



# **QUALITY INDICATORS: PERFORMANCE TOOLS OF BLOOD TRANSFUSION SERVICE**

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# INTRODUCTION

- The primary goal of transfusion medicine is to promote high standards of quality in all aspects of patient care and services.
- BTS can reach the highest levels of efficiency through implementation of quality management systems (QMS).<sup>1</sup>
- QMS includes the organizational structure, responsibilities, policies, processes, procedures, and resources established by the management to achieve and maintain quality.<sup>2</sup>

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2. Bhatnagar NM, Soni S, Gajjar M, Shah M, Shah S, Patel V. Performance indicators: A tool for continuous quality improvement. *Asian J Transfus Sci* 2016;10:42-7.



- Quality indicators are Quality Management System (QMS) tools which;
  - ✓ provide proof of the level of quality performances.
  - ✓ utilize the information gained to seek improvements in the quality.<sup>3</sup>
- Hence they monitor & evaluate the quality of transfusion process.



## AIMS & OBJECTIVES

To evaluate and analyse quality indicators as performance tools of our Blood Transfusion Services.



# MATERIALS & METHODS

- STUDY DESIGN: Retrospective study.
- DURATION OF STUDY: 2 years ( 2014-2015)
- PLACE OF STUDY: Department of IHBT,  
MGM Hospital Blood Bank, Kamothe, Navi Mumbai.



The data was captured for 8 quality indicators defined by NABH, namely;

- TTI%
- Adverse transfusion reaction rate
- Wastage rate for each component
- TAT for blood issues
- Component QC failure
- Adverse donor reaction rate
- Donor deferral rate
- % of components issued



1. **TTI%** = 
$$\frac{\text{Combined TTI cases ( HIV + HBV + HCV + Syphilis + MP )}}{\text{Total No of Donors}} \times 100$$

2. **Adverse Transfusion Reaction Rate %** = 
$$\frac{\text{No. of adverse transfusion reactions} \times 100}{\text{Total no. of blood and components issued}}$$

3. **Wastage rate %** = 
$$\frac{\text{No. of blood/ blood components discarded} \times 100}{\text{Total no of blood / blood components issued}}$$



#### 4. Turnaround Time (TAT) of Blood Issues =

$$\frac{\text{Sum of the time taken}}{\text{Total number of blood and blood components cross matched/reserved}}$$

#### 5. Component QC failures (for each component) =

$$\frac{\text{No. of component QC failures}}{\text{Total no. of component tested}} \times 100$$

#### 6. Adverse Donor Reaction Rate % =

$$\frac{\text{No. of donors experiencing adverse reaction}}{\text{Total no. of donors}} \times 100$$





## 7. Donor Deferral Rate % =

$$\frac{\text{No. of donor deferrals}}{\text{Total no. of donation + total no. of deferrals}} \times 100$$

## 8. % of components =

$$\frac{\text{Total component issues}}{\text{Total whole blood + component issues}} \times 100$$

- Outcomes of the data were analysed and charted.



## RESULT

A total of 8444 blood bags were collected of which 7849 units were separated into components and rest were either kept as whole blood or were discarded.

QI's	2014	2015	Overall
<b>TTI%</b>	0.74	0.94	0.85
<b>ATRR%</b>	0.11	0.19	0.15
<b>Wastage rate %</b>			
• WB	1.69	2.48	2.11
• PRBC	2.21	3.59	5.64
• Platelet	16.65	15.6	15.98
• FFP	2.32	1.00	7.32%
<b>TAT</b>			
• Routine	2.45 hrs	2.10 hrs	2.18 hrs
• Emergency	32.36 min	25.67 min	26.99 min
<b>QC Failure Rate %</b>			
• WB	0	0	0
• PRBC	7.1	8.33	7.69
• Platelet	6	14.58	10.20
• FFP	8.33	12.5	10.41
• SwPC	8.69	4.16	6.38
<b>ADRR%</b>	0.94	1.24	1.18
<b>DDR%</b>	10.28	8.3	9.3
<b>% Components Issue</b>	97.86	98.99	98.18



