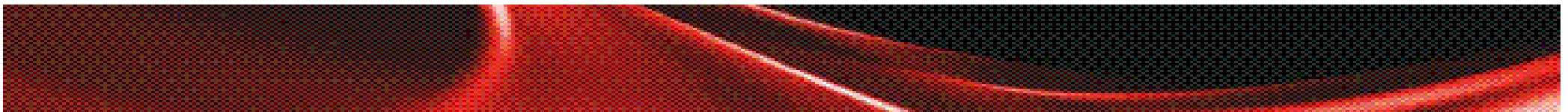
ABO and D incompatibility

- 10 cases ABO incompatible red cell transfusion
 - 4 bedside administration errors
 - 3 WBIT phlebotomy errors
 - 3 laboratory errors
- 1 cases ABO incompatible FFP transfusion
 - Laboratory error following mismatched SCT
- 17 cases of D incompatible red cell transfusion
 - 3 clinical administration errors
 - 14 laboratory errors
 - 10 D typing
 - 3 component selection
 - 1 incorrect issue following a SCT



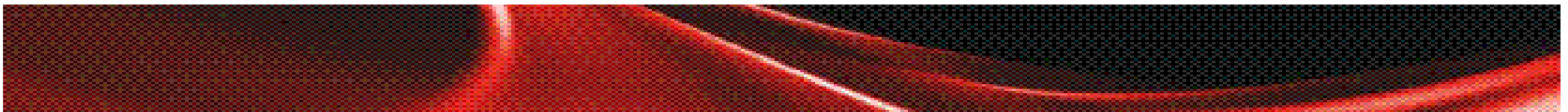
Administration of wrong blood - 1

- 47 cases – majority (42) involved nursing or midwifery staff as primary or sole checker
- 29 cases involved collection of the incorrect unit from the storage site
 - 15 nurse/midwife
 - 8 porters
 - 1 unqualified nurse
 - 1 ODA
 - 1 healthcare assistant
 - 1 'housekeeper'
 - 1 Anaesthetist (doctor)
 - 1 unknown
- All cases would have been prevented by a properly conducted patient ID check at the bedside



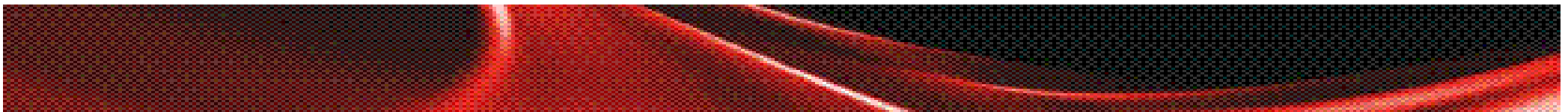
Administration of wrong blood - 2

- ABO incompatible transfusion 4
 - All 4 involved collection of incorrect unit from storage
 - Fewer than last year (9) despite increase in reports
- D incompatible 3
- Compatible wrong blood 32
 - 30 involved red cell, 1 platelets, 1 FFP
 - More than last year (10)
- Incorrect component type 3
 - 1 case red cells given when platelets were prescribed
 - 2 cases given FFP where platelets were prescribed
- Component given when not prescribed 5



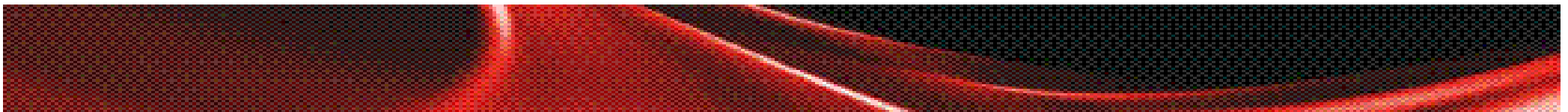
Case

- An elderly patient with an acute haemorrhage required a red cell transfusion. Correct documentation was taken by a porter to collect the unit, but was not used to identify and check the unit. The incorrect unit, intended for another patient, was collected. A 'check' was performed by two staff nurses between the unit and the accompanying compatibility form, but not against the patient ID. Transfusion was commenced of a group B unit to a group A patient, which was stopped when the patient developed clinical symptoms. The patient made a good recovery from the ensuing haemolytic episode.



