FIGURES FROM THE ANNUAL SHOT REPORT 2025

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SHOT Serious Hazards of Transfusion

Figure 2.1: Haemovigilance reports submitted by year with reports per 1,000 blood components issued 2010-2025

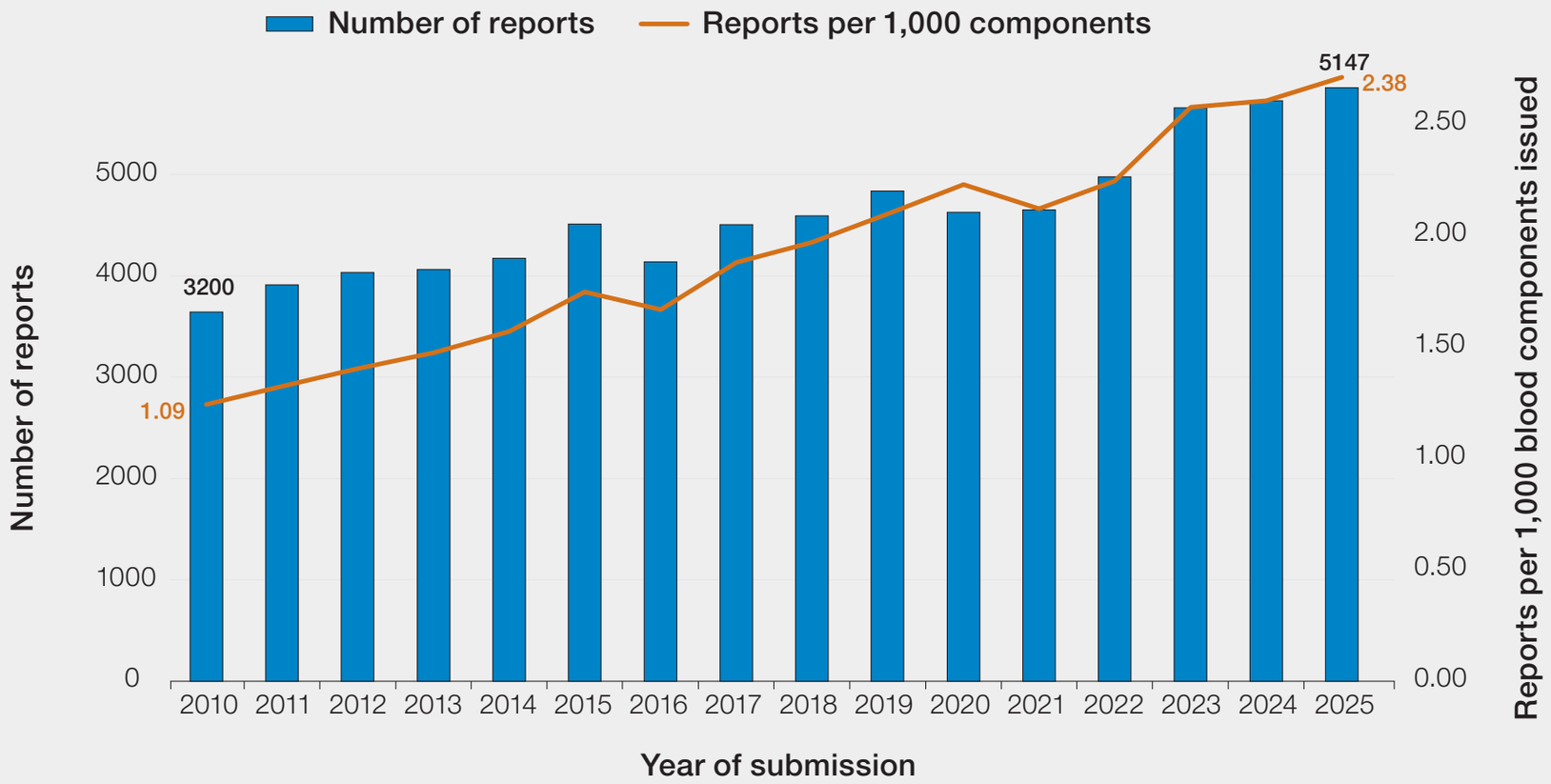
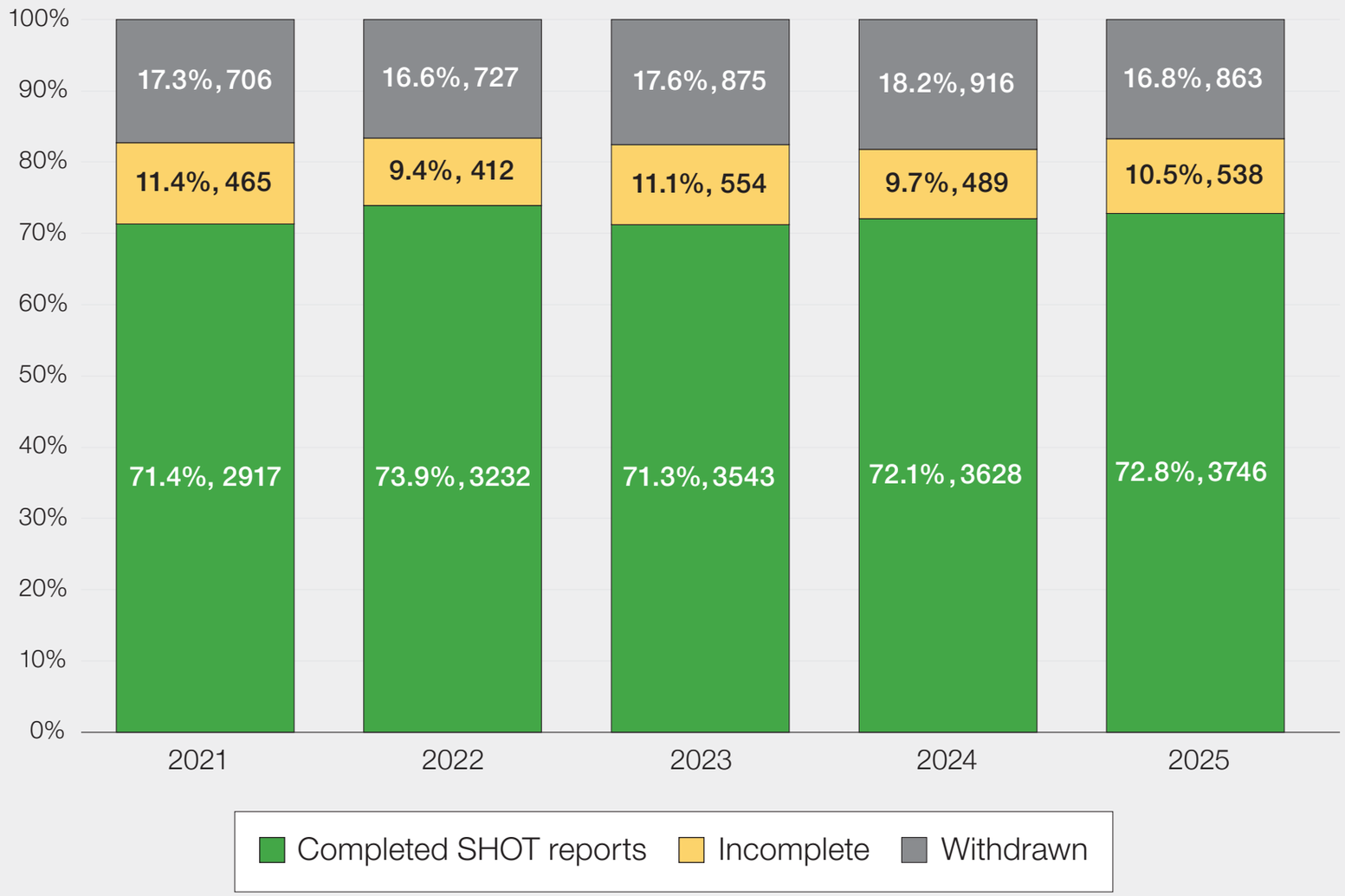


Figure 2.2: The status of reports submitted to SHOT 2021-2025



The number of completed SHOT reports includes anti-D immunisation reports, acknowledging continuing excellence in transfusion (ACE) reports from 2023, and Blood Service reports from August 2025

Figure 2.3: Number of reports completed by month in 2025

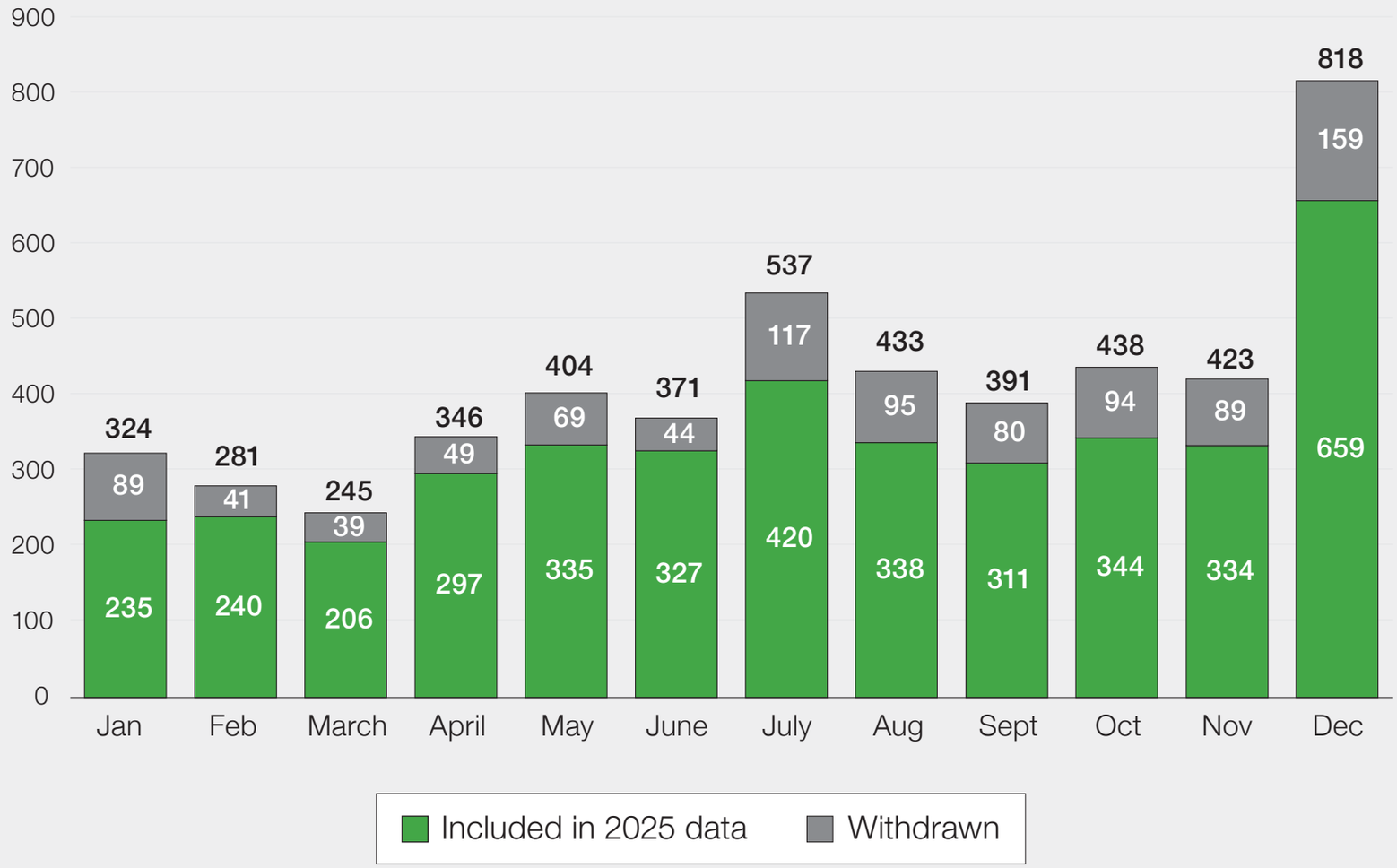


Figure 2.4: Using SHOT participation benchmarking data to drive improvements

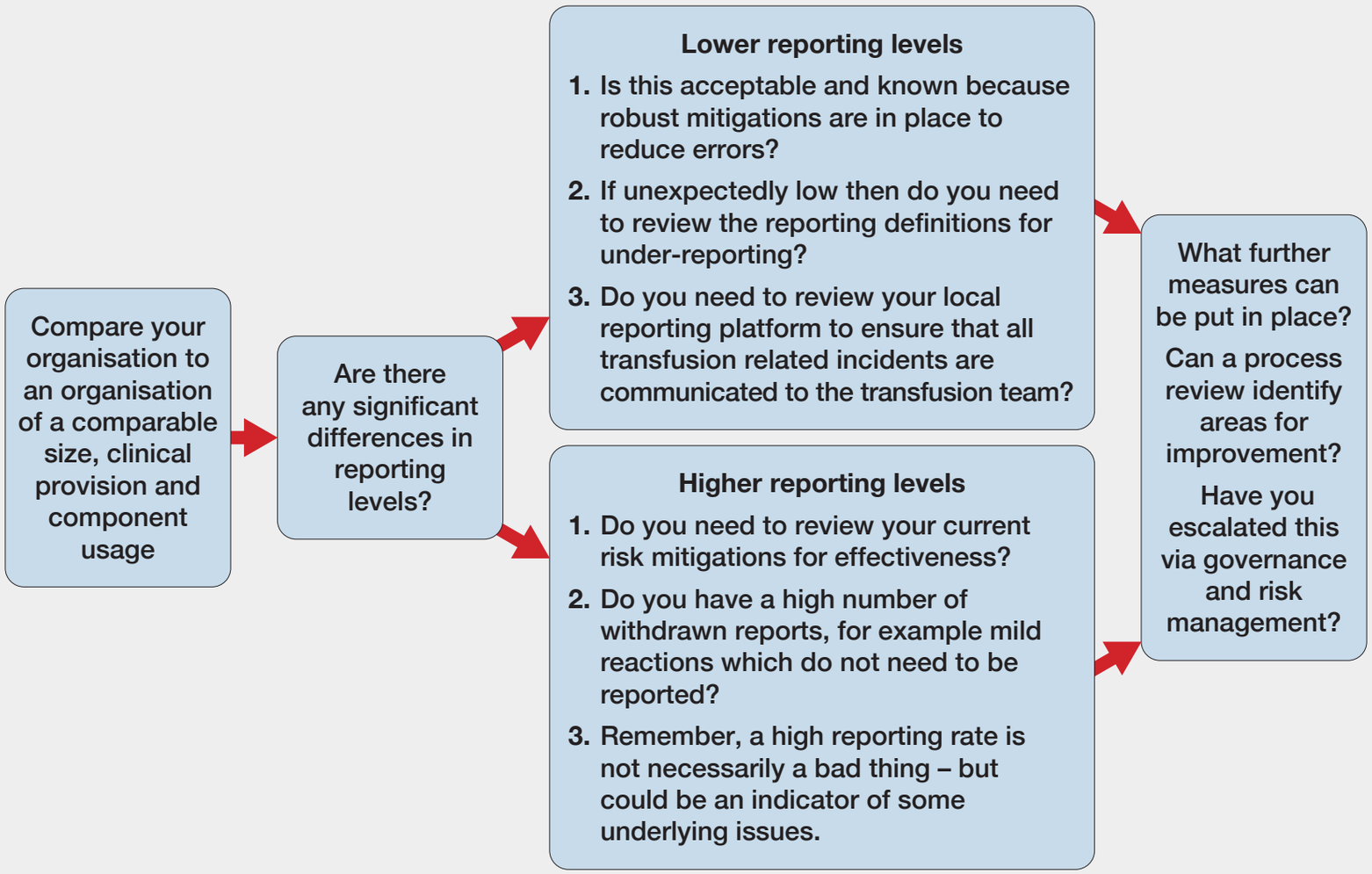


Figure 3.1: Errors account for most reports in 2025 (n=3358/4046)

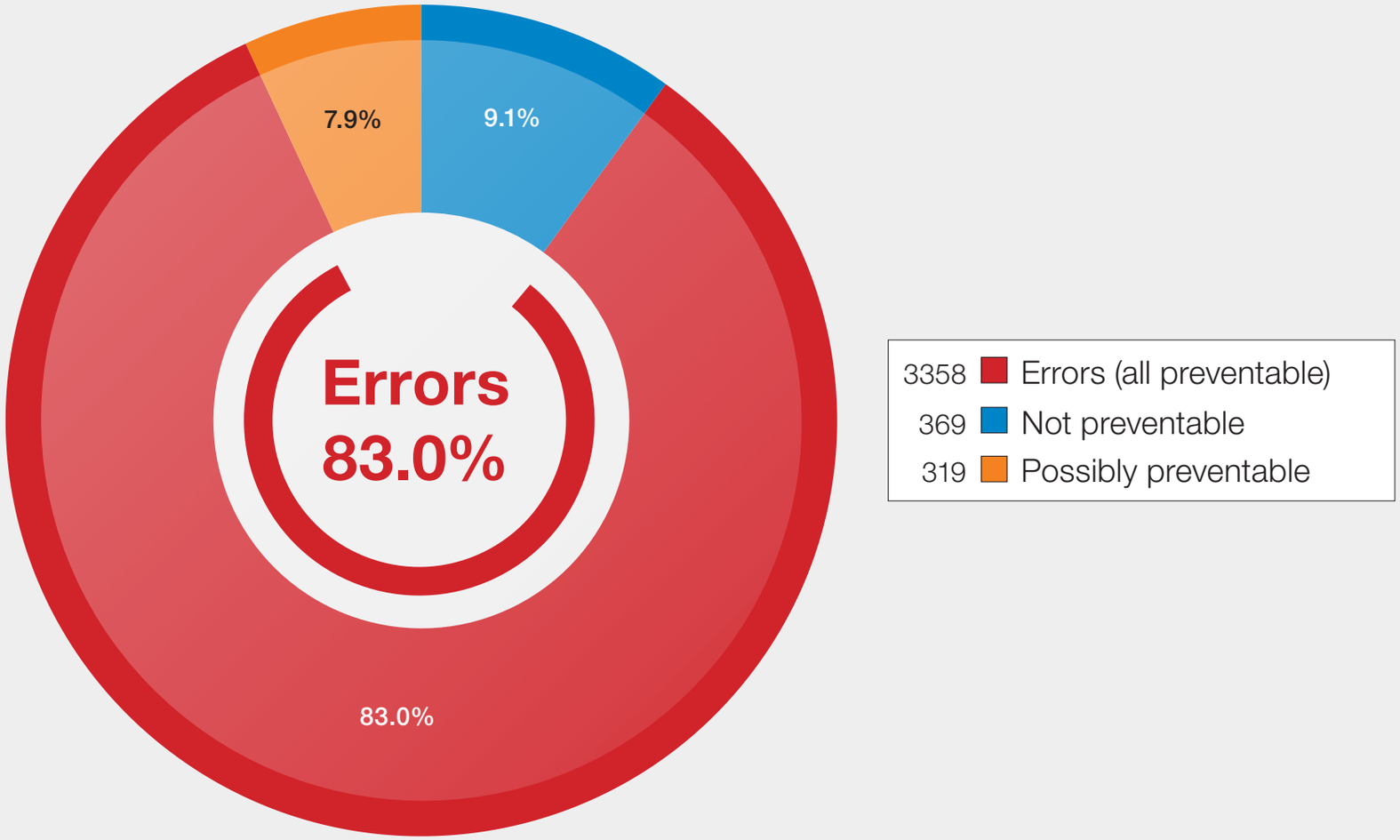
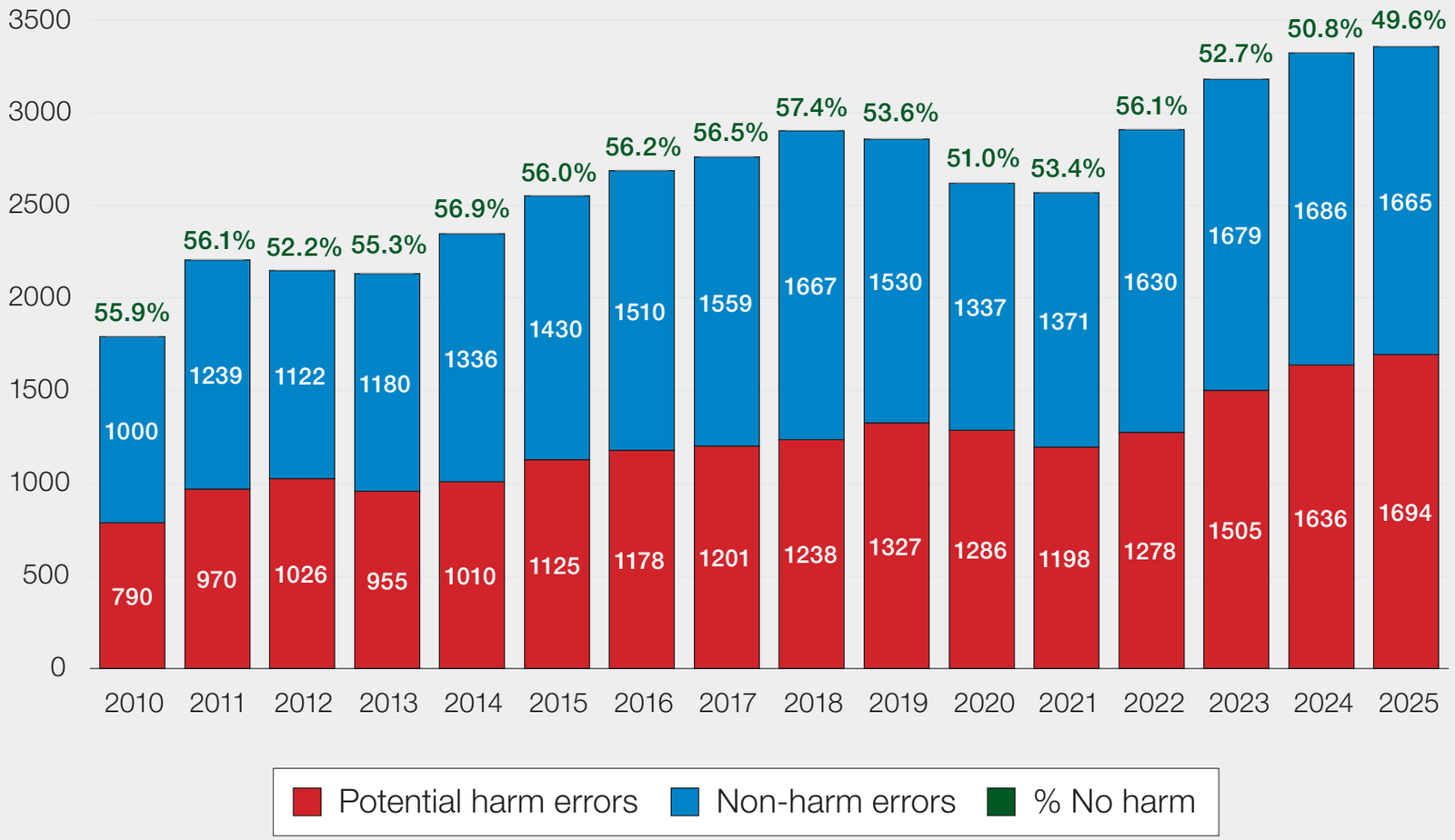
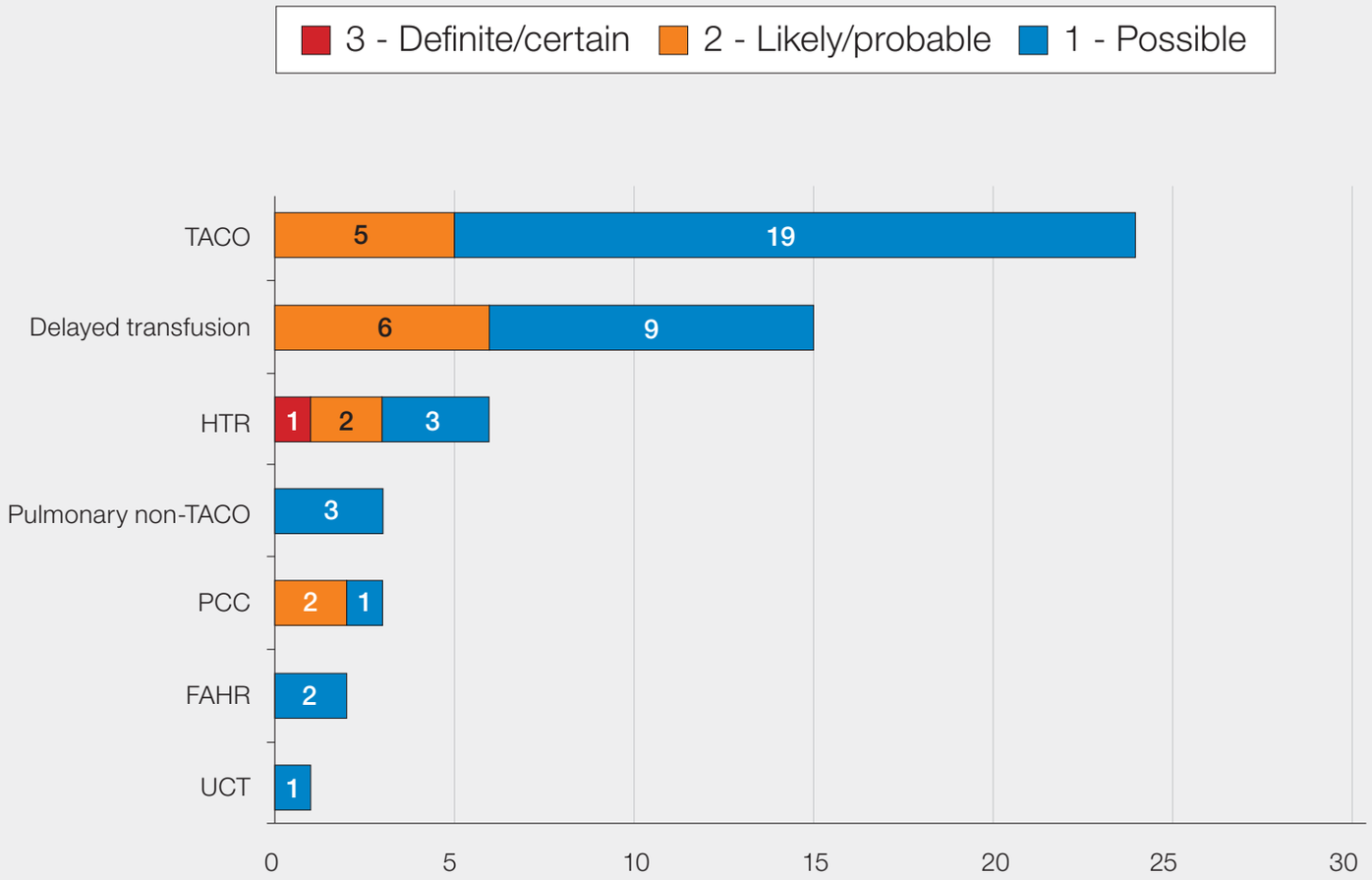


Figure 3.2: No patient-harm and potential patient-harm incidents 2010-2025



Potential harm incidents include incorrect blood component transfused (IBCT) errors, delayed transfusion, avoidable transfusion, under or overtransfusion, incidents related to prothrombin complex concentrates, handling and storage errors (HSE) and errors related to anti-D immunoglobulin administration. Non-harm incidents include near miss (NM) and right blood right patient (RBRP) errors

Figure 3.3: Deaths related to transfusion with imputability reported in 2025 (n=54)



FAHR=febrile, allergic or hypotensive reactions; HTR=haemolytic transfusion reactions; PCC=prothrombin complex concentrates; TACO=transfusion-associated circulatory overload; UCT=uncommon complications of transfusion

Figure 3.4: Deaths related to transfusion with imputability reported 2010-2025 (n=433)

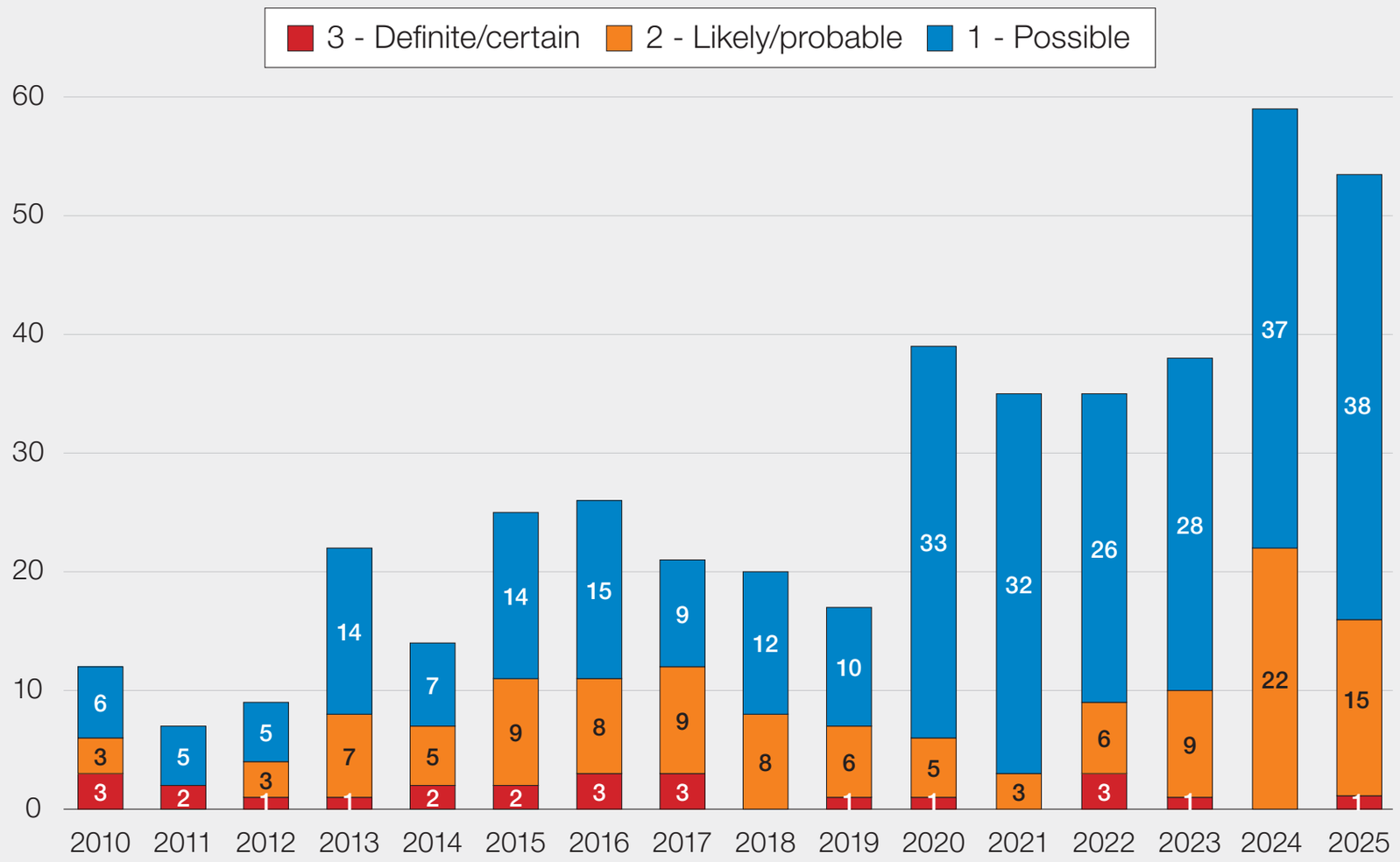
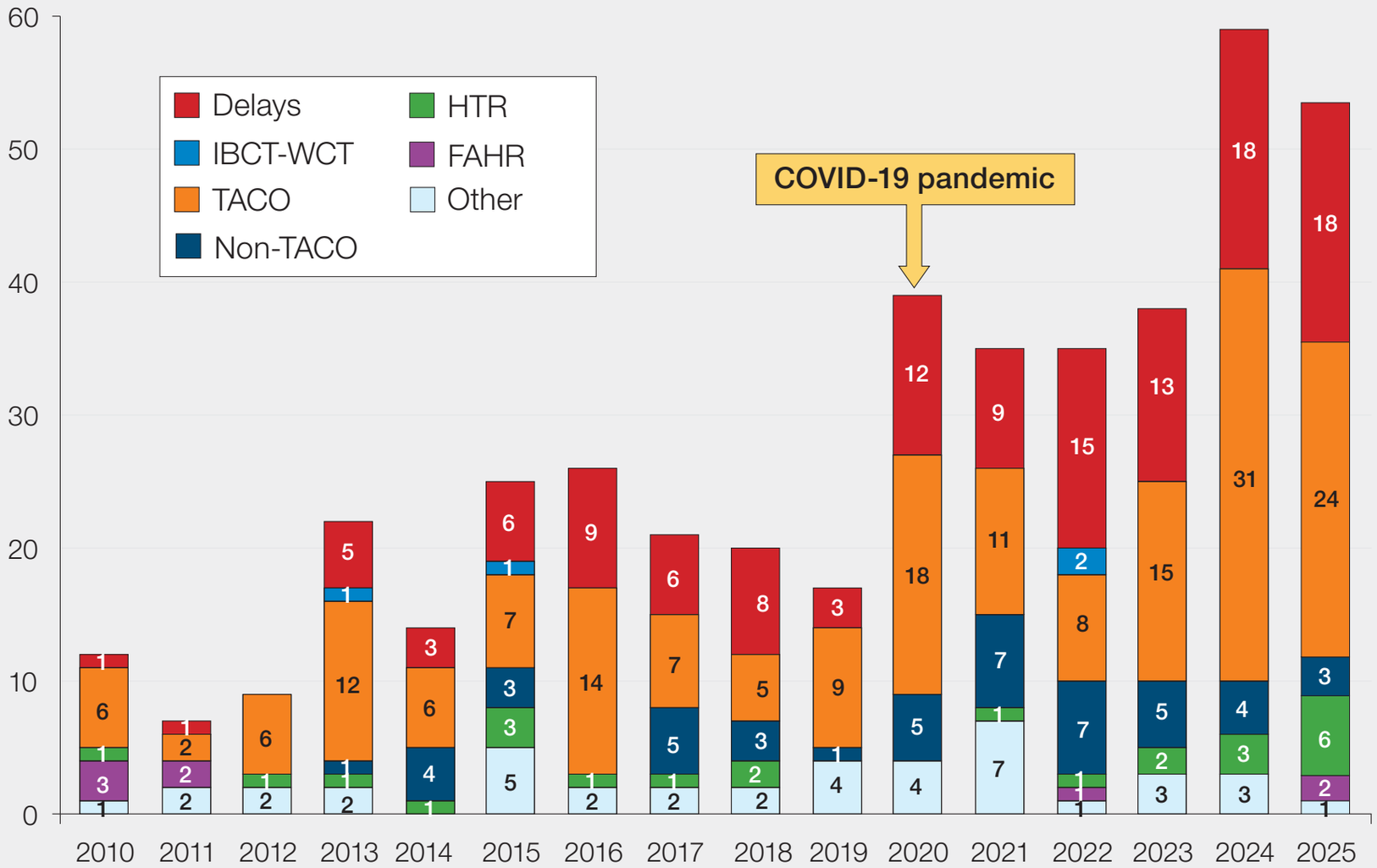
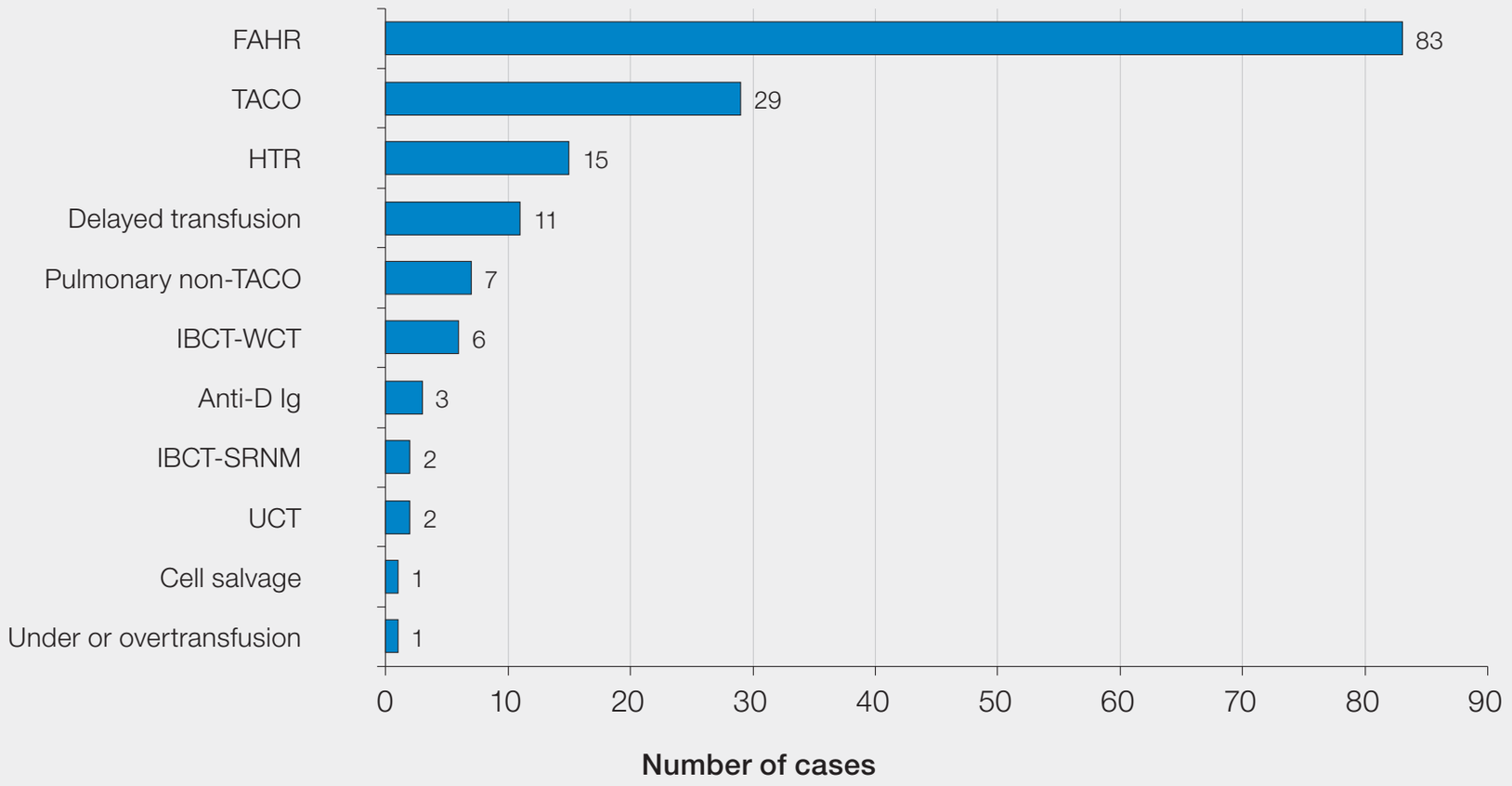


