Error Surveillance for Continuous Quality Improvement

TESS Data 2005-2010

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International Haemovigilance Seminar
April 26, 2012

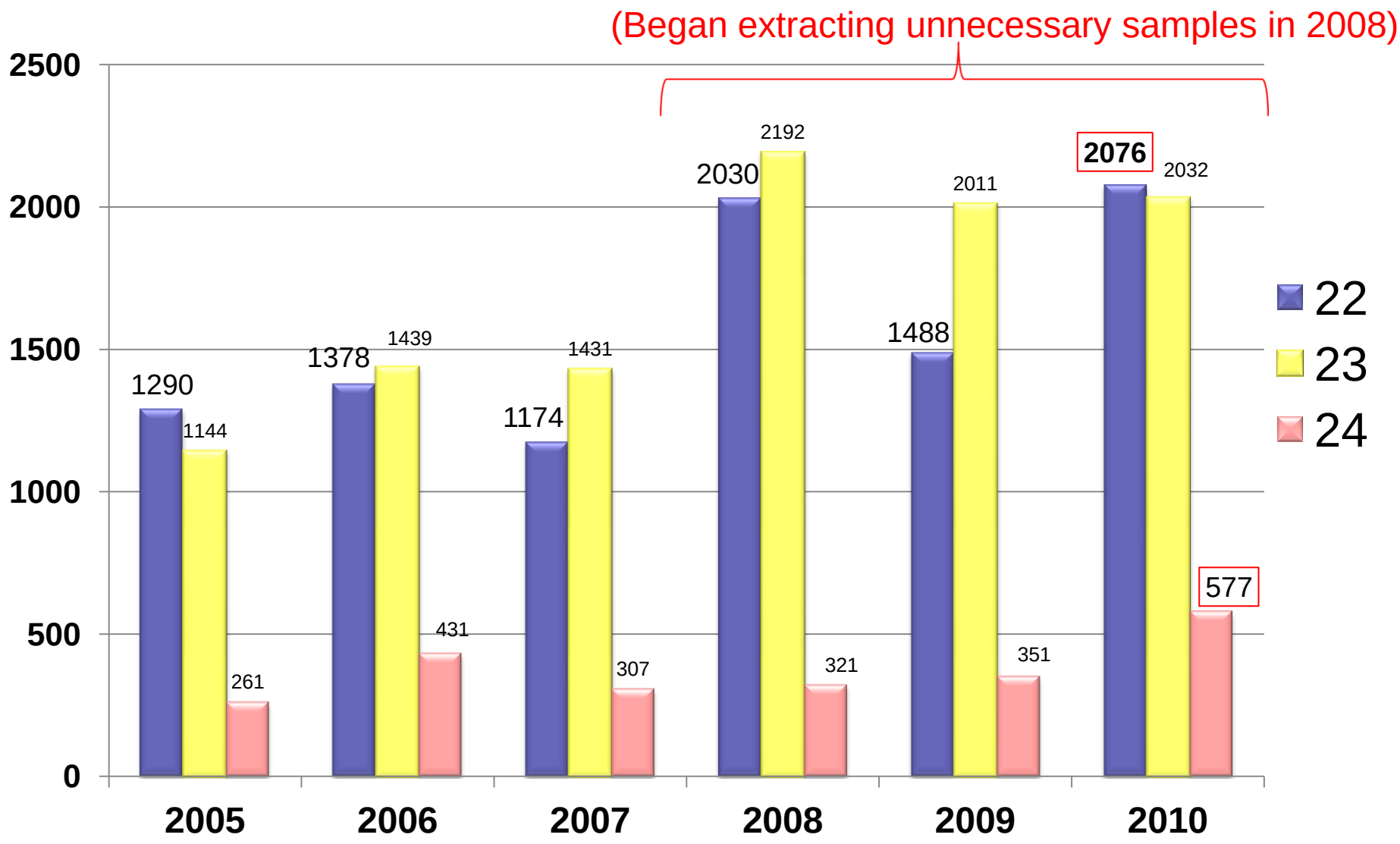
Centre universitaire de santé McGill
McGill University Health Centre

McGill University Health Centre

~27000 RBCs

- Site **22**
  - Large Adult (Cardiac, HemOnc-Tx, Neuro) 13750
- Site **23**
  - Large Trauma centre (HemOnc, Ortho) 8500
- Site **24**
  - Medium Pediatric (Cardiac, HemOnc-Tx) 3500
- New site (not included)
  - Small community hospital 1000

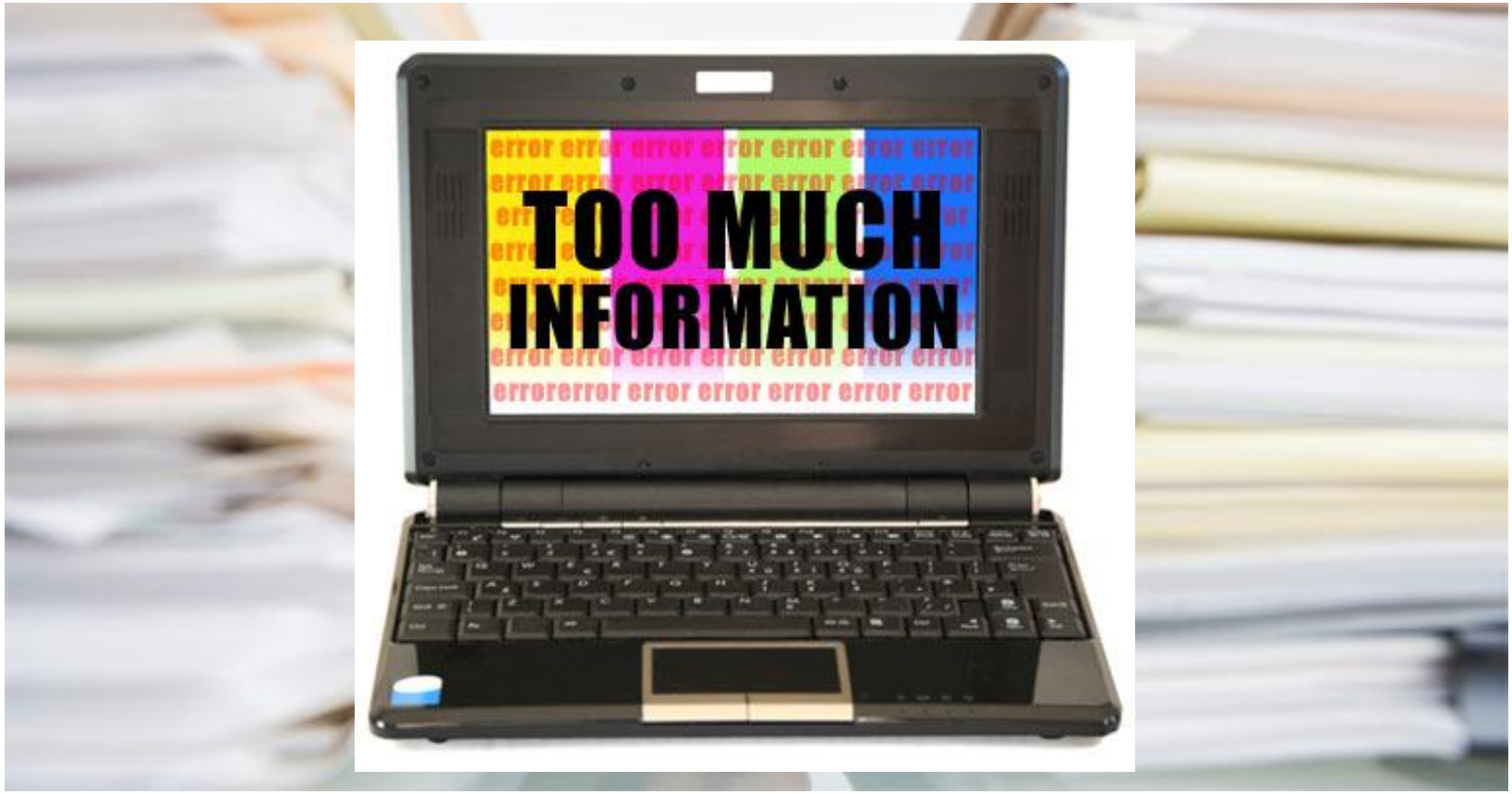
Error Events 2005 – 2010



Total:	2695	3248	2912	4543	3850	4685

Error Management Program

How do we manage >4500 errors per year ?



Systematic Error Assessment

- Track and trend events by type, severity, frequency
  - Overall view of what's going on, what's new, what's changing,
  - Demonstrate patterns, clusters, trends
- Check - What are we not catching ?
- Verify - Are we still catching what we expect to catch ?
- Select for "in depth" analysis, a few incidents to determine root cause and to understand the "system" or circumstances that allow them to happen
  - Selection may be based on:
    - Seriousness for the patient
    - Educational value for the lab or care unit
    - Frequency of events of a particular category
    - "New" events

Measures of severity:

Assess: Discovery x Potential to harm

Discovery of event:

- Actual – Harm : 0%
- Actual – No Harm : <1%
- Near Miss – Unplanned recovery: <1%
- Near Miss – Planned recovery: >98%

Potential for harm:

- High – potential to result in harm
- Medium – potential to result in temporary harm
- Low – no real potential for harm to come to a patient

MUHC: Cases (Discovery / Severity)

2010

Sites	22			22 Total		23			23 Total		24			24 Total	
	High	Med	Low			High	Med	Low			High	Med	Low		
2. No recovery -no harm	33	31	11	75	3.6%	15	11	11	37	1.8%	13	14	107	134	23.2%
3. Near miss -unplanned	7	4	8	19	0.9%	3			3	0.1%	1		1	2	0.3%
4. Near miss -planned	335	71	1576	1982	95.5%	276	116	1600	1992	98.0%	43	21	377	441	76.4%
Grand Total	375	106	1595	2076	100%	294	127	1611	2032	100%	57	35	485	577	100%

MUHC: Cases (Discovery / Severity)

2010

Sites	22			22 Total	
	High	Med	Low		
2. No recovery -no harm	33	31	11	75	3.6%
3. Near miss -unplanned	7	4	8	19	0.9%
4. Near miss -planned	335	71	1576	1982	95.5%
Grand Total	375	106	1595	2076	100%