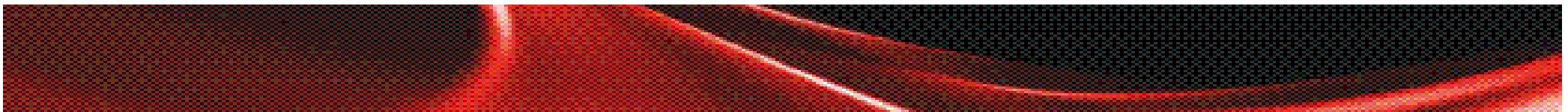
Quotes.....

- “The check was completed in the treatment room but unfortunately the nurse then connected the unit to the wrong patient”
- “They checked the unit in the treatment room and completed the documentation appropriately”
- “The bedside check was performed at the nurses station...”



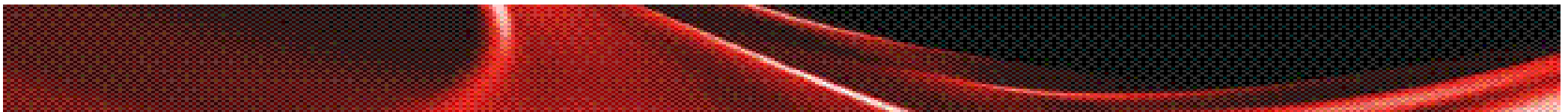
'Bedside' checking errors

Unit checked against compatibility form	18
Unit checked against patient's notes	2
Unit checked against prescription chart	2
Patient asleep so did not give antibody card	1
No bedside ID check performed	16
No details given	1
Unit correctly checked against ID band	7
TOTAL	47



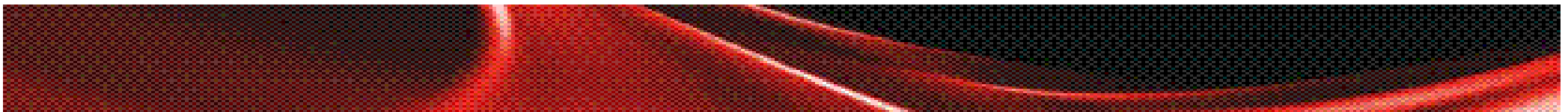
Recurrent problem areas

- Collection of wrong unit
 - training and understanding may be inadequate
- Total absence of a bedside check
 - Failure to understand the purpose of elements of 'checking the blood'
 - Perhaps nomenclature is wrong - 'patient ID cross check'?
- Many reporters stated that the involved personnel had received transfusion training within the last year, often much more recently
- Content and effectiveness of teaching and training
- Now starting to receive more reports in which the prescription had not been consulted
 - Whether prescribed at all
 - What is prescribed and special requirements or specification
 - Dose and rate prescribed



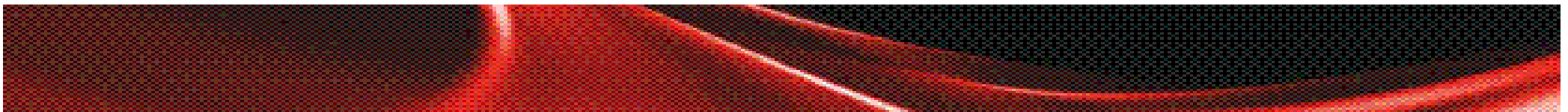
Wrong blood in tube

- 3 of the 5 cases led to large volume ABO incompatible red cell transfusion
- 1 case resulted in ABO incompatible platelet transfusion, but red cells were fortunately not used
- 1 cases led to the wrong patient being transfused as the Hb was for another patient
- In 2 cases phlebotomy had been carried out by a junior doctor, in 1 case a phlebotomist, in 2 cases not recorded



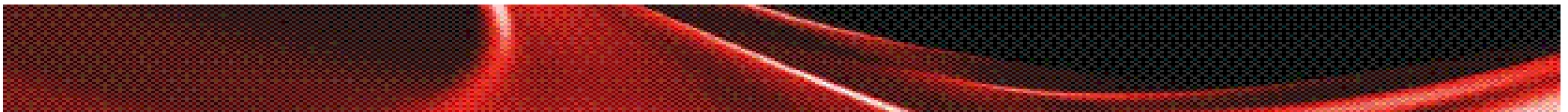
Special requirements not met

- 100 cases of CMV/irradiation requirement
 - Clinical errors and omissions 70
 - 56 irradiation
 - 7 CMV negative
 - 7 CMV negative and irradiation
 - Laboratory errors and omissions 30
 - 20 irradiation
 - 7 CMV negative
 - 3 both
- 17 cases of 'other' requirement
 - Clinical 6
 - Laboratory 11