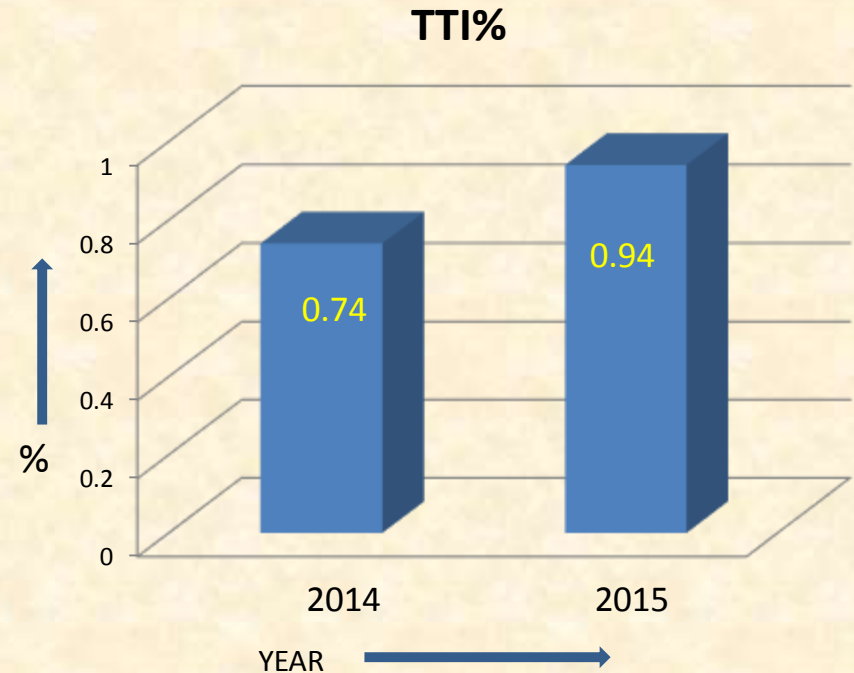
# DISCUSSION

Quality Indicator Data is acted upon by<sup>4</sup>:-

- Continuous measurement
- Identifying problems
- Root cause analysis
- Implementing corrective action
- Developing a quality improvement strategy ( Preventive action)
- Reporting
- Seeking opportunities for improvement.



- Overall TTI % was **0.85%**
- Increased in 2015 ( 0.94%) from 2014 ( 0.74%).
- **HBsAg was most seroprevalent.**
- Similar findings in Fernandes et al.(2010)<sup>5</sup>- 0.6% and Zulfikar et al. (2102)<sup>6</sup>- 0.82% .
- PA-Proper donor screening
  - reliable screening tests
  - counselling of positive donors.<sup>7</sup>



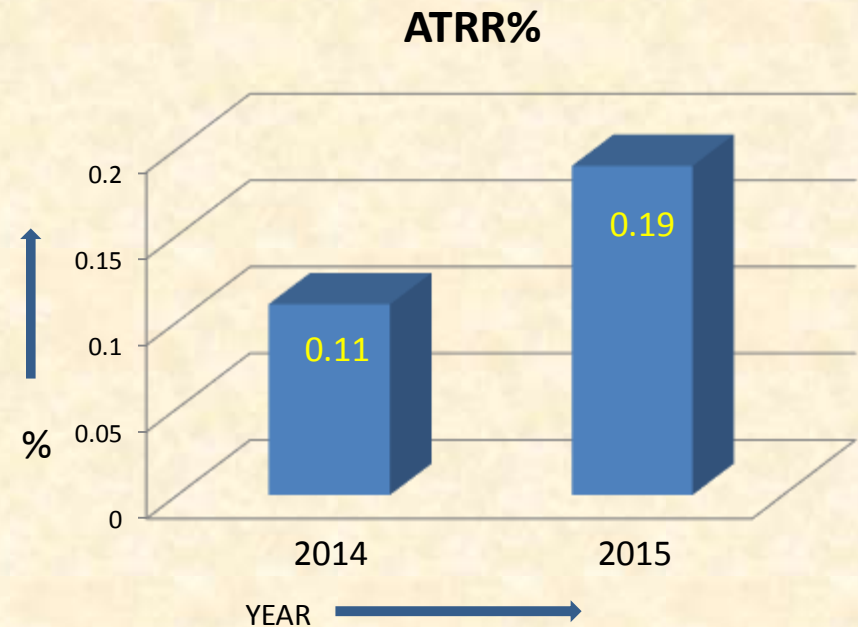
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- Overall ATRR % was **0.15%**, similar to Bhattacharya et al (2011)<sup>8</sup>-0.18% and Chakravarty-Vartak et al (2016)<sup>9</sup>-0.16%
- Majority caused by **allergic reactions and FNHTR's(90%)**.
- Use of newer technologies like leukoreduction, reporting of all adverse events & continuous education to medical and paramedical staff will help in reducing the ATR's <sup>10</sup>.