2009

Sites	22			22 Total	
	High	Med	Low		
2. No recovery -no harm	3	9	17	29	1.9%
3. Near miss -unplanned	6	1	1	8	0.5%
4. Near miss -planned	282	32	1137	1451	97.5%
Grand Total	291	42	1155	1488	100%

MUHC: Cases (Discovery / Severity)

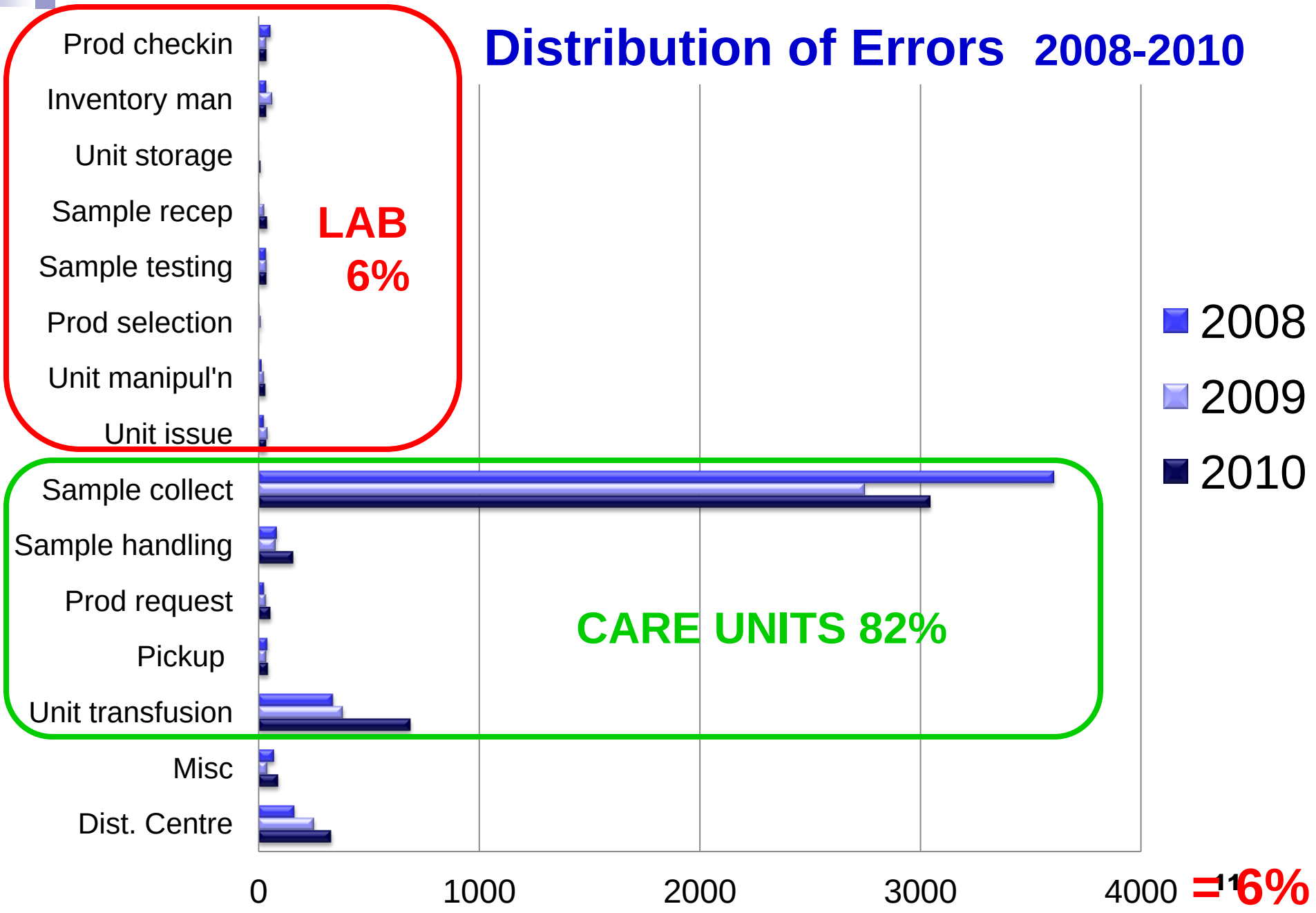
2010

Sites	22			22 Total	
	High	Med	Low		
2. No recovery -no harm	33	31	11	75	3.6%
3. Near miss -unplanned	7	4	8	19	0.9%
4. Near miss -planned	335	71	1576	1982	95.5%
Grand Total	375	106	1595	2076	100%

	22		
Row Labels	High	Med	Low
CQ 01 Procedure delayed		1	
CQ 02 Transfusion delayed	31	3	3
CQ 03 Adverse Txn event		1	
CQ 04 Tx'd - No reaction	2	26	7
CQ 06 Lost traceability			1
TOTAL	33	31	11

7 Sample collection / patient identification errors reported to the Blood Bank by the Care unit after a sample was transported to the lab. (unplanned)
5/7 = WBIT

Distribution of Errors 2008-2010



Distribution of Discovery 2010

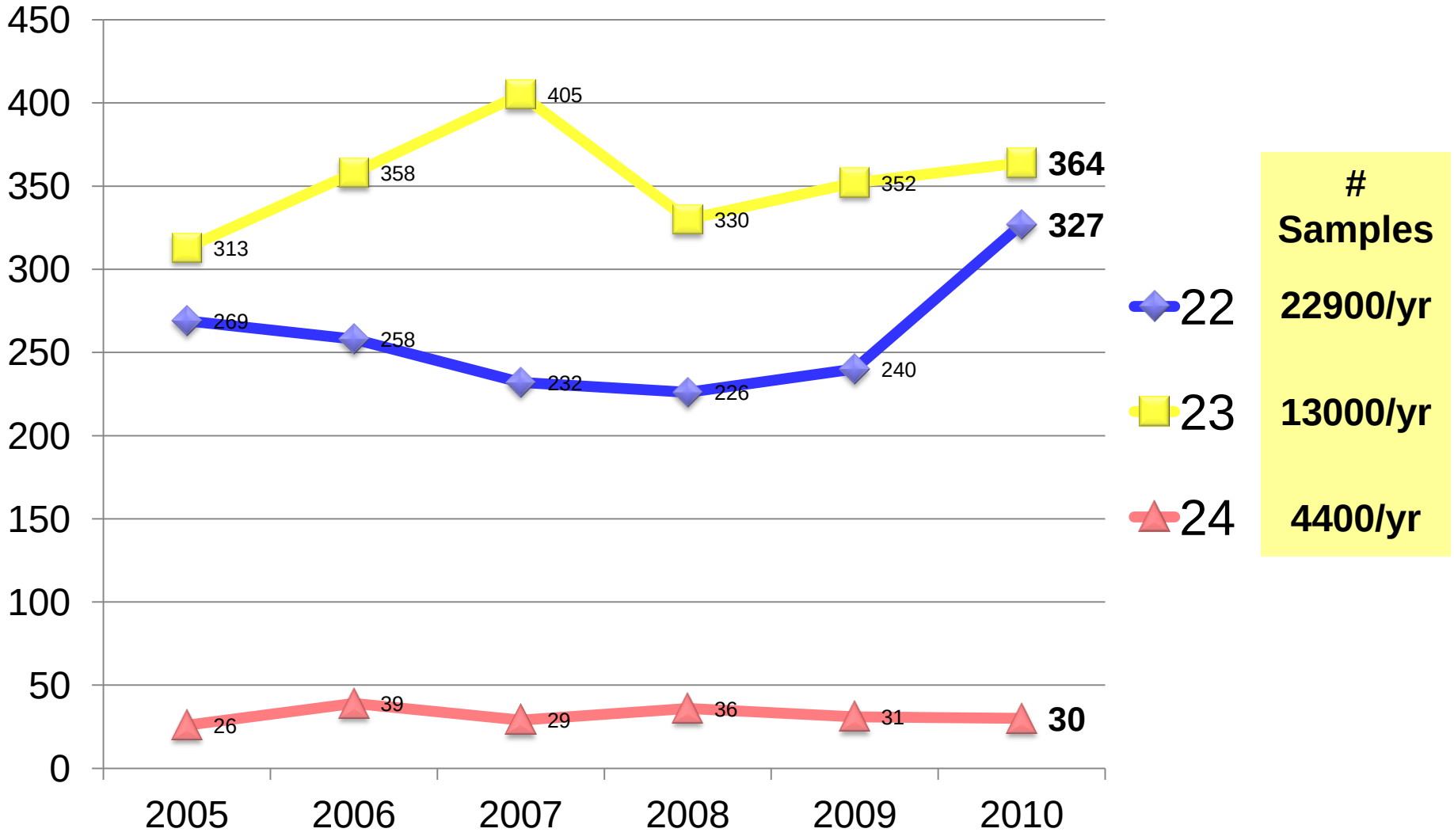
Discovered by :	# Events	%
Lab Assistant	1	91.4%
Technologist	3401	
Supervisor	160	
QA/TSO	718	
Clerk	23	8.4%
Nurse	355	
MD/DO	16	
Other	7	0.1%
Supplier	4	0.1%
Grand Total	4685	100%

Discovered during:	# Events	%
Event did not involve a product	1	0.0%
Product Check-in	324	6.9%
Product storage	1	0.0%
Before testing pt sample	2412	51.5%
After pt test verif/before xmatch	42	0.9%
During xmatch/processing	294	6.3%
After xmatch/processing before issue	39	0.8%
After xmatch/processing at issue	77	1.6%
After issue before infusion	351	7.5%
After infusion	168	3.6%
QA Review	860	18.4%
Subsequent pt test	8	0.2%
Inventory audit	46	1.0%
Other	62	1.3%
Grand Total	4685	100%