Figure 3.5: Transfusion-related deaths by SHOT category, 2010 to 2025 (n=433)



FAHR=febrile, allergic, and hypotensive reactions; HTR=haemolytic transfusion reaction; IBCT-WCT=incorrect blood component transfused-wrong component transfused; TACO=transfusion-associated circulatory overload; Delays include 1 delay related to PCC in 2019, 2 in 2022, 4 in 2023 and 3 in 2025; 'Other' includes 1 each for post-transfusion purpura, transfusion-associated graft-versus-host disease (2012) and anti-D Ig related; there were 11 in the avoidable, over or undertransfusion category, 3 transfusion-transmitted infections, and 24 deaths related to other unclassified reactions

Figure 3.6: Ranking of categories to show number of major morbidity in 2025 (n=160)



FAHR=febrile, allergic, and hypotensive reactions; HTR=haemolytic transfusion reactions; IBCT-SRNM=incorrect blood component transfused-specific requirements not met; IBCT-WCT=IBCT-wrong component transfused; Ig=immunoglobulin; PCC=prothrombin complex concentrates; TACO=transfusion-associated circulatory overload; UCT=uncommon complications of transfusion

Figure 3.7: Summary data for 2025, all categories (includes RBRP and NM) (n=4046)

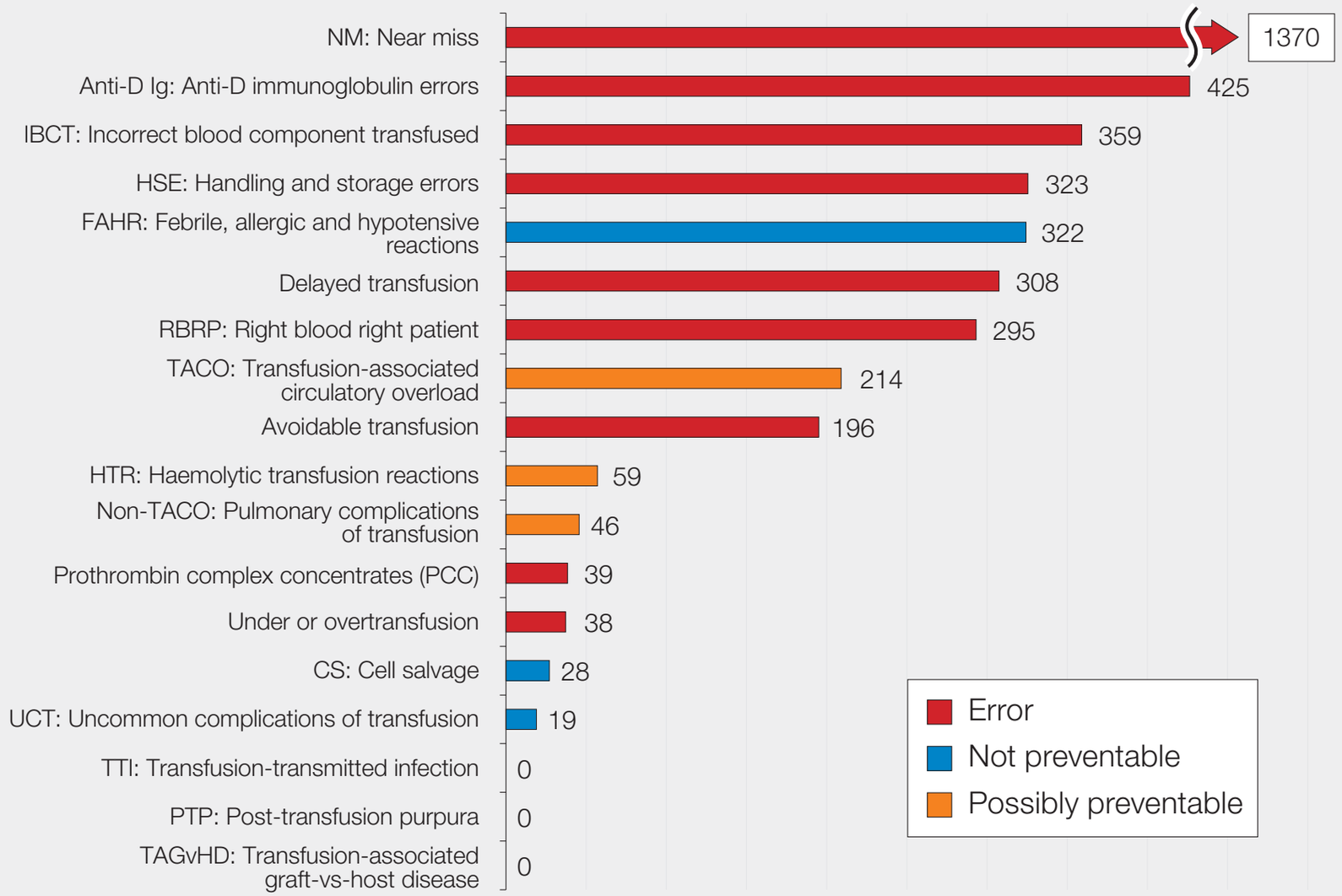
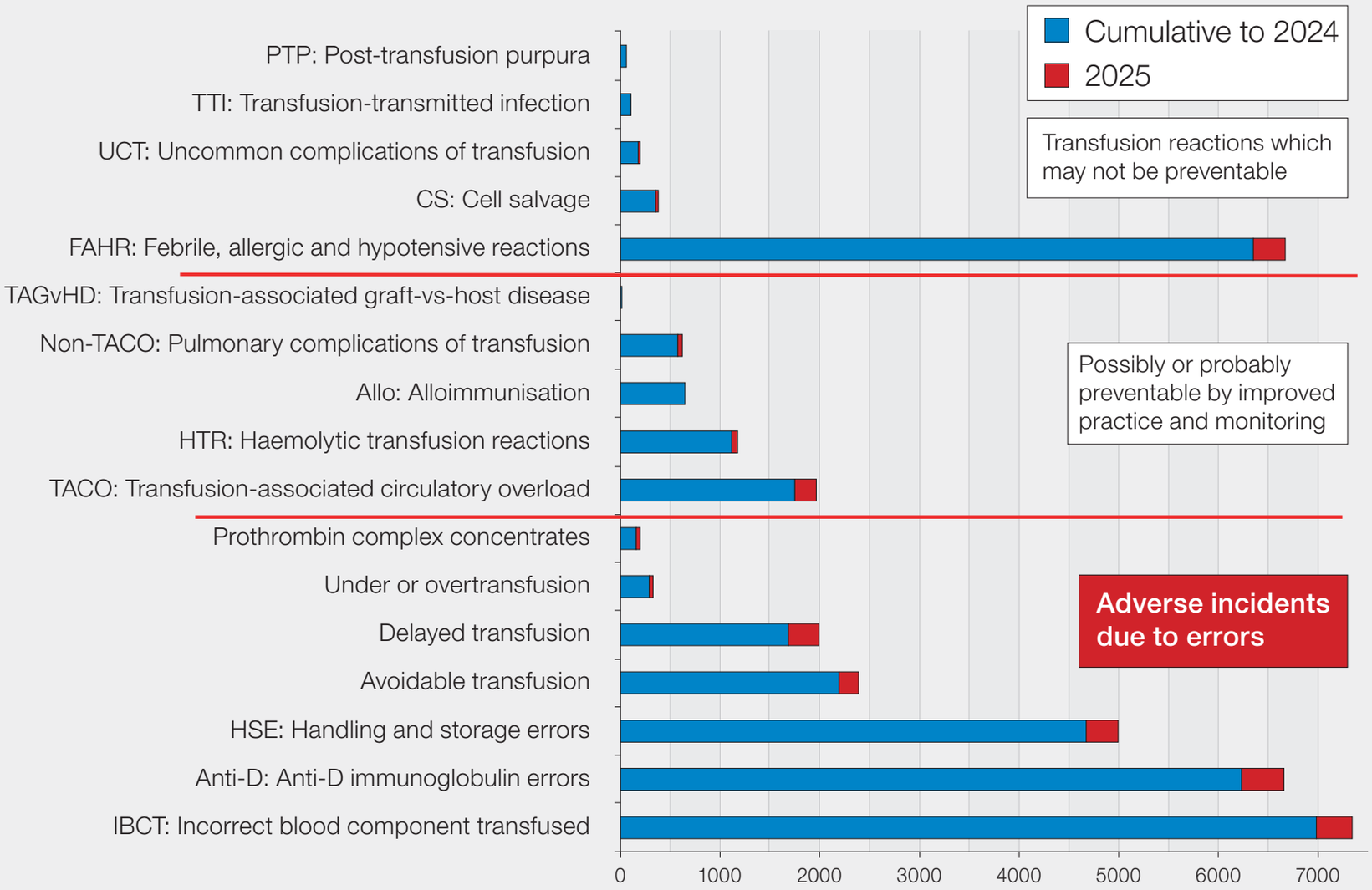


Figure 3.8: Cumulative data for SHOT categories 1996-2025 (n=35724)



Data on alloimmunisation has not been collected by SHOT since 2015

Figure 3.9: Number of ABO-incompatible (ABOi) transfusions 2015-2025

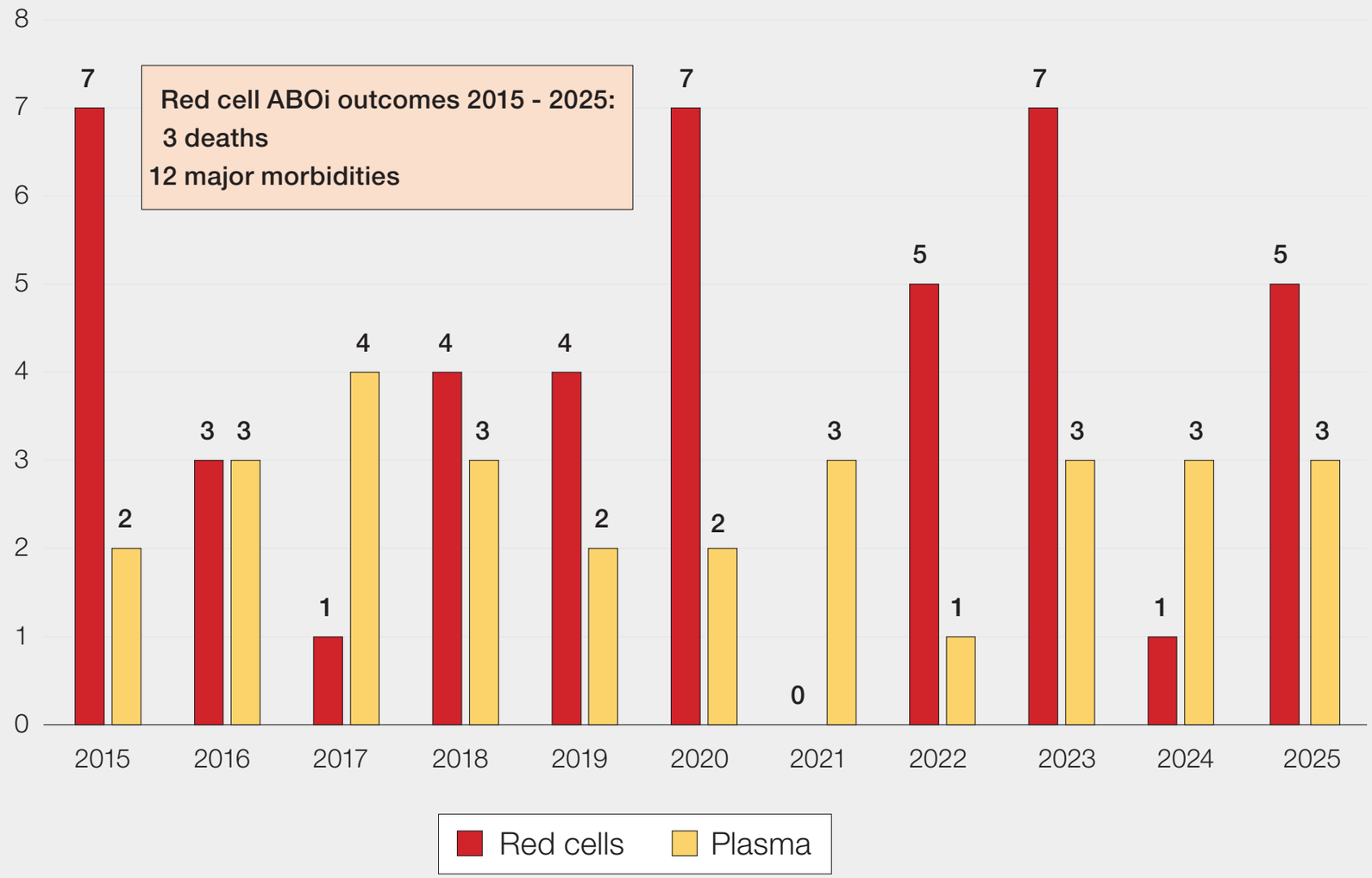


Figure 3.10: ABO-incompatible red cell transfusions by step in the transfusion process 2015-2025 (n=44)

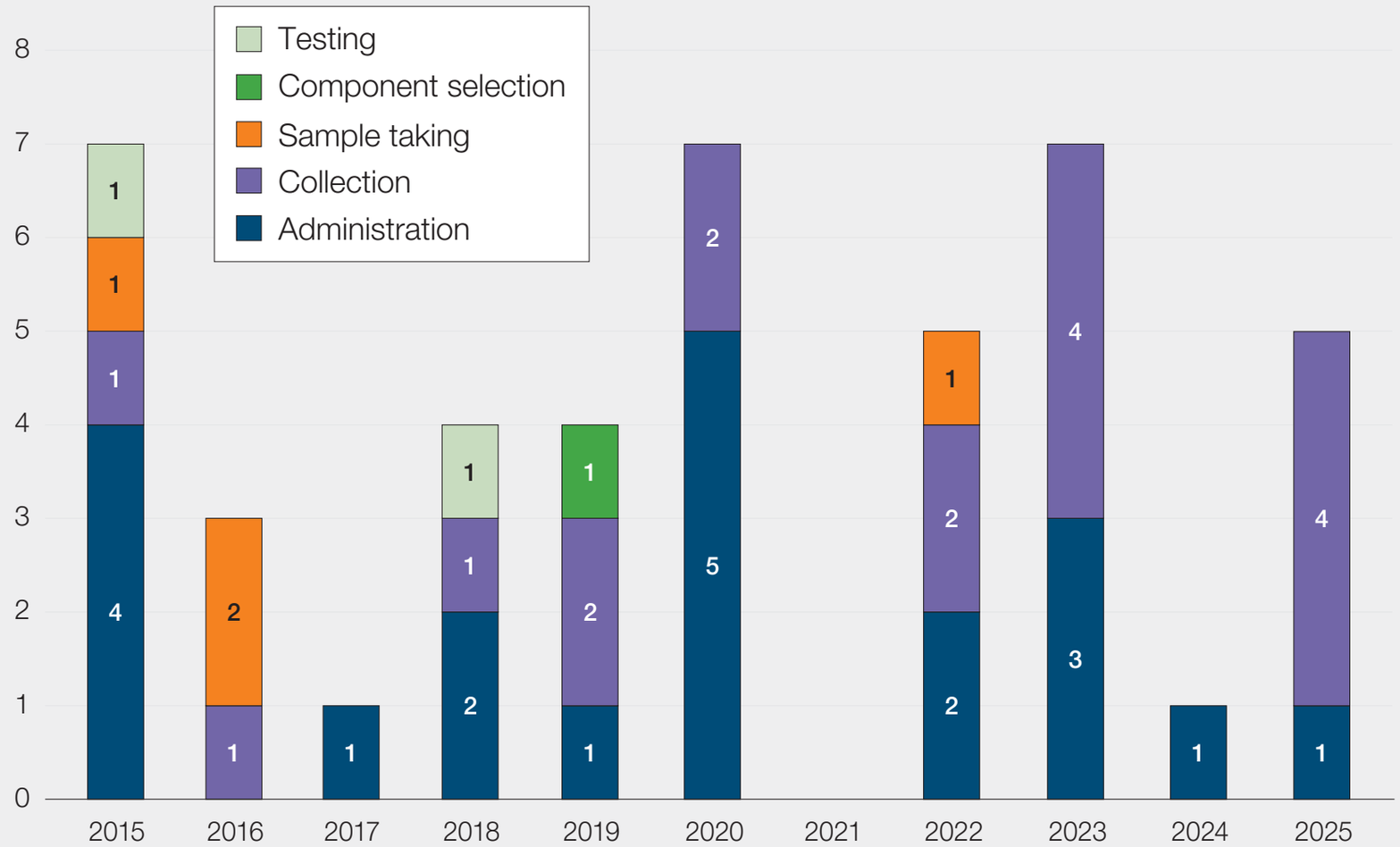


Figure 3.11: ABO-incompatible red cell transfusions 2016-2025: few events (n=37) but many near misses (n=2949)

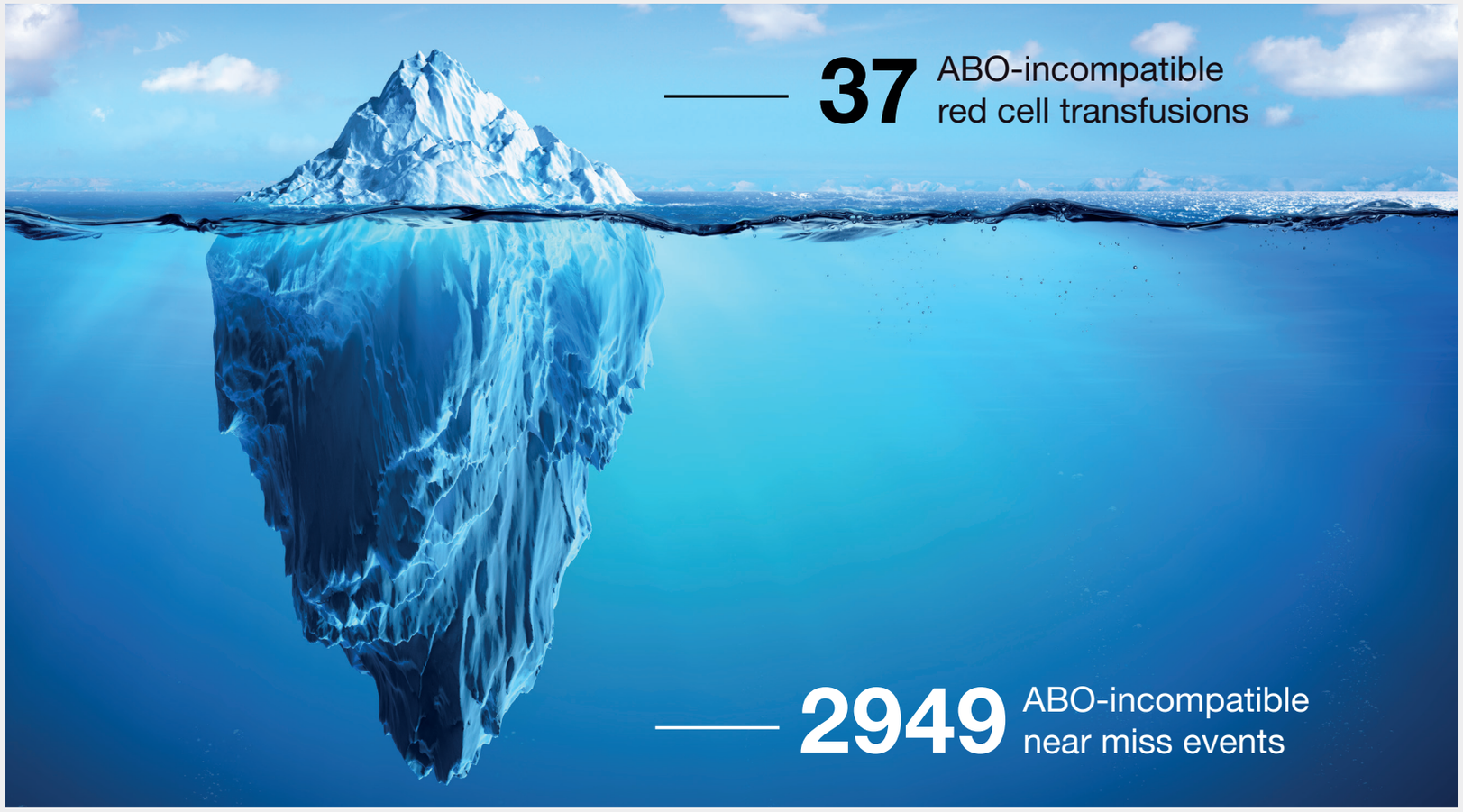


Figure 3.12: Hierarchy of interventions and their effectiveness in healthcare

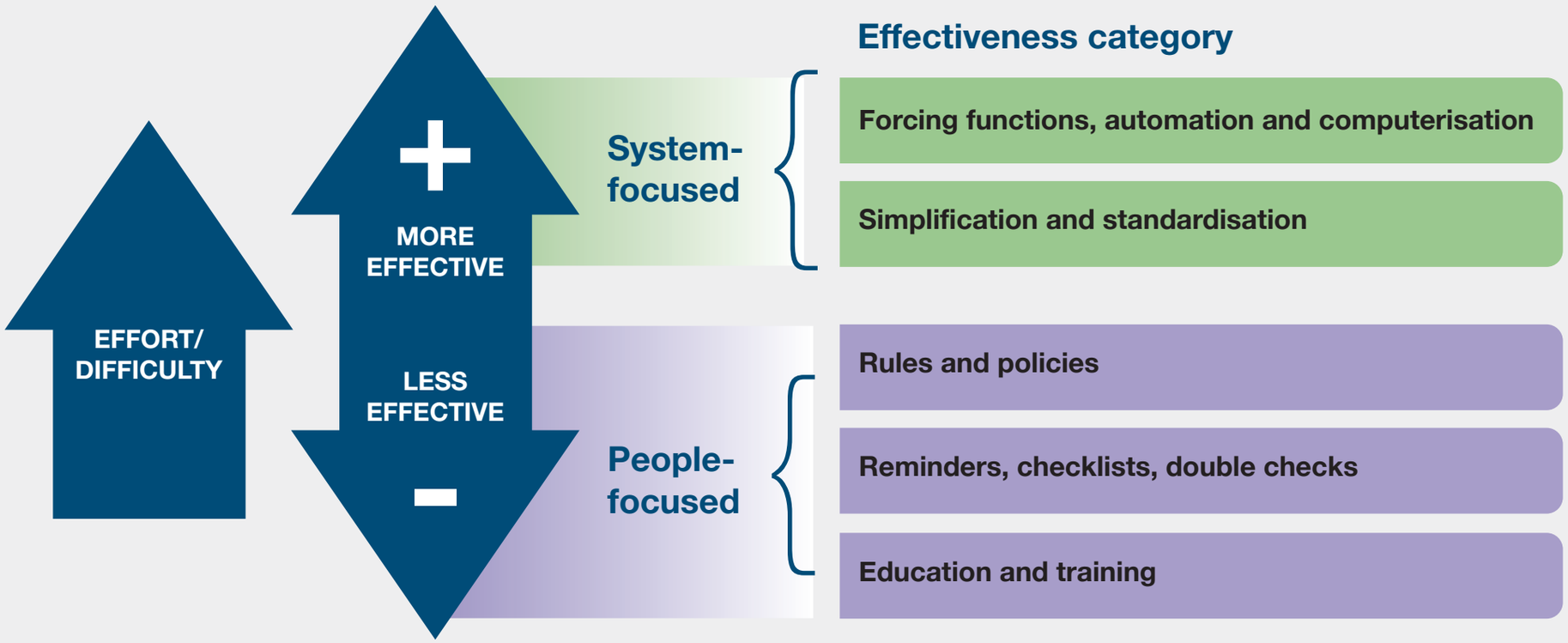


Figure 4.1: The core domains of the SHOT Transfusion Safety Standards

Figure 4.2: SHOT Transfusion Safety Standards: key strengths, weaknesses and implementation challenges

Strengths	Weaknesses	Implementation challenges
Breadth of the standards - covering clinical and laboratory aspects and all 10 steps in the transfusion pathway	SHOT's lack of regulatory authority	Work pressures
Alignment with national priorities and addressing gaps identified in the Infected Blood Inquiry report	Resource challenges and lack of additional funding for service improvements	Digital disparities
Grounded in decades of haemovigilance data	Reliance on variable haemovigilance reporting	Leadership issues
Emphasis on system design and human factors	Risk of organisations misusing the standards as checklists rather than dynamic tools	Organisational culture

Figure 4.3: From incident to improvement

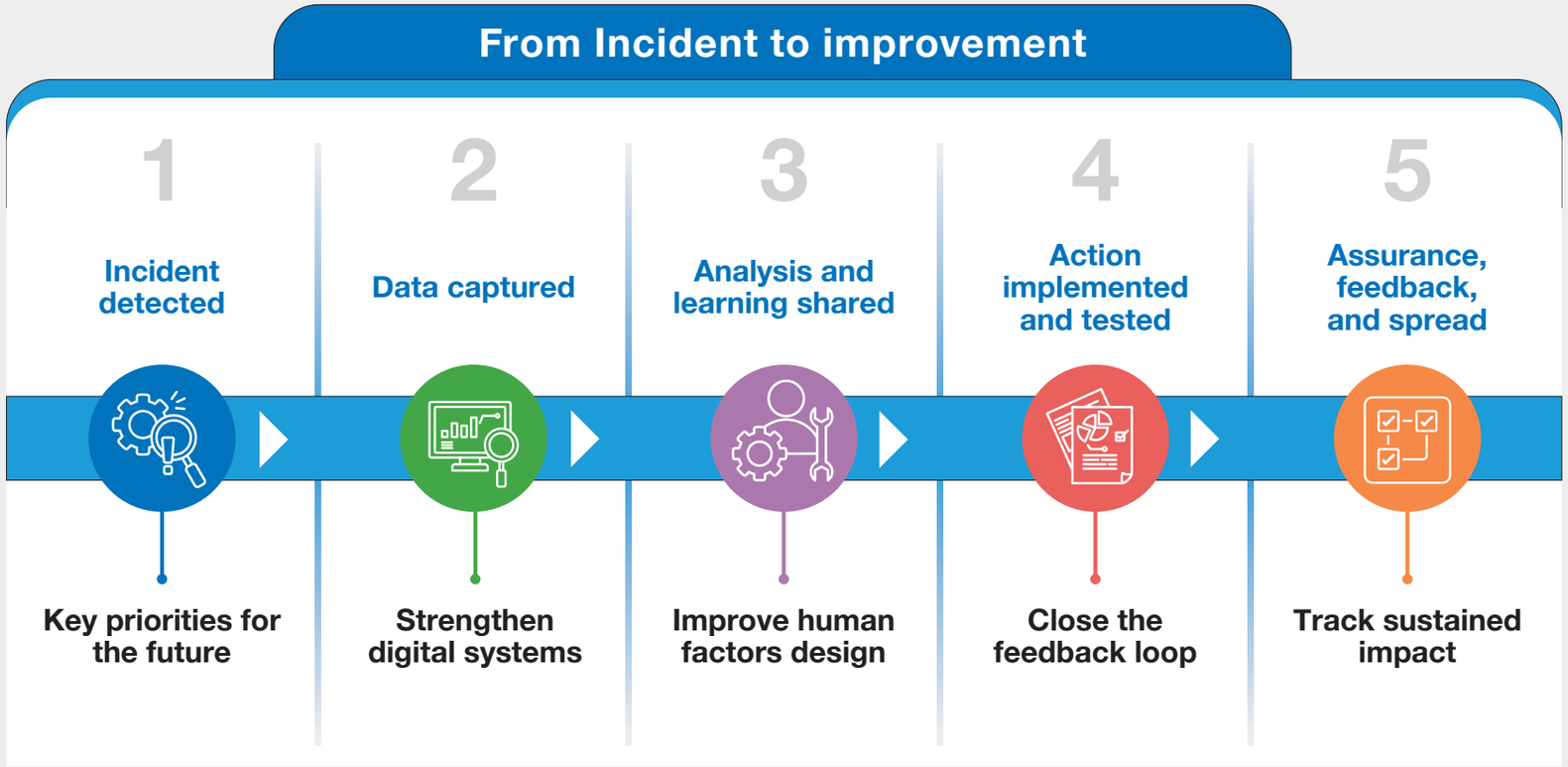


Figure 5.1: Visualising excellence: word cloud themes from ACE reports (2022–2025)

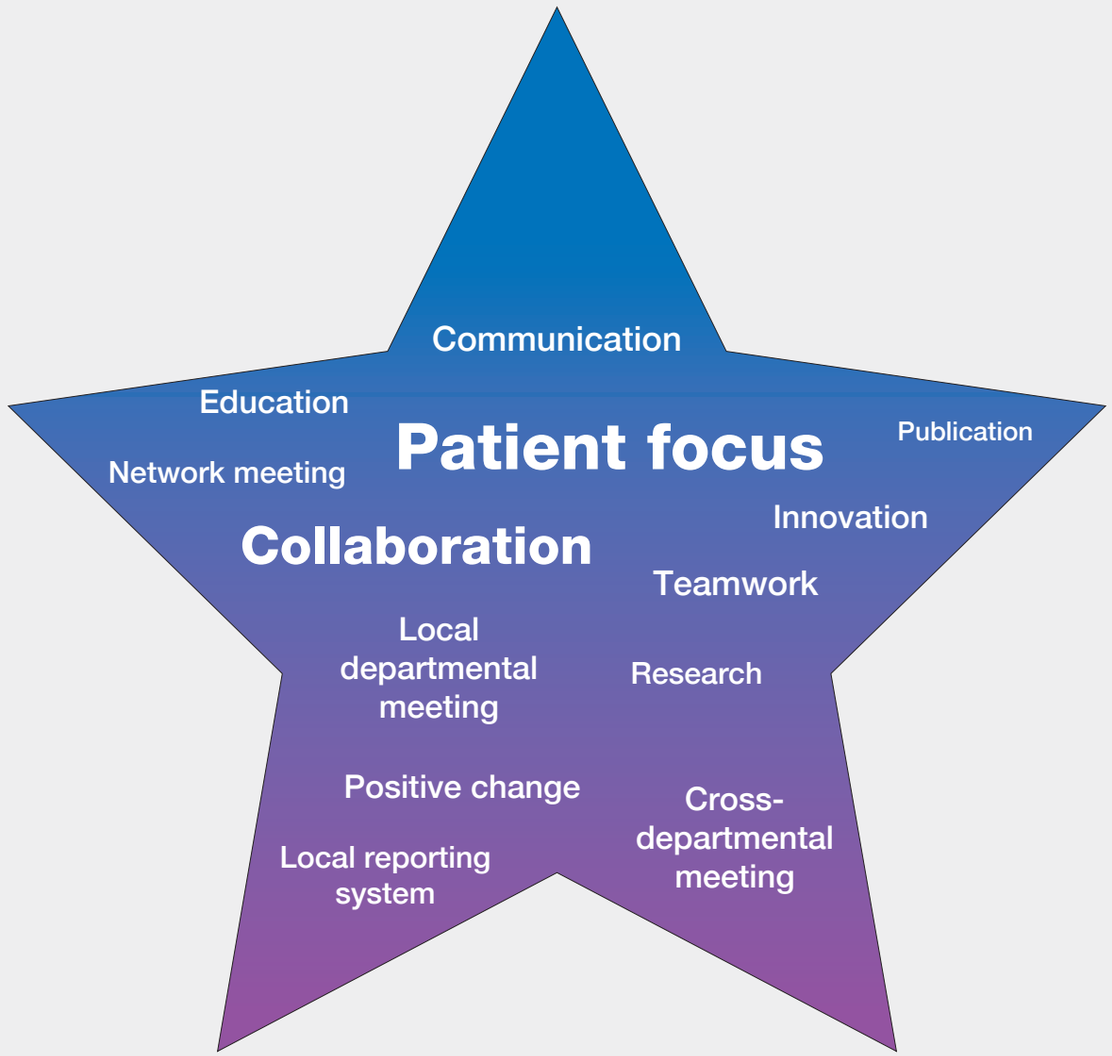
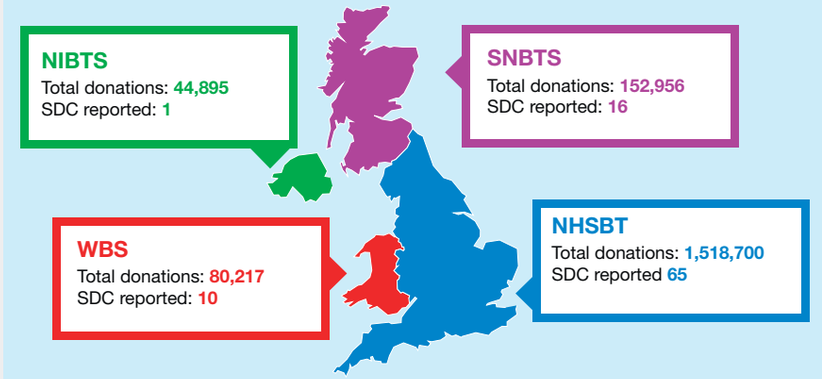


Figure 5.2: Learning from excellence: the ripple effect on practice

Serious adverse events following blood donation reported to the UK Blood Services in 2025

The UK Blood Services, through the good will and altruism of blood donors, collected a total of 1,796,768 donations in the calendar year 2025. The rate of serious donor complications (SDC) was 0.51 per 10,000 donations, irrespective of imputability. While this is higher than recent years (0.29 per 10,000 donations in 2023, 0.43 per 10,000 donations in 2024), it must be interpreted with caution due to the changes in recording of donor complications.

Recommendation 1	All United Kingdom (UK) Blood Services must ensure that donors understand the importance of reporting any adverse events related to donation, particularly those that occur after leaving the donation session.
Recommendation 2	Blood Services should continue to develop, share, and apply learning to promote best practice in the prevention and management of donor adverse events.
Recommendation 3	Blood Services should work collaboratively to improve understanding of current practices for recording and managing donor adverse events, and to address any variation between services. This will support benchmarking, strengthen consistency, and enable the implementation of evidence-based improvements.

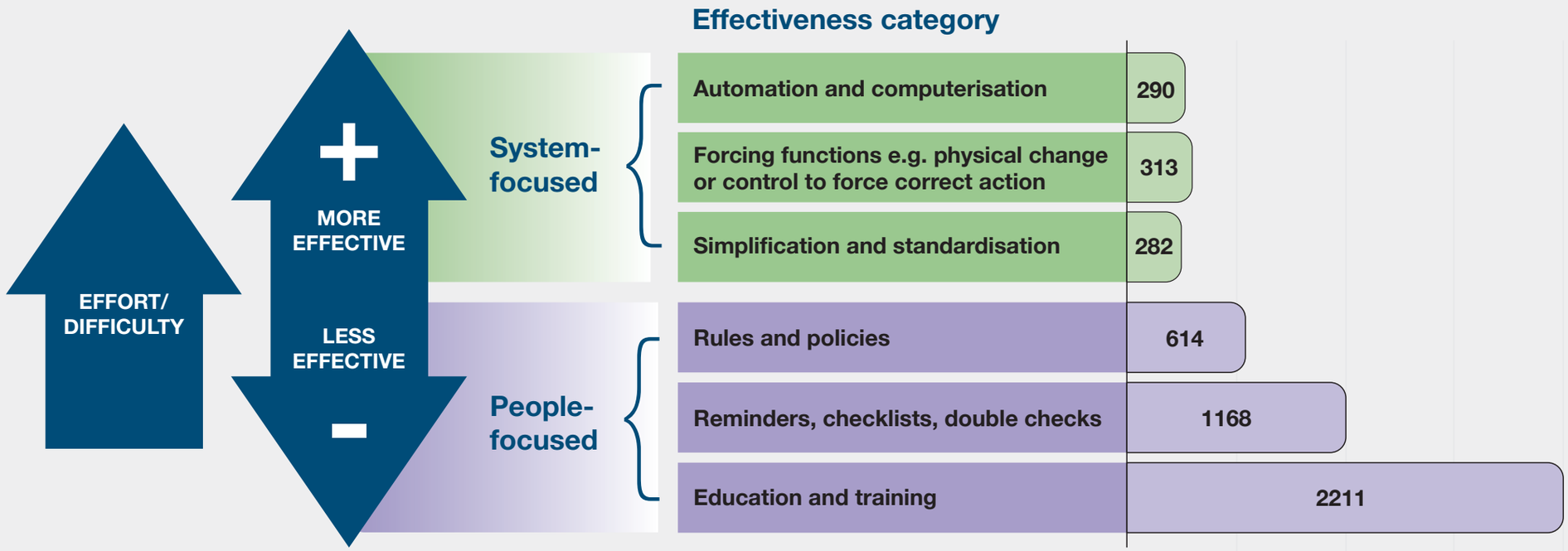


NHSBT=National Health Service Blood and Transplant; NIBTS=Northern Ireland Blood Transfusion Service; SNBTS=Scottish National Blood Transfusion Service; WBS=Welsh Blood Service

Key messages:

1. High-quality donor care requires that donors are informed of the material risks associated with blood donation, that appropriate measures are taken to minimise these risks, and that any adverse reactions which do occur are recognised promptly and managed appropriately.
2. Implementation of the severity grading criteria for donor complications continues across the UK. In 2025 the rate of SDC was 0.51 per 10,000 donations in the UK, equivalent to approximately 1 SDC per 19,530 donations. This figure should be interpreted with caution due to changes in the recording of donor adverse events.
3. Arm pain related to needle insertion and vasovagal reactions remain the most commonly reported SDC.