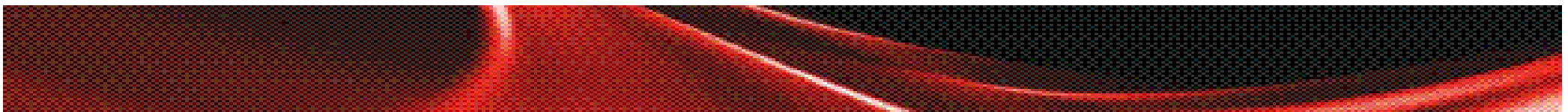
Causation - 1

- Clinicians ordering blood components unaware of the special requirements
- Non-haematology (junior) doctors maybe unaware even of possibility of additional specification
 - Includes CMV negative and irradiated for haem/onc patients
 - Also unaware of special requirements
 - pregnant women
 - sickle cell patients
 - patients under 16
 - multi-transfused patients



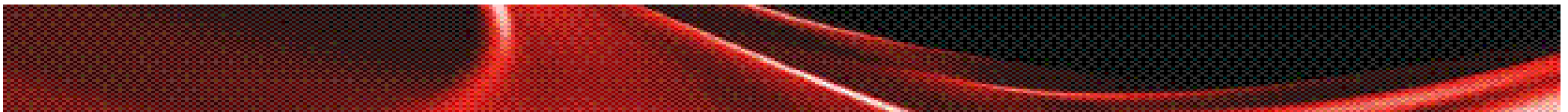
Causation - 2

- 17 of 76 clinical based cases of SRNM related to patients undergoing shared care between 2 hospital sites in same or separate trusts
- Transfusion laboratories often not included in circulation of documentation, perhaps due to lack of awareness of implications of treatment on critical transfusion requirements
- Information not communicated included:
 - treatment with purine analogues
 - diagnosis of Hodgkin's disease
 - recent mismatched BMT or SCT
 - Requirement for HLA matched platelets



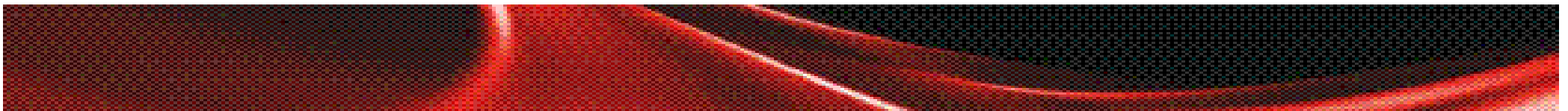
Events originating in the hospital transfusion laboratory

- 200 events altogether
 - IBCT 132 (96)
 - Wrong blood 39 (15)
 - Wrong group selected for SCT patient 4 (5)
 - Other pre-transfusion testing errors 48 (20)
 - Testing errors 8
 - Procedural errors 40
 - Special requirements not met 41 (36)
 - Anti D 47 (24)
 - Handling and storage errors 21 (20)



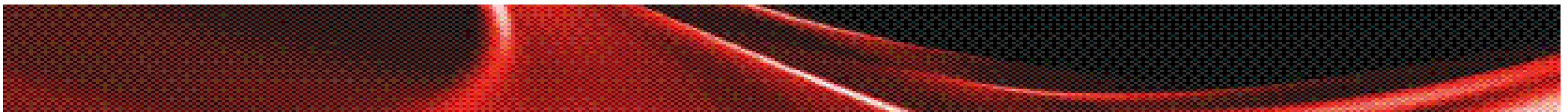
IBCT laboratory errors

- 65% increase in laboratory errors this year, and an 85% overall increase in number of SHOT reports
- 4 ABO incompatible transfusions resulting in 1 AHTR
- 8 ABO errors
 - 3 wrong sample tested
 - 5 interpretation/transcription errors
- Majority of errors are procedural e.g.
 - Testing incorrect or unsuitable sample
 - Failure to find historic records
 - Failure to provide correctly phenotyped units
 - Selection of inappropriate test
 - Incorrect component selection
 - Incorrect labelling
- Only 15% are mistakes in testing e.g.
 - Missing weak antibody