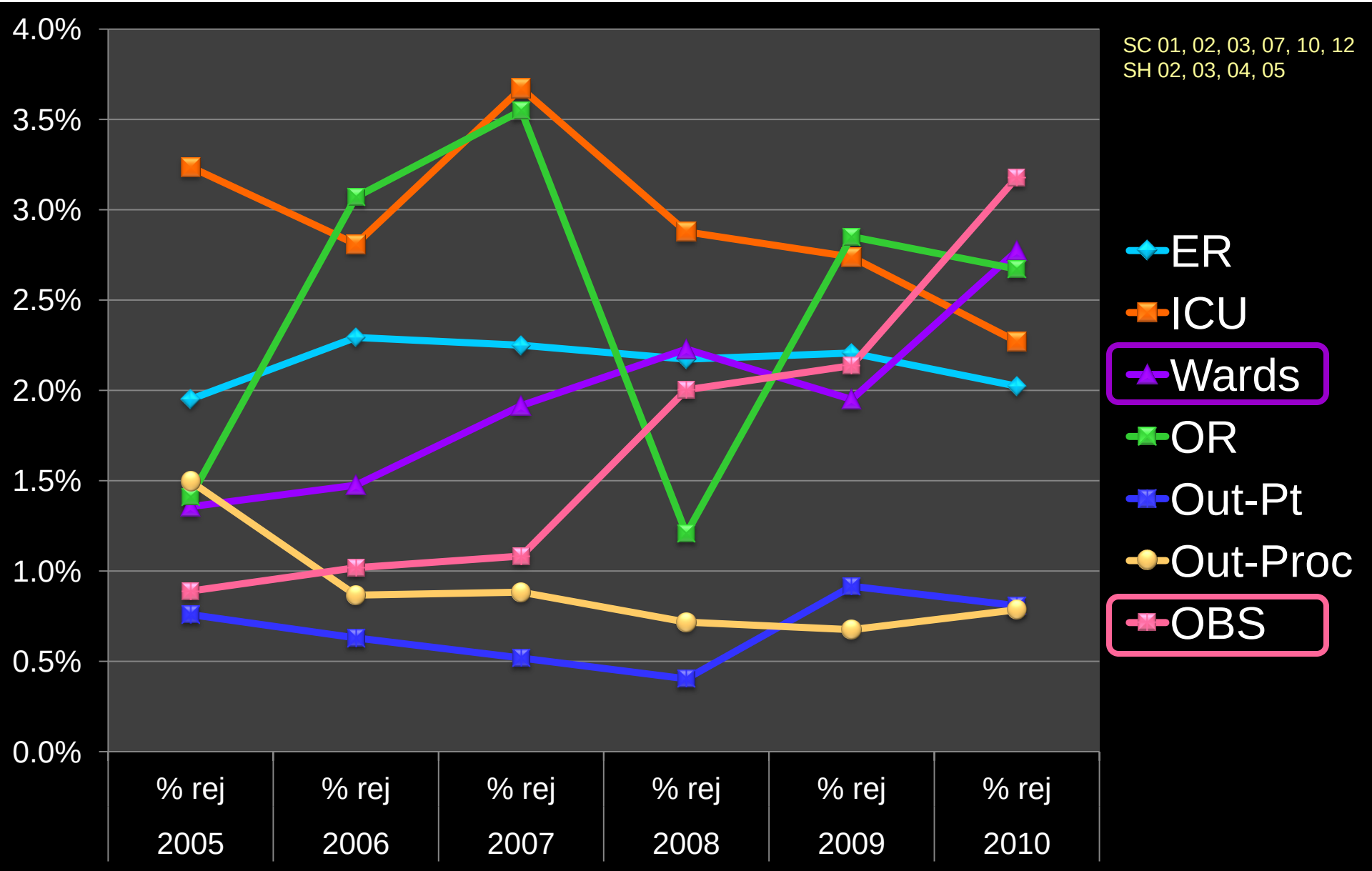
Incidence rate of events 2010

Row Labels	# Events	Denominator	Incidence	%
IM - Inventory Management	39	128509	1:3295	0.03%
PC - Product Checkin	40	128509	1:3213	0.03%
US - Unit Storage	13	128509	1:9885	0.01%
SR - Sample reception	43	128509	1:2989	0.03%
ST - Sample testing	40	110702	1:2768	0.04%
PS - Product Selection	6	110702	1:18450	0.01%
UM - Unit manipulation	35	110702	1:3163	0.03%
UI - Unit issue	39	40130	1:1029	0.10%
SC - Sample Collection	3046	40130	1:13	7.59%
SH - Sample Handling	161	40130	1:249	0.40%
PR - Product Request	58	108281	1:1867	0.05%
RP - Request for pickup	47	107819	1:2294	0.04%
UT - Unit Transfusion	692	37739	1:55	1.83%
MS - Miscellaneous	93	128509	1:1382	0.07%
DC - Donor Codes	333	107819	1:324	0.31%
Grand Total	4685			

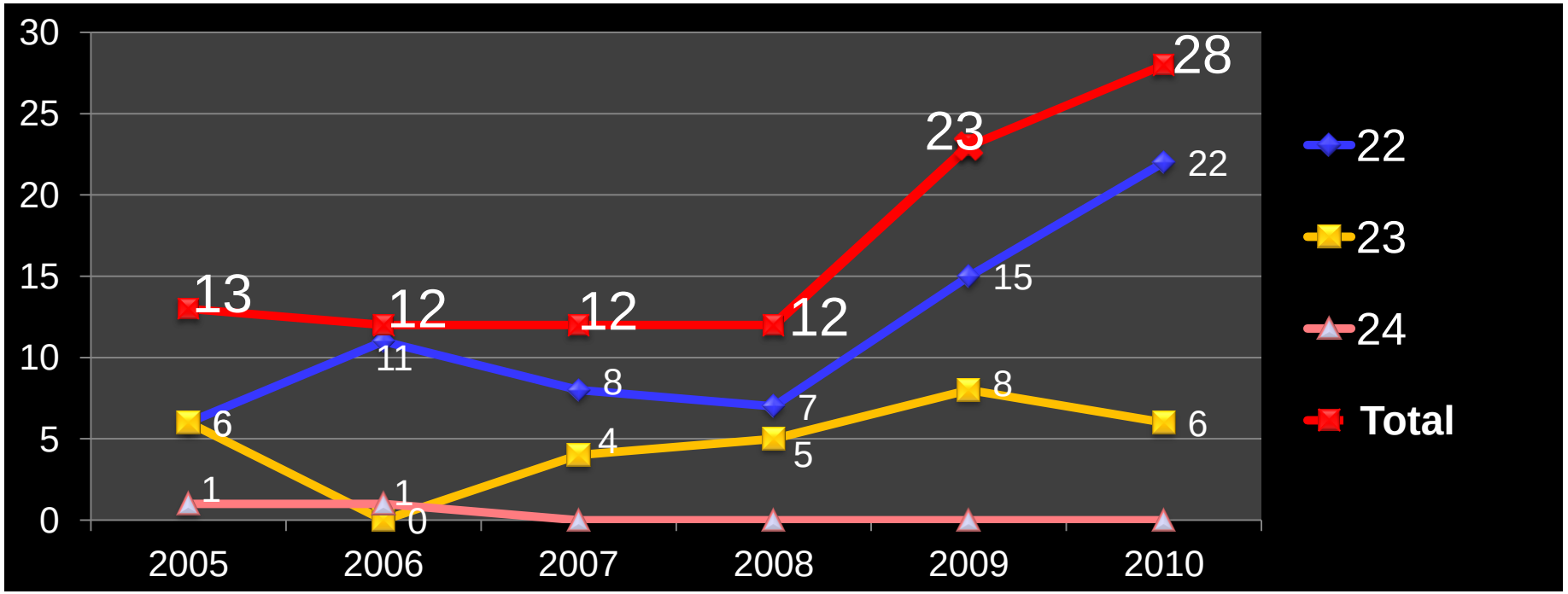
Sample Labelling Errors / site / year



High Severity Sample Errors / Service / Year (%)



Wrong patient's blood in the tube (WBIT)



fdYear	ER	ICU	Ward	OBS	OR	Out-Proc	Out-Pt	TOTAL
2005	2	2	6	1				11
2006	3		4	2	1	1	1	12
2007	5		3	3				11
2008	4	1	1	4		2		12
2009	13	1	6	2		1		23
2010	7	2	7	5		5	2	28

Person involved:

RN = 19 Tech = 9

Discovery:

Planned (21)

Mismatch = 2

Previous ABO = 19

Unplanned discovery (7)

Care unit called = 7

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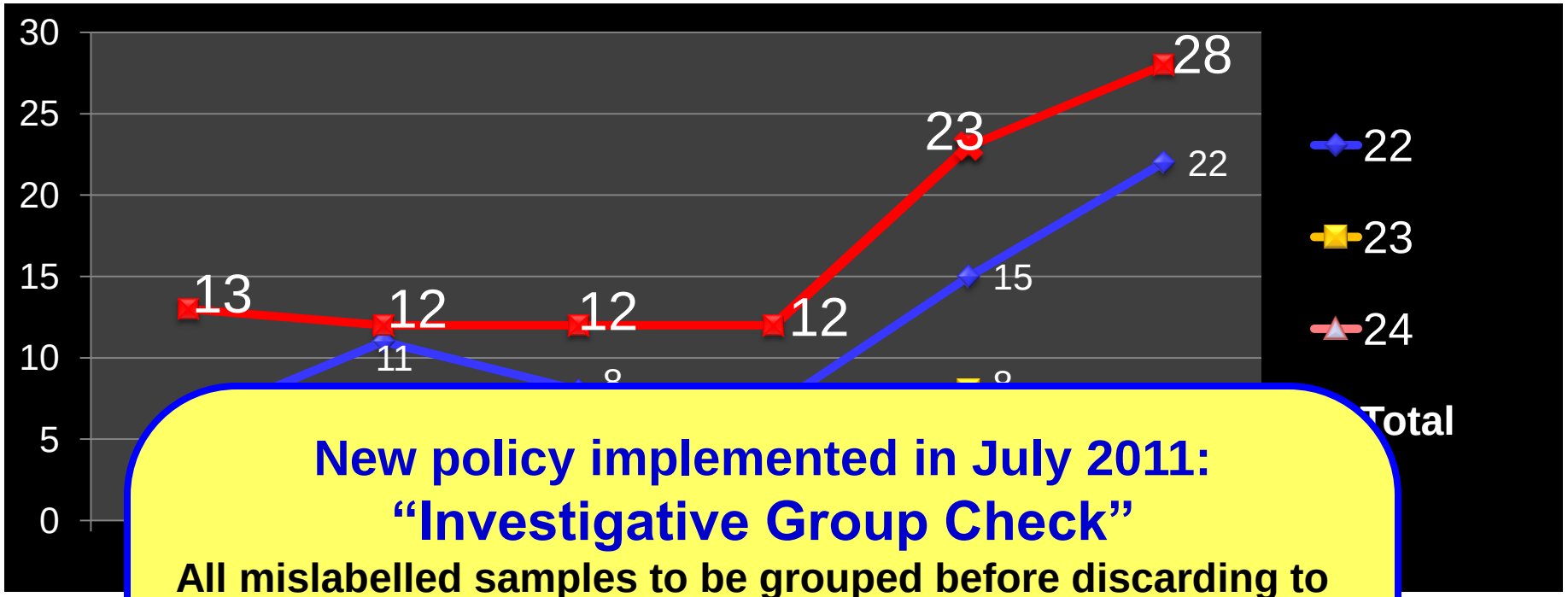


New policy implemented in July 2011:
"Investigative Group Check"

All mislabelled samples to be grouped before discarding to determine extent of error. (Labelling error only or WBIT?)

