Customer Education Series

Sample Rejection in Haematology and Transfusion Medicine Unit Jan to Jun 2021

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Pathology (Haematology)
9 Dis 2021

Sample rejection

- Sample rejection: sample that is not accepted by laboratory for analytical process.
- There is many causes of rejection.
  Most of it is due to error in requesting test (e.g. incomplete form), fail in identification of patient or sample, improper sample collection, handling and transportation.

Sample rejection

- The consequences of sample rejection:
  - delay in availability of test results → delay in treatment
  - In some case, patients may be transferred to another unit before another specimen can be obtained → patient and family dissatisfaction.
  - Repeated sample collection : affect heath care organization by increasing cost, wasting the time of skilled professionals

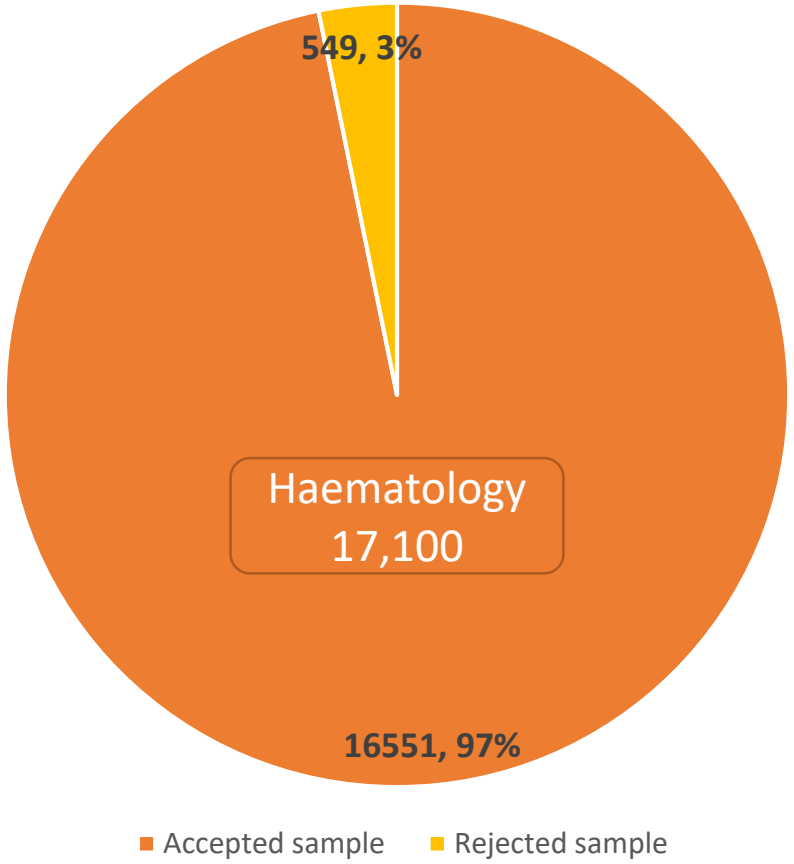
Rejection Rate

- Rejection rate = nominator/ denominator x 100%
- <1%
- Mission: Advocating, educating and monitoring continuous quality improvement and patient safety in healthcare.