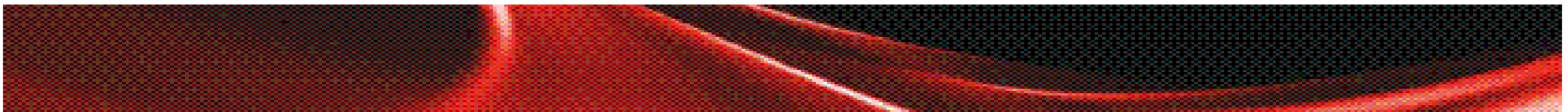
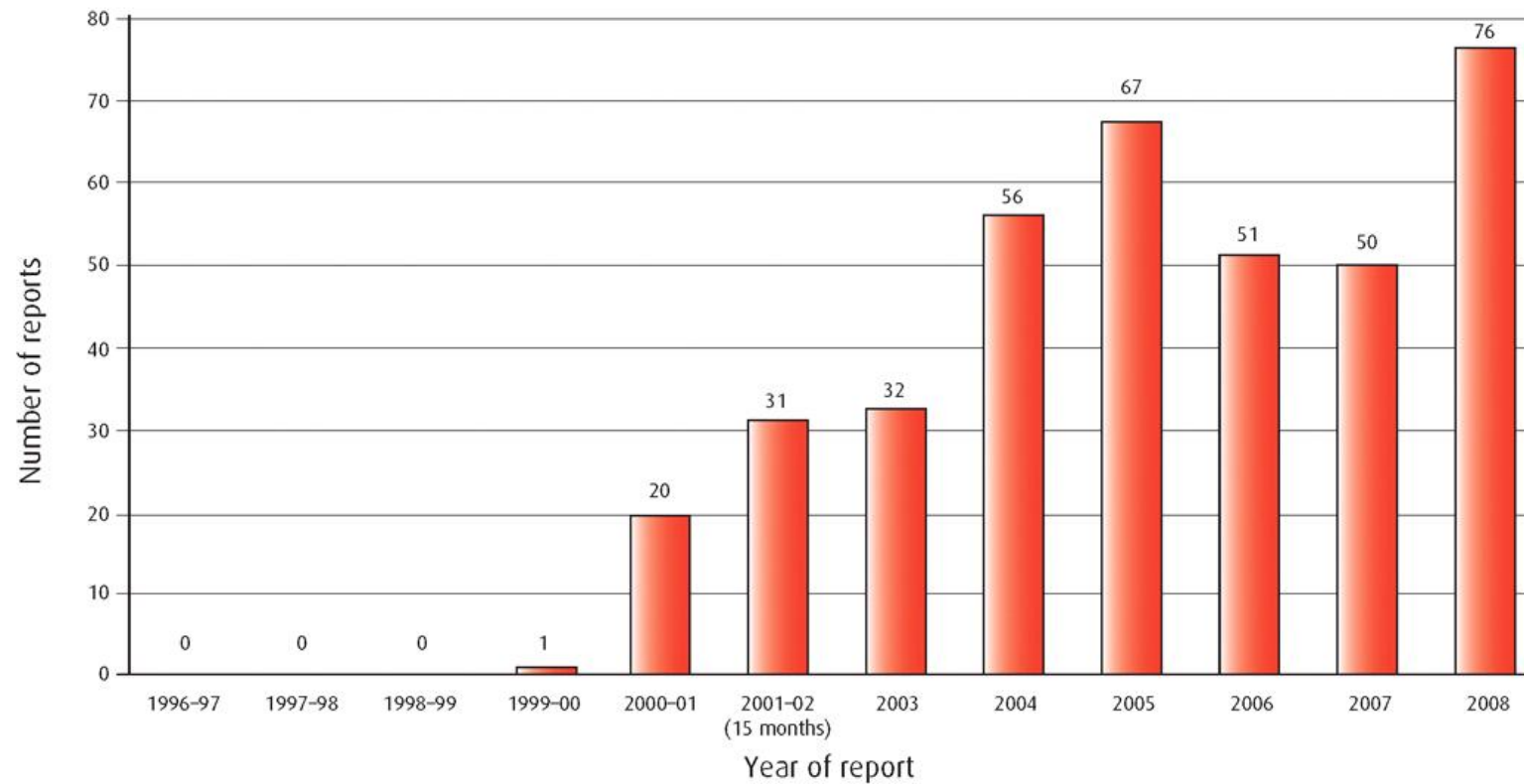