ABO/Rh results of rejected tubes can only be entered under a specific test code so as not to update or impact the patient's official blood group.

Error is coded in TESS according to findings (discrepant with historical or subsequent ABO/Rh)

fdYear
2005
2006
2007
2008
2009
2010

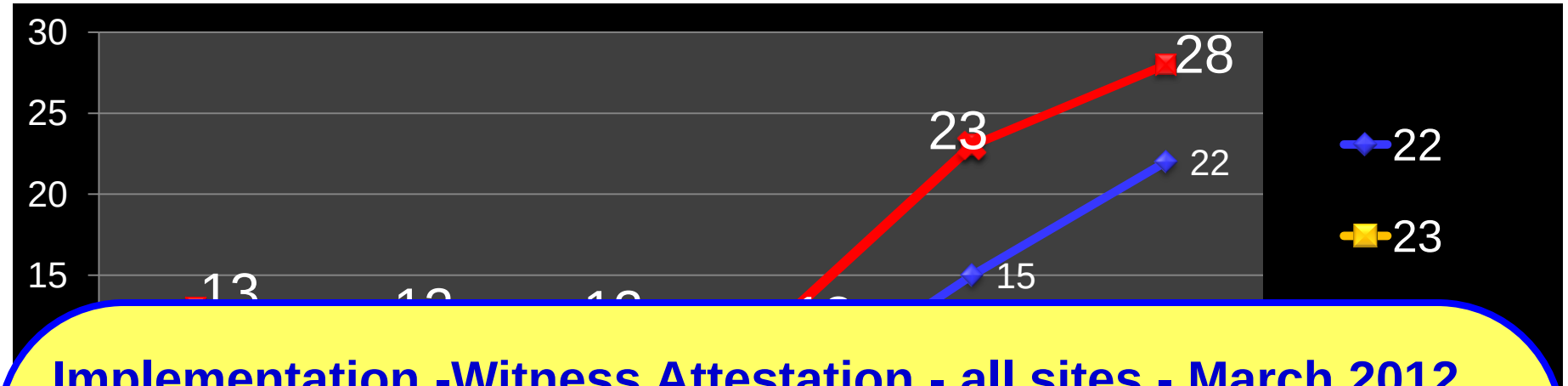
= 9

: 19

very (7)

ed = 7

Wrong patient's blood in the tube (WBIT)



Implementation -Witness Attestation - all sites - March 2012.

- Inter-professional SOP finalized June 2011 for all Blood Bank samples
- Online tool "Blood Drawing 101" available and promoted in Sept 2011.

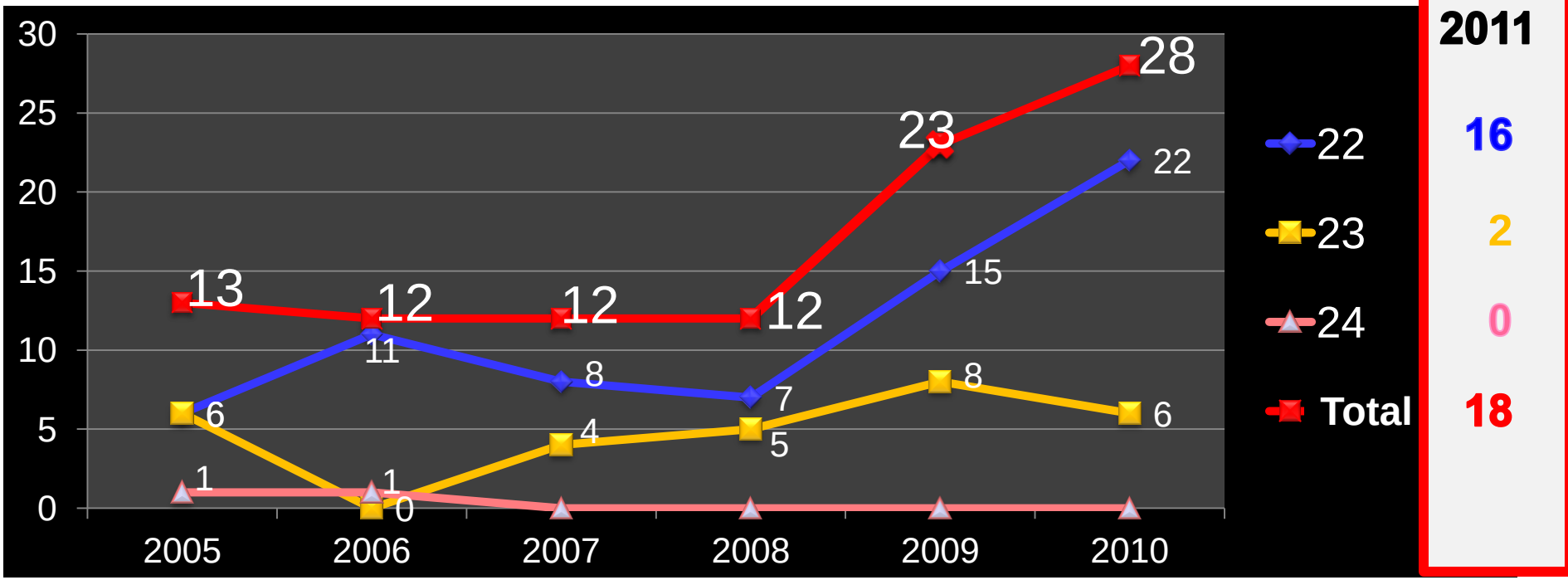
Protocol includes:

- Verbal challenge for patient's name & DOB
- Verify exact match of pt's ID (Band/card vs Req/attestation vs Label)
- Witness (conscious pt >14 yrs or other person) to sign attestation form "witnessed the draw and sample labelling at the bedside"

TSO's + Nurse educators provided intensive training fall 2011-Feb 2012.

Proof of training (trainee signatures) required by March 2012 for A.C.

Wrong patient's blood in the tube (WBIT)



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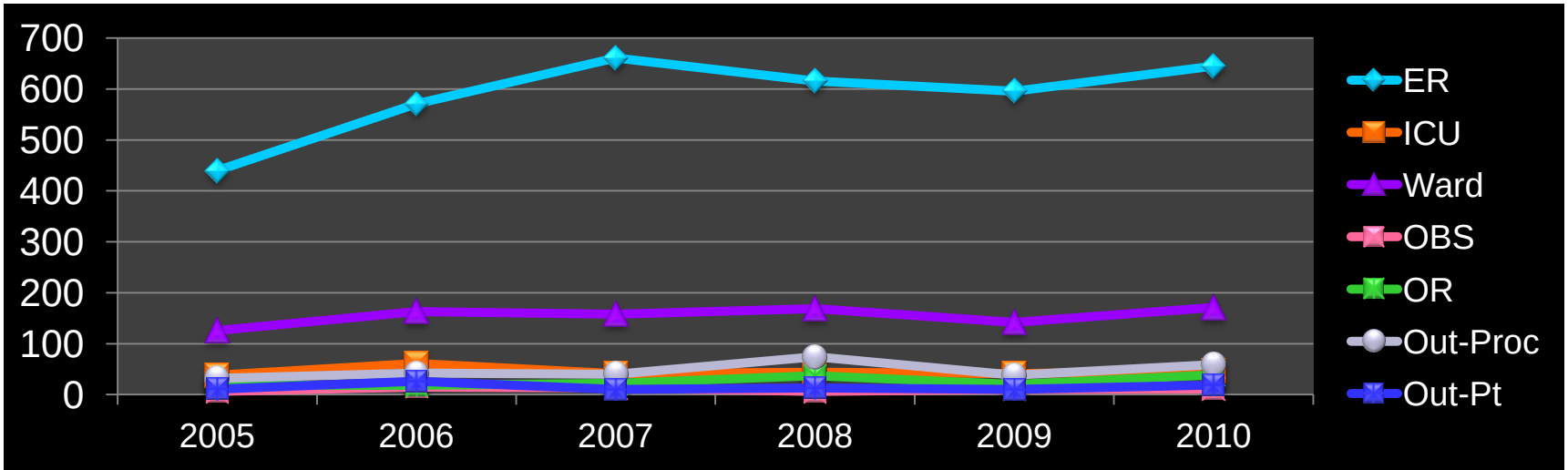
21% of all errors, 2.4% of samples

Hemolyzed samples 2010

~6-11% ER tubes

SITE	ER	ICU	Wards	OR	Out-Pt	Out-Proc	OBS	Total
22 Adult	156 6.4%	16 1.5%	50 0.9%	30 3.8%	7 0.1%	28 0.5%	11 0.8%	298 1.3%
23 Trauma	479 10.9%	20 1.4%	112 2.5%	8 1.9%	8 0.4%	16 2.9%		643 4.9%
24 Ped	10 1.1%	11 1.6%	9 0.9%	1 1.2%	4 0.6%	15 1.4%		50 1.1%



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24 Ped	10 1.1%							

Project to begin November 2011, site 23 ER:

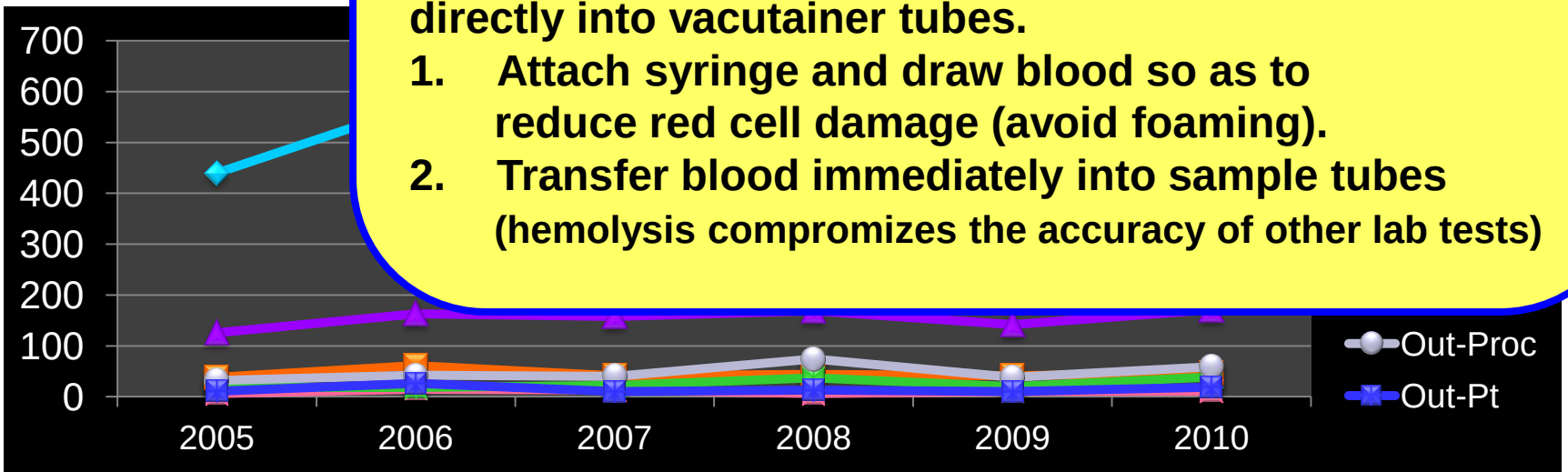
Suspected cause:

Large bore 16-gauge needle used to insert IV (one in each arm) for all patients for whom urgent rapid transfusion may be needed.

Solution:

Discontinue drawing blood from large bore needles directly into vacutainer tubes.

1. **Attach syringe and draw blood so as to reduce red cell damage (avoid foaming).**
2. **Transfer blood immediately into sample tubes (hemolysis compromizes the accuracy of other lab tests)**

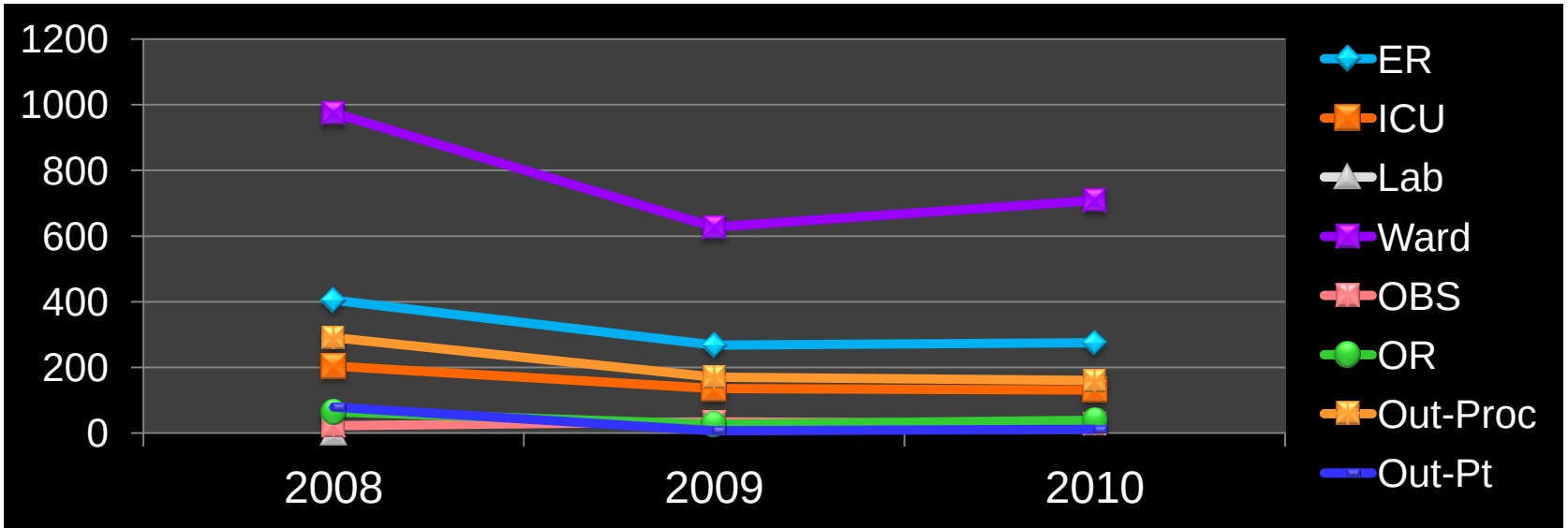


30% of all errors, 3.4% of samples

Unnecessary samples 2010 (0 - 10.4%)

SITE	ER	ICU	Wards	OR	Out-Pt	Out-Proc	OBS	TOTAL
22	133	68	365	31	3	103	28	731
Adult	5.4%	6.4%	6.6%	3.9%	0.0%	1.9%	2.1%	3.2%
23	142	63	344	8	8	57		622
Adult	3.2%	4.4%	7.7%	1.9%	0.4%	10.4%		4.8%
24	6	7	16	3	1	3		36
Ped	0.7%	1.0%	1.6%	3.7%	0.2%	0.3%		0.8%

Reminder memos to Care Units that samples are valid for XM up to 96 hours.



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24	6	7	16	3	1	3		36
Ped	0.7%	1.0%	1.6%	3.7%	0.2%	0.3%		0.8%

TraceLine Deployment Project :

(TraceLine alerts user that a valid sample exists in the lab)

Pediatric site deployed in 2004

Adult site prenatal clinics deployed in 2009

Adult sites' Hem/Oncology wards & clinics 2010-2011

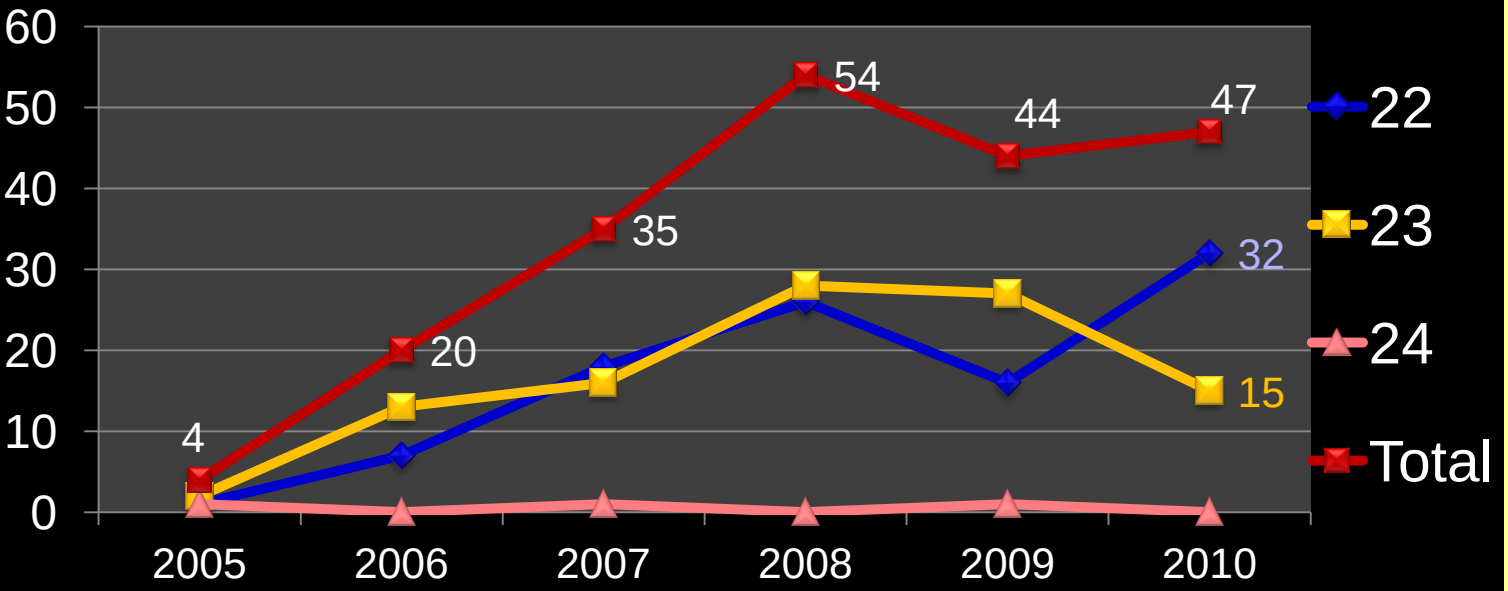
Other care units prioritized by transfusion volume / level of interest

Possible interim solution: Lab to extract & fax a list of samples expiring in less than 24 hours to high volume care units.