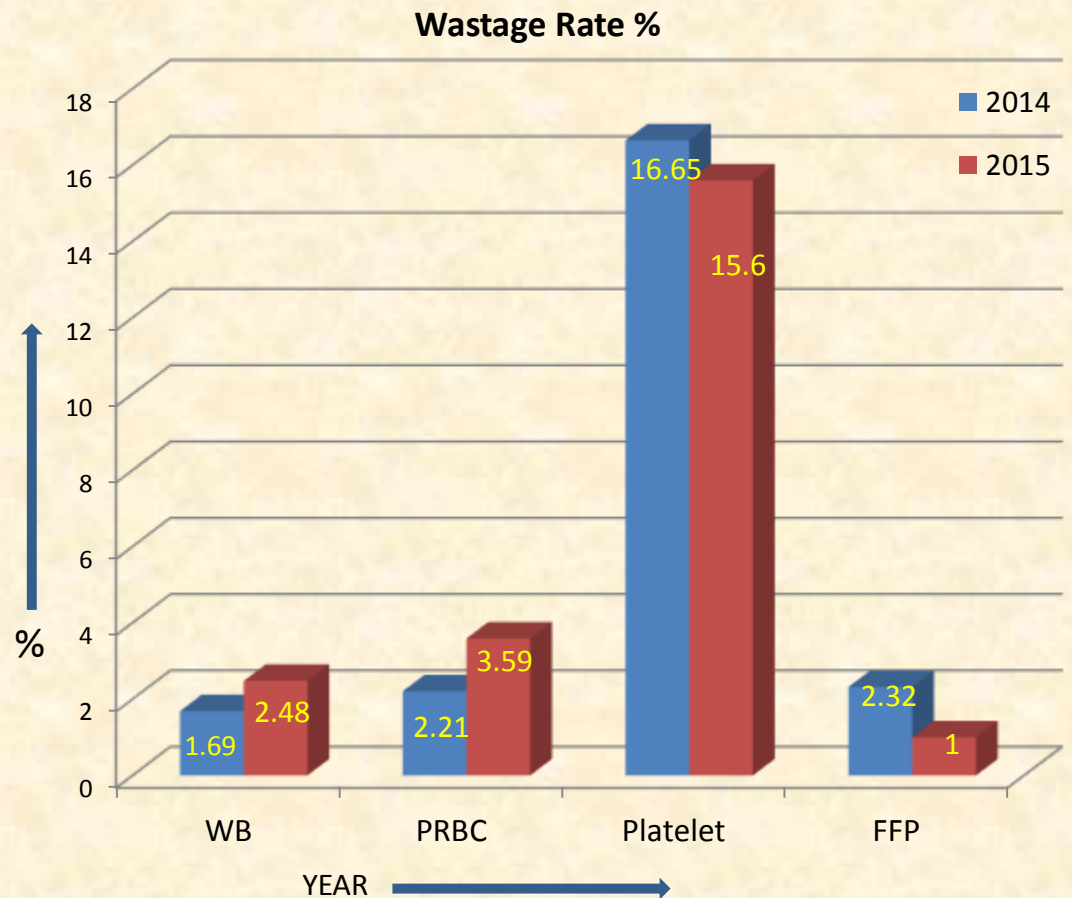
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- Overall wastage rate of
  - ✓ **WB - 2.11%**
  - ✓ **PRBC - 5.64%**
  - ✓ **Platelet - 15.98%**
  - ✓ **FFP - 7.32%**
- Similar studies-Suresh et al (2015)<sup>11</sup> & Kaur et al(2016)<sup>12</sup>.
- **Most common discarded units were platelets due to date expiry.**
- PA- Judicious use of blood can minimize the number of discarded blood to a reasonable rate.<sup>1</sup>