Inappropriate and unnecessary transfusion – 1

- 76 cases in total
 - Based on wrong FBC or coag results 38
 - Based on wrong POCT result 3
 - Haem/coag laboratory errors 10
 - Poor knowledge and prescribing 17
- 0 deaths directly related to these cases
- 2 deaths in which the transfusion, or lack of transfusion contributed to the death
- 1 case of major morbidity in which an over transfused patient required venesection

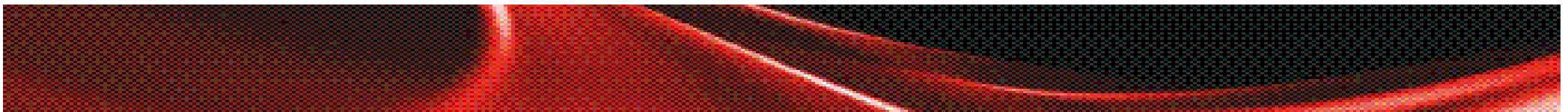


I&U cases 1996 - 2008



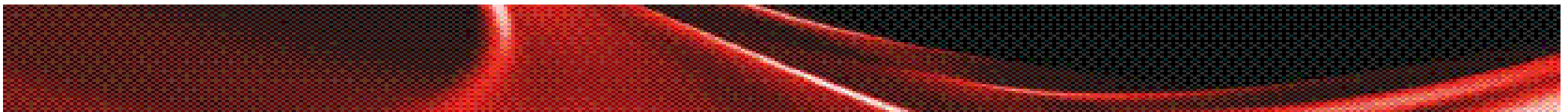
Case - wrong Hb

A patient was admitted with collapse and a history of CVA. The Hb was 11.4 g/dl but the next day had dropped to 6.9 g/dl. Although there was no evidence of blood loss the the patient was transfused, an abdominal USS and haemolysis screen were requested and a referral made to a haematology consultant. This consultant, after looking at the patient, requested a repeat Hb which was 13.1 g/dl. The previous sample was found to have been taken from a drip arm



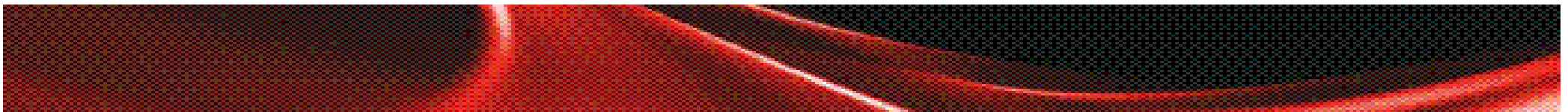
Case – over estimation of blood loss

An elderly patient had a coffee ground vomit at 02.00 and melaena. At 04.30 her Hb was 14.3 g/dl and observations were stable. Later BP was not recordable and 2 units of red cells were given. At 06.10 there was another haematemesis and a further 2 units were transfused. A BMS requested repeat samples but there were difficulties with venous access. After another 2 hours, BP was stable and a further 2 units were given. Hb was reviewed at 17.00 when it was 16.6 g/dl. At 22.30 Hb was 18.3 g/dl and the next day it was 20,8 g/dl at 15.00. The patient died at 18.30.



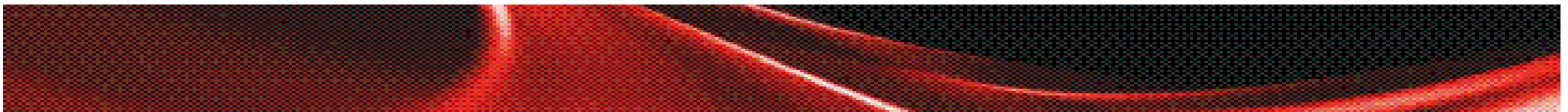
Poor knowledge and prescribing - categories

- Overestimation of rate and volume of blood loss
- Small patient prescribed inappropriately large volume
- Wrong basic component given e.g. FFP instead of platelets
- Transfused despite documented decision to the contrary
- Confusion over correct dose/volume of cryoprecipitate
- Lack of understanding of transfusion triggers in sickle cell disease
- Inappropriate correction of 'abnormal' INR with FFP
- **Slow response to serious blood loss: under transfusion.**



