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 (LCoGS) 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 themes mentioned in LCoGS remains scant.

Our primary aim was:
-To systematically assess various aspects of blood banking in India, using a structured thematic framework at subnational levels.

Methods

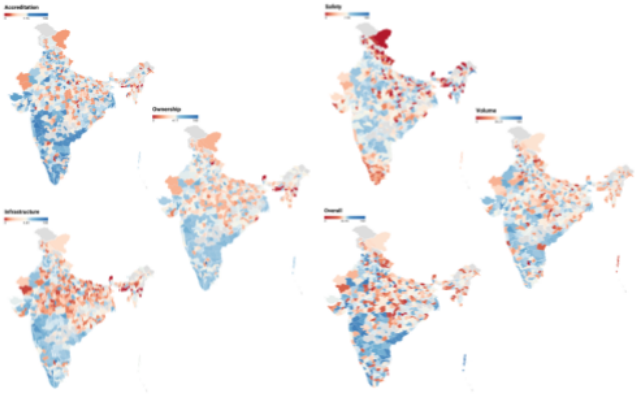
Study Design: Retrospective cross-sectional analysis

Data Sources: National Blood Transfusion Council (2016), National AIDS Control Organization (NACO)

Data analysis: Twenty-four variables were obtained for 616 districts across 35 states and union territories.

-Our framework, based on LCoGS, considered the following themes for synthesising composite indices: accreditation, ownership, infrastructure, blood handling safety, and blood volume.
-Mazziotta Pareto Index (MPI) method was used to construct the five thematic, and one overall indices for each district.
-These values were scaled to range from 0 to 100 using min-max scaling. Lower values reflected poor performance.
-Districts were then assessed using these MPI values for thematic and overall indices.

Findings



Theme	Description
Volume	Collection of blood, donation type, and separation of components component separation
Safety	Screening for transfusion infections and quality assurance
Ownership	Ownership status and their location
Infrastructure	Equipment used at blood banks for collection, testing, storage, and transit.
Accreditation	NACO accreditation of the banks.

Blood Bank Assessment Framework

Index	Median [Interquartile Range]
Accreditation	7.16 [3.64, 10.64]
Infrastructure	4.69 [1.36, 20.49]
Safety	7.39 [3.22, 12.26]
Ownership	4.17 [2.17, 8.56]
Volume	36.21 [29.85, 44.31]
Overall	32.45 [27.31, 40.63]

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-central areas must prioritise safety.

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

Caveats: Most recent data was from 2016 and the questionnaires initially filled showed under reporting of vital statistics

Acknowledgements

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