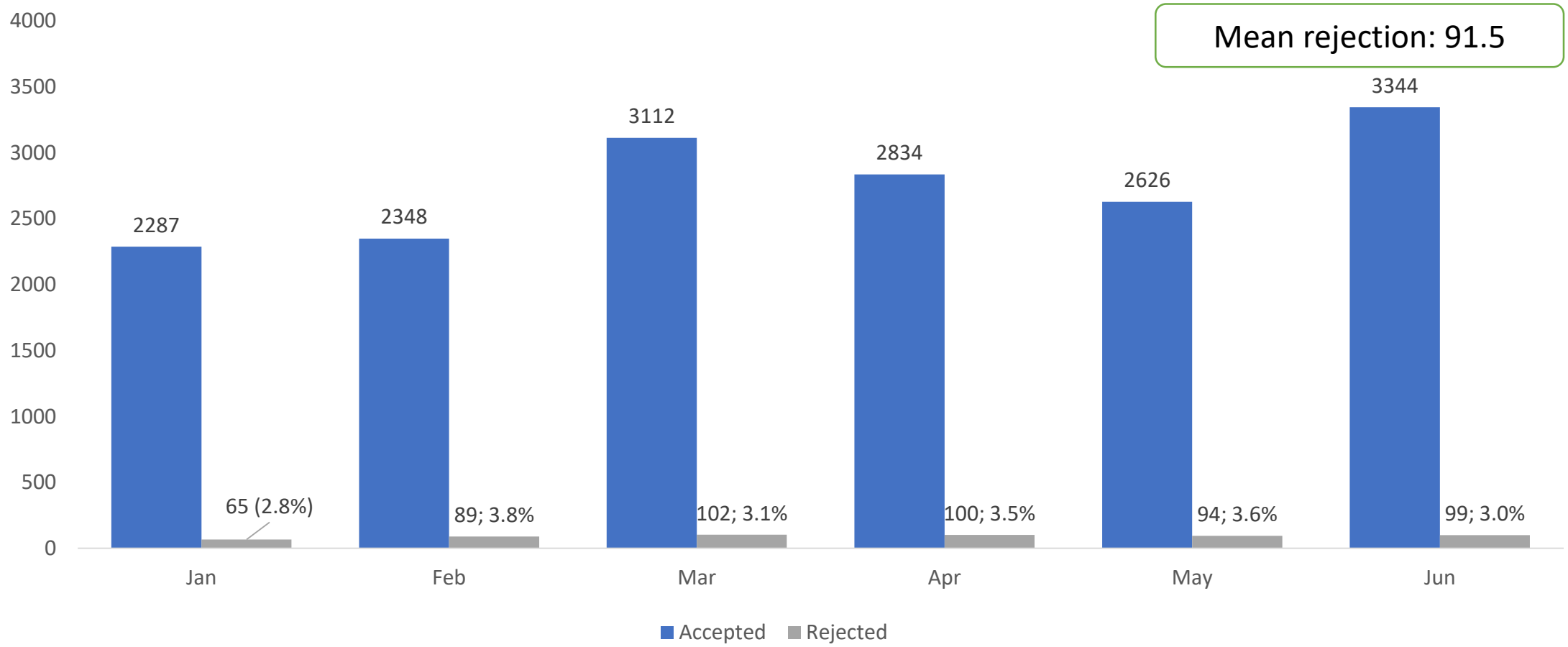
MALAYSIAN SOCIETY FOR QUALITY IN HEALTH

SERVICE STANDARD 15: PATHOLOGY SERVICES			
There is tracking and trending of specific performance indicators which include but not limited to at least two (2) of the following indicators:			
No	**INDICATOR**	**TARGET**	**Reporting Frequency**
1.	Laboratory Turnaround Time (TAT) for urgent Full Blood Count within 45 minutes	> 90%	Monthly
2.	Notification of neonatal serum bilirubin result >300 umol/L within 30 minutes	within 30 minutes	Monthly
3.	Rejection Rate of specimens	<1%	Monthly