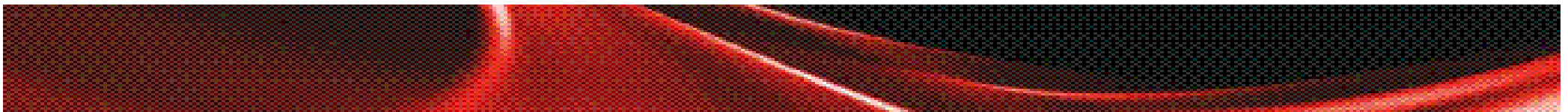
Handling and storage errors - 1

- Increased to 139 cases in this report from 118 in 2007
 - Technical administration errors 9 (15)
 - Transfusion of expired red cells 45 (12)
 - Excessive time to transfuse 24 (57)
 - Cold chain errors 61 (34)
- Overall 21 (15%) were laboratory errors



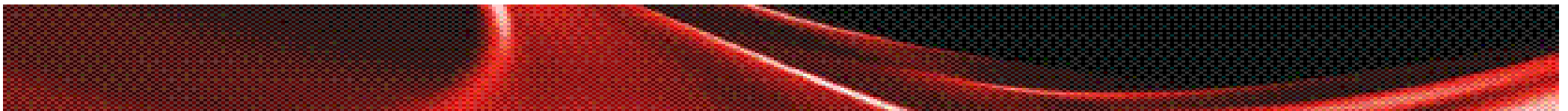
Areas of increase in HSE

- Transfusion of expired red cells
 - Unit checked by 2 nurses in 32 cases
 - BMS did not check unit in 9 cases
 - 5 cases error started at Blood Service, and continued through laboratory issue, collection and administration – 4 opportunities to detect the expired unit
 - In 2 cases warning from electronic system was ignored
- Cold chain errors
 - Inappropriate storage accounts for 42/61 cases – return to stock when should have been discarded
 - 10 cases relate to transfer and deliver of components



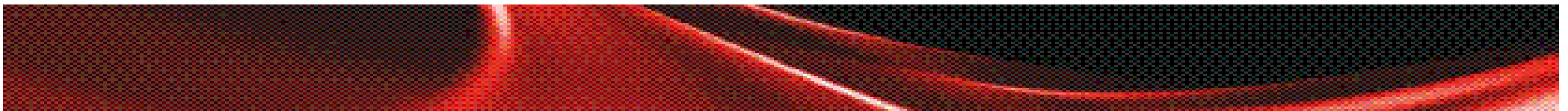
Recommendation

- Hospitals should review who collects and transports blood. Only appropriately trained and competent staff should participate in collection and transportation of blood components. All staff must have sufficient knowledge to appreciate the critical points in the task.