Figure 8.1: Number of improvement interventions by effectiveness category in 2025 (n=4878)



Note: some reports had more than one improvement intervention

Figure 8.2: A comparison of HFIT categories assigned by SHOT reporters in 2022-2025

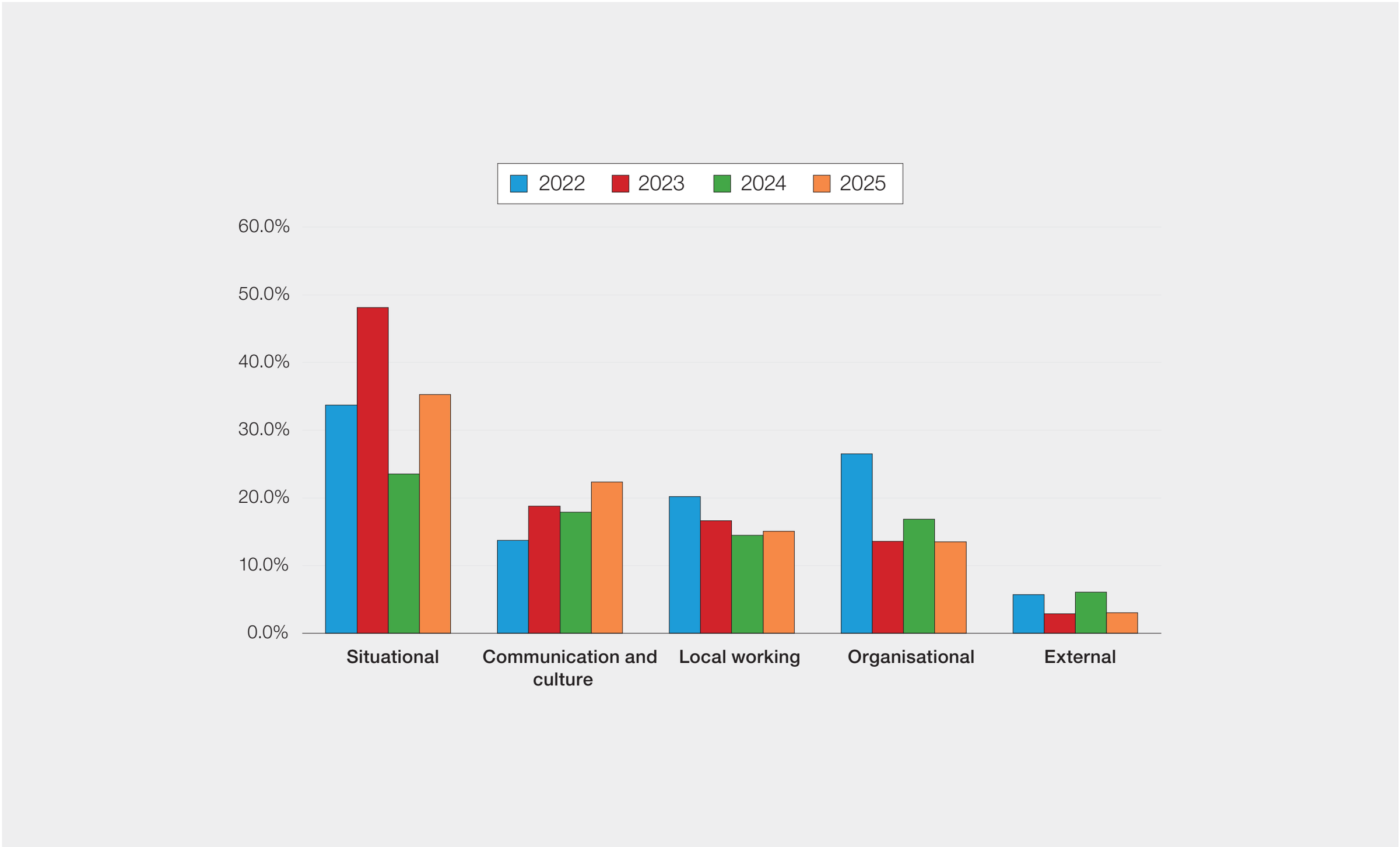


Figure 9.1: Distribution of anti-D immunoglobulin (Ig) related errors reported in 2025 (n=425)

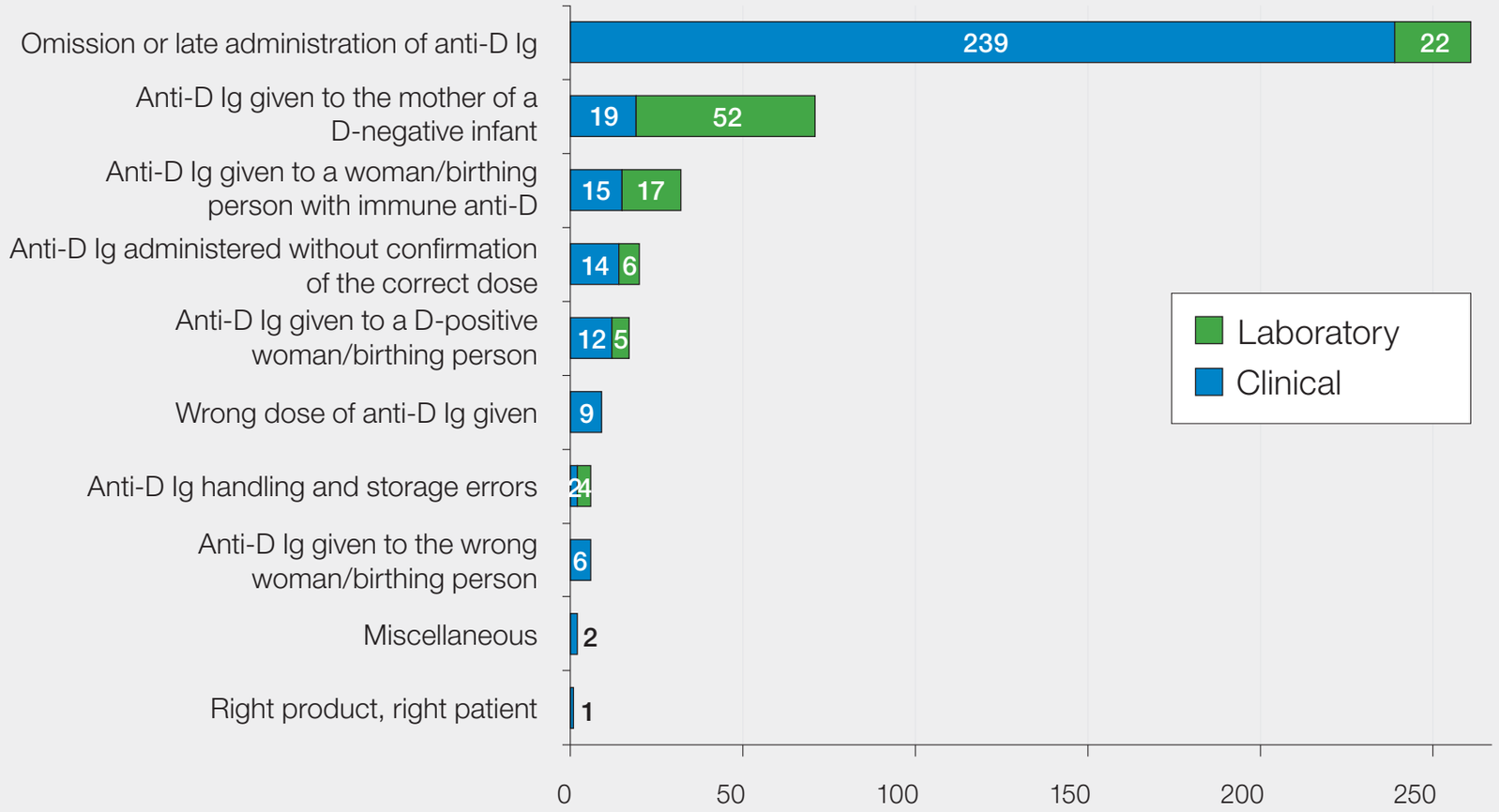


Figure 9.2: The impact of information technology in anti-D Ig errors (n=105)

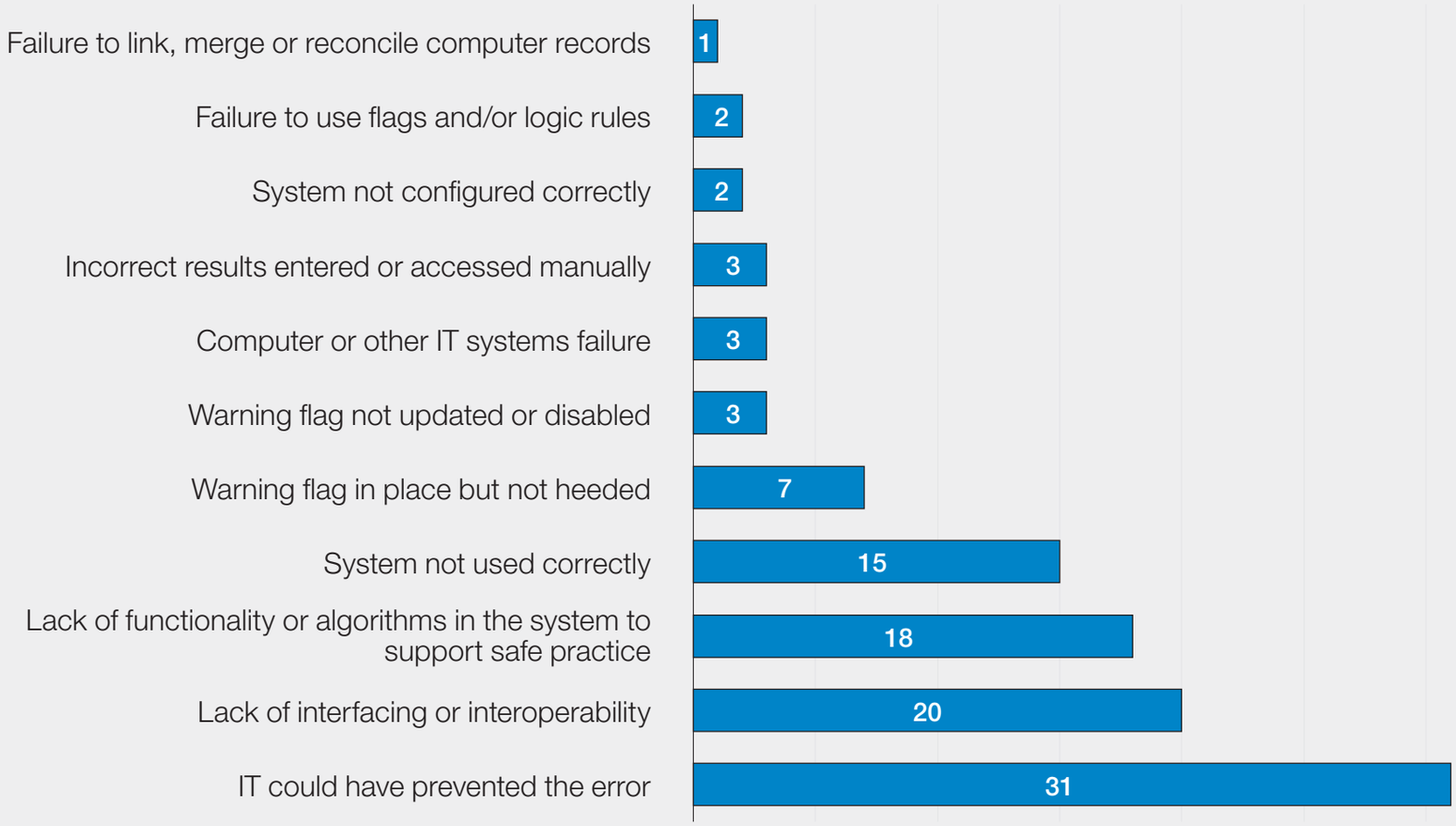


Figure 10.1: Overview of reports where an incorrect blood component was transfused in 2025 (n=364)

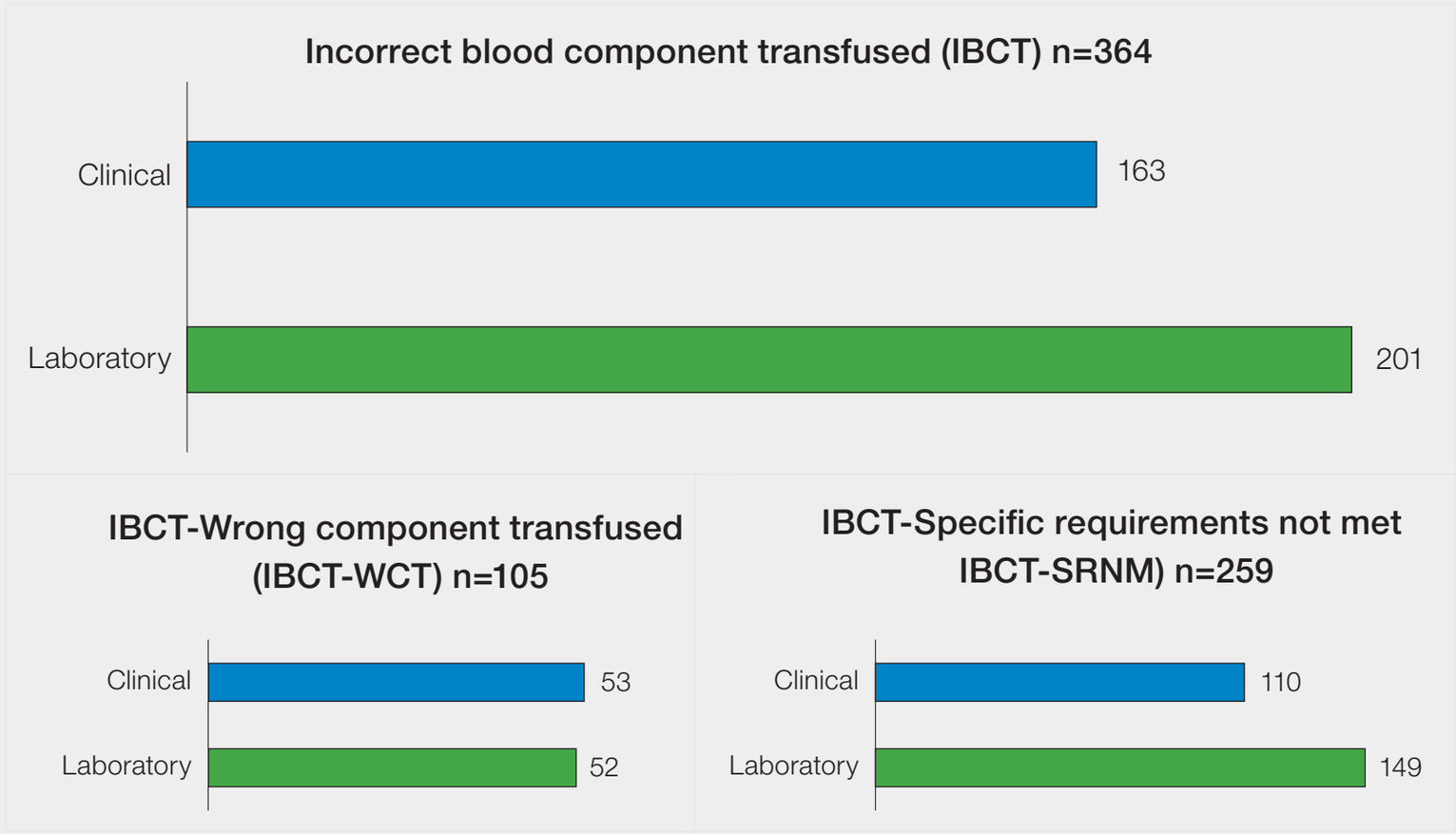
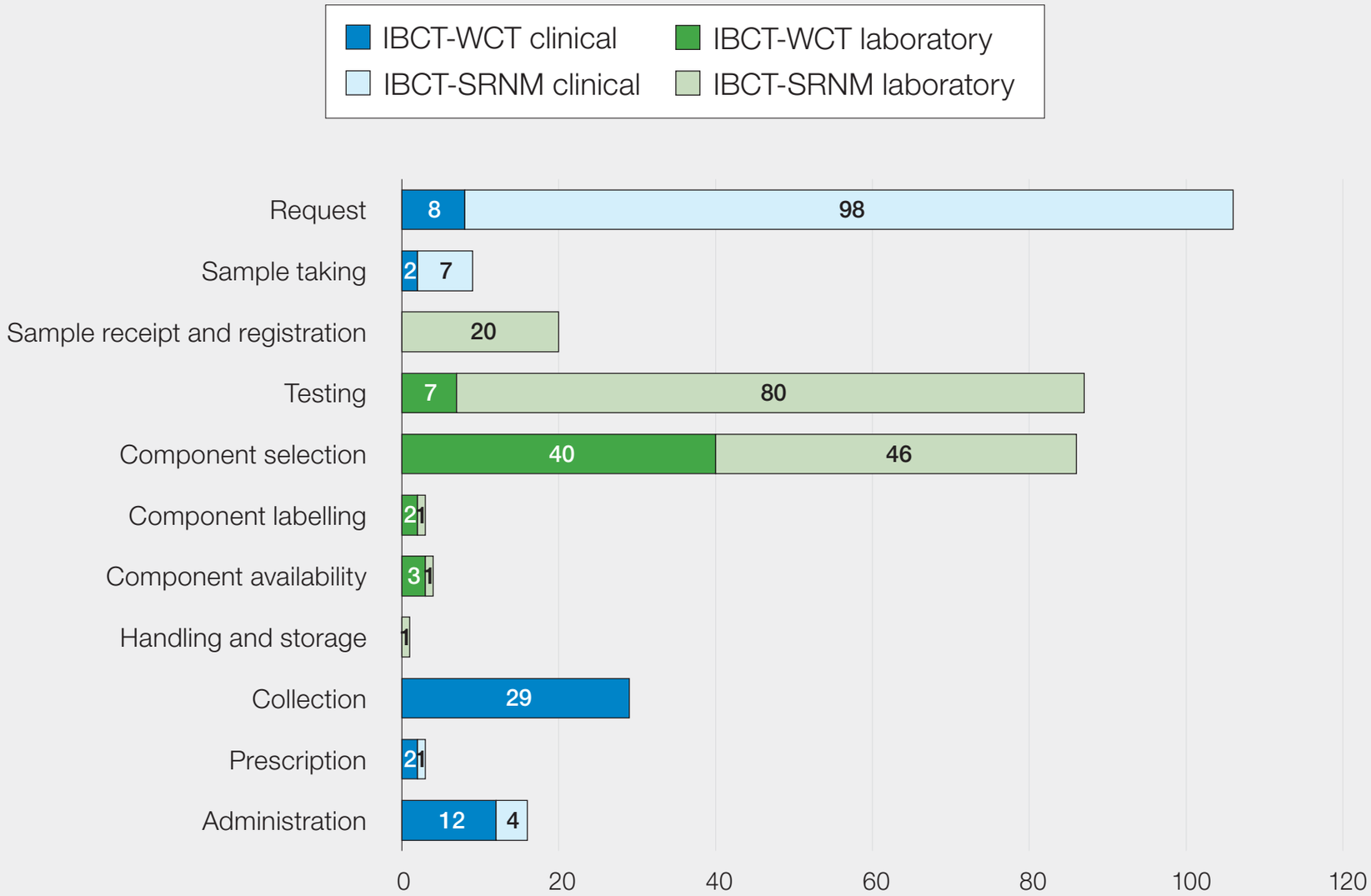
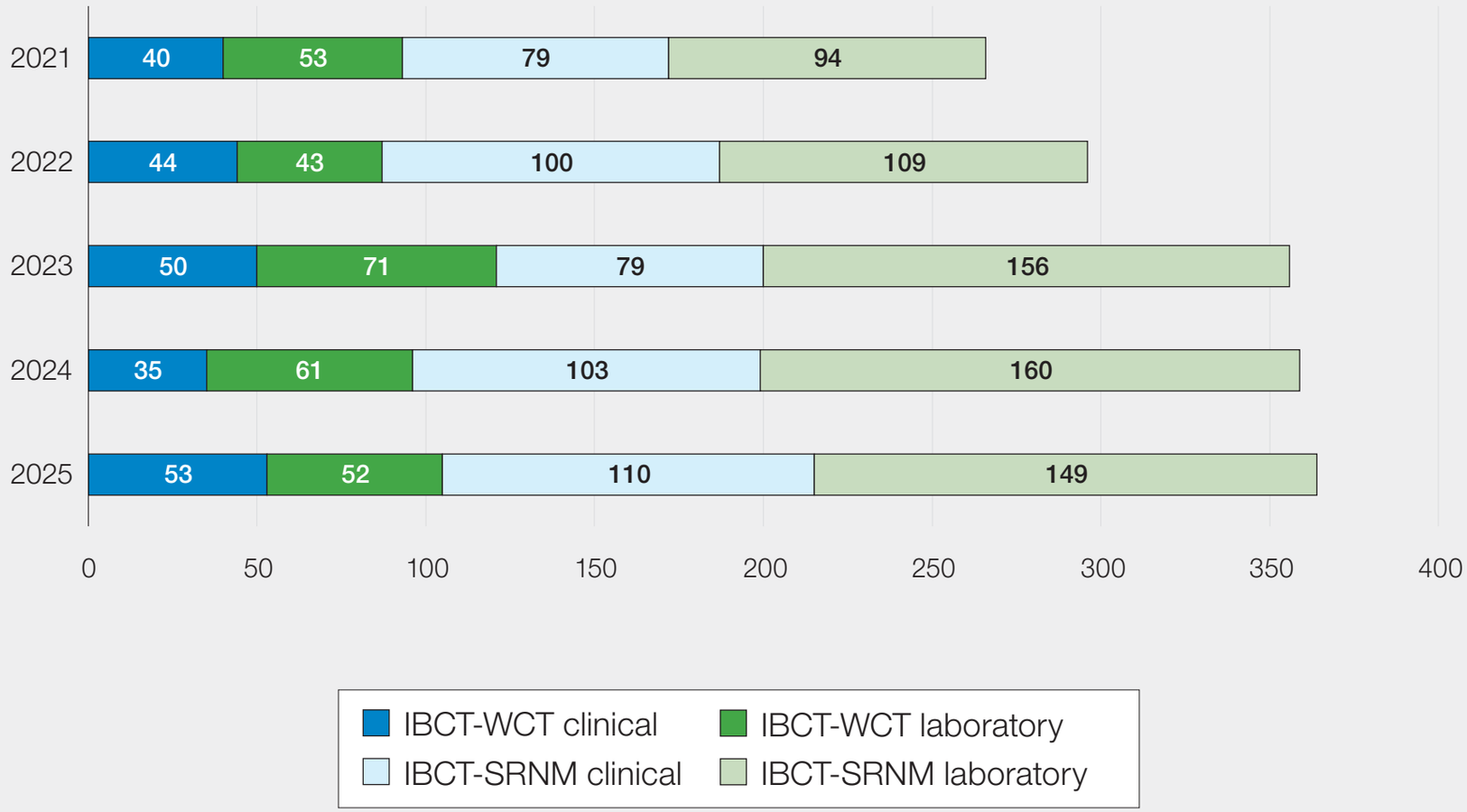


Figure 10.2: Total IBCT errors in 2025 categorised by the step in the transfusion process where the primary error occurred (n=364)



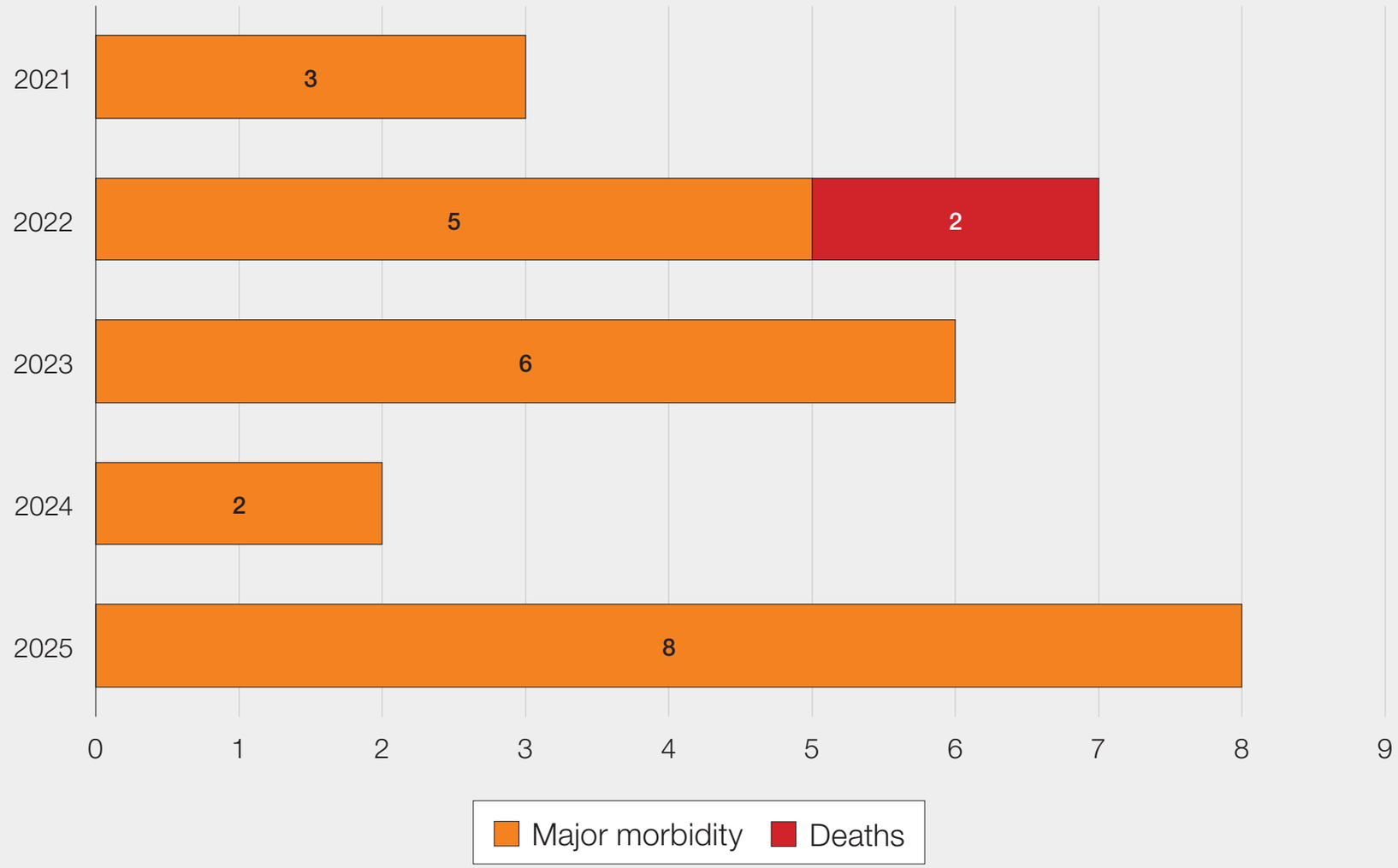
IBCT-incorrect blood component transfused; SRNM=specific requirements not met; WCT=wrong component transfused

Figure 10.3: Total IBCT events reported to SHOT 2021-2025



IBCT-incorrect blood component transfused; SRNM=specific requirements not met; WCT=wrong component transfused

Figure 10.4: Impact of IBCT events on transfusion recipients related to major morbidity and patient death 2021-2025



Both deaths were imputabilty 1 (possibly related to the transfusion)

Figure 10.5: Clinical IBCT-WCT errors by category in 2025 (n=53)

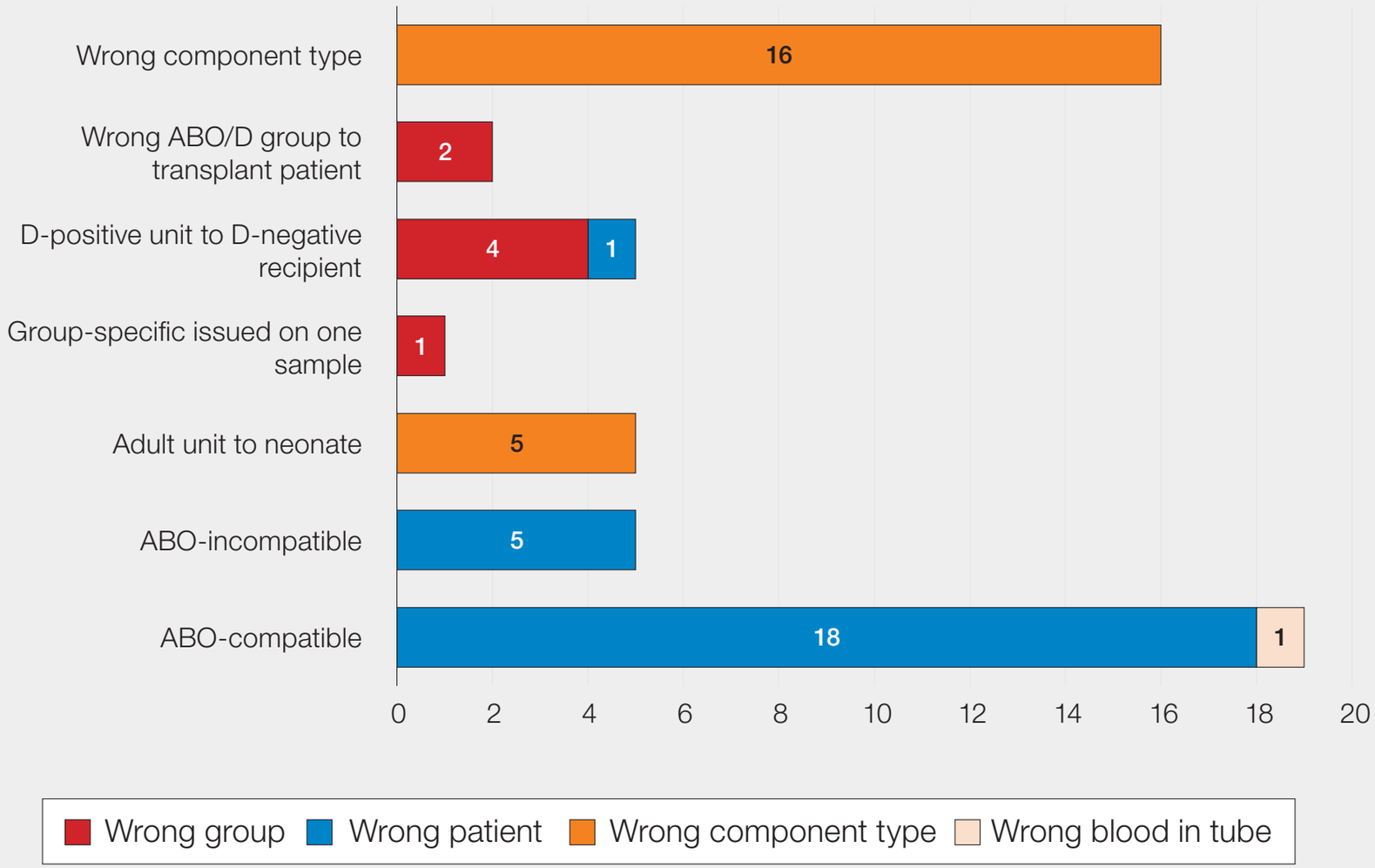
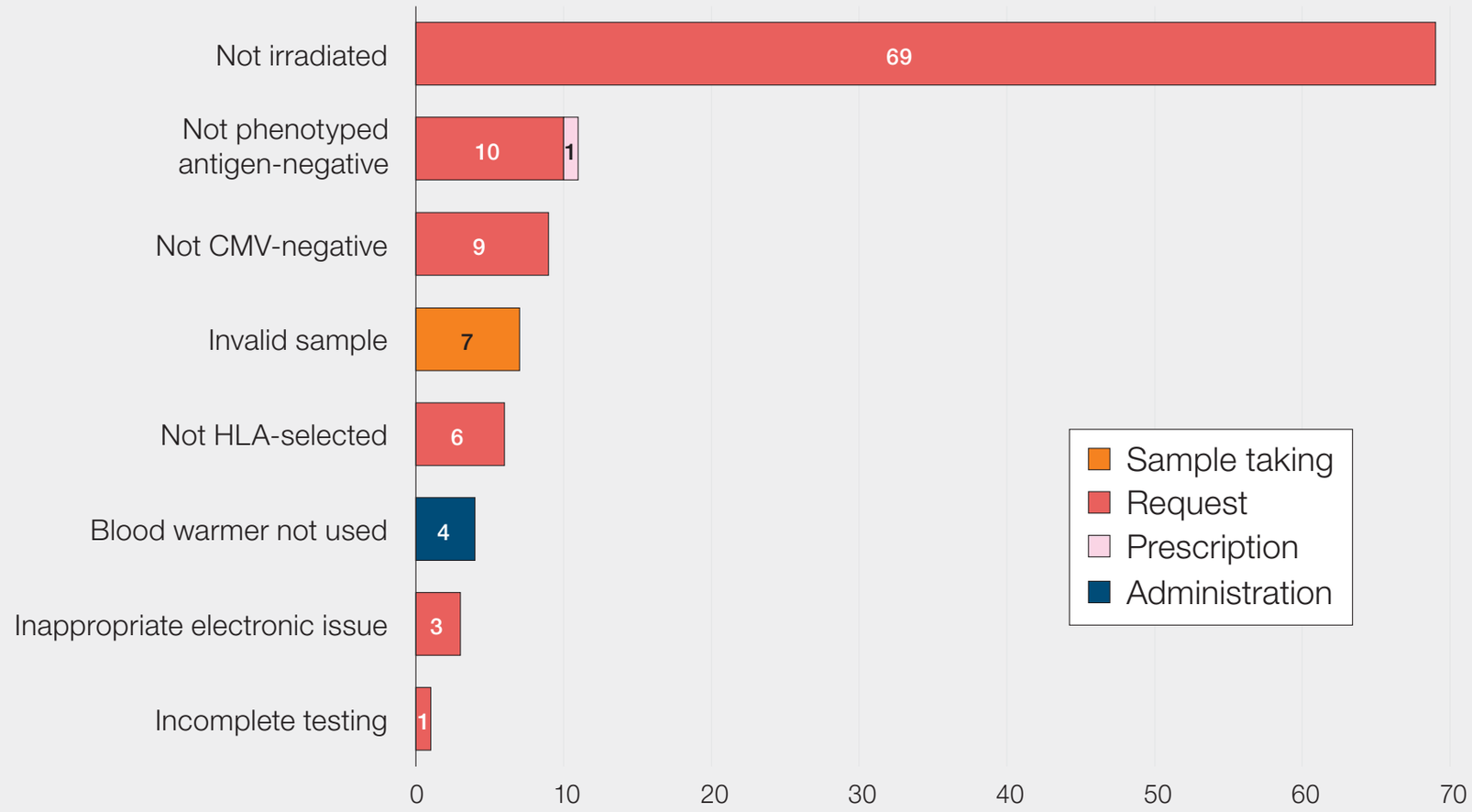


Figure 10.6: Clinical IBCT-SRNM errors and transfusion step where the error occurred in 2025 (n=110)



CMV=cytomegalovirus; HLA-human leucocyte antigen

Figure 10.7: Contributory factors to clinical IBCT errors (n=163)

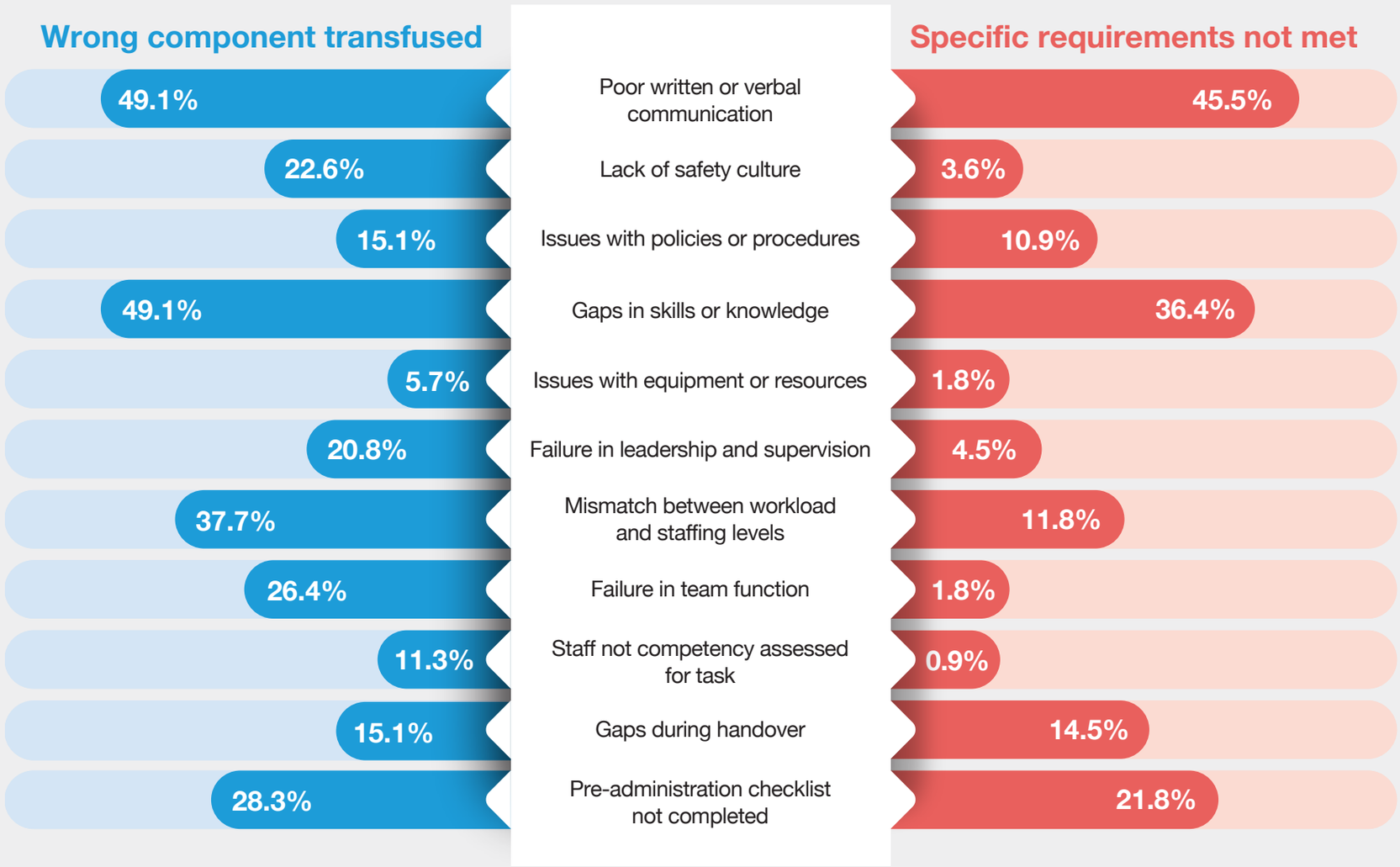


Figure 10.8: Laboratory IBCT-WCT errors by transfusion step in 2025 (n=52)