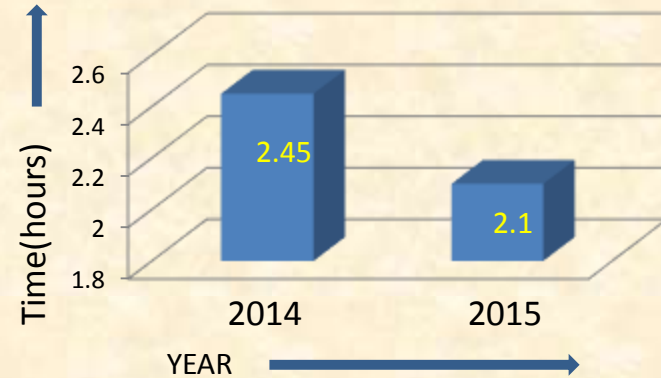
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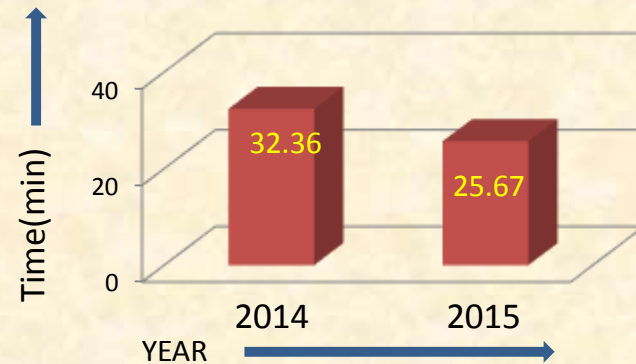


- Overall **TAT for routine issues was 2.18 hours** similar to study Gupta et al<sup>13</sup> (2015) -2.55 hours
- **Overall TAT for emergency issues was 26.99 min** similar to Ramanathan et al<sup>14</sup> (2015)- 30.3 min.
- More TAT in 2014
- Training of the technical staff to act momentarily for blood requests- reduced TAT in 2015.
- Limitation- less availability of other studies to compare.