Product Request & Pickup errors 2010

SITE	ER	ICU	Wards	OR	Out-Proc	OBS	TOTAL
22	2	16	28	10	6	1	65
Adult	0.1%	1.5%	0.5%	1.3%	0.1%	0.1%	0.3%
23	6	9	5	1	4		25
Trauma	0.1%	0.6%	0.1%	0.2%	0.7%		0.2%
24	1	3	3	6	2		15
Ped	0.1%	0.4%	0.3%	7.4%	0.2%		0.3%

Req'n or pickup slip for <u>wrong patient or wrong product</u>



<u>Discovery</u>

27 after issue before txn by nurse

20 before issue

19 by tech

1 by nurse

Product Request & Pickup errors 2010

SITE	ER	ICU	Wards	OR	Out-Proc	OBS	TOTAL
22	2	16	28	10	6	1	65
Adult	0.1%	1.5%	0.5%	1.3%	0.1%	0.1%	0.3%
23	6	9	5	1	4		25
Trauma	0.1%	0.6%	0.1%	0.2%	0.7%		0.2%
24	1	3	3	6	2		15
Ped	0.1%	0.4%	0.3%	7.4%	0.2%		0.3%

Rec

60
50
40
30
20
10
0

Computer Physician Order Entry via Oacis :

To pilot in pediatric site May 2012

Default fields for ordering physician, location, date/time

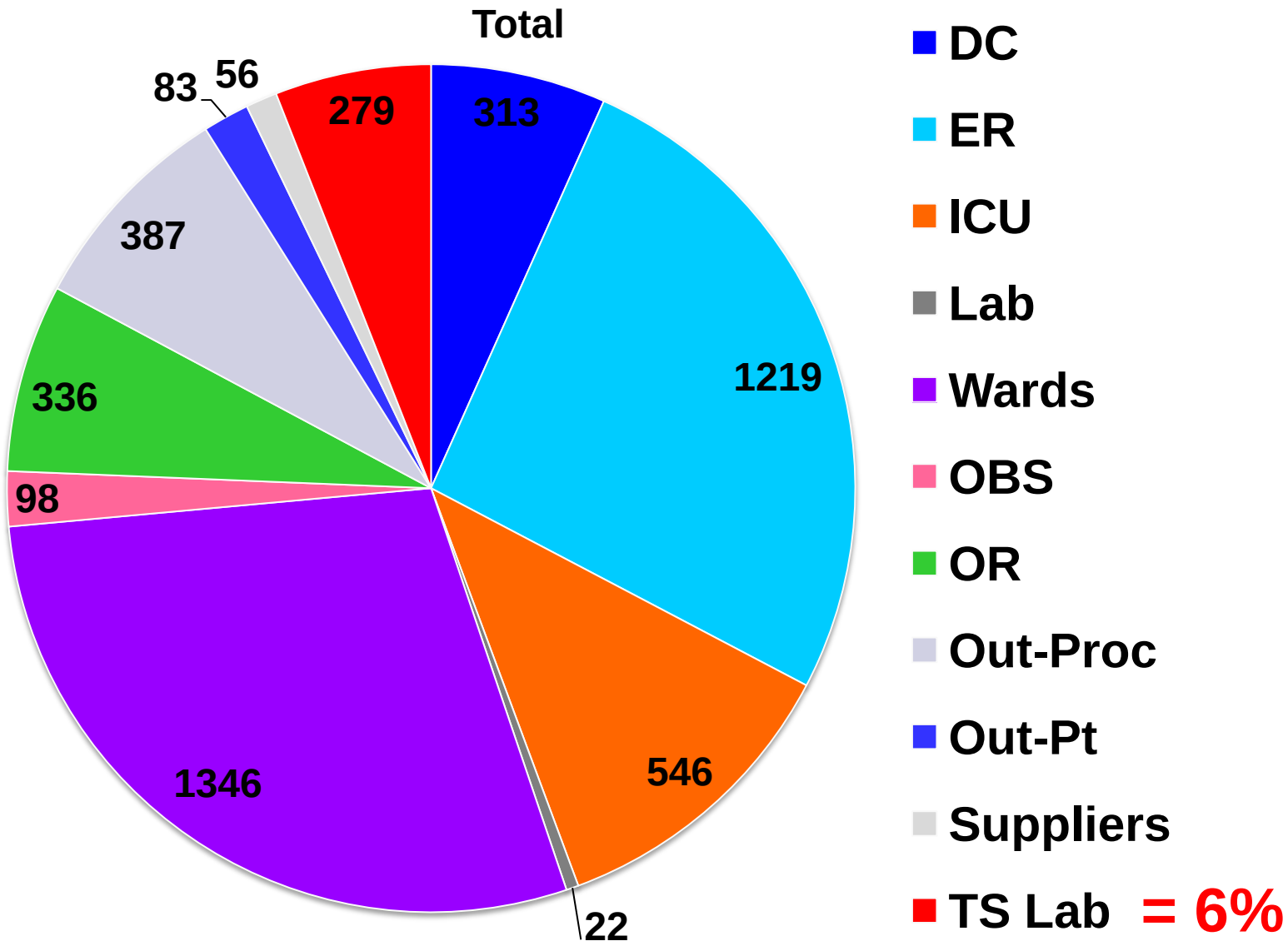
Mandatory fields for diagnosis, clinical history, particular conditions, reason for testing, date of surgery/treatment

List of indications filtered to the product being ordered

Displays last diagnostic test result related to product being ordered

Displays last 3 blood bank orders (active, inactive)

Distribution of Errors 2008-2010



Transfusion Lab Errors 2010 (6% of all)

	High Severity			Total	Med. Severity			Total	Low Severity			Total	TOTAL		
Row Labels	2. Actual NH	3. NM Unplan	4.NM Plan		2. Actual NH	3. NM Unplan	4.NM Plan		2. Actual NH	3. NM Unplan	4.NM Plan				
Invent.Man	1			1	4			4	1		33	34	39	0.3	per 1000 products managed
Prod checkin							3	3	1		36	37	40	0.3	per 1000 products received
Unit storage							1	1			12	12	13	0.1	per 1000 products stored
Sample receive	1	2	11	14	10		10	20			9	9	43	1.1	per 1000 samples received
Sample Testing	1	1	1	3	5	3	10	18	2	3	14	19	40	0.4	per 1000 tests done
Prod select'n			1	1	1			1		1	3	4	6	0.1	per 1000 product issued
Unit manip'n					1		1	2	2		31	33	35	0.9	per 1000 products transforme
Unit issue		1	3	4	8		3	11	5	1	18	24	39	0.4	per 1000 products issued
Grand Total	3	4	16	23	29	3	28	60	11	5	156	172	255		
	1%	High		9%	11%	Medium		24%	4%	Low		67%			
	Actual				Actual				Actual						

3 High, no recovery:

- Platelet stock not maintained, no platelets available for a trauma case
- Group O platelets issued to neonate without checking group with birth hospital
- ABS entered as Neg. before testing, transfused blood (eXM) before ABS done.

Transfusion Lab Errors 2010 (6% of all)

	High Severity			Total	Med. Severity			Total	Low Severity			Total	TOTAL		
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Sample receive													43	1.1	per 1000 samples received
Sample Testing													40	0.4	per 1000 tests done
Prod select'n													6	0.1	per 1000 product issued
Unit manip'n													35	0.9	per 1000 products transforme
Unit issue													39	0.4	per 1000 products issued
Grand Total	3	4	16	23	29	3	28	60	11	5	##	172	255		
	1%	High		9%	11%	Medium		24%	4%	Low		67%			
	Actual				Actual				Actual						