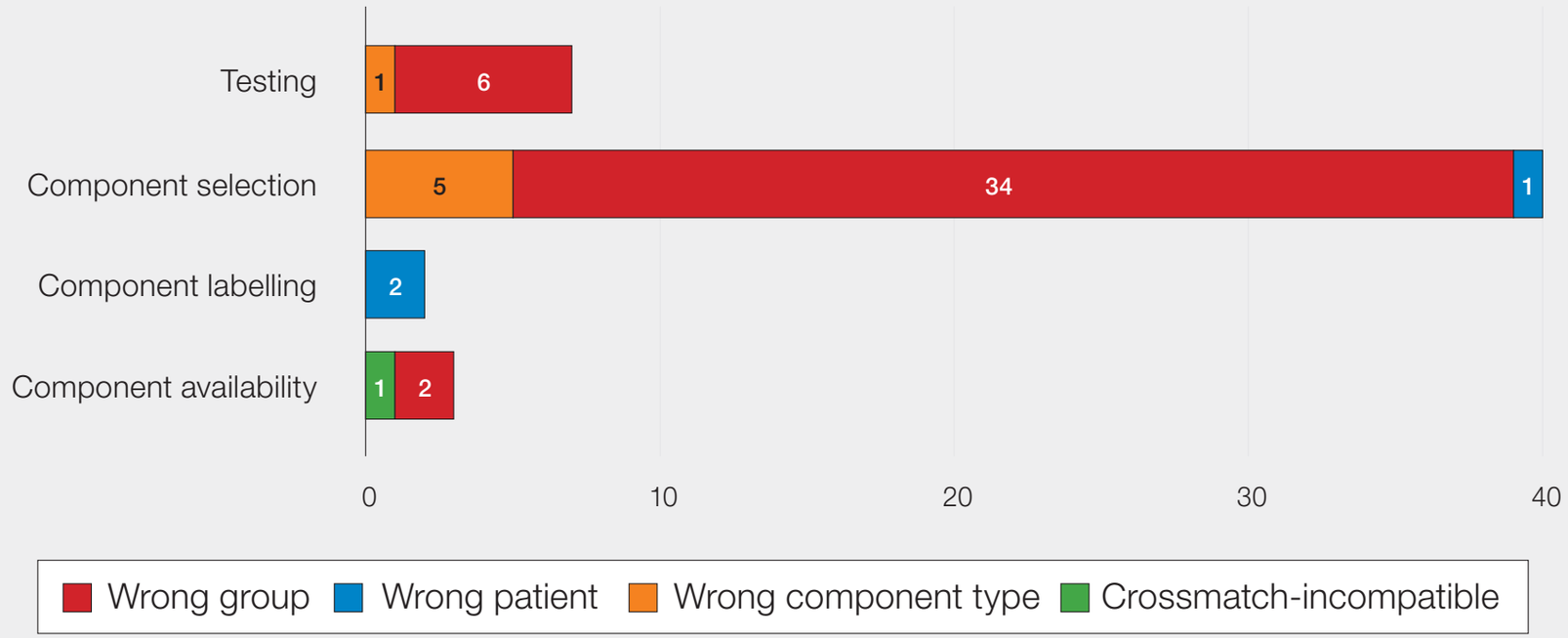


Figure 10.9: Laboratory IBCT-WCT error by category in 2025 (n=52)

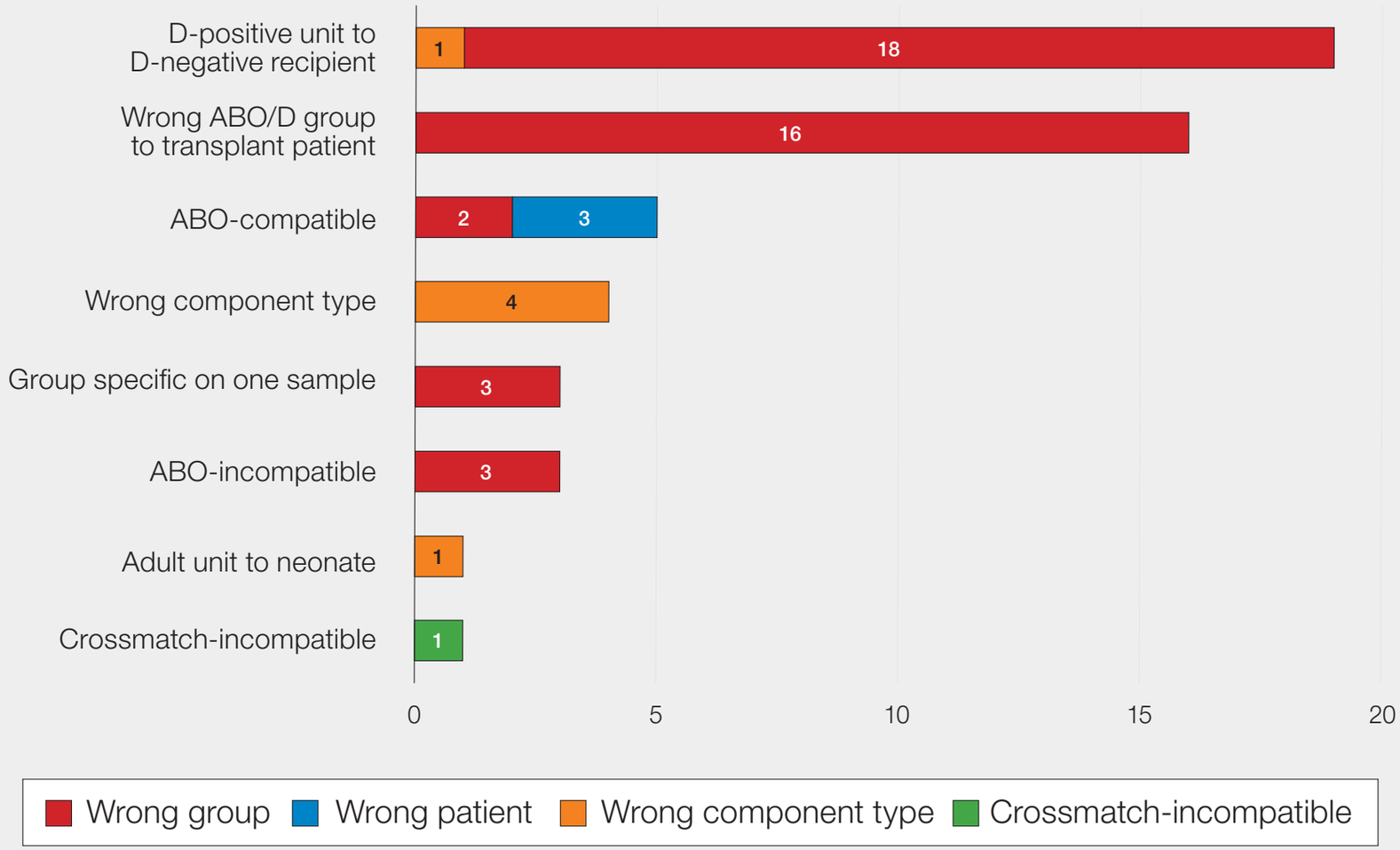
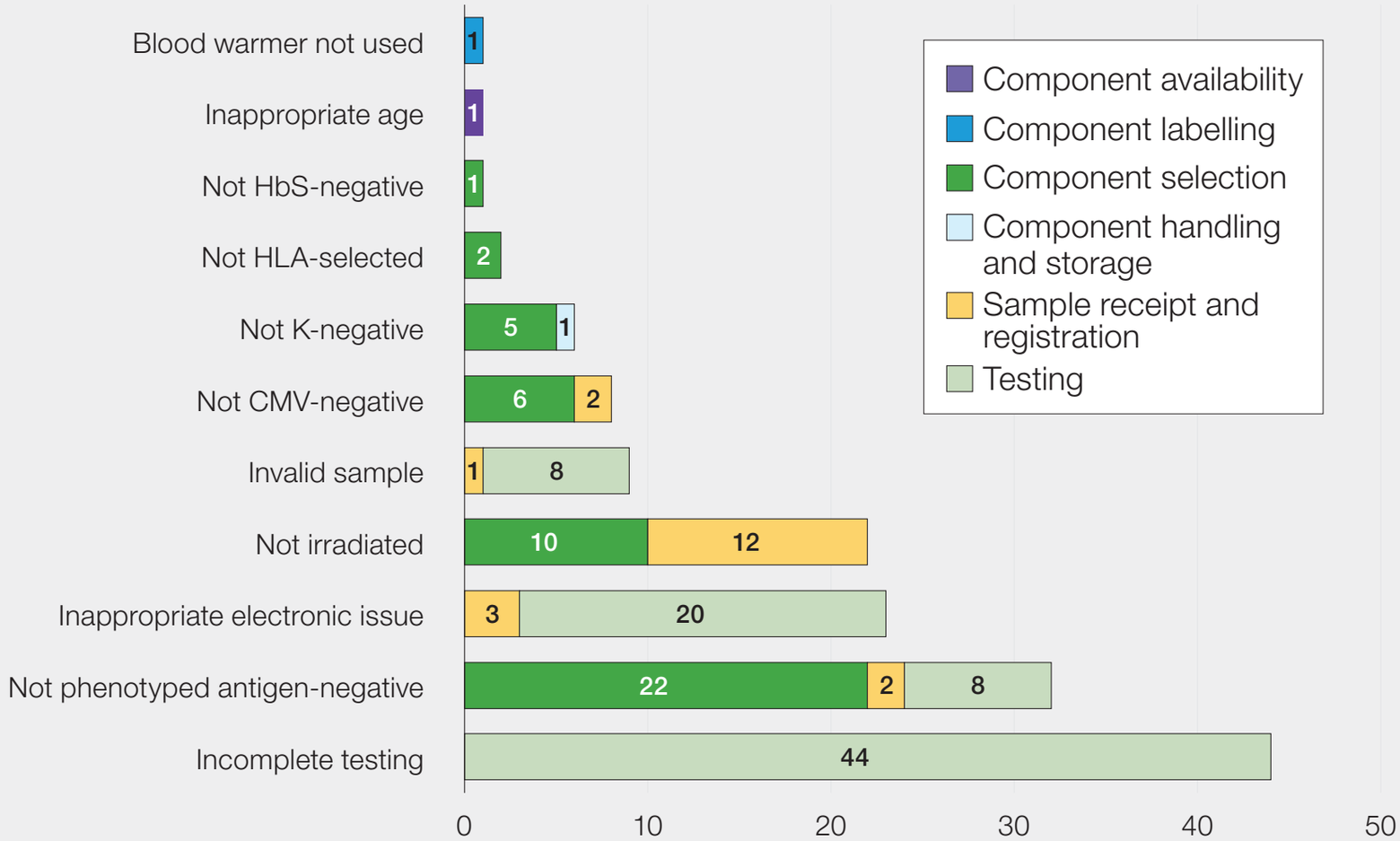
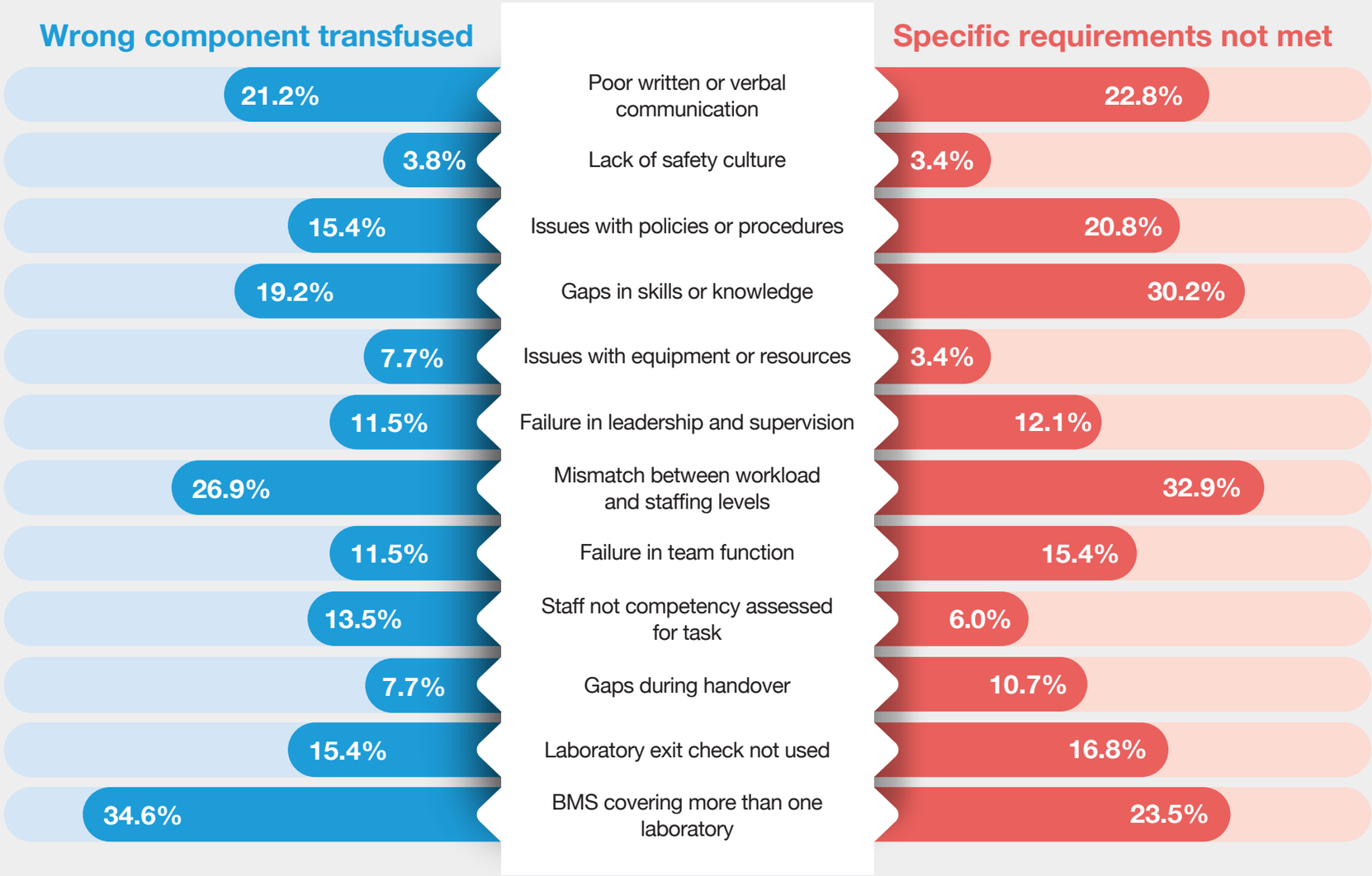


Figure 10.10: Laboratory IBCT-SRNM errors by transfusion step in 2025 (n=149)



CMV=cytomegalovirus; HbS=haemoglobin S; HLA=human leucocyte antigen

Figure 10.11: Contributory factors to laboratory IBCT errors (n=201)



BMS=biomedical scientist

Figure 11.1: Breakdown of 2025 handling and storage error (HSE) reports (n=323)

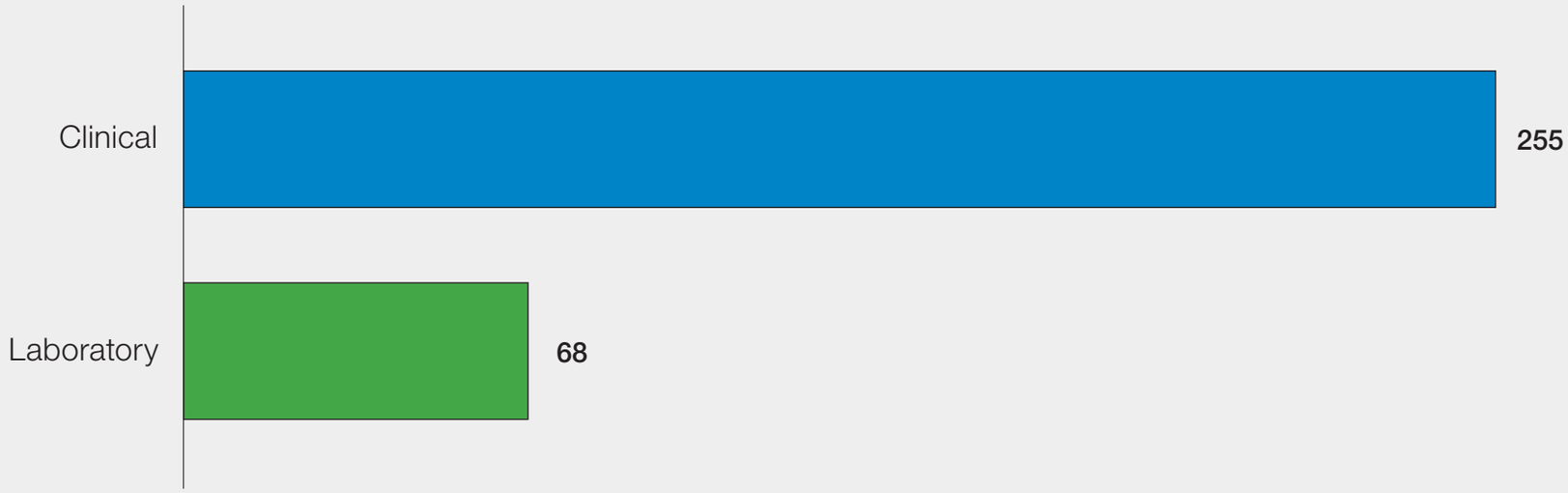


Figure 11.2: Breakdown of clinical HSE by category in 2025 (n=255)

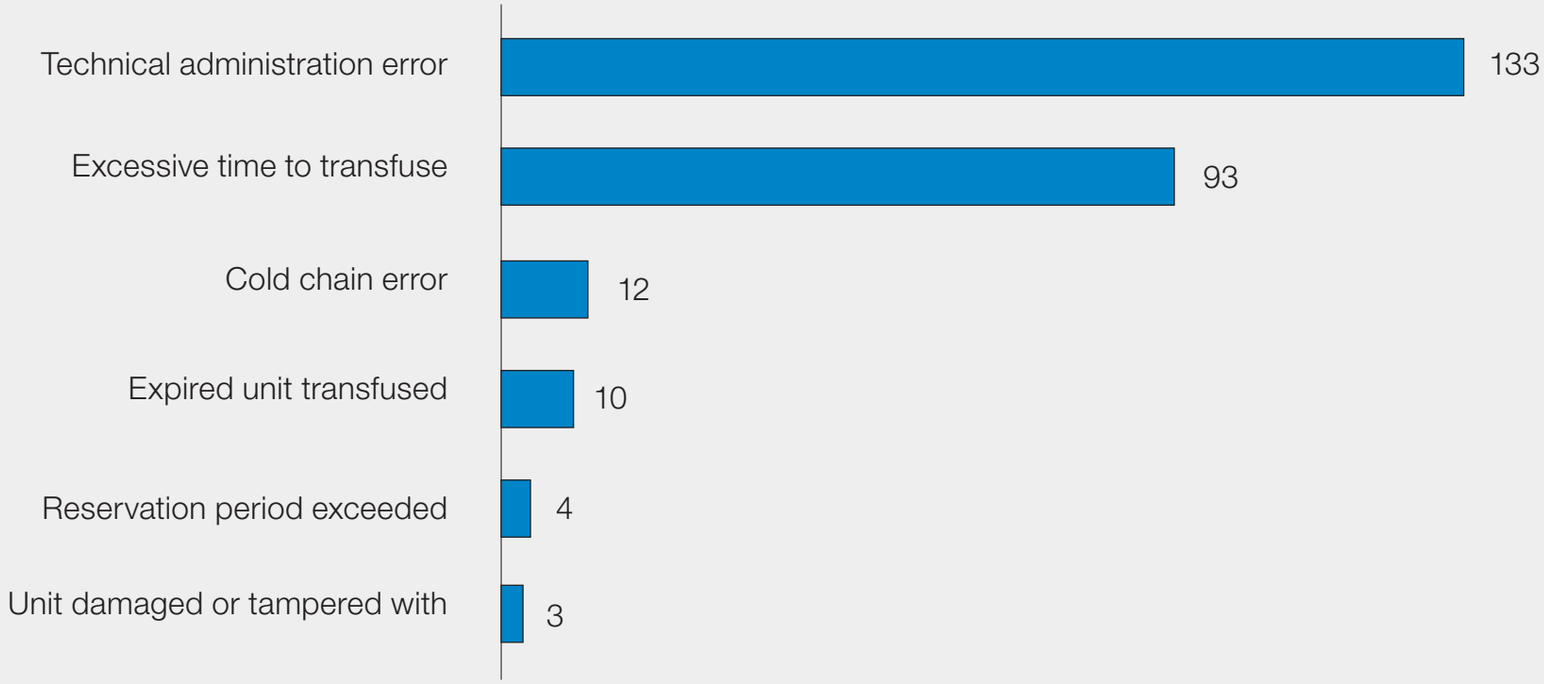


Figure 11.3: Breakdown of laboratory HSE by category in 2025 (n=68)

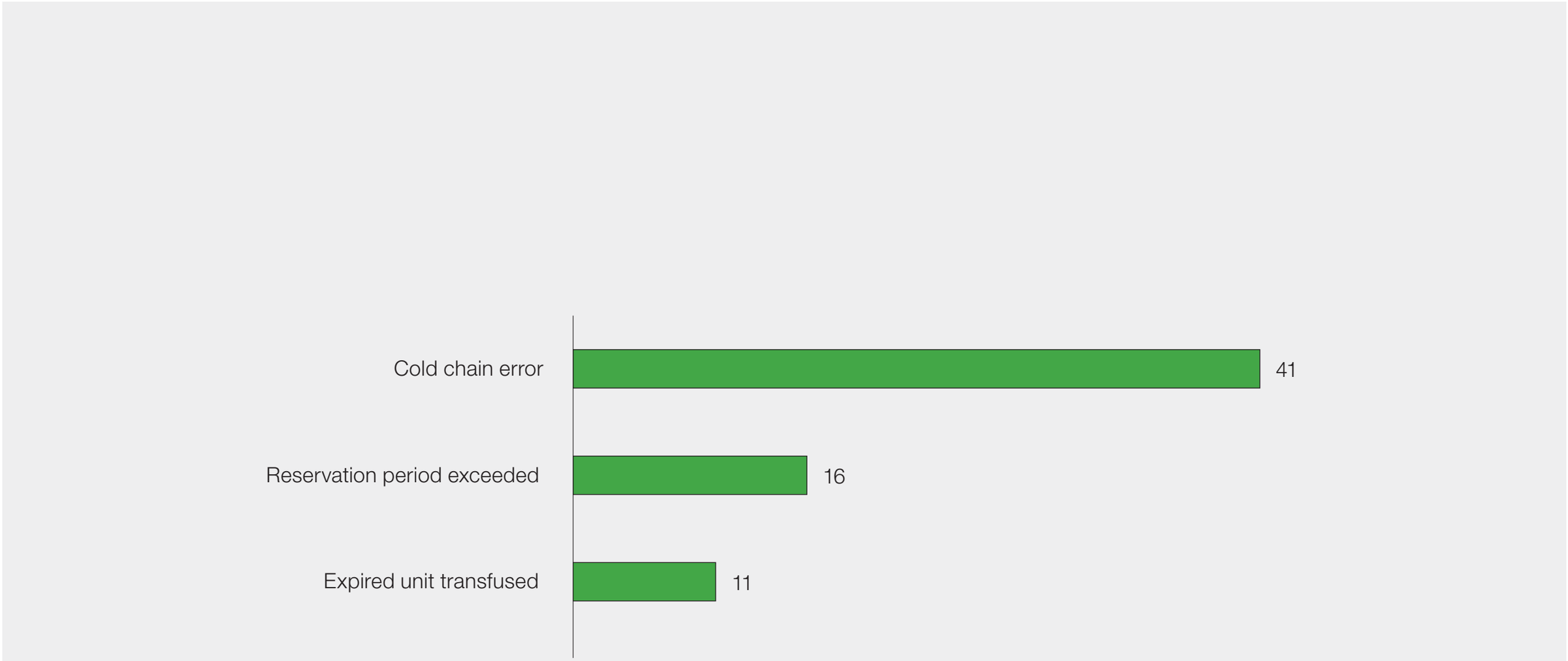


Figure 12.1: Delayed transfusions by year 2011-2025

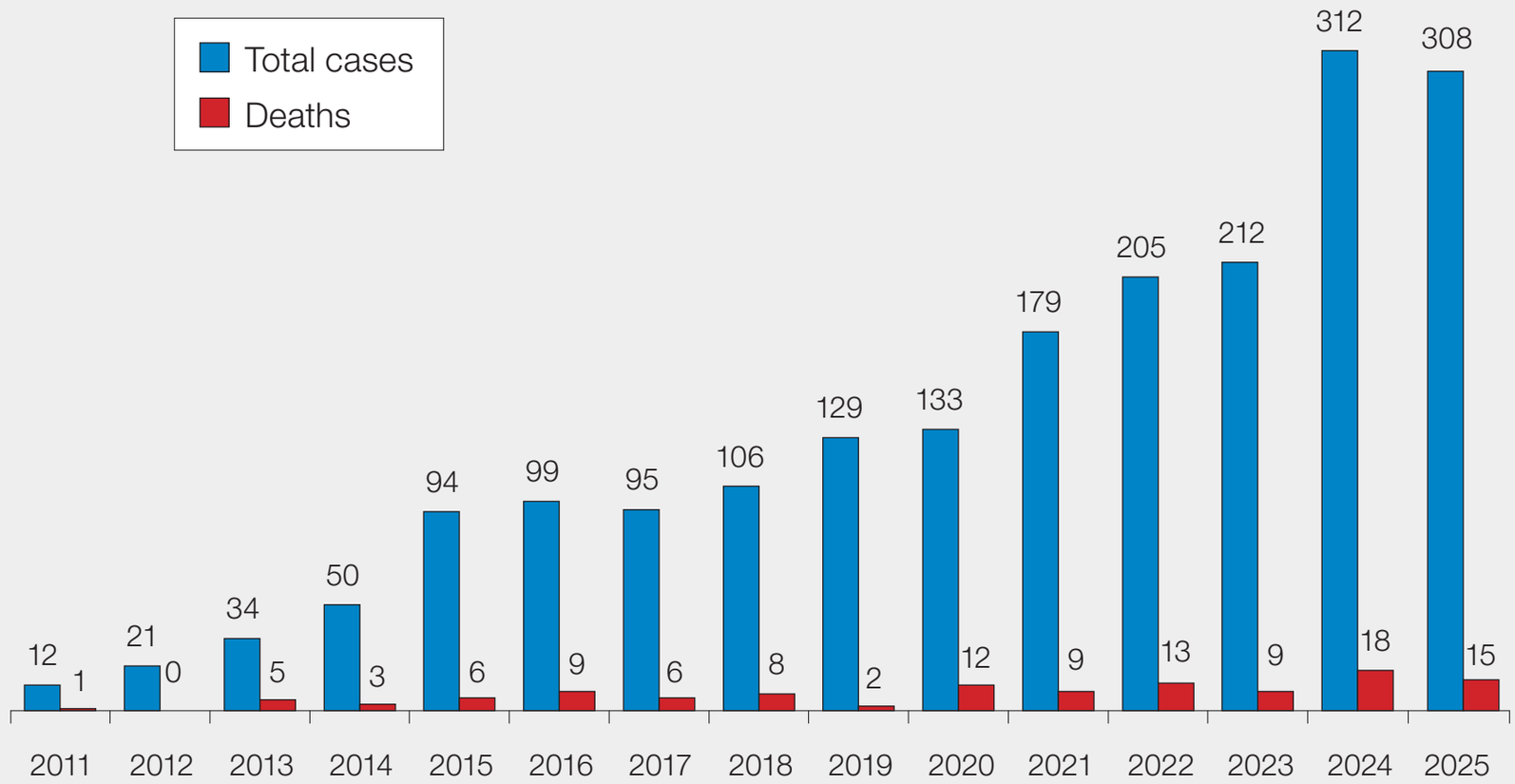


Figure 12.2: Reason for delays in blood transfusion and location of errors associated with Blood Services in 2025 (n=18)

Figure 12.3: Delays associated with MHP 2016-2025, including the proportion of reports resulting in mortality or major morbidity

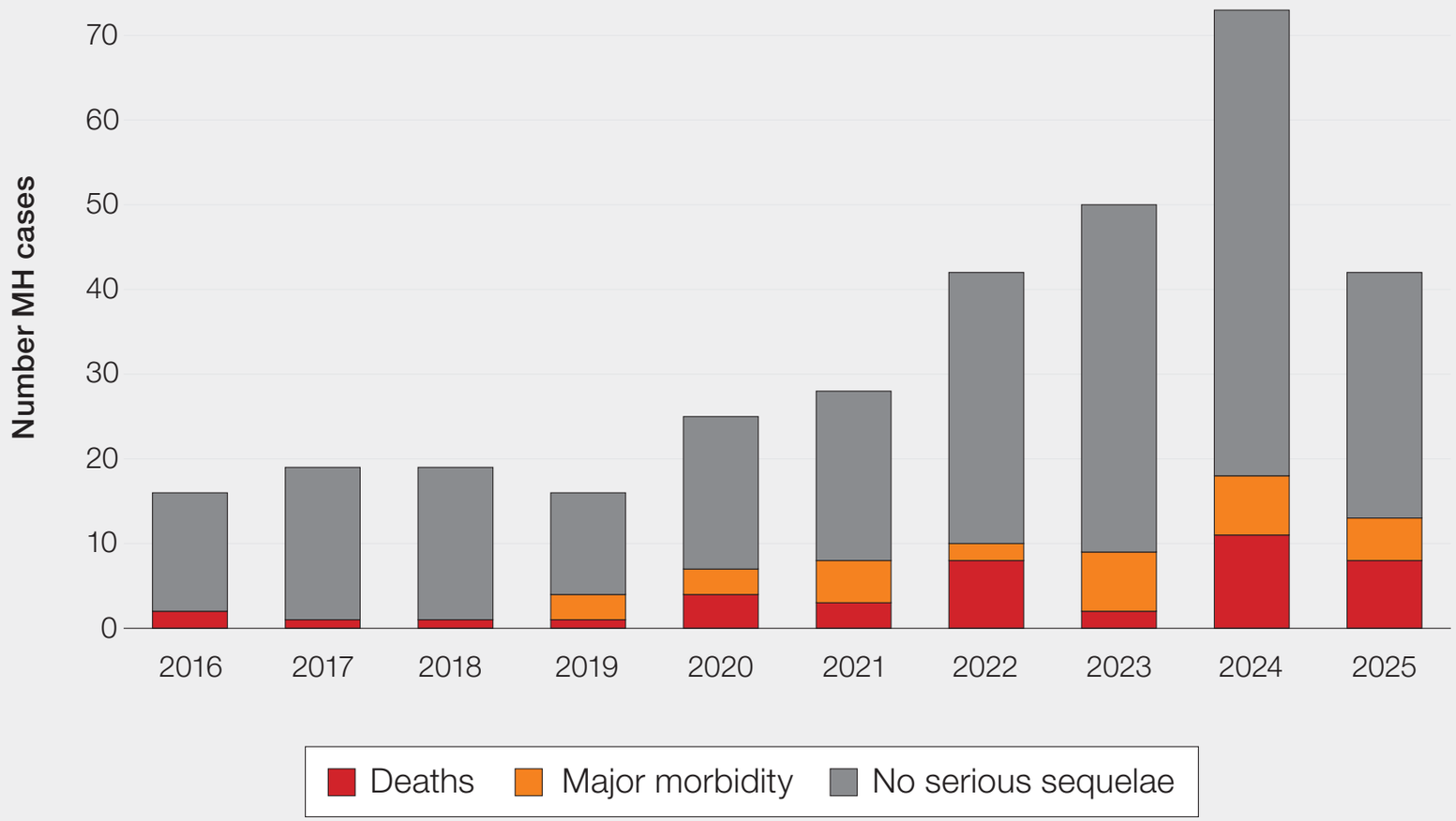


Figure 12.4: Common themes identified that contributed to delays during MH in 2025

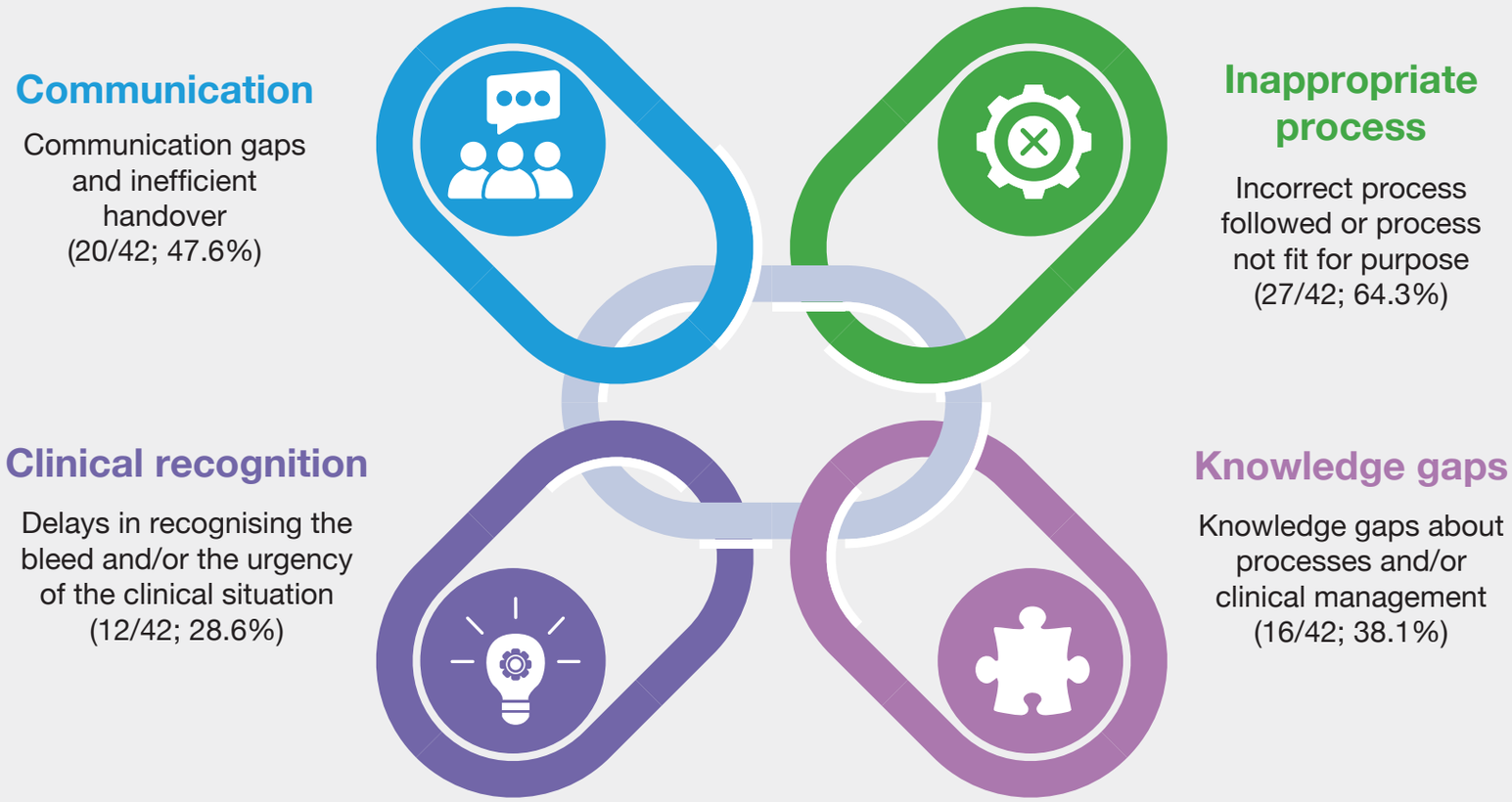


Figure 13.1: Errors during the transfusion pathway resulting in avoidable use of emergency group O (n=61)