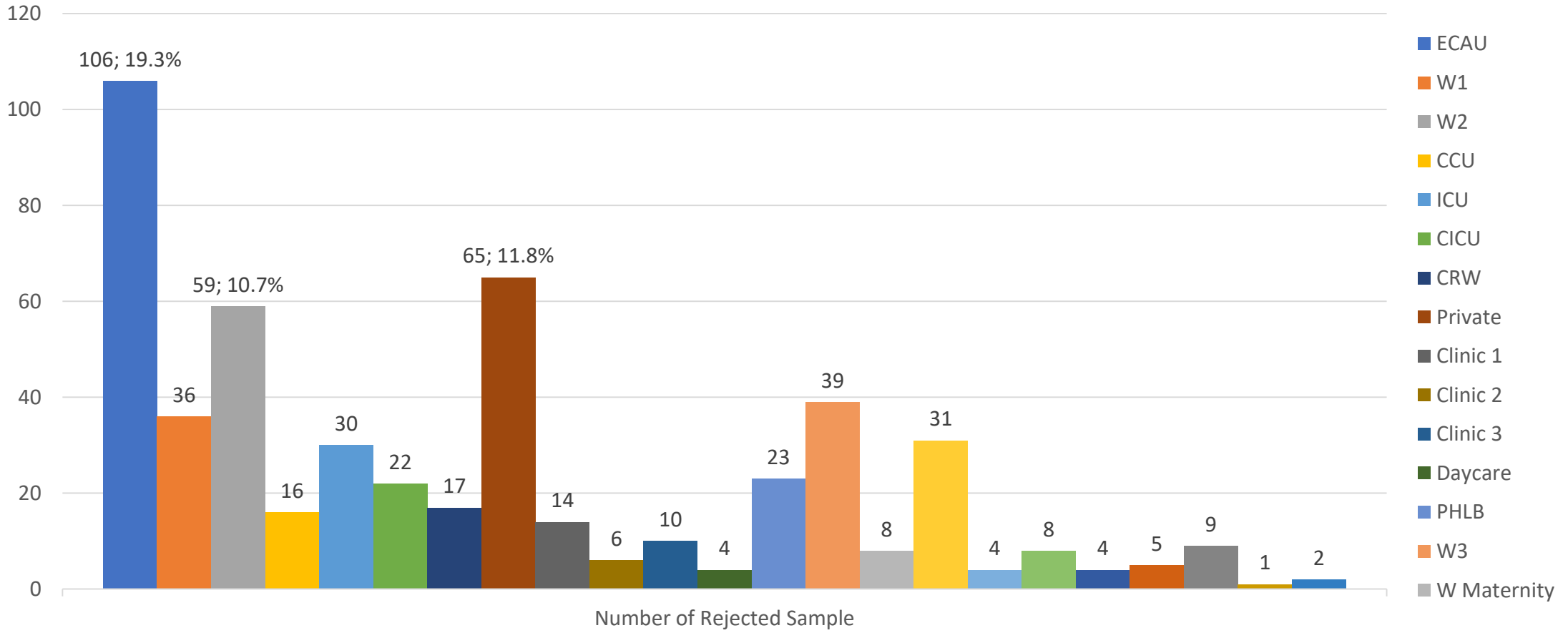
Sample Rejection in H&TM unit
Jan to Jun 2021