Lab error detection

78% Near Miss planned

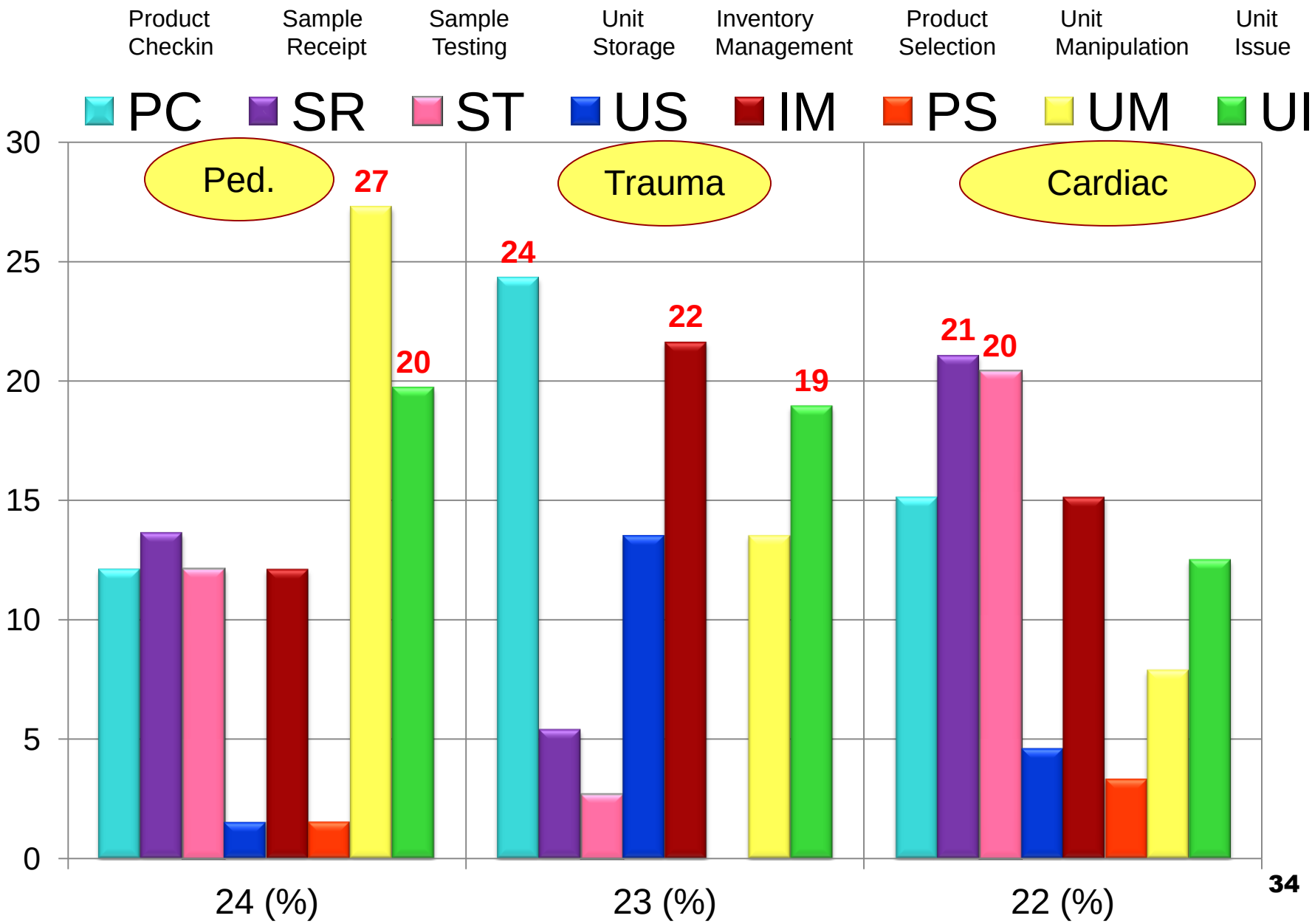
5% Near Miss unplanned

17% No recovery, no harm

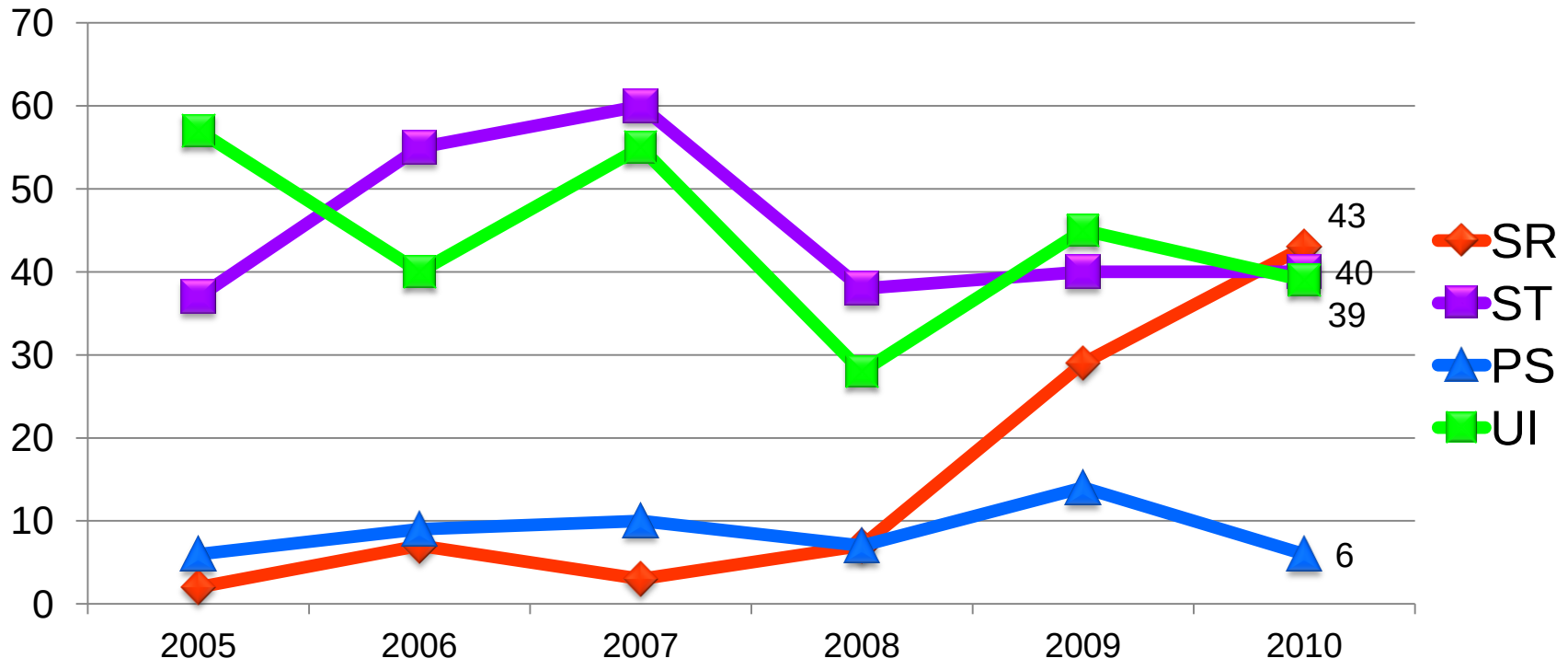
3 High, no recovery:

- Platelet stock not maintained, no platelets available for a trauma case
- Group O platelets issued to neonate without checking group with birth hospital
- ABS entered as Neg. before testing, transfused blood (eXM) before ABS done.

Distribution or lab errors (%)



Transfusion Lab Errors 2005 - 2010



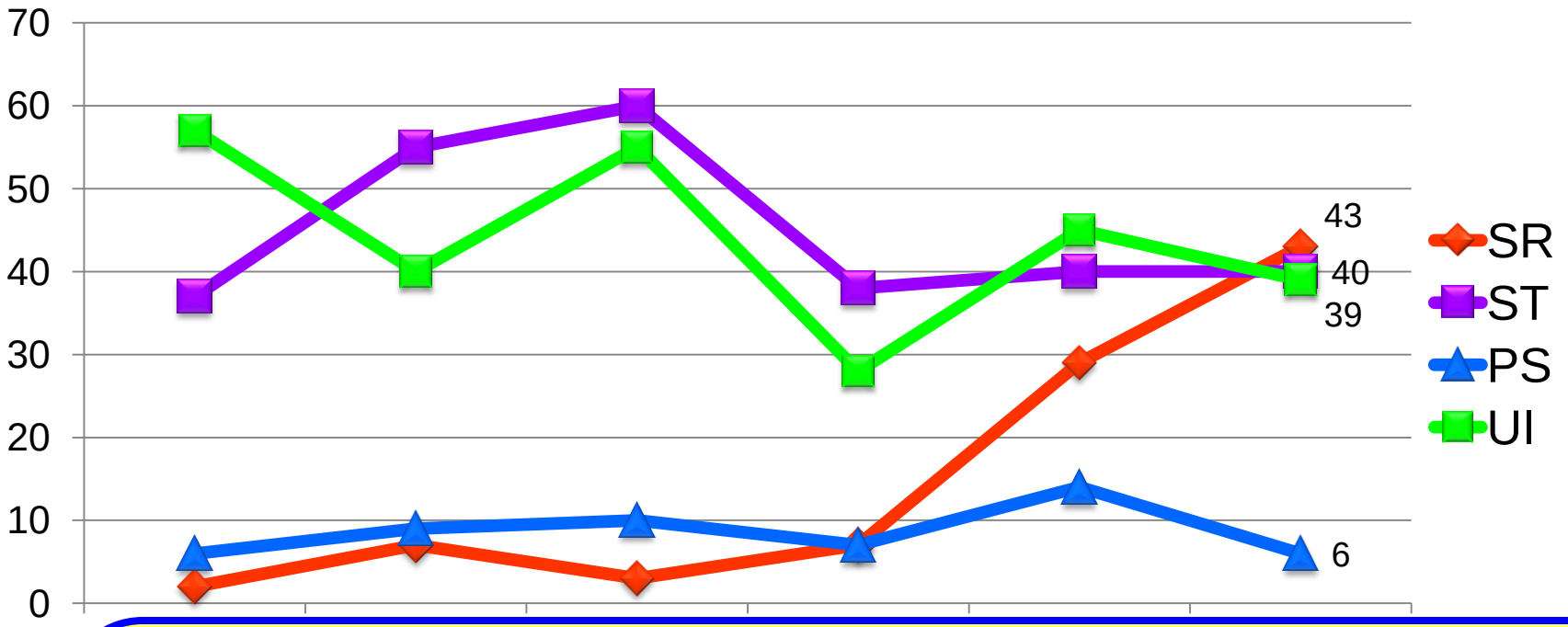
SR Sample receiving – Record check, Directives entry, Tube accept & re-label (**Hi**)

ST Sample testing – Wrong result entered, Test not done (**Hi**)

PS Product selection – 1 wrong product (**Hi**), Directives, dose errors (Lo)

UI Unit issuing – 4 wrong prod, 1 wrong pt, 1 wrong dose (**Hi**),
5 wrong IVIG, 3 prod/voucher mismatch (Med), Various other (Lo)