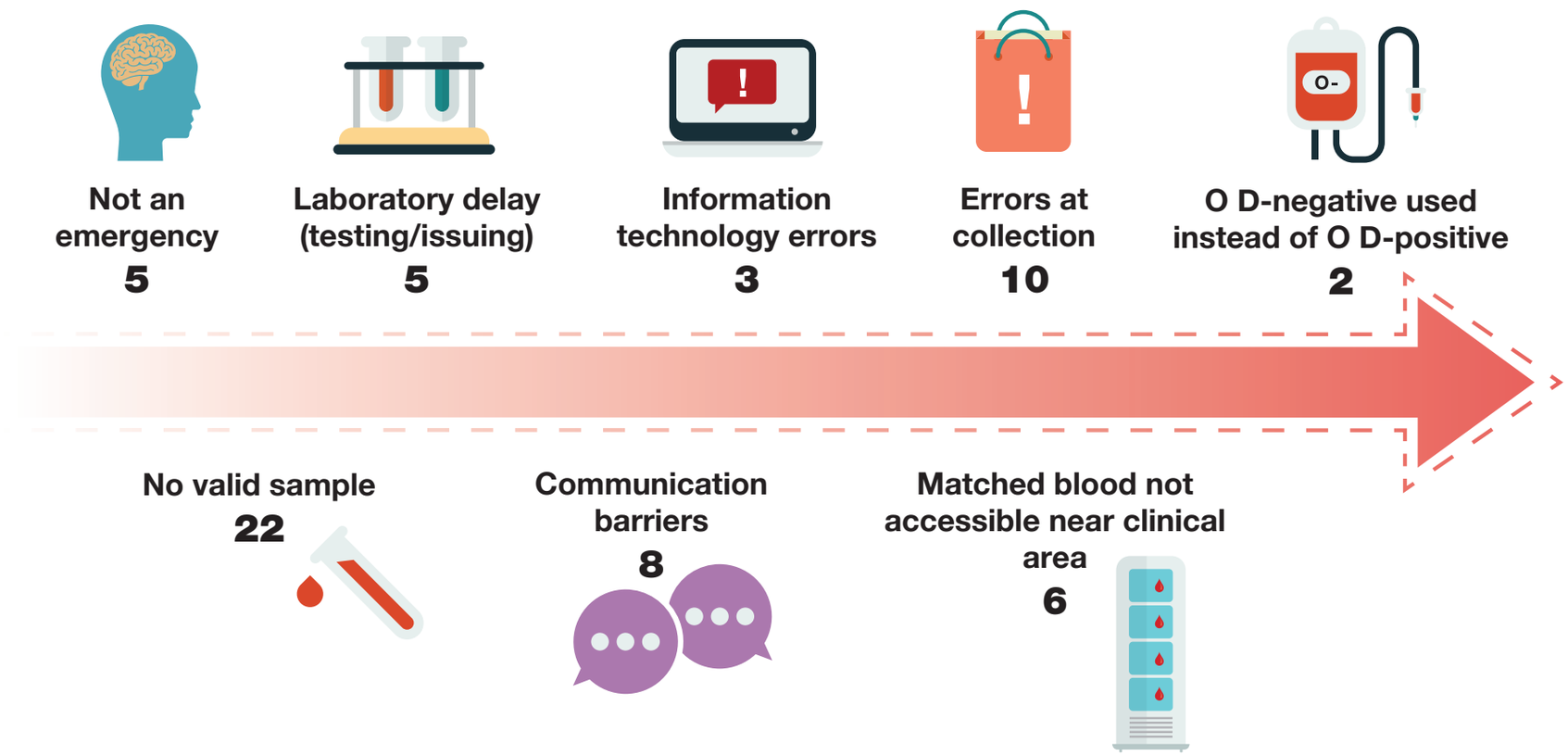


Figure 15.1: Points of delay in the PCC care pathway, 2025

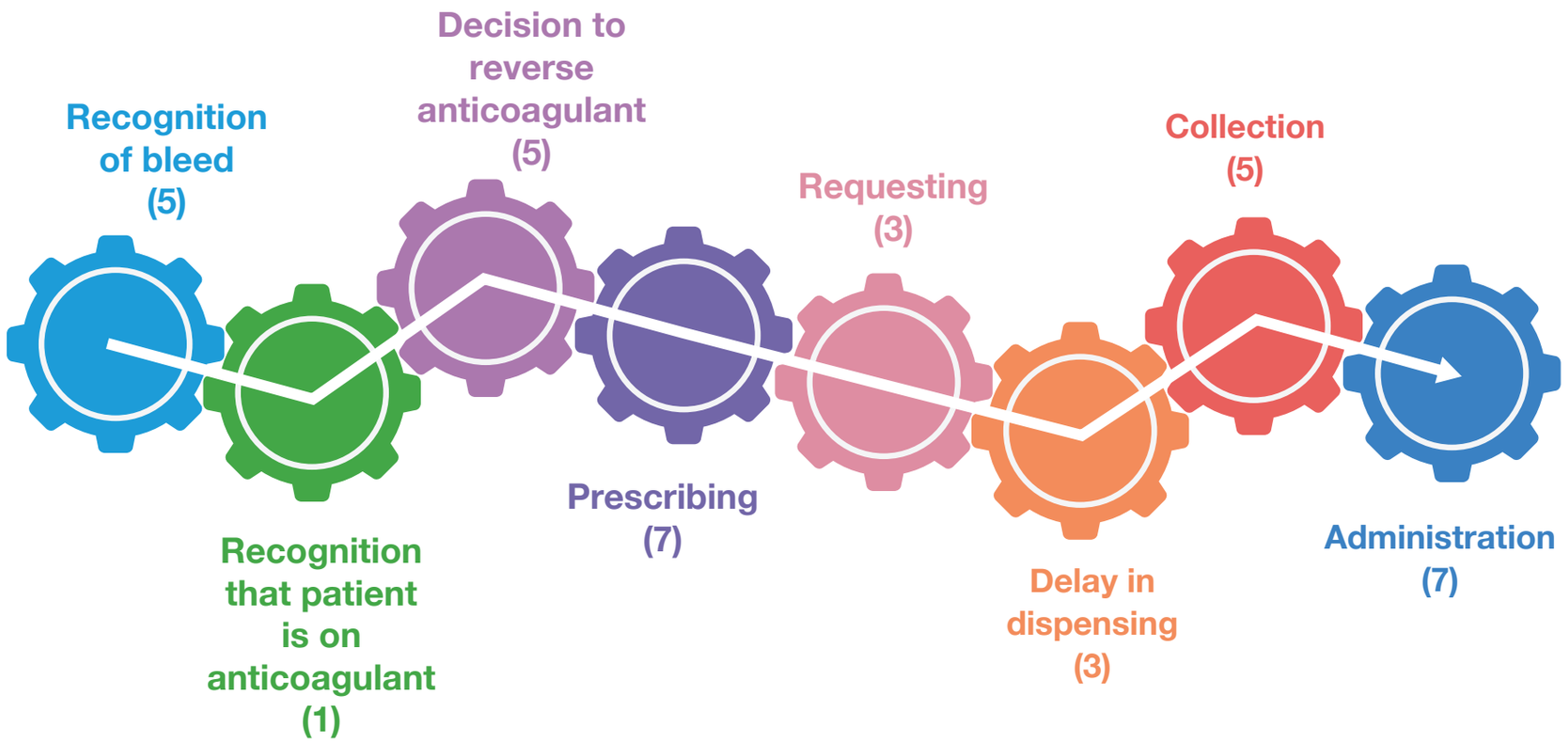
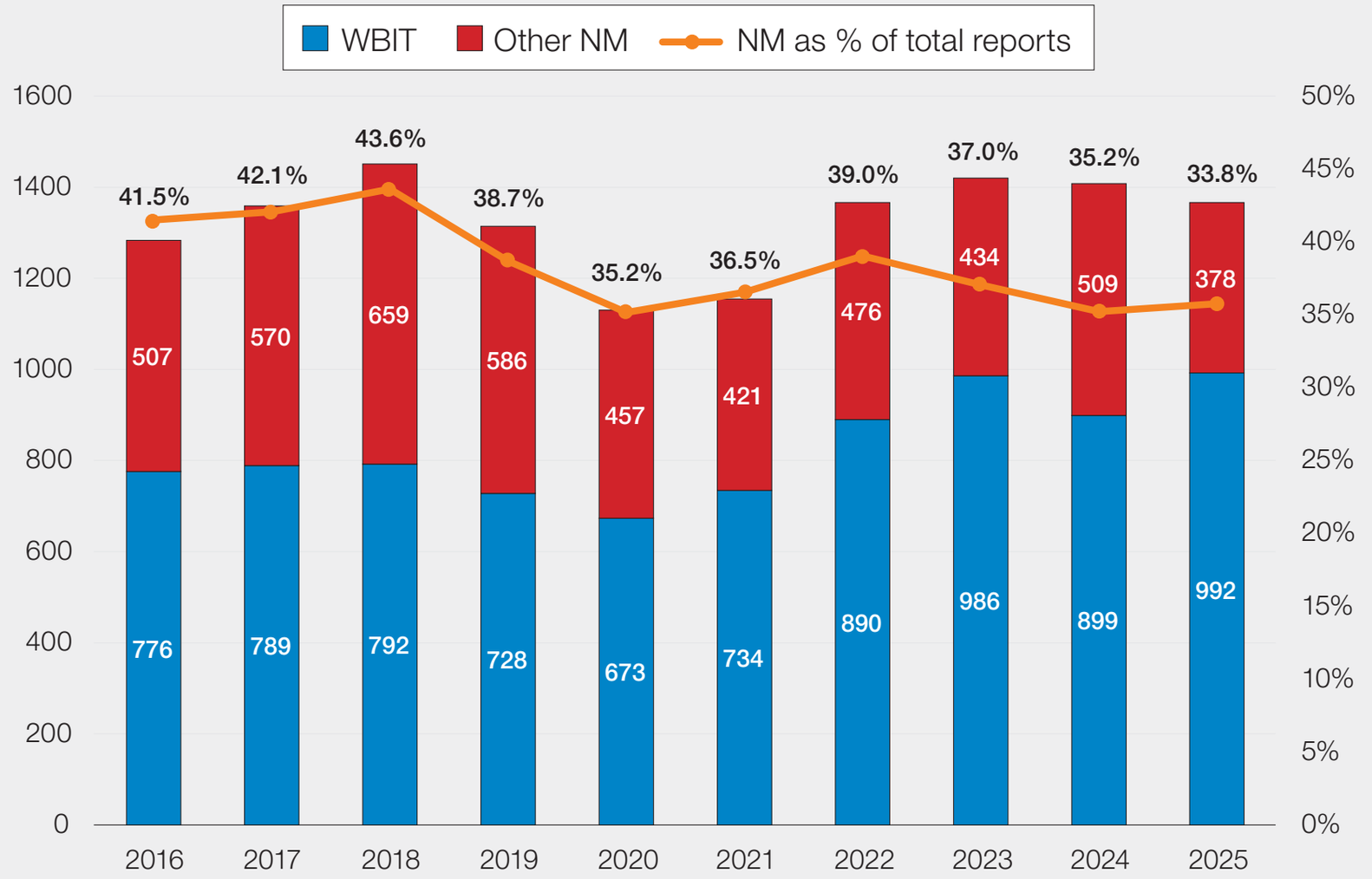


Figure 16.1: A decade of NM (other) and WBIT reports (2016-2025)



NM=near miss; WBIT=wrong blood in tube

Figure 16a.1: Primary causes of WBIT in 2025 (n=992)

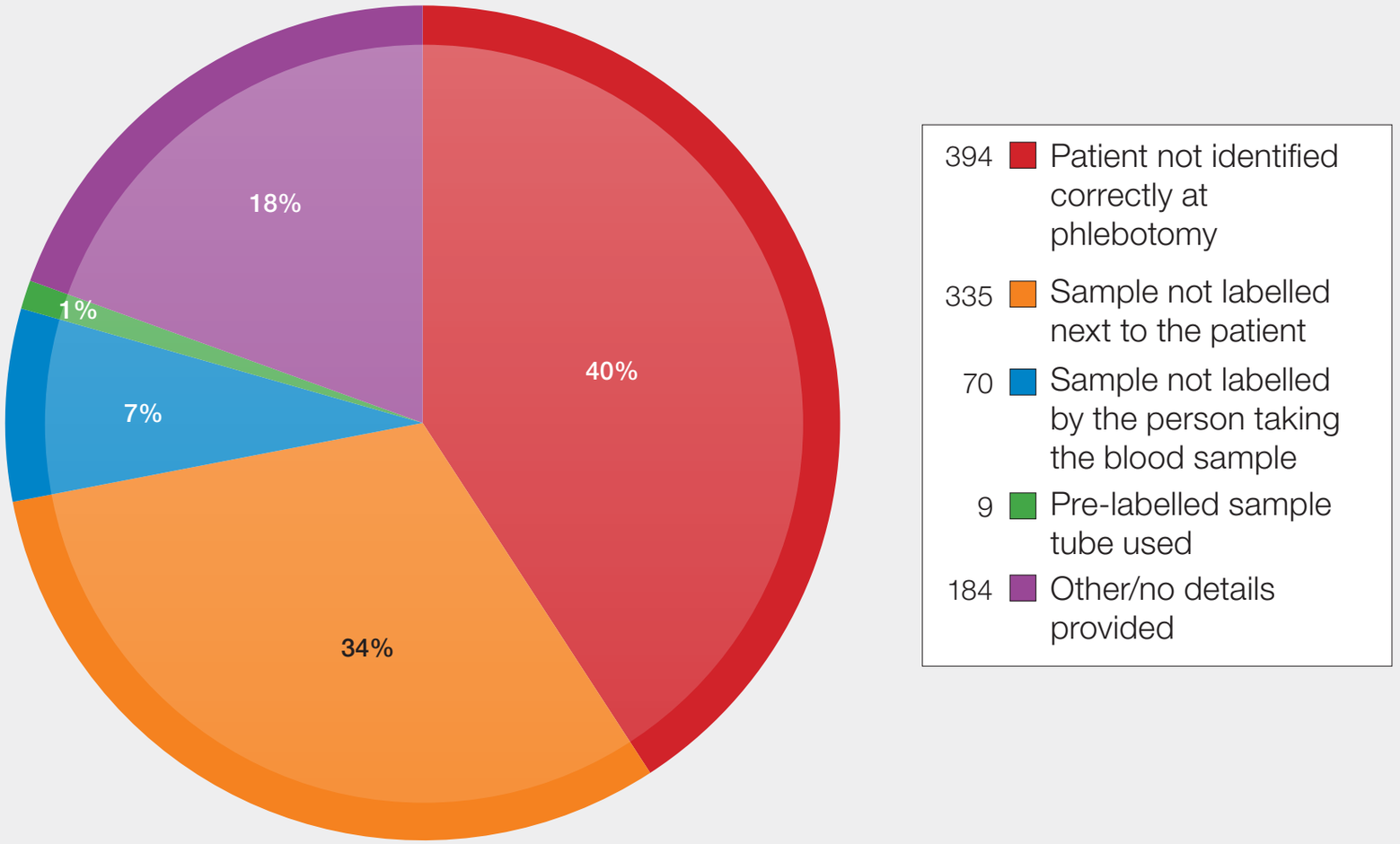


Figure 16a.2: Point in the process where the error was detected in WBIT reported in 2025 (n=992)

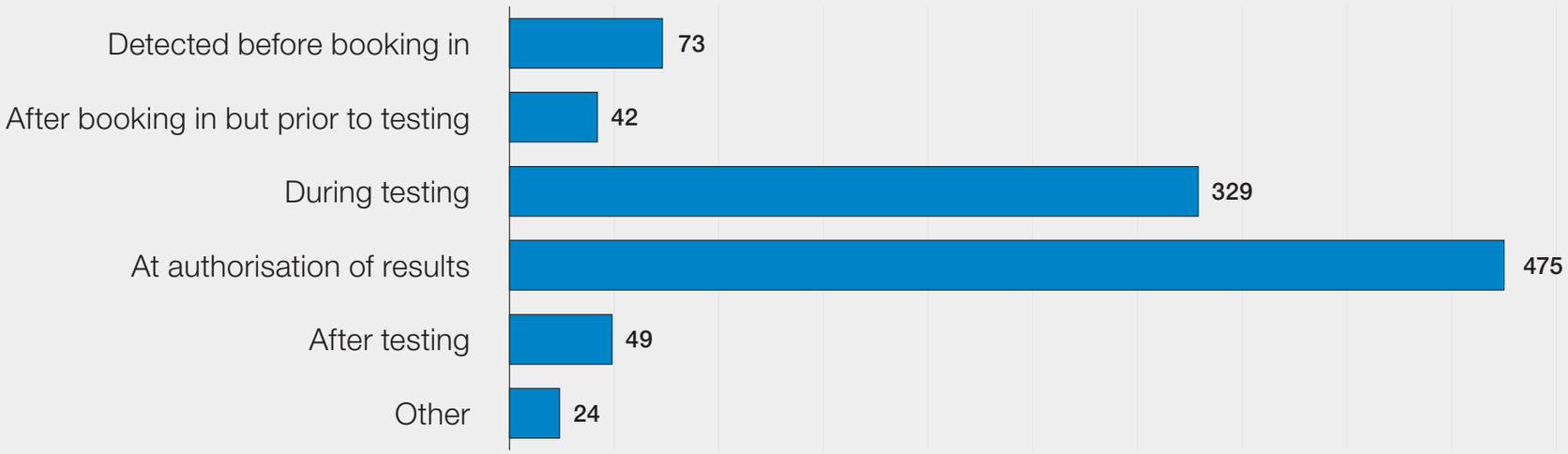


Figure 17.1: RBRP classified by the step in the transfusion process where the primary error occurred in 2025 (n=295)

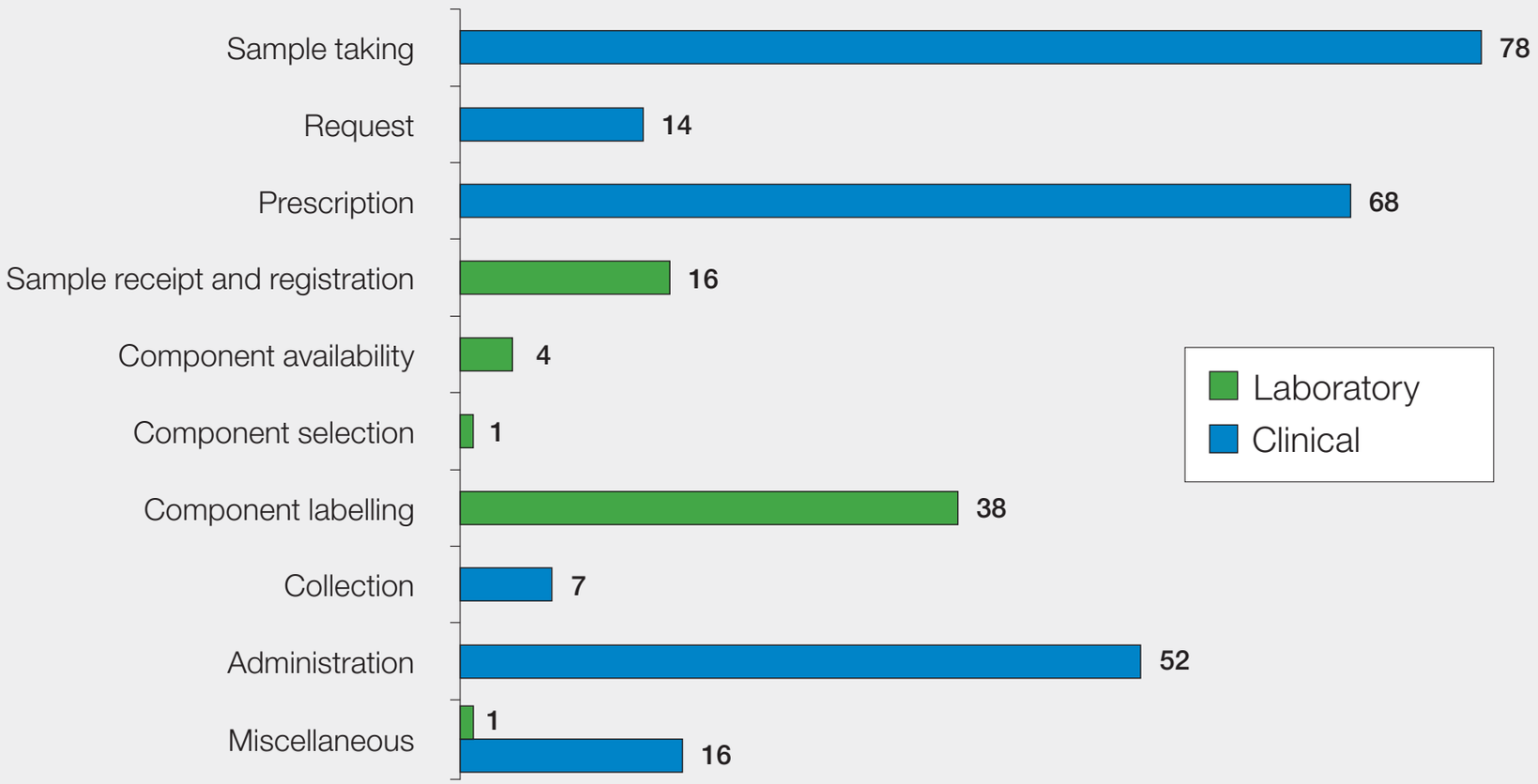


Figure 17.2: Contributory factors in RBRP errors reported in 2025

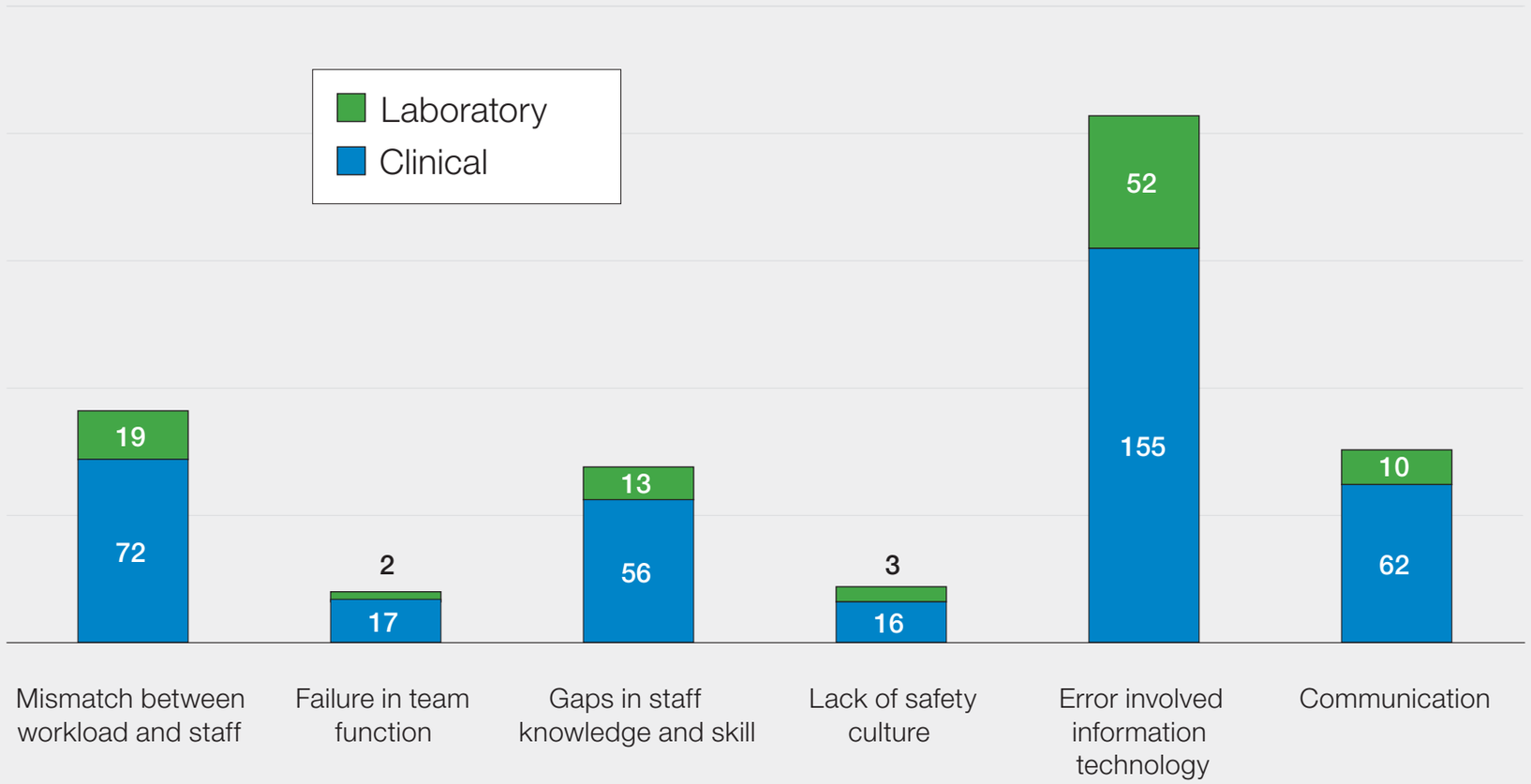
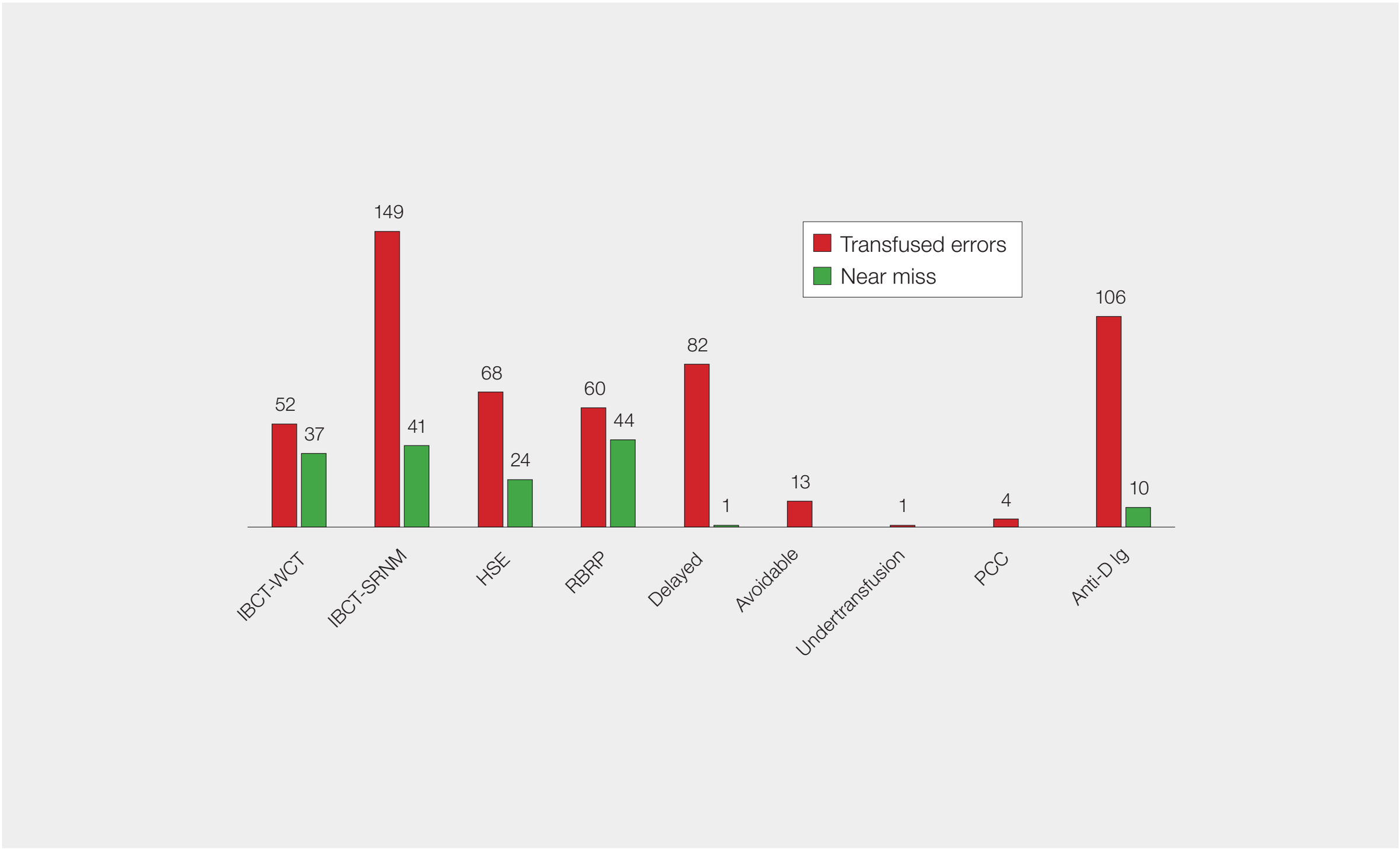
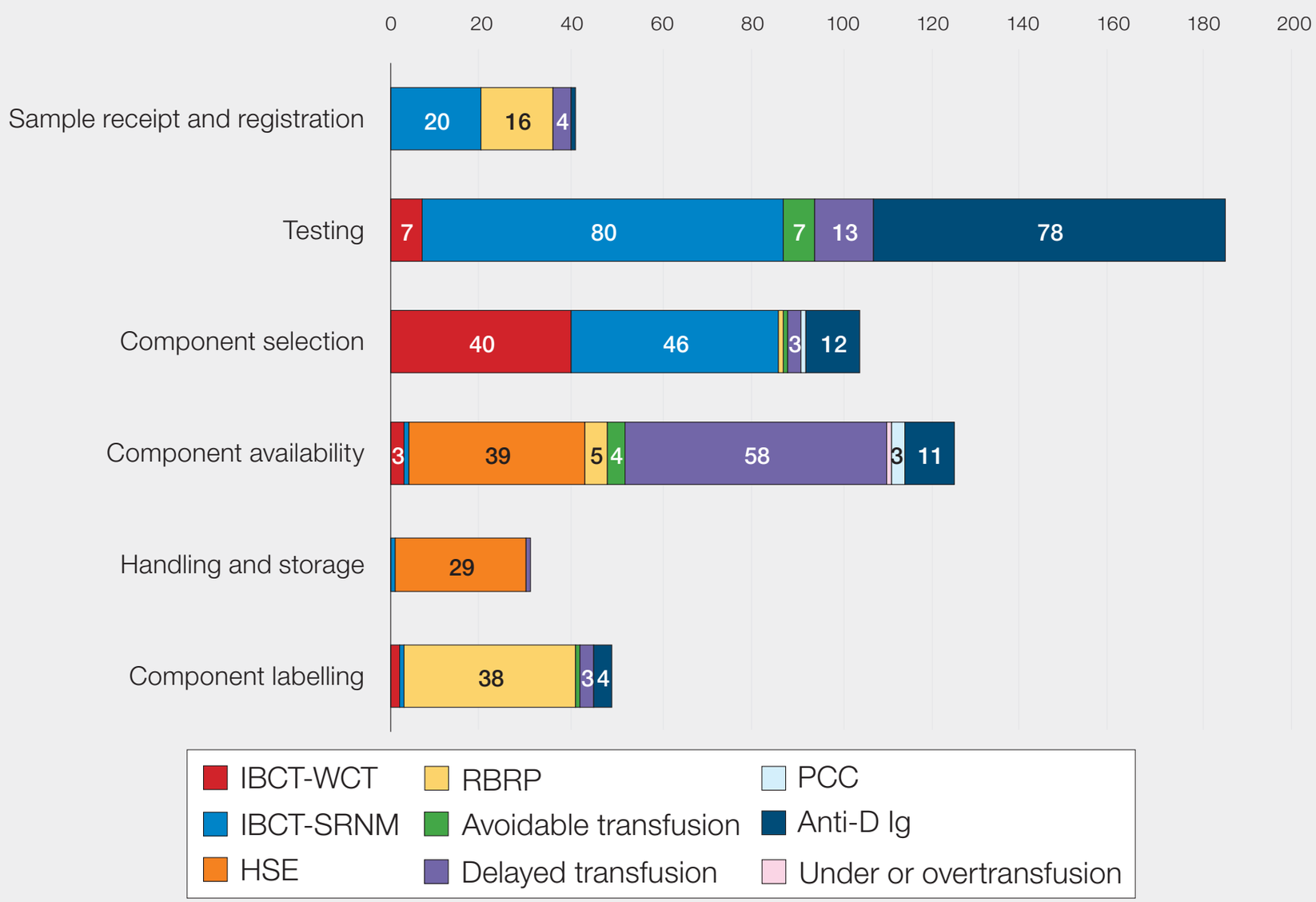


Figure 18.1: Laboratory errors and near misses in 2025 (n=692)



HSE=handling and storage errors; IBCT=incorrect blood component transfused; Ig=immunoglobulin; PCC=prothrombin complex concentrates; RBRP=right blood right patient; SRNM=specific requirements not met; WCT=wrong component transfused

Figure 18.2: Laboratory errors classified by the transfusion step where the primary error occurred (n=535)



HSE=handling and storage errors; IBCT=incorrect blood component transfused; Ig=immunoglobulin; PCC=prothrombin complex concentrates; RBRP=right blood right patient; SRNM=specific requirements not met; WCT=wrong component transfused. Note: numbers <3 are too small to be annotated on the figure

Figure 18.3: Laboratory error reports with staffing and workload mismatch 2022-2025

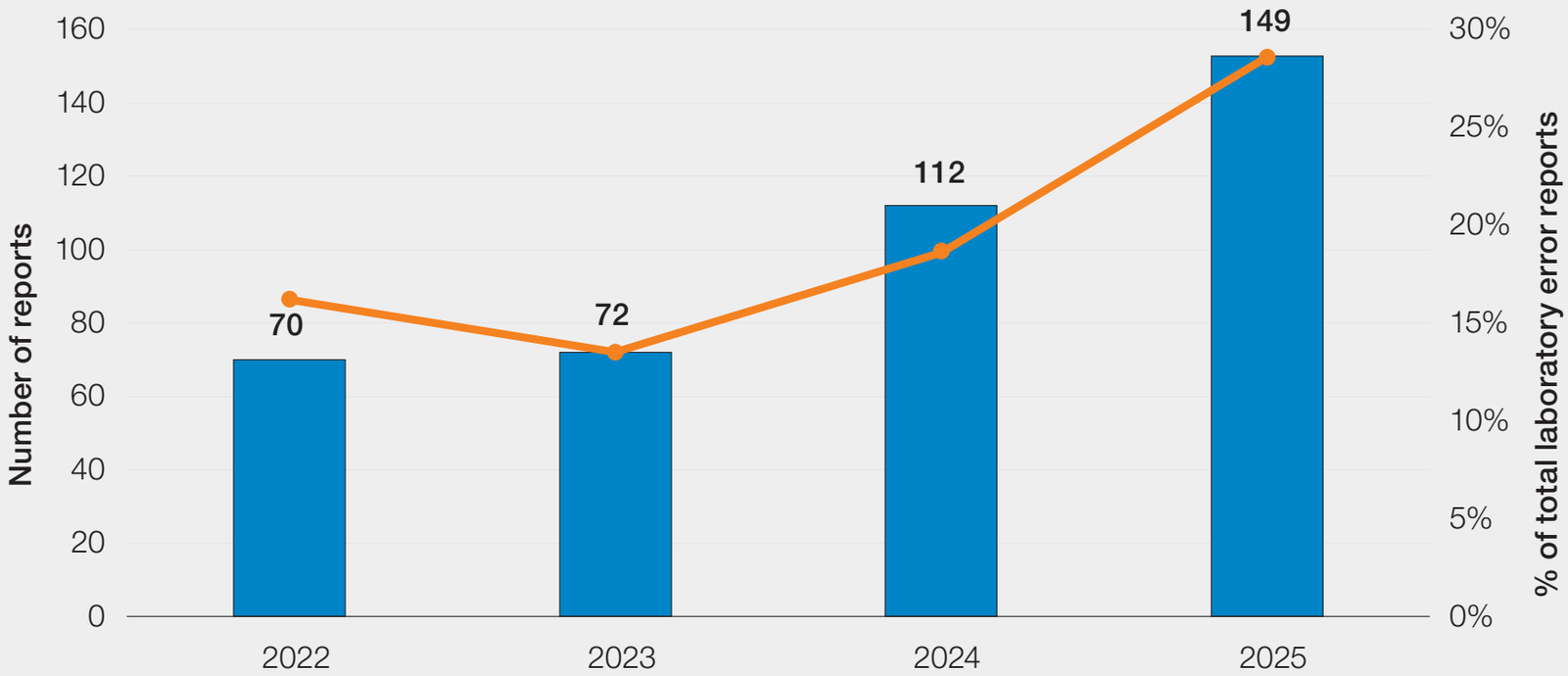
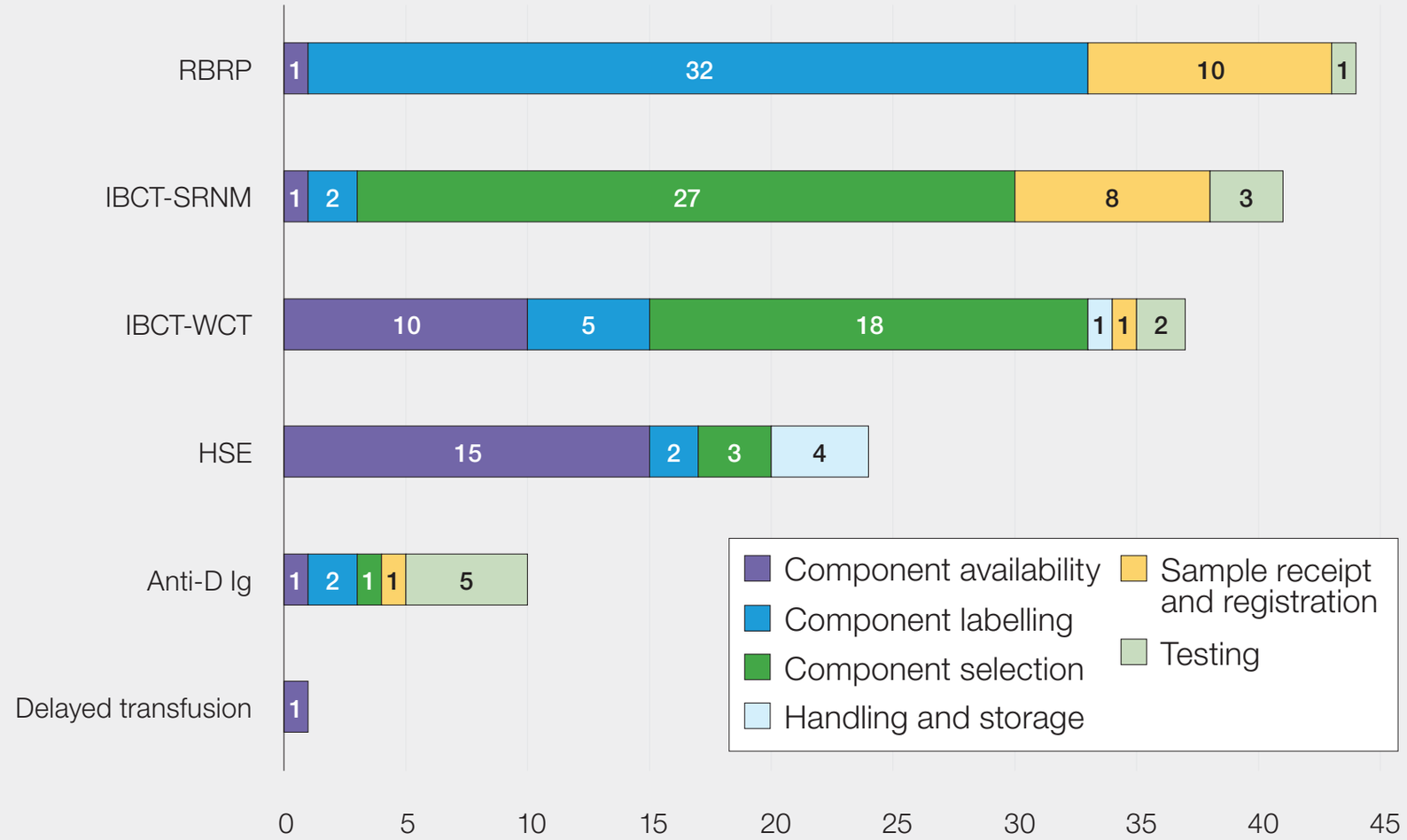