### ROUTINE TAT



### EMERGENCY TAT



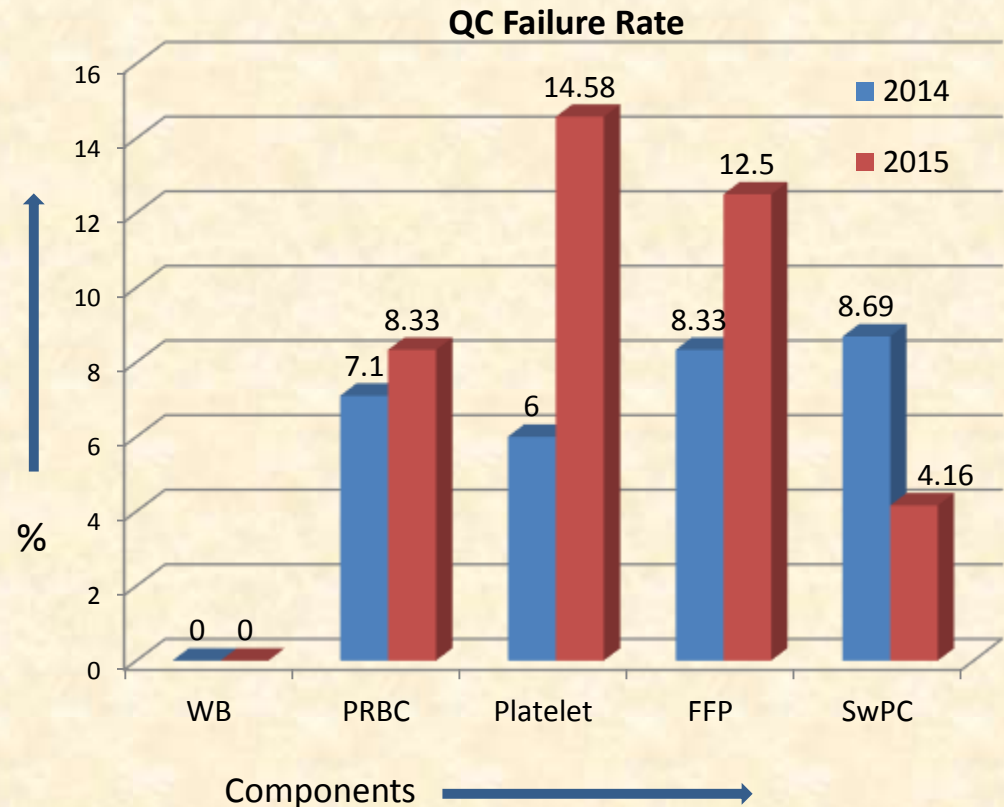
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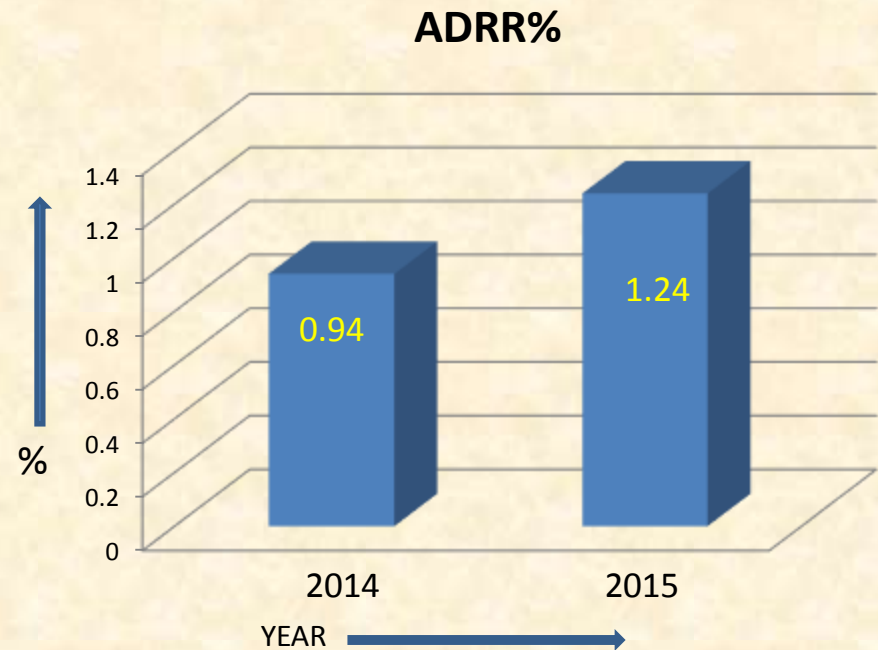
- Overall QC failure rate
- ✓ WB - 0
- ✓ PRC - 7.69% , Passed QC- 92.31%
- ✓ Platelet - 10.20% , Passed QC- 89.90%
- ✓ FFP - 10.41% , Passed QC- 89.59%
- ✓ SwPC - 6.38% , Passed QC- 93.62%
- **1% of component is tested for Quality Control out of which 75% should match the acceptable ranges.<sup>15</sup>**
- No failure rate for WB- not much kept in stock.
- Upgradation & training of technical staff for component separation will help in further reducing QC failure.



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- Overall ADRR% was **1.18%**
- Similar studies- Abhishekh et al<sup>16</sup>(2013)- 2.03% and Kumar et al<sup>17</sup> (2014)- 0.93%.
- Was more in the year 2015.
- Majority were **vasovagal** in nature.
- PA- Pre-donation counselling, post-donation counselling and care required to minimize risk of adverse events.<sup>18</sup>



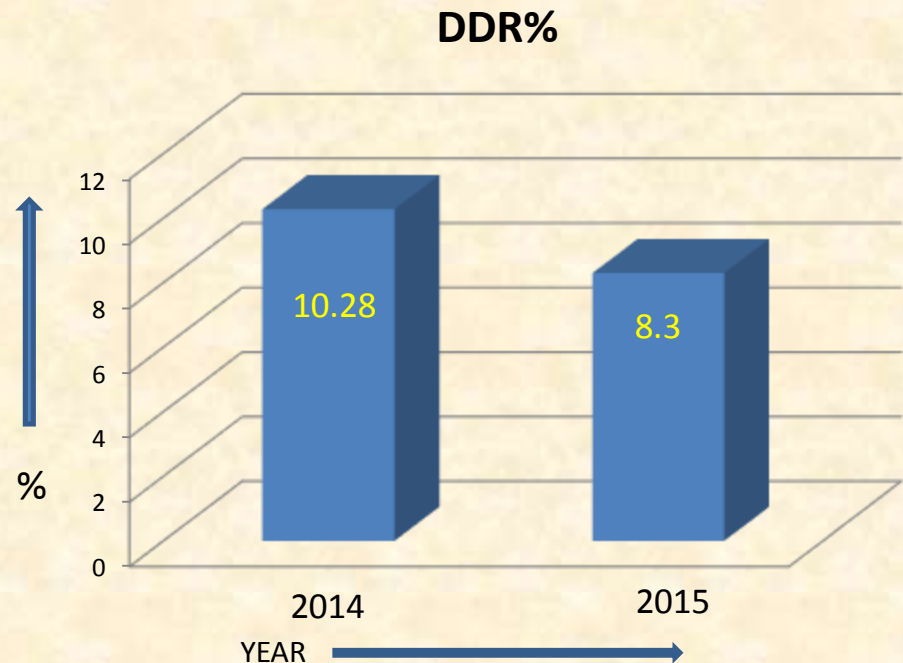
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- DDR% was **9.3%**
- Similar studies-John et al<sup>19</sup>(2015)- 5.12% , Rehman et al<sup>20</sup>(2012)-12.4%, Agnihotri et al<sup>21</sup>(2010)-11.6%
- Variability can be due to demographics of study population.
- Most common cause **low Hb** followed by medication history.
- PA-Modification of donor recruitment strategies,
  - Rationalization of deferral criteria and
  - counselling of deferred donors.<sup>20</sup>