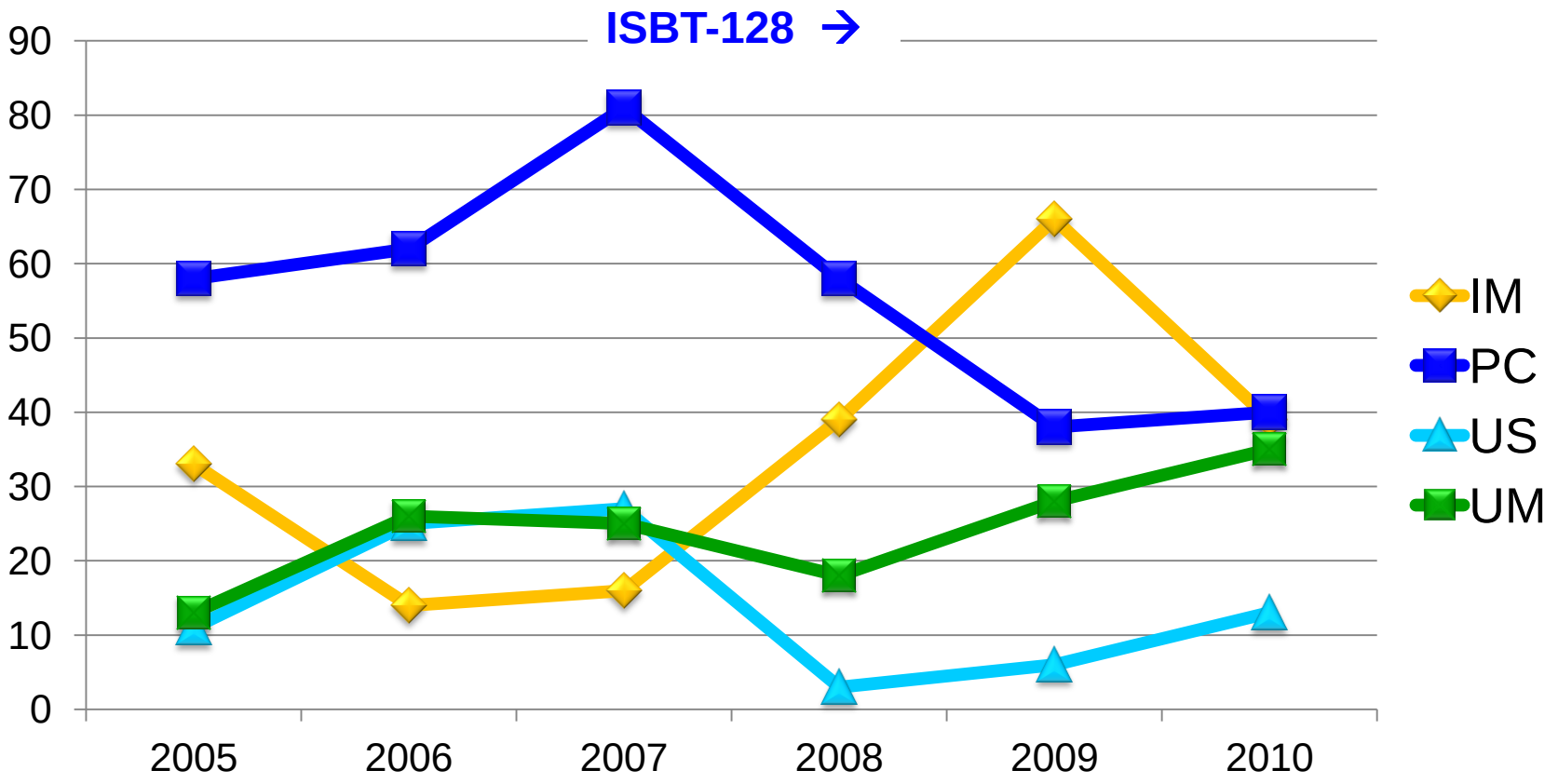
Transfusion Lab Errors 2005 - 2010



SR
ST
PS
UI

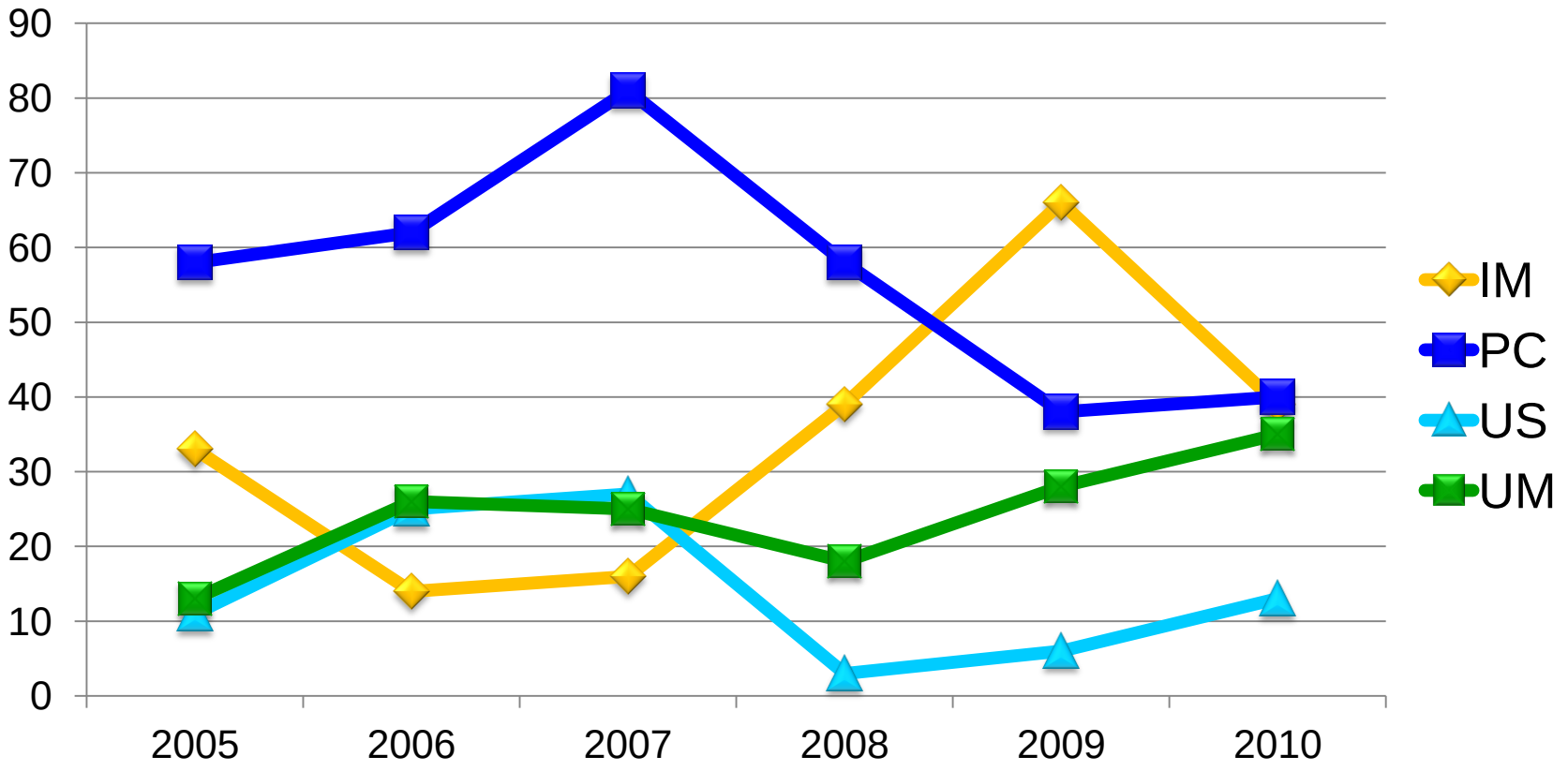
1. **Revised SOP on sample acceptance, registration, and record check in TL & ST to emphasize / clarify ;**
   - **Criteria to enter directives from ST (Quebec's transfusion database)**
   - **Obligation to verify the baby's history at birth hospital**
2. **Added "Verification ST" as a reflex test after 2nd group done on new patients & to check all, not just the group**

Transfusion Lab Errors 2005 - 2010



- **IM** Inventory Management - Ordering errors, product update entry errors (**Hi**-Lo)
- **PC** Product Check in - Wrong lot#, expiry dates, quantity received (Lo)
- **US** Unit Storage – Product misplacement, monitoring gaps (Lo)
- **UM** Unit Manipulation – Damage during transformation, TL entry error (Lo)

Transfusion Lab Errors 2005 - 2010



IM Inventory Management - Ordering errors, product update entry errors (**Hi**-Lo)

PC

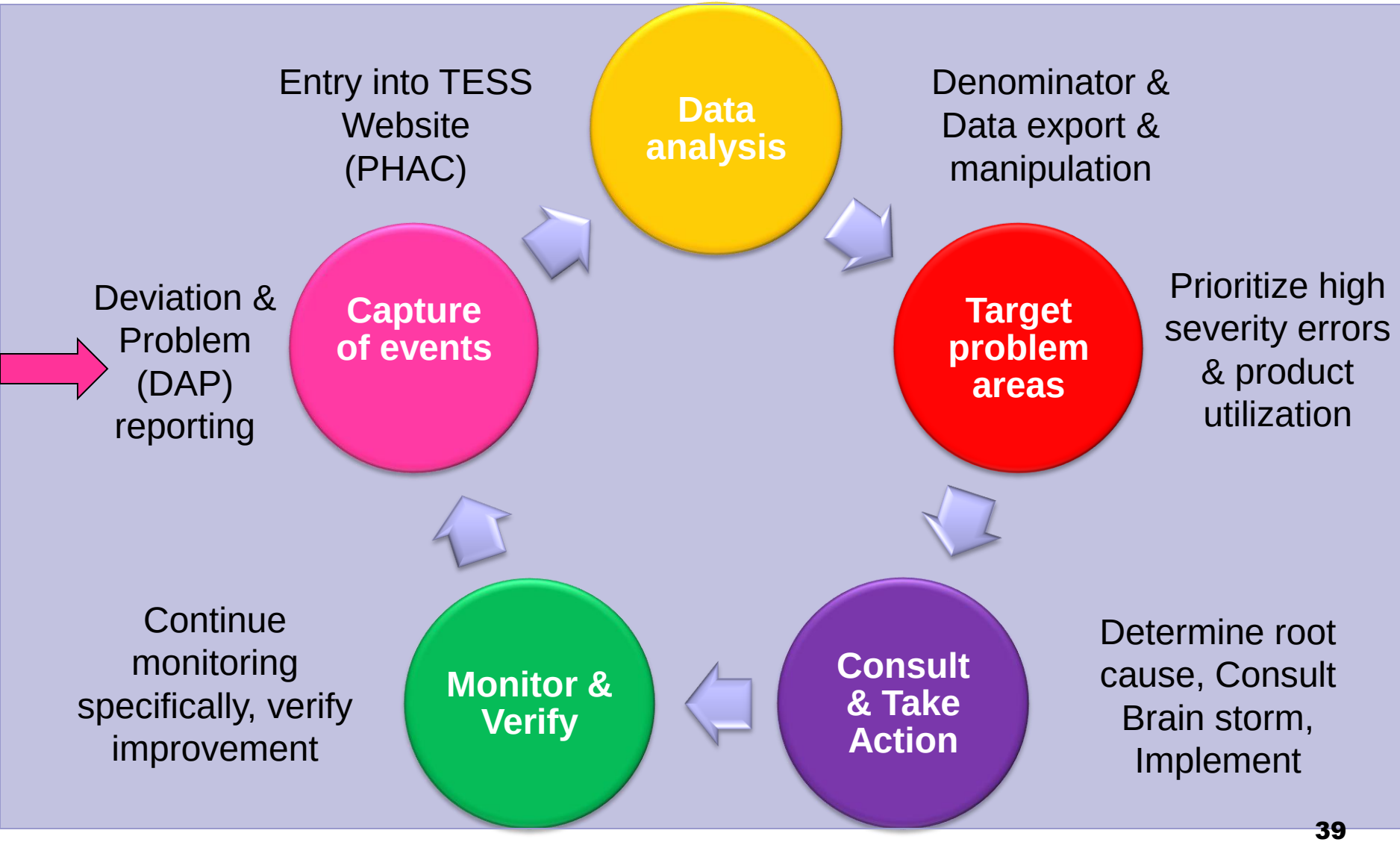
US

UM

Increased Platelet inventory at Adult Trauma Centre

Memo : All staff responsible to monitor/order platelets.

→ Continuous Quality Improvement



Thank you !

MUHC technologists who faithfully report errors and problems

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