Figure 18.4: Incident investigation flow

Figure 18.5: Laboratory NM classified by the transfusion step where the primary error occurred (n=157)



HSE=handling and storage errors; IBCT=incorrect blood component transfused; Ig=immunoglobulin; RBRP=right blood right patient; SRNM=specific requirements not met; WCT=wrong component transfused

Figure 19.1: Distribution of cases across type of IT issues (n=889)

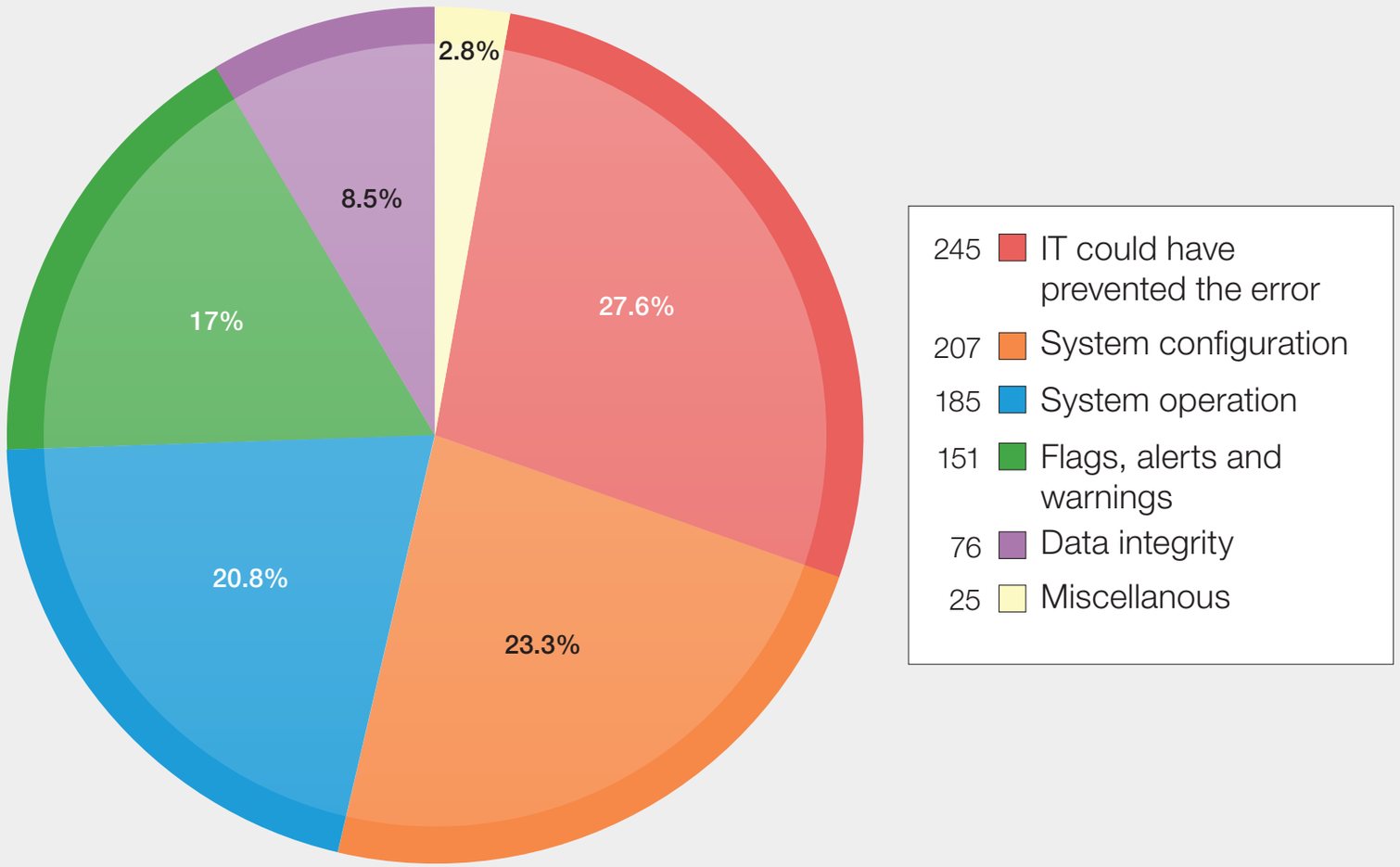


Figure 19.2: Proportion of near miss cases identified as belonging to IT error categories in 2025 (n=597)

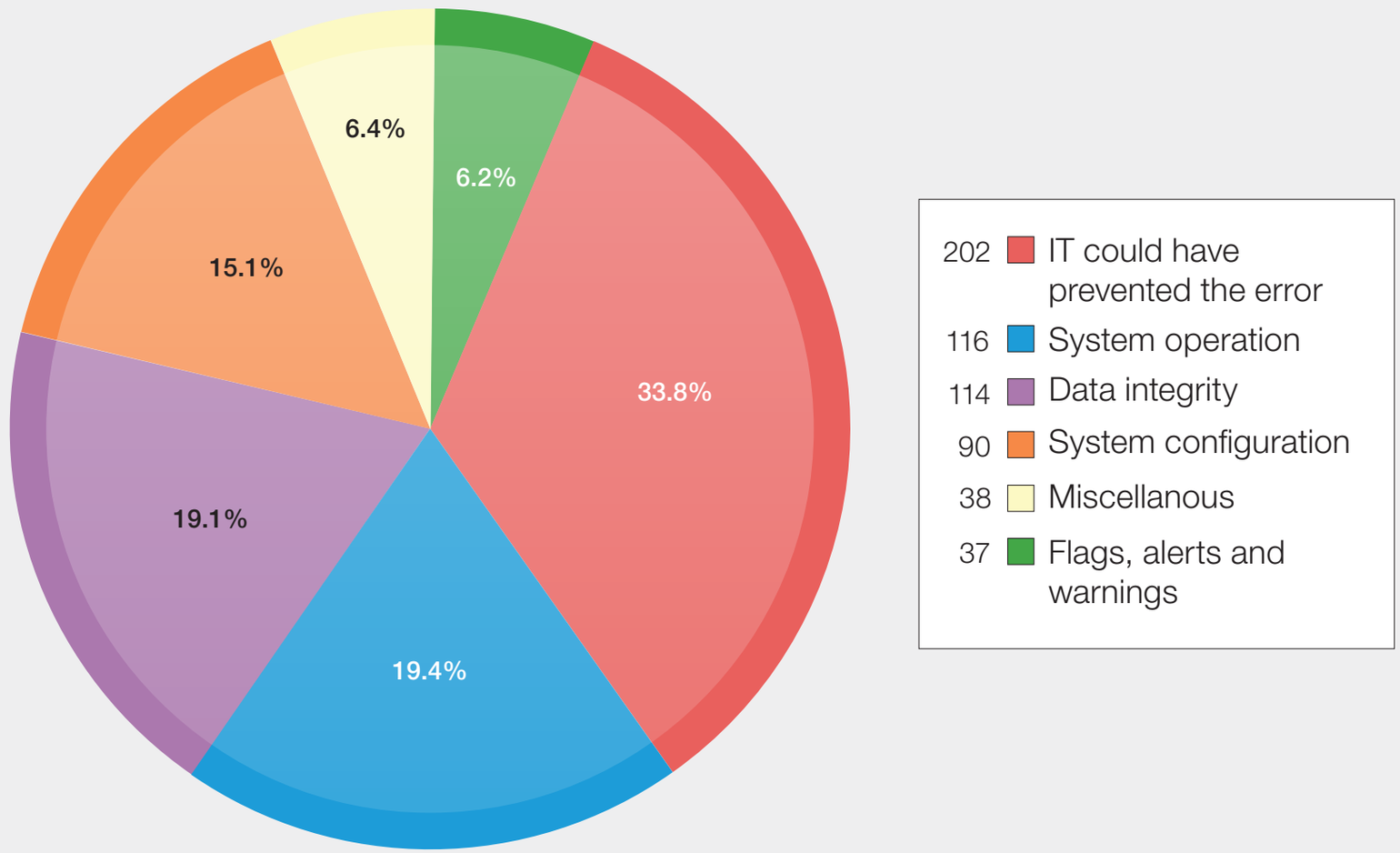
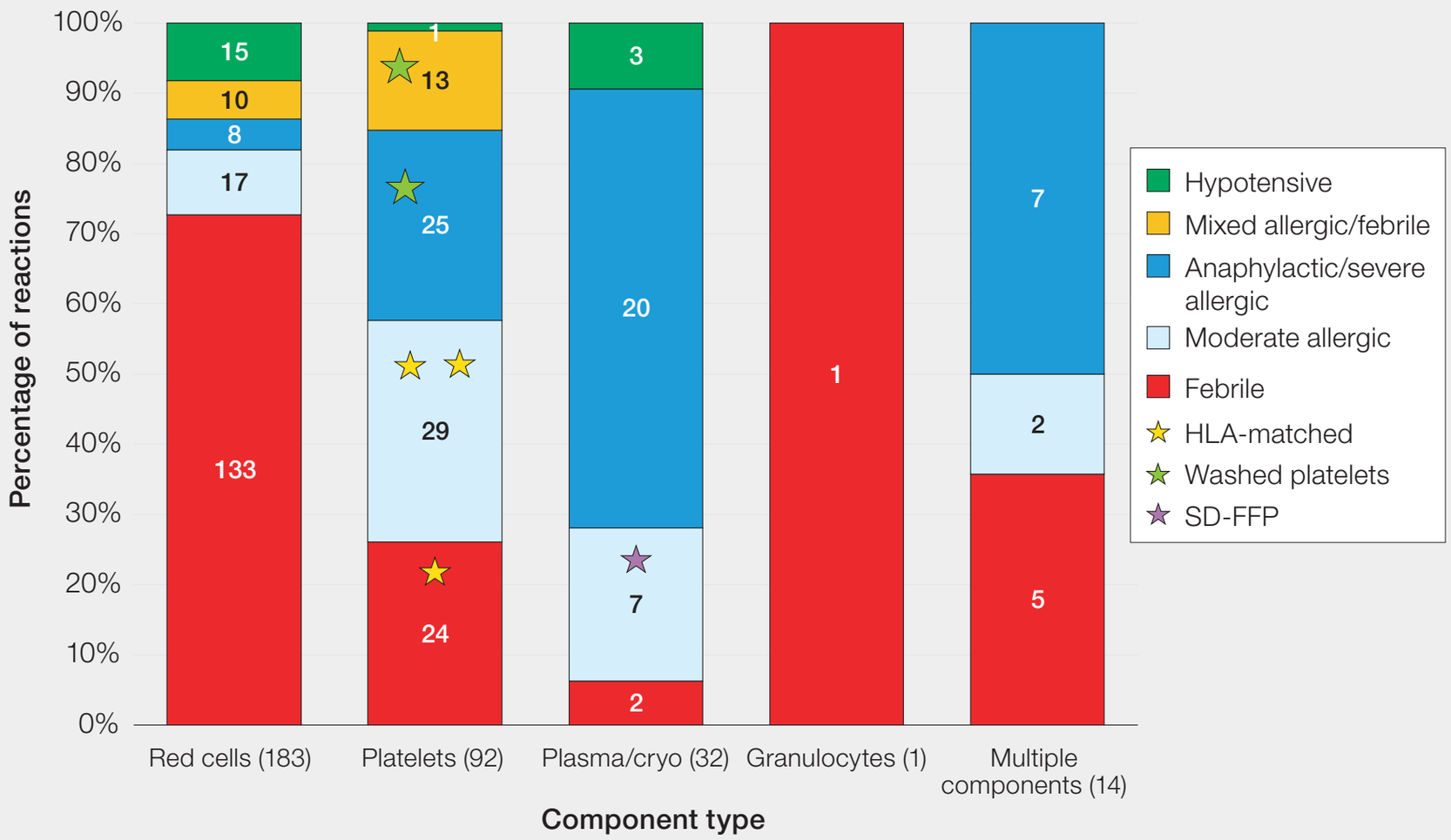


Figure 20.1: FAHR reactions by component type in 2025 (n=322)



cryo=cryoprecipitate; HLA=human leucocyte antigen; SD-FFP=solvent detergent-treated fresh frozen plasma

Figure 20.2: Incidence of reactions by type of platelet component in 2025

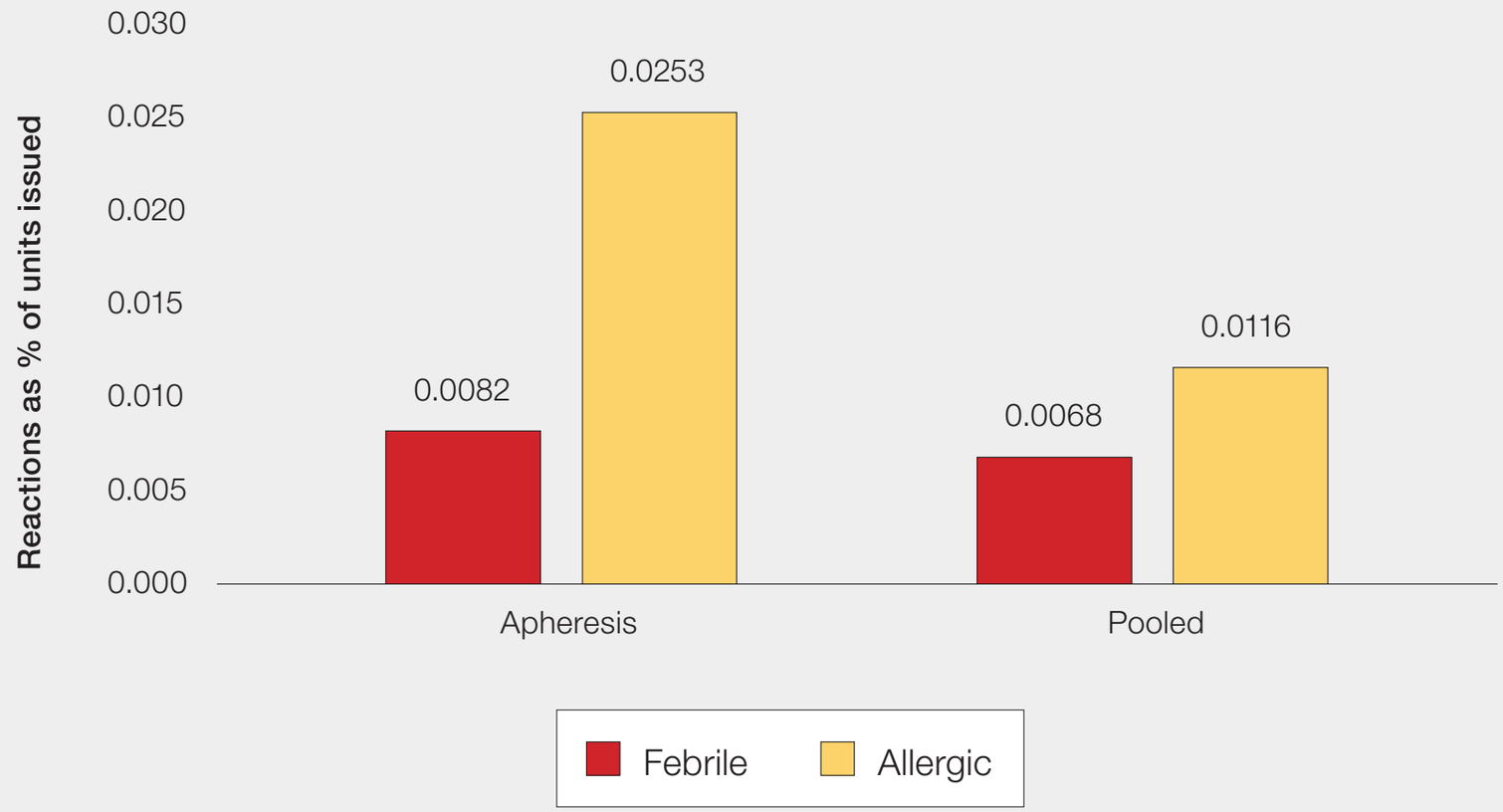


Figure 21.1: Pulmonary complications of transfusion 2016-2025

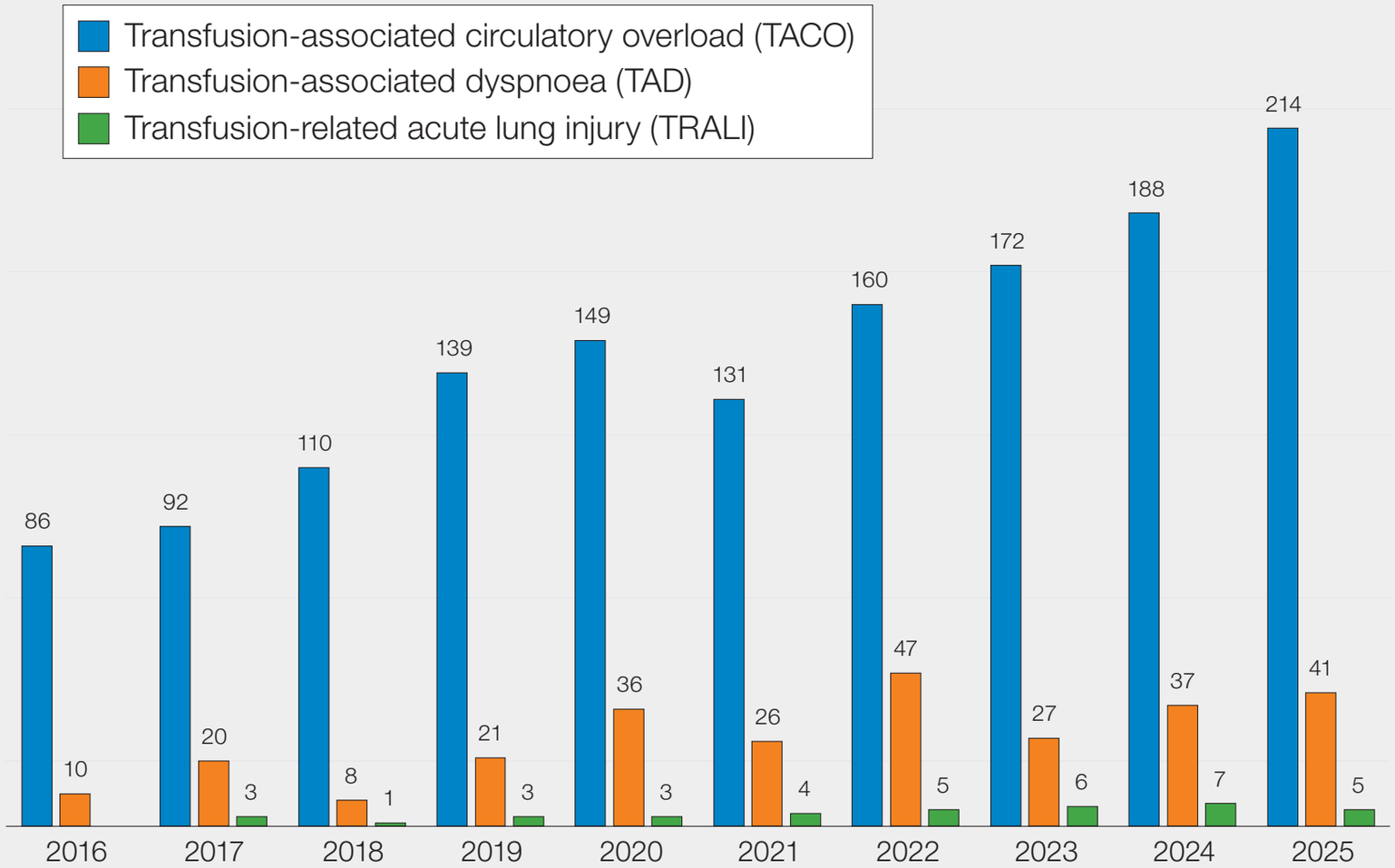


Figure 21a.1: Current TACO pre-transfusion risk assessment (published in the 2024 Annual SHOT Report)

TACO Risk Assessment		YES	NO
	Does the patient have any of the following?: diagnosis of 'heart failure', congestive cardiac failure (CCF), left ventricular dysfunction, aortic stenosis, or any other heart valve disease		
	Is the patient on a regular diuretic?		
	Does the patient have severe anaemia?		
	Is the patient known to have pulmonary oedema?		
	Does the patient have respiratory symptoms of undiagnosed cause?		
	Is the fluid balance clinically significantly positive?		
	Is the patient receiving intravenous fluids (or received them in the previous 24 hours)?		
	Is there any peripheral oedema?		
	Does the patient have a low serum albumin level?		
	Does the patient have significant renal impairment?		

If risks identified	YES	NO
Review the need for transfusion (do the benefits outweigh the risks)?		
Can the transfusion be safely deferred until the issue is investigated, treated or resolved?		

If proceeding with red cell transfusion: ensure appropriate indication and volume is prescribed (adults)

Indication code for transfusion	Target Hb	Dosing advice
Acute anaemia (R2)	Post-transfusion target Hb 70 - 90g/L	Body weight dosing (max 2 units)
Acute anaemia (R3: with acute MI/ACS)	Post-transfusion target Hb 80 - 100g/L	Body weight dosing (max 2 units)
Severe symptomatic chronic anaemia (R7)	No target Hb - minimum transfusion	Usually single unit only
Regular transfusion programme (R4)	Individualised target Hb	Body weight dosing (max 2 units)

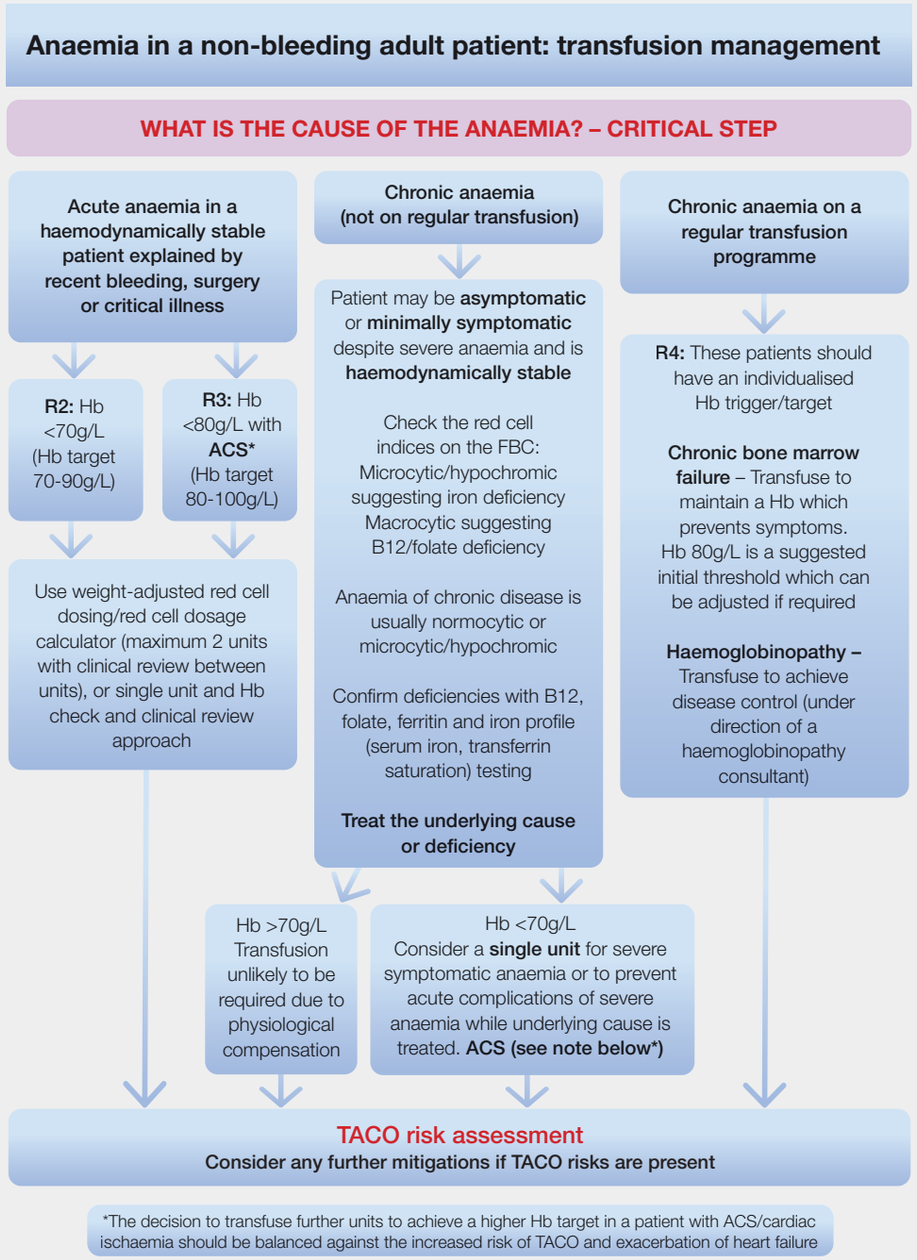
Other measures to mitigate TACO: ASSIGN ACTION AS APPROPRIATE	TICK
Review patient after each unit (red cells) and review symptoms of anaemia. Is further transfusion necessary?	
Measure the fluid balance	
Consider a prophylactic diuretic (where appropriate/not contraindicated)	
Monitor the vital signs closely, including oxygen saturation	

Name (PRINT):	**Due to the differences in adult and neonatal physiology, babies may have a different risk for TACO. Calculate the dose by weight and observe the notes above.**
Role:	
Date: **Time (24hr):**	
Signature:	

TACO=transfusion-associated circulatory overload; MI=myocardial infarction; ACS=acute coronary syndrome; Hb=haemoglobin

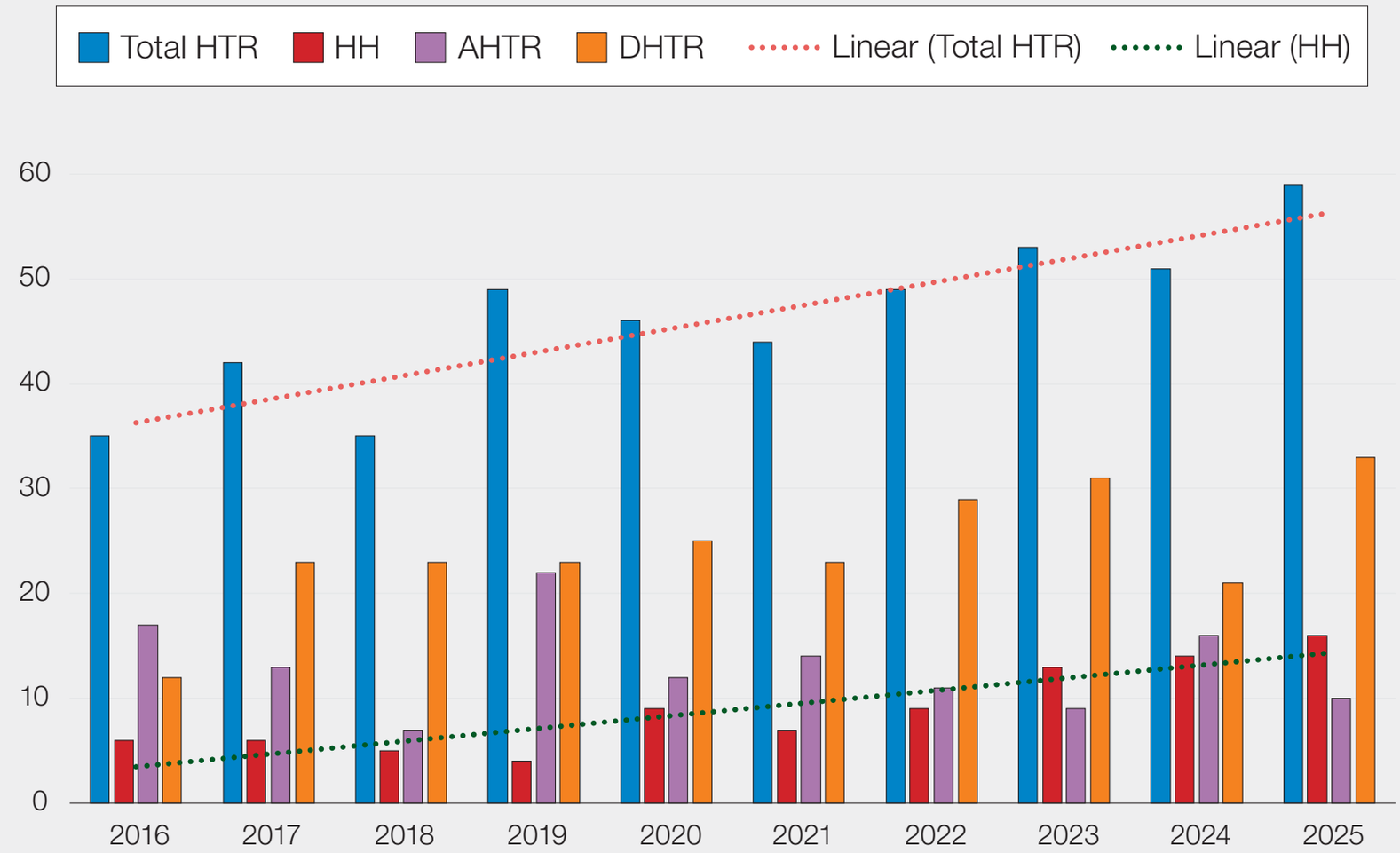
https://www.shotuk.org/resources/taco-pre-administration-risk-assessment-transfusion-associated-circulatory-overload/

Figure 21a.2: Transfusion management of a non-bleeding adult patient – identification of the cause of anaemia



https://www.shotuk.org/resources/new-taco-anaemia-management-resource/

Figure 22.1: Total number of haemolytic transfusion reactions (HTR) reported by year (2016-2025)



AHTR=acute haemolytic transfusion reaction; DHTR=delayed haemolytic transfusion reaction; HH=hyperhaemolysis

Figure 22.2: Age range in males and females experiencing HTR in 2025 (n=59)

