Title: Performance of Blood Banks in India: A Retrospective Cross-sectional Analysis of States and Districts

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Aim: This India-wide retrospective cross-sectional analysis using data from National Blood Transfusion Council (NBTC) for the most recent year: 2016, created a framework with multiple thematic indices to understand blood banking performance across the country.

Methods: For this retrospective cross-sectional analysis, data was extracted from the National Blood Transfusion Council for the most recent year: 2016. 205 and 24 variables at state and district levels were used for analysis, respectively. Our LCoGS-based framework considered themes of volumes, safety, regulations, infrastructure, workforce, and ownership for synthesising composite indices using the Mazziotta Pareto Index (MPI) method. Seven and five thematic indices were estimated at state and district levels, respectively. The overall index was a composite of thematic indices. These values were scaled from 0 to 100 using min-max scaling. Lower values reflected poor performance. Pearson correlation was used to test association among different thematic indices. Ethics approval was not needed since the research was conducted on publicly available aggregate data.

Results: For 35 states, the median [interquartile range] value of the overall index was 59.61 [46.35, 71.67] and that for 616 districts was 32.45 [27.31, 40.63]. Chandigarh had the highest overall value among states while Kolkata, West Bengal among the districts. Ownership and accreditation indices were correlated at the district level (n=616, R=0.92).

Conclusion: Central and southern Indian districts performed better than other regions. Infrastructure and ownership indices had lower median values than the other indices indicating a shortfall across blood banks.
Performance of Blood Banks in India: A Retrospective Cross-sectional Analysis of States and Districts

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Introduction

The Lancet Commission on Global Surgery (LCGS) and subsequent research have highlighted gaps in blood banking globally, and its impact on surgical care in several low and middle-income countries, including India.

A comprehensive assessment investigating the factors associated in LCGS research found

Objective

To systematically review various aspects of blood banking in India, using a structured diagnostic framework at institutional level.

Methods

Study Design
Retropective cross-sectional analysis

Data Source
National Blood Transfusion Council (NBTC), National AIDS Control Organization (NACO)

Data Analysis
Twenty-five variables were obtained

- Qualitative scoring for mobilizing, recruitment, administration, blood banking, and blood volume.
- Mortality and Morbidity Index (MMI) method was used to construct the five thematic, and one overall index for each domain.
- These values were scored in a range from 0 to 100 using a rating scale. Lower scores indicated poor performance.

- Finally, these were then assessed using their MPI values for thematic and overall indices.

Findings

<table>
<thead>
<tr>
<th>Index</th>
<th>Median (Interquartile Range)</th>
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<tbody>
<tr>
<td>Accreditation</td>
<td>7.1 (4.4, 10.4)</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>6.8 (3.4, 12.8)</td>
</tr>
<tr>
<td>Safety</td>
<td>7.1 (3.0, 12.5)</td>
</tr>
<tr>
<td>Ownership</td>
<td>4.5 (1.2, 8.3)</td>
</tr>
<tr>
<td>Volume</td>
<td>30.2 (20.0, 44.4)</td>
</tr>
<tr>
<td>Overall</td>
<td>32.4 (27.3, 44.4)</td>
</tr>
</tbody>
</table>

Analysis of MPI values

Conclusion

Blood banks in the northern and northeastern states require additional attention in terms of volume, accreditation, infrastructure, and ownership. Southern and western states are most proficient in safety.

This framework can be used for monitoring and evaluating activities and can support local blood-banking policies and strategies unique to each district.

Acknowledgements

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