Monthy sample rejection

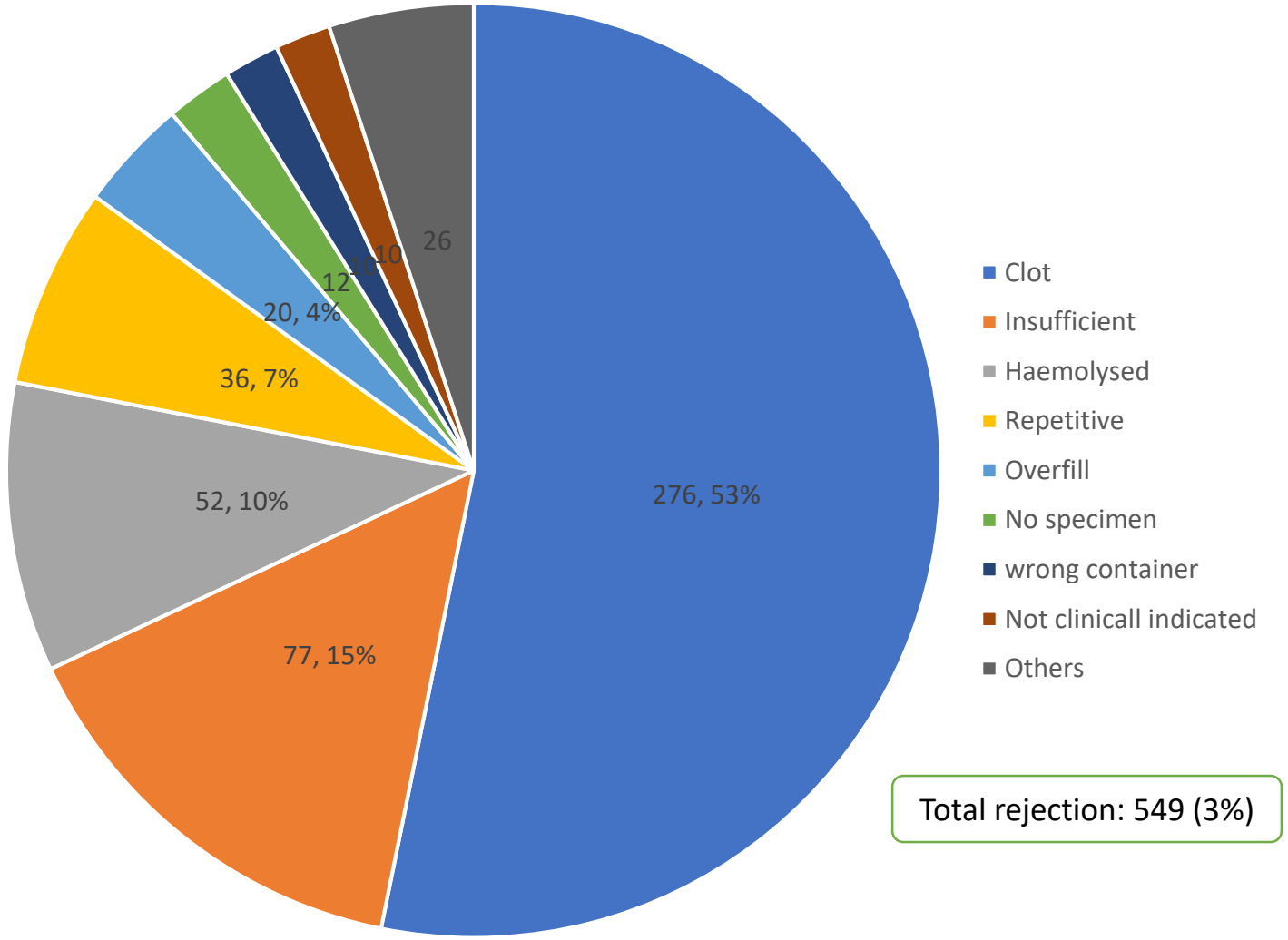


Location


120
100
80
60
40
20
0
106; 19.3%
36
59; 10.7%
16
30
22
17
65; 11.8%
14
6
10
4
23
39
8
31
4
8
4
5
9
1
2
Number of Rejected Sample
ECAU
W1
W2
CCU
ICU
CICU
CRW
Private
Clinic 1
Clinic 2
Clinic 3
Daycare
PHLB
W3
W Maternity

Causes

Clotted	276
Insufficient	77
Haemolysed	52
Repetitive order	36
Overfilled	20
No Specimen	12
Wrong Container	10
Not Clinically Indicated	10
Contaminated Sample	7
Wrong Labelling	5
Cancelled By Requester	4
Lipaemic Sample	3
Result Not Tally With Previous	3
Out Of Stability	2
Missing Label	1
Test Is Not Offered	1

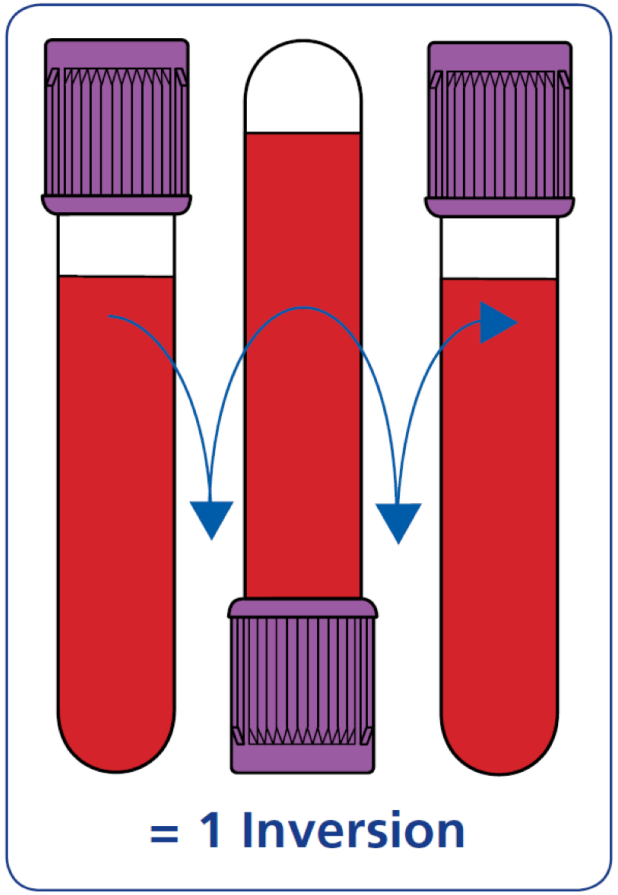


Total rejection: 549 (3%)