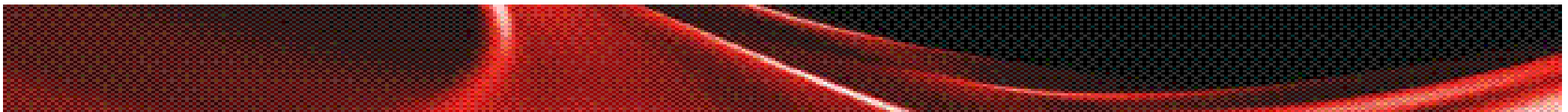
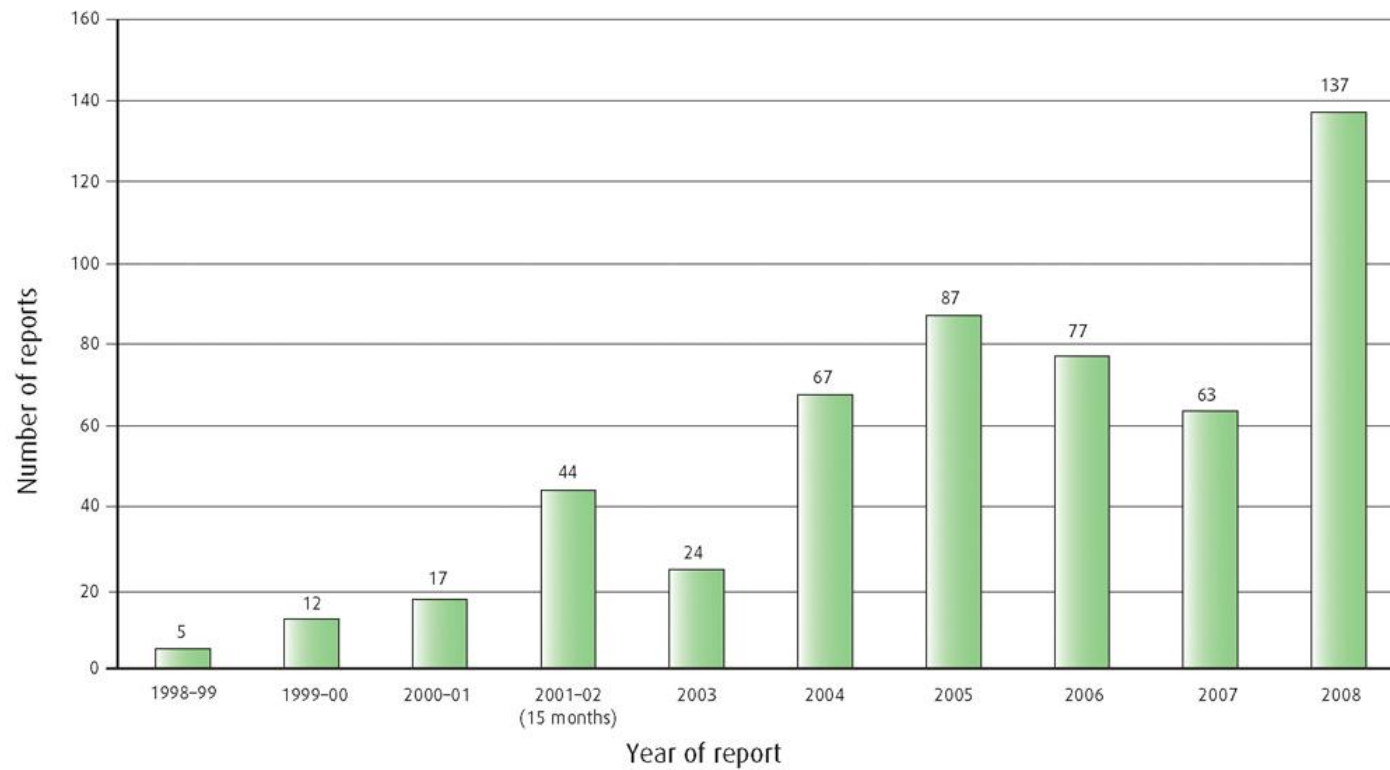
Anti-D related events

- Number of reports to SHOT in this category has more than doubled from 63 in 2007 to 137 in 2008
- Highlighted in the last SHOT report and meeting including a main recommendation
- Transfusion laboratory Anti-D education group – part of a UK anti-D educational collaborative



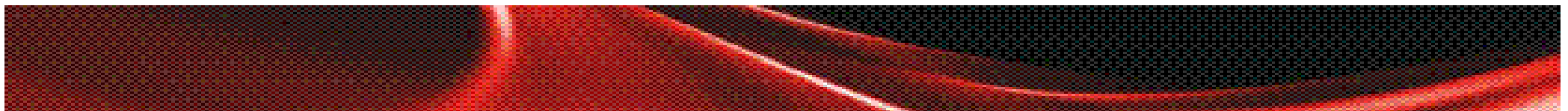
Anti D reports 1998 - 2008

Figure 8
Anti-D cases 1998-2008



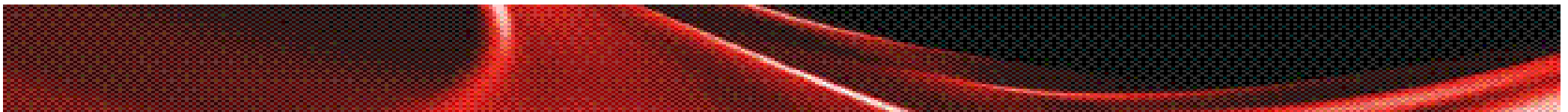
Categories of anti-D events

Type of event	Cases	Number of Primary Errors		
		Midwife	Laboratory	Doctor
Omission or late administration of anti-D Ig	58	50	8	-
Anti-D Ig given to D positive patient	38	19	18	1
Anti-D Ig given to patient with immune anti-D	14	7	7	-
Anti-D Ig given to mother of D negative infant	6	1	5	-
Anti-D given to wrong patient	5	5	-	-
Wrong dose of anti-D given	10	4	6	-
Anti-D Ig expired or out of temperature control	3	3	-	-
Other handling errors 1 x wrong product given and 2 x clerical error recording batch number issued	3	-	3	-
TOTALS	137	89	47	1



