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IMPROVING BLOOD SAMPLE COLLECTION PROCESS USING DMAIC METHODOLOGY

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INTRODUCTION

Blood sample collection is a critical process more so in **oncology**, as the every sample collected is precious as often times patients' veins are fragile, small in diameter and difficult to anchor. The challenge got highlighted in the year 2021 when analysis showed that on an average 28 Sample collection errors per month from IPD areas including ICUs required intervention and overall review. In order improve the overall process; a study was planned using **DMAIC methodology** in view of increasing number of sampling related errors . It demanded an intervention and overall review.

AIM

To review overall blood sample collection process using DMAIC with following objectives:

- To reduce the errors in sample collection techniques and reduce number of re-dos;
- To ensure the aseptic techniques are followed during sample collection.
- Reduce waiting time for report generation

METHOD

DMAIC approach was adopted to review the overall process and analyze existing data using various quality tools.

(DEFINE) Pareto applied to sampling errors of year 2021.

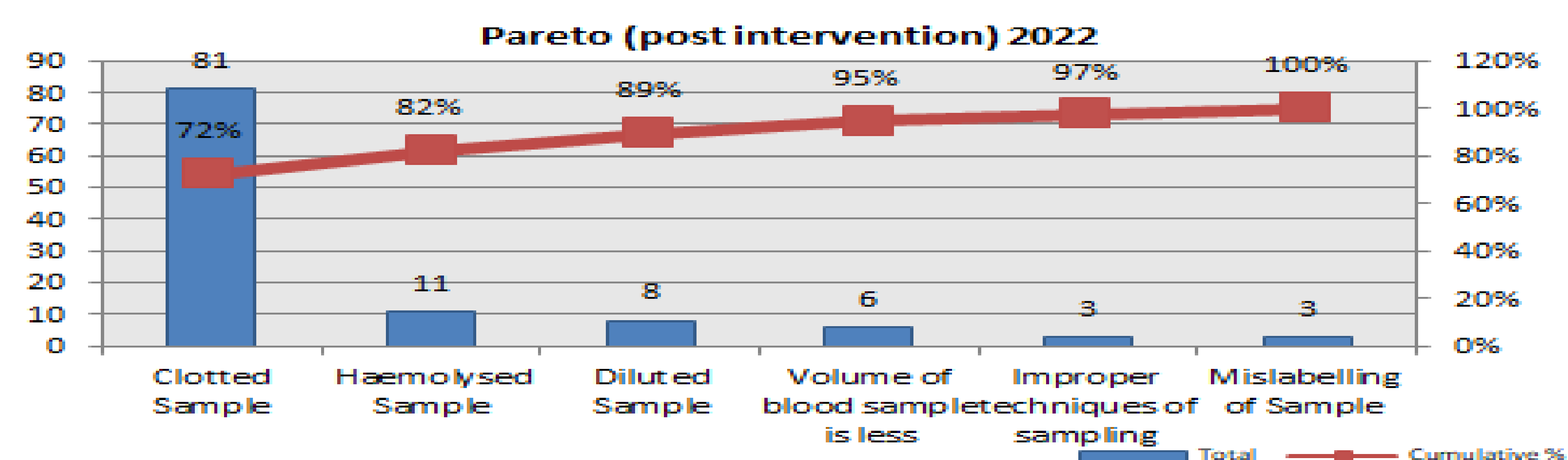
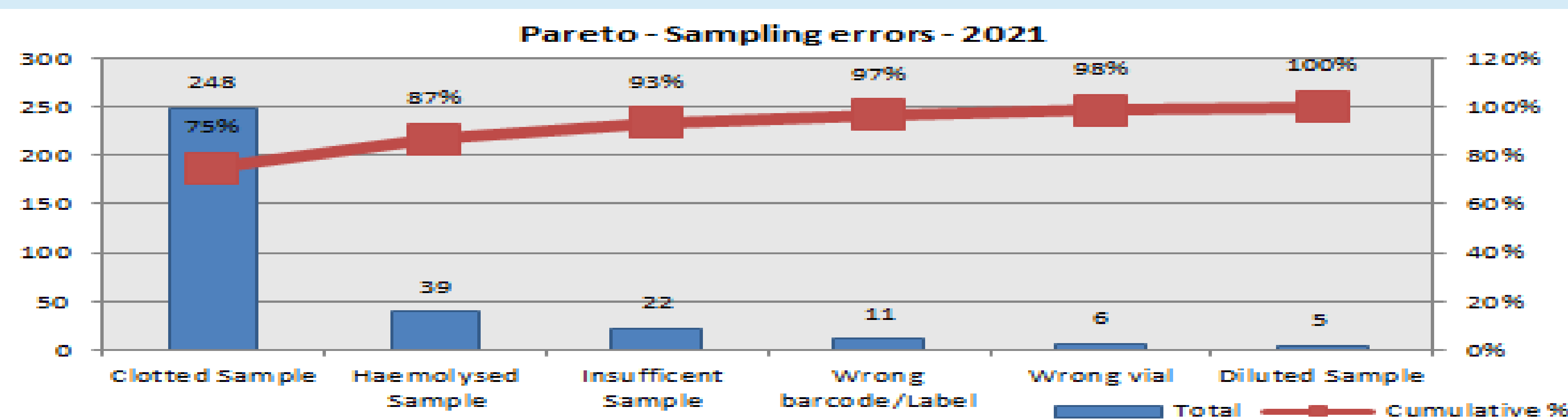
(MEASURE) - A prospective sampling audit initiated using a checklist, 50 Samples per week were observed for 2 months (Jan-Feb2022) followed by an audit in Mar – Apr 2022 (Post Intervention). The observers were Night Supervisor/Quality/Nurse/ Designated observers.

(ANALYSE) The root cause identified was < 90% compliance were bar code not generated before sampling, IPSG 1not followed in 20% of the cases, inappropriate tray arrangement (21% of cases). The mixing of sample by inversion was only 76% (reason for sample clotting). The cross verification by seniors before collection (63%) and patient education (51%) was very low. 53% staffs involved in wrong collection had experience of less than 1 year.

RESULTS

(IMPROVE) - Preventive action - sample collection by novice staff to be supervised by senior staff; blanket training to staff on sample collection technique & other safety measures. Difficult sampling to be either done by senior staff or line care team. The problem of samples in wrong tubes addressed with vial colors displays in system (screen) during barcode generation. The availability of resources like tourniquets, sampling trays and other items were ensured;

(CONTROL) - In order to sustain the compliance audits continued along with monitoring of sampling errors and CAPA in on case to case basis. The findings also being discussed in Incident review meeting. Clotted samples reduced from 248 to 81; Haemolysed samples from 39 to 11; insufficient quality and samples in wrong vial zero and mislabeled samples from 11 reduced to 8 with stated interventions. The patient population was almost same from comparison point of view.



CONCLUSIONS

Blood sample collection process needs to be reviewed on time to time basis along with continuous monitoring of sampling related errors.

Post intervention a re-audit was conducted in Mar – Apr 2022 and it was observed that sampling errors reduced to 18 per month as compared to 28 in the year 2021.

Continuous training of nursing staffs on sample collection technique and infection prevention practices regularly.

The error rate cannot be zero especially in oncology set up due to challenges in blood sample collection as patients have fragile veins, veins are difficult to locate as they are thin and multiple times testing is required.

The monitoring of the same to be continued with interventions wherever required for continual quality improvement.

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