Clotted Sample

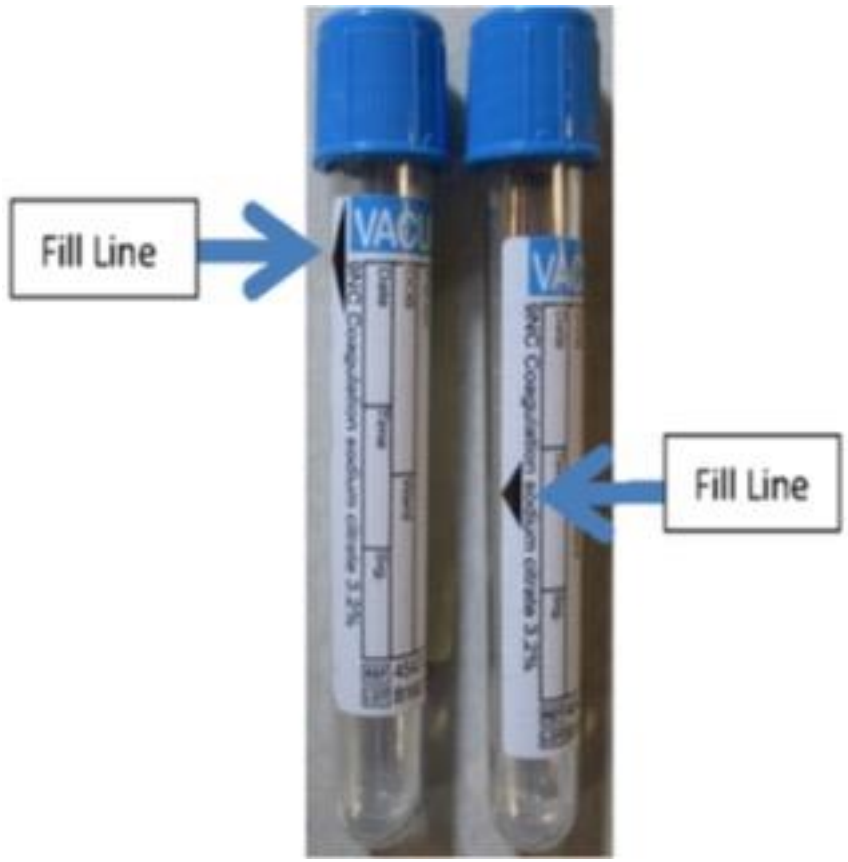
- Improper mixing of anti-coagulated tubes [EDTA (lavender) and coagulation sodium citrate (blue) tubes] after collection.
  - The anticoagulant in EDTA tube is sprayed onto the inside of the tube while the coagulation sodium citrate tube has a liquid anticoagulant.
  - The tubes need to be gently inverted at least 8 - 10 times immediately after collection to make sure that the anticoagulant is properly mixed with the blood components to stop the entire clotting mechanism.
  - A slow draw into a vacutainer tube- tube should be mixed intermittently until filled to prevent hemostasis.
- Delay in placing blood in tubes e.g slow draw using a syringe or leaving blood in a syringe too long.


349 × 465


= 1 Inversion

INSUFFICIENT SAMPLE

- All collection tubes must be filled with the required volume.
- Fill lines are indicated by the black and white notches on the side of the label.
- Blood collection tubes contain an additive, e.g. anticoagulant in EDTA tubes.
  If less blood than required is drawn into the tube, the amount of additive present may interfere with the accuracy of test results.
  You may see:
  - false decrease in haematocrit value due to dilution of the blood
  - false decrease of analyte values due to dilution of the blood
  - inaccurate MCV, MCH, MCHC and HGB
  - altered RBC shape: erythrocytes will shrink d/t high osmolality of anticoagulant fluid
  - artifactually prolonged clotting time


Fill Line
Fill Line


K2E EDTA K2
DOB
Date
Time
Ward
Sig
REF
LOT

HAEMOLYSED SAMPLE

- Occurs when RBCs burst and the haemoglobin escapes and spoils the surrounding sample.
- In vitro hemolysis may be caused by:
  - incorrect needle size
  - improper tube mixing (vigorous mixing)
  - incorrect filling of tubes
  - excessive suction
  - prolonged tourniquet
  - difficult collection
  - extreme temperature
  - delayed processing
  - prolonged storage
  - finger-prick samples: squeezed finger too hard or scraped finger on the side of the tube rather than letting the droplets drop down the tube gently.
- The impact of in vitro hemolysis:
  - potassium concentrations inaccurate
  - artefactually low hb