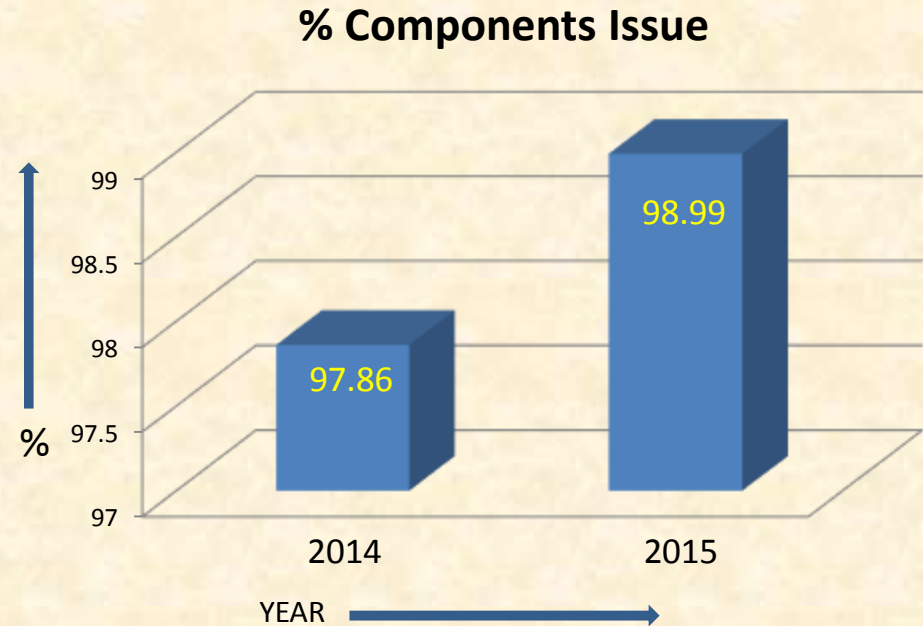
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21. Agnihotri N. Whole blood donor deferral analysis at a center in Western India. *Asian Journal of Transfusion Science*. 2010;4(2):116-122. doi:10.4103/0973-6247.67035.



- Overall Percent component issue was **98.18%**.
- More in 2015 (98.99%) than 2014 (97.86%).
- We are not into 100% components as during big camps all collected blood is not separated into components due to shortage of staff.





# CONCLUSION

- Blood and blood components play an essential role in patients' management.<sup>22</sup>
- Blood components are frequently ordered and utilized without proper analysis of the real needs, thus wasting a very important resource.
- A well-structured BTS contribute towards better healthcare<sup>22</sup> - reflected by quality indicators(QI's).



- QI's are important QMS tool for accomplishment of the quality goals.<sup>23</sup>
- Quality improvement by QI's- enable an organization to attain higher levels of performance by creating new or better standards or removing deficiencies in products, processes or services.<sup>2</sup>
- Stakeholders need to ensure that the QI's are instituted in the right way for improving the quality of BTS in the organization.<sup>24</sup>
- Thus, this study provide a basis for the implementation of corrective measures and continuous quality improvement by means of QI's.

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**THANK YOU**