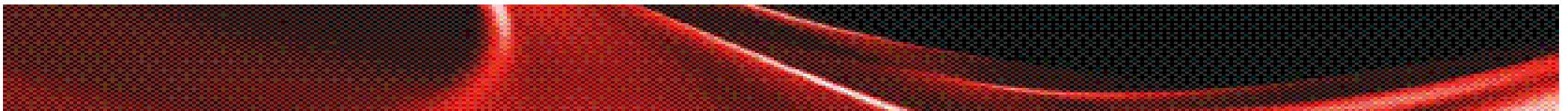
Recommendation

- 58 patients exposed to sensitising events with not anti-D given, or late administration
- 44/58 were in post natal setting
- 21% related to remotely held stocks
- Trusts should ensure that robust systems under overall control of the hospital transfusion laboratory are in place for anti-D Ig to be issued on a named patient basis, to ensure both appropriate use and to meet traceability requirements



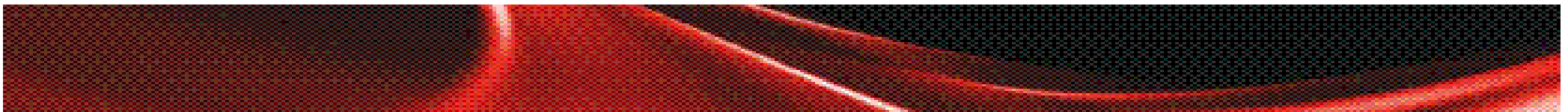
Near Miss pilot

- Phase 1
 - 1 calendar month documenting all samples rejected at booking in
 - 224,829 samples received, 8535 rejected (~4%)
 - 74% relate to missing or incorrect details on sample
 - Rate varied from 0.4% to 13% of samples
 - 40% of hospitals across UK allow relabelling
 - 3.2% of rejected samples are relabelled despite not knowing who took the sample
 - In 38% it is not known who took the sample
 - In 31% it was medical staff, midwives 15%, nurses 10%



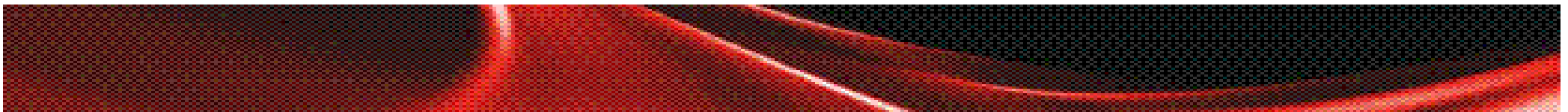
Near Miss pilot

- Phase 2
 - 6 months 09/08 to 02/09
 - Errors detected after booking in
 - 214 reports analysed: 123 incorrect details; 90 WBIT
 - 74/90 WBIT errors were discovered because of discrepancy with historical record
 - 8 detected because person who took sample realised their error
 - 45% by doctors, 29% nurses and midwives, 10% phlebotomists
- Local analysis of root cause should be conducted against background of competency assessment of clinical staff in patient ID procedures



Key message

- This years report has highlighted the differences between different hospitals, trusts, regions and countries in the way certain parts of the transfusion process are carried out. In particular this relates to the use of local or regional protocols and SOPs, and the standards used and expected within them.
- Main SHOT recommendations this year therefore relate to standardisation.



Thanks

- Writing group
- Steering Group and Working Expert Group
- Dr Hannah Cohen, Steering Group Chair
- David Mold, Operations Manager
- Hilary Jones, Data Analyst
- Tony Davies, SHOT transfusion liaison practitioner
- Kathryn Gradwell and Victoria Peake, SHOT office information officers
- NHSBT for accommodation in Manchester and London
- UK Forum for funding
- HTTs for reporting