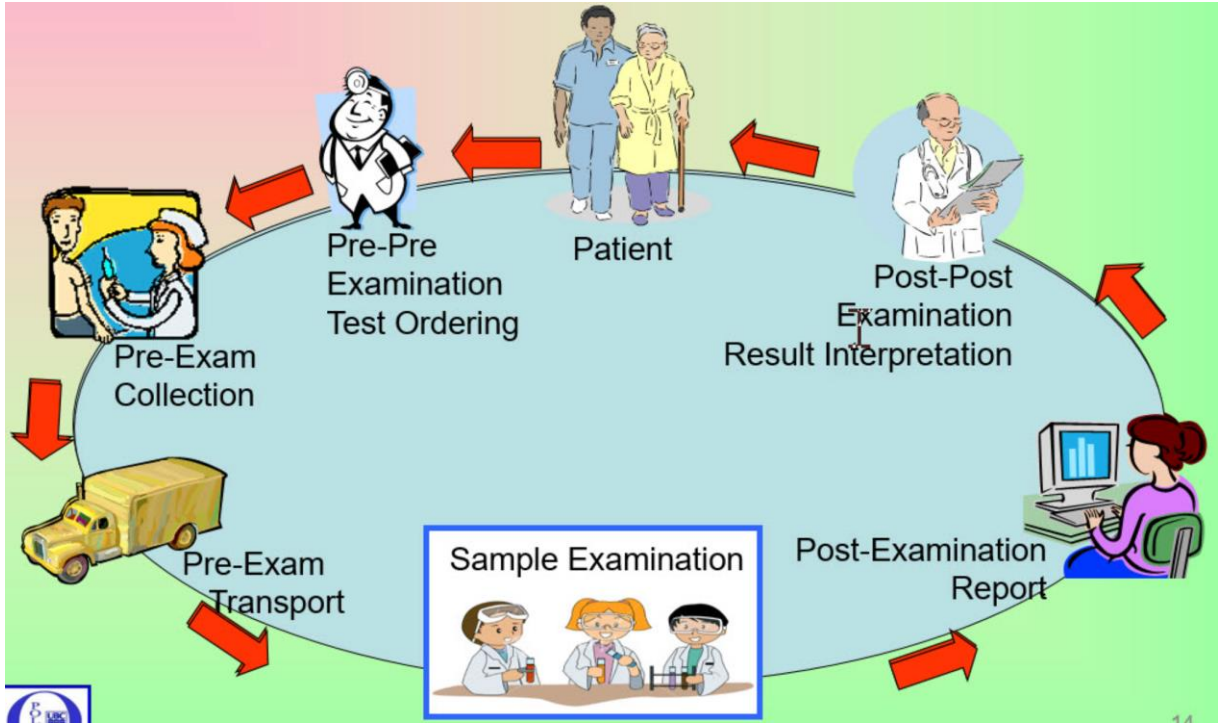
Repetitive order

- Consequences:
  - Iatrogenic Anemia in Patients
  - Increased Expenditure: Unnecessary ↑ cost to healthcare system and ↑ laboratory's workload
  - Increase chances of FP, leading to unnecessary further laboratory investigations.
- Approches to reduce repetitive order
  - Education
  - Audits
  - Information technology play a crucial role in avoiding repeat testing. Review results in UNIMEDS before deciding to order lab test.
  - Comparison of ordering practices among clinicians can improve ordering practices and avoid repetitive tests.
  - Knowing turn around time (TAT) of test

Test	TAT
FBC ESR	Urgent: 1 H Ward: 4 H Clinic: 5 days
PBF	5 working days
Coagulation	Urgent: 1 H Ward: 4 H Clinic: 5 days
Hb analysis	30 working days

Conclusion

- Diagnostic tests influence around 60-70% of the clinical decision-making process.
- Avoiding the incidence of sample rejection can minimize laboratory expenditure and ensure high-quality patient care.
- There is no single standard approach to ↓ sample rejection rate. Physicians, lab personnel & hospital, must work together and coherently, using available guidelines to minimize rate of sample rejection.