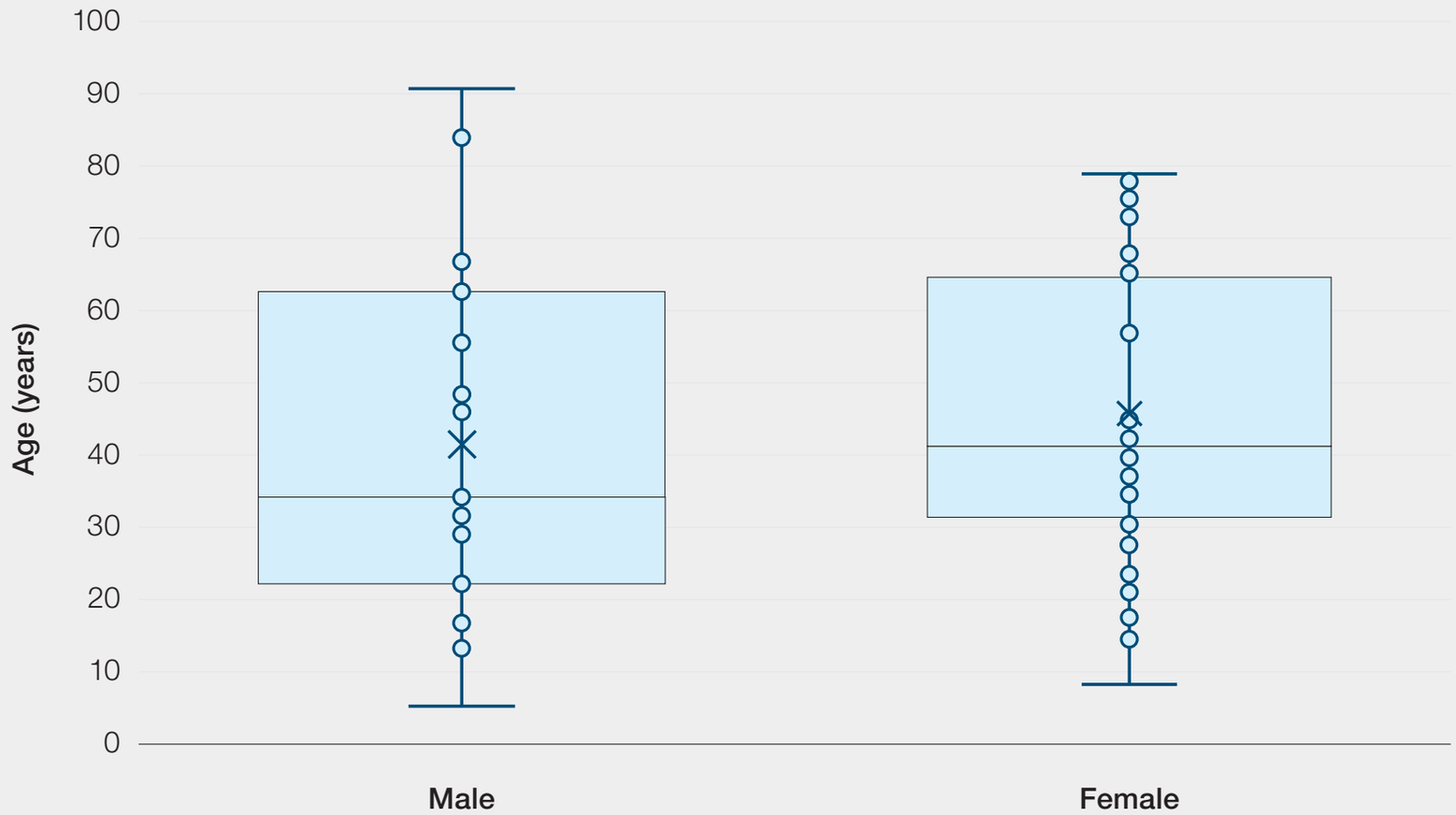


Figure 22.3: Antibodies implicated in AHTR in 2025

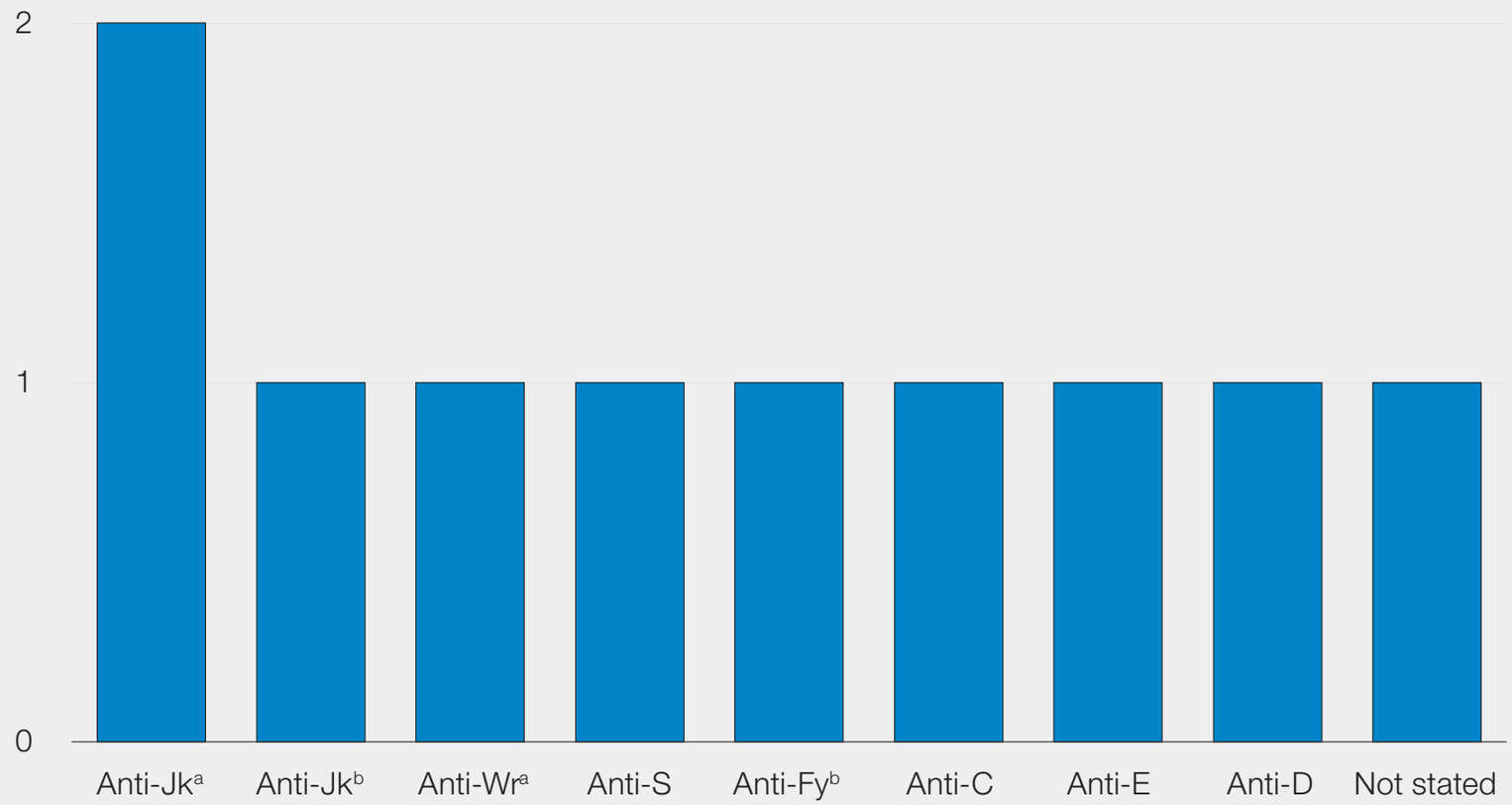


Figure 22.4: Antibodies implicated in DHTR in 2025

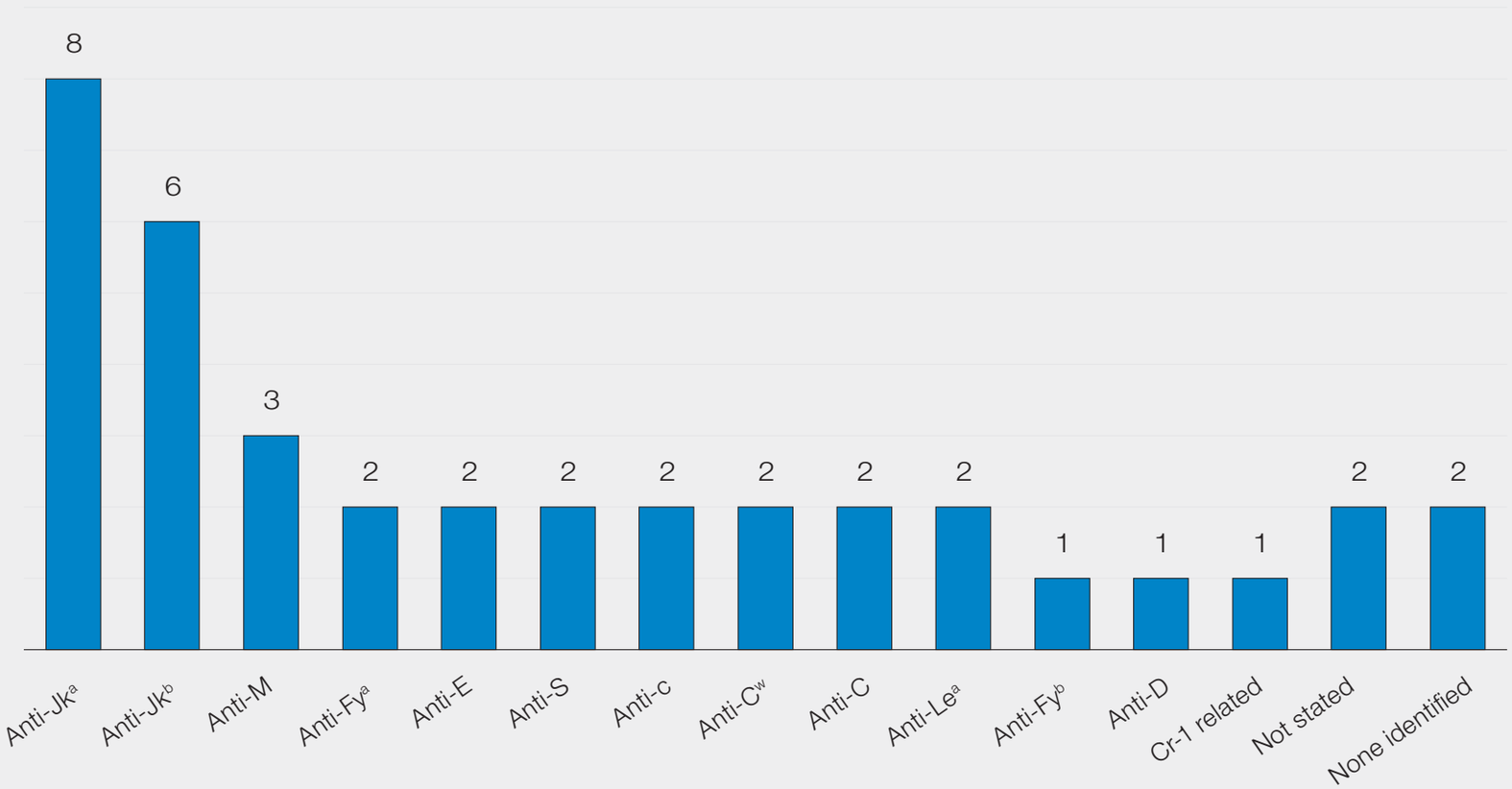
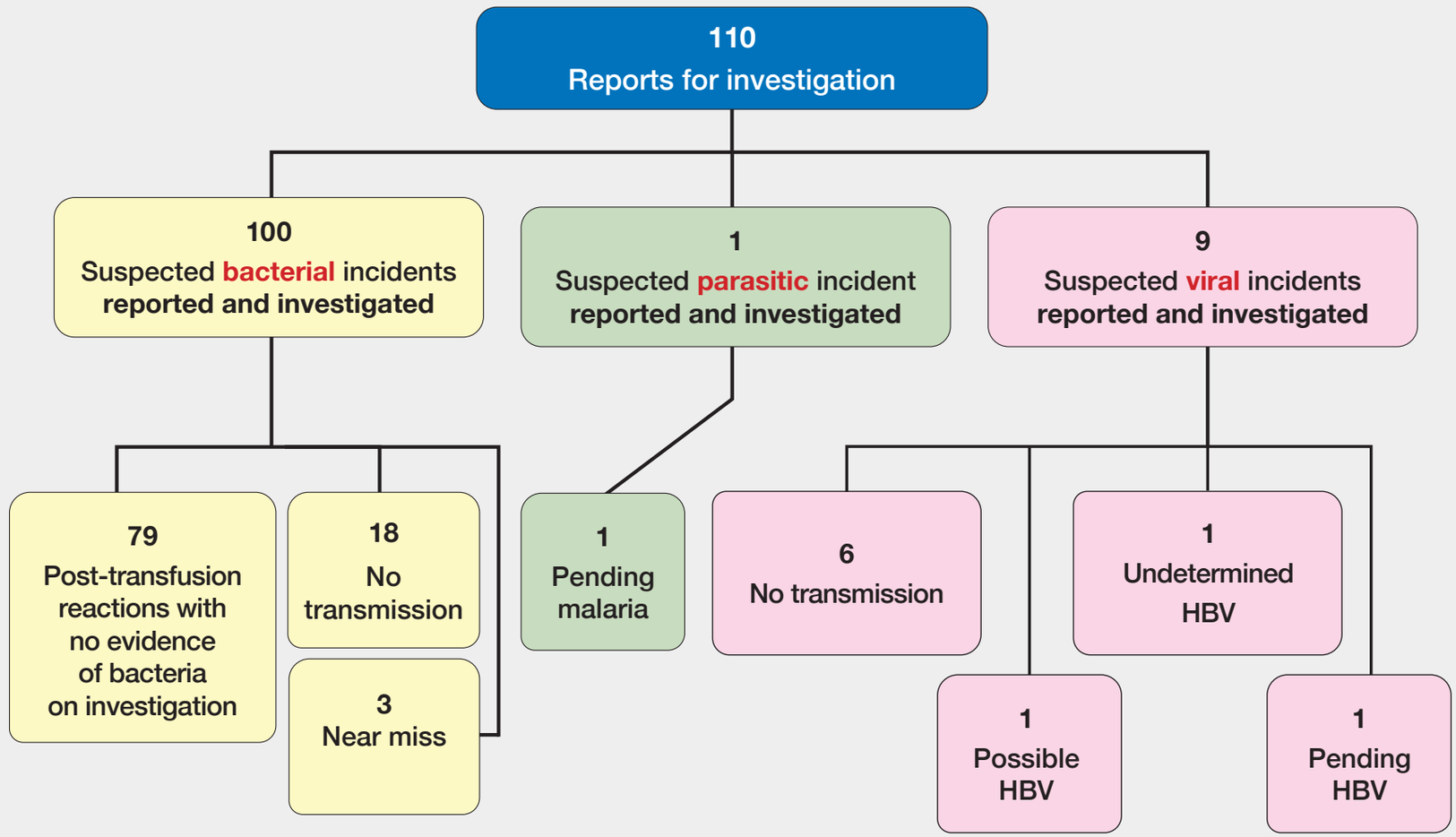


Figure 24.1: Outcomes of suspected TTI investigated in 2025 and reported to NHSBT/UKHSA Epidemiology Unit for England, Northern Ireland, Scotland, and Wales



HBV=hepatitis B virus

Figure 26.1: Trends in paediatric SHOT reports 2016-2025

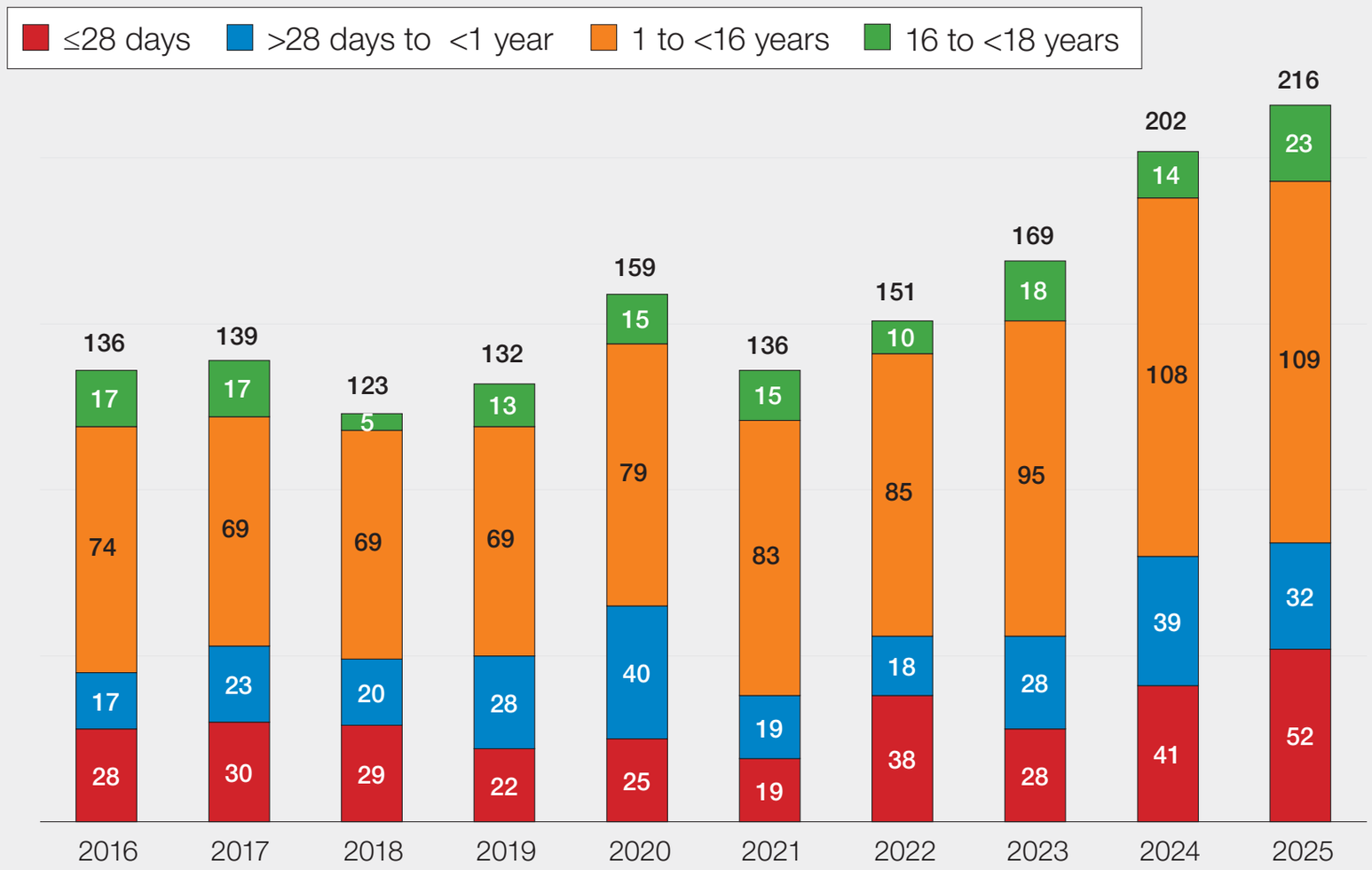


Figure 26.2: Summary of paediatric cases by category and age in 2025 (n=216)

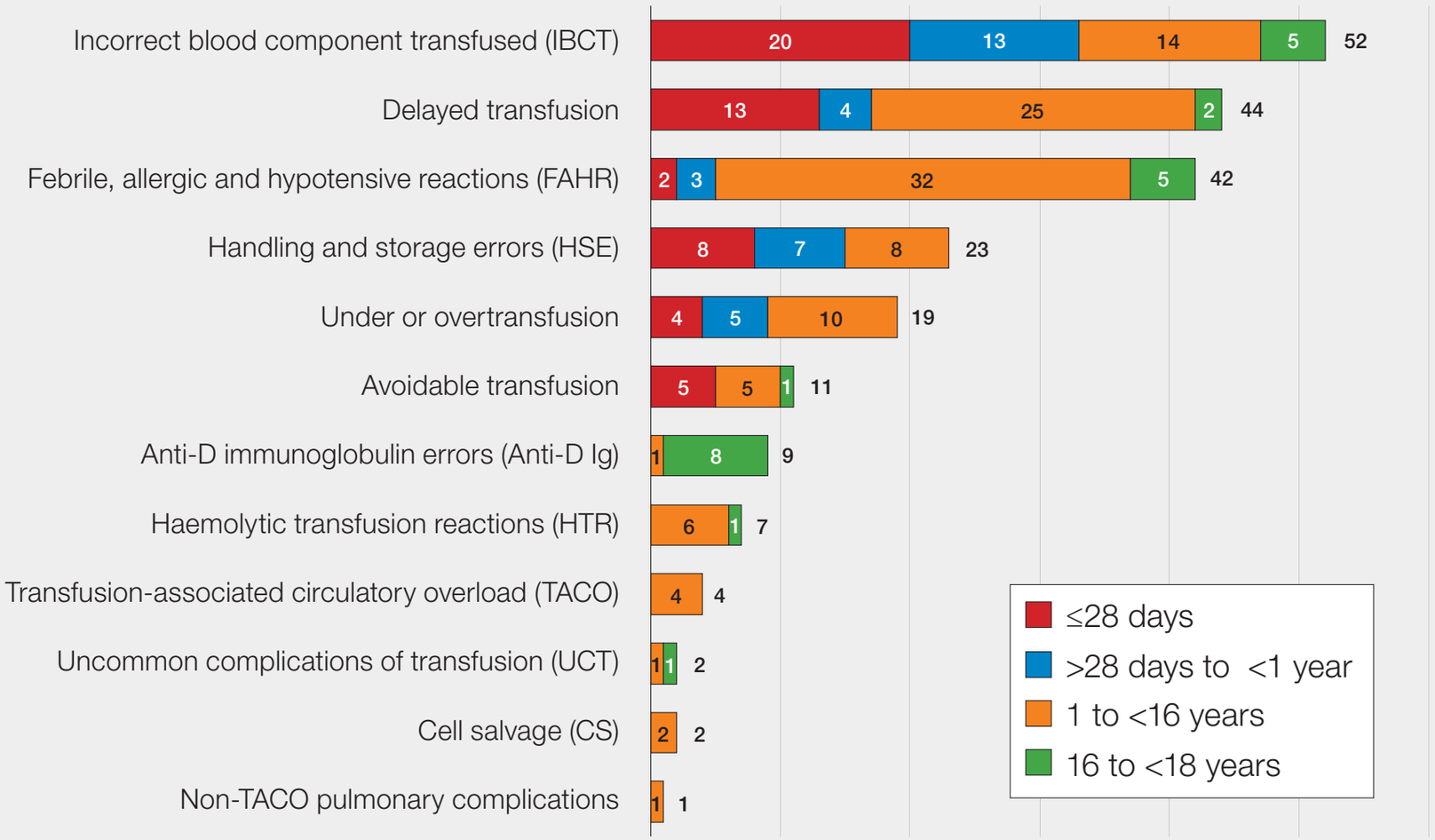
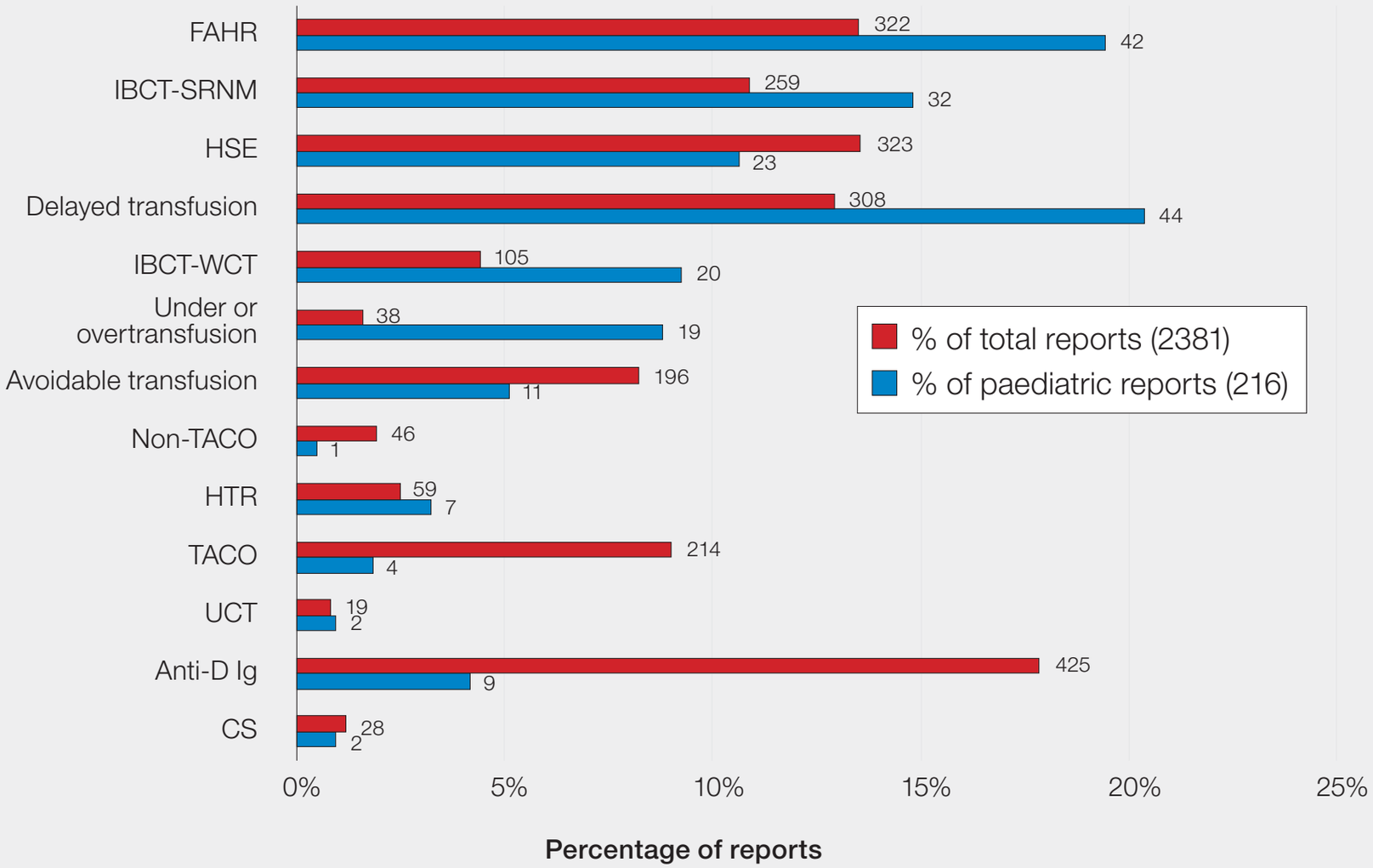
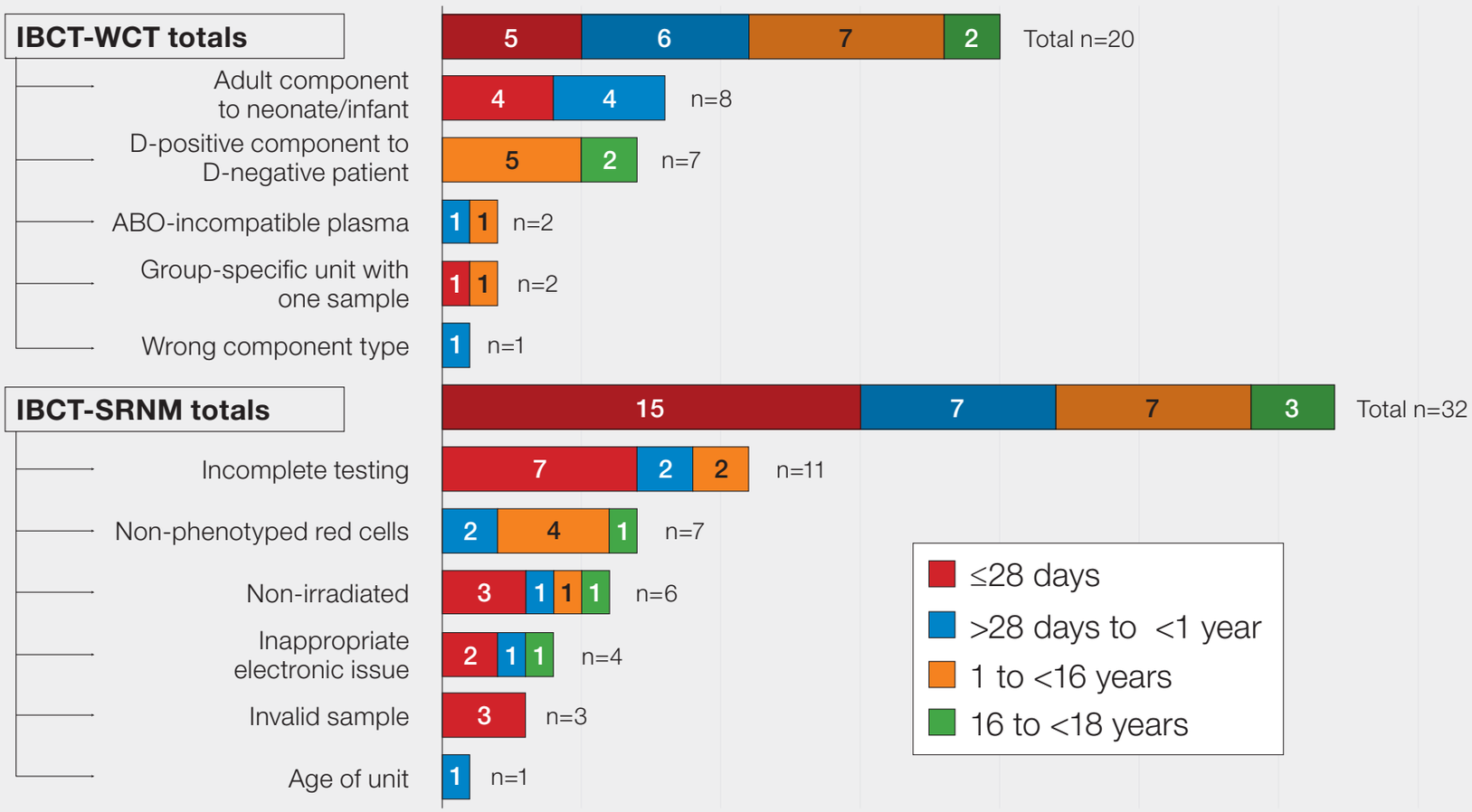


Figure 26.3: Percentages of paediatric and total reports in each category in 2025 (n=216)



CS=cell salvage; FAHR=febrile, allergic and hypotensive reactions; HSE=handling and storage errors; HTR=haemolytic transfusion reactions; IBCT=incorrect blood component transfused; Ig=immunoglobulin; SRNM=specific requirements not met; TACO=transfusion-associated circulatory overload; UCT=uncommon complications of transfusion; WCT=wrong component transfused

Figure 26.4: Breakdown of incorrect blood component transfused reports in 2025 (n=52)



IBCT=incorrect blood component transfused; SRNM=specific requirements not met; WCT=wrong component transfused

Figure 26.5: Blood administration giving sets

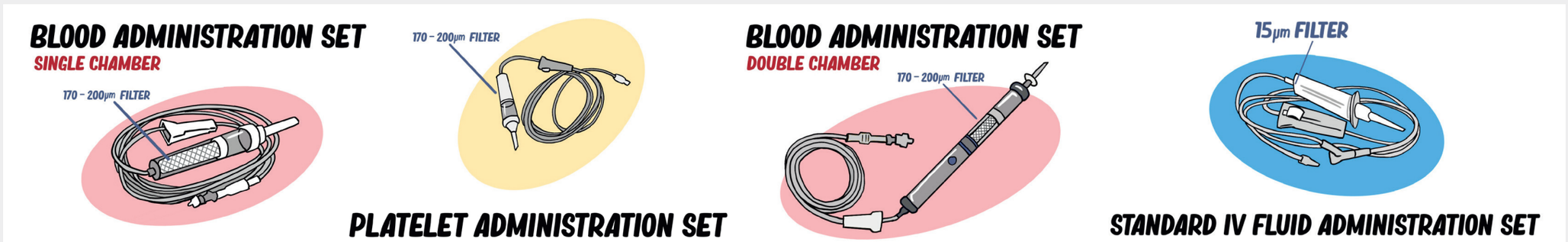


Figure 26.6: Summary of paediatric FAHR reports by component 2016-2025

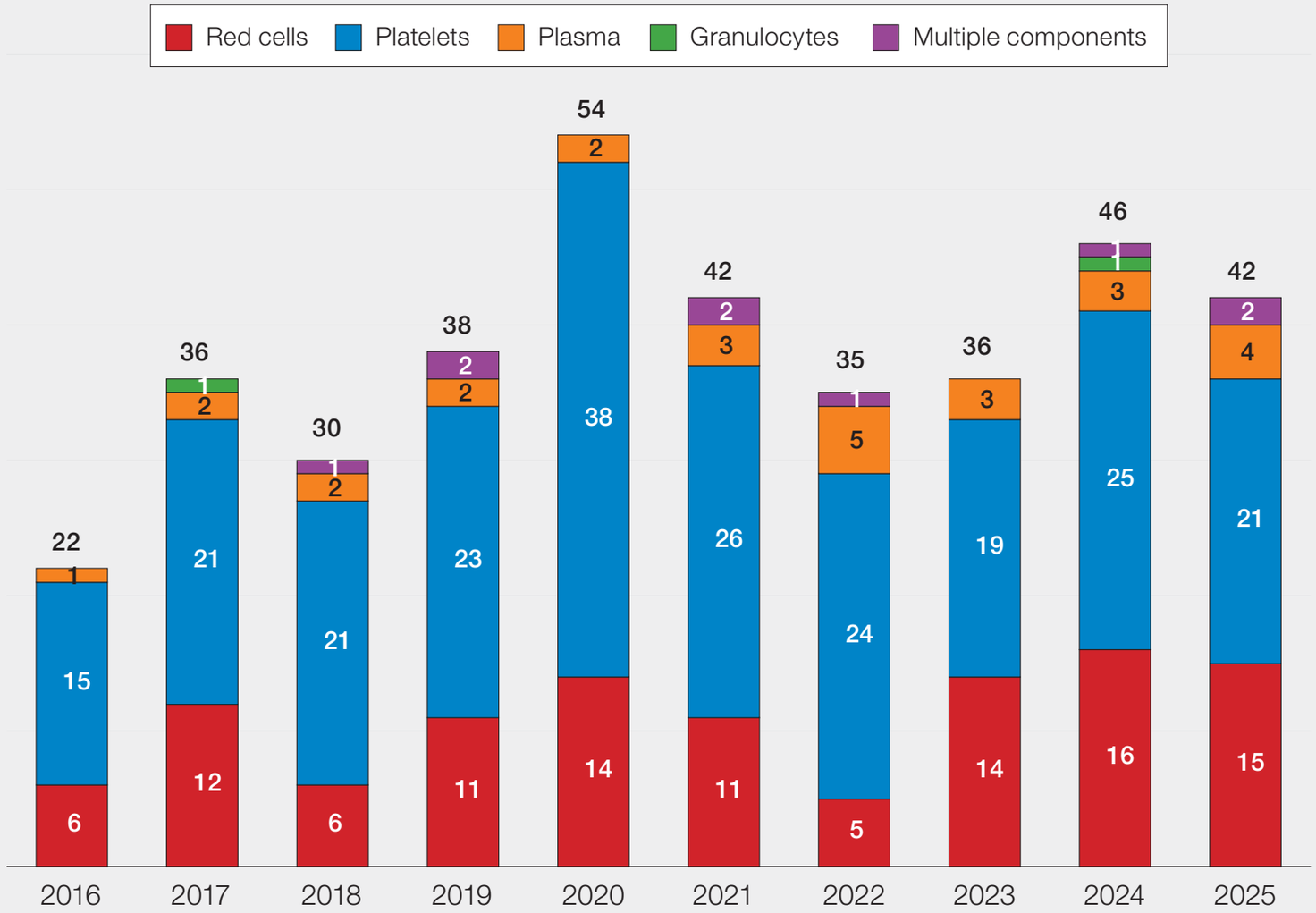
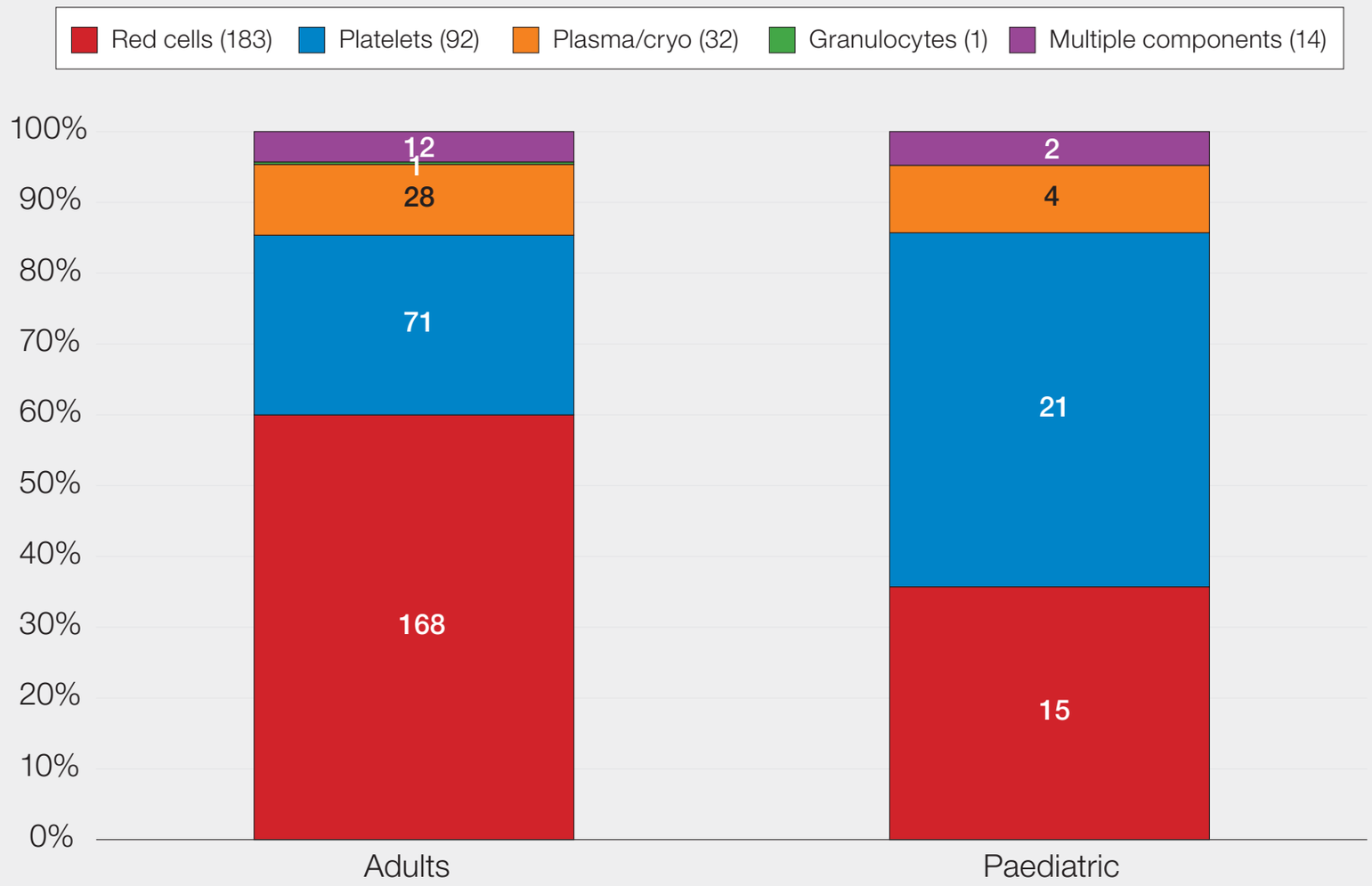
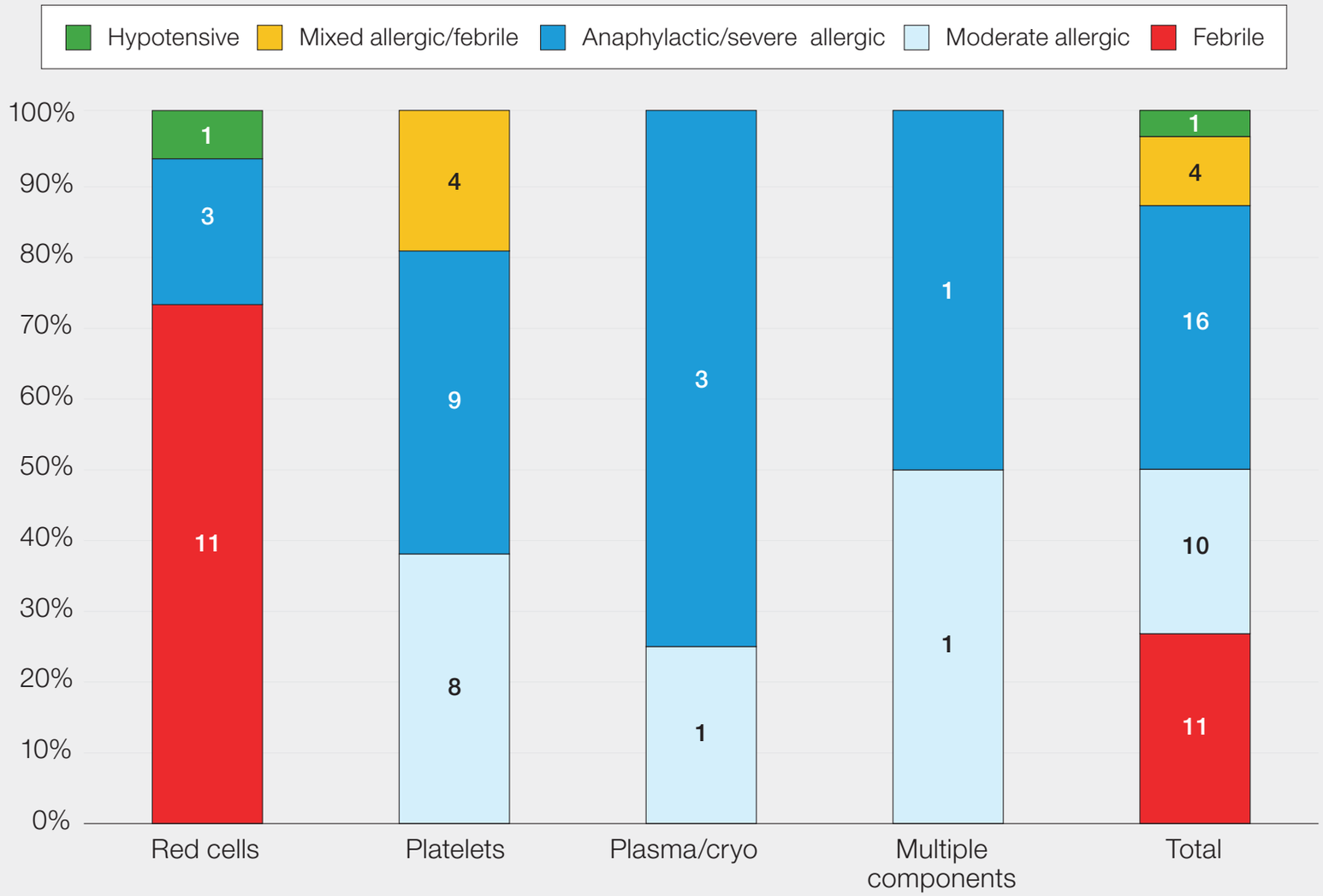


Figure 26.7: Paediatric FAHR reports in 2025 (n=42)
a: Comparison of proportions of adult and paediatric reports by component types