References

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- Tolan NV, Kaleta EJ, Fang JL, Colby CE, Carey WA, Karon BS, et al. Neonatal intensive care unit quality initiative: identifying preanalytical variables contributing to specimen hemolysis and measuring the impact of evidence-based practice interventions. Am J Clin Pathol 2016. Jul;146(1):113-118.
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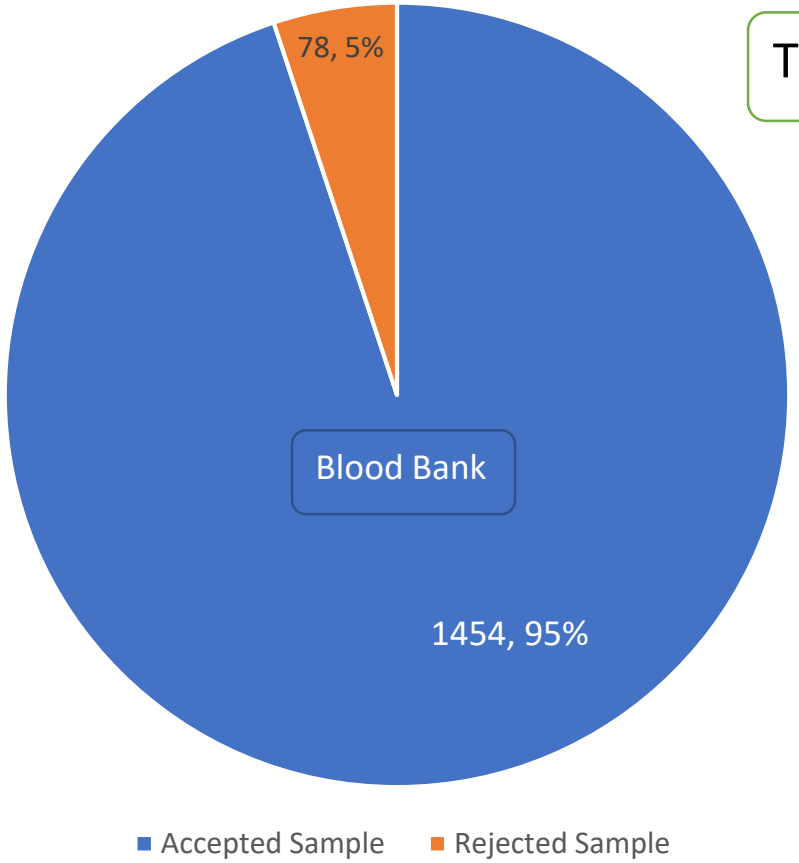
- Streichert T, Otto B, Schnabel C, Nordholt G, Haddad M, Maric M, et al. Determination of hemolysis thresholds by the use of data loggers in pneumatic tube systems. Clin Chem 2011. Oct;57(10):1390-1397.


Thank You!

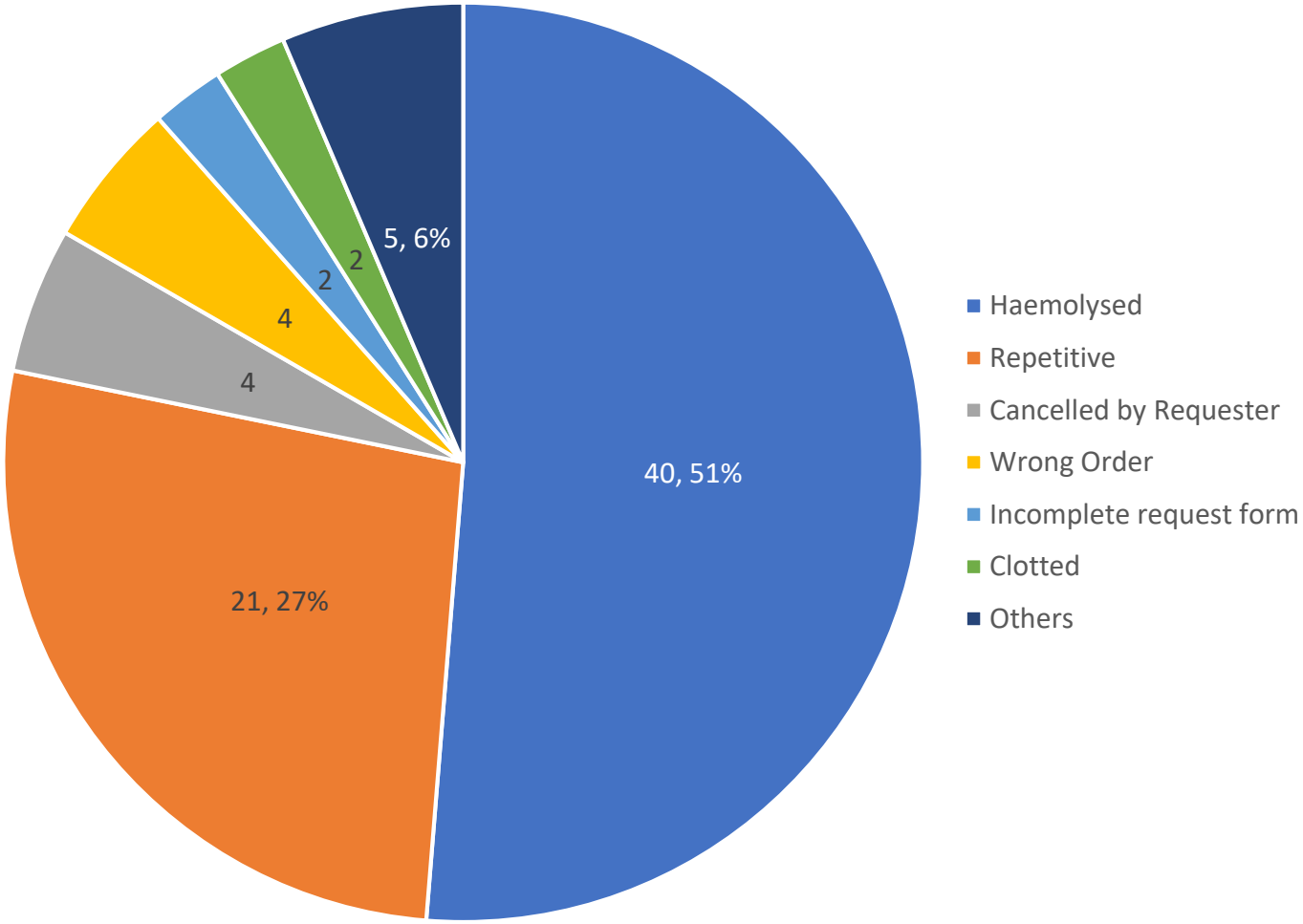
Sample Rejection in H&TM unit
Jan to Jun 2021