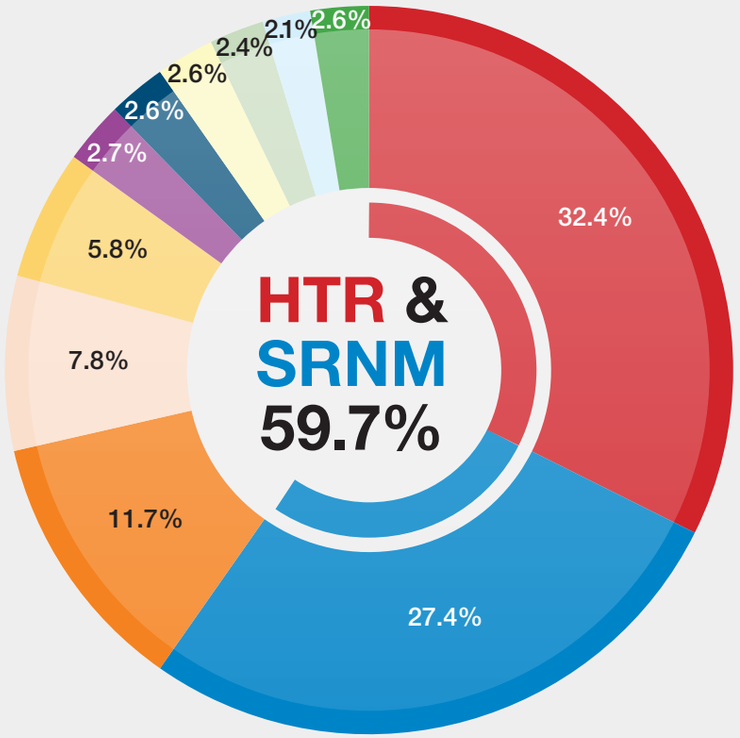
b: Percentages of reaction types in paediatric FAHR related to different component types



cryo=cryoprecipitate

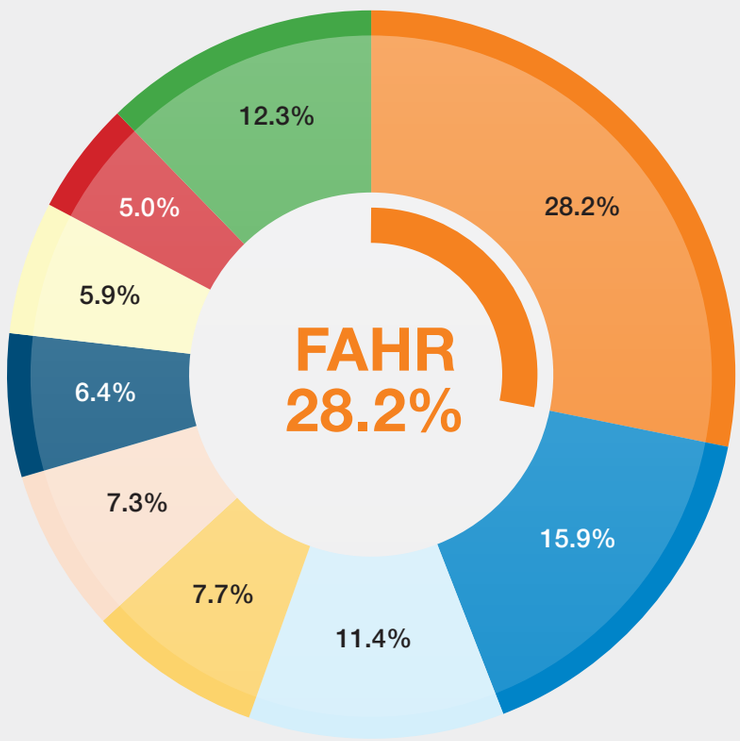
Figure 27.1: Cumulative data for adverse transfusion events in patients with haemoglobin disorders 2010 to 2025

a. Sickle cell disorder (n=658)



(213) HTR
(180) IBCT-SRNM
(77) FAHR
(51) Delayed transfusion
(38) NM
(18) IBCT-WCT
(17) RBRP
(17) Under or overtransfusion
(16) Avoidable transfusion
(14) HSE
(17) Other

b. Thalassaemia (n=220)

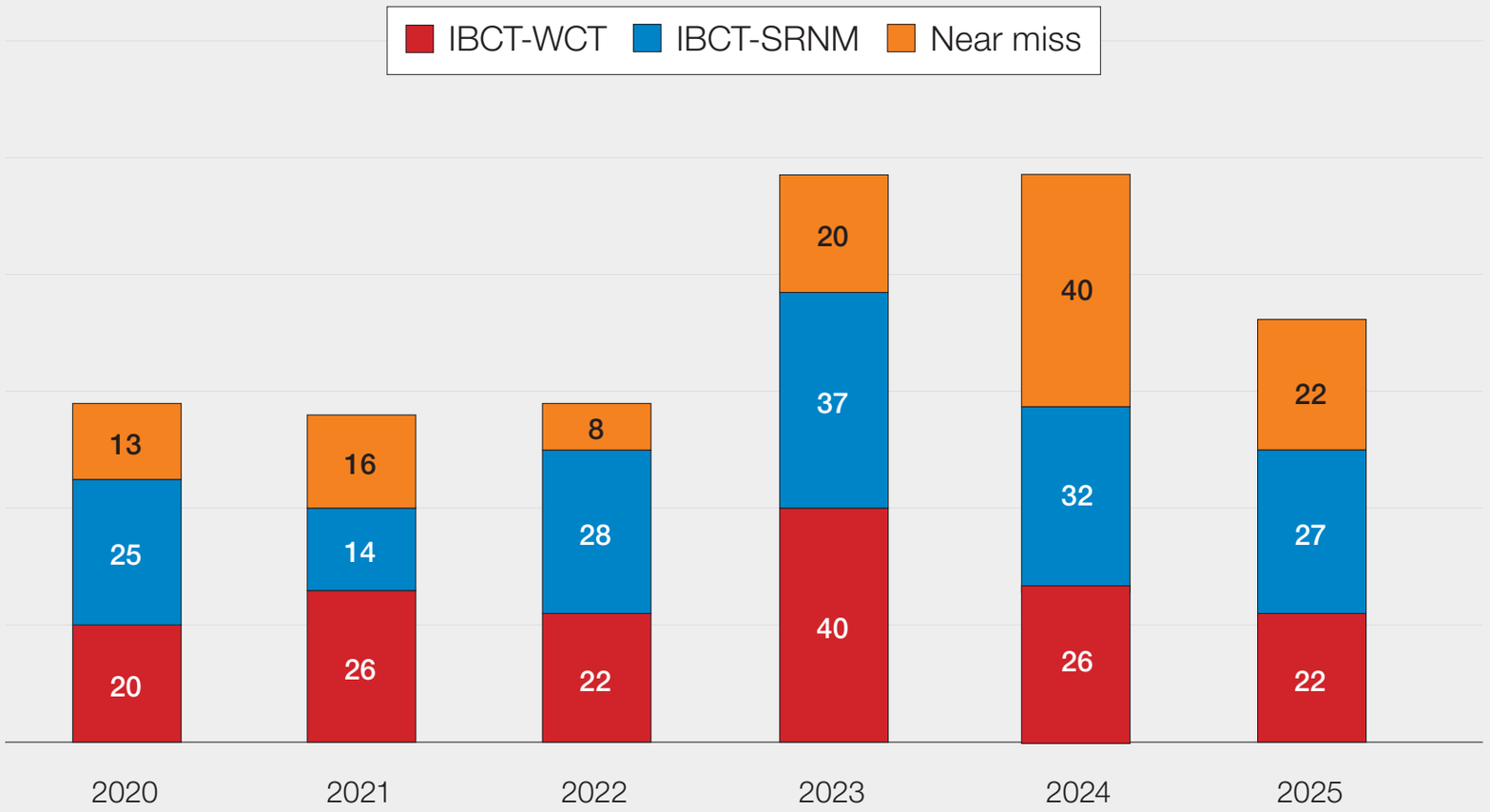


(62) FAHR
(35) IBCT-SRNM
(25) HSE
(17) NM
(16) Delayed transfusion
(14) RBRP
(13) Under or overtransfusion
(11) HTR
(27) Other

FAHR=febrile, allergic or hypotensive reactions; HSE=handling and storage errors; HTR=haemolytic transfusion reactions; IBCT=incorrect blood component transfused; NM=near miss; RBRP=right blood right patient; SRNM=specific requirements not met; TACO=transfusion-associated circulatory overload; TTI=transfusion-transmitted infection; UCT=uncommon complications of transfusion; WCT=wrong component transfused

Categories with 10 or fewer reports are included as 'Other'

Figure 28.1: Number of transplant-related reports (HSCT and SOT) from 2020 to 2025



IBCT=incorrect blood component transfused; SRNM=specific requirements not met; WCT=wrong component transfused

Figure 29.1: Number of SHOT reports of D sensitisation by year, 2012-2025

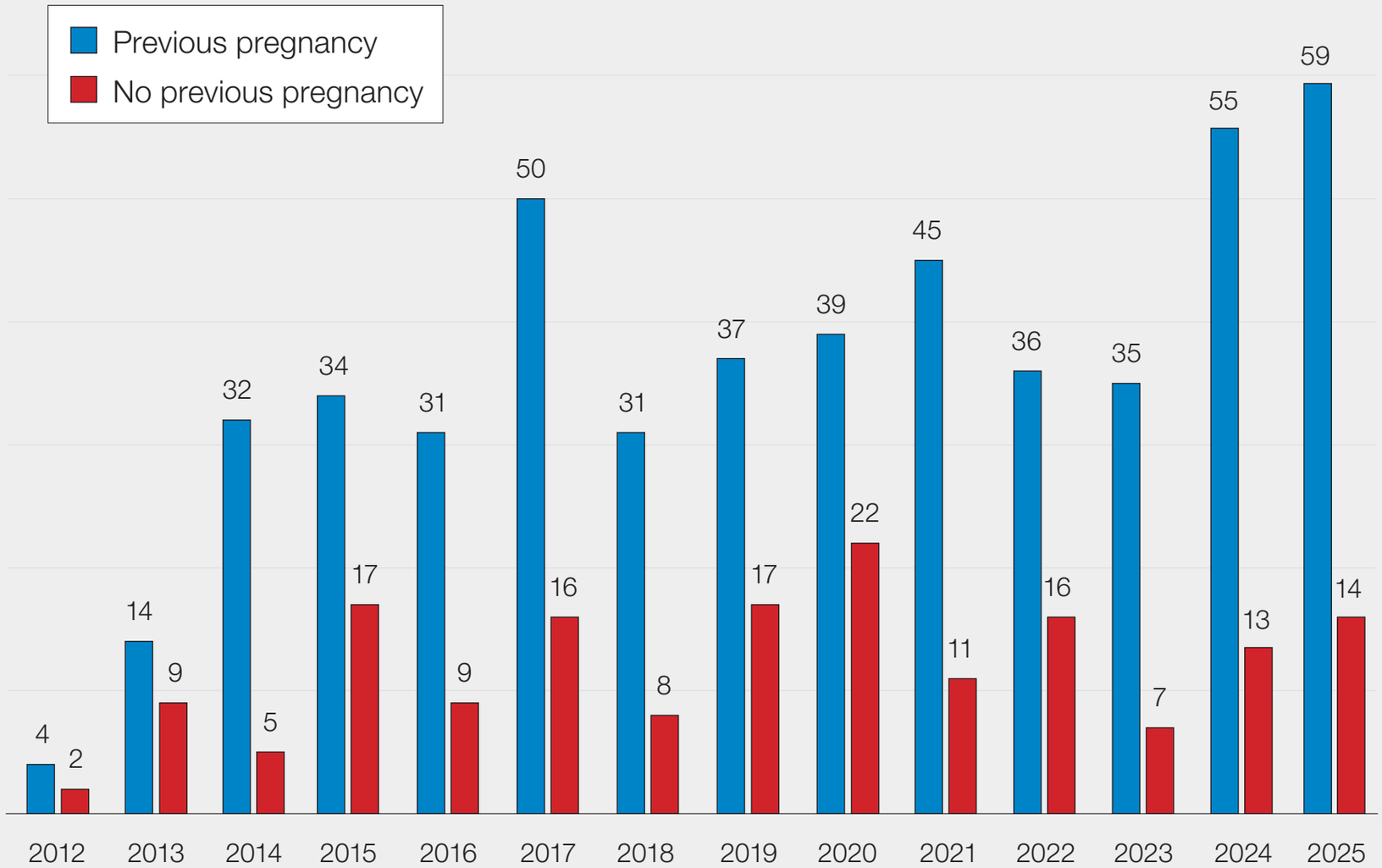
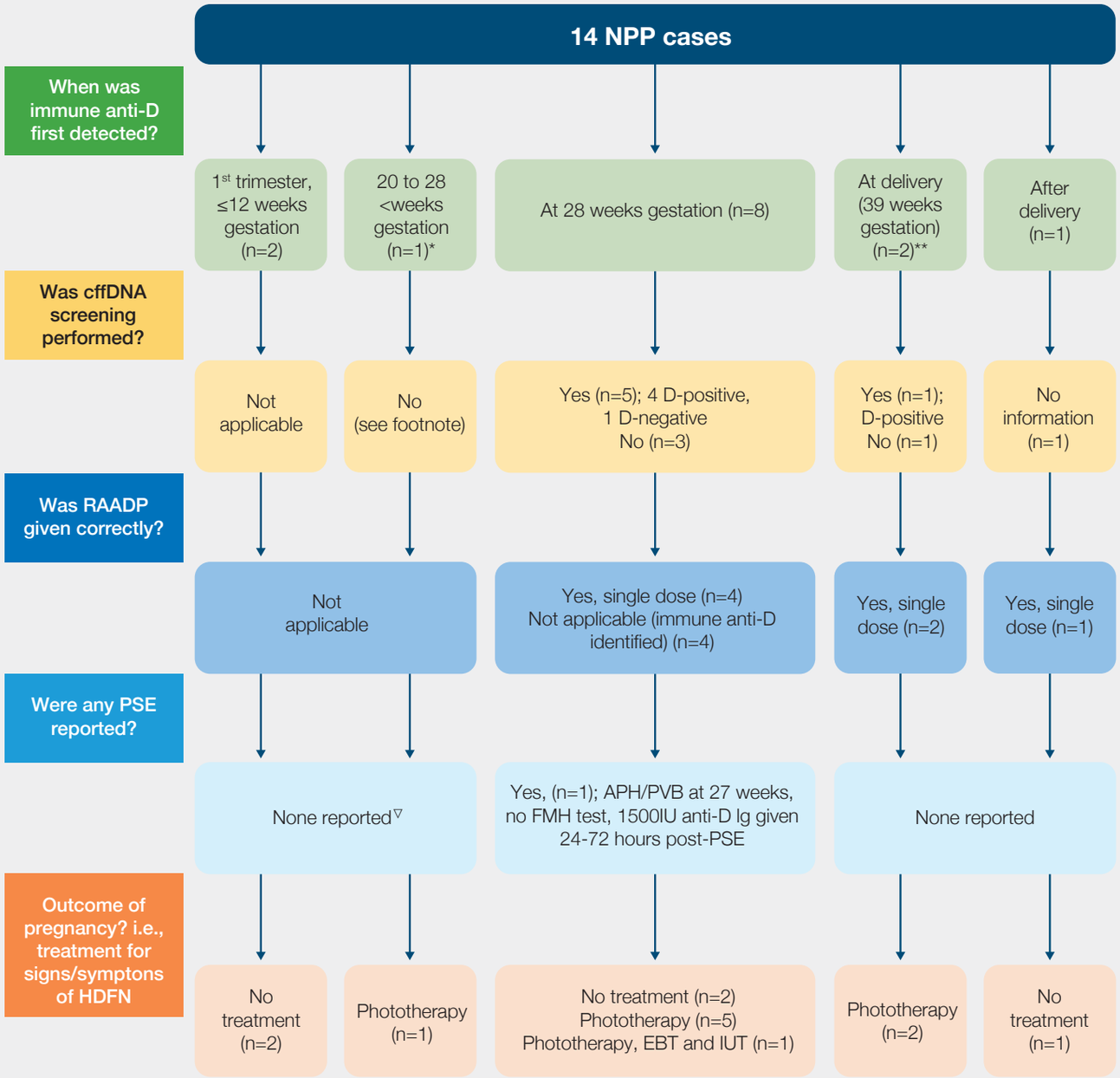


Figure 29.2: Summary of the 2025 NPP data (n=14)



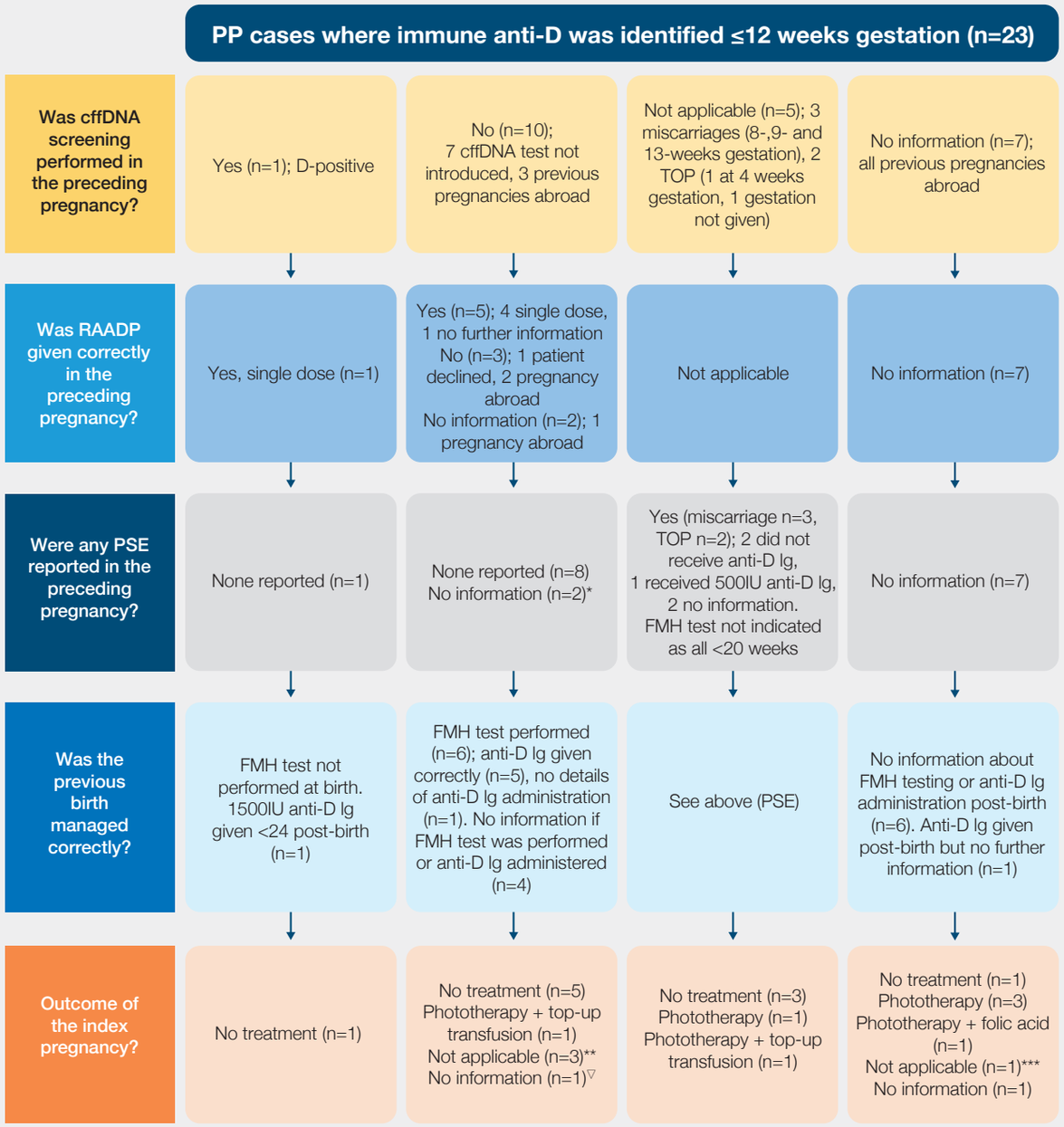
APH=antepartum haemorrhage; cffDNA=cell-free fetal deoxyribonucleic acid; EBT=exchange blood transfusion; FMH=fetomaternal haemorrhage; HDFN=haemolytic disease of the fetus and newborn; IUT=intrauterine transfusion; PSE=potential sensitising event; PVB=per vaginal bleed; RAADP=routine antenatal anti-D prophylaxis

**Late booking – woman was first seen at 26+5 weeks gestation, when immune anti-D was identified*

***Potentially identified at 28 weeks, however sample taken after anti-D Ig administration and not referred for quantification*

▽First pregnancy, no PSE reported in early pregnancy and baby found to be D-negative at birth. No history of previous miscarriages or other PSE that could explain D sensitisation

Figure 29.3: Summary of the 2025 PP data where anti-D was detected ≤12 weeks (n=23)



cffDNA=cell-free fetal deoxyribonucleic acid; FMH=fetomaternal haemorrhage; IUT=intrauterine transfusion; PSE=potential sensitising event; RAADP=routine antenatal anti-D prophylaxis; TOP=termination of pregnancy

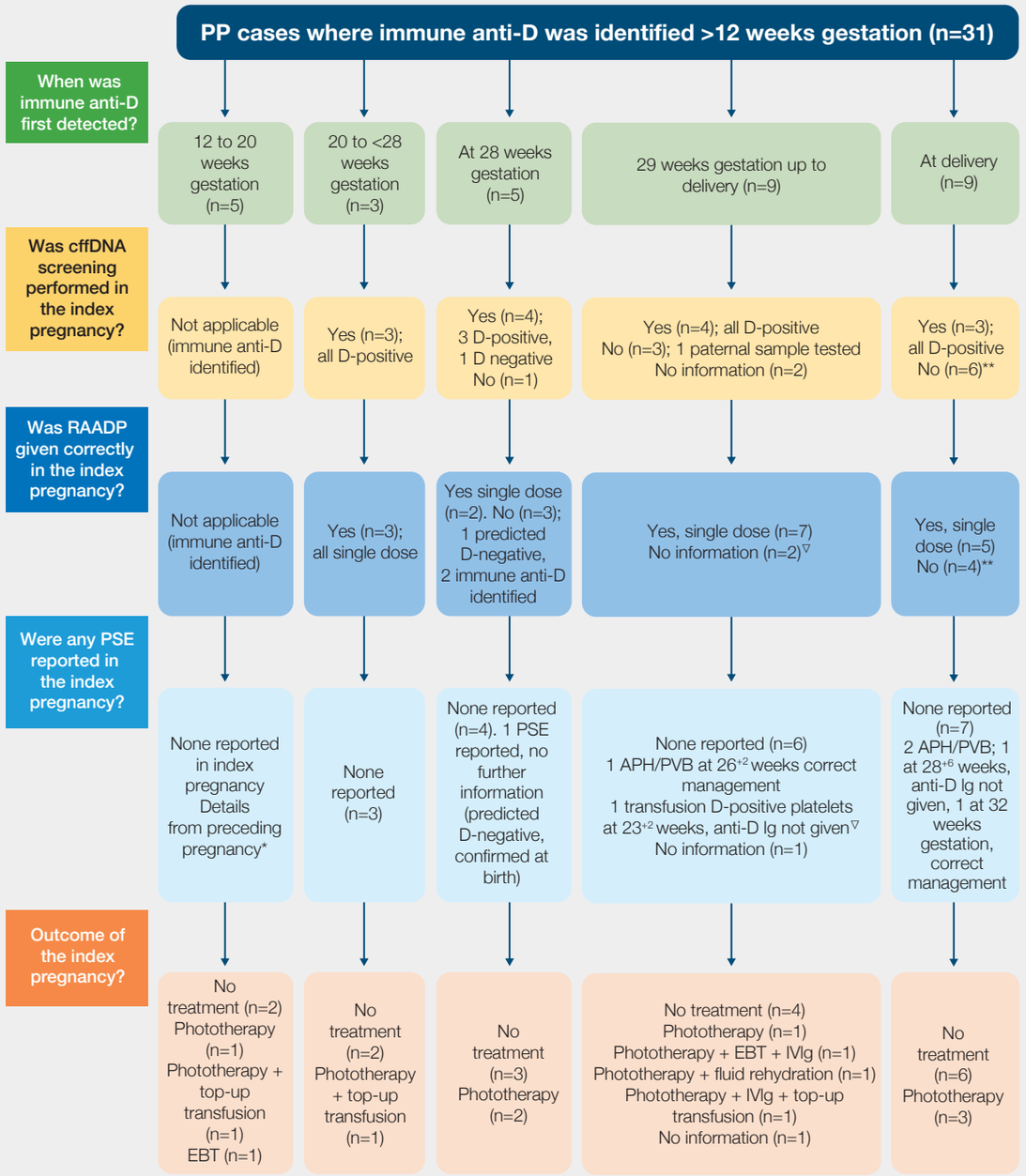
**1 case in previous pregnancy baby was found to be D-negative*

***Outcome of index pregnancy: 1 miscarriage at 19 weeks, 1 TOP at 4 weeks, intrauterine death (IUD) at 26 weeks*

****Outcome of index pregnancy: 1 miscarriage at 12 weeks*

▽Patient moved abroad during pregnancy, unable to provide information about the outcome of index pregnancy

Figure 29.4: Summary of the 2025 PP data where anti-D was detected >12 weeks (n=31)



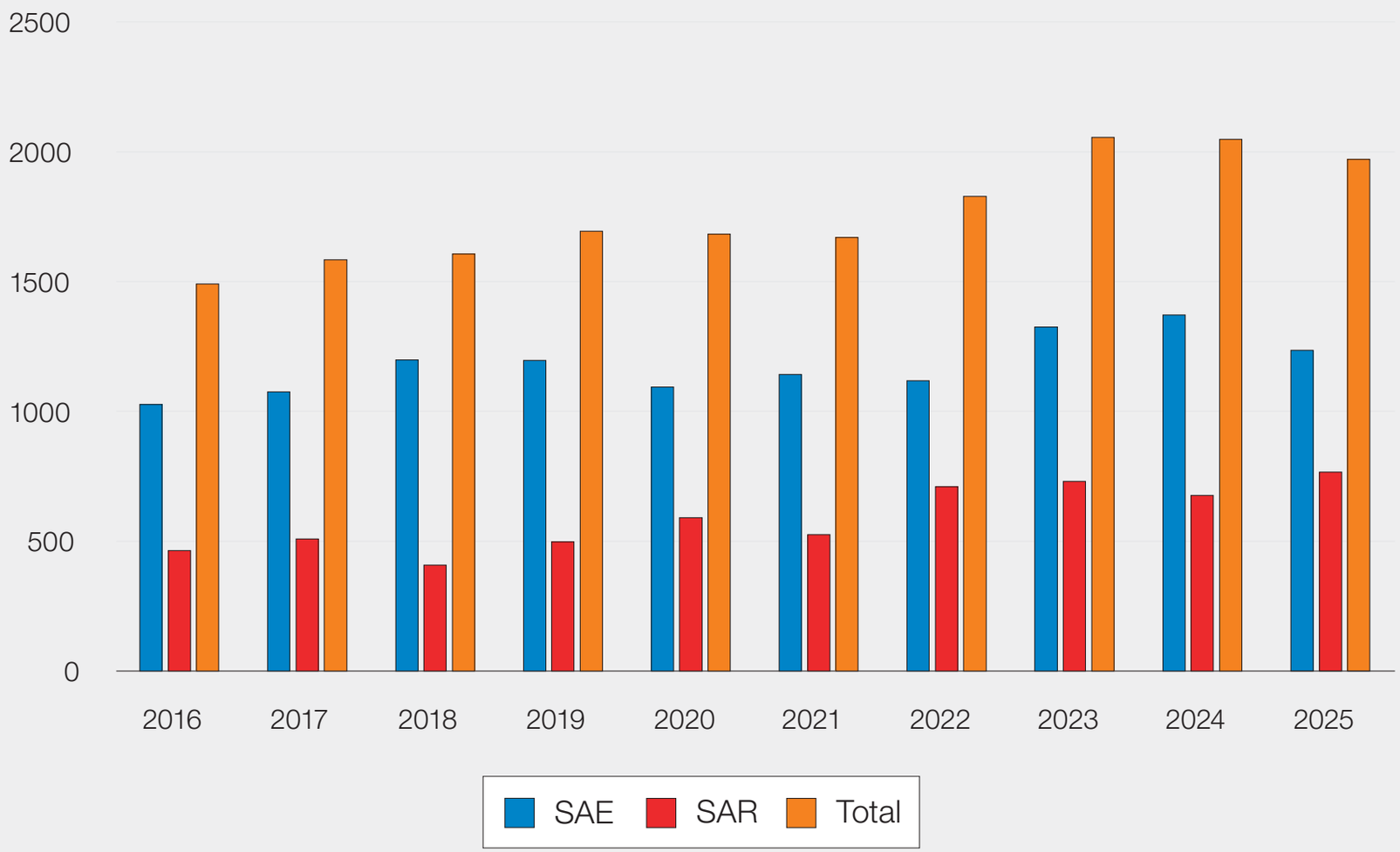
APH=antepartum haemorrhage; cffDNA=cell-free fetal deoxyribonucleic acid; EBT=exchange blood transfusion; HDFN=haemolytic disease of the fetus and newborn; IVIg=intravenous immunoglobulin; PSE=potential sensitising event; PVB=per vaginal bleed; RAADP=routine antenatal anti-D prophylaxis

**1 case woman declined prophylaxis during pregnancy and at birth; 1 case previous 3 TOP, in the last TOP no G&S sample taken or anti-D Ig given; 1 case no information available regarding previous pregnancy (abroad); 1 case not reported if anti-D Ig was given after birth in preceding pregnancy*

***2 women were treated as D-positive throughout pregnancy, D-variant detected at birth (when immune anti-D was identified). In both cases cffDNA screening testing was not offered and RAADP not given*

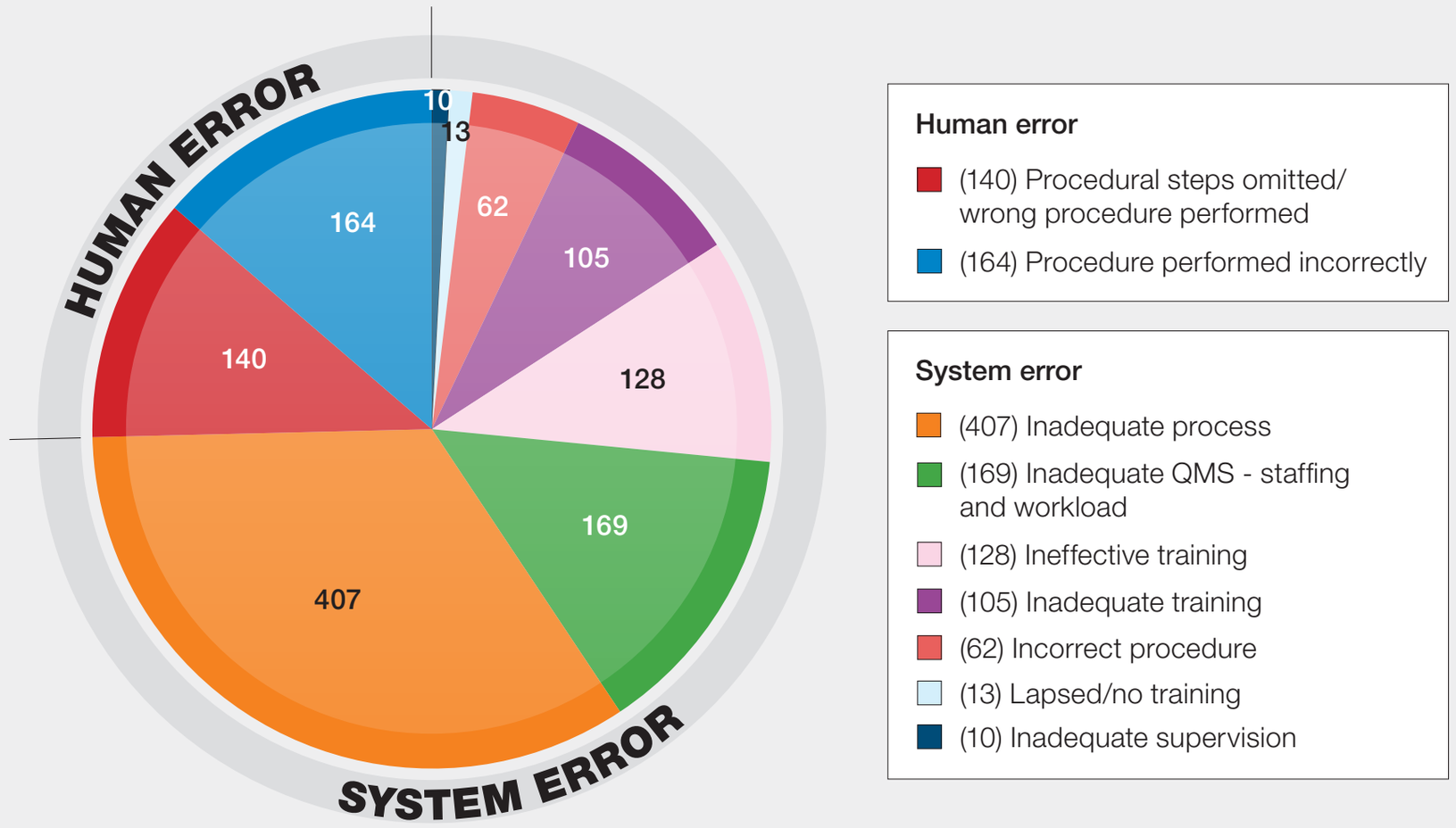
▽1 case the baby was found to be D-negative at birth, 1 immune anti-D developed following transfusion of D-positive platelets. Case described in Chapter 9, Adverse Events Related to Anti-D Immunoglobulin (Ig) Case 9.1y

Figure 30.1: Submitted confirmation reports 2016–2025



SAE=serious adverse event; SAR=serious adverse reaction

Figure 30.2: Human/system error subcategories (n=1198)



QMS=quality management system

Figure 30.3: SAR reports, by imputability, reported to SABRE in 2025 (n=746)

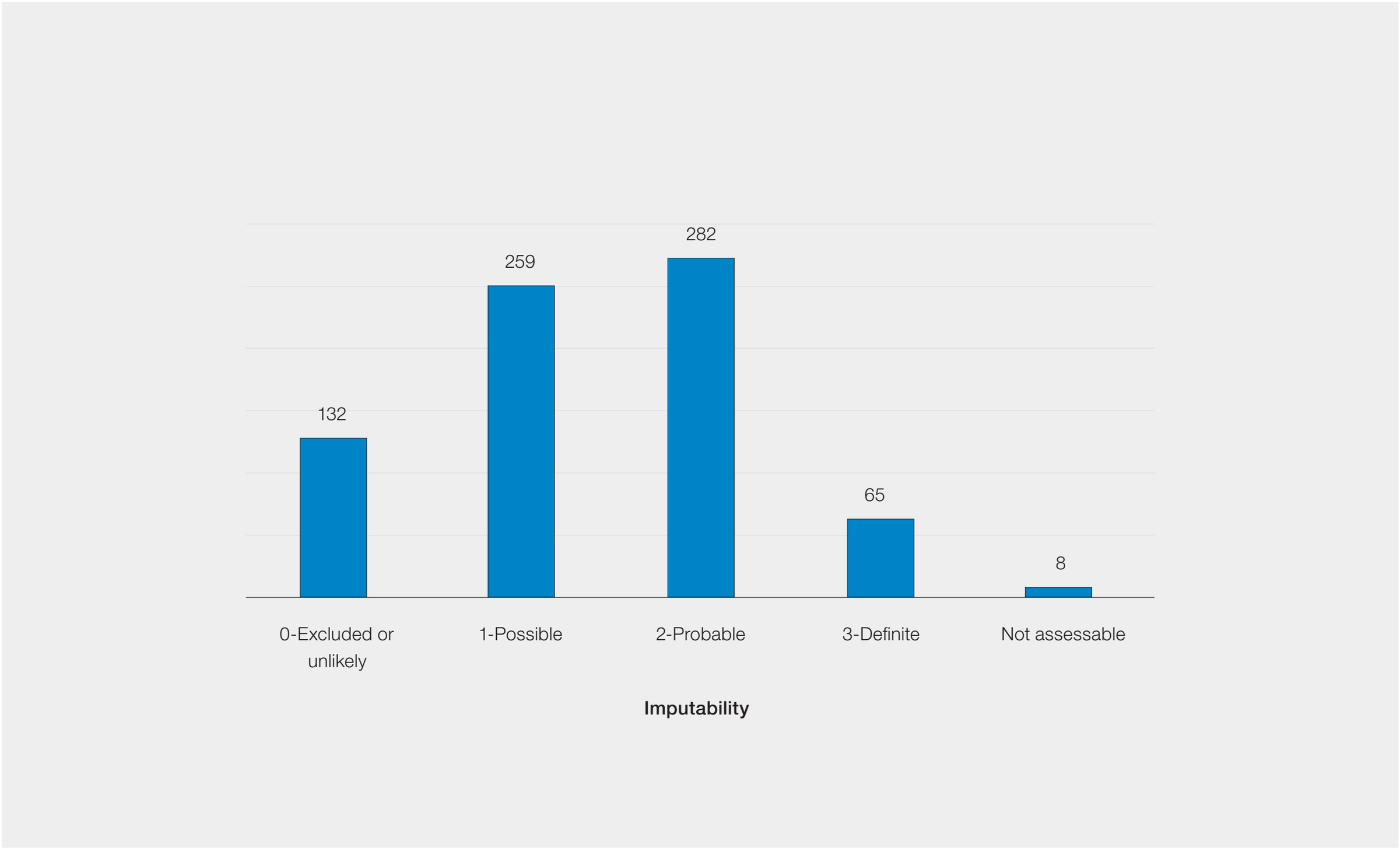


Figure 30.4: Measures that must be undertaken to ensure blood component quality and safety