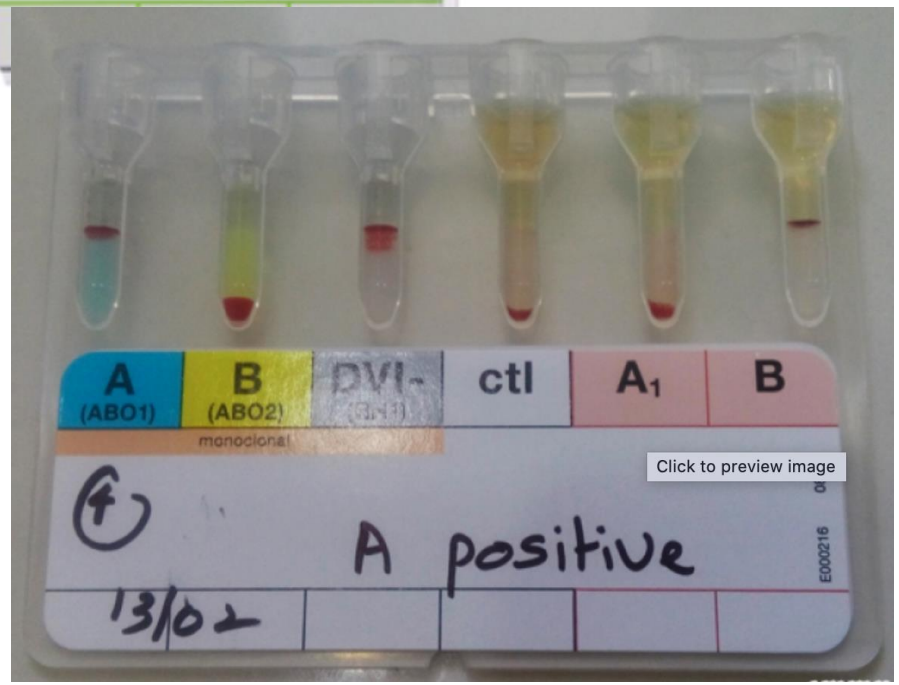
Total Received sample: 1532

Causes:

Haemolysed	40
Repetitive	21
Cancelled by requester	4
Wrong order	4
Incomplete request form	2
Clotted	2
Lipaemic	2
Insufficient sample	1
Wrong container	1
Not indicated	1
TOTAL	78




II
III
I
II
III
Anti-IgG+C3d
2
3
–


A
(ABO1)
B
(ABO2)
monoclonal
DVI-
ctl
A1
B
Click to preview image
A positive
13/02


A-cell
B-cell
shutterstock